

MediaFirst Video Processing Running on Custom Hardware 2

Software Version 11.7

REFERENCE GUIDE





ENGLISH (UK) - READ THIS FIRST!

If you do not understand the contents of this manual. DO NOT OPERATE THIS EQUIPMENT. Also, translation into any EC official language of this manual can be made available, at your cost.

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Chapter 1: Introduction

This chapter identifies the equipment versions covered by this Reference Guide, describes the purpose of the equipment in a typical system and lists the available options.

Chapter 2: Installing the Equipment

This chapter provides product specific installation information including rack mounting, ventilation and pin-out details of the external connectors.

Chapter 3: Getting Started

This chapter provides instructions for powering up the unit, setting up the IP address and how to configure and use the unit.

Chapter 4: Front Panel Control

This chapter describes the front panel display menus and options and details any operating procedures.

Chapter 5: Web GUI Control

This chapter describes the features available using the Web Graphical User Interface.

Chapter 6: Networking, Redundancy and Monitoring

This chapter describes the principles and techniques used in the design of the equipment to aid in understanding its operation and function.

Chapter 7: Options, Licensing and Upgrades

This chapter describes the removal and replacement of options. It also describes the procedure for obtaining licenses and how to upgrade your unit.

Chapter 8: Preventive Maintenance and Fault-finding

This chapter details routine maintenance tasks, servicing advice and information regarding warranty and maintenance. It also lists error and error messages that may occur and recommends the action to be taken.

Annex A: Glossary

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Introduction

In a fast changing, highly competitive market, media organizations need encoding solutions that deliver high quality, high reliability and operational flexibility. The number of channels continues to increase. HD is growing fast, offering a better quality viewing experience. Consumers are buying larger and larger TV sets and now plans are being laid for Ultra High Definition TV. All that means media organizations need to make the most efficient use of bandwidth and ensure consumers get a quality viewing experience.

The Custom Hardware 2 is designed for flexibility, modularity, and multiple independent outputs. Please ensure that you are familiar with the operation of the unit by reading this guide carefully.

This Reference Guide should be kept in a safe place for reference for the life of the equipment. It is not intended that this Reference Guide will be amended by the issue of individual pages. Any revision will be by a complete reissue. Further copies of this Reference Guide can be ordered from the address listed in *Customer Services*. If passing the equipment to a third party, also pass the relevant documentation.

Revision History

Issues of this Reference Guide are listed below:

Issue	Date	Software Version	Comments
A	Jan 2016	10.2	Release for the AVP 2 Platform Reference Guide SV 10.2.
B	May 2016	11.0	Updated to software version 11.0, including support for workflow based user interface, Remux, Conditional Access and Multiscreen Encoding.
C	July 2016	11.2	Updated to software version 11.2, including support for 25 Hz frame rates, EMMs and 4:2:2 10-bit H.264 decoding.
D	Sept 2016	11.3	Updated to software version 11.3, including support for stream processing multiple component drag-and-drop.
E	Nov 2016	11.4	Updated to software version 11.4, including support for transcode/remux inputs, and ASI/IO outputs.
F	Dec 2016	11.5	Updated to software version 11.5, including support for global descriptor pass-thru, SNMP community names, independent PAT and PMT and Simulcrypt configurable TCP.
G	Mar 2017	11.6	Updated to software version 11.6, including support for multiple services to an SCG, Simulcrypt multiple EMMs, AutoCAT, and RTP/UDP IP encapsulation.

Issue	Date	Software Version	Comments
H	Apr 2017	11.7	Updated to software version 11.7, including support for broadcast workflow, ABR transcode and broadcast Transcode, and Reflex.

Associated Documents

The following manuals/guides are also associated with this equipment:

Ericsson Document Identity	Title
1/1424-EN/LZT 790 0083	MediaFirst Video Processing Running on Custom Hardware 2 – Generic Product Information - Quick Guide
1424-EN/LZT 790 0030	Installation, Safety and Compliance Information Generic Product Information - Reference Guide

Useful Links:

Installation, Safety and Compliance Information – Generic Product Information - Reference Guide can be viewed at:

<http://archive.ericsson.net/service/internet/picov/get?DocNo=17402-FGB101348&Lang=EN&HighestFree=Y>

Product Guide downloads are available for all Product Families:

<http://www.ericsson.com/ourportfolio/products/television-and-video>

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Warnings, Cautions and Notes

Heed Warnings

All warnings on the product and in the operating instructions should be adhered to. The manufacturer can not be held responsible for injuries or damage where warnings and cautions have been ignored or taken lightly.

Read Instructions

All the safety and operating instructions should be read before this product is operated.

Follow Instructions

All operating and use instructions should be followed.

Retain Instructions

The safety and operating instructions should be retained for future reference.



Warning!

Warnings give information which, if strictly observed, will prevent personal injury or death, or damage to property or the environment. They are highlighted for emphasis, as in this example, and are placed immediately preceding the point at which the reader requires them.



Caution!

Cautions give information which, if strictly followed, will prevent damage to equipment or other goods. They are highlighted for emphasis, as in this example, and are placed immediately preceding the point at which the reader requires them.

Note: Notes provide supplementary information. They are highlighted for emphasis, as in this example, and are placed immediately after the relevant text.

EMC Compliance

This equipment is certified to the EMC requirements detailed in the *Installation, Safety and Compliance Information for Ericsson Compression Products Reference Guide* supplied with your product. To maintain this certification, only use the leads supplied or if in doubt contact Customer Services.

Contact Information

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All Ericsson products and systems are designed and built to the highest standards and are covered under a comprehensive 12-month warranty.

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Customers may choose one of several Support packages, either as an enhancement during the standard 12-month warranty or as an extension after the warranty has expired.

For standalone equipment, customers may choose either Ericsson’s **Extended Hardware Warranty** or **Secure Basic Support**. Extended Hardware Warranty provides hardware repair of covered equipment after the expiration of the standard warranty. Secure Basic Support provides hardware repair, remote diagnostics and support, and 24x7x365 remote support for emergencies.

For systems, along with Secure Basic Support, customers have the option of either **Secure Advanced Support** or **Secure Superior Support**. These support packages provide higher committed response and resolution times, onsite support where necessary, service performance review and a host of other proactive services to help you get the maximum return on your investment in Ericsson solutions.

Call Ericsson Sales for more details.

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SO30 4DA
United Kingdom

Return of Equipment

If you need to return equipment for repair please contact your local Ericsson Customer Services Department.

Please refer to the Customer Services Contact Information on Page vii.

You will then be directed to return the faulty equipment to a repair centre with the appropriate facilities for that equipment. A tracking number will be issued that should be used if you need to enquire about the progress of the repair. The equipment should be properly packed and the tracking number should be clearly marked on the outside of the packaging.

Technical Publications

If you need to contact Ericsson Technical Publications regarding this publication, e-mail: tvtechpubs@ericsson.com.



Introduction

Chapter 1

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1.1 Introduction

1.1.1 Who Should Use this Reference Guide

This Reference Guide is written for operators / users of the MediaFirst Video Processing Running on Custom Hardware 2. It describes the basic functions and operations of the platform without any Option Cards fitted. This Reference Guide is written to assist in the installation and day-to-day operation and care of the platform. Maintenance information requiring the covers to be removed is not included.



Warning!

Do not remove the top cover of this equipment. Hazardous voltages are present within this equipment and may be exposed if the top cover is removed. Only Ericsson television trained and approved service engineers are permitted to service this equipment.



Caution!

Unauthorized maintenance or the use of non-approved replacements may affect the equipment specification and invalidate any warranties.

1.1.2 Software Version

This Reference Guide covers the functions of software **version 11.7**.

To verify the installed version either:

- Access the front panel, see *Chapter 4, Front Panel Control*.
- Access the Web Browser screens, see *Chapter 5, Web GUI Control*.

This manual continues to be relevant to subsequent build versions where the functionality of the equipment has not changed. Where the build standard changes the functionality, a new issue of this manual will be provided. The appropriate number should be quoted in all correspondence with Ericsson.

1.1.3 New Features in this Release

The 11.7 release of software supports the following new features:

- Broadcast workflow (with support for transcode/remux inputs).
- Creation of Reflex groups for broadcast workflows to ensure efficient use of available bandwidth.

- Variable Bit Rate (VBR) input Transport Stream (TS) support.
- Active/Inactive workflow control.
- Transcode Adaptive PreProcessing Filter (APF) as a picture quality improvements for Broadcast and Multiscreen workflows.
- Auto and Manual redundancy control for primary sources.
- 1 + 1 redundancy modes re-named as 'On Air' and 'Off Air'.
- Dolby Digital Audio Encode for Multiscreen and Broadcast workflows.
- Dolby Digital Plus Audio Encode for Multiscreen and Broadcast workflows.
- HE-AAC Audio Encode for Multiscreen and Broadcast workflows.
- SD Input support for Multiscreen workflows.
- Alarm on Option Card removal and insertion and user acceptance of changes in the Option Card Slot configuration.
- Alarm on absence of input components for Multiscreen and Broadcast workflows.

1.2 What Equipment is Covered by this Reference Guide

This Reference Guide covers the Ericsson Custom Hardware 2 base unit and options.

The base chassis options available for the unit are described in the following table.

Table 1.1 Base Chassis Options

Marketing Code	Price Object Number	Supply Object Number	Description
AVP2/BAS/AC/1600	FAZ 101 0334/13	KDU137811/2	Custom Hardware 2 Base Unit with enclosure, fans, Host Card and single AC PSU.

1.2.1 Hardware and Software Options

Hardware and software options available for this unit are listed in the following table.

Table 1.2 Hardware Options

Marketing Code	Price Object Number	Supply Object Number	Description
AVP2/HWO/AC/1600	FAZ 101 0334/14	BML 901 379	Additional AC PSU, when two are fitted provides redundant operation.
AVP2/HWO/EI9201	FAZ 101 0334/33	ROA 128 6312	Media Processing Module for up to 4 services.
AVP2/HWO/ASI/IO	FAZ 101 0334/39	ROA 128 6491	6 port ASI/IO Card.
AVP2/HWS/STD/FAN	FAZ 101 0334/22	BKV106210	Spare fan for servicing.
AVP2/HWS/STD/HOST	FAZ 101 0334/23	ROA1286278	Spare host processor for servicing.

Table 1.3 Software Options

Marketing Code	Price Object Number	Supply Object Number	Description
AVP2/SWO/BWIDTH	FAZ 101 0334/7	FAT 102 1093	Remux License for 1 Gbps of throughput per chassis. Maximum two licenses available for total of 2 Gbps.
AVP2/SWO/VP/ABR/HD	FAZ 101 0334/24	FAT 102 3485	Value pack for complete channel of ABR encoding from HD input.
AVP2/SWO/M1L2/DEC	FAZ 101 0334/25	FAT 102 3486	MPEG1 Layer II 1 x 2.0 decoding license.
AVP2/SWO/DOLBY/DEC	FAZ 101 0334/26	FAT 102 3487	Dolby Digital and Dolby Digital Plus decoding up to 5.1.
AVP2/SWO/AAC	FAZ 101 0334/27	FAT 102 3488	AAC or HE-AAC encode 1 x 2.0 including 1 x 2.0 AAC-ALC.
AVP2/SWO/DVBCA/50	FAZ 101 0334/20	FAT 102 3396	Scramble up to 50 services with DVB CSA v1 or v2.
AVP/SWO/DOLBY	FAZ 101 0334/19	FAT 102 3395	Dolby and Dolby Digital Plus 2.0 encoding with ALC up to 5.1.
AVP/SWO/MEZZ/DEC	TBD	TBD	Enables MPEG-4 AVC 4:2:2 10-bit mezzanine decode.
AVP/SWO/VP/HD	FAZ 101 0334/43	FAT 102 3817	Linear HD Value Pack.

1.3 Custom Hardware 2 Overview

The Custom Hardware 2 is Ericsson's new modular platform for multiplexing, stream processing, network adaptation and multiscreen encoding. This flexible unit is simply configured by the addition of Option Cards and licenses to build customized solutions for integrating broadcast head-end components.

The base unit is constructed using a screened self-ventilated modular system. The unit is a 2U-high chassis that may be operated freestanding or mounted in a 19-inch rack.

The following features are provided by the base unit:

- The 2U-high, 19" rack-mount chassis enables scalable solutions to be easily constructed, providing six slots for high-capacity Option Cards and two slots for dual PSUs.
- 'Hot-swappable' fans.
- Dual AC Power Supplies providing automatic load sharing and 'hot-swappable' replacement without interruption to communications or unit operation. Fuseholders are built-in to the PSU Modules
- Improved airflow from front (to rear) of unit, permitting closer-packed units and racks.
- Simplified front panel display for control, configuration and status monitoring.
- Front panel tri-color (Red/Amber/Green) light bar for clear identification of unit health/status.
- Host Card provides advanced stream processing functionality, including IP connectivity and conditional access. Control, configuration and monitoring is performed by Ericsson's easy-to-use Web Graphical User Interface (GUI).
- Dual redundant Ethernet control ports, for configuration of the unit.
- Pair 1: 2x 10GbE (10GBASE-SR/LR) on SFP+ or 2 x 10GbE/1GbE (10GBASE-T/1000BASE-T) on RJ45, for data input, output or input/output.
- Pair 2: 2x 10GbE / 1GbE (10GBASE-T/1000BASE-T) on RJ45 for data input and/or output.
- Six Option Card slots (Option Cards are 'hot swappable'). Option Cards are responsible for adding broadcast-specific functionality to the base unit and provide video, audio and data processing. The Option Cards are 'hot swappable' and can be inserted or removed while the chassis is powered on.
- Integration with nCompass monitoring.

1.4 Front Panel

The 2U-high Front Panel consists of a light bar, a display screen and a keypad. Airflow Fan Grilles are visible at the Front Panel for the intake of cooling air for the internal cards and components, with air being expelled from the rear of the unit.

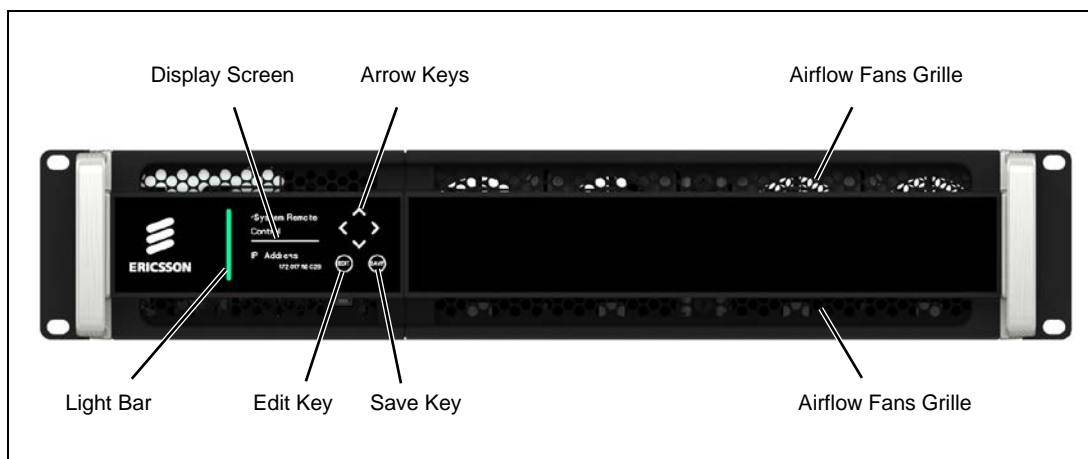


Figure 1.1 Front Panel - Base Unit

1.4.1 Light Bar

The light bar indicates the alarm status of the unit:

- **Red** – indicates there is a critical or major alarm.
- **Amber** – indicates there is an active warning or minor alarm.
- **Green** – indicates there are no active alarms or warnings.

1.4.2 Display Screen

The Organic Light Emitting Diode (OLED) display is illuminated at boot-up and provides various screen menus and options for control, configuration and monitoring of the unit. See *Chapter 4, Front Panel Control* for details of all the available front panel menus and displays.

Additional menus and options may be provided when Option Cards are fitted to the base unit. These are described in the relevant *Option Card Reference Guide*.

1.4.3 Keys

Six touch-sensitive keys are individually illuminated as required, according to the menu option selected on the display screen.

The keypad includes four arrow keys (left, right, up and down) which are used either for navigating the display or for incrementing/decrementing a selected parameter value.

Edit and **Save** keys are provided, when required, for editing parameters and saving changes to menu items on the display screen.

1.5 Rear Panel

The Rear Panel provides signal and power connections and access to the Option Cards and PSU modules.

Always use the specified cables supplied for signal integrity and compliance with EMC requirements (see Installation, Safety and Compliance Information for details).

Details of the rear panel connectors provided by the base unit are given in *Chapter 2, Installing the Equipment*.

The 2U-high Rear Panel provides access to the Option Cards, Power Supply Units and all connectors.

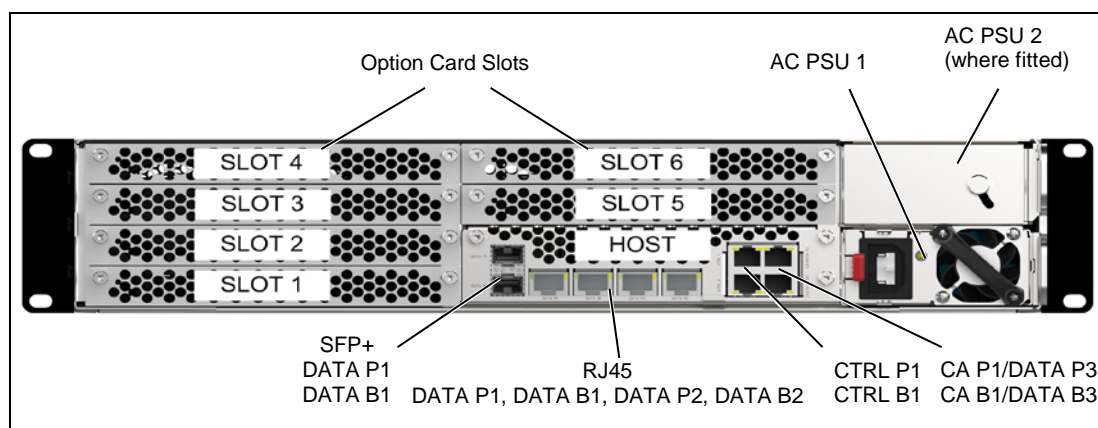


Figure 1.2 Rear Panel - Base Unit

1.5.1 Option Card Slots

Six slots are available for the fitting of high capacity Option Cards. Option Cards are hot-swappable, allowing removal and replacement without interruption to unit operation. For a list of available Option Cards, contact Ericsson.

When Option Cards are not fitted, care should be taken to ensure the slotted blanking panels provided are fitted for adequate airflow and cooling through the unit.

1.5.2 Power Supply Slots

Two slots are available for AC (100-240 V, 50-60 Hz) Power Supply Units (AVP2/HWO/AC/1600).

If two PSUs are fitted, the load is automatically distributed equally between them. PSUs are hot-swappable, allowing removal and replacement without interruption to unit operation.

Note: Power supply cables are standard IEC C13.

PSU redundancy and hot swap capabilities are described in *Table 1.4*.

Table 1.4 PSU Redundancy and Hot-Swap Capability

Quantity of AVP2/HWO/E19201 fitted	Single PSU		Dual PSU	
	Redundancy Operation	Hot-Swap Capability	Redundancy Operation	Hot-Swap Capability
Input >200V				
1	No	No ¹	Yes	Yes
2	No	No ¹	Yes	Yes
3	No	No ¹	Yes	Yes
4	No	No ¹	Yes	Yes
5	No	No ¹	Yes	Yes
6	No	No ¹	Yes	Yes
Input <200V				
1	No	No ¹	Yes	Yes
2	No	No ¹	Yes	Yes
3	No	No ¹	No	No ¹
4	No	No ¹	No ²	No ¹
5	No	No ¹	No ²	No ¹
6	No	No ¹	No ²	No ¹

¹ Chassis must be powered down.

² PSU operates in parallel.

1.5.3 Host (Processor) Card

The Host Card provides stream processing functionality, IP connectivity and conditional access as standard.

The following connectors are provided on the Rear Panel of the base unit. When the unit supports redundancy then the P/B denotes which physical ports should be connected (P denotes 'Primary', B denotes 'Backup'):

- 2x (redundant pair) 10BASE-SR/LR (SFP+) optical connectors and 1000/10GBASE-T (RJ45) copper connectors for data IO (Transport Stream) that may be configured as input, output or input/output at 10GbE (optical/copper) or 1GbE (copper only) (**DATA P1, DATA B1**). Both types can be connected at the same time but only one type can be active. Can be configurable to work standalone, as a redundant pair, or in conjunction with **DATA P2, DATA B2** to support redundancy input and output configurations (copper only).
- 2x (redundant pair) 1000/10GBASE-T (RJ45) copper connector for data IO (Transport Stream) that may be configured as input, output or input/output at 10GbE or 1GbE (**DATA P2, DATA B2**). Can be configurable to work standalone, as a redundant pair, or in conjunction with **DATA P1, DATA B1** to support redundancy input and output configurations.
- 2x (redundant pair) 100BASE-TX/1000BASE-T (RJ45) copper connectors for main control interface (**CTRL P1, CTRL B1**).
- 2x (redundant pair) 100BASE-TX/1000BASE-T (RJ45) copper connectors for Conditional Access (**CA P1, CA B1**) or 2x 1000BASE-T (RJ45) copper connectors for data I/O (Transport Stream) that may be configured as input, output or input/output (**DATA P3, DATA B3**).



Installing the Equipment

Chapter 2

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2.1 Read This First!

Please refer to the *Installation, Safety and Compliance Information for Ericsson Compression Products Reference Guide* supplied with your product for full details of installation requirements. This guide only contains additional product specific information where required.

2.2 Mounting and Ventilation

2.2.1 Fixing and Rack Mounting

The equipment is designed for fixed use and has been shipped with fixing brackets suitable for a standard 19-inch rack. When installed in a rack, it should be secured using the fixing brackets. In addition, support shelves must be used to reduce the weight on the brackets. Ensure it is firmly and safely located and it has an adequate free-flow of air.

Slide the unit onto the chassis supports and affix to the rack by means of an M6 x 18 mm panhead screw in each corner.

A freestanding unit should be installed on a secure horizontal surface where it is unlikely to be knocked or its connectors and leads disturbed.

2.2.2 Ventilation

A front grille and front-mounted cooling fans are provided for ventilation of the unit. They ensure reliable operation of the product and protect it from overheating. The openings of the fans must not be blocked or covered.

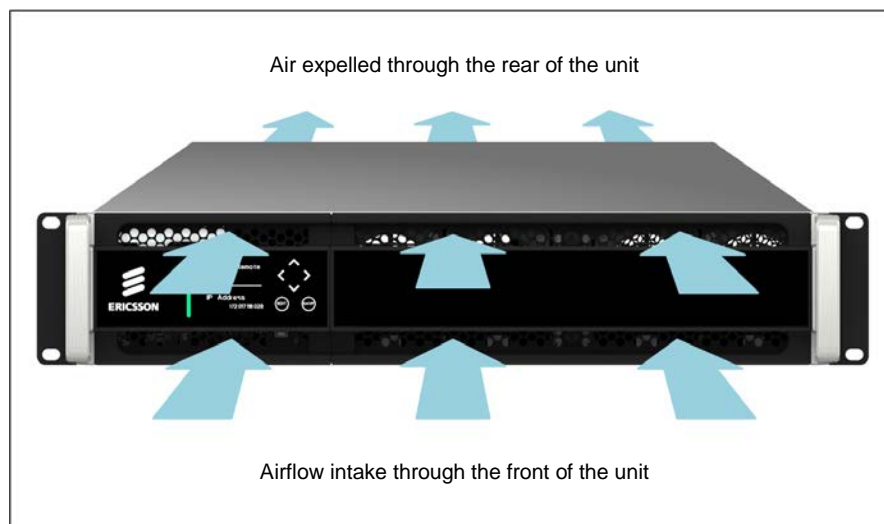


Figure 2.1 Airflow through the Unit

2.3 Signal Connectors

Only data and control interface connectors, and the PSU connectors, are provided by the Base Unit and Host Card. All other connections at the rear panel are provided with the Option Cards that may be fitted. For details of those connectors, see the relevant *Option Card Reference Guide*.



Caution!

It is strongly recommended that the terminal marked \perp at the rear panel of the equipment is connected to a site Technical Earth before any external connections are made and the equipment is powered. This limits the migration of stray charges.

Connections are made via the rear panel. Full technical specifications for the connections are given in *Annex B*.

2.3.1 Technical Earth Connectors

The Technical Earth terminal provides a suitable connection between the unit and the installation to give a low impedance path at normal operating frequencies. A Technical Earth terminal, located at the rear panel, is provided to:

- Ensure all equipment chassis fixed within a rack are at the same technical earth potential (connect a wire between the Technical earth terminal and a suitable point on the rack).
- Eliminate the migration of stray charges when connecting between equipment.

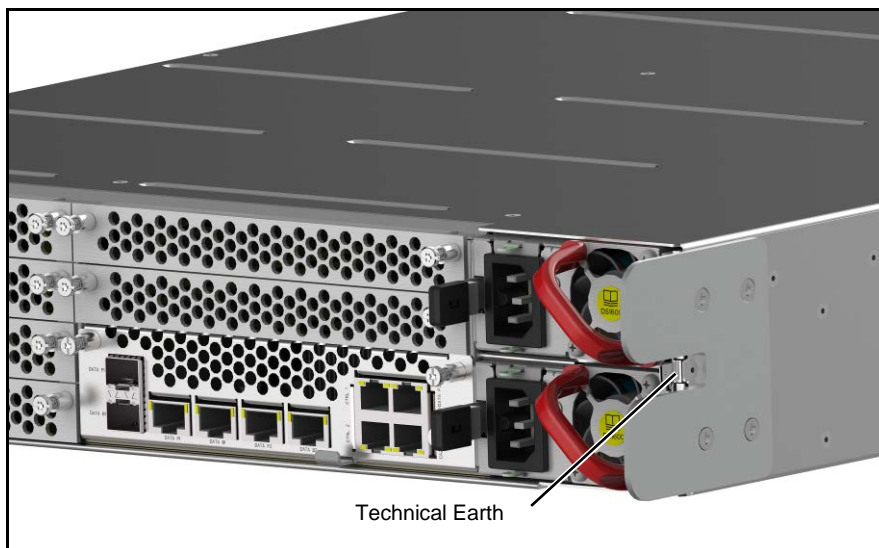


Figure 2.2: Technical Earth Connectors

Note: The technical earth is a spade connector.

2.3.2 Data I/O TS (SFP+) Optical Connectors

The unit provides two enhanced small form-factor pluggable (SFP+) optical connectors. 10GBASE-R ports and SFP+ DirectAttach are used to connect the unit to Transport Stream inputs. The ports are individually configurable as input, output or input/output.



Each pair is also configurable to work standalone or as a redundant pair and will respond to ARPs, pings and other low-level Ethernet traffic. Redundancy is only available in input/output configuration.

Table 2.1 Data I/O TS (SFP+) Optical Connectors

Item	Specification
Connector type	SFP+ Optical
10GBASE-R supported formats	10GBASE-SR Short range, up to 400 m using 850 nm wavelength multi-mode fiber cabling
	10GBASE-LR Long reach, up to 10 km using 1310 nm wavelength single-mode fiber cabling
SFP+DirectAttach supported formats	Active twin-ax cable assembly up to 15 m.
Connector designation (from top to bottom)	DATA P1 DATA B1
Pin outs	Single fiber-optic cable

Note: When the unit supports redundancy, the P/B denotes which physical ports should be connected (P denotes 'Primary', B denotes 'Backup')

Status and Activity Indication

Each Ethernet Data Port has rear panel mounted status LEDs to indicate link status, activity and speed as follows:

Table 2.2 Port Status: Left (Green LED)

Port Status	Link Speed	LED Status	
Primary Port	No Link	Off	— — — — —
	10 Gbps	Flash Off x 4	— ■ — ■ — ■ ■ ■ — ■ — ■ — ■ ■ ■ ■
Backup Port	No Link	Off	— — — — —
	10 Gbps	Flash On x 4	■ — ■ — ■ — ■ — — — ■ — ■ — ■ — ■ —

The left LED flash sequence period is 1 s, with a short flash duration of 100 ms.

Table 2.3 Link Activity: Right (Yellow) LED

[illegible]

2.3.3 Data I/O TS (RJ45) Ethernet Connectors

The unit provides four RJ45 Ethernet connectors arranged as two pairs. IP Transport Stream Ethernet ports are used to connect the equipment to Transport Stream inputs. Each pair of ports is individually configurable as input, output or input/output and may also be configured to communicate at 1000BASE-T or 10GBASE-T.



Each pair is also configurable to work standalone or as a redundant pair and will respond to ARPs, pings and other low-level Ethernet traffic. Redundancy is only available in input/output configuration when using a single pair. However, both pairs can be used to support redundancy input and output configurations.

Table 2.4 Data I/O TS (RJ45) Ethernet Connectors

Item	Specification
Connector type	RJ45 (1000BASE-T or 10GBASE-T)
Connector designation (from left to right)	DATA P1 / DATA B1 / DATA P2 / DATA B2

Note: When the unit supports redundancy, the P/B denotes which physical ports should be connected (P denotes 'Primary', B denotes 'Backup')

Status and Activity Indication

Each Ethernet Data Port has rear panel mounted status LEDs to indicate link status, activity and speed as follows:

Table 2.5 Port Status: Left (Green) LED

Port Status	Link Speed	LED Status	
Primary Port	No Link	Off	-----
	1000 Mbps	Flash Off x 3	— ■ — ■ — ■ ■ ■ — ■ — ■ — ■ ■ ■ ■
	10 Gbps	Flash Off x 4	— ■ — ■ — ■ — ■ ■ ■ — ■ — ■ — ■ — ■ ■
Backup Port	No Link	Off	-----
	1000 Mbps	Flash On x 3	■ — ■ — ■ — — — — ■ — ■ — ■ — — —
	10 Gbps	Flash On x 4	■ — ■ — ■ — ■ — — — — ■ — ■ — ■ — ■ —

The left LED flash sequence period is 1 s, with a short flash duration of 100 ms.

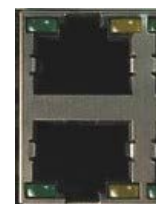
Table 2.6 Link Activity: Right (Yellow) LED

Link Speed	LED Status	
No Link	Off	-----
Link	On	■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Activity	Flash	— ■ — ■ — ■ ■ ■ — ■ ■ ■ — ■ ■ ■

2.3.4

Control (RJ45) Ethernet Connectors

The unit provides two Ethernet control ports - a redundant pair for main control (CTRL P1, CTRL B1) and will respond to ARPs, pings and other low-level Ethernet traffic.



The Ethernet control ports are used to connect the equipment to a PC for access with a web browser. Both connectors share the same IP address, CTRL P1 is the Primary control port, and is by default the active control port.

Control Port CTRL B1 should be considered as the backup control network as it will not respond to the Control Port IP Address unless control has been passed to it either as a result of a redundancy switch, or via a user command. The active control port switches when CTRL P1 has no link (e.g. carrier), and CTRL B1 has the link.

Table 2.7 Control Ethernet Connector

Item	Specification
Connector type	RJ45 (100BASE-TX/1000BASE-T)
Connector designation (from top to bottom)	CTRL P1 / CTRL B1

Status and Activity Indication

Each Ethernet Data Port has a rear panel mounted status LED associated with it to indicate link status, activity and speed as follows:

Table 2.8 Link Speed: Left (Green) LED

Port Status	Link Speed	LED Status	
Primary Port	No Link	Off	— — — — —
	1000 Mbps	Flash Off x 3	— ■ — ■ — ■ ■ ■ — ■ — ■ — ■ ■ ■ ■ ■
	100 Mbps	Flash Off x 4	— ■ — ■ — ■ — ■ ■ ■ — ■ — ■ — ■ — ■ ■
Backup Port	No Link	Off	— — — — —
	1000 Mbps	Flash On x 3	■ — ■ — ■ — — — — ■ — ■ — ■ — — — —
	100 Mbps	Flash On x 4	■ — ■ — ■ — ■ — — — — ■ — ■ — ■ — ■ —

The left LED flash sequence period is 1 s, with a short flash duration of 100 ms.

Table 2.9 Link Activity: Right (Yellow) LED

Link Speed	LED Status	
No Link	Off	— — — — — — — — — —
Link	On	■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Activity	Flash	— ■ — ■ — ■ ■ ■ ■ ■ — ■ ■ ■ — ■ ■ ■

2.3.5

Conditional Access/ Data I/O TS (RJ45) Ethernet Connectors

The unit provides two Ethernet ports - a redundant pair for conditional access or data (CA P1/DATA P3, CA B1/DATA B3) and will respond to ARPs, pings and other low-level Ethernet traffic.



In CA P1 and CA B1 operation, both 100BASE-TX and 1000BASE-T are supported.

In DATA P3 and DATA B3 only 1000BASE-T is supported.

Table 2.10 Control Ethernet Connector

Item	Specification
Connector type	RJ45 (1000BASE-T)
Connector designation (from top to bottom)	CA P1/DATA P3 CA B1/DATA B3

Status and Activity Indication

Each Ethernet Data Port has a rear panel mounted status LED associated with it to indicate link status, activity and speed as follows:

Table 2.11 Link Speed: Left (Green) LED

Port Status	Link Speed	LED Status	
Primary Port	No Link	Off	— — — — —
	1000 Mbps	Flash Off x 3	— ■ — ■ — ■ ■ ■ — ■ — ■ — ■ ■ ■ ■
	100 Mbps	Flash Off x 4	— ■ — ■ — ■ — ■ ■ ■ — ■ — ■ — ■ — ■ ■
Backup Port	No Link	Off	— — — — —
	1000 Mbps	Flash On x 3	■ — ■ — ■ — — — ■ — ■ — ■ — — —
	100 Mbps	Flash On x 4	■ — ■ — ■ — ■ — — — ■ — ■ — ■ — ■ —

The left LED flash sequence period is 1 s, with a short flash duration of 100 ms.

Table 2.12 Link Activity: Right (Yellow) LED

Link Speed	LED Status	
No Link	Off	— — — — —
Link	On	■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Activity	Flash	— ■ — ■ — ■ ■ ■ — ■ ■ ■ — ■ ■ ■



BLANK



Getting Started

Chapter 3

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3.1 Introduction

This chapter provides general guidance and principles on how to power up and set up your unit for operation and describes the more common operations you will want to perform.

For details of all Front Panel menus and controls, see *Chapter 4, Front Panel Control*. For details of all Web Graphical User Interface (GUI) menus and controls, see *Chapter 5, Web GUI Control*.

For more information on possible networking scenarios, see *Chapter 6, Video Processing and Networking*.

3.2 How to Connect Up the Unit

See *Chapter 2, Installing the Equipment* for connector details.

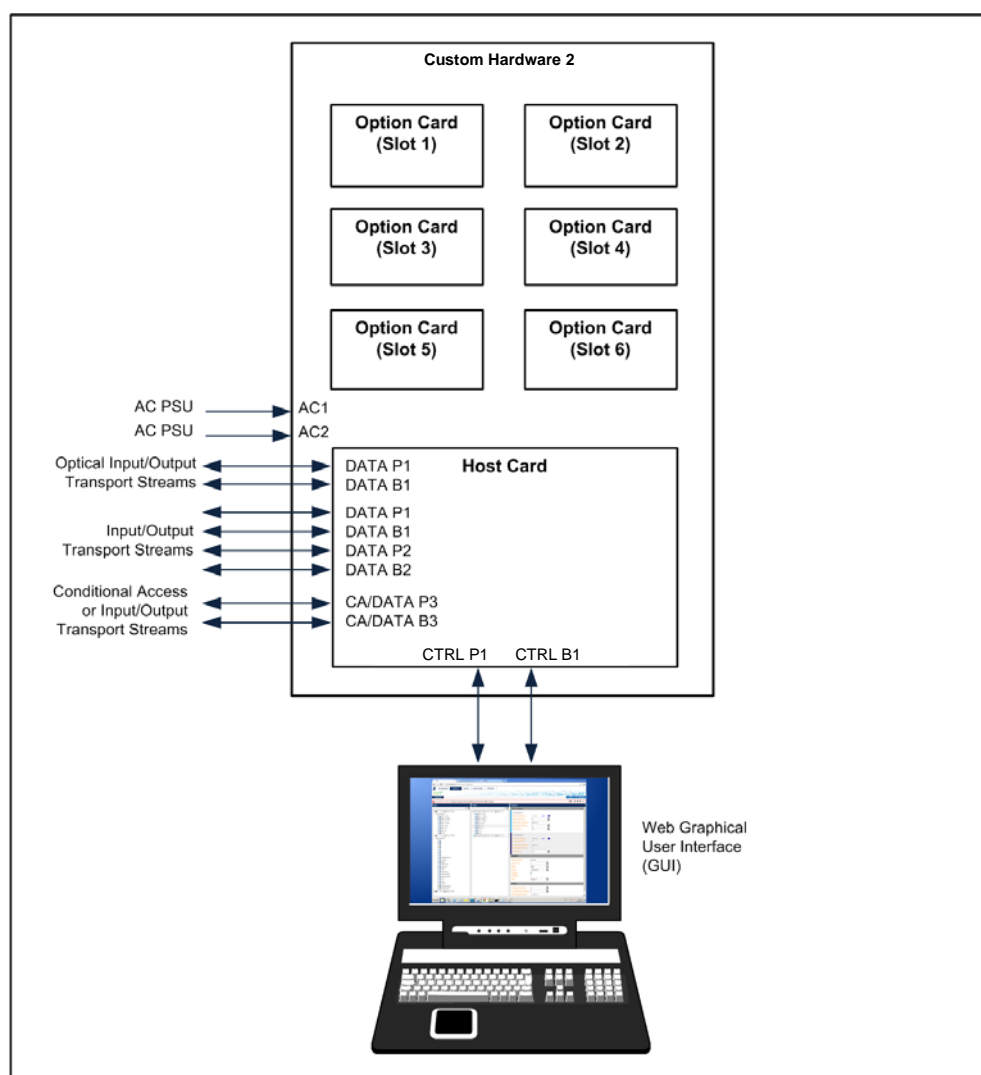


Figure 3.1 Connections

After the unit has been installed, connect all the relevant signal and power cables.

To connect your unit:

1. Connect your signal cables to/from your Option Cards as required, depending on options fitted to your unit.
2. Connect your optical connectors (**DATA P1**, **DATA B1**) for data I/O (Transport Stream), if used.
3. Connect your four RJ45 Ethernet connectors (**DATA P1**, **DATA B1**, **DATA P2**, **DATA B2**) for data I/O (Transport Stream), if used.
4. Connect computer Control Ethernet connectors (**CTRL P1**, **CTRL B1**) to your local area network (Web GUI Control). Both connectors share the same IP address, **CTRL P1** is the Primary control port, and is by default the active control port. Control Port **CTRL B1** should be considered as the secondary control network as it will not respond to the Control Port IP Address unless control has been passed to it either as a result of a redundancy switch, or via a user command. The active control port switches when **CTRL P1** has no link (e.g. carrier), and **CTRL B1** has the link.
5. Connect Conditional Access connectors (**CA P1**, **CA B1**) to control subscriber access to broadcast services, if used, or data I/O (Transport Stream) connectors (**DATA P3**, **DATA B3**).
6. Connect the supplied IEC C13 cable(s) to the AC power connector(s). One cable is required for a single PSU, two cables are required for two PSUs.

3.3 How to Power Up the Unit



Caution!

This equipment should not be operated unless the cooling fans are working and there is free airflow around the unit.

To power up your unit(s):

1. Ensure all signal and power cables are connected as required
2. Switch on the power supply to the unit at the wall or rack outlet.
3. Wait for unit initialisation to complete before attempting to use the front panel menus and controls. This will take approximately 1 minute, depending on the number of options fitted in the unit.

3.4 How to Set the Unit IP Address

Setting the IP address of a unit is accomplished using the front panel menus. For a full description of these menus, see *Chapter 4, Front Panel Control*.

To set the IP address of the unit(s):

1. Ensure the unit is fully powered up and unit initialisation is complete.
2. On the front panel, navigate to the **SYSTEM > REMOTE CONTROL > IP ADDRESS** option.
3. Using the keypad, set the IP address, subnet mask and gateway address, as required.
4. Press the **Save** button to save the changes.

Note: It may be necessary to set the IP address, gateway address and Virtual IP address to 0, and to set a subnet mask in order to allow the IP address to be changed.

IP Addresses on the unit must adhere to RFC3330 range of restrictions as listed in the following table of allocated IP addresses.

Table 3.1 IP Address Restrictions

Block	Present Use	Reference
0.0.0.0/8	This Network	[RFC1700, p4]
10.0.0.0/8	Private-Use Networks	[RFC1918]
14.0.0.0/8	Public-Data Networks	[RFC1700, p181]
24.0.0.0/8	Cable Television Networks	---
39.0.0.0/8	Reserved but subject to allocation	[RFC1797]
127.0.0.0/8	Loopback	[RFC1700, p5]
128.0.0.0/16	Reserved but subject to allocation	---
169.254.0.0/16	Link Local	---
172.16.0.0/12	Private-Use Networks	[RFC1918]
191.255.0.0/16	Reserved but subject to allocation	---
192.0.0.0/24	Reserved but subject to allocation	---
192.0.2.0/24	Test-Net	---
192.88.99.0/24	6to4 Relay Anycast	[RFC3068]
192.168.0.0/16	Private-Use Networks	[RFC1918]
198.18.0.0/15	Network Interconnect Unit Benchmark Testing	[RFC2544]
223.255.255.0/24	Reserved but subject to allocation	---

Block	Present Use	Reference
224.0.0.0/4	Multicast	[RFC3171]
240.0.0.0/4	Reserved for Future Use	[RFC1700, p4]

3.5 How to View the Web GUI

The unit's features and parameters may all be configured using the web browser Graphical User Interface (GUI). For details of the generic GUI screens, see *Chapter 5, Web GUI Control*. For details of screens and functions of the Option Cards, see the relevant *Option Card Reference Guide*.

The Ethernet control ports (**CTRL P1/CTRL B1**) are used to connect the unit to a control computer for control through a web browser or to a control system.

The web browser Graphical User interface (GUI) is designed to configure, control and monitor the unit and can be run on any Personal Computer (PC) or laptop using a suitable web browser.

Note: The Front Panel display and keypad may be used to configure, control and monitor the unit when an external PC or control system is not used.

The following web browsers are recommended:

- Microsoft Internet Explorer (IE9 minimum)
- Google Chrome

Configuring Browser Refresh

To configure browser refresh:

1. Select **Tools > Developer Tools** in the Internet Explorer browser menu.
2. Select **Cache > Always Refresh from Server** from the **Developer Tools** menu.

Configuring Web Access

To access the Web GUI:

1. Ensure the laptop/computer console is connected to the **CTRL P1** or **CTRL B1** port on the unit.
2. Open a web browser session.
3. Type the IP address (assigned to the unit control port in the front panel system menu) into the address field of the Web browser.
4. If the network is correctly configured, the **SERVICES > DASHBOARD** page should be automatically loaded and displayed. The unit can then be configured and monitored as required.

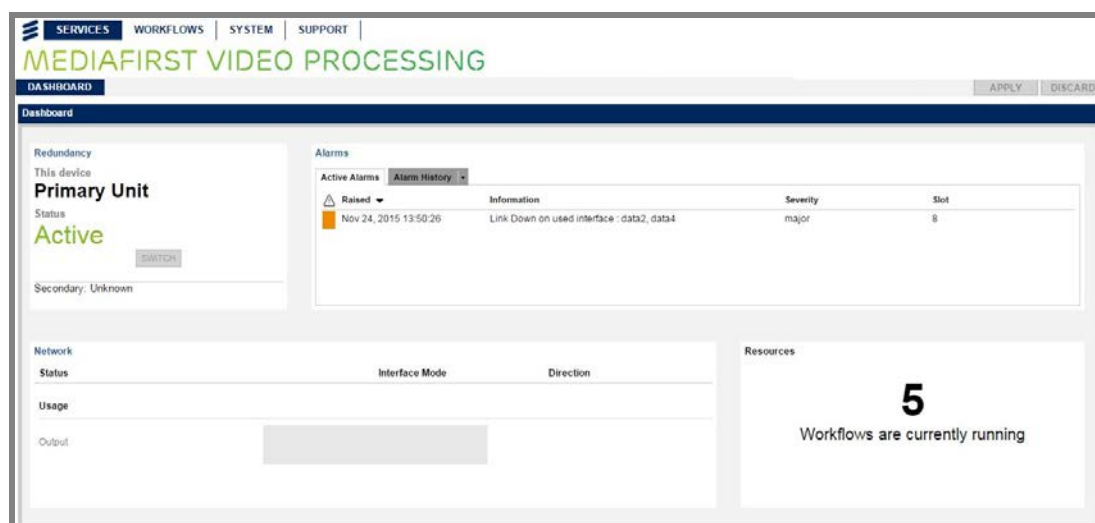


Figure 3.2 Web GUI - Dashboard Page

For details of how to use the web GUI pages and for detailed descriptions of all the features, options and parameters, see *Chapter 5, Web GUI Control*.

3.6 How to Monitor Your Unit Status and Alarms

Alarms are reported on the web GUI **Dashboard** and **Monitoring** pages, and also on the Front Panel. Alarm trap handling is also supported through SNMP.

Monitoring Alarms Using the Front Panel

To monitor alarms using the unit Front Panel:

1. The default display on the unit Front Panel lists the current active alarm, its severity and the number of alarms [in brackets].



Figure 3.3 Viewing Alarms on the Front Panel

2. To view a complete list of all the active alarms, navigate to the **Workflows > Alarms** screen. See *Chapter 4, Front Panel Control* for a full description of alarm messages and states.

Monitoring Alarms Using the Web GUI Dashboard Page

To monitor alarms using the web GUI **Dashboard**:

1. Navigate to the **SERVICES > DASHBOARD** web GUI page. See *Section 3.5 How to View the Web GUI* for instructions on viewing this configuration, control and monitoring interface.
2. The current **Active Alarms** and **Alarm History** are displayed in the **Alarms** panel at the top of the page. See *Chapter 5, Web GUI Control* for a full description of alarm states.

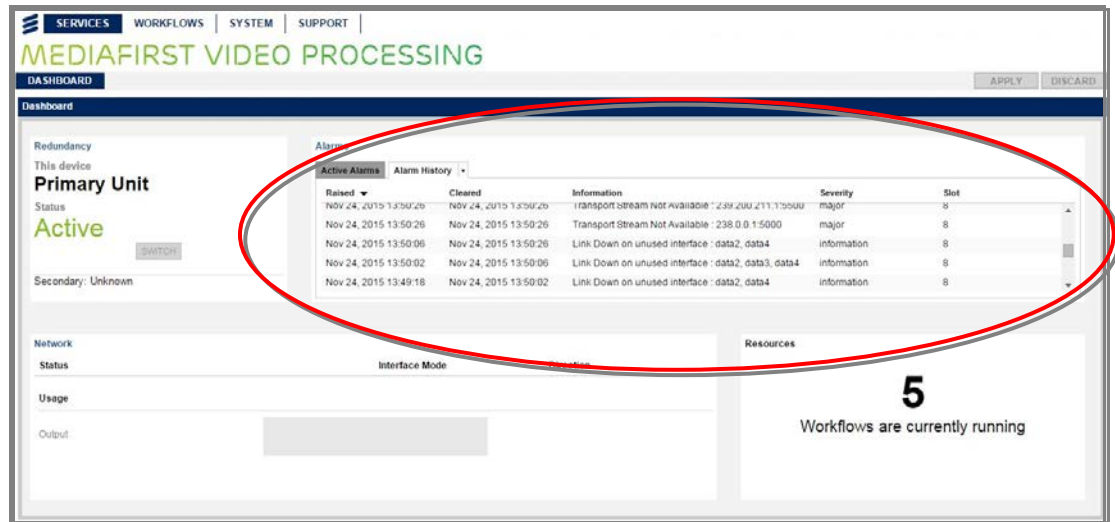


Figure 3.4 Monitoring Alarms Using the Services > Dashboard Page

Monitoring Alarms Using the Web GUI Workflows Page

To monitor alarms using the web GUI **WORKFLOWS > ALARMS** page:

1. Navigate to the **WORKFLOWS > ALARMS** web GUI page. See *Section 3.5 How to View the Web GUI* for instructions on viewing this configuration, control and monitoring interface.
2. The current **Active Alarms** and **Alarm History** are displayed on separate tabs. See *Chapter 5, Web GUI Control* for a full description of alarm states.

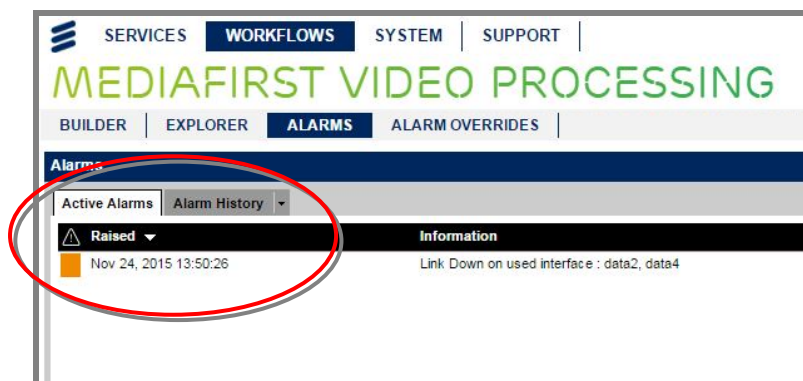


Figure 3.5 Monitoring Alarms Using the Workflows > Alarms Page

3.7 How to Configure Alarm Masking and Severity

Alarms can be masked (ignored/silenced) or their severity modified (critical, major, minor or warning), enabling you to customize the reporting of alarms to suit your requirements.

To configure alarm masking or severity:

1. Navigate to the **WORKFLOWS > ALARM OVERRIDES** page on the web GUI.

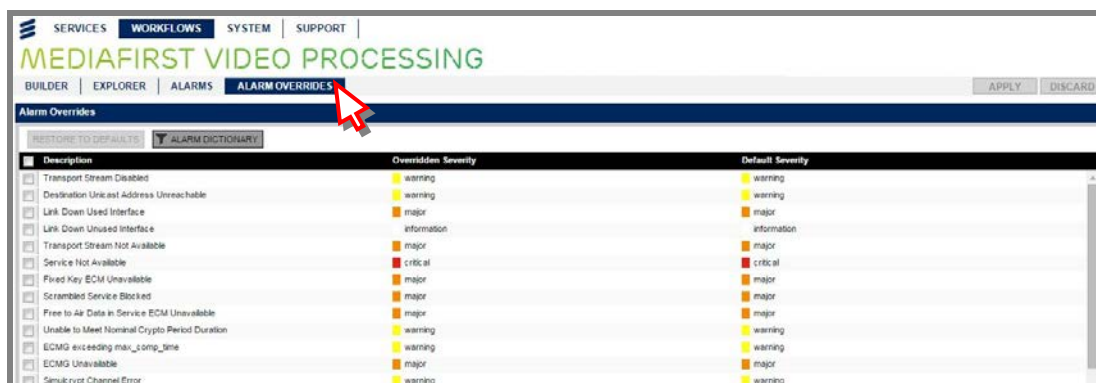


Figure 3.6 Alarm Overrides Tab

2. Select the alarm description that you wish to modify by either placing a check mark in the relevant check box or by clicking on the alarm description.

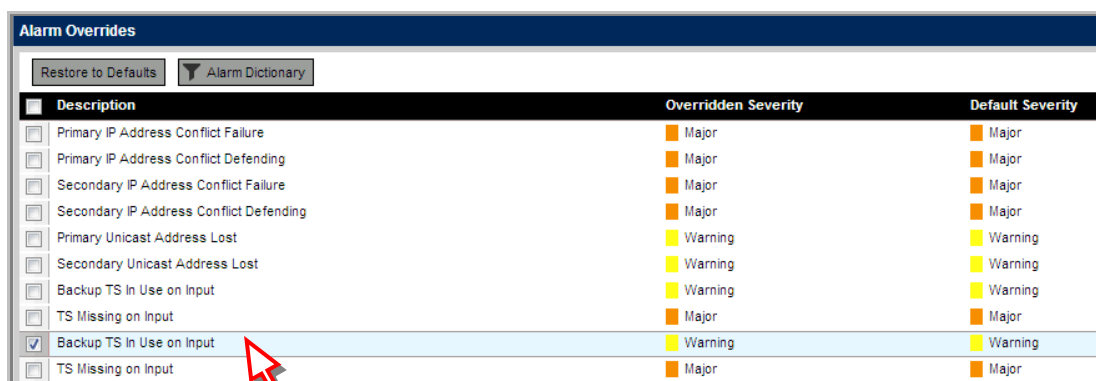
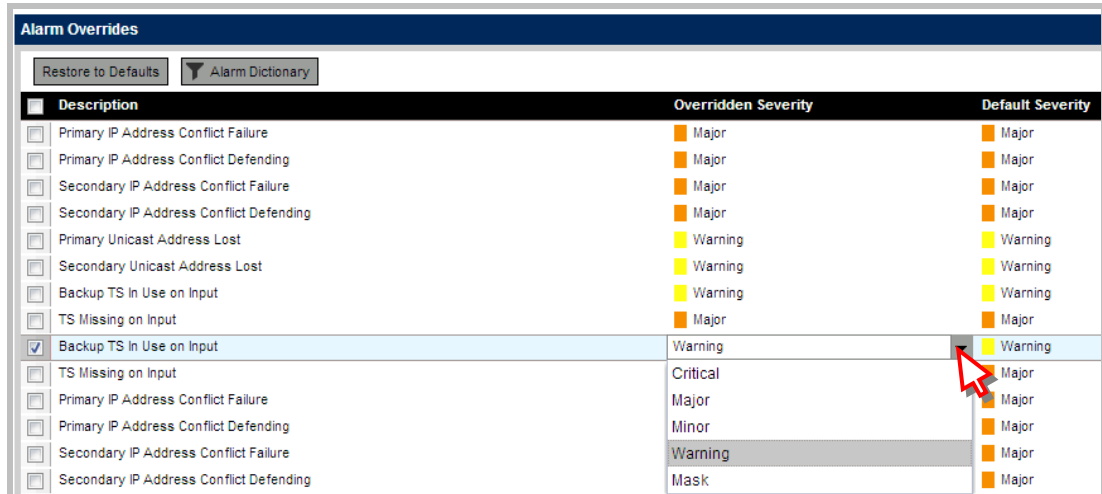


Figure 3.7 Selecting an Alarm to Modify

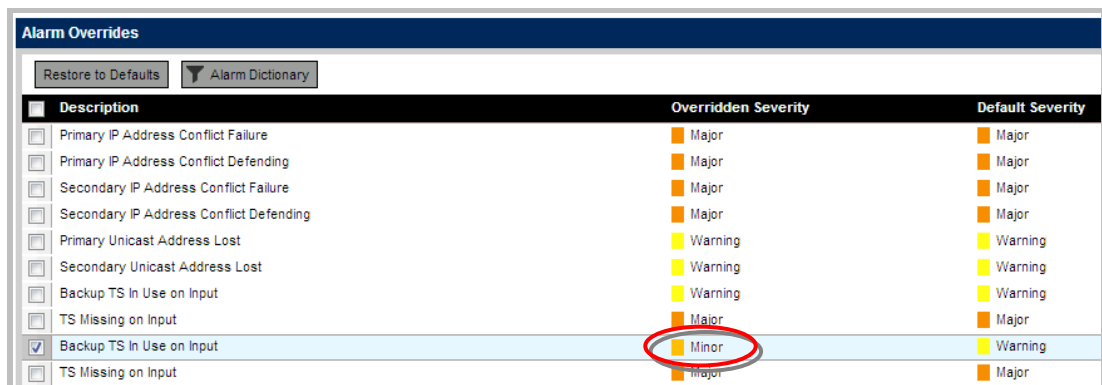
3. Click on the currently displayed severity value (critical, major, minor, warning or mask) in the **Overridden Severity** column to display a drop-down box and select the required value for this alarm.



Description	Overridden Severity	Default Severity
<input type="checkbox"/> Primary IP Address Conflict Failure	Major	Major
<input type="checkbox"/> Primary IP Address Conflict Defending	Major	Major
<input type="checkbox"/> Secondary IP Address Conflict Failure	Major	Major
<input type="checkbox"/> Secondary IP Address Conflict Defending	Major	Major
<input type="checkbox"/> Primary Unicast Address Lost	Warning	Warning
<input type="checkbox"/> Secondary Unicast Address Lost	Warning	Warning
<input type="checkbox"/> Backup TS In Use on Input	Warning	Warning
<input type="checkbox"/> TS Missing on Input	Major	Major
<input checked="" type="checkbox"/> Backup TS In Use on Input	Warning	Warning
<input type="checkbox"/> TS Missing on Input	Critical	Major
<input type="checkbox"/> Primary IP Address Conflict Failure	Major	Major
<input type="checkbox"/> Primary IP Address Conflict Defending	Minor	Major
<input type="checkbox"/> Secondary IP Address Conflict Failure	Warning	Major
<input type="checkbox"/> Secondary IP Address Conflict Defending	Mask	Major

Figure 3.8 Selecting Alarm Severity/Masking

- To save your changes, click the **APPLY** button. The new alarm severity will now be displayed in the **Overridden Severity** column.



Description	Overridden Severity	Default Severity
<input type="checkbox"/> Primary IP Address Conflict Failure	Major	Major
<input type="checkbox"/> Primary IP Address Conflict Defending	Major	Major
<input type="checkbox"/> Secondary IP Address Conflict Failure	Major	Major
<input type="checkbox"/> Secondary IP Address Conflict Defending	Major	Major
<input type="checkbox"/> Primary Unicast Address Lost	Warning	Warning
<input type="checkbox"/> Secondary Unicast Address Lost	Warning	Warning
<input type="checkbox"/> Backup TS In Use on Input	Warning	Warning
<input type="checkbox"/> TS Missing on Input	Major	Major
<input checked="" type="checkbox"/> Backup TS In Use on Input	Minor	Warning
<input type="checkbox"/> TS Missing on Input	Major	Major

Figure 3.9 Changed Alarm Severity/Masking

- All overridden alarms can be viewed, and modified, by clicking on the **Alarm Dictionary / Overridden Alarms** filter at the top of the table. Alternatively, **Alarm Masks** are displayed on the **Monitoring > Alarms** tab. See *Chapter 5, Web GUI Control* for a full description of alarm states.

3.8 How to Identify a Device (Front Panel)

When many devices are installed in an equipment room it may be difficult to identify the physical device when it has a reported alarm or been configured remotely using the Web GUI. In order to facilitate easier identification, the front panel LCD and alarm LED can be flashed.

To identify a device:

1. Navigate to the **SUPPORT > BACKUP/RESTORE** web page.
2. Click the **Device Configuration** group at the left-hand side of the screen.

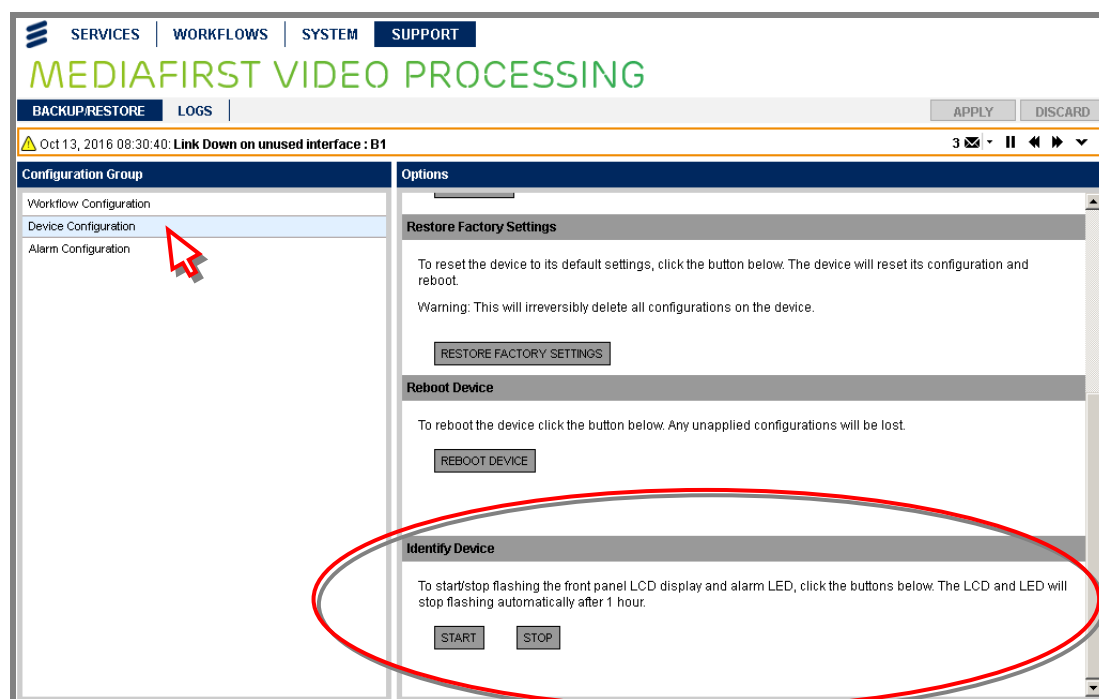


Figure 3.10 Identifying the Device Front Panel

3. Scroll down to the bottom of the Options list until the **Identify Device** option is displayed.
4. Click the **START** button to begin flashing of the front panel LCD and alarm LED. Flashing will automatically stop after 1 hour. This should give you the time you need to go to the equipment room and identify the relevant device. If you want to stop the flashing before this time, click the **STOP** button.

3.9 How to Set Up a Redundant Input Source

To ensure continuity of signal, a secondary ('redundant' or 'backup') source may be configured, where available, to switch in automatically in the event that the primary source is lost or the link goes down.

To set up a redundant input source:

1. Navigate to the **SYSTEM > SOURCES** web page.
2. Select the **ADD SOURCE** button under the **Backup Sources** panel and enter the stream details within the relevant field(s).

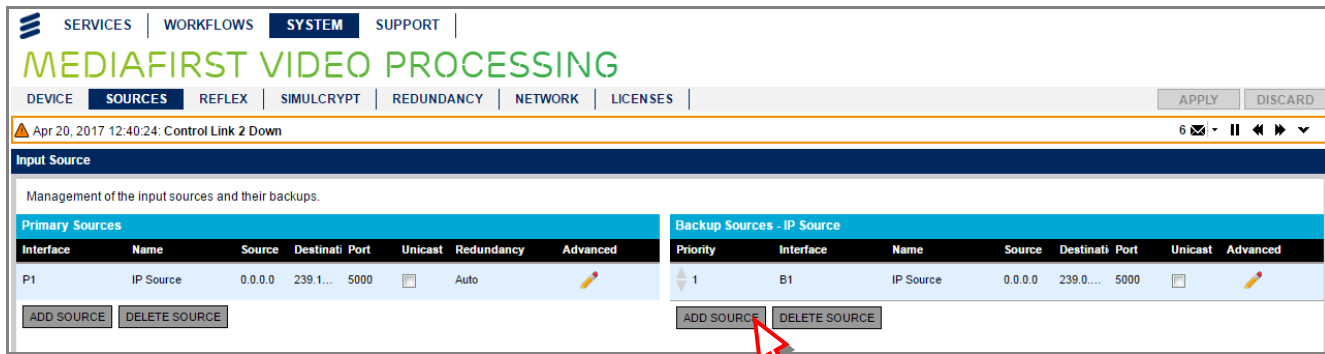


Figure 3.11 Adding a Backup Source

3. The default mode is automatic source selection (**Auto**), as indicated in the **Redundancy** column in the **Primary Sources** pane. In Auto mode, if there is a detectable problem with the primary source the backup source will be selected. If the primary source then recovers, the backup source will remain selected. If a problem then occurs with the backup source, the primary source will be automatically selected. For manual primary source selection, double-click the **Redundancy** cell, select **Primary** from the drop-down menu, and apply changes. If there is a problem with the primary source in Manual mode, a backup source IS NOT automatically selected. Likewise, for manual backup source selection, the primary source IS NOT automatically selected. To return to automatic source selection mode, select **Auto** and apply changes.
4. To save your changes, click the **APPLY** button.
5. The unit will automatically switch to the configured redundant Transport Stream when the primary Transport Stream stops or if the link drops. A “Service On Backup” alarm will be raised to explain to the user which services are currently on backup sources.

3.10 How to Configure Interfaces and Redundancy

The unit supports the following fixed output redundancy mode:

- **Active-Active Mode** – Both data interfaces stream the same multicast at the same time.

To configure the interfaces:

1. Navigate to the **SYSTEM > NETWORK** web page.
2. Select **Interface Group Role** from the **Interfaces and Protocols** widget on the left-hand side.
3. Select an interface group role from the **Data Interface Group Setup** drop-down list in the **Properties** widget on the right-hand side to configure the required interfaces.

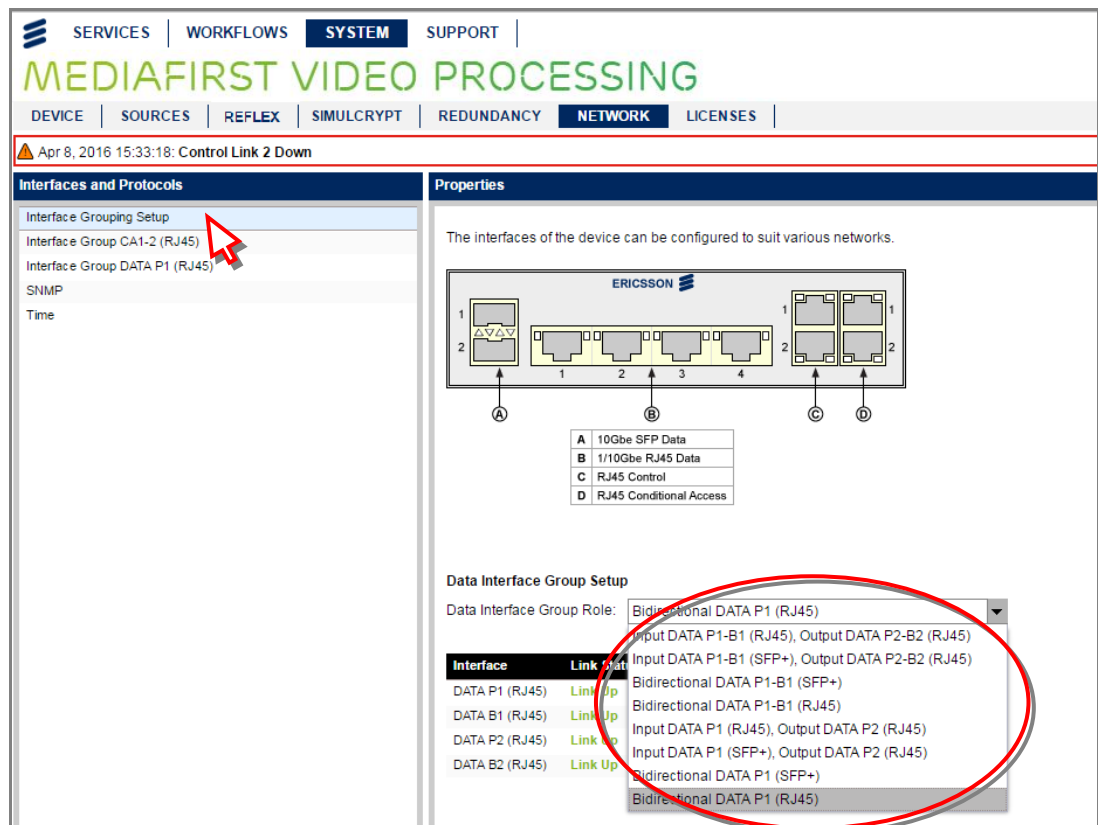


Figure 3.12 Selecting Data Interface Group Roles

4. To save your changes, click the **APPLY** button.
5. Then select the relevant Condition Access (CA) or data interface in the **Interfaces and Protocols** widget on the left-hand side to display the associated parameters for the CA or data interface.

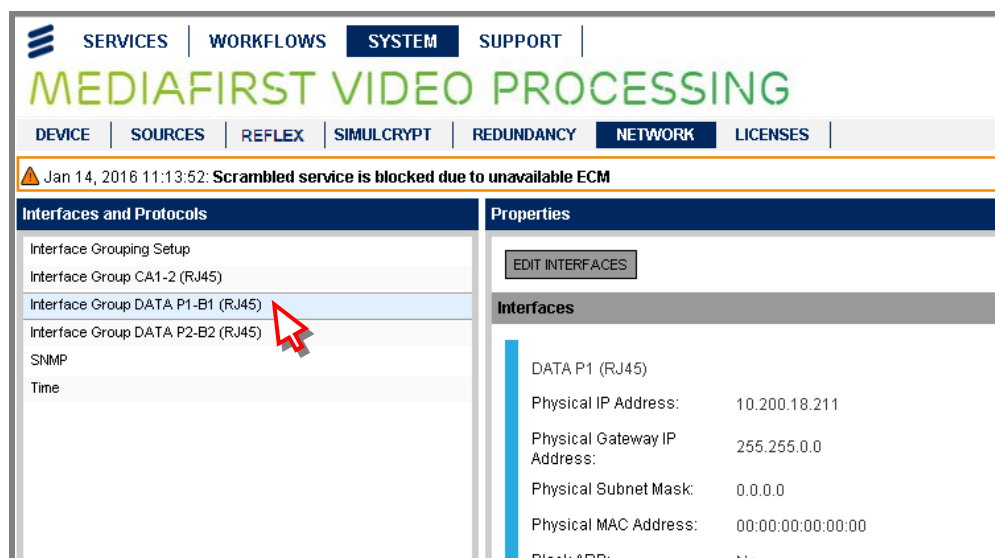


Figure 3.13 Selecting Data Interface Group Parameters

6. Then click **EDIT INTERFACES** button in the **Properties** widget to display a screen enabling you to set/modify specific parameters for the CA or data interface.

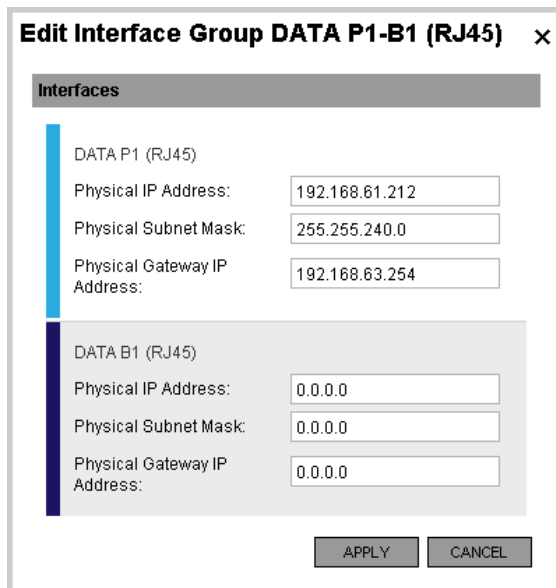


Figure 3.14 Editing the Data Interface Parameters

7. To save your changes, click the **APPLY** button.

See *Chapter 6, Video Processing and Networking* for further details regarding redundancy.

3.11 How to Configure Your Unit Using Workflows

Workflows graphically display the functions performed by your unit. They are used to assist you in configuring your unit quickly and efficiently in a step-by-step manner. The **WORKFLOWS > BUILDER** page displays the available workflow templates for you to create. The **WORKFLOWS > EXPLORER** page displays workflows that have been created/customized and are available for editing.

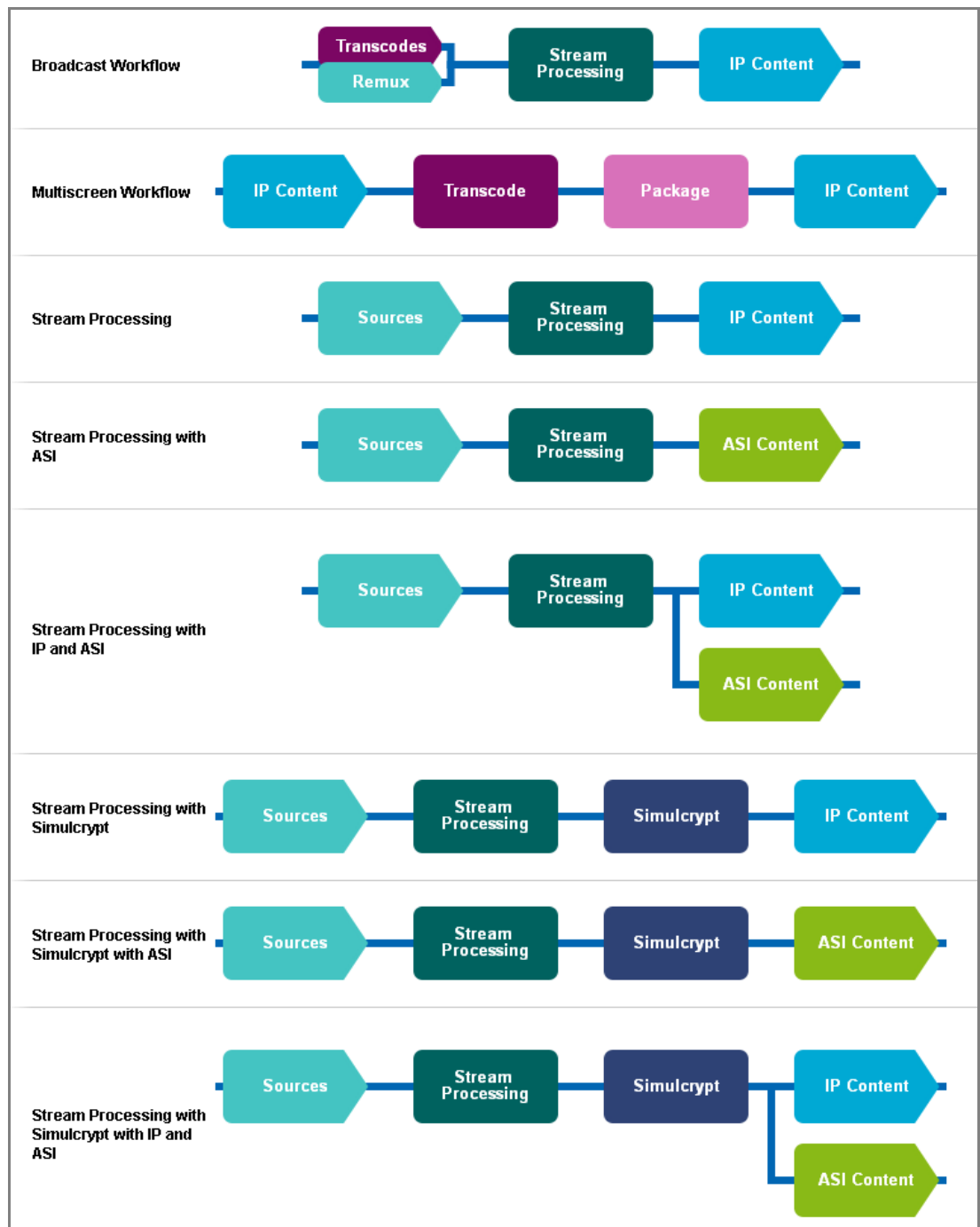


Figure 3.15 Latest Available Workflow Templates

The workflow templates, shown above, are available when you purchase the base chassis with a Host Card and the currently available hardware and software options for the latest software version (available by purchasing the appropriate licenses from Ericsson).

To configure your unit using a workflow template:

1. Navigate to the **WORKFLOWS > BUILDER** page to display the available workflows.
2. Click on the **CREATE** button alongside the relevant workflow type to create a new workflow of this type (in this example, a **Stream Processing** workflow is selected).

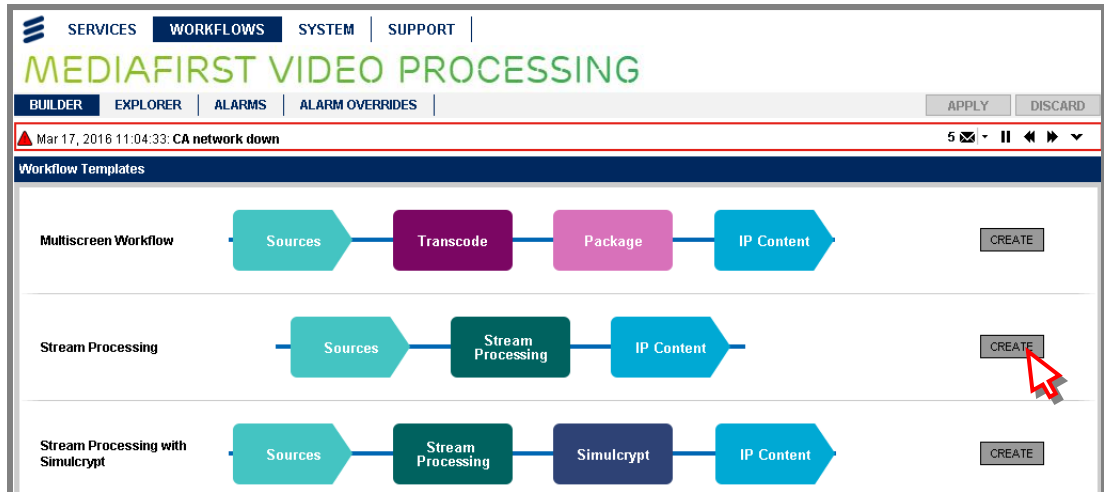


Figure 3.16 Creating a New Workflow

3. A new workflow is created and automatically named/numbered. The overview parameters for the workflow are displayed and can be modified by typing in relevant field or by using the arrow buttons.

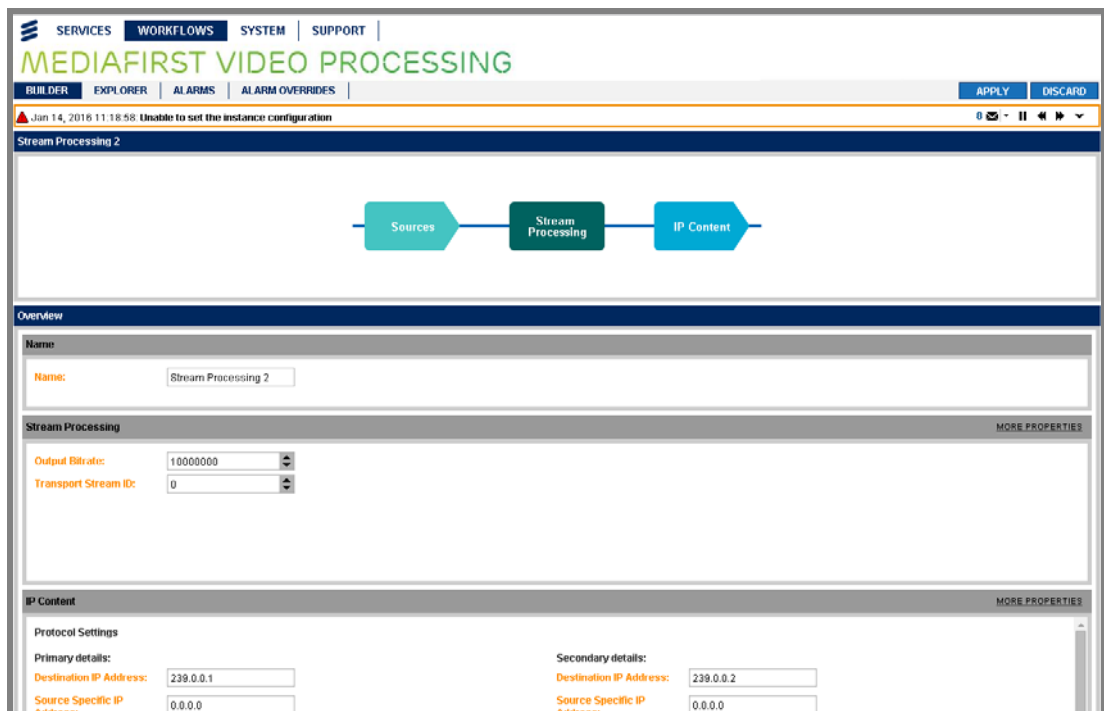


Figure 3.17 Workflow Overview Settings

4. To view or modify detailed parameters for each functional block in your workflow, click on the block in the workflow graphic to display the associated parameters below. Further instructions for configuring blocks are given in the following paragraphs in this chapter. A detailed description of all the parameter settings is provided in *Chapter 5, Web GUI Control*.
5. When you have finished modifying your workflow, click the **APPLY** button to save your settings.
6. Your customised workflow will now appear on the **WORKFLOW > EXPLORER** page, which can be edited, deleted or cloned (i.e., duplicated).

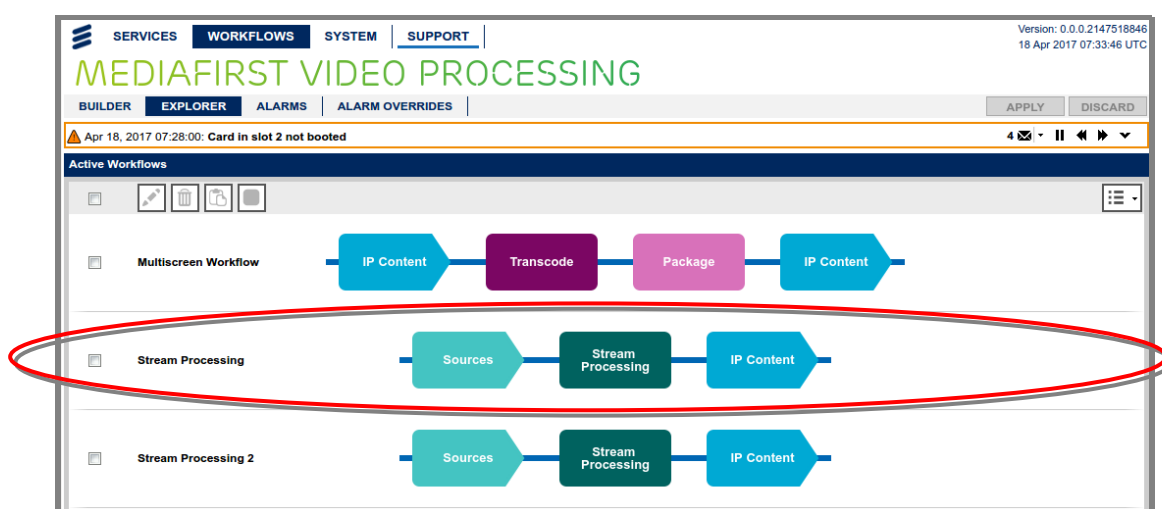


Figure 3.18 New Workflow Displayed on the Workflows > Explorer Page

The following sections detail how to configure each type of workflow.

3.12 How to Configure a Broadcast Workflow

The Broadcast Workflow enables you to create an output MPMS containing two different types of outputs: transcode an input service or re-multiplexing an input service.

A Broadcast Workflow comprises the following functional blocks:

- **Transcode** – enables you to create a transcode service by creating a broadcast source. The following licenses are required to be able to configure a transcode broadcast workflow: AVP2/SWO/HD or AVP2/SWO/SD.
- **Remux** – enables you to select an input service and re-multiplex it on the output.
- **Stream Processing** – enables you to select input Transport Streams, Services or Components for output processing (to create new streams and define services) or passthrough.
- **IP Content (Out)** – enables you to configure the IP destination settings.

Multiple transcode and remux services can be part of the same output Multi Program Transport Stream (MPTS).

The Broadcast Workflow is displayed on the **WORKFLOWS > BUILDER** page.



Figure 3.19 Broadcast Workflow

Note: In the current release, when configuring multiple broadcast workflows, some parameters must be set carefully to ensure there is no clash between the various parameters which can result in the “**Configuration Application Failure**” when the **Apply** button is clicked. The parameters that must be unique are currently: The service ID, the PMT PID. Also the name of the workflow and the name of the broadcast source cannot be set with the same text. After up to 30 seconds, the parameter clash (if they exist) will be displayed as a message in the alert banner

3.12.1 How to Configure Transcodes/Remux

The Broadcast Workflow template permits inputs (multiple services in a Transport Stream) for transcoding and remultiplexing to be selected as indicated by the dual (split) functional block.



Figure 3.20 Transcodes/Remux Functional Block

3.12.1.1 Configuring Transcodes

To configure Transcode properties:

1. On the **SYSTEM > SOURCES** page, add the required sources.
2. Ensure no alarm is present on those sources on the **SERVICES > DASHBOARD** page or the alert list at the top of the page.
3. Create the Broadcast Workflow on the **WORKFLOWS > BUILDER** page by clicking the **CREATE** button alongside the **Broadcast Workflow** graphic.
4. Click on the **Transcodes/Remux** block in the workflow you are creating/editing to display the associated detailed parameters.

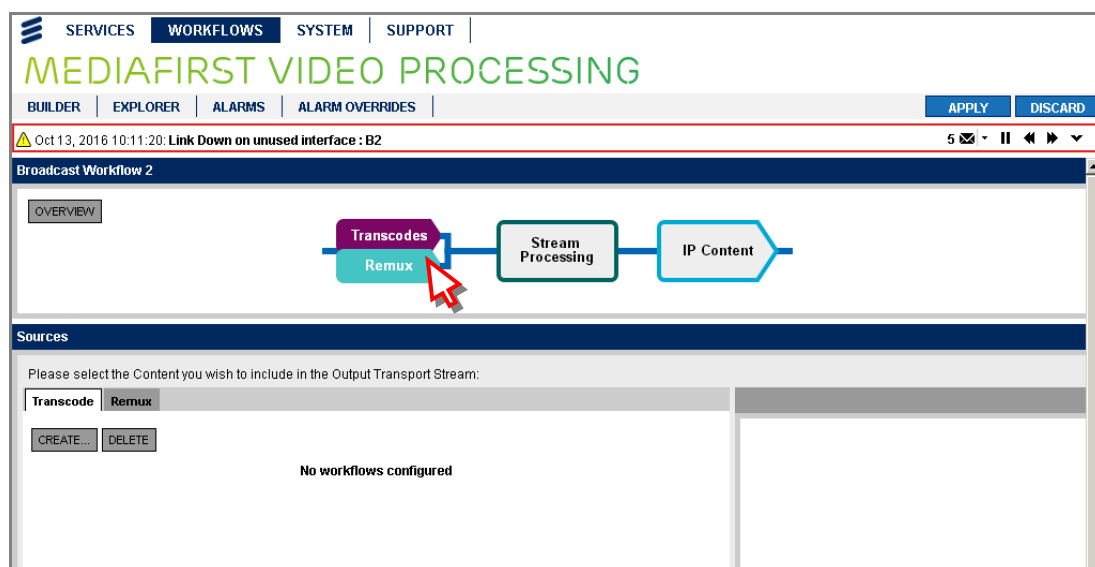


Figure 3.21 Selecting Detailed Parameters for Transcode/Remux

5. The **Sources** widget displays the **Transcode** and **Remux** tabs. Initially the tab content will display **No workflows configured**.
6. To create a Transcode operation (broadcast source), click the **CREATE** button.

Notes: This will display a similar page graphic to Transcode functions used in other workflows and contains a subset of the normal Transcode features. This graphic is only displayed for the duration of the configuration. Only the **IP Content** and **Transcode** blocks are selectable in this graphic and require settings to be configured. Other blocks are grayed out.

At any stage in the Transcode configuration process you can click on the **BACK** button in the top right-hand corner of the screen to undo your changes. Please note the current changes are not lost. The back button allows the configuration of the overall workflow to continue.

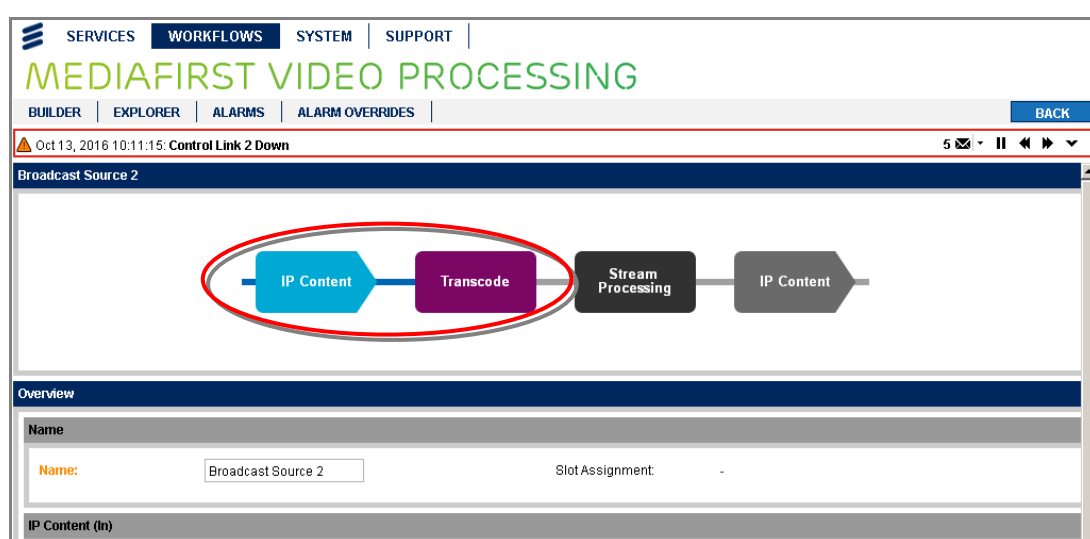


Figure 3.22 Creating a Transcode Configuration for a Broadcast Workflow

- Click on the **IP Content** block in the above graphic to display the **IP** tab page. When a source is selected it will be displayed here.

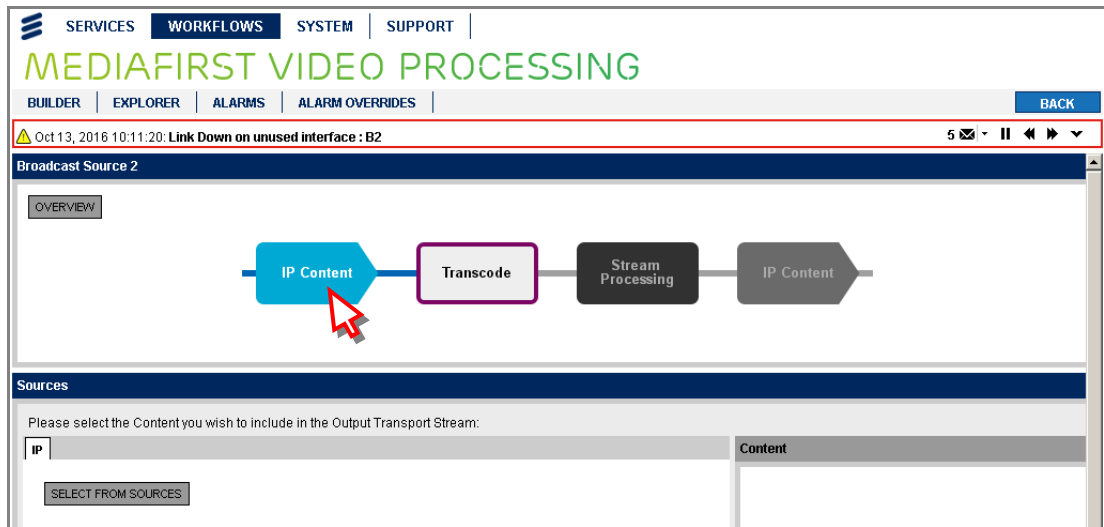


Figure 3.23 Displaying IP Content for Transcode Configuration

- Choose the appropriate IP Source containing the required services and components to be transcoded by clicking on the **SELECT FROM SOURCES** button. Select the appropriate source displayed in the **IP** tab list.
- Expand the displayed tree of **IP Sources** and select the services required by placing a check mark in the relevant checkbox.

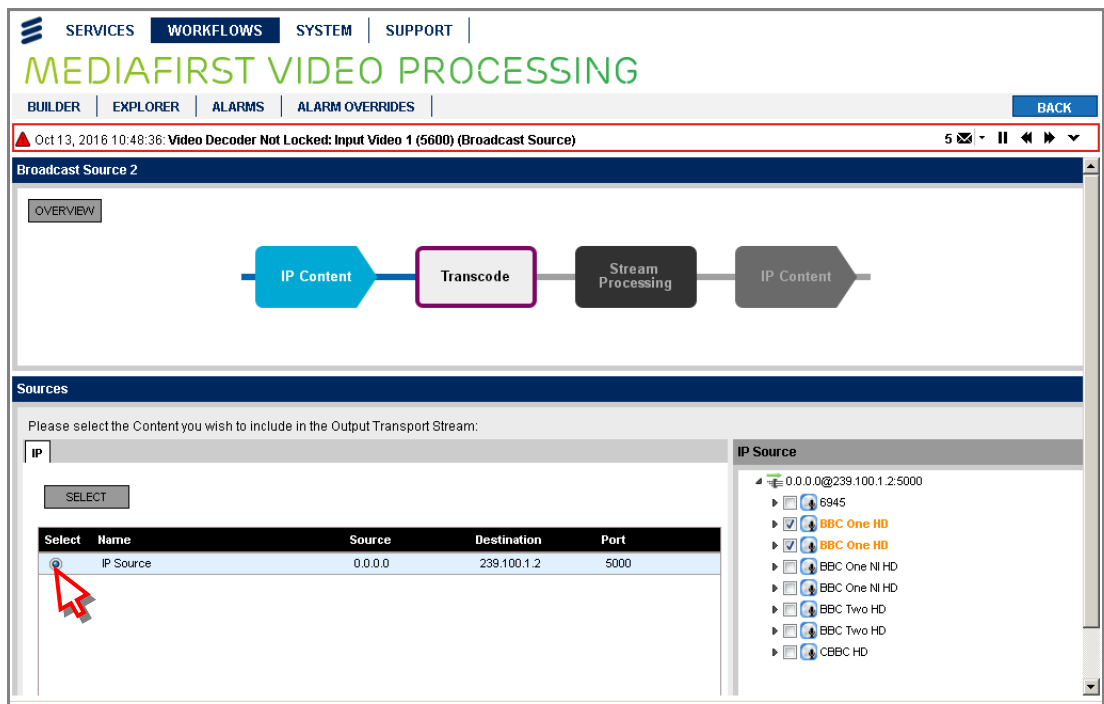
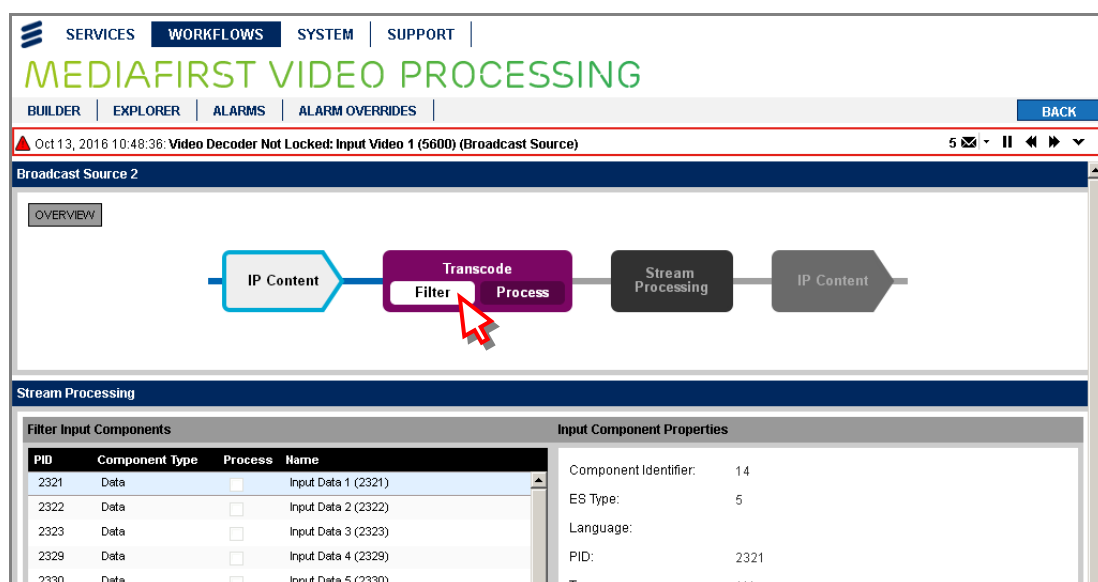


Figure 3.24 Selecting IP Content for Transcode Configuration

10. With your IP Content now selected, click on the **Transcode** block to display its detailed parameters. The block will be split into two further sub-blocks for **Filter** and **Process**. Click on the **Filter** sub-block.



The screenshot shows the MediaFirst Video Processing interface. At the top, there are navigation tabs: SERVICES, WORKFLOWS, SYSTEM, and SUPPORT. Below these are sub-tabs: BUILDER, EXPLORER, ALARMS, and ALARM OVERRIDES. A red banner at the top displays a warning: "Oct 13, 2016 10:48:36: Video Decoder Not Locked: Input Video 1 (5600) (Broadcast Source)". The main workflow diagram shows a sequence of blocks: IP Content, Transcode (split into Filter and Process), Stream Processing, and IP Content. A red arrow points to the Filter sub-block. Below the workflow, the Stream Processing section is expanded, showing a table of Filter Input Components and their properties.

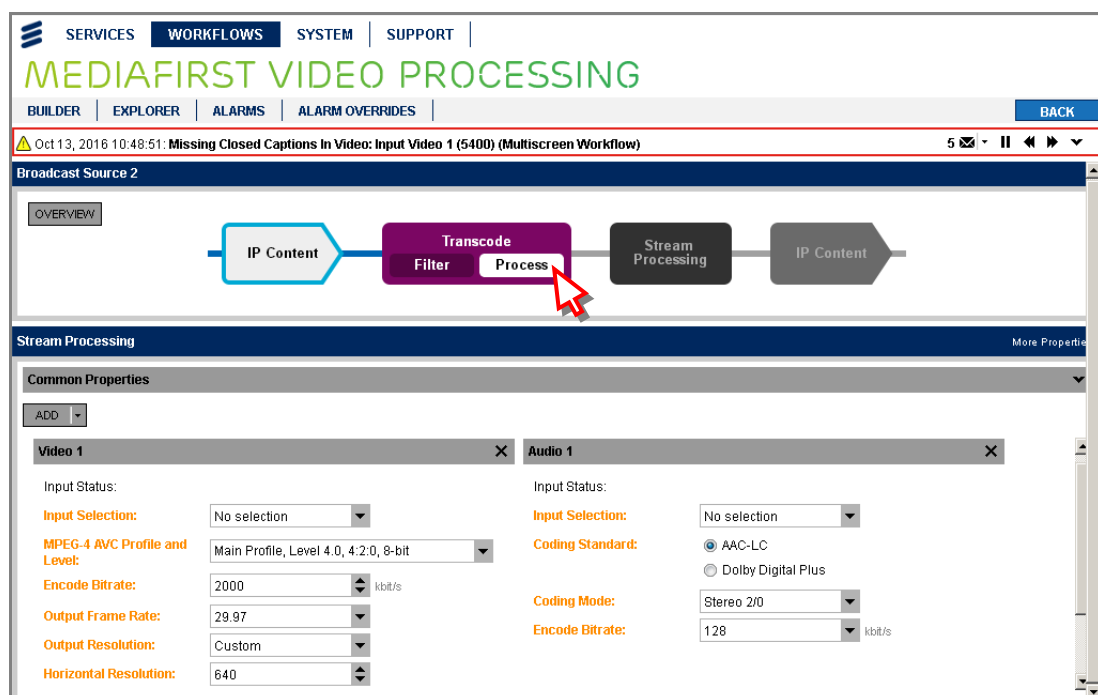
PID	Component Type	Process	Name
2321	Data	<input type="checkbox"/>	Input Data 1 (2321)
2322	Data	<input type="checkbox"/>	Input Data 2 (2322)
2323	Data	<input type="checkbox"/>	Input Data 3 (2323)
2329	Data	<input type="checkbox"/>	Input Data 4 (2329)
2330	Data	<input type="checkbox"/>	Input Data 5 (2330)

Input Component Properties:

- Component Identifier: 14
- ES Type: 5
- Language:
- PID: 2321
- Tag: 111

Figure 3.25 Selecting Components for the Transcode Filter

11. Select the relevant components (video, audio and data) for transcoding by placing a check mark in the relevant checkboxes. Component formats must be selected before proceeding to the **Process** function. Only valid formats are displayed for selection.
12. Click on the **Process** sub-block in the **Transcode** functional block.



The screenshot shows the MediaFirst Video Processing interface with the Transcode Process sub-block selected. The workflow diagram is the same as in Figure 3.25, but a red arrow points to the Process sub-block. Below the workflow, the Stream Processing section is expanded, showing the Common Properties for Video 1 and Audio 1.

Common Properties

ADD

Video 1

Input Status:

Input Selection: No selection

MPEG-4 AVC Profile and Level: Main Profile, Level 4.0, 4:2:0, 8-bit

Encode Bitrate: 2000 kbit/s

Output Frame Rate: 29.97

Output Resolution: Custom

Horizontal Resolution: 640

Audio 1

Input Status:

Input Selection: No selection

Coding Standard: AAC-LC

Coding Mode: Stereo 2/0

Encode Bitrate: 128 kbit/s

Figure 3.26 Selecting Transcoding Properties for the Transcode Process

13. Configure the relevant components (video, audio and data) for transcoding by modifying the settings in this screen as required. This screen is automatically populated with 8 video and 1 audio components, each configured with typical resolution and bit rate settings that are in common usage. You may add (using the **ADD** button) or delete (by clicking on the **X**) any of these components and you may modify their settings as required. Currently, a maximum of 10 video and 16 audio components may be configured.

Note: If the transcoding demands placed on the unit are too great, one or more **Invalid configuration parameter** warnings will be displayed on the Alarm Newsfeed and you will not be able to **APPLY** the configuration. To remove these warnings and restore operation you must reduce the overloading by selecting lesser values for **MPEG-4 AVC Profile Level**, **Output Frame Rate** and /or **Output Resolution**. Only valid frame rates are displayed determined by the **Filter** selection made previously.

14. Further settings are available by selecting **More Properties** on the **Stream Processing** widget.
15. Click the **BACK** button to go back to the Broadcast Workflow screen. Your transcoding configuration will now be displayed in the **Transcode** tab, where you can either edit or delete it.

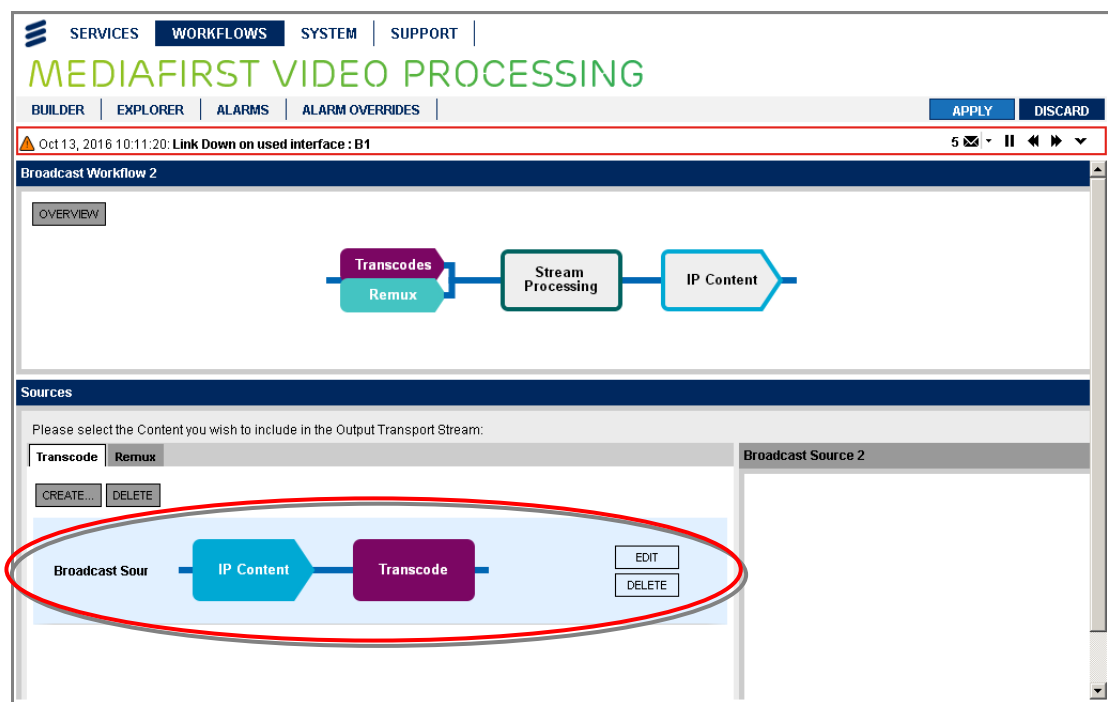


Figure 3.27 Displaying the New Transcode Configuration

3.12.1.2 Configuring Remux

To configure Remux parameters:

1. Click on the **Remux** tab to display the available IP sources.

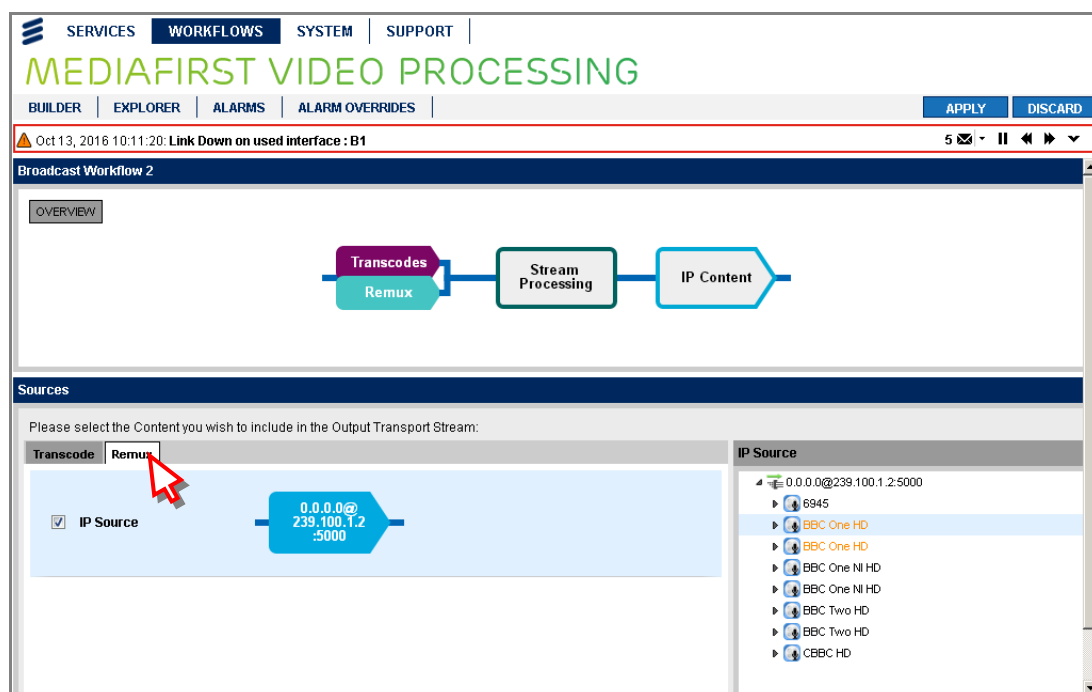


Figure 3.28 Displaying the Remux Properties

2. Select the required IP source by placing a check mark in the relevant checkbox.
3. To save your changes, click the **APPLY** button.

To complete your workflow configuration, see the relevant sections in this chapter according to which functional blocks are present in your workflow.

3.12.2 How to Configure Stream Processing

Any or all input broadcast sources, Transport Streams, Services and Components (video, audio and data), received and displayed in the **Inputs** widget can be selected for use by the unit i.e., for processing or passthrough.



Figure 3.29 Stream Processing Functional Block

To configure Stream Processing:

1. Click on the **Stream Processing** block on the broadcast workflow you are creating/editing to display the associated detailed parameters.

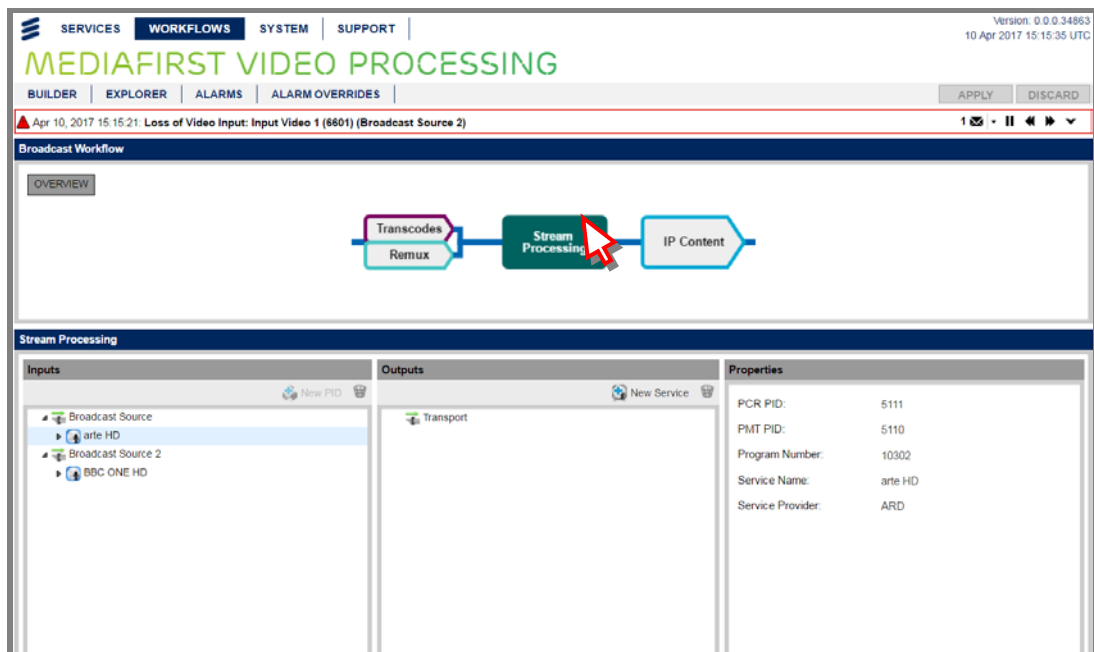


Figure 3.30 Displaying Stream Processing Detailed Parameters

2. Click on the triangle at the left-hand side of the displayed Broadcast Sources to open up the trees and display the services and components. Clicking on any item in the **Input** or **Output** panel will display the associated properties in the **Properties** panel.
3. To use a Broadcast Source; click on the item in the **Inputs** panel and drag-and-drop onto the **Outputs** panel (to select more than one, use **Shift-click** to select adjacent items or **Ctrl-click** to select non-adjacent items).

Note: Only a single instance of a Broadcast Source is permitted in the **Outputs** panel. Multiple copies of Video, Audio and Data Components are permitted but note that these are referenced duplicates of the original and their properties (and PIDs) are the same.

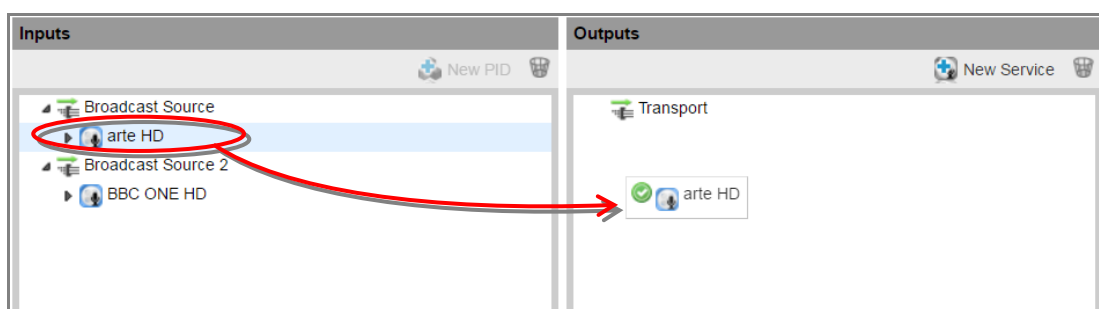


Figure 3.31 Dragging-and-Dropping a Broadcast Source

4. The copied item will be added to the list in the **Outputs** panel (highlighted in orange, signifying it is new and unsaved) and the associated settings are displayed in the **Properties** widget (also highlighted in orange).

5. Modify the **Properties** as required for the items copied. See *Chapter 5, Web GUI Control* for a detailed description of all properties.
6. To save your configuration changes, click the **APPLY** button.

For further details of how to configure a **Stream Processing** functional block, see section 3.14.2 *How to Configure Stream Processing*.

3.12.3 How to Configure IP Content (Out)

The Internet Protocol (IP) Content (Out) must be correctly configured with the destination settings to deliver the content.



Figure 3.32 IP Content (Out) Functional Block

To configure IP Content (Out):

1. Click on the **IP Content** block on the workflow you are creating/editing to display the associated detailed parameters.

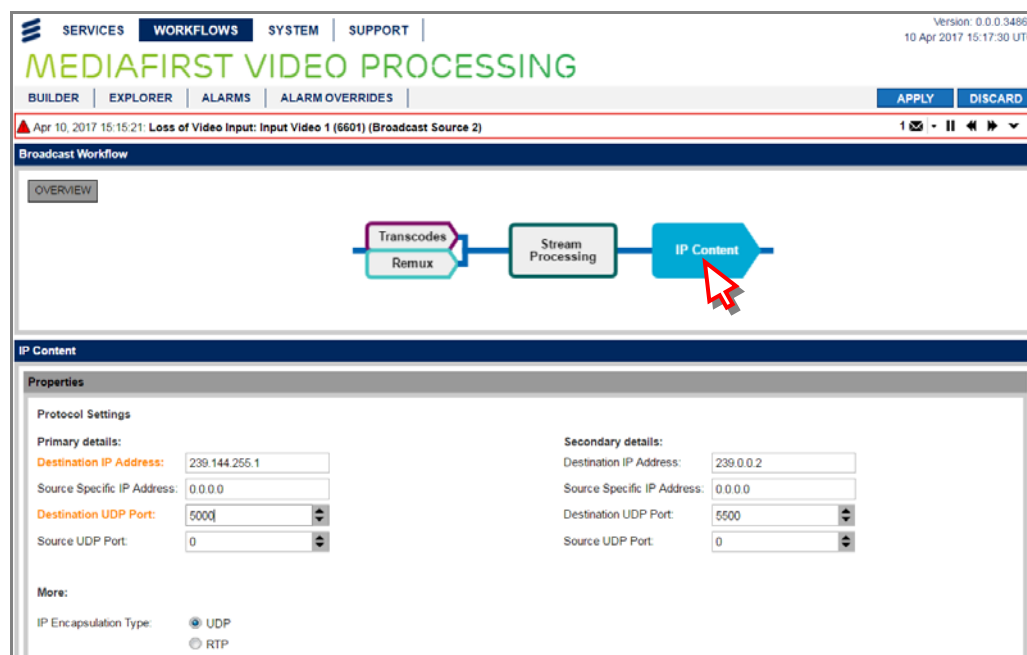


Figure 3.33 Displaying IP Content (Out) Properties

2. The available IP Sources are displayed in the **IP Content** widget. Enter the appropriate settings for the Primary and Secondary.
3. Select an IP encapsulation type, UDP (User Datagram Protocol) or RTP (Real-time Transport Protocol).

4. To save your changes, click the **APPLY** button.

3.13 How to Configure a Multiscreen Workflow

Multiscreen Workflows enable you to create multiple output profiles to support Adaptive Bit Rate (ABR) operation.

A Multiscreen Workflow comprises the following functional blocks:

- **IP Content (In)** – enables you to select your IP content.
- **Transcode** – enables you to define the component properties for transcoding.
- **Package** – enables you to create your multiscreen profiles.
- **IP Content (Out)** – enables you to configure the IP destination settings

The figure below shows the currently available Multiscreen Workflow option on the **WORKFLOWS > BUILDER** page.



Figure 3.34 Multiscreen Workflow

3.13.1 How to Configure IP Content (In)

Multiscreen Workflows transcode a single selected input into several output video profiles comprising different resolutions and bit rates to support Adaptive Bit Rate (ABR) operation.

Content may be either IP inputs or specific inputs from option cards that are fitted. Each IP source must be correctly configured in order to receive the Transport Streams and Input Services present on the received signal.

The first step in the Multiscreen Workflow template is to configure the IP Content (In).



Figure 3.35 IP Content (In) Functional Block

To configure IP Content (In):

1. Click on the left-most (input) **IP Content** block on the workflow you are creating/editing.

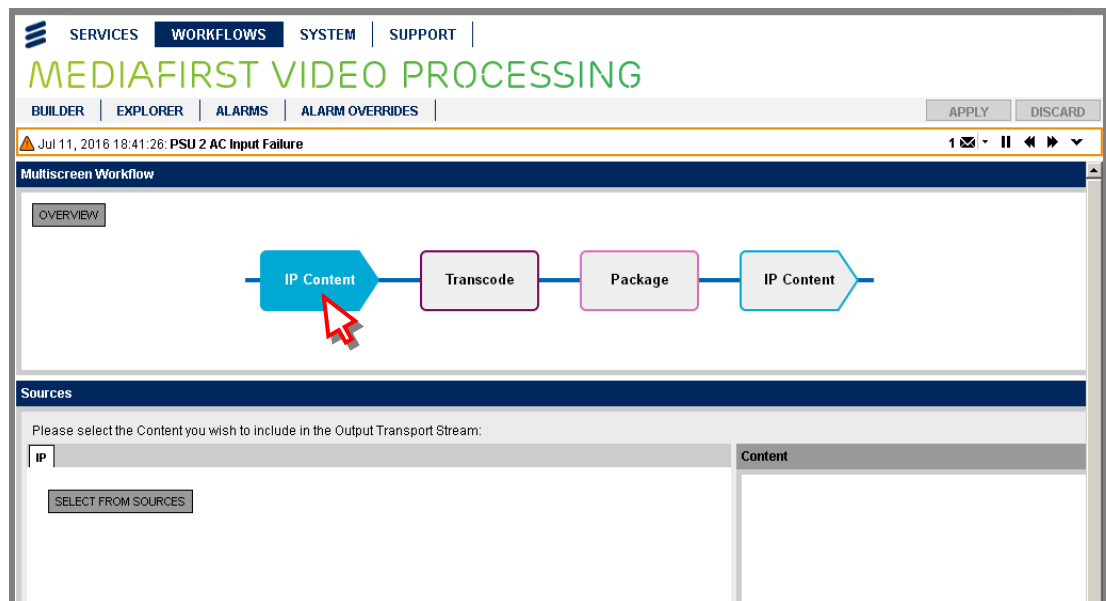


Figure 3.36 Displaying IP Content (In) for Multiscreen Workflow

2. Click on the **SELECT FROM SOURCES** button in the **IP** tab to display a list of available sources.
3. Select a source containing the required services and components that are to be transcoded from the displayed list, by clicking on the relevant button in the **Select** column.

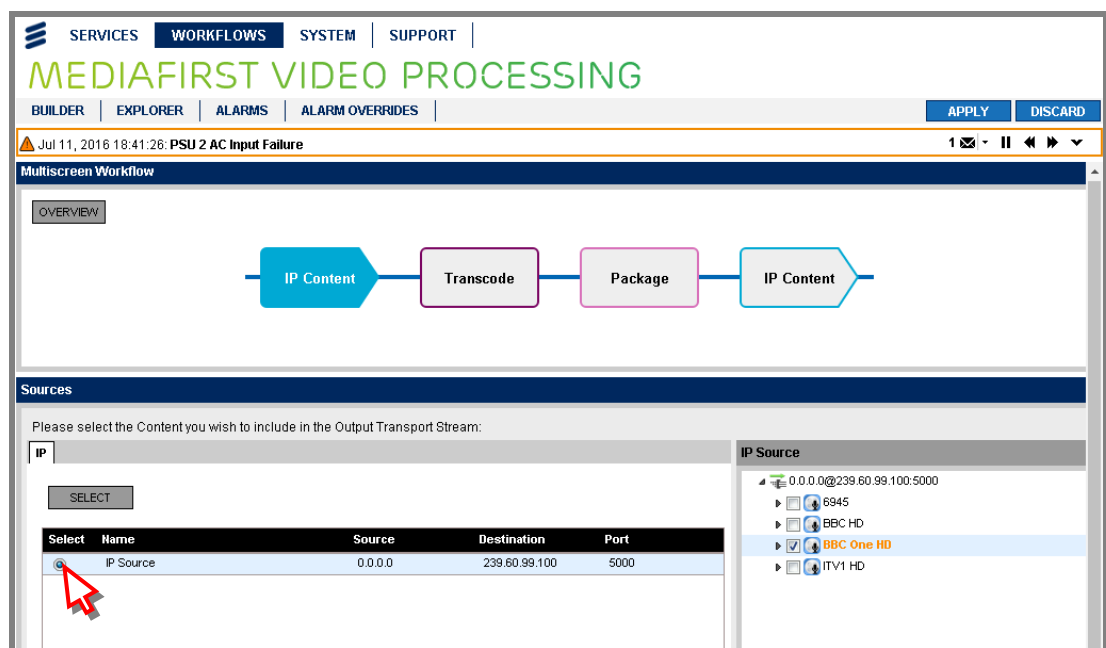


Figure 3.37 Selecting IP Source for Multiscreen Workflow

4. Expand the displayed tree of **IP Sources**, displayed on the right-hand side, and select the services required by placing a check mark in the relevant checkbox.

- Click on the **SELECT** button to confirm and return to the initial display showing the source that has been selected.

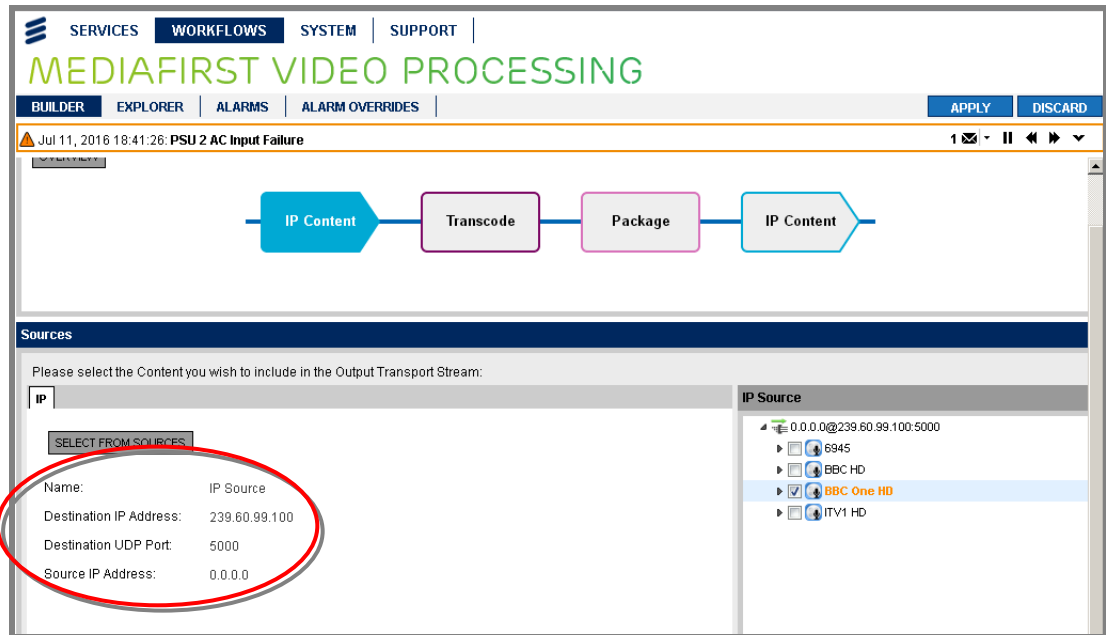


Figure 3.38 Multiscreen Workflow - Selected IP Source and Service

To complete your workflow configuration, see the relevant sections in this chapter according to which functional blocks are present in your workflow.

3.13.2 How to Configure Transcode

Multiscreen workflows transcode a single selected input into several output video profiles comprising different resolutions and bit rates to support Adaptive Bit Rate (ABR) operation.

The second step in the Multiscreen Workflow template is to configure Transcode.



Figure 3.39 Transcode Functional Block

To configure a Transcode:

- Click on the **Transcode** block in the workflow you are creating/editing to display the associated detailed parameters. The block will be divided into sub-blocks of **Filter** and **Process**.
- Click on the **Filter** sub-block.

3. Select the relevant components (video, audio and data) for transcoding by placing a check mark in the relevant checkboxes in the **Process** column. Component formats must be selected before proceeding to the **Process** function. Only valid formats are displayed for selection.

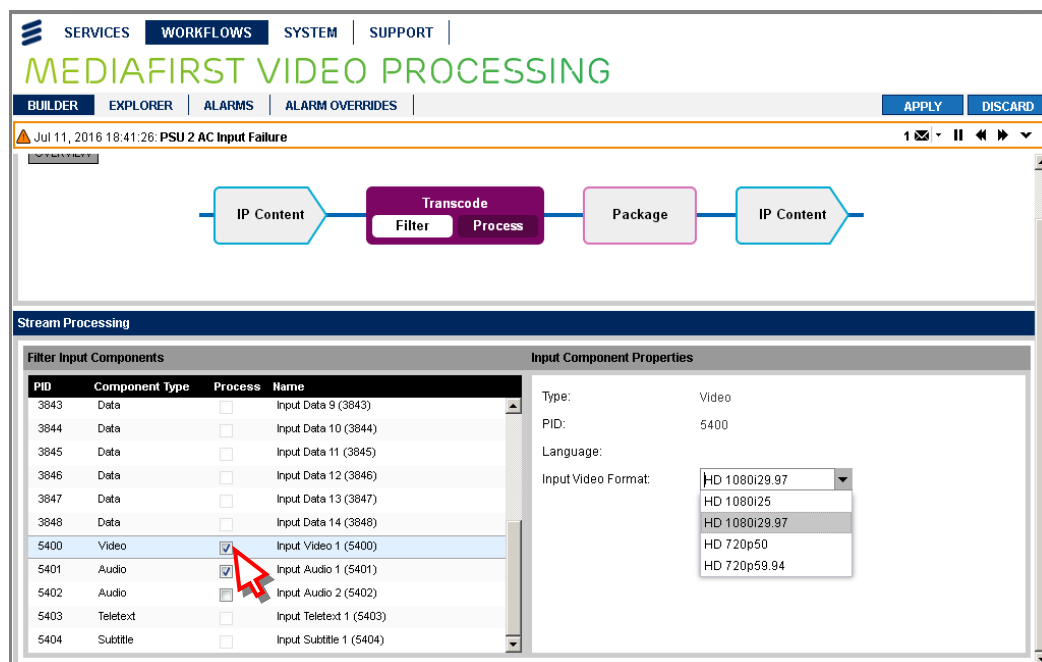


Figure 3.40 Selecting Transcode Filter Settings for Multiscreen Workflow

4. Click on the **Process** sub-block in the **Transcode** functional block.

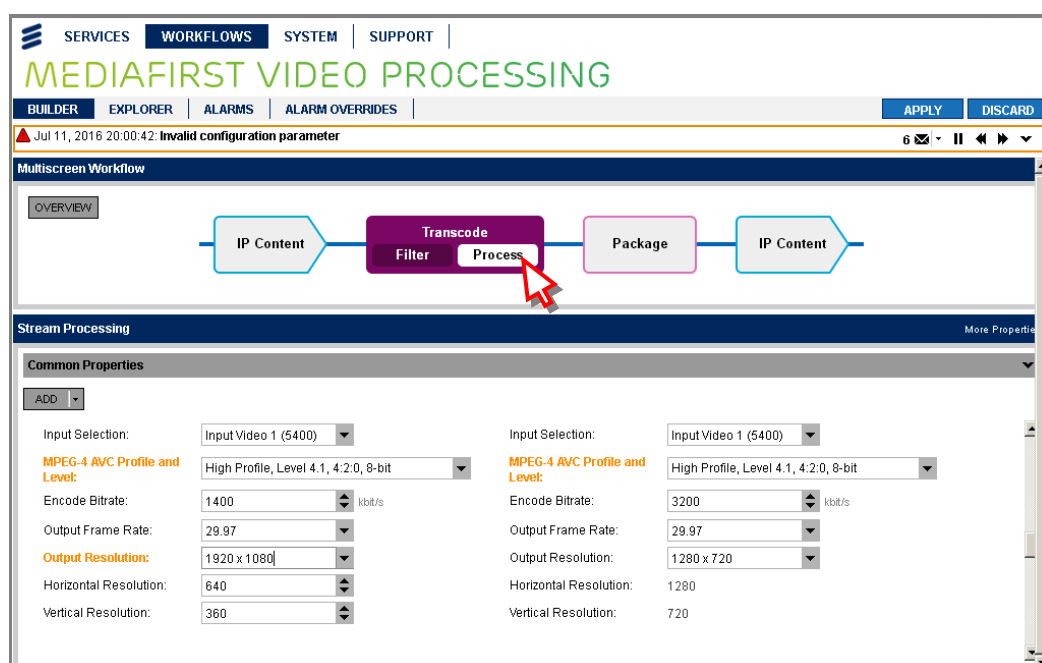


Figure 3.41 Selecting Transcode Process Settings for Multiscreen Workflow

- Configure the relevant components (video, audio and data) for transcoding by modifying the settings in this screen as required. This screen is automatically populated with 8 video and 1 audio components, each configured with typical resolution and bit rate settings that are in common usage. You may add (using the **ADD** button) or delete (by clicking on the **X**) any of these components and you may modify their settings as required. Currently, a maximum of 10 video and 16 audio components may be configured.

Note: If the transcoding demands placed on the unit are too great, one or more **Invalid configuration parameter** warnings will be displayed on the Alarm Newsfeed and you will not be able to **APPLY** the configuration. To remove these warnings and restore operation you must reduce the overloading by selecting lesser values for **MPEG-4 AVC Profile Level**, **Output Frame Rate** and /or **Output Resolution**. Only valid frame rates are displayed determined by the **Filter** selection made previously.

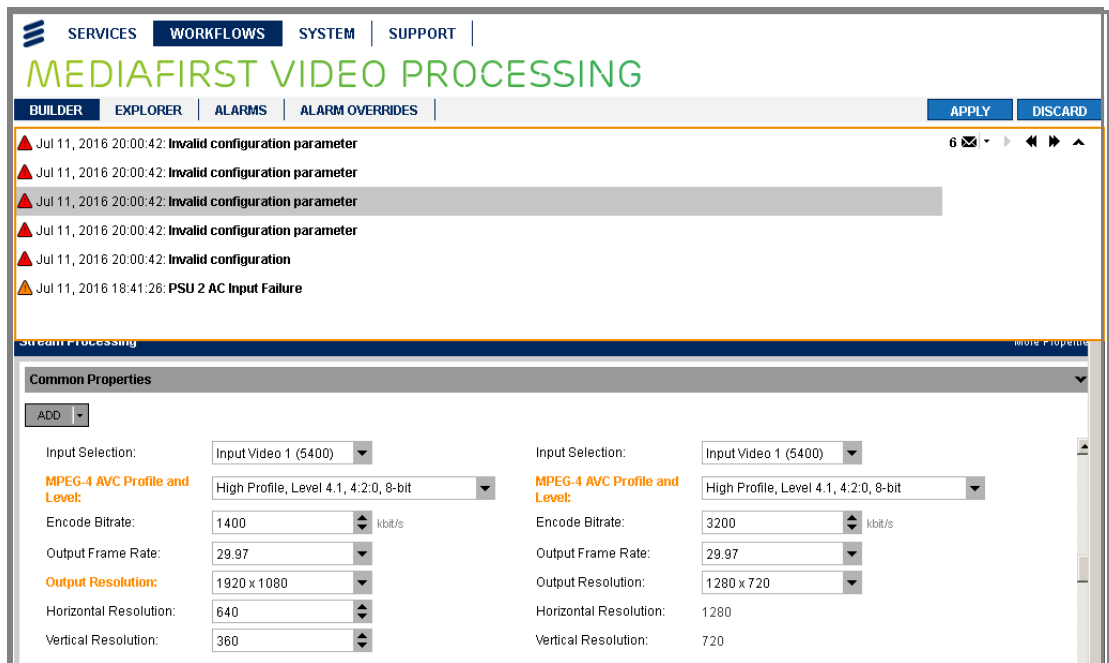


Figure 3.42 Invalid Configuration Parameter Warning for Multiscreen Workflow

- Further settings are available by selecting **More Properties** on the **Stream Processing** widget.

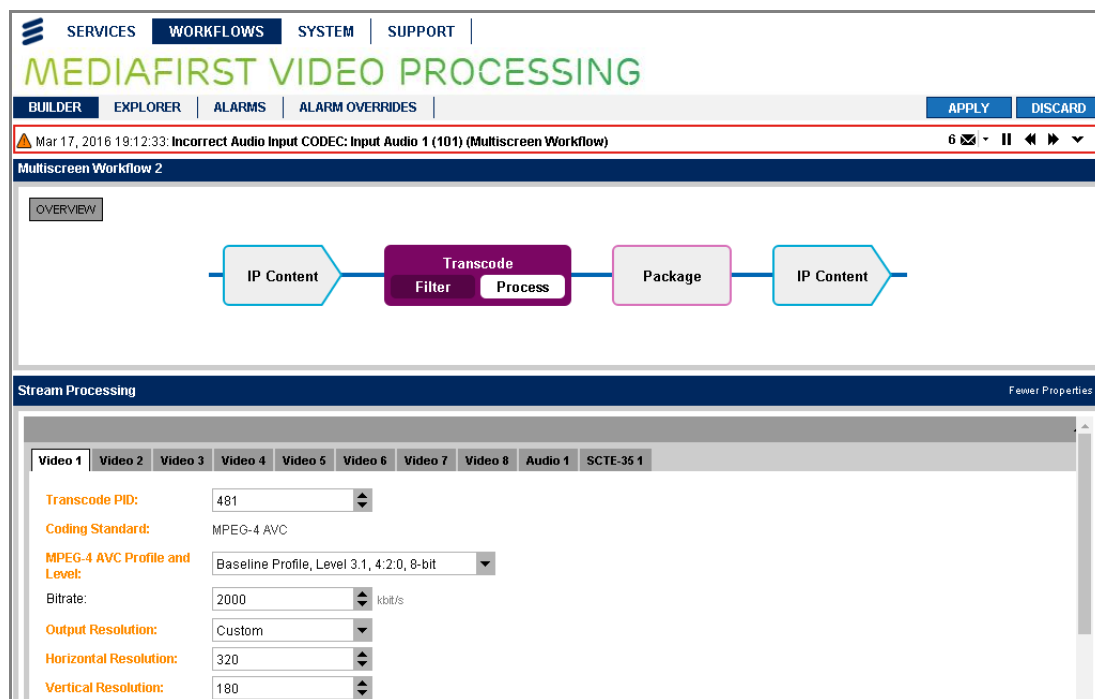


Figure 3.43 Displaying More Properties for Transcode Process

7. Click the **APPLY** button to implement the changes to the workflow.

To complete your workflow configuration, see the relevant sections in this chapter according to which functional blocks are present in your workflow.

3.13.3 How to Configure Package

Multiscreen workflows transcode a single selected input into several output video profiles comprising different resolutions and bit rates to support Adaptive Bit Rate (ABR) operation.

The third step in the Multiscreen Workflow template is to configure Package.



Figure 3.44 Package Functional Block

1. Click on the **Package** functional block in the workflow you are creating/editing to display the available video, audio and data profiles and bit rates.

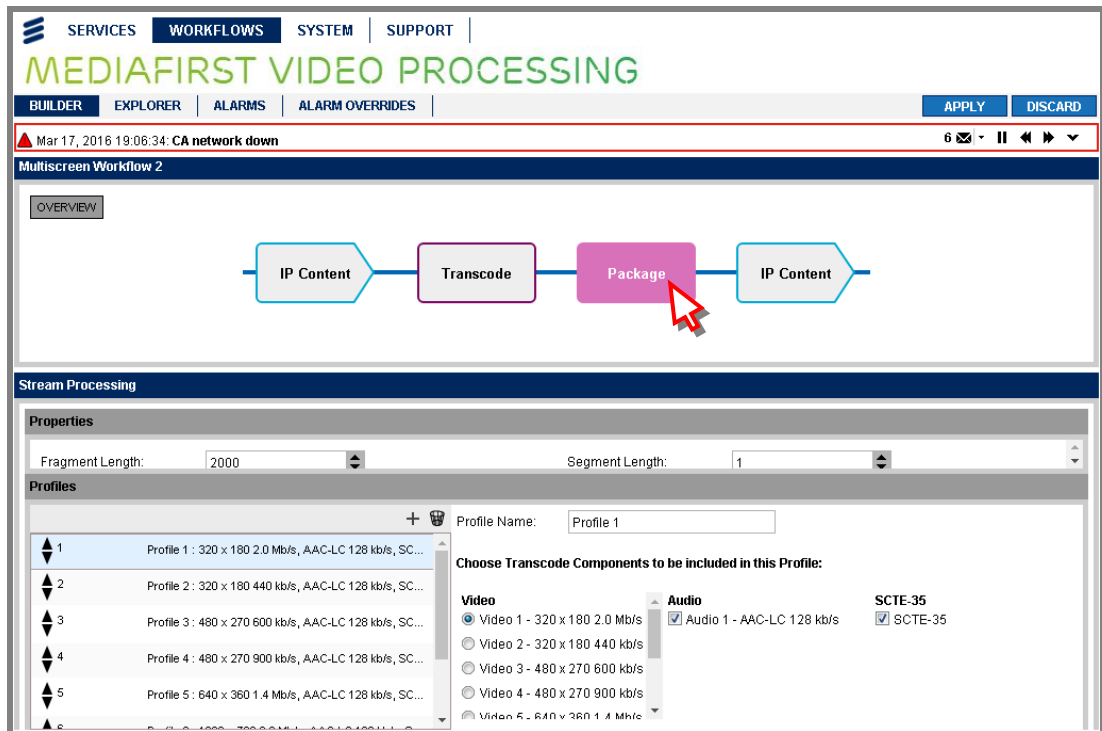


Figure 3.45 Displaying Package Settings for Multiscreen Workflow

2. A profile for each video component is created automatically (this may take a few seconds). These profiles may be renamed and modified, as required.
3. Click the **APPLY** button to implement the changes to the workflow.

To complete your workflow configuration, see the relevant sections in this chapter according to which functional blocks are present in your workflow.

3.13.4 How to Configure IP Content (Out)

The Internet Protocol (IP) Content (Out) must be correctly configured with the destination settings to deliver the content.



Figure 3.46 IP Content (Out) Functional Block

To configure IP Content (Out):

1. Click on the **IP Content** block on the workflow you are creating/editing to display the associated detailed parameters.

Note: Fewer properties may be displayed than show below, depending on workflow type (e.g. Multiscreen Workflow).

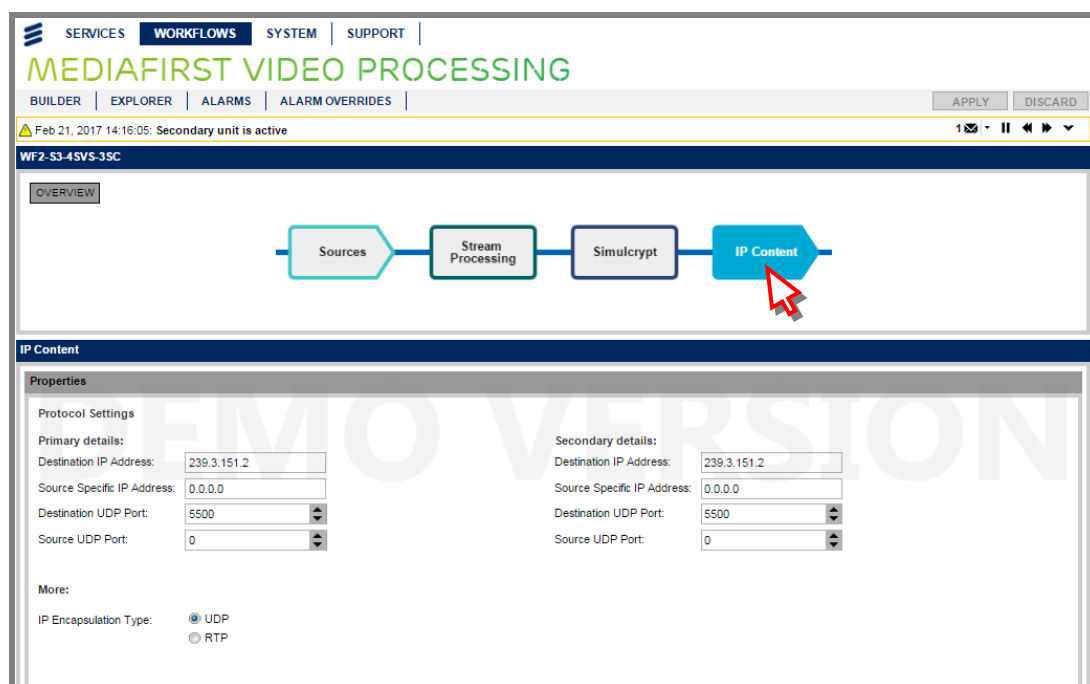


Figure 3.47 Displaying IP Content (Out) Properties

2. The available IP Sources are displayed in the **IP Content** widget. Enter the appropriate settings for the Primary and Secondary.
3. Select an IP encapsulation type, UDP (User Datagram Protocol) or RTP (Real-time Transport Protocol).
4. To save your changes, click the **APPLY** button.

3.14 How to Configure a Stream Processing Workflow

Stream Processing Workflows enable you to

Stream Processing Workflows comprise combinations of the following functional blocks:

- **Sources** – enables you to select the input source.
- **Stream Processing** – enables you to select input Transport Streams, Services or Components for output processing (to create new streams and define services) or passthrough.
- **Simulcrypt** – enables you to configure Conditional Access to encrypt your services.
- **IP Content** – enables you to configure the IP destination settings.
- **ASI Content** – enables you to configure the Asynchronous Serial Interface destination settings.

The figure below shows the currently available Stream Processing Workflow options on the **WORKFLOWS > BUILDER** page.

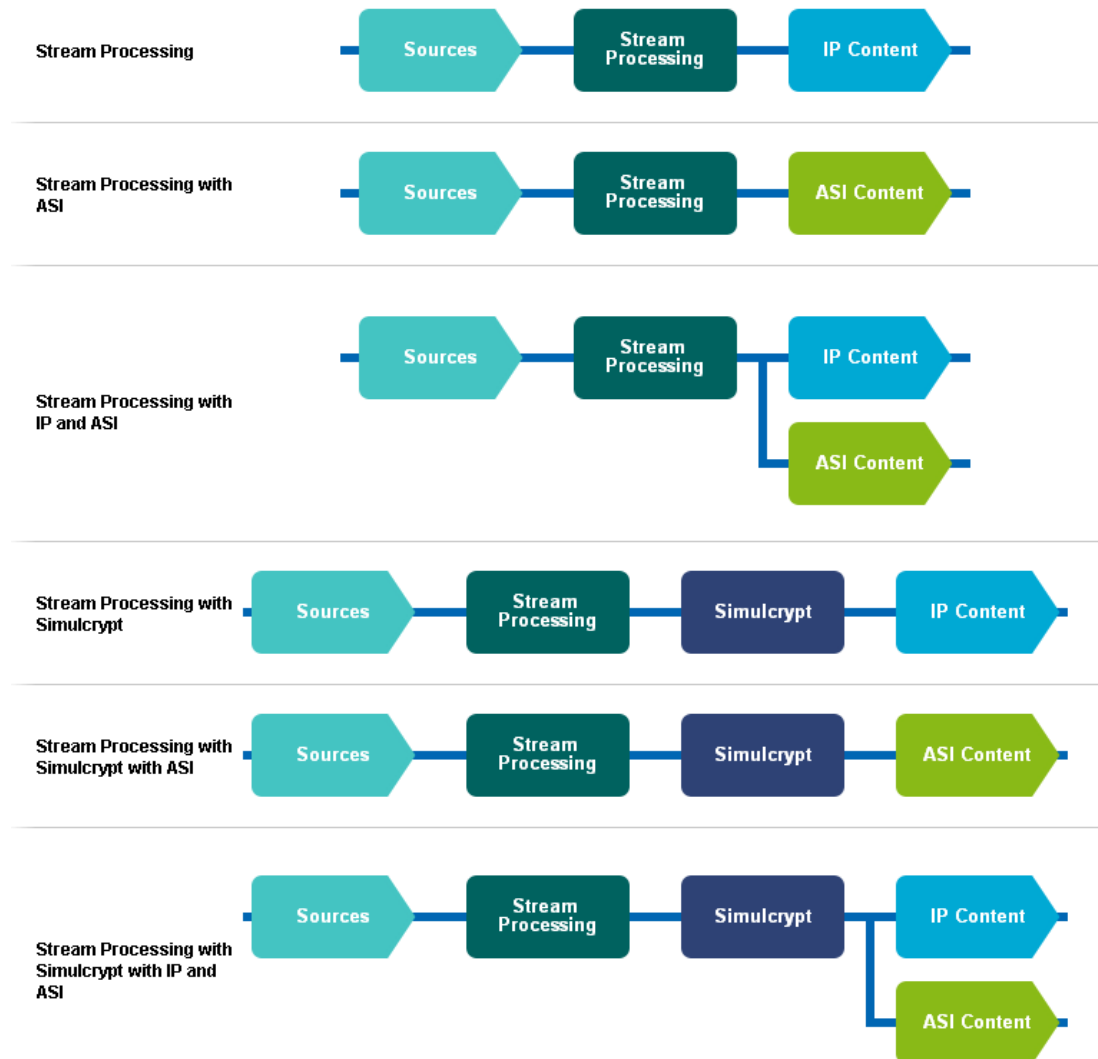


Figure 3.48 Stream Processing Workflows

3.14.1 How to Configure Sources

Input sources may be either IP inputs or specific inputs from option cards that are fitted. Each source must be correctly configured in order to receive the Transport Streams and Input Services present on the received signal.



Figure 3.49 Sources Functional Block

To configure Sources:

1. Navigate to the **SYSTEM > SOURCES** web page.
2. Click on the **ADD SOURCE** button to add a new IP Source.

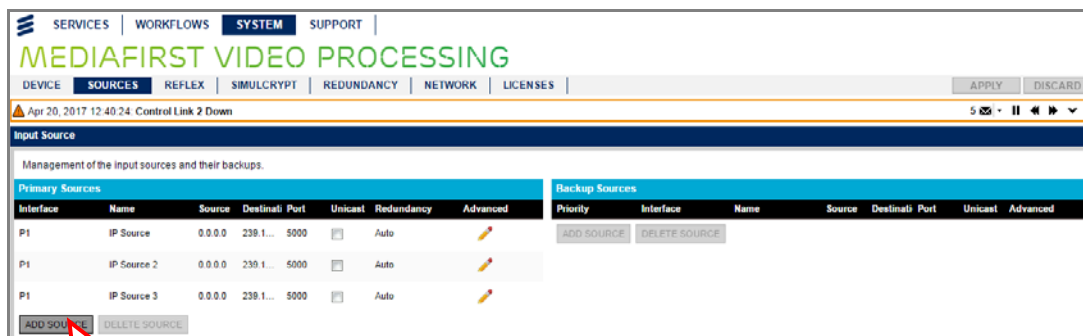


Figure 3.50 Adding Input Sources

3. If editing an existing workflow, navigate to the **WORKFLOWS > EXPLORER** web page and click the **EDIT** button; or, if creating a new workflow, navigate to the **WORKFLOWS > BUILDER** web page and click the **CREATE** button.
4. Click on the **Sources** block on the workflow you are creating/editing to display the associated detailed parameters.

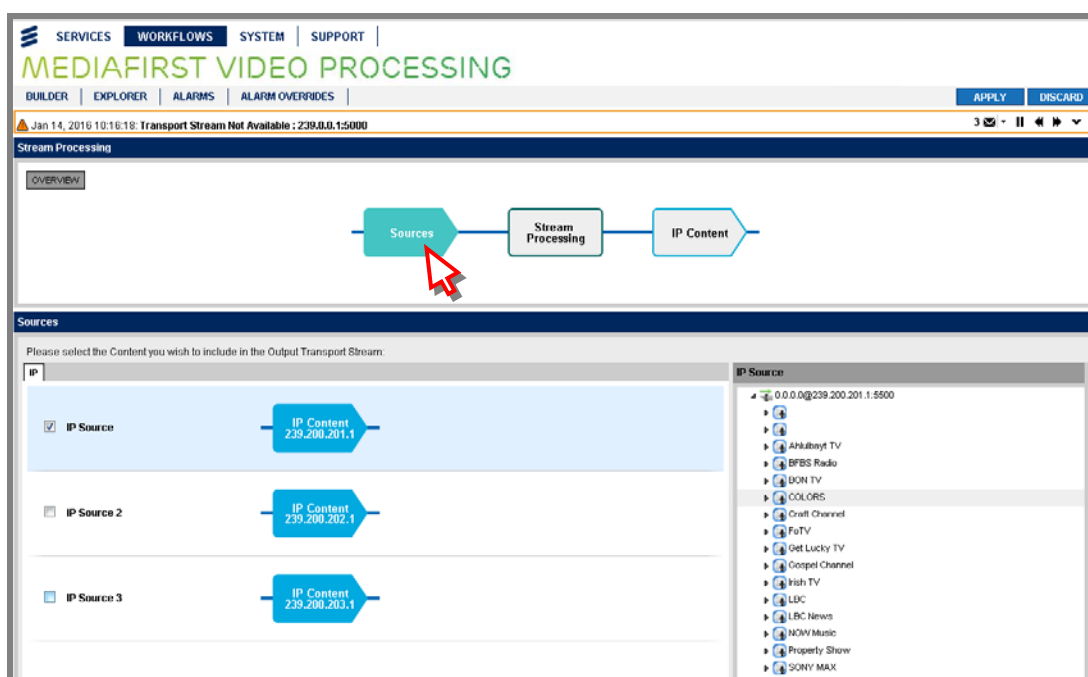


Figure 3.51 Selecting IP Sources

5. The available multicast details are displayed in **IP Source** tree. Select the required multicast by clicking on it.
6. The available IP Sources are displayed in the **IP** tab. Select the required IP Source by checking the relevant box.

- If your workflow permits ASI content, there will be an **ASI** tab also displayed for you to choose a suitable ASI source.

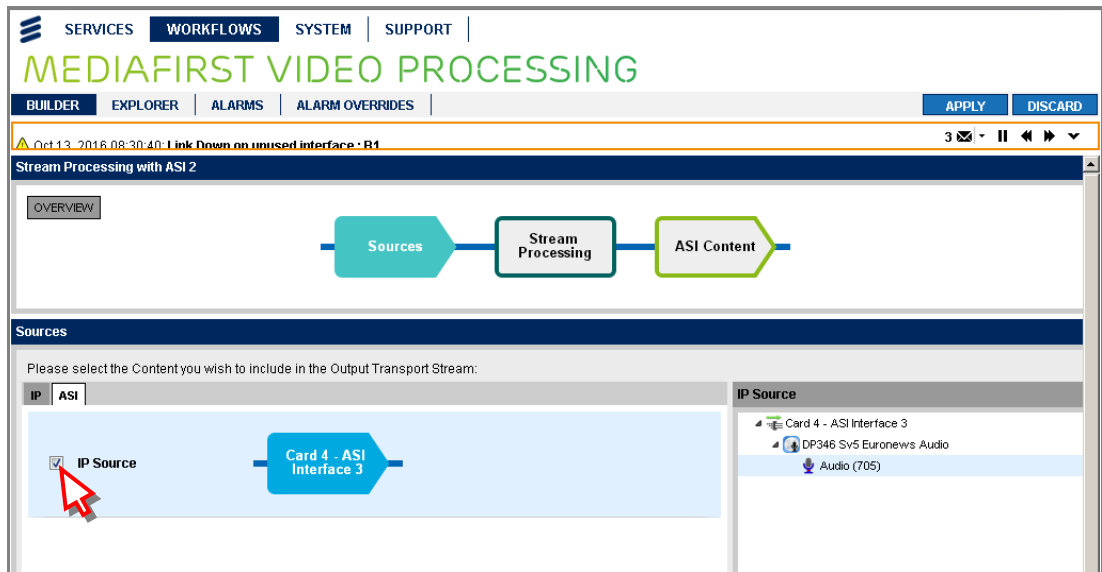


Figure 3.52 Selecting ASI Sources

- To save your changes, click the **APPLY** button. A correctly received Transport Stream will automatically be displayed in the **IP Source** tree.

To complete your workflow configuration, see the relevant sections in this chapter according to which functional blocks are present in your workflow.

Viewing Input Transport Streams, Services and Components

Transport Streams are automatically detected and listed in the **IP Source** tree. Simply click on the arrows to expand, or collapse, the tree.

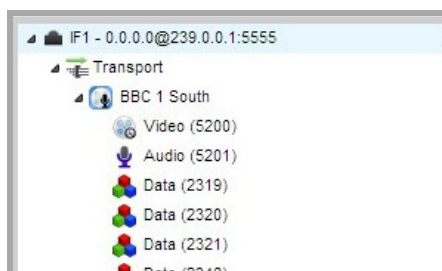


Figure 3.53 Viewing Input Transport Streams, Services and Components

The Transport Streams, Services and Components (video, audio and data) are listed in Option Card order in a tree structure, beginning with Input IF1 at the top.

To quickly expand or collapse the tree structure at a particular point, double-click on the item.

3.14.2 How to Configure Stream Processing

Any or all input Transport Streams, Services and Components (video, audio and data) received and displayed in the **Inputs** widget can be selected for use by the unit i.e., for processing or passthrough.

A new output Transport Stream may be created from scratch if you want to define new services and configure new settings for it. Alternatively, you could simply copy an existing workflow and modify the services and settings, which in most cases will be quicker.



Figure 3.54 Stream Processing Functional Block

To configure Stream Processing:

1. Click on the **Stream Processing** block on the workflow you are creating/editing to display the associated detailed parameters.

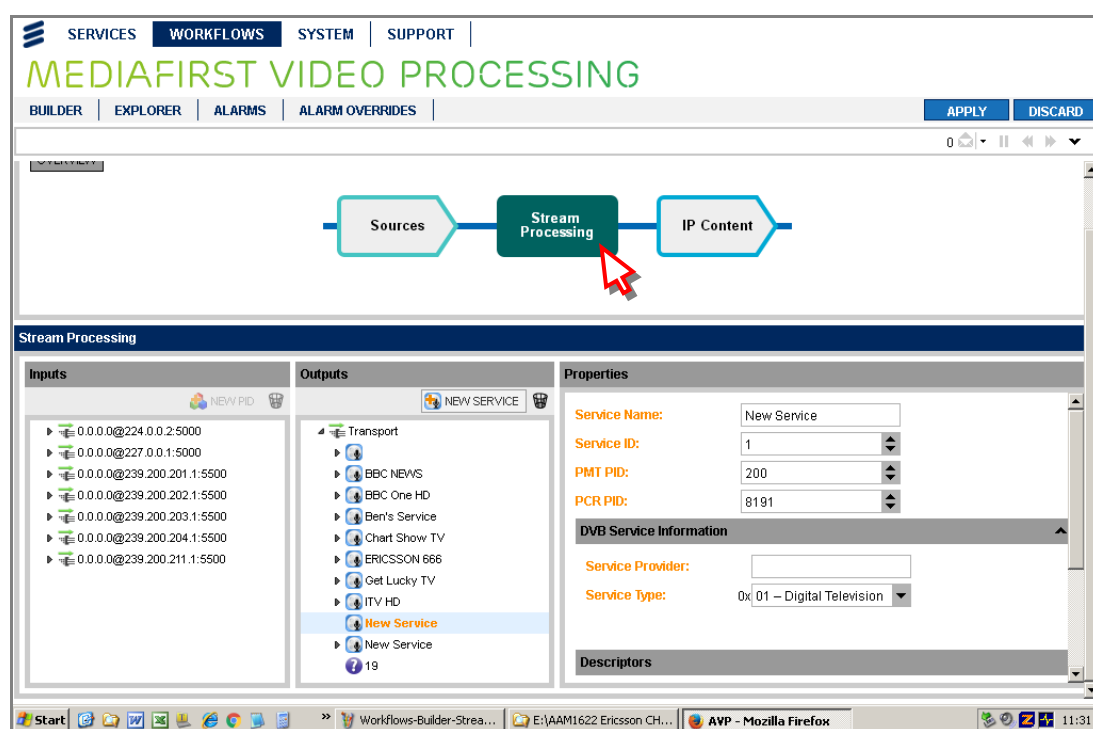


Figure 3.55 Displaying Stream Processing Detailed Parameters

- Click on the triangle at the left-hand side of the displayed Transport Streams to open up the trees and display the services and components. Clicking on any item in the **Input** or **Output** panel will display the associated properties in the **Properties** panel.

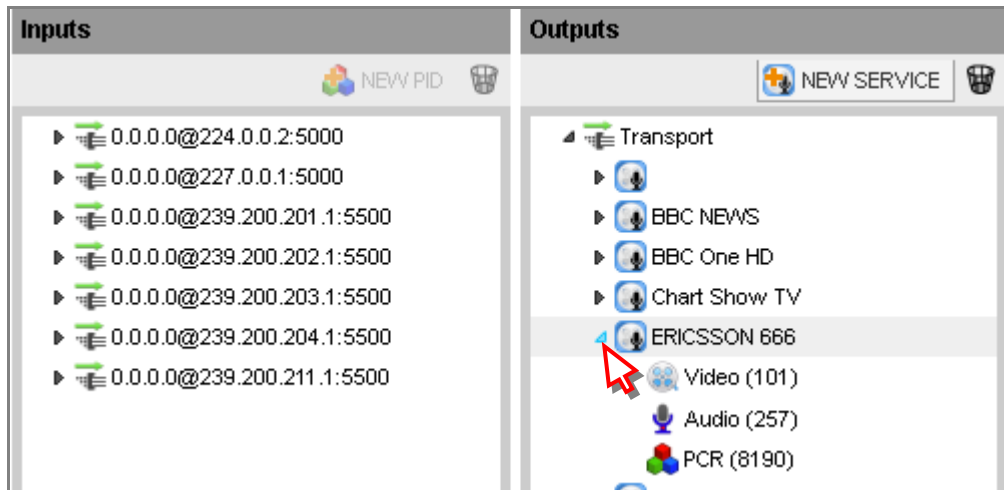


Figure 3.56 Viewing Services and Components

- To copy a Transport Stream, Service or Component; click on the item in the **Inputs** panel and drag-and-drop onto the **Outputs** panel (to select more than one, use **Shift-click** to select adjacent items or **Ctrl-click** to select non-adjacent items).

Note: Only a single instance of a Transport Stream or a Service is permitted in the **Outputs** panel. Multiple copies of Video, Audio and Data Components are permitted but note that these are referenced duplicates of the original and their properties (and PIDs) are the same.

- If drag-and-drop is permitted, a green check mark is displayed in the dragged object.

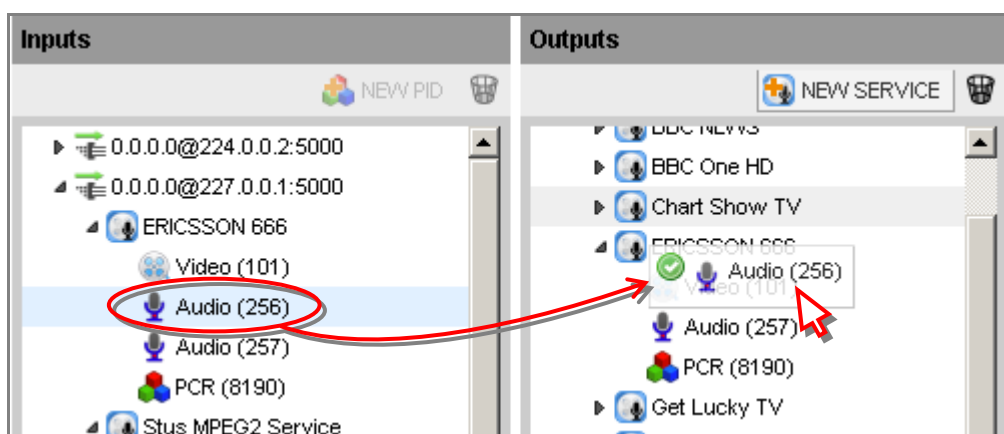


Figure 3.57 Drag-and-Drop Permitted

- b If drag-and-drop is not permitted, a red no-entry symbol is displayed in the dragged object.

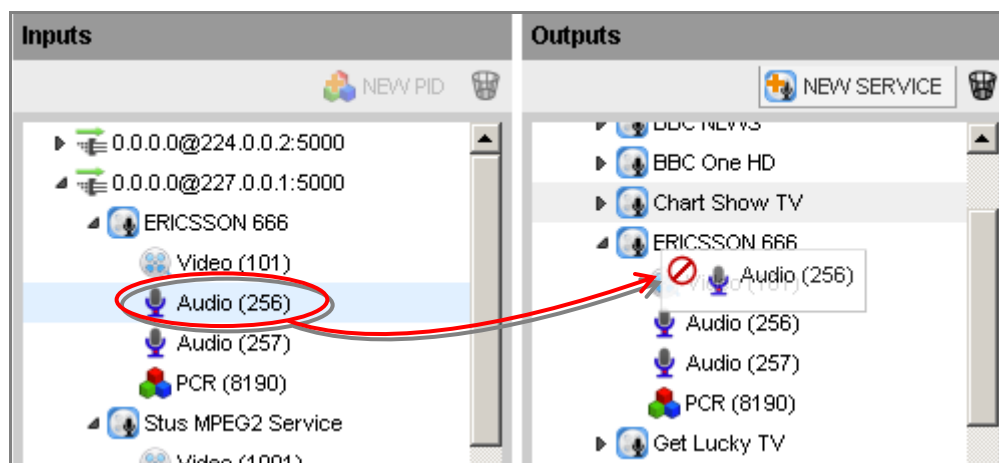


Figure 3.58 Drag-and-Drop Not Permitted

4. The copied item will be added to the list in the **Outputs** panel (highlighted in orange, signifying it is new and unsaved) and the associated settings are displayed in the **Properties** widget (also highlighted in orange).

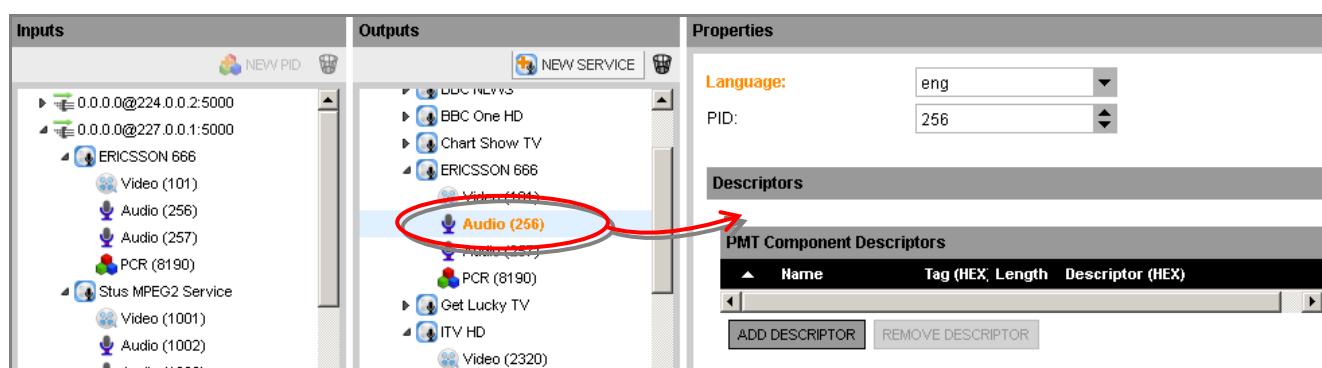



Figure 3.59 Dragging-and-Dropping Transport Streams

5. Modify the **Properties** as required for the items copied. See *Chapter 5, Web GUI Control* for a detailed description of all properties.
6. To save your configuration changes, click the **APPLY** button.

Deleting a Transport Stream, Service or Component

To delete a Transport Stream, Service or Component:

1. Click on the **Stream Processing** block on the workflow you are creating/editing to display the associated detailed parameters.
2. Click on the item you wish to delete (in either the **Inputs** or **Outputs** panel).
3. Click on the wastebasket icon  or select the **Delete** option from the right-click menu. A confirmation dialog box will be displayed.

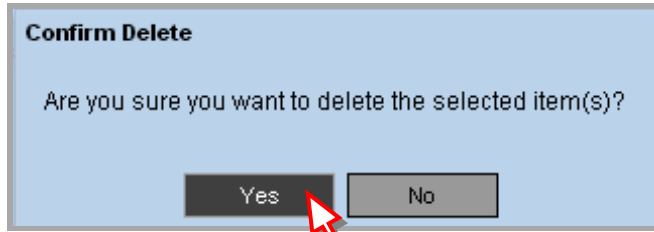


Figure 3.60 Confirm Delete Dialog Box

4. Click **Yes** to permanently delete the item.

Configuring Passthrough of Service Descriptors

To select passthrough for a Service descriptor:

1. Click on the **Stream Processing** block on the workflow you are creating/editing to display the associated detailed parameters.
2. Select the output service by clicking on it in the **Outputs** panel.
3. In the **Properties** panel, under the **Descriptors** heading, ensure that the **PMT** option is selected in the **Passthrough** drop-down list (this is the default value). If **None** is selected, no pass through of service descriptors will occur.

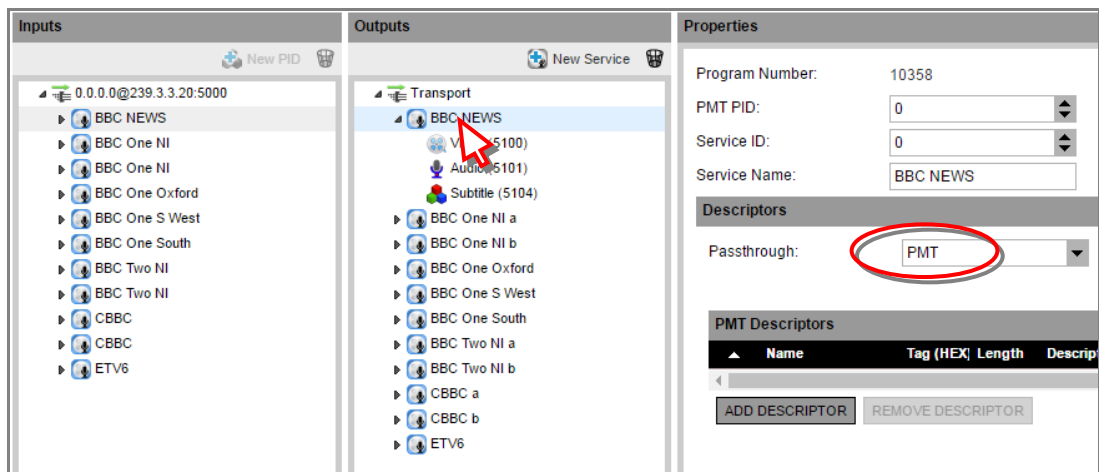


Figure 3.61 Configuring a Service for Passthrough

4. To save your configuration changes, click the **APPLY** button.

Service-level descriptors will be actively copied from the master input service PMT to the output PMT only. No SDT descriptors will be copied.

Configuring Passthrough of Component Descriptors

To select passthrough for a Component descriptor:

1. Click on the **Stream Processing** block on the workflow you are creating/editing to display the associated detailed parameters.
2. Select the output component by clicking on it in the **Outputs** panel.
3. In the **Properties** panel, under the **Descriptors** heading, ensure that the **Yes** option is selected in the **Passthrough** drop-down list (this is the default value). If **No** is selected, component descriptors are not copied.

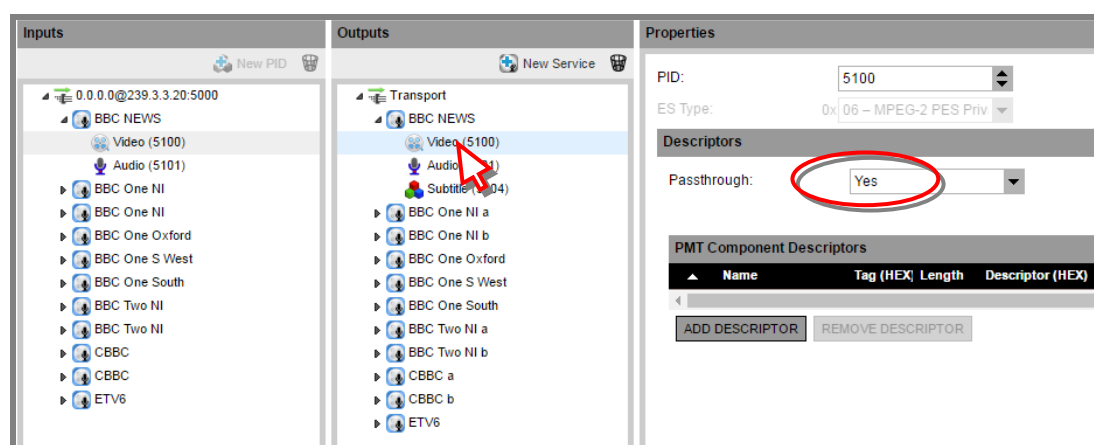


Figure 3.62 Configuring a Service for Passthrough

4. To save your configuration changes, click the **APPLY** button.


Component-level descriptors will be actively copied from the elementary stream info item in the source PMT to the output PMT elementary stream info item.

Notes: If the source of a component is an unreferenced PID then the passthrough setting will have no effect, as there can never be any descriptors to pass through.

When using Component references, all shared references must have the same passthrough setting, i.e. you cannot choose to have the shared Component use descriptor passthrough in one output Service but not another in the same output Transport Stream.

Adding a New Service

To add a new Service to a Stream Processing output:

1. Click on the **Stream Processing** block on the workflow you are creating/editing to display the associated detailed parameters.
2. Click on the  **NEW SERVICE** button in the **Outputs** panel. A new service will be added and highlighted as **orange** text.

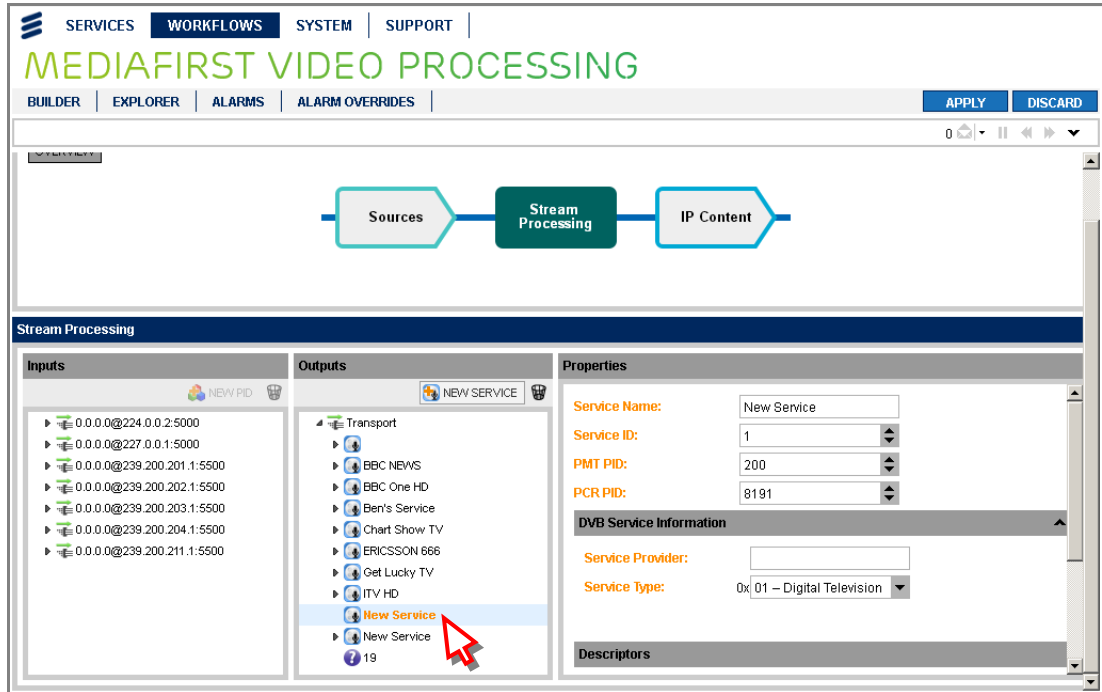



Figure 3.63 Adding a New Service

3. Select the New Service and modify the **Properties** as required. See *Chapter 5, Web GUI Control* for a detailed description of all properties.
4. To save your configuration changes, click the **APPLY** button.

Note: Unique PIDs and Service IDs must be set for services within the same Transport Stream. The unit detects potential clashes as they are entered and will display alert messages in the Alarm Newsfeed, preventing invalid configurations from being applied.

Adding a New PID

To add a new PID to a Stream Processing input:

1. Click on the **Stream Processing** block on the workflow you are creating/editing to display the associated detailed parameters.
2. Select the required Transport Stream in the **Inputs** panel.
3. Click on the  button in the **Inputs** panel. A new PID will be added and highlighted as **orange** text.

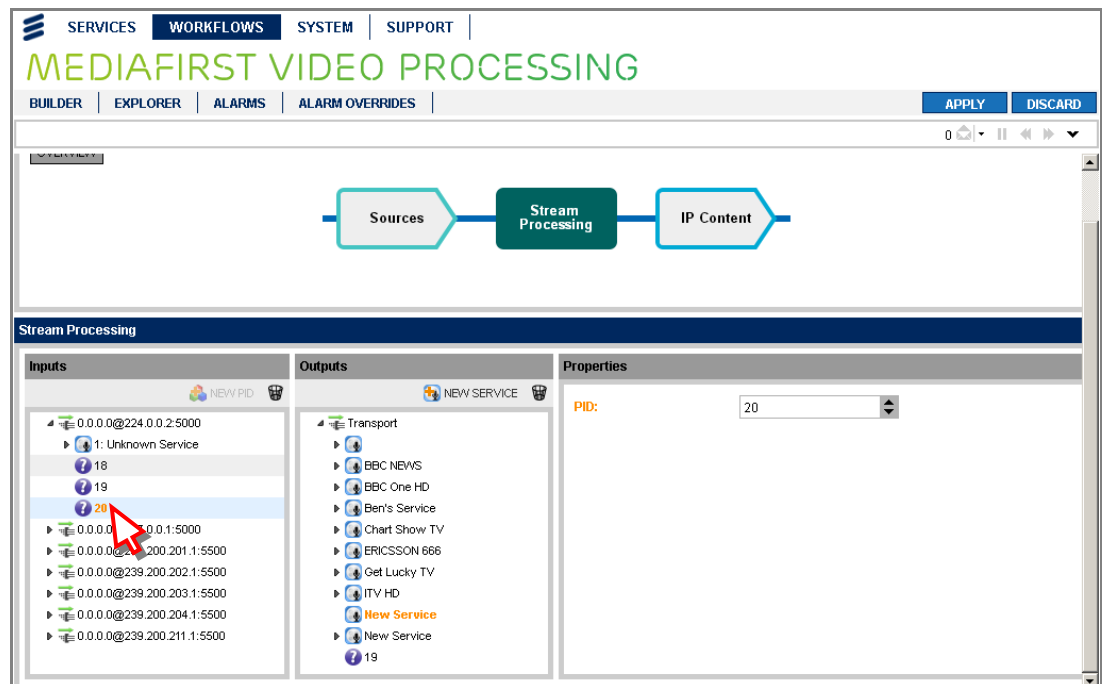


Figure 3.64 Adding a New PID

- To use the newly generated PID as a reference for the output, drag-and-drop it into the **Outputs** panel.

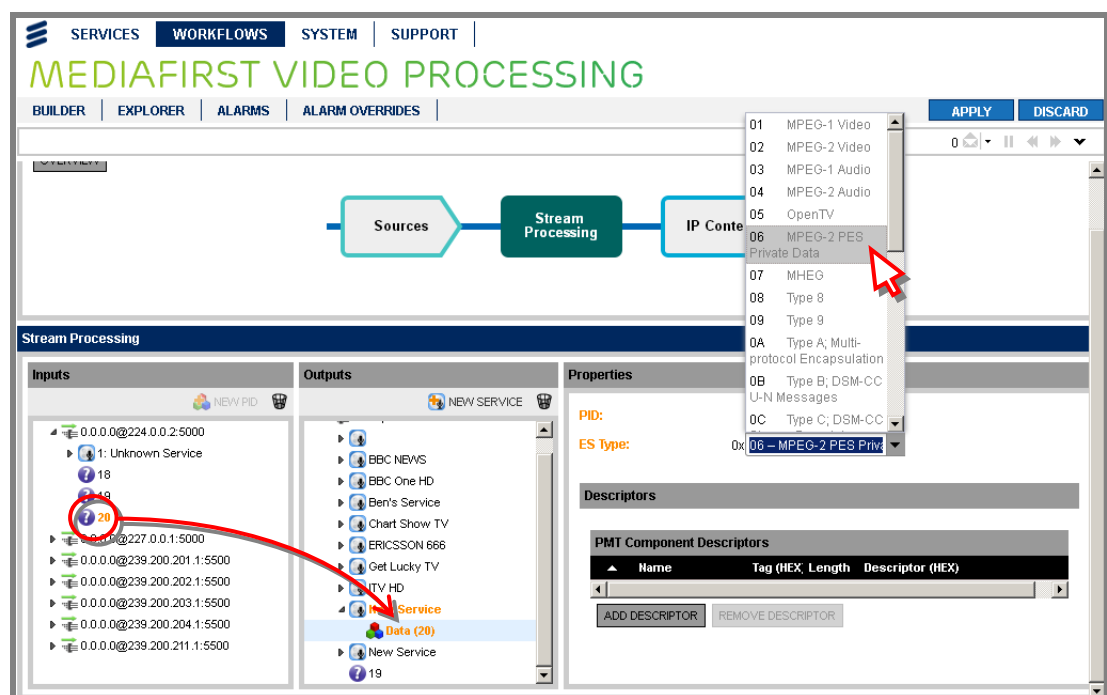


Figure 3.65 Referencing the PID in the Stream Processing Output

- Click on the new Data component and give it an Elementary Stream type. See *Chapter 5, Web GUI Control* for a detailed description of all properties.
- To save your configuration changes, click the **APPLY** button.

Note: Unique PIDs and Service IDs must be set for services within the same Transport Stream. The unit detects potential clashes as they are entered and will display alert messages in the Alarm Newsfeed, preventing invalid configurations from being applied.

Defining an Unreferenced PID

Packet Identifiers (PIDs) for Transport Streams may be user defined. There is no limit to the number of unreferenced PIDs that can be created for Transport Streams.

To define an unreferenced PID:

1. Click on the **Stream Processing** block on the workflow you are creating/editing to display the associated detailed parameters.
2. From the **Input** widget, right-click the required input Transport Stream and select **Add Unreferenced PID** from the displayed menu.

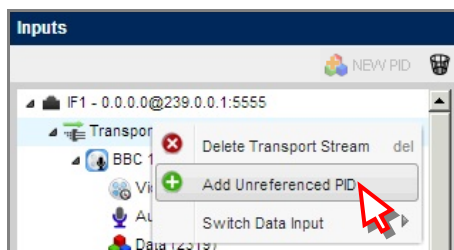


Figure 3.66 Adding an Unreferenced PID

3. PID 18 (default value) is added as a separate component to the input at the Transport Stream level. This PID can be remapped (i.e., renumbered), if required, using the **Properties** widget by selecting the PID component and either typing a new **Input PID** or clicking on the up/down button.



Figure 3.67 Viewing the Remapped PID

4. To save your changes, click the **APPLY** button. The component in the **Input** widget is set to the entered (remapped) value.

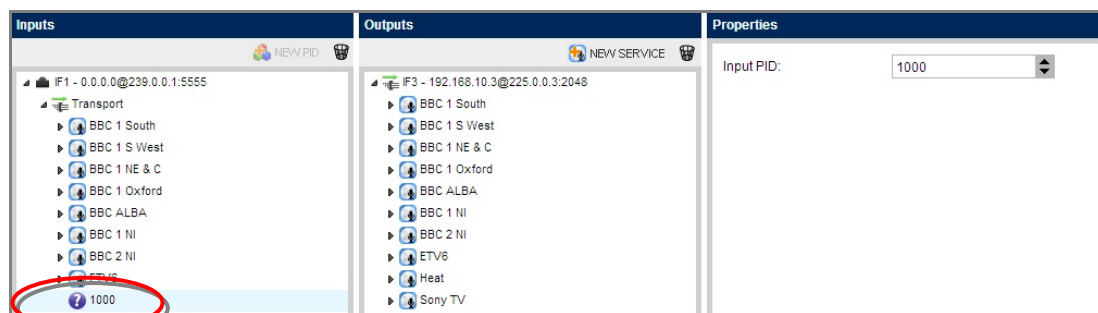


Figure 3.68 Remapped PID - Applied

5. The PID can be dragged-and-dropped into the **Output** at Transport Stream level.

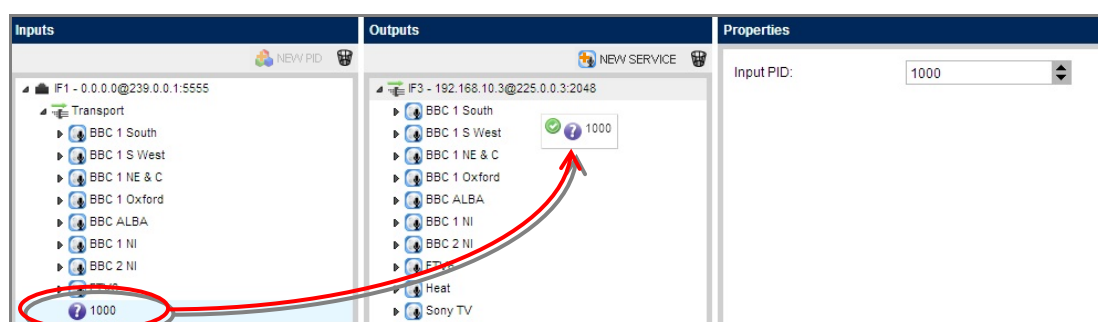


Figure 3.69 Dragging-and-Dropping the PID

6. The PID can now be remapped (i.e. renumbered) as normal on the output using the **Properties** widget by selecting the PID component and either typing a new **Output PID** or clicking on the up/down button.

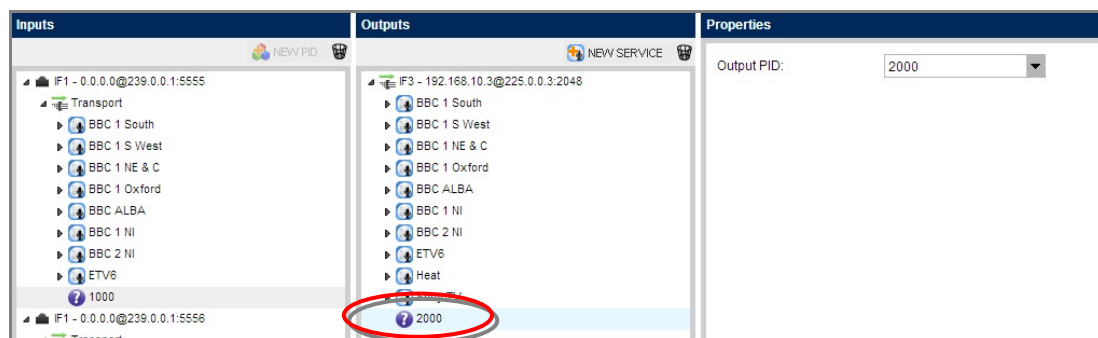


Figure 3.70 Output PID Remapped

7. To save your configuration changes, click the **APPLY** button.

Note: Unique PIDs and Service IDs must be set for services within the same Transport Stream. The unit detects potential clashes as they are entered and will display alert messages in the Alarm Newsfeed, preventing invalid configurations from being applied.

Defining Services that Share Components

Shared components cannot be dragged to a second output service if those components are already part of a service that has itself been dragged from the input to the output.

To configure two services that share components and are identical apart from Service ID and PMT PID, you must create two new services in the output TS (using the **New Service** feature) and then drag the components from the input to both new services, as described below.

1. Click on the **Stream Processing** block on the workflow you are creating/editing to display the associated detailed parameters.
2. Click **New Service** and enter the details, as required, in the associated **Properties** panel.

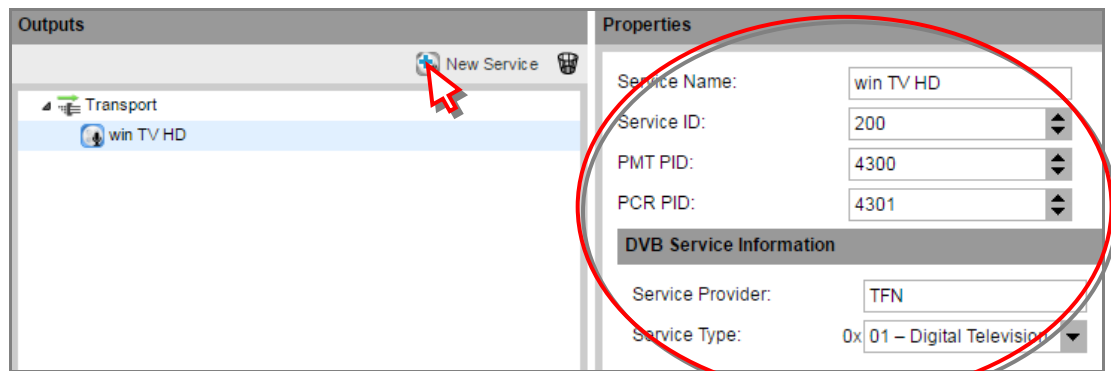


Figure 3.71 Creating a New Service

3. Click **New Service** again, to create a second new service, and enter the details in the associated **Properties** panel, changing **Service ID** and **PMT PID**.

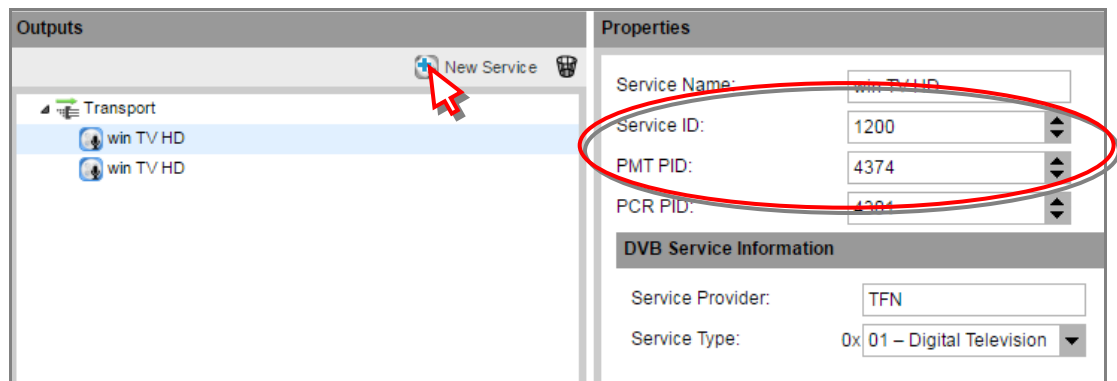


Figure 3.72 Creating a Second Service

4. Then drag the video, audio and data components from their respective inputs to both output services.

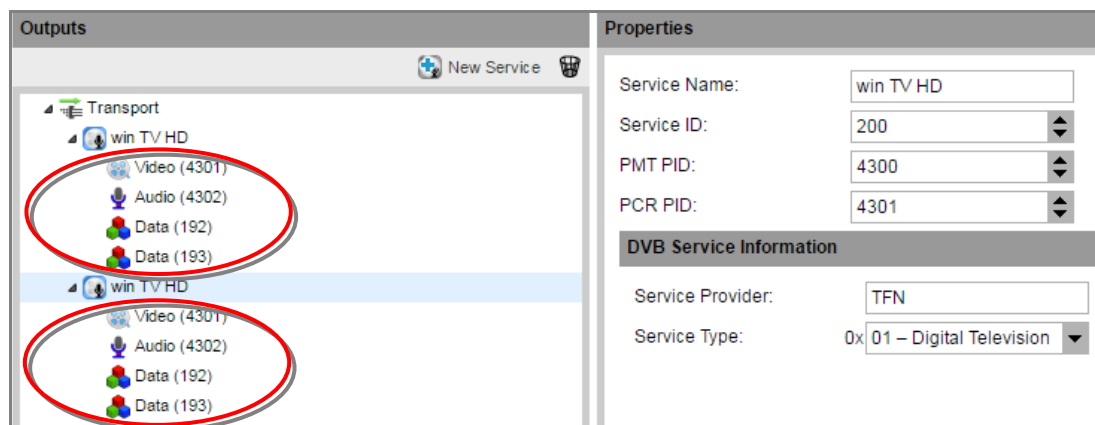


Figure 3.73 Dragging Components to Both Services

3.14.3 How to Configure Simulcrypt

Conditional Access (CA) may be configured to encrypt your services.



Figure 3.74 Simulcrypt Functional Block

To configure Simulcrypt:

1. Navigate to **SYSTEM > SIMULCRYPT** web page.
2. Add ECMGs to the system by clicking on the **ADD VENDOR** button.

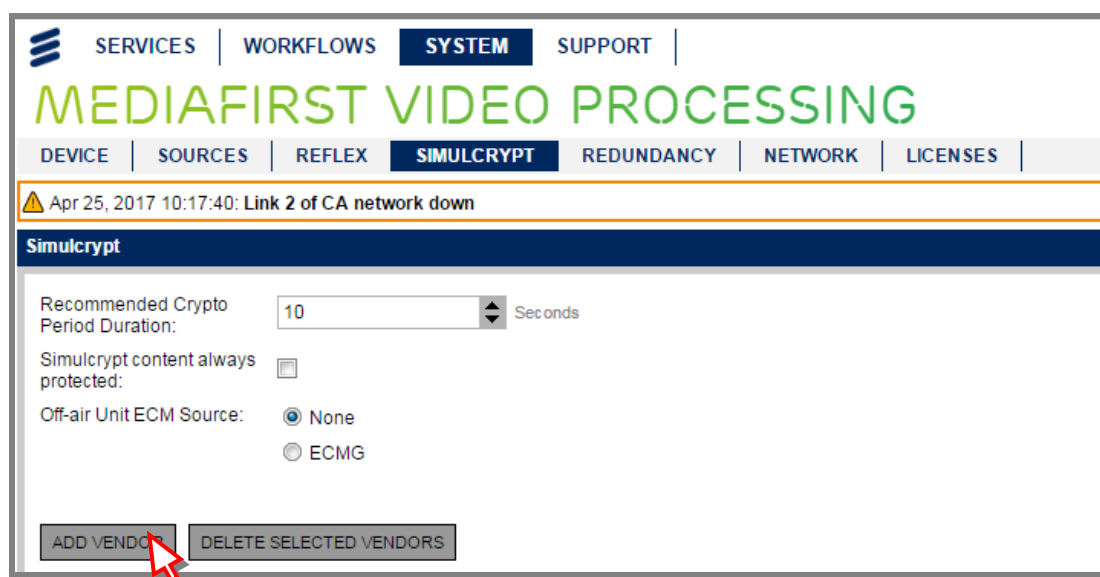
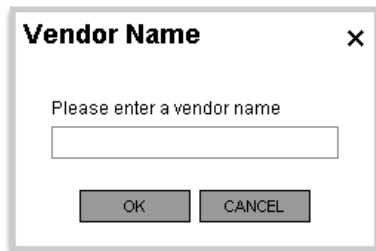


Figure 3.75 Adding Simulcrypt Vendors

3. Enter the name of the Vendor in the dialog box (six characters max.).



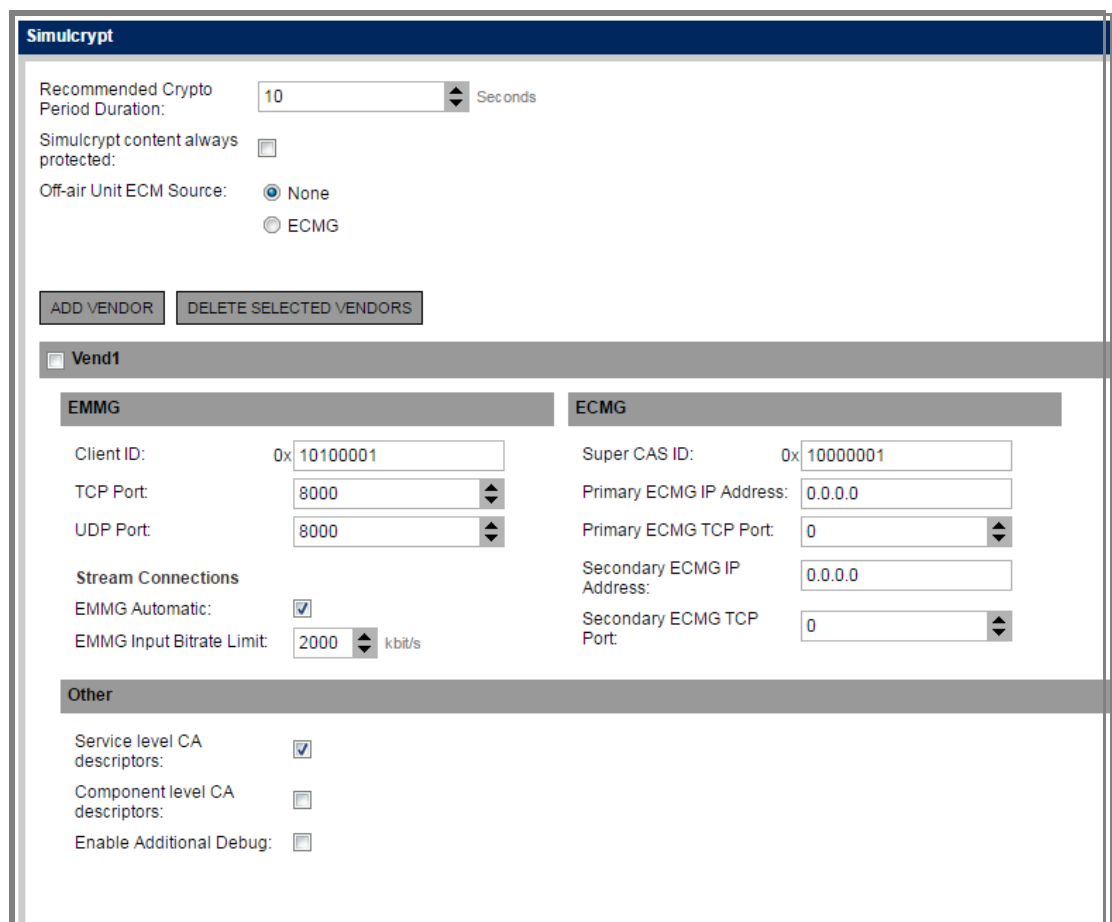
Vendor Name [X]

Please enter a vendor name

OK CANCEL

Figure 3.76 Adding Vendor Name

4. Modify the EMMG and ECMG settings as required. A Client ID and/or Super CAS ID must be entered for the vendor to be available for workflows.



Simulcrypt

Recommended Crypto Period Duration: 10 Seconds

Simulcrypt content always protected: ☐

Off-air Unit ECM Source: ☒ None ☐ ECMG

ADD VENDOR DELETE SELECTED VENDORS

☒ Vend1

EMMG	ECMG
Client ID: 0x 10100001	Super CAS ID: 0x 10000001
TCP Port: 8000	Primary ECMG IP Address: 0.0.0.0
UDP Port: 8000	Primary ECMG TCP Port: 0
Stream Connections	Secondary ECMG IP Address: 0.0.0.0
EMMG Automatic: <input checked="" type="checkbox"/>	Secondary ECMG TCP Port: 0
EMMG Input Bitrate Limit: 2000 kbit/s	

Other

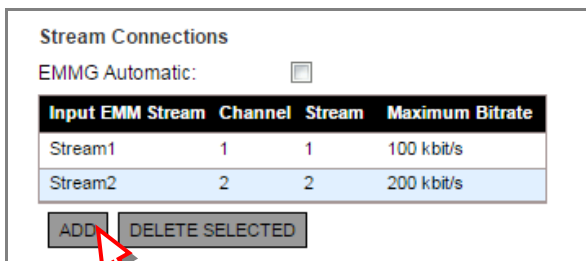
Service level CA descriptors: ☒

Component level CA descriptors: ☐

Enable Additional Debug: ☐

Figure 3.77 Entering EMMG and ECMG Parameters

5. **EMMG Automatic** is selected (checked) by default. Uncheck this checkbox to enter EMMG streams manually; then click the **Add** button to enter new streams.



Stream Connections

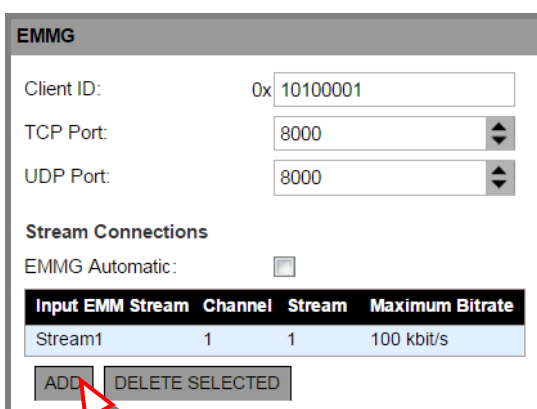
EMMG Automatic: ☒

Input EMM Stream	Channel	Stream	Maximum Bitrate
Stream1	1	1	100 kbit/s
Stream2	2	2	200 kbit/s

ADD **DELETE SELECTED**

Figure 3.78 Entering EMMG Streams Manually

6. In the **EMMG** dialog, enter the relevant settings. Select the **Add** button to enter new streams.



EMMG

Client ID: 0x10100001

TCP Port: 8000

UDP Port: 8000

Stream Connections

EMMG Automatic: ☒

Input EMM Stream	Channel	Stream	Maximum Bitrate
Stream1	1	1	100 kbit/s

ADD **DELETE SELECTED**

Figure 3.79 Selecting EMMG Properties

7. To create a new workflow (with Simulcrypt), navigate to the **WORKFLOWS > EXPLORER** web page.
8. Click on the **EDIT** button for the relevant workflow (that includes Simulcrypt).
9. Click on the **ECMs** sub-block in the Simulcrypt functional block, to display the configuration settings in an **ECM** widget below (if required).
10. Drag the services to be encrypted from the **Inputs** left-hand panel to the **Scrambling Groups** panel to create the Scrambling Control Groups (SCG) that will share the same encryption settings.

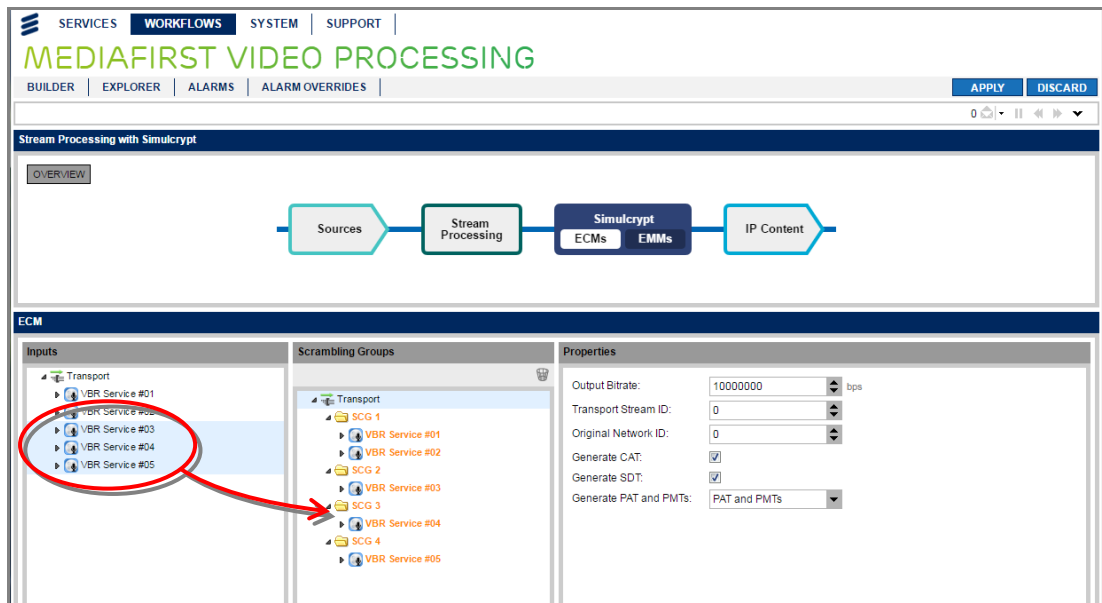


Figure 3.80 Selecting Services for Scrambling

11. Click on the SCG or the services to select the scrambling algorithm to be used for the group.

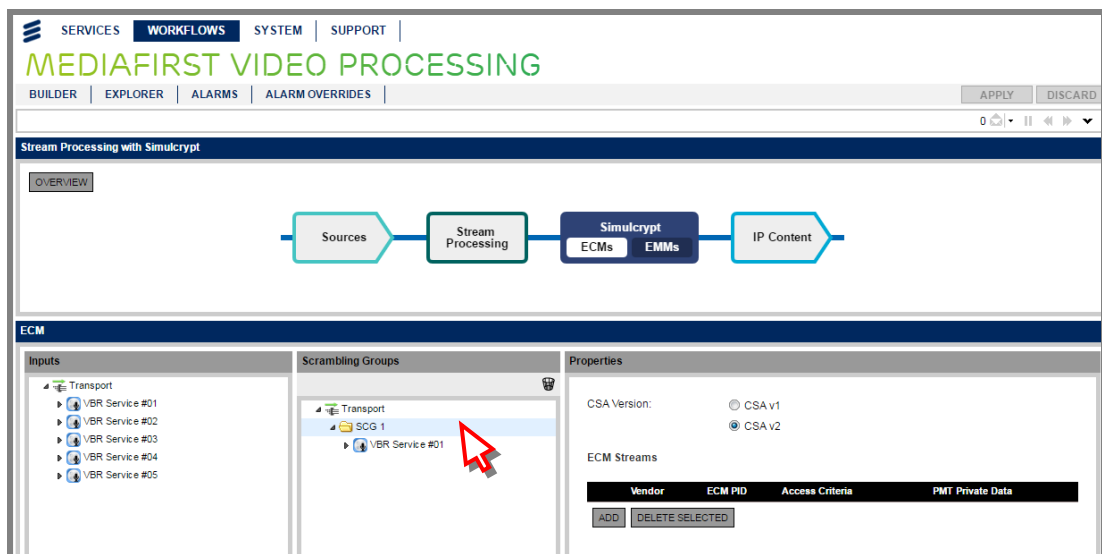


Figure 3.81 Selecting SCG or Services for Scrambling

12. Add **ECM Streams** as required, by clicking the **Add** button in the **Properties** panel.
13. Then click on the **EMMs** sub-block in the **Simulcrypt** functional block, to display the configuration settings in an **EMM & PD** widget below (if required).

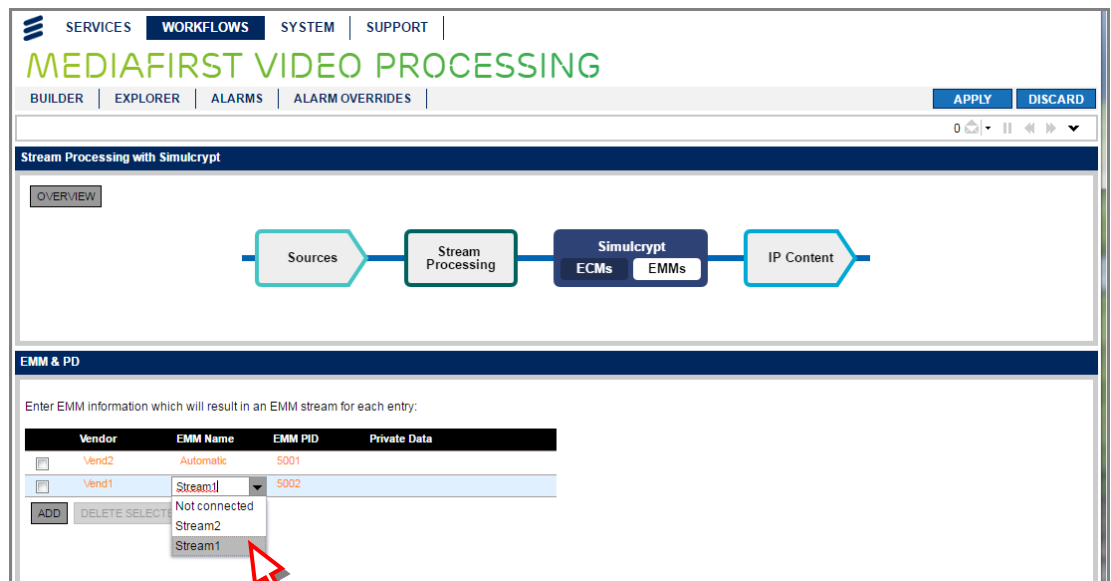


Figure 3.82 Selecting EMM

14. Click on **EMM Name**, if Automatic is not required, to select stream from the drop-down list. Multiple EMMs (up to 8 max.) may be added from the same vendor.
15. Click on **EMM PID** to edit the PID value, if required. Either type the new value directly into the field or click on the increment/decrement arrows.

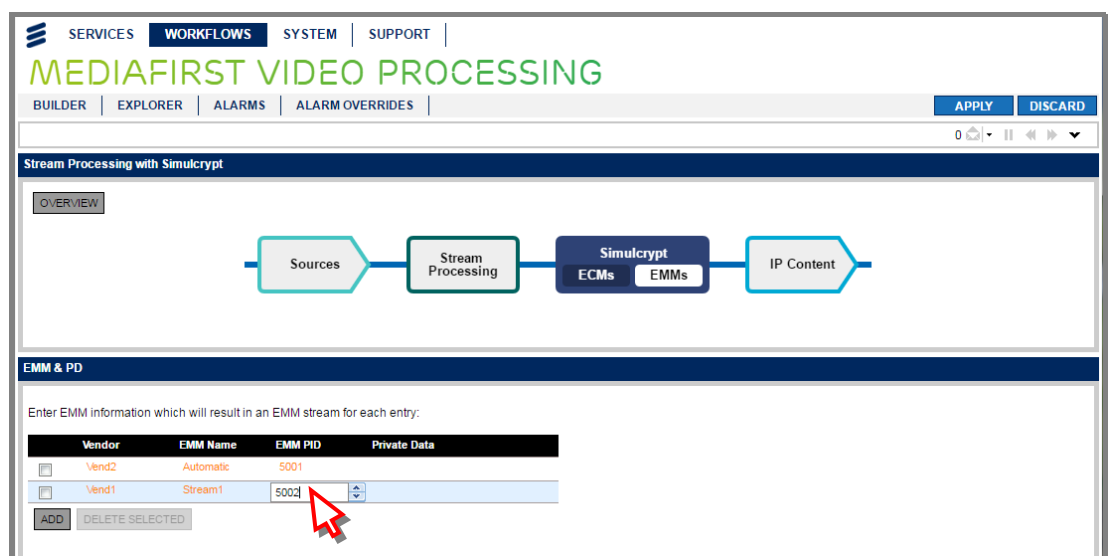


Figure 3.83 Modifying EMM PID

16. To save your changes, click the **APPLY** button.

To complete your workflow configuration, see the relevant sections in this chapter according to which functional blocks are present in your workflow.

3.14.4 How to Configure IP Content (Out)

The Internet Protocol (IP) Content (Out) must be correctly configured with the destination settings to deliver the content.



Figure 3.84 IP Content (Out) Functional Block

To configure IP Content (Out):

1. Click on the **IP Content** block on the workflow you are creating/editing to display the associated detailed parameters.

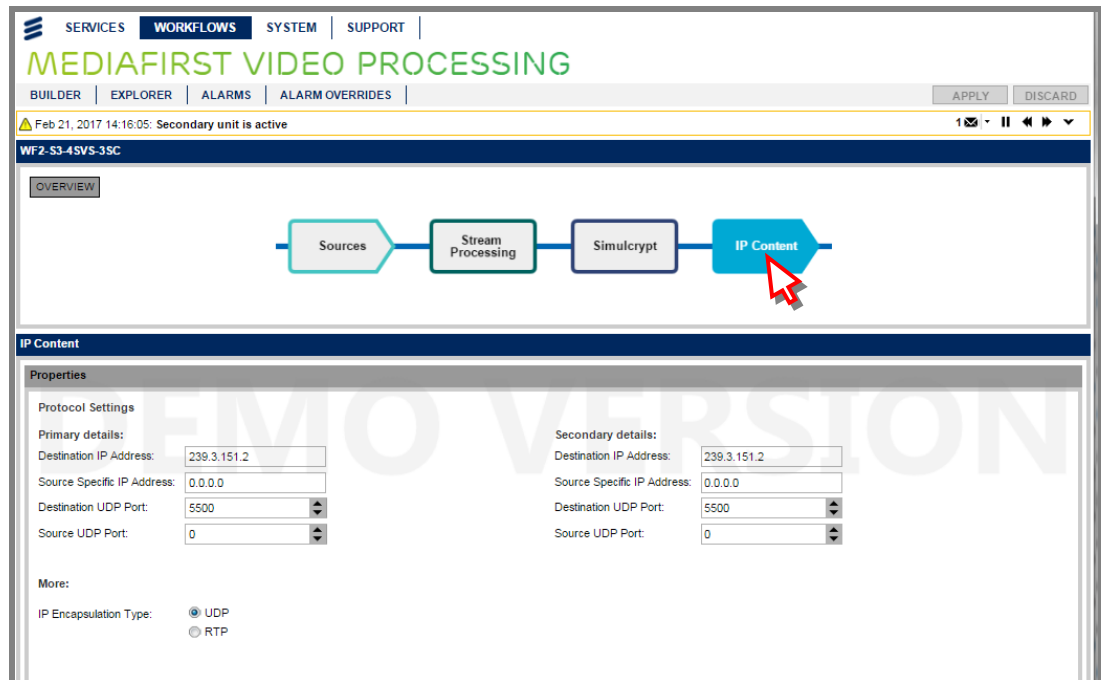


Figure 3.85 Displaying IP Content (Out) Properties

2. The available IP Sources are displayed in the **IP Content** widget. Enter the appropriate settings for the Primary and Secondary.
3. Select an IP encapsulation type, UDP (User Datagram Protocol) or RTP (Real-time Transport Protocol).
4. To save your changes, click the **APPLY** button.

3.14.5 How to Configure ASI Content

The Asynchronous Serial Interface (ASI) Content must be correctly configured with the destination settings to deliver streaming data. This will be the final step in configuring many of your workflows.



Figure 3.86 ASI Content Functional Block

To configure ASI Content:

1. Click on the **ASI Content** block on the workflow you are creating/editing to display the associated detailed parameters.

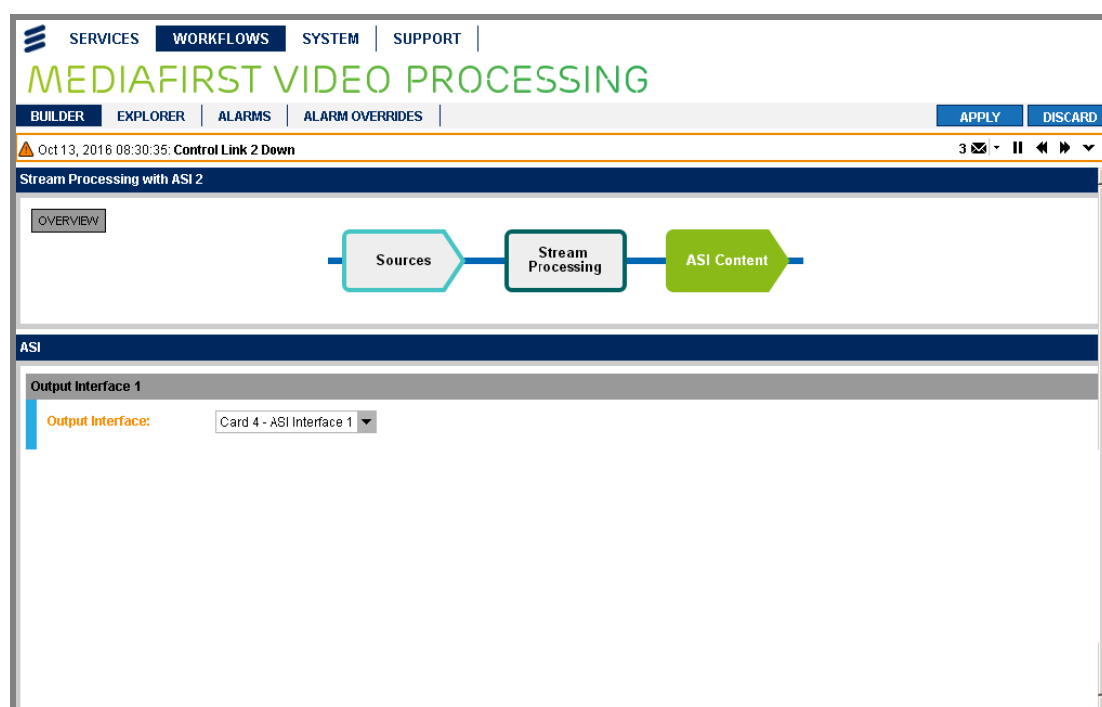


Figure 3.87 Displaying ASI Content Detailed Parameters

2. The available ASI Output Interfaces are displayed. Select the required card interface.
3. To save your changes, click the **APPLY** button.

3.15 How to Apply or Discard Configuration Changes

To change configuration settings:

1. Change the configuration setting(s) as required on the web GUI page. All modifications made appear highlighted as **orange** text to enable you to see the changes at a glance.

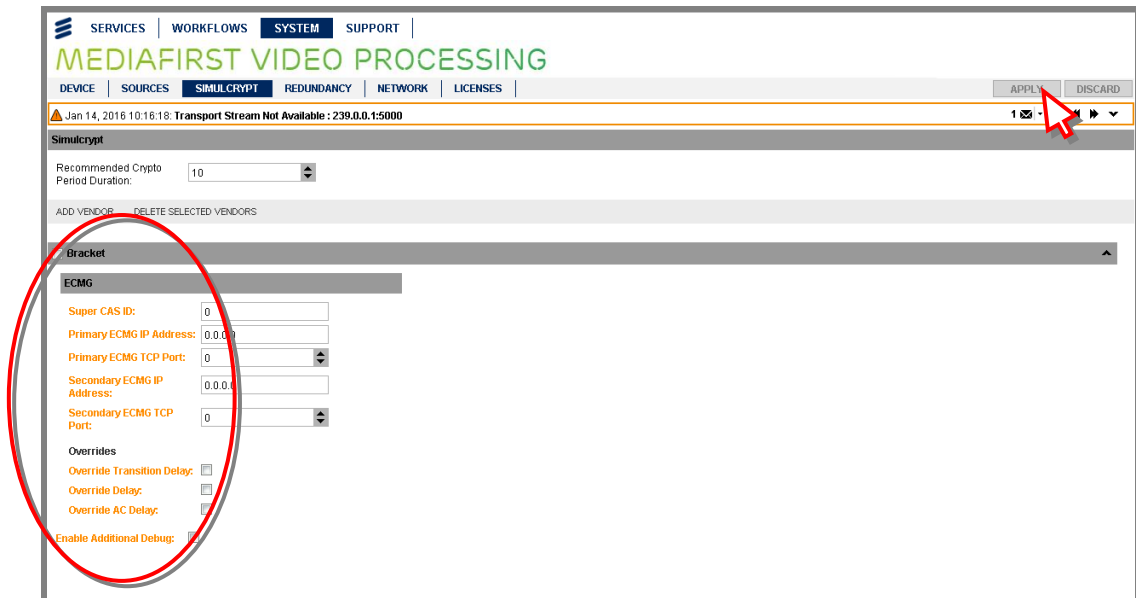


Figure 3.88 Property Changes Highlighted in Orange

2. Click the **APPLY** button located in the top right-hand corner of the GUI header. The unit will not accept any changes to the configuration until the **APPLY** button, is clicked.

Note: Changing some parameters during operation may cause output glitching. Changing the output bit rate will **not** cause a glitch.

Clicking the **Discard** button displays a confirmation dialog box and rejects any changes you have made when you confirm by clicking the **Yes** button.

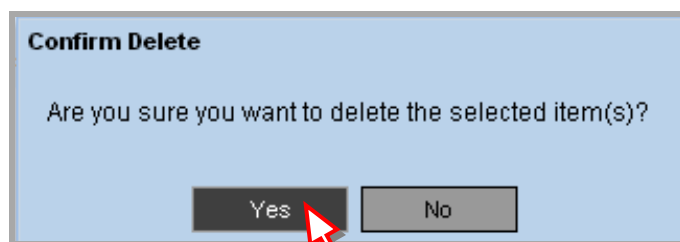


Figure 3.89 Discarding Changes Confirmation Dialog

3.16 How to Configure Reflex

Reflex enables you to set up a workflow with multiple broadcast sources and enables you to add more channels to the available bandwidth efficiently without sacrificing picture quality. Each broadcast sources is capable of transcoding a single service. The output services are part of the same MPTS output.

To configure reflex:

1. Navigate to the **SYSTEM > SOURCES** page to configure your input sources.

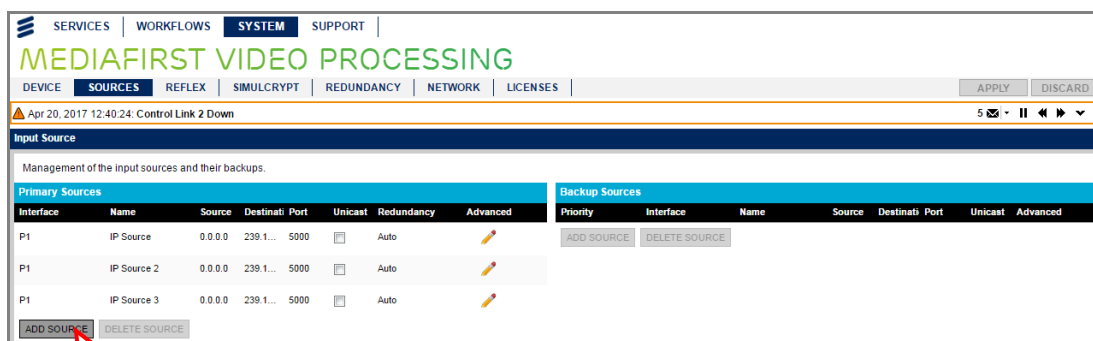
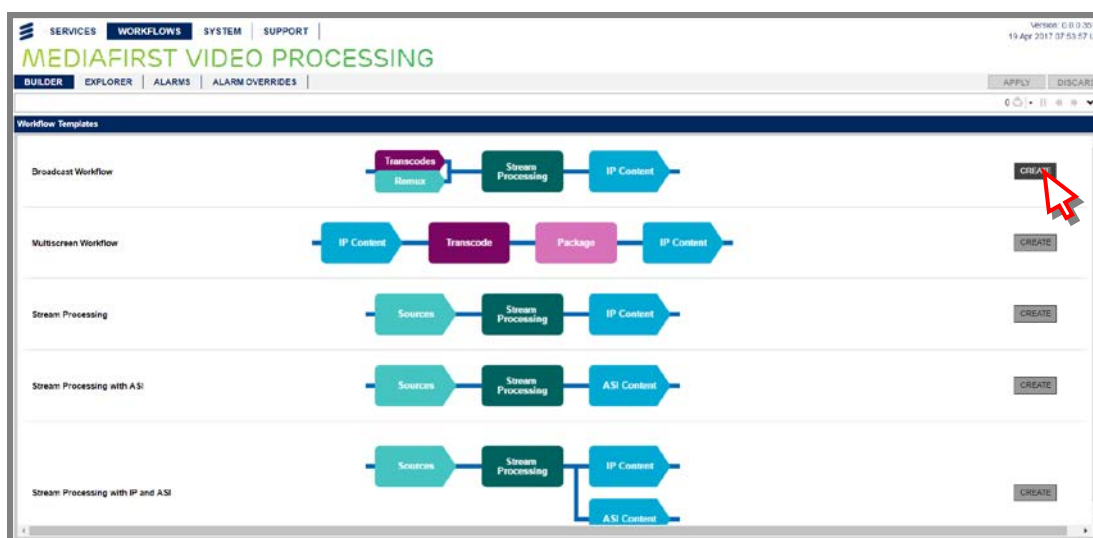


Figure 3.90 Configuring Sources

2. Navigate to the **WORKFLOWS > BUILDER** page to create a Broadcast Workflow.



3. Use the **Transcode/Remux** block and the **Transcode** tab to create your broadcast sources.

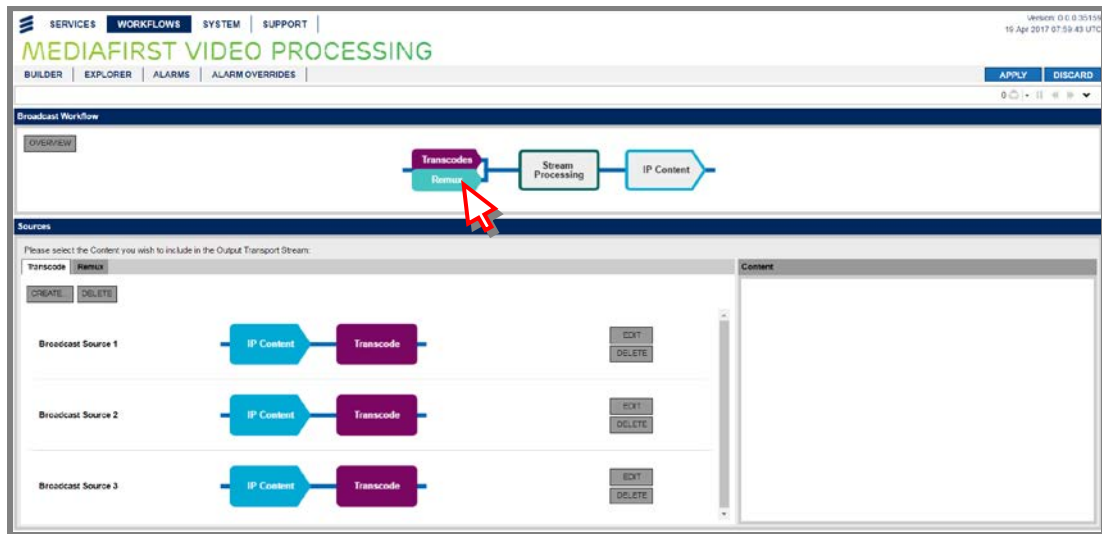


Figure 3.91 Creating Transcoded Broadcast Sources

4. Use the **Stream Processing** block to drag the broadcast sources containing the required video components from the **Input** to the **Output** pane.

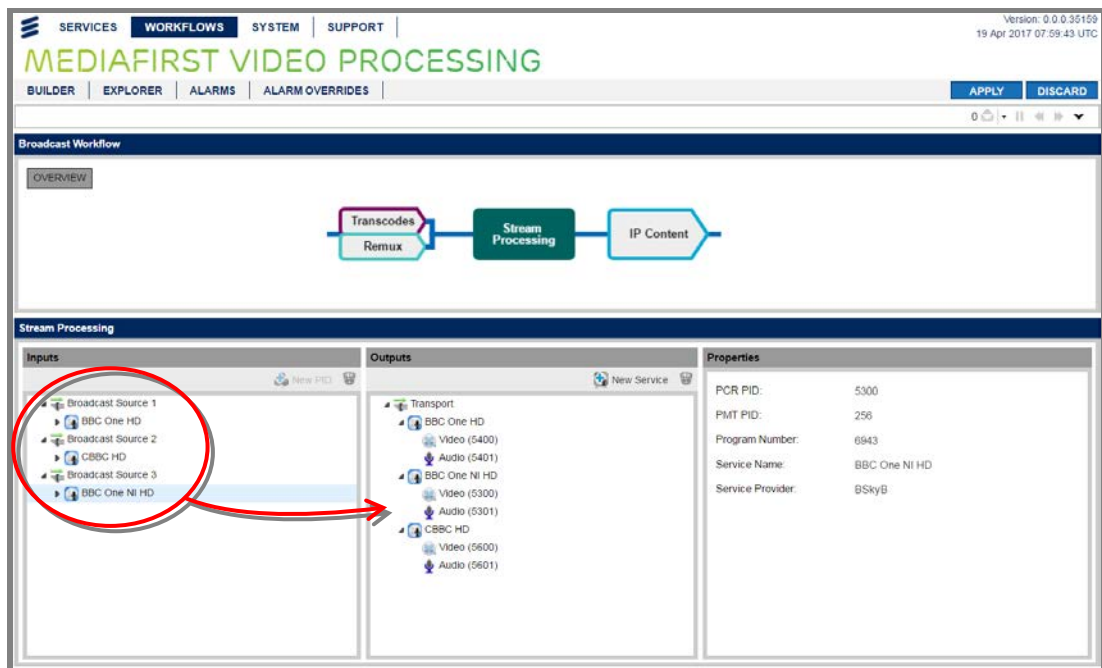


Figure 3.92 Dragging Broadcast Sources

5. Navigate to the **SYSTEM > REFLEX** page to create a Reflex group. Click the **ADD** button to create a new group.

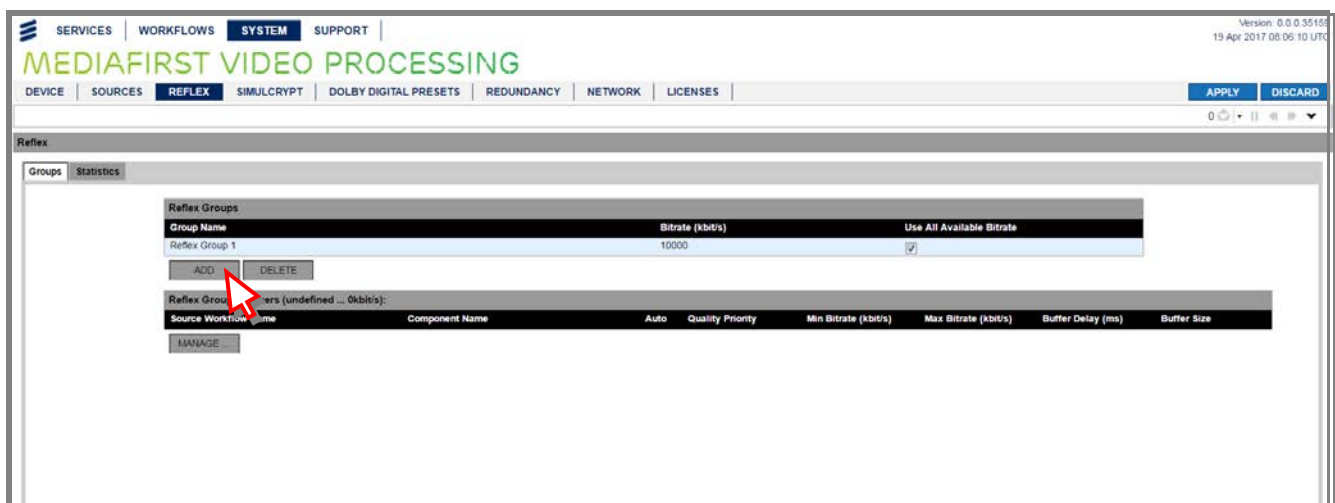


Figure 3.93 Creating a Reflex Group

- Specify the group rate by clicking on the **Bitrate** column.

Notes: In the current release, you must ensure the sum of the video group bitrate and the audio bitrates do not exceed the total TS rate. There is no indication if the limit has been exceeded, thus having no null bitrate on the output. Caution must be taken to avoid this.

The name of the Reflex group is set automatically.

- Click the **MANAGE...** button to configure Reflex Membership.

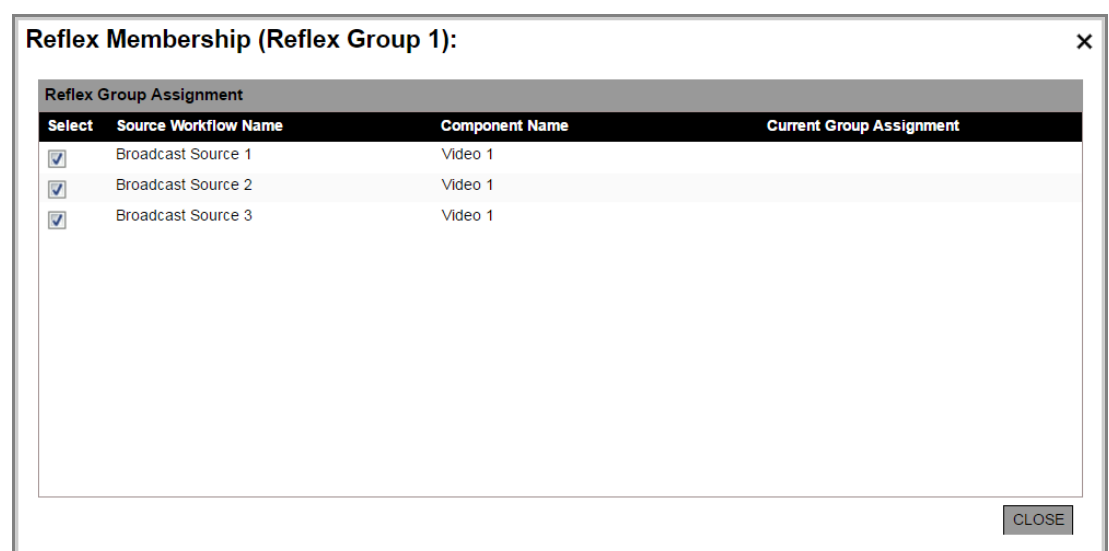


Figure 3.94 Managing a Reflex Group

- Specify the video components that are part of the Reflex group.

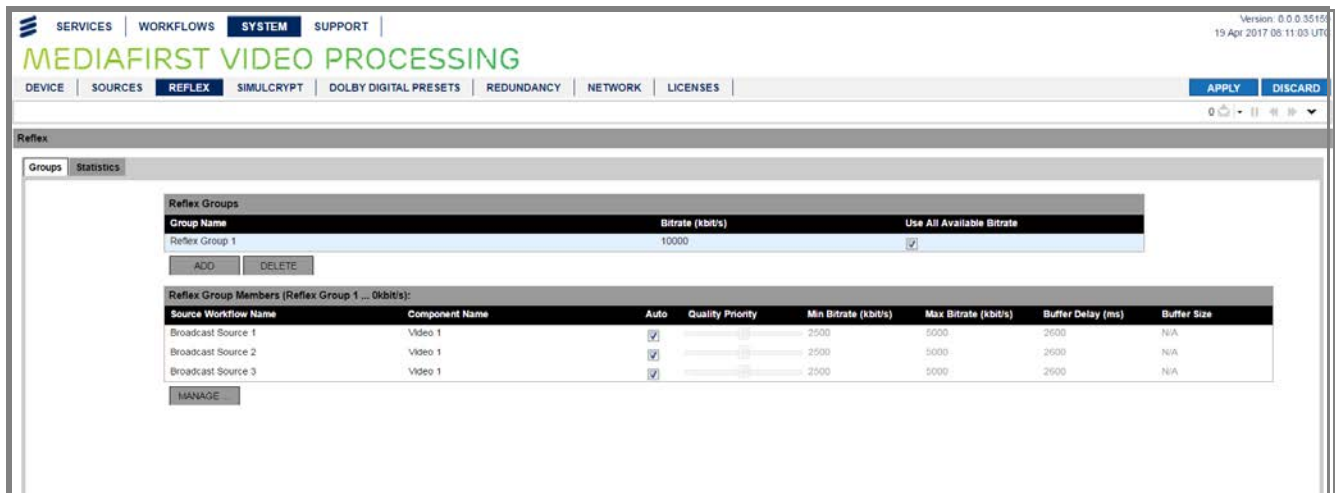


Figure 3.95 Specifying Video Components

- Check the video components are part of the Reflex group by going back to the **WORKFLOW > BUILDER** page and viewing the **Transcode Process** functional block.

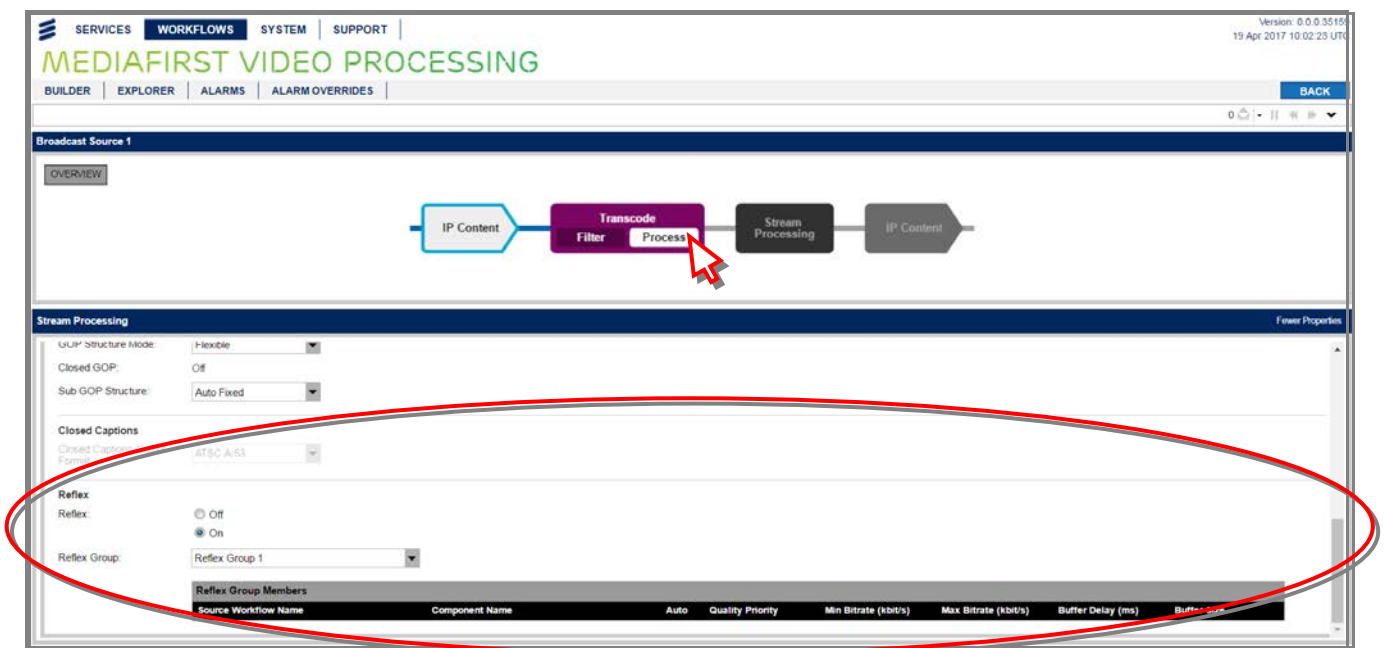


Figure 3.96 Checking Video Components

Configuring Reflex Manual or Automatic Mode

Using the SYSTEM > REFLEX page, by default, automatic mode is used. In this mode, the manual slide control is grayed-out and the following parameters are set automatically: **Quality Priority**, **Min Bitrate**, **Max Bitrate** and **Buffer Delay**.

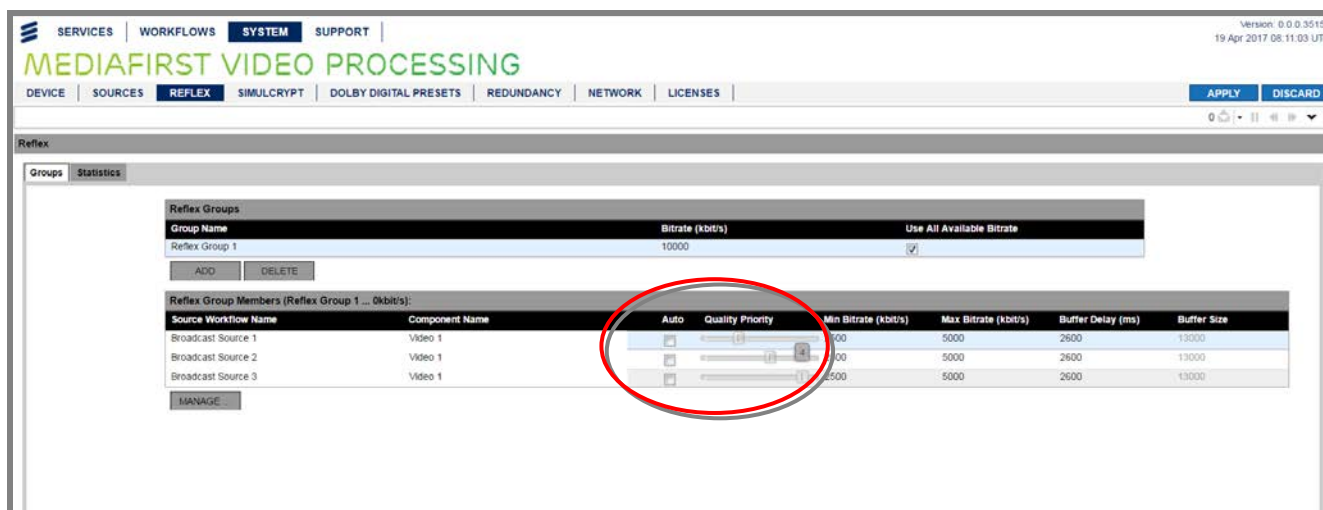


Figure 3.97 Reflex Manual and Automatic Mode

When the Auto option is deselected, **Quality Priority** can be set manually: This steers the Reflex algorithm to allocate a lower or higher weighting on that video bitrate with a range of -5 to +5. For example, sport channels can be set with a higher 'Quality Priority' at the expense of cartoon channels. This will result in a higher bitrate allocation to the sport channels.

3.17 How to Import/Export Your Workflows

We recommend that you save your workflows regularly, as a file, particularly when changes have been made. This can then be used to archive your settings for Transport Streams and Services, in order that you can upload them in the event that your settings have been changed or lost, or to quickly load another machine with an identical configuration.

Exporting Workflows

To save your workflows:

1. Navigate to the **SUPPORT > BACKUP/RESTORE** web GUI page.
2. Select **Workflow Configuration** in the **Configuration Group** widget.
3. In the **Export Device Configuration** panel, click the **DOWNLOAD** button.

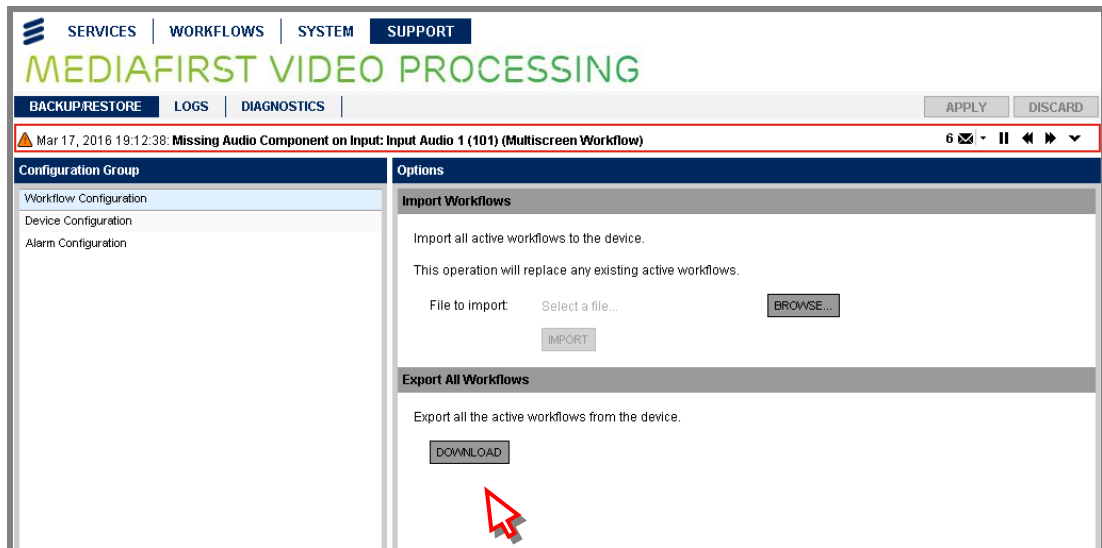


Figure 3.98 Exporting Device Configurations

4. A file is automatically created and is shown in the bottom left-hand corner of the page. This file is stored in the PC's configured download destination folder. For further options, such as opening/viewing the file, click on the arrow next to the file name.

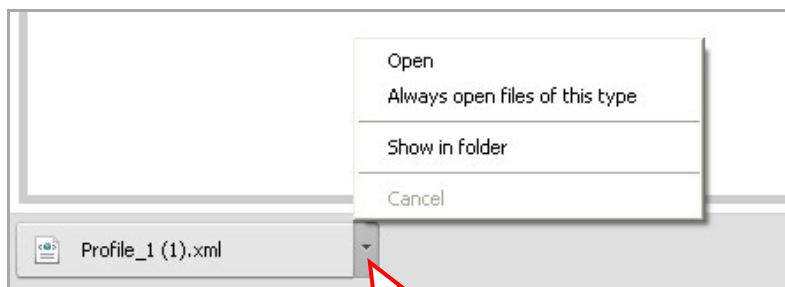


Figure 3.99 Opening the Workflows File

Importing Workflows

To restore/load workflows from a file:

1. Navigate to the **SUPPORT > BACKUP/RESTORE** web GUI page.
2. Select **Workflow Configuration** in the **Configuration Group** widget.
3. In the **Import Workflows** panel, click the **BROWSE...** button. A browse window will be displayed to enable you to select the configuration file.

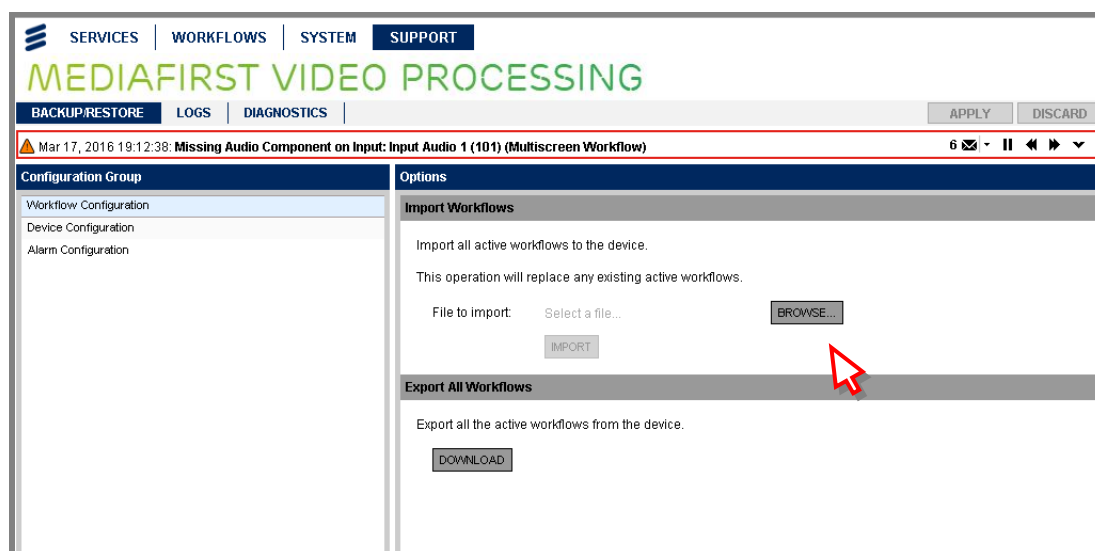


Figure 3.100 Importing Workflows

4. Select the required workflows file file.
5. On the **Import Workflows** panel, click the **IMPORT** button.
6. The imported workflows will be actioned immediately (no re-boot is required), when completed, provided that the file is valid. In the event of an invalid file being uploaded, none of the unit settings will be changed.

3.18 How to Import/Export Your Configurations

We recommend that you save your configurations regularly, as an XML file, particularly when changes have been made. This can then be used to archive your settings for Transport Streams and Services, in order that you can upload them in the event that your settings have been changed or lost, or to quickly load another machine with an identical configuration.

The parameters associated with each Card slot are stored, so that if a Card is removed, and then a Card of the same type is plugged in to the slot, the system will attempt to apply the previous configuration for the module in that slot.

Exporting Device Configurations

To save your unit configuration:

1. Navigate to the **SUPPORT > BACKUP/RESTORE** web GUI page.
2. Select **Device Configuration** in the **Configuration Group** widget.
3. In the **Export Device Configuration** panel, click the **DOWNLOAD** button.

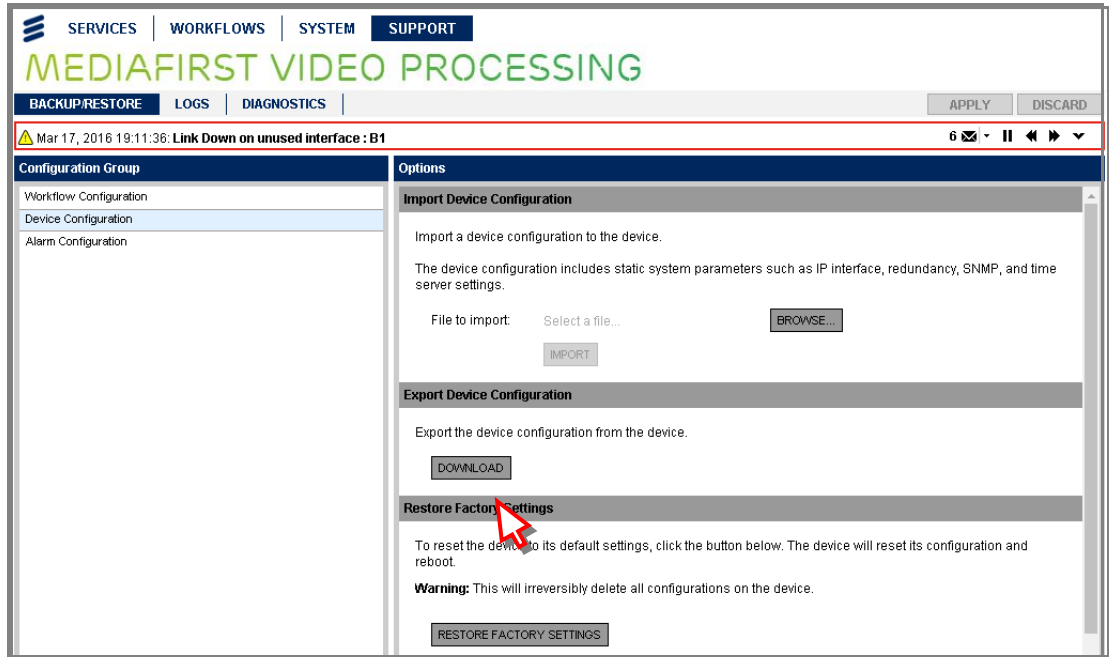


Figure 3.101 Exporting Device Configurations

4. An XML file is automatically created and is shown in the bottom left-hand corner of the page. This file is stored in the PC's configured download destination folder. For further options, such as opening/viewing the file, click on the arrow next to the file name.

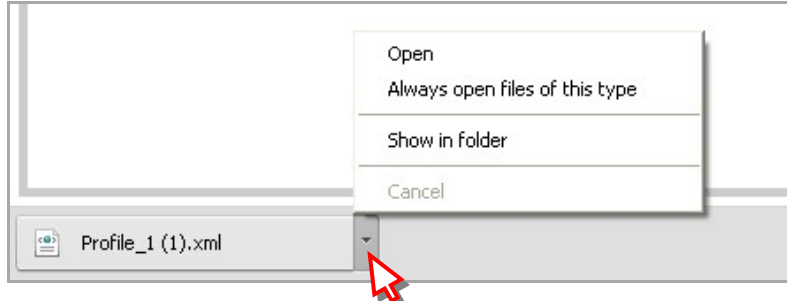


Figure 3.102 Opening the Configurations File

Importing Device Configurations

To restore a previous unit configuration from a file:

1. Navigate to the **SUPPORT > BACKUP/RESTORE** web GUI page.
2. Select **Device Configuration** in the **Configuration Group** widget.
3. In the **Import Device Configuration** panel, click the **BROWSE...** button. A browse window will be displayed to enable you to select the configuration XML file.

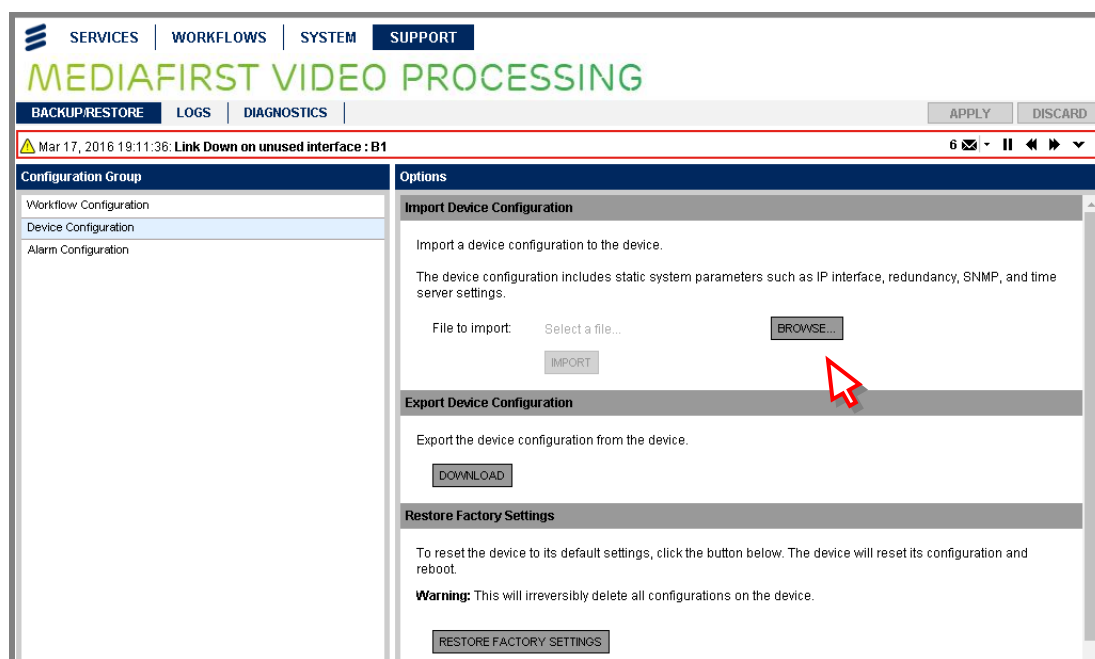


Figure 3.103 Importing Device Configurations

4. Select the required configuration XML file.
5. On the **Import Device Configuration** panel, click the **IMPORT** button.
6. The imported configuration will be actioned immediately (no re-boot is required), when completed, provided that the file is valid. In the event of an invalid file being uploaded, none of the unit settings will be changed.

Note: When the software is upgraded, or configurations imported, checks are performed on the equipment's configuration. If there are PID or service ID clashes for output Transport Streams, valid values will automatically be used to enable the configuration to work. Always check the PID and service ID values after performing such an operation.

3.19 How to Restore Factory Default Settings

Restoring your unit configuration to the factory default settings will enable you to restore your unit to a known working condition, in the event of problems.

To restore the unit to factory settings:

1. Navigate to the **SUPPORT > BACKUP/RESTORE** web GUI page.
2. Select **Device Configuration** in the **Configuration Group** widget.
3. In the **Restore Factory Settings** panel, click on the **RESTORE FACTORY SETTINGS** button.

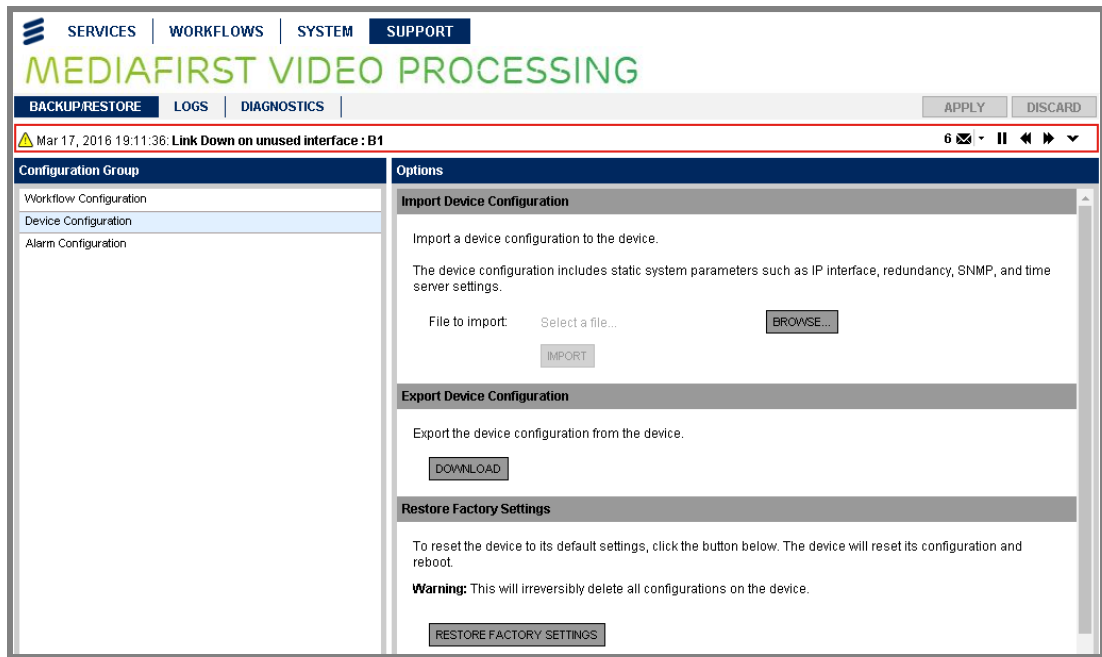


Figure 3.104 Restore Factory Settings Widget

4. The following confirmation dialog is displayed.

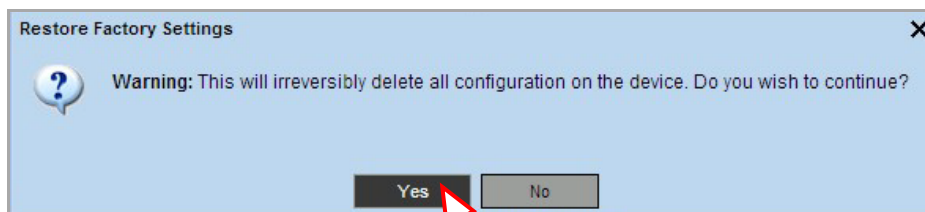


Figure 3.105 Restore Factory Settings Confirmation Dialog Box

5. If you are sure that you wish to restore factory settings, click **Yes**. This will restore all configuration to the factory defaults (control interface settings will be preserved however) and reboot into the factory default configuration.

3.20 How to Reboot Your Unit

Rebooting the unit may help, in the event of a configuration problem, to return the unit to operation.

To reboot the device to its current configuration:

1. Navigate to the **SUPPORT > BACKUP/RESTORE** web GUI page.
2. Select **Device Configuration** in the **Configuration Group** widget.
3. In the **Reboot Device** panel, click on the **REBOOT DEVICE** button.

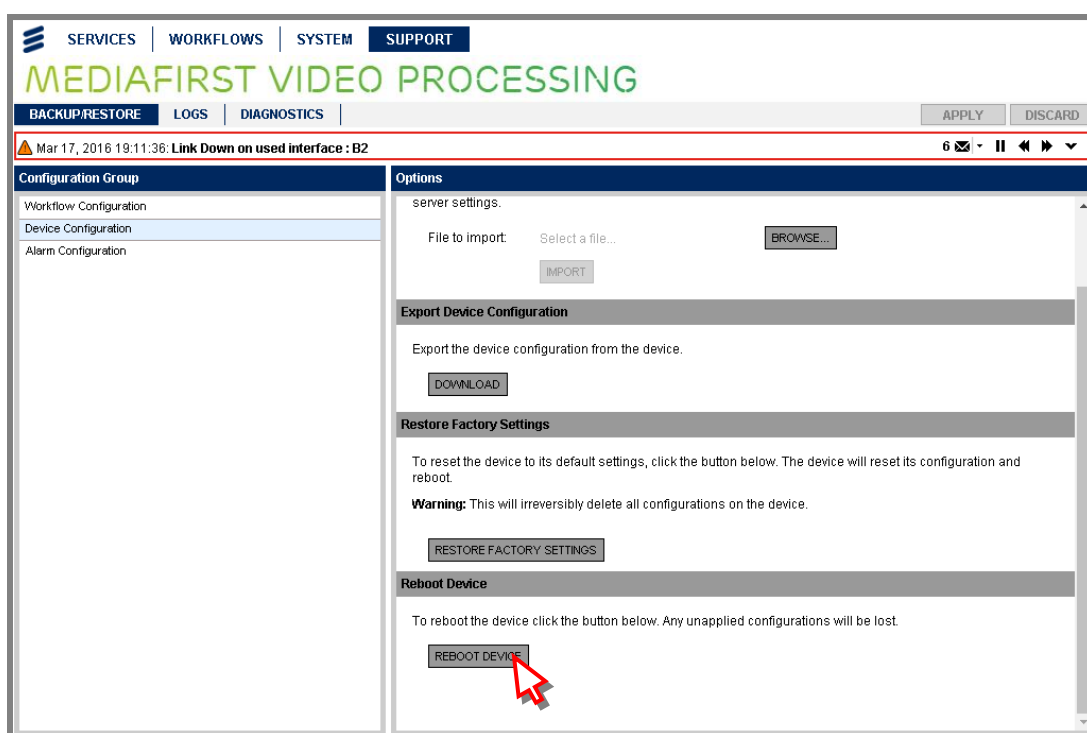


Figure 3.106 Backup/Restore Page

4. The following confirmation dialog is displayed.

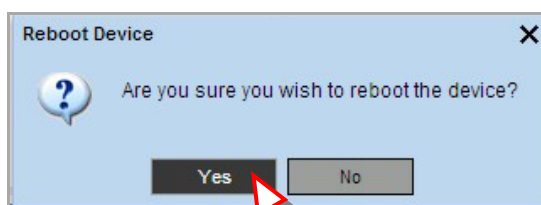


Figure 3.107 Reboot Device Confirmation Dialog Box

5. If you are sure that you wish to reboot the device, click **Yes**. The device will be rebooted to its current configuration. All non-saved configurations will be lost.

3.21 How to Generate Log Files

The unit enables you to generate log files of various types, which record the status and use of your unit. These may be useful in assessing the actions and operations carried out by the unit in the event that a problem or fault is suspected. When contacting Ericsson regarding a possible fault, we may ask you to provide us with appropriate logs.

To create a log file:

1. Navigate to the **SUPPORT > LOGS** web page.

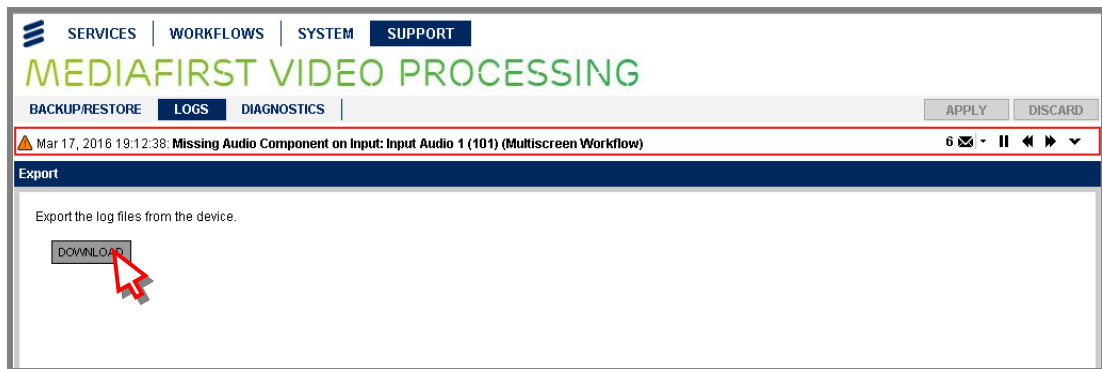


Figure 3.108 Exporting a Log File

2. Click the **DOWNLOAD** button in the **Export** widget.
3. Select the type of log file required from the drop-down menu.

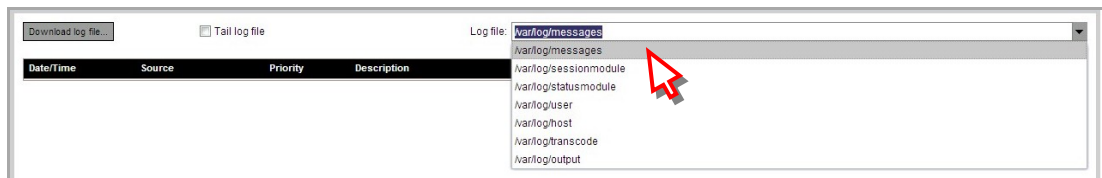


Figure 3.109 Selecting a Log File

4. Click the **Download log file...** button.

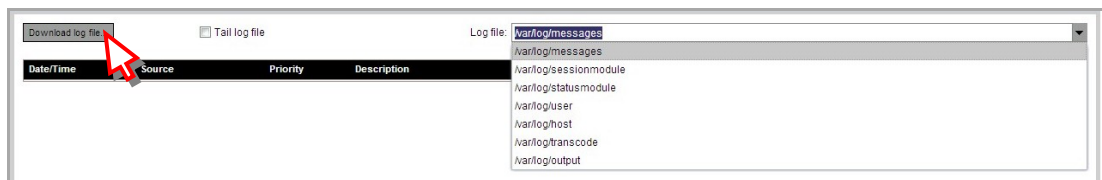


Figure 3.110 Downloading the Log File

5. If you wish to track the progress of the download, check the **Tail Log File** box.

3.22 How to Order and Apply Additional Licenses

The unit is delivered with the option cards and licenses, which were ordered, already installed. Licenses can be extended and new licenses ordered after the unit has been shipped.

All licenses are stored on the host card (on the chassis). Access to the web GUI is necessary to verify the licenses that are enabled on the unit.

Verifying Your Current Licenses

To view your current licenses:

1. Navigate to the **SYSTEM > LICENSES** web GUI page.

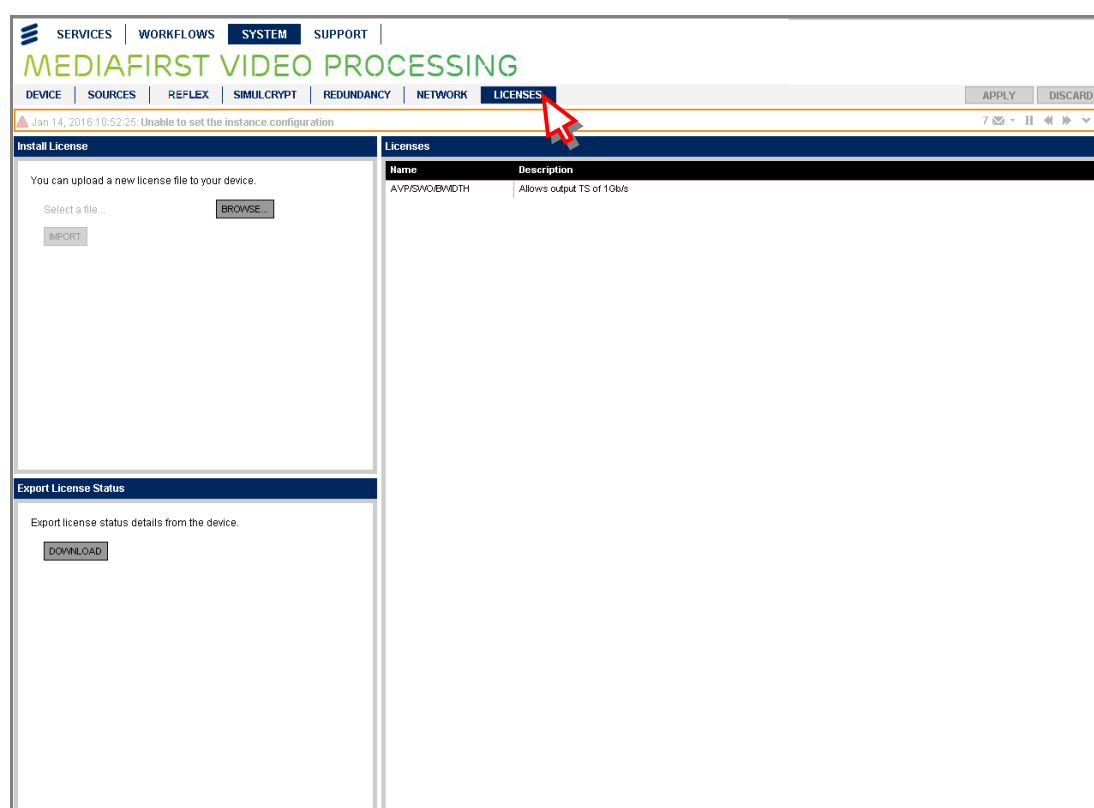


Figure 3.111 Viewing Your Licenses

2. All your current licenses are listed in the **License** widget on the right-hand side of the page, including information regarding their remaining time and whether they are expired or active.

Installing Additional/New Licenses

To install additional/new licenses:

1. Navigate to the **SYSTEM > LICENSES** web GUI page.

2. In the **Install License** widget, click the **BROWSE...** button to locate the license key file.

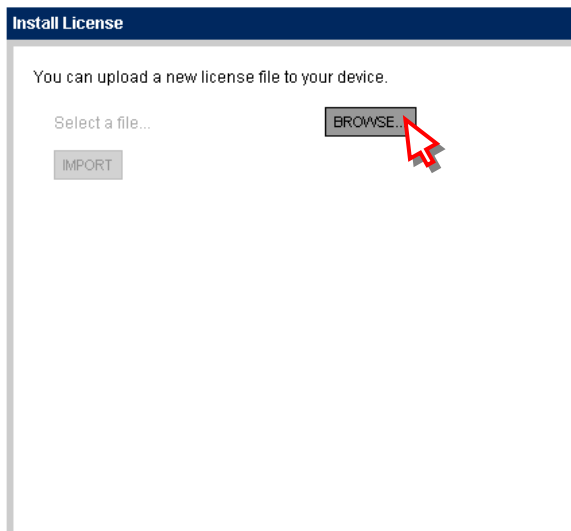


Figure 3.112 Browsing for Licenses File

3. Click on the **IMPORT** button to upload the license.

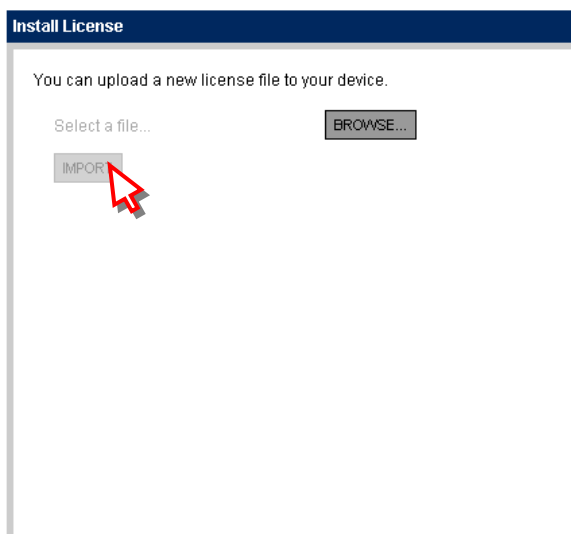


Figure 3.113 Importing Licenses File

4. If licenses are required for both the base chassis and option card then multiple files will be provided which all need to be loaded onto the specific unit.
5. Re-boot the unit for the changes to take effect.

Note: The front panel CANNOT be used to upload license keys.



Front Panel Control

Chapter 4

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4.1 Introduction

This chapter describes the features and options provided by the Front Panel menus for controlling and monitoring the unit.

4.2 Using the Front Panel Controls

The user interface for the Front Panel consists of a light bar, keypad and main display, all contained within one unit. These are used to set-up, control and monitor the unit. In a given state, only the illuminated keys are functional.



Figure 4.1 Front Panel

4.2.1 Status (Light) Bar

The status (light) bar indicates the alarm state of the unit.

- **Red (Fault)** – Indicates a Critical/Major fault condition, e.g. a missing or faulty input signal, although it may be lit briefly during power-up.
- **Amber (Locked/Non-Functional)** – Indicates that the unit is locked to a Transport Stream, but also indicates a Minor/Warning of incorrect conditions or incorrect system functioning.
- **Green (Locked/Functional)** – Indicates that the unit is locked to a Transport Stream and also indicates correct conditions and correct system functioning. There are no active alarms or active alarms or warnings are masked.

4.2.2 Keypad

Various keys are provided on the keypad, as detailed in *Table 4.1*

Table 4.1 Keypad

Key	Description
Up (^)	Used for moving to previous menus within the same level.
Down (v)	Used for moving to further menus within the same level.
Forward (>)	Used for moving forward to further sub-menus.
Back (<)	Used for moving back to higher menu levels.
Edit	Used for changing editable parameters.
Save	Used for saving any changes made.

4.3 Front Panel Menus

The following menus, shown in *Table 4.2* are available on the main screen.

To navigate to the next level of menus, press the **Forward (>)** key. To return to the top level menu menus, press the **Backward (<)** key. Press the **Forward (>)** key to select a parameter and press the **Edit** key to modify the setting.

Table 4.2 Front Panel Menus

Top Level Menu	Menu Level 2	Menu Level 3	Menu Level 4	Description
IP address & Status	> /System	> Remote Control	> IP Address	Sets IP parameters for Ethernet Control ports.
			> Subnet Mask	Sets Subnet mask parameters for Ethernet Control ports.
			> Gateway Address	Set Gateway parameters for Ethernet Control ports.
			> Default MAC Address	Set default MAC address.
		> Alarms	> <critical>	Lists currently active alarms beginning with critical alarms, then major , and minor .
		> Versions	> Hardware Version	Displays the hardware version of the unit.
			> Software Version	Displays the software version of the unit.
			> Assembly Date	Displays the assembly date of the unit.
			> Serial Number	Displays the serial number of the unit.
			> Chassis Identity	Displays the chassis identity of the unit.
		> Redundancy	> State	Displays the redundancy state of the unit.
		> Restore Factory Defaults	> Erase All Settings?	Enables the erasure of all settings.
		> Switch Boot Bank	> Switch Boot Bank?	Enables switching of the boot bank.

4.4 Front Panel Menu Descriptions

4.4.1 Top-Level Menu

Shortly after power-up this menu displays the current IP Address, status of major alarms and redundancy status.



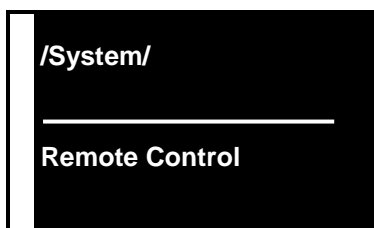
To navigate to the next level of menus press the **Forward (>)** key

4.4.2 System Menu

The functions and sub-menus within the **System** menu are used to set **Remote Control**, **Alarms**, **Versions**, **Redundancy Status**, **Restore Factory Defaults** and **Switch Boot Bank**. To access and edit the **System** menus from the top-level menu, press the **Forward (>)** key. The first menu displayed is the **Remote Control** menu, described below.

4.4.3 System > Remote Control

This menu provides user settings for **Remote Control**. To access and edit this menu from the top-level menu, press the **Forward (>)** key.



To return to the **System** main menu, press the **Back (<)** key.

4.4.3.1 System > Remote Control > IP Address

This menu enables you to view and edit the unit IP address. To access and edit this menu from the **Remote Control** menu, press the **Forward (>)** key.

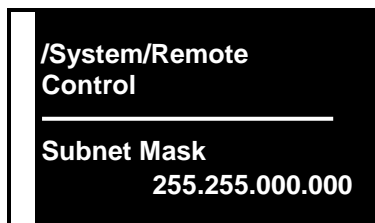
To modify the IP address, press the **Edit** key. Use the **Forward (>)** and **Back (<)** keys to move between the digits and use the alphanumeric keypad to increment or decrement the numeric value. Press the **Save** key to save any changes or press the **Edit** key again to cancel the changes.



4.4.3.2 System > Remote Control > Subnet Mask

This menu enables you to view and edit the subnet mask. To access and edit this menu from the **IP Address** menu, press the **Down (v)** key.

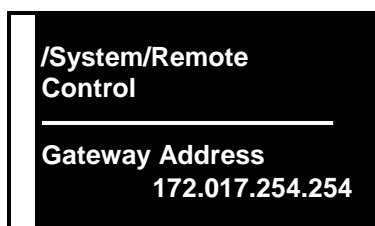
To modify the subnet mask, press the **Edit** key. Use the **Forward (>)** and **Back (<)** keys to move between the digits and use the alphanumeric keypad to increment or decrement the numeric value. Press the **Save** key to save any changes or press the **Edit** key again to cancel the changes.



4.4.3.3 System > Remote Control > Gateway Address

This menu enables you to view and edit the gateway address. To access and edit this menu from the **Subnet Mask** menu, press the **Down (v)** key.

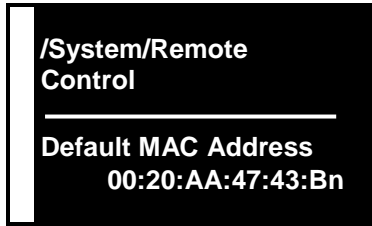
To modify the gateway address, press the **Edit** key. Use the **Forward (>)** and **Back (<)** keys to move between the digits and use the alphanumeric keypad to increment or decrement the numeric value. Press the **Save** key to save any changes or press the **Edit** key again to cancel the changes.



4.4.3.4 System > Remote Control > Default MAC Address

This menu enables you to view and edit the default MAC address. To access and edit this menu from the **Gateway Address** menu, press the **Down (v)** key.

To modify the default MAC address, press the **Edit** key. Use the **Forward (>)** and **Back (<)** keys to move between the digits and use the alphanumeric keypad to increment or decrement the numeric value. Press the **Save** key to save any changes or press the **Edit** key again to cancel the changes.



This is the last of the **Remote** sub-menus. Press the **Back (<)** key twice to return to the **System** main menu.

4.4.4 System > Alarms

This menu lists currently active alarms. To access and edit this menu from the **System** menu, press the **Forward (>)** key.

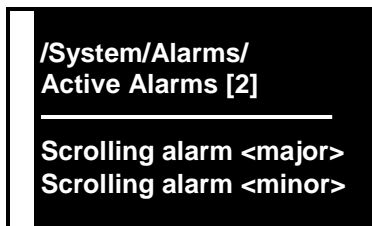


To view the current alarms, press the **Forward (>)** key.

4.4.4.1 System > Alarms > (Detail)

These menus enable you to view the alarms in increasing order of severity, beginning with critical alarms, then major, etc. A sub-menu is displayed which may be scrolled through to view the various alarms. The severity of an alarm event may be modified using the web GUI **Alarms** web page, see *Chapter 5, Web GUI Control* for details.

To access these menus from the **Alarms** menu, press the **Forward (>)** key.



To view all of the current alarms, press the **Forward (>)** key to display the next alarm detail menu. Press the **Back (<)** key twice to return to the **System** main menu.

4.4.5 System > Versions

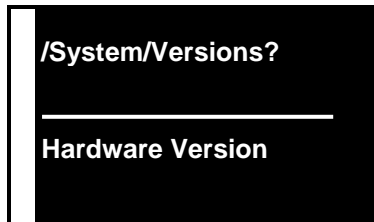
This menu enables you to view the software version and build number of the unit. To access this menu from the **System** menu, press the **Forward (>)** key.



Press the **Forward (>)** key the hardware, software, assembly date, serial number and chassis identity.

4.4.5.1 System > Versions > Hardware Versions

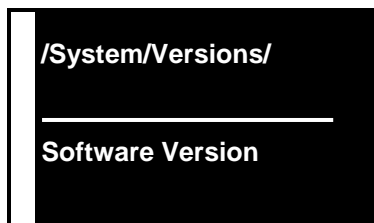
This menu enables you to view the hardware version of the unit. To access this menu from the **Versions** menu, press the **Forward (>)** key.



Press the **Back (<)** key twice to return to the **Versions** main menu.

4.4.5.2 System > Versions > Software Versions

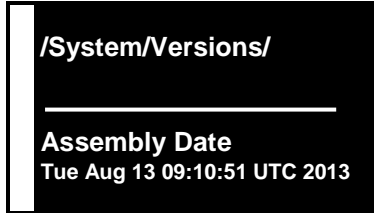
This menu enables you to view the software version of the unit. To access this menu from the **HW Version** menu, press the **Forward (>)** key.



Press the **Back (<)** key to return to the **Versions** main menu.

4.4.5.3 System > Versions > Assembly Date

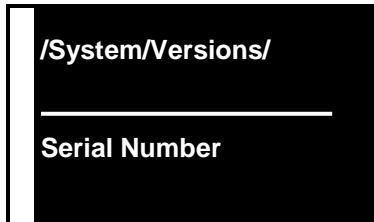
This menu enables you to view the assembly date of the unit. To access this menu from the **SW Version** menu, press the **Forward (>)** key.



Press the **Back (<)** key to return to the **Versions** main menu.

4.4.5.4 System > Versions > Serial Number

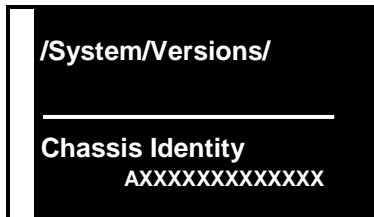
This menu enables you to view the serial number of the unit. To access this menu from the **Assembly Date** menu, press the **Forward (>)** key.



Press the **Back (<)** key to return to the **Versions** main menu.

4.4.5.5 System > Versions > Chassis Identity

This menu enables you to view the chassis identity of the unit. To access this menu from the **Serial Number** menu, press the **Forward (>)** key.



Press the **Back (<)** key twice to return to the **System** main menu.

4.4.6 System > Redundancy

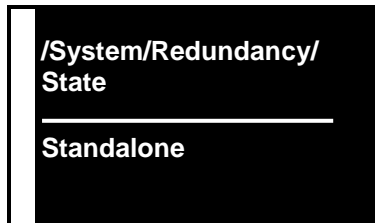
This menu enables you to view the redundancy state of the unit. To access and edit this menu from the **System** menu, press the **Forward (>)** key.



Press the **Forward (>)** key to view the redundancy status.

4.4.7 System > Redundancy Status

This menu enables you to view the redundancy status of the unit. To access and edit this menu from the **System > Redundancy** menu, press the **Forward (>)** key.



Press the **Back (<)** key to return to the **System** main menu.

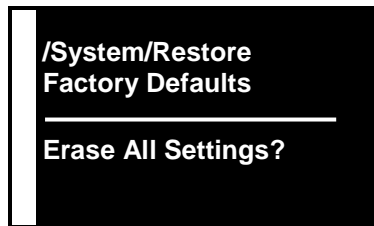
4.4.8 System > Restore Factory Defaults

This menu enables you to restore the factory-set default settings to the unit. To access and edit this menu from the **System** menu, press the **Forward (>)** key.



Press the **Back (<)** key to return to the **System** main menu.

To erase all settings, press the **Edit** key to change the display to **Yes** and then press the **Save** key.

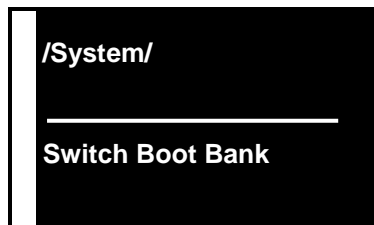


Choose between **Yes** and **No** and press the **Save** key to confirm.

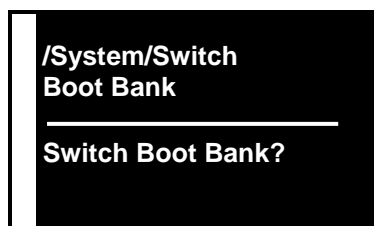
Press the **Back (<)** key to return to the **System** main menu.

4.4.9 **System > Switch Boot Bank**

This menu enables you to switch the boot bank. To access and edit this menu from the **System** menu, press the **Forward (>)** key.



To switch the boot bank press the **Forward (>)** key.



Choose between **Yes** and **No** and press the **Save** key to confirm.

Press the **Back (<)** key to return to the **System** main menu.



Web GUI Control

Chapter 5

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5.1 Using the Web Graphical User Interface

The Custom Hardware 2 is designed to be configured and controlled by its own web Graphical User Interface (GUI). This chapter describes, in sequence, all the GUI screens, and their functions, associated with the Host Card and base chassis.

The GUI uses widget-based architecture. This section defines the terminology used to describe typical elements of the GUI screens and any general operations that may be performed.

Note: For GUI screens and functions associated with Option Cards, see the relevant *Option Card Reference Guide*.

The main components of a typical Web GUI page are shown in *Figure 5.1*.

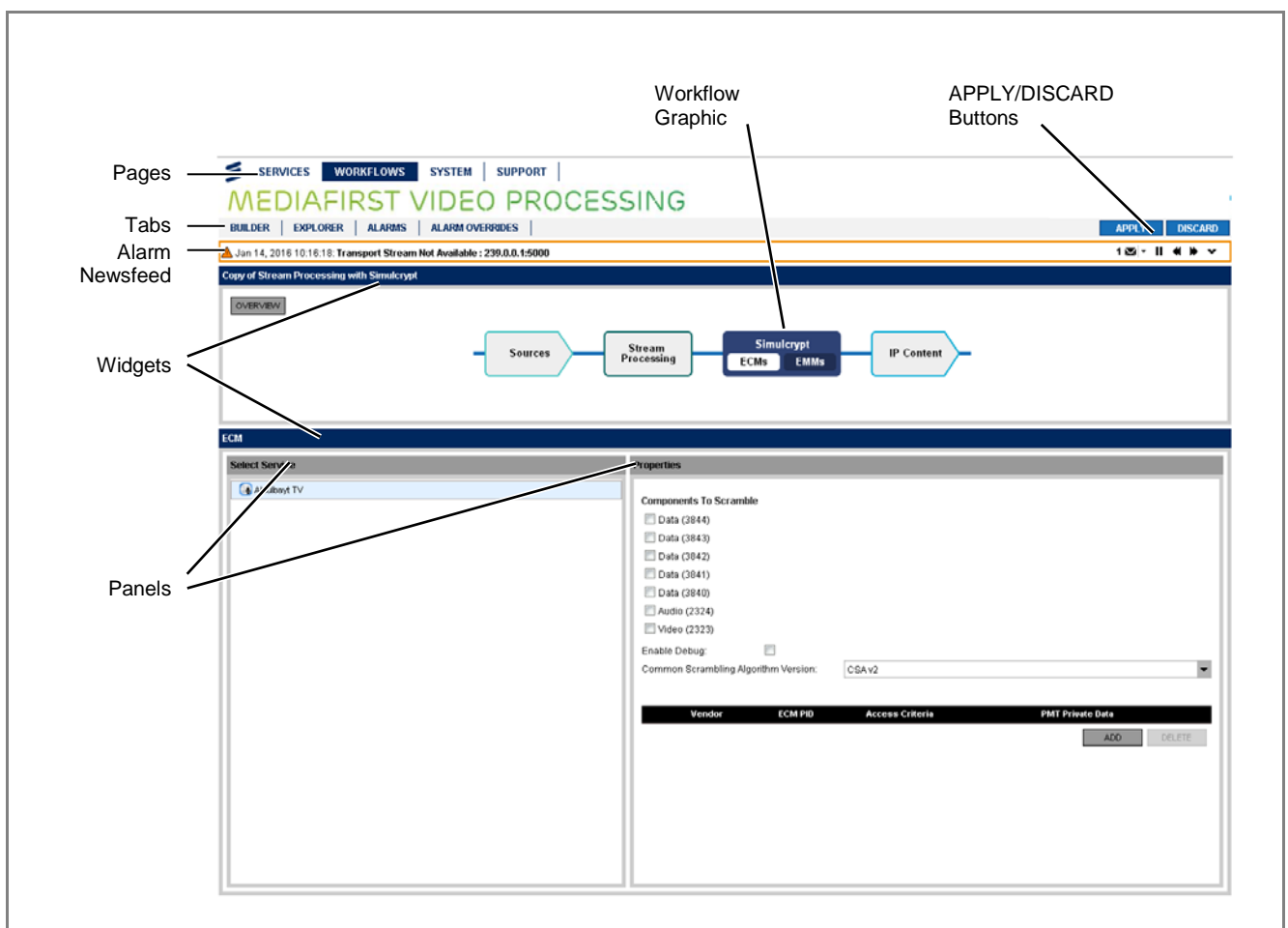


Figure 5.1 Web GUI Components (Typical Page)

5.1.1 Pages (Navigation Header)

The control functions for the unit are grouped into four main categories, with each category presented on a separate web ‘page’. Links to these pages are provided at the top of the header, above the banner. Simply click on them to access the relevant web page.

Example: “Click on the **SYSTEM** page to select the ...”

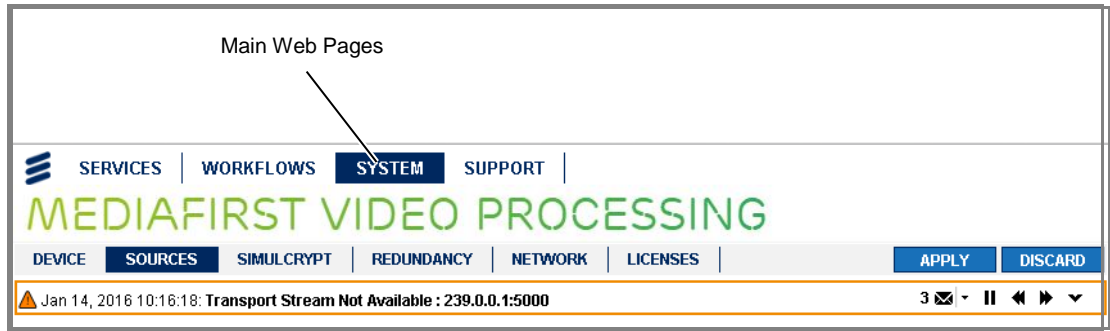


Figure 5.2 Web Pages

The four main web pages are:

- **SERVICES** (see section 5.2)
- **WORKFLOWS** (see section 5.3)
- **SYSTEM** (see section 5.4)
- **SUPPORT** (see section 5.5)

5.1.2 Tab Pages (Navigation Header)

Where appropriate, the control functions for each web page may be further broken down into smaller sub-categories, with each sub-category presented on a separate ‘tab’ pages. Links to these tab pages are provided at the bottom of the header, below the banner. Simply click on them to access the relevant tab page.

Example: “Click on the **SYSTEM > NETWORK** tab page to select the ...”

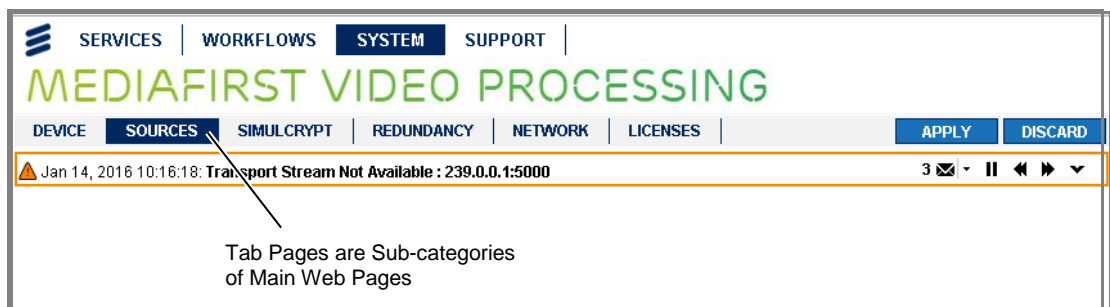


Figure 5.3 Tab Pages

5.1.3 APPLY/DISCARD Buttons

Changes made to parameters on any of the GUI pages/tabs are automatically highlighted in orange, signifying that these changes have not yet been saved. If you modify parameters and then attempt to navigate away from the page/tab, a warning dialog will be displayed.

Example: “To save your changes, click on the **APPLY** button.”



Figure 5.4 APPLY/DISCARD Buttons

The two buttons on the right-hand side of the web GUI header are:

- **APPLY** – Enables any changes made to that page/tab to be applied. The affected parameters will then become part of the current unit configuration and their color will return to normal, i.e. black.
- **DISCARD** – Enables any changes made to that page/tab to be rejected. The unit configuration will not be modified.

5.1.4 Alarm Newsfeed

The ‘Alarm Newsfeed’ is positioned at the bottom of the header and therefore remains visible when any of the web pages are selected, displaying any current active alarms/alerts.

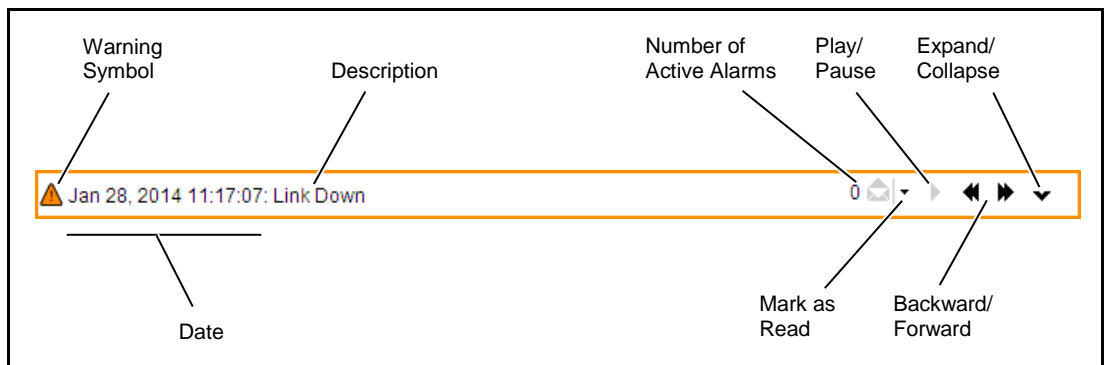






Figure 5.5 Alarm Newsfeed

New alarm messages (at the left-hand side) scroll automatically through the 1-line display and comprise a colored warning symbol, indicating the severity of the alarm, followed by the month, date, year, time (hh:mm:ss) and then an alarm description. Alarm colors are:

- **Red** – critical error condition.
- **Dark Orange** – major warning condition.
- **Light Orange** – minor warning condition.
- **Yellow** – warning messages.

Alarm message controls are provided on the right-hand side of the Alarm Newsfeed as detailed in *Table 5.1*. Grayed-out icons are non-functional.

Table 5.1 Alarm Newsfeed Control Icons

Control	Description
	Displays the number of active alarms. Click on the down-arrow to acknowledge the alarm message and Mark as Read
	Pauses or plays the Alarm Newsfeed.
	Skips backward or forward through the list of active alarms.
	Expands or collapses the list of active alarms (see <i>Figure 5.6</i>).

The Alarm Newsfeed can be expanded to display the list of all current active alarms by selecting the down-arrow at the right-hand side.

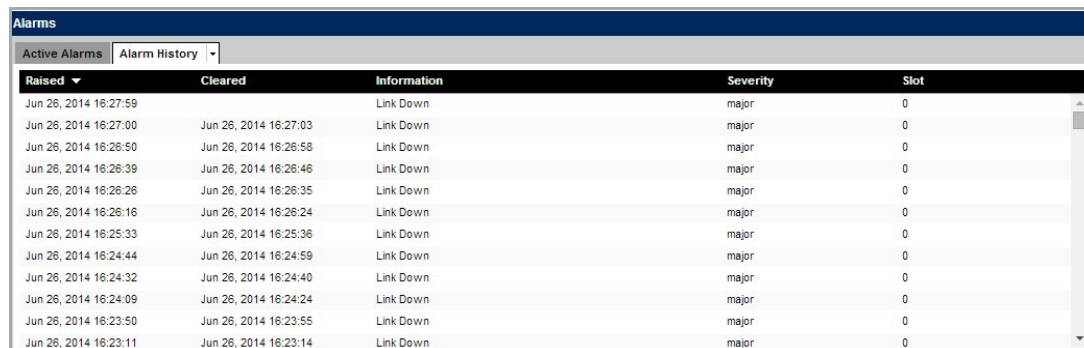


Figure 5.6 Alarm Newsfeed (Expanded)

5.1.5

Widgets

'Widgets' are sub-divisions of pages or tabs (with a blue title bar). They allow you to select or modify settings and parameters or display relevant information.



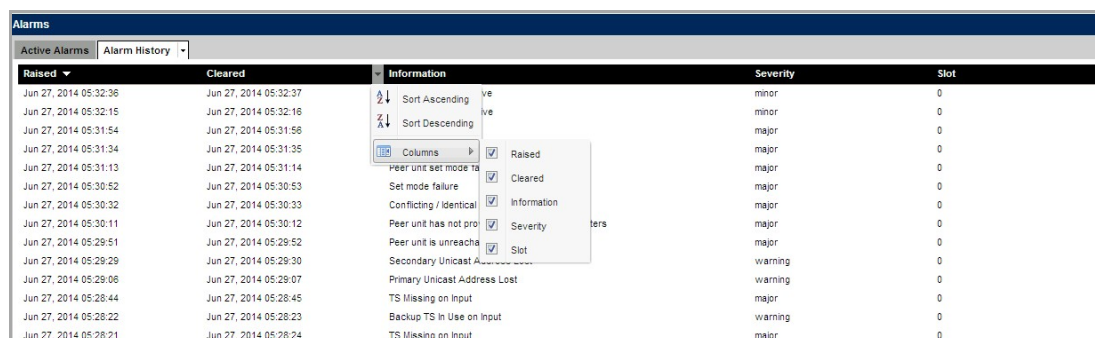
Alarms					
Active Alarms		Alarm History			
Raised	Cleared	Information	Severity	Slot	
Jun 26, 2014 16:27:59		Link Down	major	0	
Jun 26, 2014 16:27:00	Jun 26, 2014 16:27:03	Link Down	major	0	
Jun 26, 2014 16:26:50	Jun 26, 2014 16:26:58	Link Down	major	0	
Jun 26, 2014 16:26:39	Jun 26, 2014 16:26:46	Link Down	major	0	
Jun 26, 2014 16:26:26	Jun 26, 2014 16:26:35	Link Down	major	0	
Jun 26, 2014 16:26:16	Jun 26, 2014 16:26:24	Link Down	major	0	
Jun 26, 2014 16:25:33	Jun 26, 2014 16:25:36	Link Down	major	0	
Jun 26, 2014 16:24:44	Jun 26, 2014 16:24:59	Link Down	major	0	
Jun 26, 2014 16:24:32	Jun 26, 2014 16:24:40	Link Down	major	0	
Jun 26, 2014 16:24:09	Jun 26, 2014 16:24:24	Link Down	major	0	
Jun 26, 2014 16:23:50	Jun 26, 2014 16:23:55	Link Down	major	0	
Jun 26, 2014 16:23:11	Jun 26, 2014 16:23:14	Link Down	major	0	

Figure 5.7 Widgets (Example)

Widget can be resized by dragging the splitters between them, where provided. Where relevant, objects may be copied by drag-and-drop within or between widgets.

Selecting and Sorting Tabular Data

Tables are frequently used within widgets to display data. The data in all tables may be alphabetically sorted ascending descending by clicking on the black table column header and selecting the appropriate option from the drop-down menu.



Alarms					
Active Alarms		Alarm History			
Raised	Cleared	Information	Severity	Slot	
Jun 27, 2014 05:32:36	Jun 27, 2014 05:32:37	Peer unit set mode to	minor	0	
Jun 27, 2014 05:32:15	Jun 27, 2014 05:32:16	Set mode failure	minor	0	
Jun 27, 2014 05:31:54	Jun 27, 2014 05:31:56	Conflicting / identical	major	0	
Jun 27, 2014 05:31:34	Jun 27, 2014 05:31:35	Peer unit has not pro	major	0	
Jun 27, 2014 05:31:13	Jun 27, 2014 05:31:14	Peer unit is unreacha	major	0	
Jun 27, 2014 05:30:52	Jun 27, 2014 05:30:53	Secondary Unicast A	major	0	
Jun 27, 2014 05:30:32	Jun 27, 2014 05:30:33	Primary Unicast Address Lost	warning	0	
Jun 27, 2014 05:30:11	Jun 27, 2014 05:30:12	TS Missing on Input	warning	0	
Jun 27, 2014 05:29:51	Jun 27, 2014 05:29:52	Backup TS In Use on Input	major	0	
Jun 27, 2014 05:29:29	Jun 27, 2014 05:29:30	TS Missing on Input	warning	0	
Jun 27, 2014 05:29:06	Jun 27, 2014 05:29:07		major	0	
Jun 27, 2014 05:28:44	Jun 27, 2014 05:28:45		major	0	
Jun 27, 2014 05:28:22	Jun 27, 2014 05:28:23		major	0	
Jun 27, 2014 05:28:21	Jun 27, 2014 05:28:24		major	0	

Figure 5.8 Selecting and Sorting Tabular Data

In addition, columns may be selected or deselected for viewing by clicking on the black table column header and selecting the appropriate option from the drop-down menu by checking or unchecking the relevant checkbox.

5.1.6 Panels (Fixed and Accordion)

Fixed panels are accordion panels are further sub-divisions of widgets (with a gray title bar). They are separate areas to show more or less information. Accordion panels may be collapsed and expanded by clicking on the small arrow on the top right-hand of the panel.

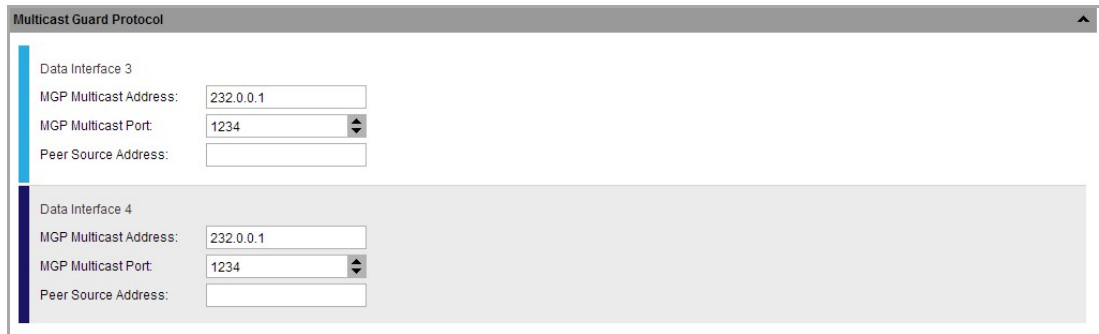


Figure 5.9 Accordion Panel (Example)

5.1.7 Supported Actions and Features

The following actions and features are supported by the web GUI:

- **Drag-and-Drop** – The web GUI supports **drag-and-drop**, for example in the **Services > Configure** page, to enables you to quickly copy services and profiles. Additionally, when selecting services and profiles, the web GUI supports **Shift-Click** operation to enables you to select multiple adjacent items, and **Ctrl-Click** operation when selecting multiple non-adjacent items.
- **Drop-Down Menus** – Some web GUI pages provide drop-down menus to enables you to select from the available options.
- **Right-Click/Context Menus** – Some web GUI pages provide right-click menus for speedier configuration.
- **Parameter Highlighting** – When you modify service and profile properties, any changes you make will be highlighted as **orange text**. These changes will not be carried out until they are confirmed, by clicking the **APPLY** button.
- **Web Page Resizing and Collapsing** – To enable you to view just the information that you need, the panes displayed on some web pages may be resized by dragging the pane boundary, or collapsed by clicking on the ◀ symbol in the pane boundary. If your monitor screen width is less than 1300 pixels, panes may be collapsed automatically.

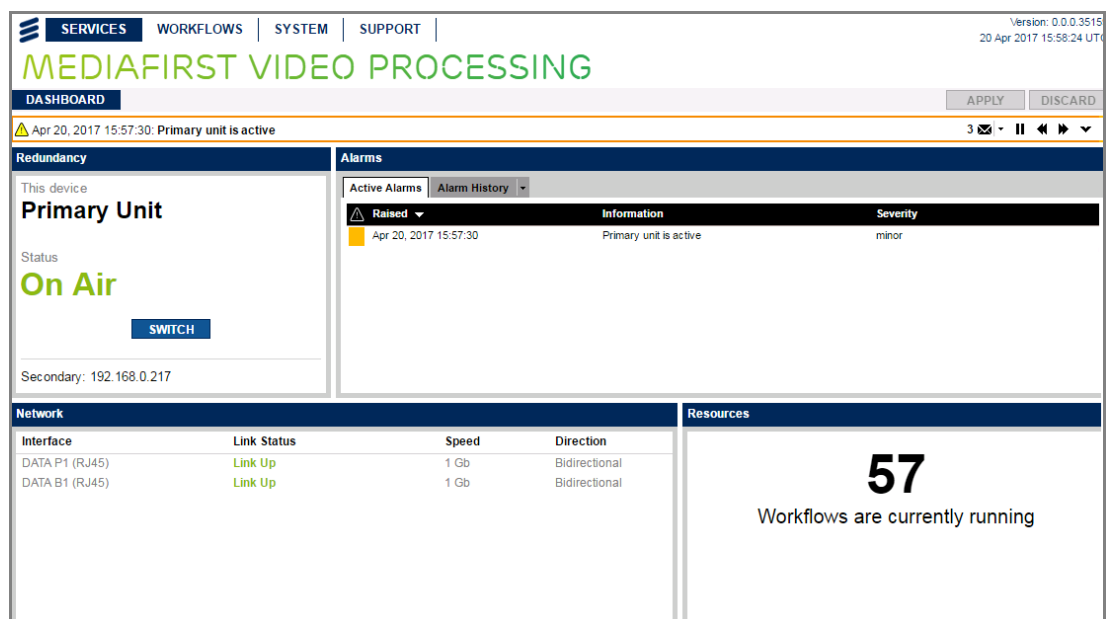
5.2 SERVICES Page

The **SERVICES** page groups together an overview of the unit and provides access to further related tab pages. Currently only one tabs is provided:

- **DASHBOARD** (see section 5.2.1)

5.2.1 SERVICES > DASHBOARD Page

The **SERVICES > DASHBOARD** tab page provides an overview of device operation and status.



The screenshot shows the 'SERVICES' tab selected in the top navigation bar. The page title is 'MEDIAFIRST VIDEO PROCESSING'. Below the title, there's a 'DASHBOARD' tab. A status bar indicates 'Apr 20, 2017 15:57:30: Primary unit is active'. The main content area is divided into several sections:

- Redundancy**: Shows 'This device' as 'Primary Unit' with a status of 'On Air' and a 'SWITCH' button. Below it, 'Secondary: 192.168.0.217'.
- Alarms**: A table with columns 'Active Alarms', 'Alarm History', 'Information', and 'Severity'. It shows one active alarm: 'Apr 20, 2017 15:57:30' with 'Primary unit is active' and 'minor' severity.
- Network**: A table with columns 'Interface', 'Link Status', 'Speed', and 'Direction'. It lists two interfaces: 'DATA P1 (RJ45)' and 'DATA B1 (RJ45)', both with 'Link Up' status and '1 Gb' speed, and 'Bidirectional' direction.
- Resources**: A large box displaying the number '57' and the text 'Workflows are currently running'.

Figure 5.10 SERVICES > DASHBOARD Page

5.2.2 Redundancy Panel

The Dashboard **Redundancy** panel displays the role this chassis takes when operating in a redundancy mode (**Primary** or **Secondary**). The panel only appears if the unit is configured for redundancy (in a 1+1 configuration).

The panel also displays the current operating mode of the device (**On Air** or **Off Air**).

A **SWITCH** button is provided to enable manual switching between Primary and Secondary in a 1+1 configuration.

The detected status of the Secondary device (in a 1+1 configuration) is displayed at the bottom of the panel. If a secondary unit is undetected, the status is displayed as "unknown".

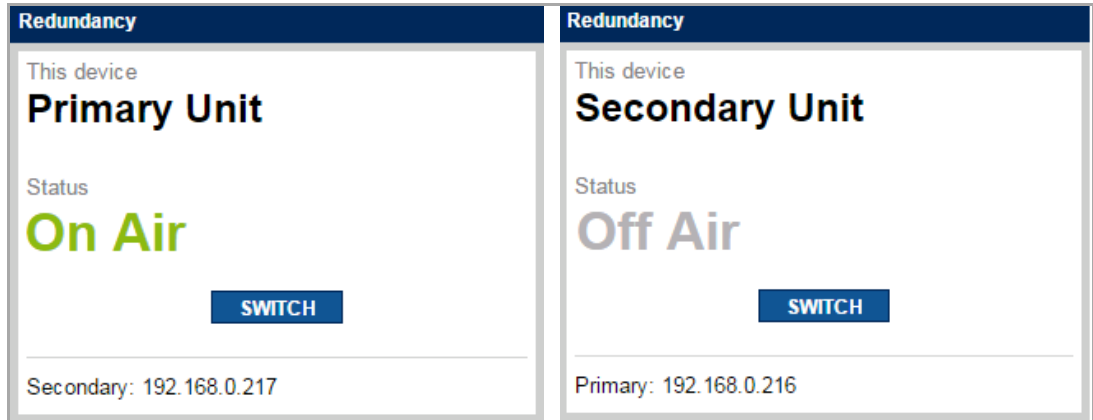


Figure 5.11 Dashboard Redundancy Panel

5.2.2.1 Alarms Panel

The Dashboard **Alarms** panel duplicates the information displayed on the **Monitoring > Alarms** page, providing a list of all the **Active Alarms** and the **Alarm History**.

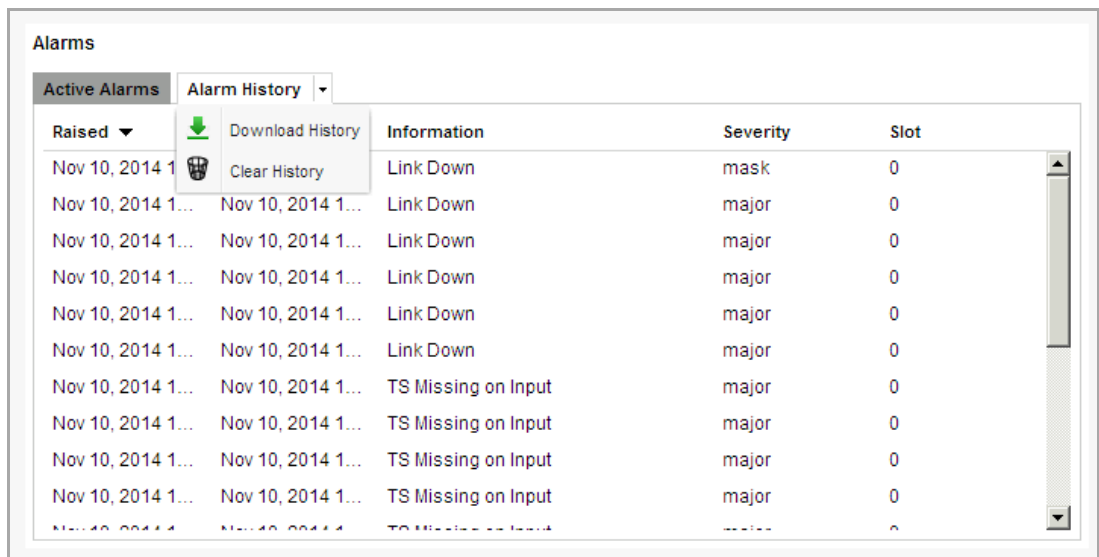


Figure 5.12 SERVICES > DASHBOARD - Alarms Panel

The **Alarm History** tab provides a drop-down menu to enable you to download the alarm history information to a file or to clear the display.

5.2.2.2 Network Panel

This Dashboard **Network** panel displays the status of the configurable data input/output interfaces and indicates the total bandwidth usage of the device.

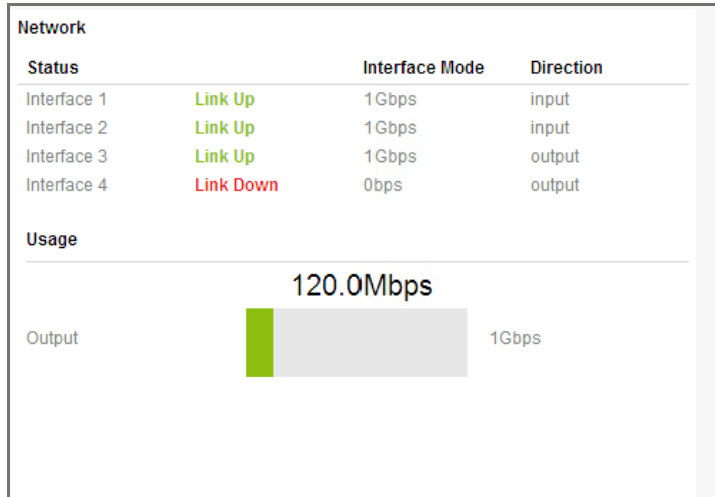


Figure 5.13 SERVICES > DASHBOARD - Network Panel

The **Status** table lists the individual data interfaces and displays either **Link Up**, if the interface is operational or **Link Down** if it is not. The **Interface Mode** specifies the detected speed of the communications link in bits per second (bps) and the **Direction** specifies whether the interface is configured as an input or an output.

The **Usage** bar total length (in gray) represents the total bandwidth available to the device. The usage bar indicator (in green) specifies the bandwidth currently being used by the device.

5.2.2.3

Resources Panel

This Dashboard **Resources** panel displays the number of workflows that have been configured and active.

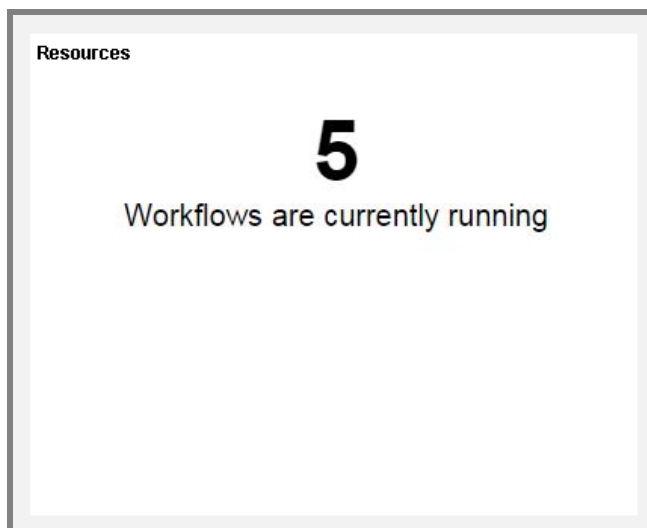


Figure 5.14 SERVICES > DASHBOARD - Resources Panel

5.3 WORKFLOWS Page

The **WORKFLOWS** page groups together the functions for configuring the unit and provides access to further related tab pages. Currently, four tabs are provided:

- **BUILDER** (see section 5.3.1)
- **EXPLORER** (see section 5.3.2)
- **ALARM** (see section 5.3.3)
- **ALARM OVERRIDES** (see section 5.3.4)

5.3.1 WORKFLOWS > BUILDER Page

The **BUILDER** tab page provides a graphical list of the available workflow templates that may be configured, as determined by the available features and options fitted to the unit.

5.3.1.1 Workflow Templates Widget

The **Workflow Templates** widget displays the unit functions that may be configured, provided in a graphical form showing each of the step-by-step blocks that must be completed to enable the unit function.

In the latest release of software, the following types of workflow may be created:

- **Broadcast Workflow** – a multi-services Transport Stream workflow that accepts IP inputs for transcoding AND remultiplexing into the output stream.
- **Multiscreen Workflow** – a single-service Transport Stream workflow that enables Adaptive Bit Rate (ABR) streaming of the service by transcoding different resolutions and bit rates to suit alternative output devices.
- **Stream Processing** – a multi-service Transport Stream that enables the selection of input services and components for output.
- **Stream Processing with ASI** – a multi-service Transport Stream that enables the selection of input services and components for output in Asynchronous Serial Interface (ASI) format.
- **Stream Processing with IP and ASI** – a multi-service Transport Stream that enables the selection of input services and components for output in either IP or ASI format.
- **Stream Processing with Simulcrypt** – a multi-service Transport Stream that enables the selection of input services and components for output. Multiple Conditional Access systems can co-exist on the same network at the same time.
- **Stream Processing with Simulcrypt with ASI** – a multi-service Transport Stream that enables the selection of input services and components for output in ASI format. Multiple Conditional Access systems can co-exist on the same network at the same time.

- **Stream Processing with Simulcrypt with IP and ASI** – a multi-service Transport Stream that enables the selection of input services and components for output in IP or ASI format. Multiple Conditional Access systems can co-exist on the same network at the same time.

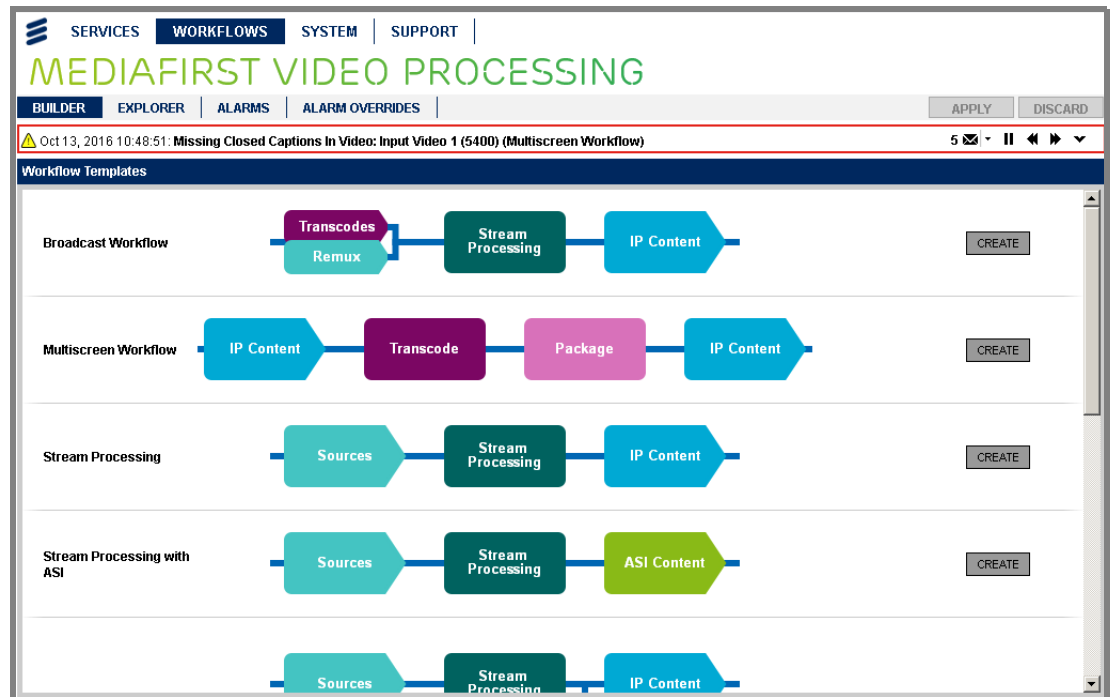


Figure 5.15 WORKFLOWS > BUILDER Page

When a **CREATE** button is clicked, a copy of the relevant workflow is created for you to configure and customize.

5.3.1.1.1 Overview Widget

The **Overview** widget displays the overview parameters appropriate for the type of workflow selected.

The overview contains further sub panels, displaying top-level settings for each of the functional blocks that make up the workflow. In the example below, a Stream Processing overview is displayed.

The parameters displayed on the **Overview** widget will therefore differ for each type of workflow, and their values can be modified by typing into the editable field or by clicking on the arrow buttons, if provided. These same parameters can also be modified on the detailed parameters screens, available by clicking on each of the functional blocks.

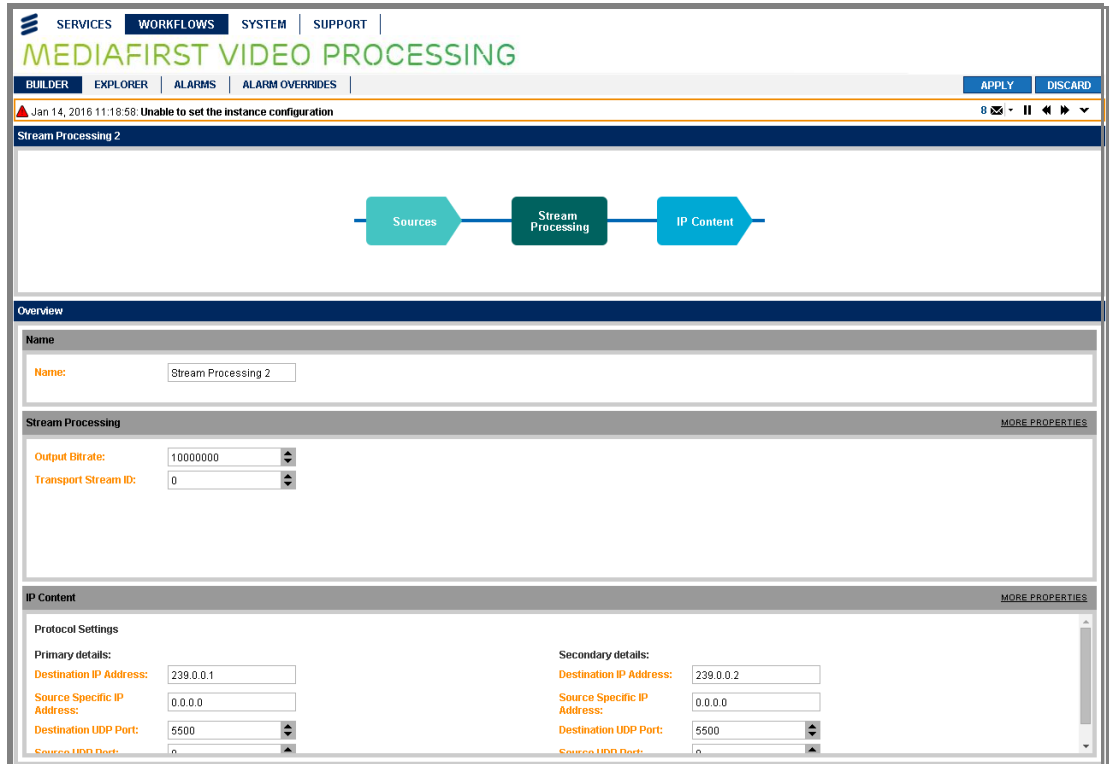


Figure 5.16 WORKFLOWS > BUILDER - Stream Processing Workflow Creation

Name Panel

The **Name** panel displays the name field that will be used to identify the new workflow:

- **Name** – This field displays the name that has been automatically assigned to the workflow. It can be edited, as required, by overtyping directly in this field.

Stream Processing Panel

The **Stream Processing** panel displays the parameters fields associated with stream processing (further details are available by clicking the **MORE PROPERTIES** link on the right-hand side - this displays the same page as when editing a workflow using **WORKFLOWS > EXPLORER**):

- **Output Bitrate** – Sets the bit rate (in 1 kbps steps) of the Transport Stream. Increment or decrement using the arrow buttons (valid range = 10000 - 216000000).
- **Transport Stream ID** – Sets the Transport Stream Identifier. Increment or decrement using the arrow buttons (valid range = 1 – 512).

IP Content Panel

The **IP Content** panel displays the parameters fields associated with IP content (further details are available by clicking the **MORE PROPERTIES** link on the right-hand side - this displays the same page as when editing a workflow using **WORKFLOWS > EXPLORER**):

- **Destination IP Address** – Sets the IP Address for the destination of IP content. Type the IP address directly into the field.
- **Source Specific IP Address** – Sets the IP Address for the source of IP content. Type the IP address directly into the field.
- **Destination UDP Port** – Sets the User Datagram Protocol port for the destination of IP content. Increment or decrement using the arrow buttons (valid range = 0 - 65535).
- **Source UDP Port** – Sets the User Datagram Protocol port for the source of IP content. Increment or decrement using the arrow buttons (valid range = 0 - 65535).

5.3.2 WORKFLOWS > EXPLORER Page

The **WORKFLOWS > EXPLORER** tab page provides a graphical list of the live configurations that have been created for the unit (using the **WORKFLOWS > BUILDER** tab page).

5.3.2.1 Active Workflows Widget

The **Active Workflows** widget displays the unit functions that have been created and configured in a graphical form, showing each of the functional blocks that make up the configuration. In the example below, four configurations have been created.

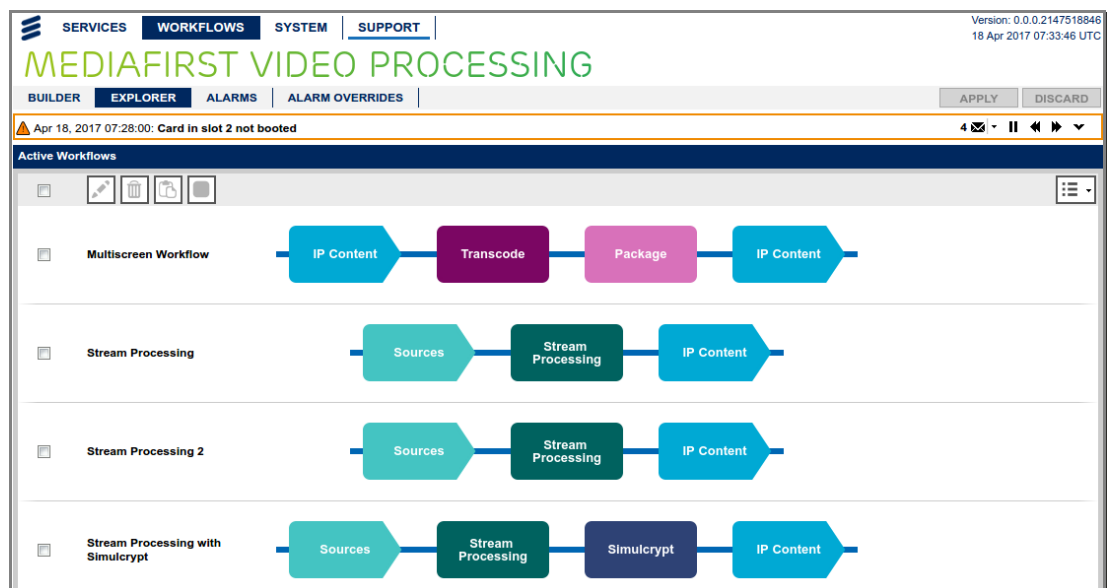






Figure 5.17 WORKFLOWS > EXPLORER Page

Managing Workflows

Each workflow can be actioned in four ways, using the buttons on the top left-hand corner.

-  **EDIT WORKFLOW** – enables the settings of the configuration to be changed/modified. When the button is clicked, the screen displayed depends on the configuration selected. In editing mode, the functional blocks of the displayed configuration are clickable, displays appropriate panels in the widget below for parameter selection and editing.
-  **DELETE WORKFLOW** – deletes the configuration and removes it from the displayed list.
-  **DUPLICATE WORKFLOW** – enables the configuration to be replicated (with all its associated parameters) to enable you to quickly create and build new configurations without having to re-enter detailed parameters.
-  **MAKE WORKFLOW INACTIVE** – disables a workflow. By default, the workflow is active and consumes resources and licenses, and produces an output TS. When inactive, it does not consume resources or licenses, and does not produce an output TS.

Displaying Active and Inactive Workflows

If a workflow is made inactive, it will be listed as part of the inactive workflows list. To toggle between the list of '**Active Workflows**' and '**Inactive Workflows**', click on the **Inactive Workflows** button in the top right-hand corner.

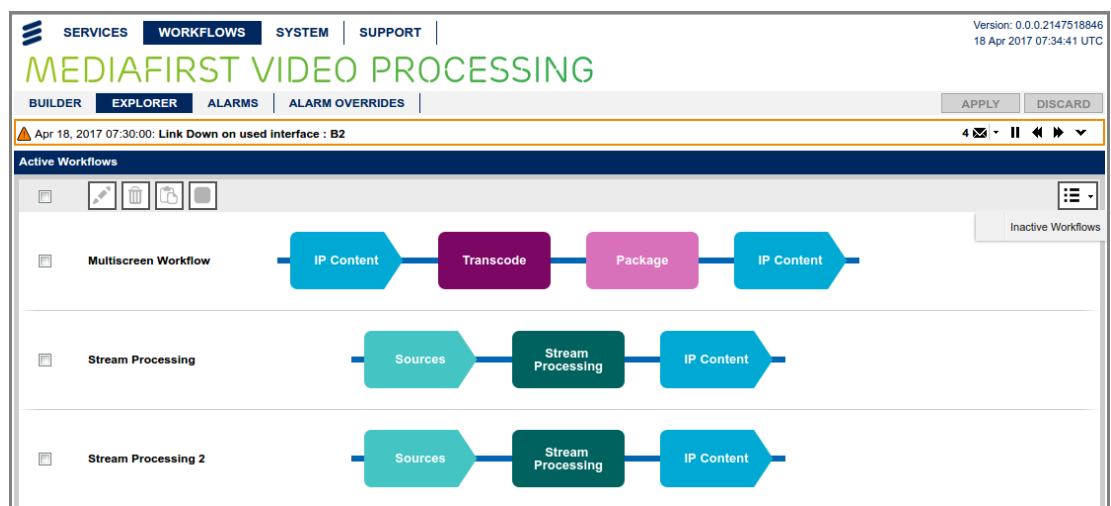


Figure 5.18 Displaying Inactive Workflows

An inactive workflow can be made active by selecting the workflow on the explorer page, and pressing the '**Make workflow active**' button.

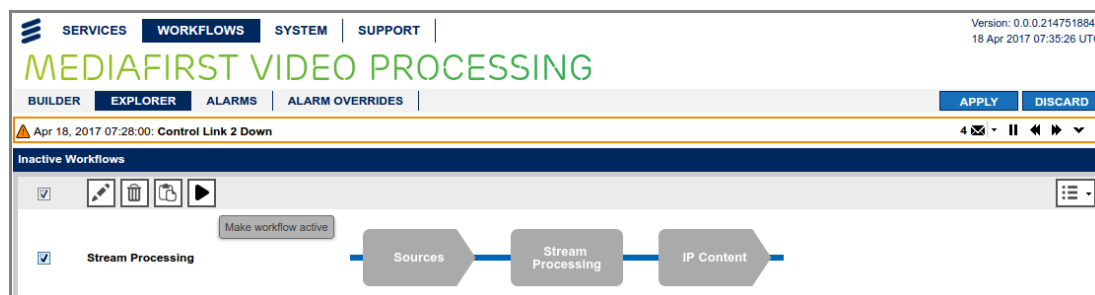


Figure 5.19 Displaying Inactive Workflows

To toggle between the list of '**Inactive Workflows**' and '**Active workflows**', click on the top right-hand corner button '**Inactive Workflows**'.

5.3.2.2 Overview Widget

When the **EDIT** button is clicked on the **Live Configuration** widget, the relevant workflow is displayed in a new page for you to configure. This is similar to the overview displayed using the **WORKFLOW > BUILDER** option, and contains further sub-panels, displaying overview settings for each of the functional blocks for the workflow selected.

5.3.2.3 Transcodes/Remux Block

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **Transcodes/Remux** functional block is selected.

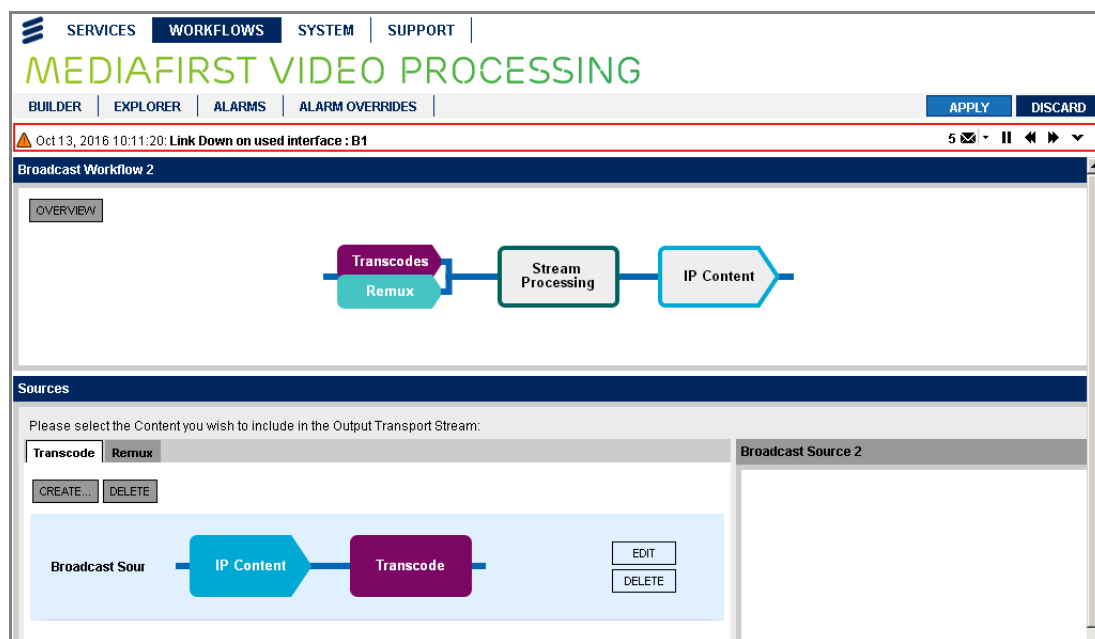


Figure 5.20 Transcodes/Remux

5.3.2.3.1 Transcode Tab

The **Transcode** tab displays the available transcode configurations for inclusion in the Output Transport Stream.

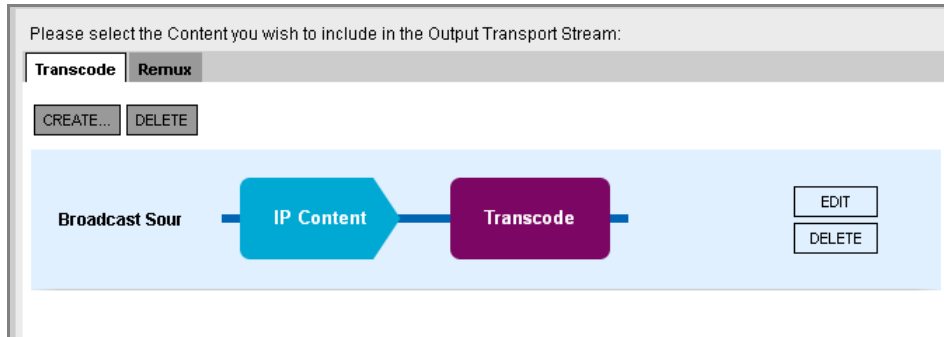


Figure 5.21 Transcodes/Remux – Transcode Tab

Initially **No workflows configured** will be displayed. The following buttons are displayed:

- **CREATE...** – Enables new transcode configurations to be created.
- **DELETE** – Deletes the transcode configurations displayed in this tab.

Below these buttons any transcode configurations that have been created are displayed. These may be edited by clicking the associated **EDIT** button or deleted by clicking the **DELETE** button.

5.3.2.3.2 Remux Tab

The **Remux** tab displays the available IP sources for remultiplexing into the Output Transport Stream. IP address and port number are displayed in the graphic.

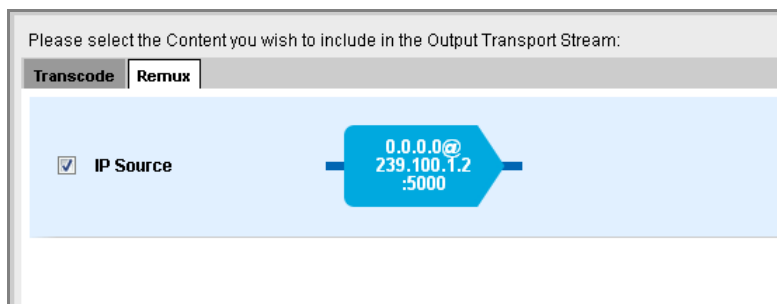


Figure 5.22 Transcodes/Remux – Remux Tab

The services and components detected in this source are listed in the **IP Source** panel at the right-hand side

5.3.2.3.3 IP Source Panel

The **IP Source** panel displays the available IP Sources for possible inclusion in the Output Transport Stream. The checkbox enables the selection of individual services, where appropriate.

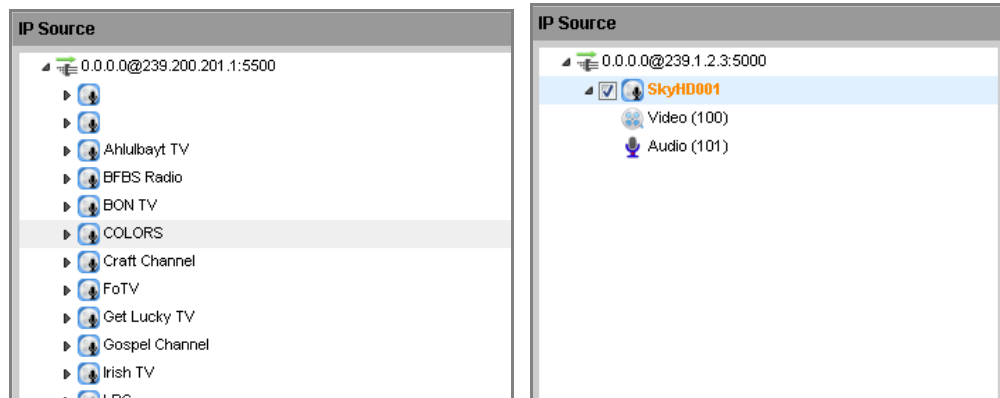


Figure 5.23 IP Source Panel

5.3.2.4 Sources Block

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **Sources** functional block is selected.

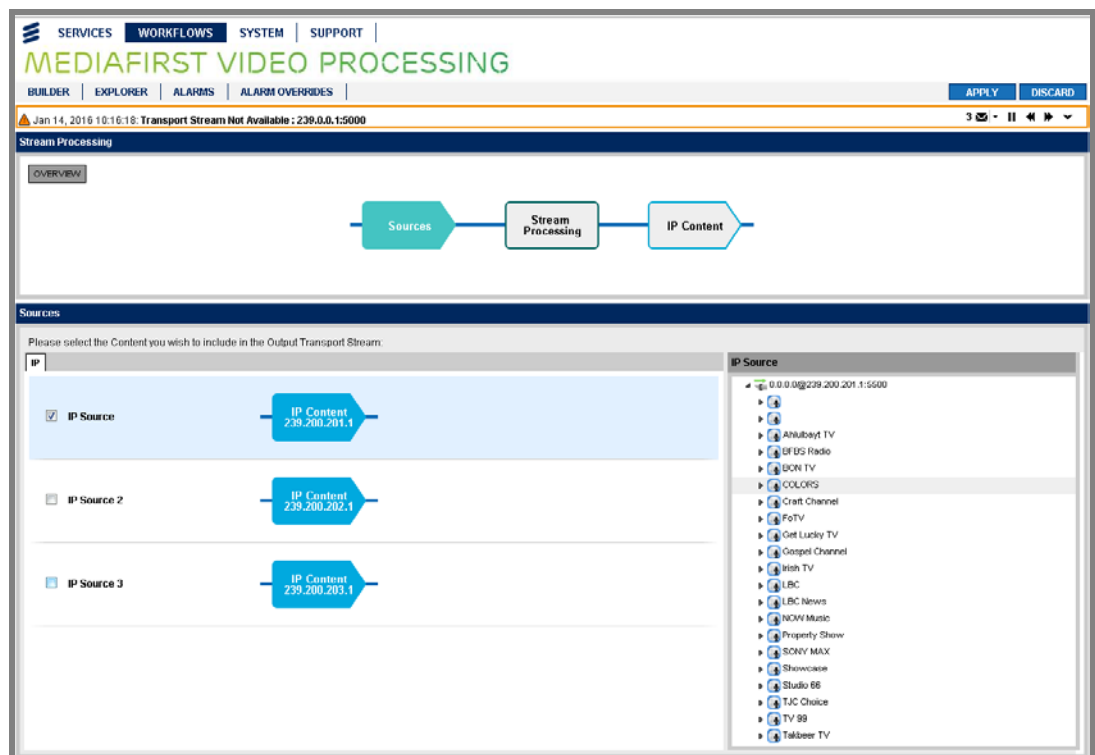


Figure 5.24 Sources

5.3.2.4.1 IP Tab

The **IP** tab displays any available Internet Protocol (IP) Sources for inclusion in the Output Transport Stream. The source type and IP address are displayed in the graphic.

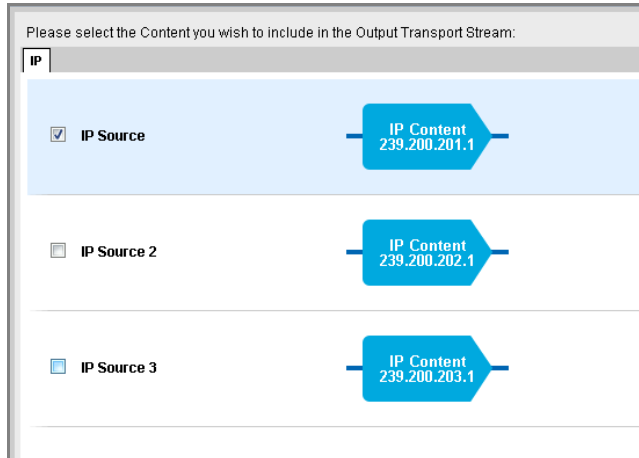


Figure 5.25 IP Tab

5.3.2.4.2 ASI Tab

The **ASI** tab displays any available Asynchronous Serial Interface (ASI) Sources for inclusion in the Output Transport Stream. The source type and card interface are displayed in the graphic.

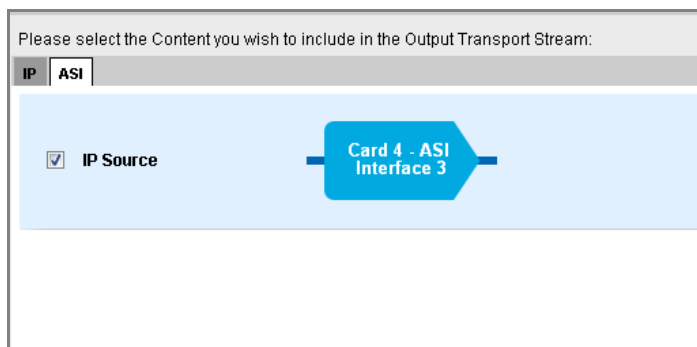


Figure 5.26 ASI Tab

5.3.2.4.3 IP Source Panel

The **IP Source** panel displays the available IP Sources for possible inclusion in the Output Transport Stream. The checkbox enables the selection of individual services, where appropriate.

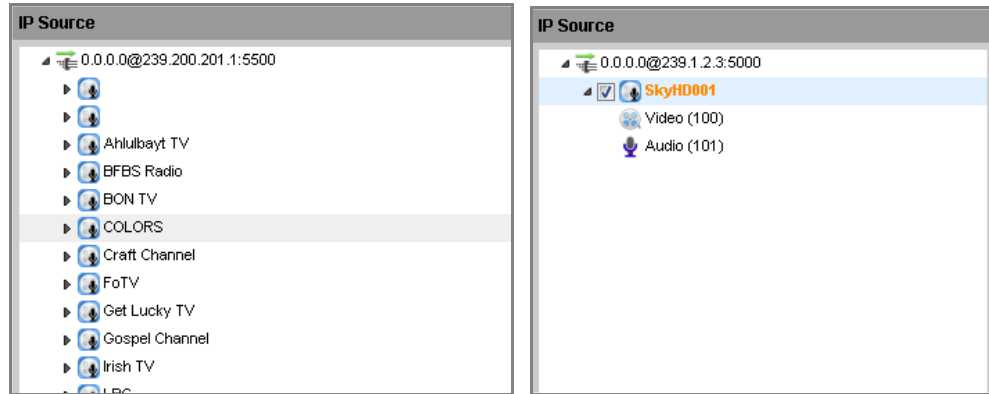


Figure 5.27 IP Source Panel

5.3.2.5 Stream Processing Block

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the Stream Processing functional block is selected.

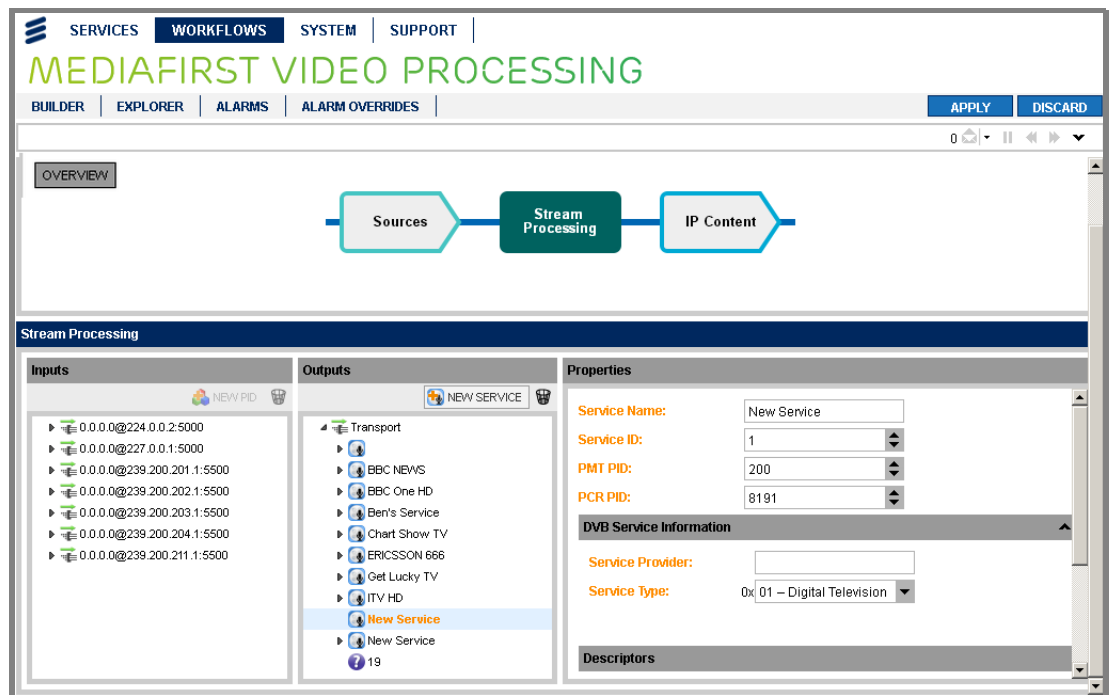


Figure 5.28 Stream Processing

5.3.2.5.1 Inputs Panel

The **Inputs** panel displays a list of the incoming Transport Streams, the Services, and their Components (video, audio, data and PIDs). Click on the triangle alongside each item in the displayed tree structure to expand or collapse to reveal or hide further information.

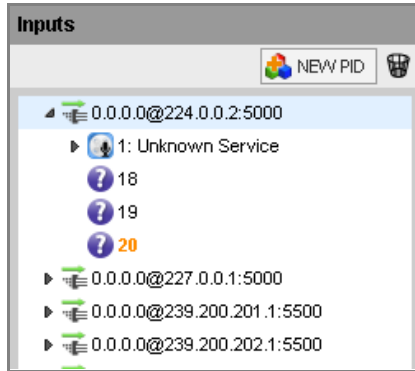




Figure 5.29 Inputs Panel

The **Inputs** panel provides the following buttons/icons:

- The NEW PID button  enables a new Packet Identifier (PID) to be added to the **Inputs** panel, which may then be dragged-and-dropped into the **Outputs** panel to be referenced by services and components.
- The wastebasket icon  enables selected Transport Streams to be deleted from the **Inputs** panel. A confirmation dialog will be displayed.

See *Chapter 3, Getting Started* for details of adding and deleting Transport Streams and Services.

5.3.2.5.2

Outputs Panel

The **Outputs** panel lists the output Transport Streams that have been selected, the Services contained within those streams and the Components (video, audio, data and PCRs). Click on the triangle alongside each item in the displayed tree structure to expand or collapse to reveal or hide Services and Components.

Note: Components may be referenced in multiple Services and Transport Streams.; these components will all display the same properties (and PIDs). Clicking on Components in the **Outputs** panel will automatically reveal its source in the **Inputs** panel.

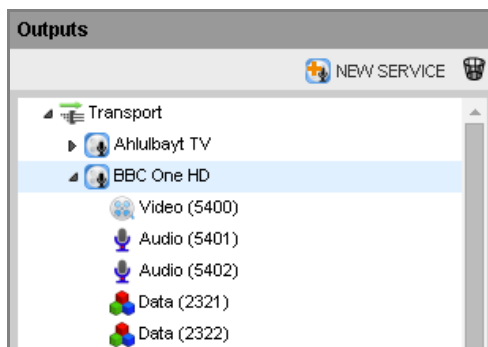




Figure 5.30 Outputs Panel

The **Outputs** panel provides the following buttons/icons:

- The NEW SERVICE button  enables new services to be added to the list in the **Outputs** panel, which may then be configured as required for Stream Processing.
- The wastebasket icon  enables selected Transport Stream to be deleted from the **Outputs** panel. A confirmation dialog will be displayed.

See *Chapter 3, Getting Started* for details of adding and deleting Transport Streams and Services.

5.3.2.5.3 Properties (Input - Transport Stream) Panel

The following parameters are displayed in the **Properties** panel when a Transport Stream is selected in the **Inputs** panel.

Properties	
Name:	IP Source 4
Data Interface:	P1
Protocol:	IP
Destination IP Address:	224.0.0.2
Destination UDP Port:	5000
Source IP Address:	0.0.0.0

Figure 5.31 Properties (Input - Transport Stream) Panel

5.3.2.5.4 Properties (Input - Service) Panel

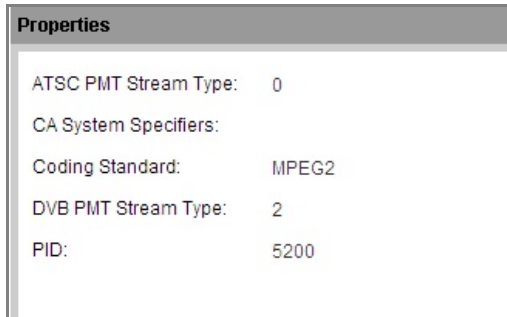
The following parameters are displayed in the **Properties** panel when a Service is selected in the **Inputs** panel.

Properties	
PCR PID:	100
PMT PID:	32
Program Number:	1
Service Name:	SkyHD001
Service Provider:	Service Provider

Figure 5.32 Properties (Input - Service) Panel

5.3.2.5.5 Properties (Input - Video Component) Panel

The following parameters are displayed in the **Properties** panel when a Video Component is selected in the **Inputs** panel.

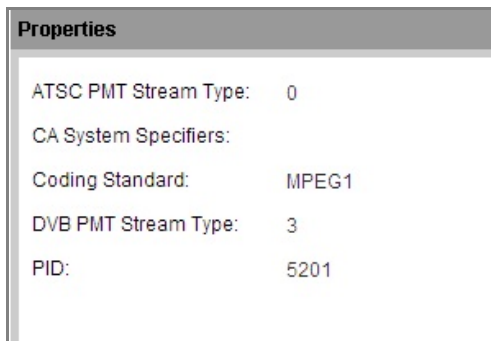


ATSC PMT Stream Type:	0
CA System Specifiers:	
Coding Standard:	MPEG2
DVB PMT Stream Type:	2
PID:	5200

Figure 5.33 Properties (Input - Video Component) Panel

5.3.2.5.6 Properties (Input - Audio Component) Panel

The following parameters are displayed in the **Properties** panel when an Audio Component is selected in the **Inputs** panel.



ATSC PMT Stream Type:	0
CA System Specifiers:	
Coding Standard:	MPEG1
DVB PMT Stream Type:	3
PID:	5201

Figure 5.34 Properties (Input - Audio Component) Panel

5.3.2.5.7 Properties (Input - PID) Panel

The following parameters are displayed in the **Properties** panel when a PID is selected in the **Inputs** panel. The value of the PID may be modified in the editable field by typing or using the arrow buttons.



PID:	20
------	----

Figure 5.35 Properties (Input - PID) Panel

5.3.2.5.8 Properties (Output - Transport Stream) Panel

The following parameters are displayed in the **Properties** panel when a Transport Stream is selected in the **Outputs** panel.

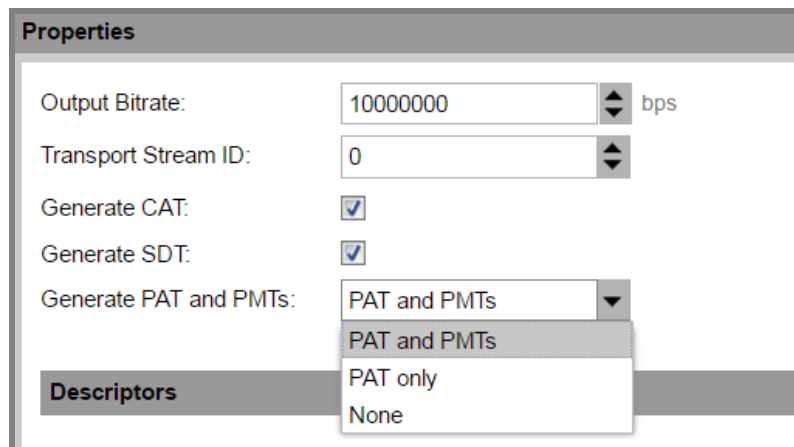


Figure 5.36 Properties (Output - Transport Stream) Panel

The following fields are available from this widget:

- **Output Bitrate** – Sets the bit rate of the output Transport Stream (in bits per second). Increment or decrement using the arrow buttons.
- **Transport Stream ID** – Sets the Transport Stream Identifier. Increment or decrement using the arrow buttons.
- **Generate CAT** – Generates a Conditional Access Table for the Transport Stream, when selected.
- **Generate SDT** – Generates a Service Description Table for the Transport Stream, when selected.
- **Generate PAT and PMTs** – Enables independent control of Program Association Table and Program Map Table generation for the Transport Stream, when selected.

Descriptors

Any Conditional Access Table (CAT) descriptors that have been added at the Transport Stream level are displayed in the **Descriptors** table.

When using Simulcrypt, CAT descriptors may be added automatically or manually. Descriptors added manually will override any automatic generated descriptors.

Their position in the table may be moved by using the up/down arrow keys on the left-hand side. The **ADD DESCRIPTOR** and **REMOVE DESCRIPTOR** buttons enable you to add and remove descriptor table entries.

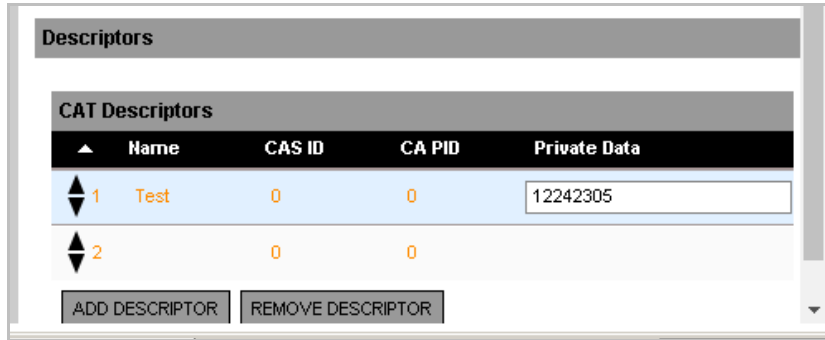


Figure 5.37 Properties (Output - Transport Stream) Panel - Adding Descriptors

5.3.2.5.9 Properties (Output - Service) Panel

The following parameters are displayed in the **Properties** panel when a Service is selected in the **Outputs** panel.

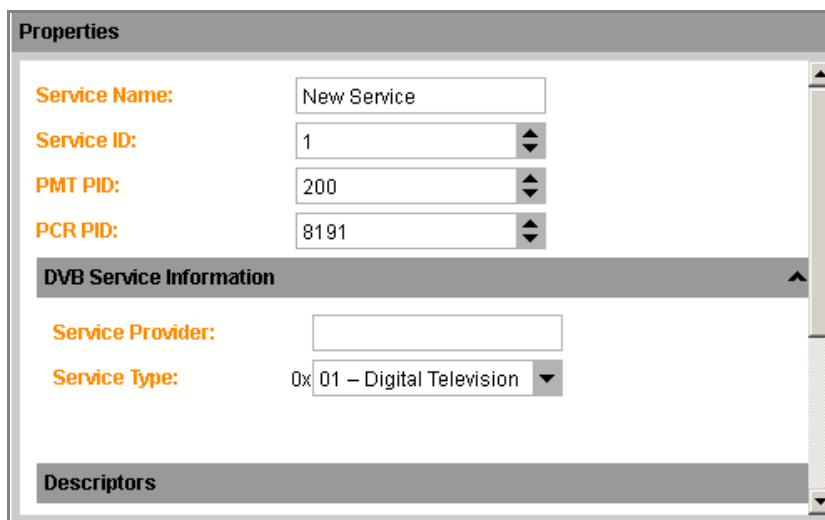


Figure 5.38 Properties (Output - Service) Panel

The following fields are available from this panel:

- **Service Name** – Displays the name allocated to the service.
- **Service ID** – Sets the Service identifier number. Increment or decrement using the arrow buttons. A unique PID/service ID must be set for services within the same Transport Stream
- **PMT PID** – Sets the Program Map Table (PMT) Packet Identifier (PID) number. Increment or decrement using the arrow buttons.
- **PCR PID** – Sets the Program Clock Reference (PCR) Packet Identifier (PID) number. Increment or decrement using the arrow buttons.

DVB Service Information

The following fields are available from this panel:

- **Service Provider** – Sets the name of the service provider.
- **Service Type** – Sets the Service type. Select the appropriate type from the drop-down list.

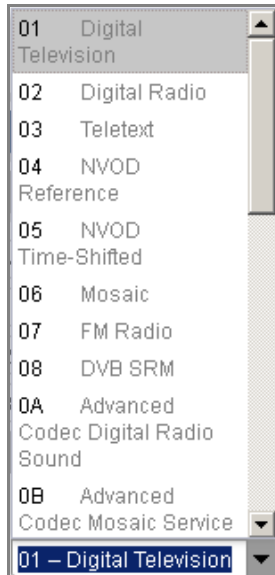


Figure 5.39 Service Types

Descriptors

A **Passthrough** drop-down list is displayed underneath this heading:

- **PMT** (default value) – Enables Service-level descriptors to be actively copied from the master input Service PMT to the output PMT only. No SDT descriptors will be copied.
- **None** – Descriptors will not be copied.

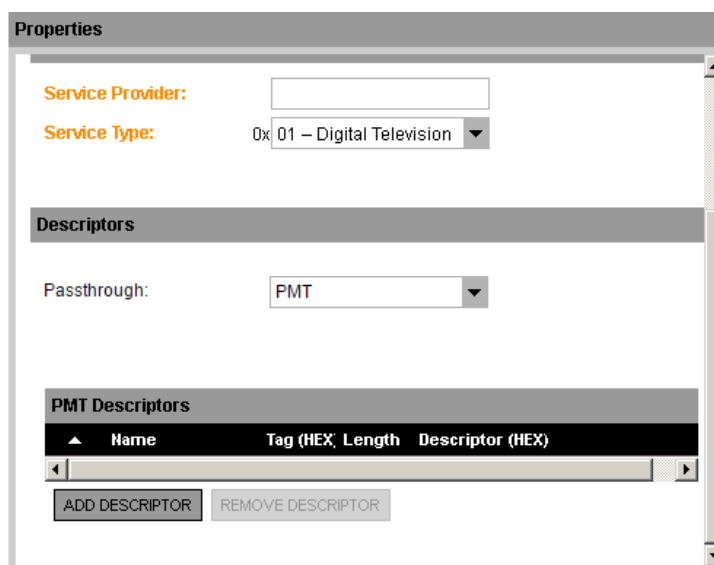


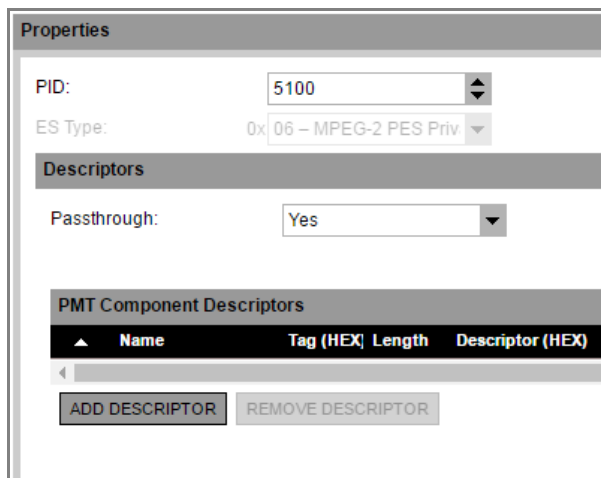
Figure 5.40 Service PMT Descriptors

PMT Descriptors

Any Program Mapping Table (PMT) descriptors that have been manually added at the Service level are displayed in the descriptors table. Their position in the table may be moved by using the up/down arrow keys on the left-hand side. The **Add Descriptor** and **Remove Descriptor** buttons enable you to add and remove descriptor table entries.

5.3.2.5.10 Properties (Output - Video Component) Panel

The following parameters are displayed in the **Properties** panel when an Audio Component is selected in the **Outputs** panel.



The screenshot shows a web interface for configuring video component properties. It includes a 'PID' field with a value of 5100 and up/down arrow buttons. Below it is an 'ES Type' dropdown menu showing '0x06 - MPEG-2 PES Priv'. A section titled 'Descriptors' contains a 'Passthrough' dropdown menu set to 'Yes'. Another section titled 'PMT Component Descriptors' features a table with headers 'Name', 'Tag (HEX)', 'Length', and 'Descriptor (HEX)'. At the bottom of this section are two buttons: 'ADD DESCRIPTOR' and 'REMOVE DESCRIPTOR'.

Figure 5.41 Properties (Output - Video Component) Panel

The following fields are available from this widget:

- **PID** – Sets the component packet identifier number. Increment or decrement using the arrow buttons. A unique PID/service ID must be set for services within the same Transport Stream.
- **ES Type** – Sets the Elementary Stream (ES) type. Select from the drop-down list (only applicable for data components).

Descriptors

A **Passthrough** drop-down list is displayed underneath this heading:

- **Yes** (default value) – Enables Component-level descriptors to be actively copied from the elementary stream info item in the source PMT to output PMT elementary stream info item.
- **No** – Descriptors will not be copied.

Notes: If the source of a component is an unreferenced PID then the passthrough setting will have no effect, as there can never be any descriptors to pass through.

When using Component references, all shared references must have the same passthrough setting, i.e. you cannot choose to have the shared Component use descriptor passthrough in one output Service but not another in the same output Transport Stream.

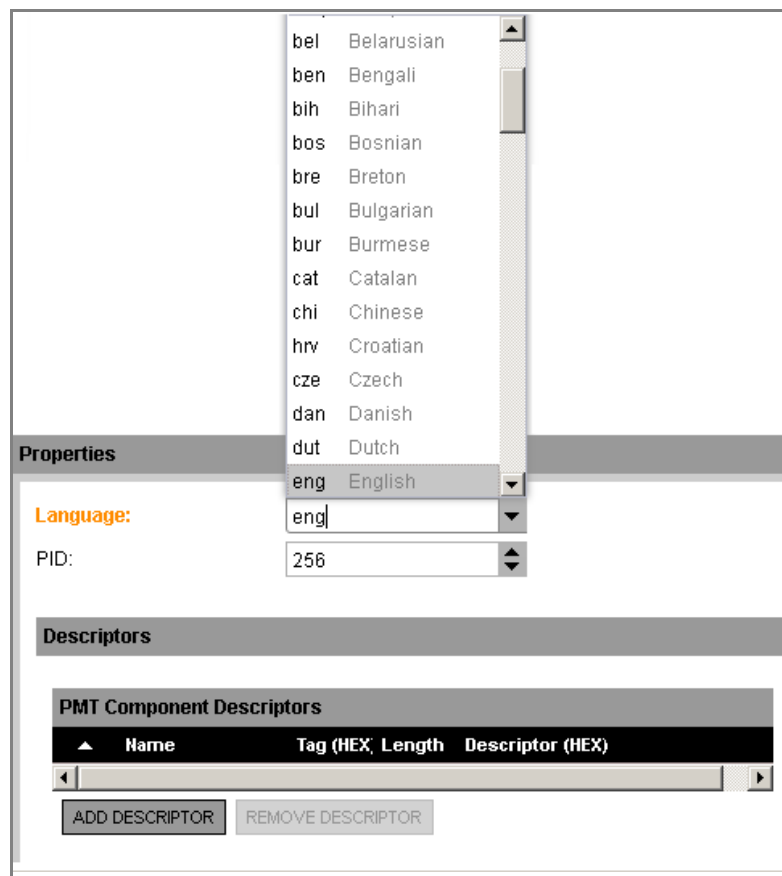
PMT Descriptors

Any Program Mapping Table (PMT) component descriptors that have been manually added are displayed in the **Descriptors** table. Their position in the table may be moved by using the up/down arrow keys on the left-hand side. The **ADD DESCRIPTOR** and **REMOVE DESCRIPTOR** buttons enable you to add and remove descriptor table entries.

5.3.2.5.11

Properties (Output - Audio Component) Panel

The following parameters are displayed in the **Properties** panel when an Audio Component is selected in the **Outputs** panel.



The screenshot shows the 'Properties (Output - Audio Component) Panel'. It features a 'Language' dropdown menu with 'eng' selected, a 'PID' field with '256', and a 'Descriptors' table. The 'Descriptors' table has columns for 'Name', 'Tag (HEX)', 'Length', and 'Descriptor (HEX)'. Below the table are 'ADD DESCRIPTOR' and 'REMOVE DESCRIPTOR' buttons.

Figure 5.42 Properties (Output - Audio Component) Panel

The following fields are available from this widget:

- **Language** – Identifies the language used on the audio component. Select a language from the drop-down box.

- **PID** – Sets the component packet identifier number. Increment or decrement using the arrow buttons.

Descriptors

A **Passthrough** drop-down list is displayed underneath this heading:

- **Yes** (default value) – Enables Component-level descriptors to be actively copied from the elementary stream info item in the source PMT to output PMT elementary stream info item.
- **No** – Descriptors will not be copied.

Notes: If the source of a component is an unreferenced PID then the passthrough setting will have no effect, as there can never be any descriptors to pass through.

When using Component references, all shared references must have the same passthrough setting, i.e. you cannot choose to have the shared Component use descriptor passthrough in one output Service but not another in the same output Transport Stream.

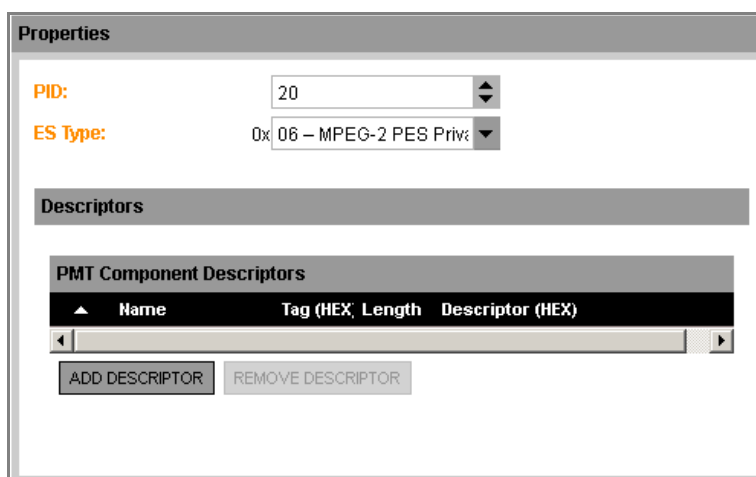
PMT Descriptors

Any Program Mapping Table (PMT) component descriptors that have been manually added are displayed in the **Descriptors** table. Their position in the table may be moved by using the up/down arrow keys on the left-hand side. The **ADD DESCRIPTOR** and **REMOVE DESCRIPTOR** buttons enable you to add and remove descriptor table entries.

5.3.2.5.12

Properties (Output - Data Component and PCR) Panel

The following parameters are displayed in the **Properties** panel when a Data Component or a PCR is selected in the **Outputs** panel.



Properties

PID: 20

ES Type: 0x06 - MPEG-2 PES Private

Descriptors

PMT Component Descriptors

Name	Tag (HEX)	Length	Descriptor (HEX)
------	-----------	--------	------------------

ADD DESCRIPTOR REMOVE DESCRIPTOR

Figure 5.43 Properties (Output - Data Component) Panel

The following fields are available from this widget:

- **PID** – Sets the component Packet Identifier (PID) number. Increment or decrement using the arrow buttons.
- **ES Type** – Sets the Elementary Stream (ES) type. Select a value from the drop-down list.

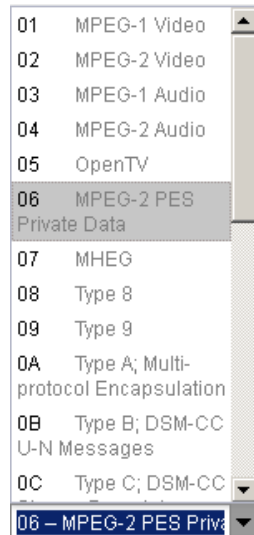


Figure 5.44 Elementary Stream Types

Descriptors

A **Passthrough** drop-down list is displayed underneath this heading:

- **Yes** (default value) – Enables Component-level descriptors to be actively copied from the elementary stream info item in the source PMT to output PMT elementary stream info item.
- **No** – Descriptors will not be copied.

Notes: If the source of a component is an unreferenced PID then the passthrough setting will have no effect, as there can never be any descriptors to pass through.

When using Component references, all shared references must have the same passthrough setting, i.e. you cannot choose to have the shared Component use descriptor passthrough in one output Service but not another in the same output Transport Stream.

PMT Descriptors

Any Program Mapping Table (PMT) component descriptors that have been manually added are displayed in the **Descriptors** table. Their position in the table may be moved by using the up/down arrow keys on the left-hand side. The **ADD DESCRIPTOR** and **REMOVE DESCRIPTOR** buttons enable you to add and remove descriptor table entries.

5.3.2.6 Simulcrypt Block (ECMs)

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **Simulcrypt** functional block is selected and the **ECMs** sub-block is clicked.

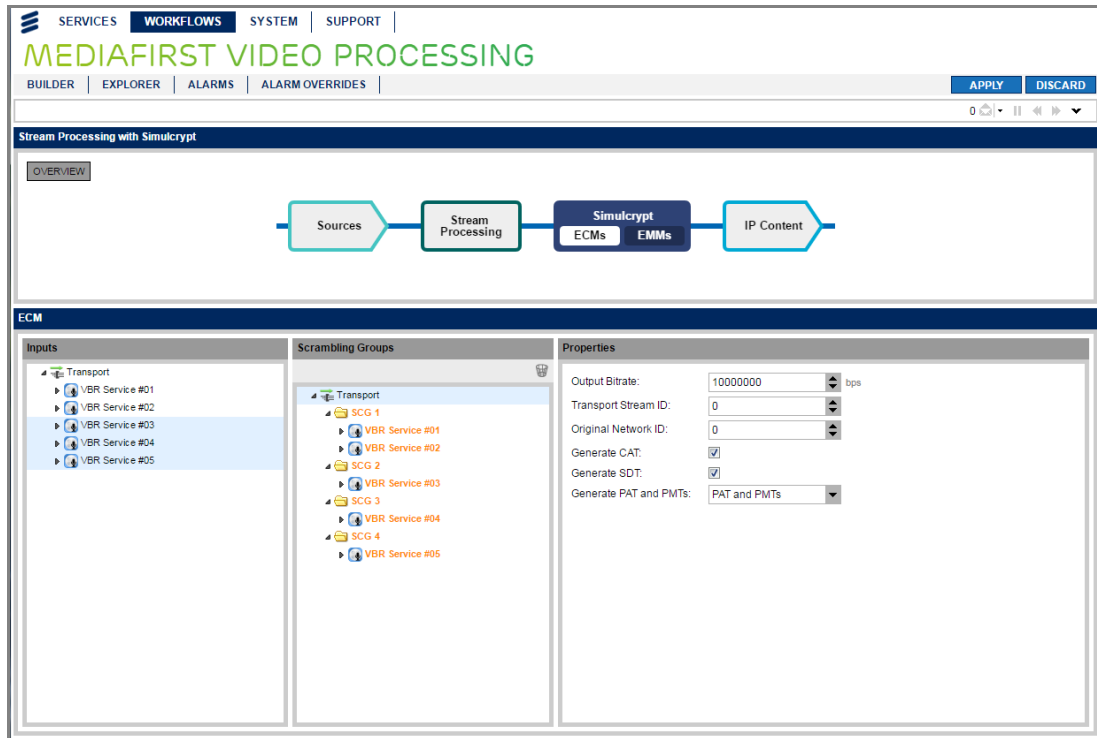


Figure 5.45 Simulcrypt Block (ECMs)

5.3.2.6.1 Inputs

The **Inputs** panel displays the available services that may be encrypted and selected for a Scrambling Group.

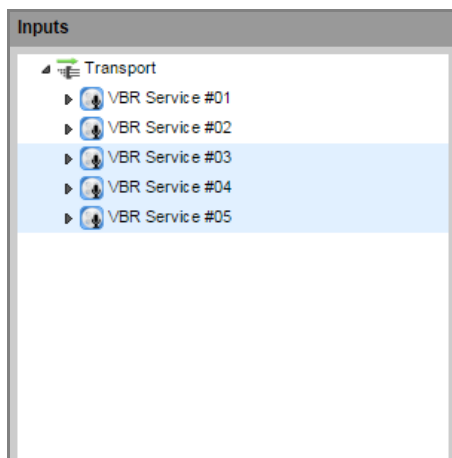


Figure 5.46 Select Input

5.3.2.6.2 Scrambling Groups

The **Scrambling Groups** panel displays the services contained within the defined Scrambling Control Groups (SCG). Each SCG contains a bundle of services, dragged-and-dropped from the **Inputs** panel, to be scrambled at the same time using the same ECMs.

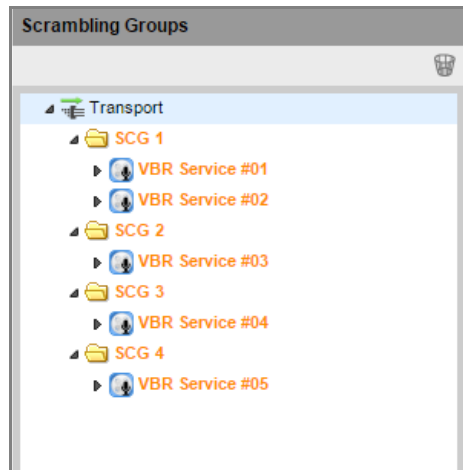


Figure 5.47 Scrambling Groups

5.3.2.6.3 Properties Panel

The **Properties** panel displays the encryption properties of the selected Scrambling Group or Service.



Figure 5.48 Simulcrypt Service Control Group Properties

The **Properties** panel enables selection of encryption properties:

- **Common Scrambling Algorithm (CSA) Version** – A drop-down list enables the selection of the encryption algorithm version.

Encryption Vendor Table

The panel tabulates the information for the encryption vendors in the following columns:

- **Vendor** – Displays the CA vendor Entitlement Control Message Generator (ECMG) name for the encryption algorithm.
- **ECM PID** – Displays the Entitlement Control Message (ECM) packet identifier (PID) for the encrypted stream.
- **Access Criteria** – Displays the free text (hex string) specified by the vendor.
- **PMT Private Data** – Displays the Program Map Table (PMT) specific data specified by the vendor.

5.3.2.7 Simulcrypt Block (EMMs)

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **Simulcrypt** functional block is selected and the **EMMs** sub-block is clicked.

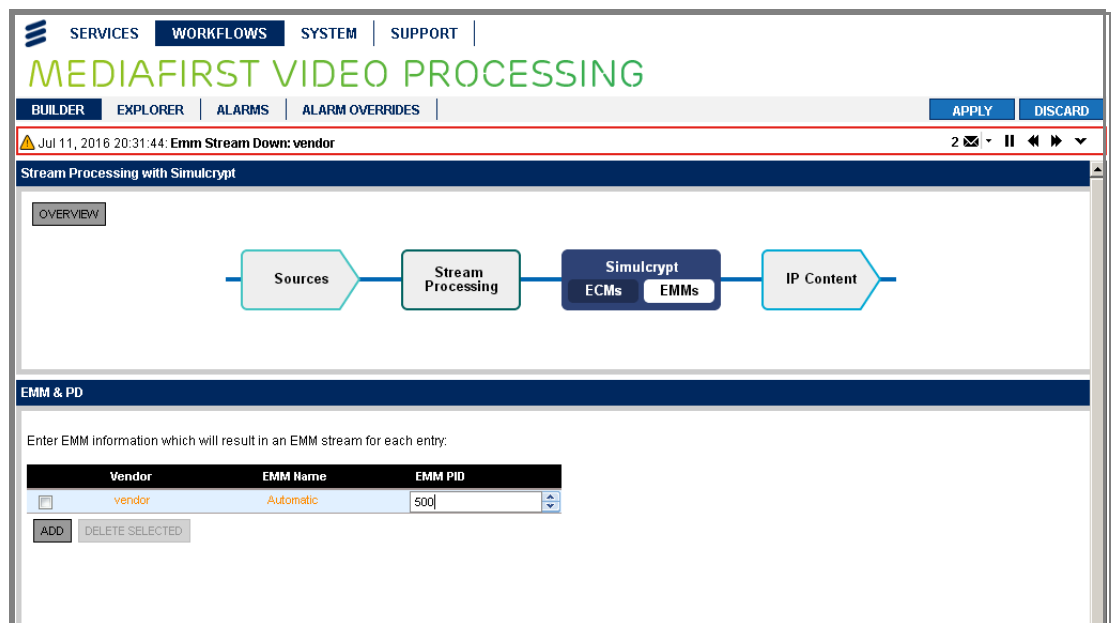
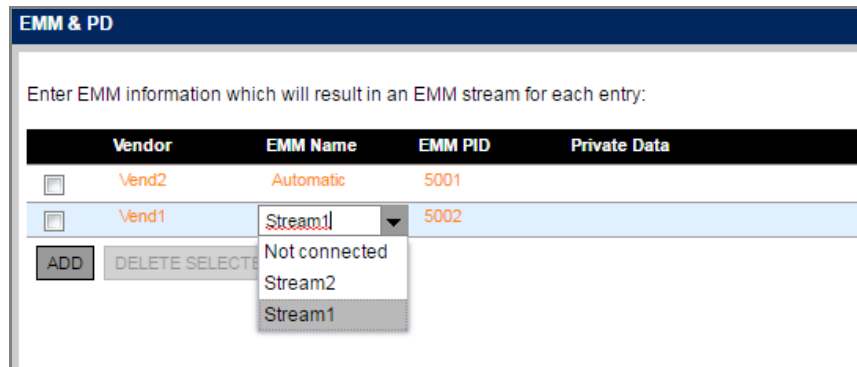


Figure 5.49 Simulcrypt Block (EMMs)

5.3.2.7.1 EMM & PD Widget

The **EMM & PD** widget displays the Entitlement Management Message (EMM) and Private Data (PD) information.



EMM & PD

Enter EMM information which will result in an EMM stream for each entry:

	Vendor	EMM Name	EMM PID	Private Data
<input type="checkbox"/>	Vend2	Automatic	5001	
<input type="checkbox"/>	Vend1	Stream1	5002	

ADD DELETE SELECT

Not connected
Stream2
Stream1

Figure 5.50 EMM Selection

The widget enables selection/editing of EMM properties:

- **Vendor** – Enables selection of the CA vendor Entitlement Management Message Generator (EMMG). Select an EMMG vendor from the list of vendors configured on the system page.
- **EMM Name** – Displays the Entitlement Management Message (EMM) name for the encrypted stream. Choose an EMM for the Vendor you have selected. If the Vendor is configured as Automatic, then “**Automatic**” will be selected.
- **EMM PID** – Enables selection of the Entitlement Management Message (EMM) packet identifier (PID) for the EMM stream.
- **Private data** – Enables selection of the Private Data for the EMM Stream descriptor.

5.3.2.8

IP Content (In) Block

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **IP Content (In)** functional block is selected.

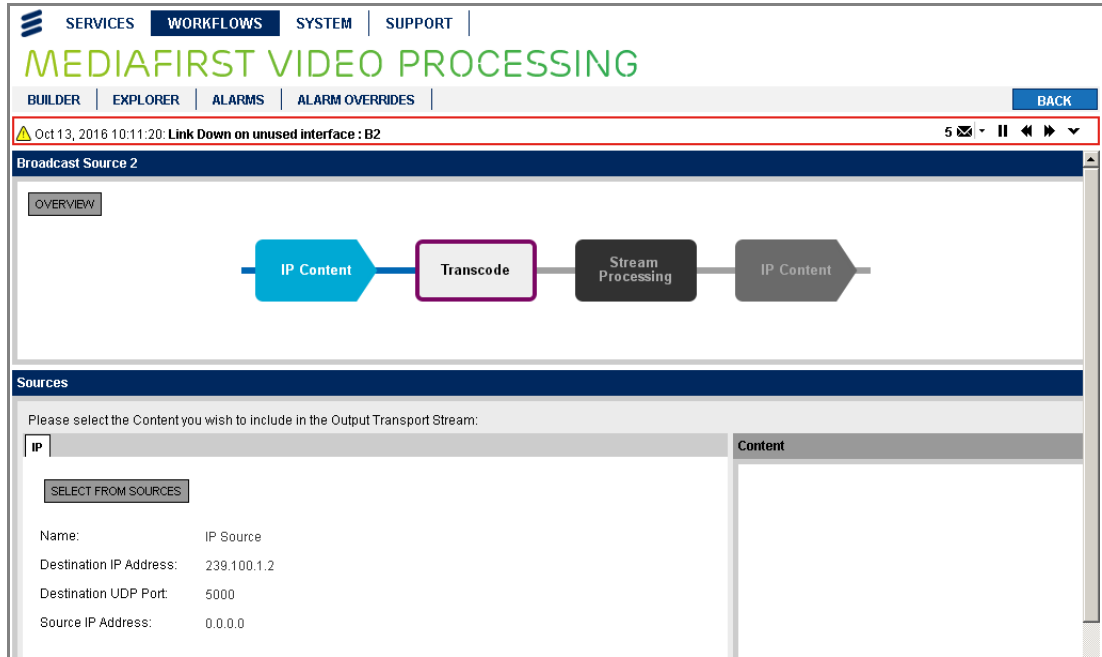


Figure 5.51 IP Content (In)

5.3.2.8.1

IP Tab

The **IP** tab displays any available Internet Protocol (IP) Sources for inclusion in the Multiscreen Workflow.

If an IP Source is not displayed here, the **SELECT FROM SOURCES** button enables selection from another screen.

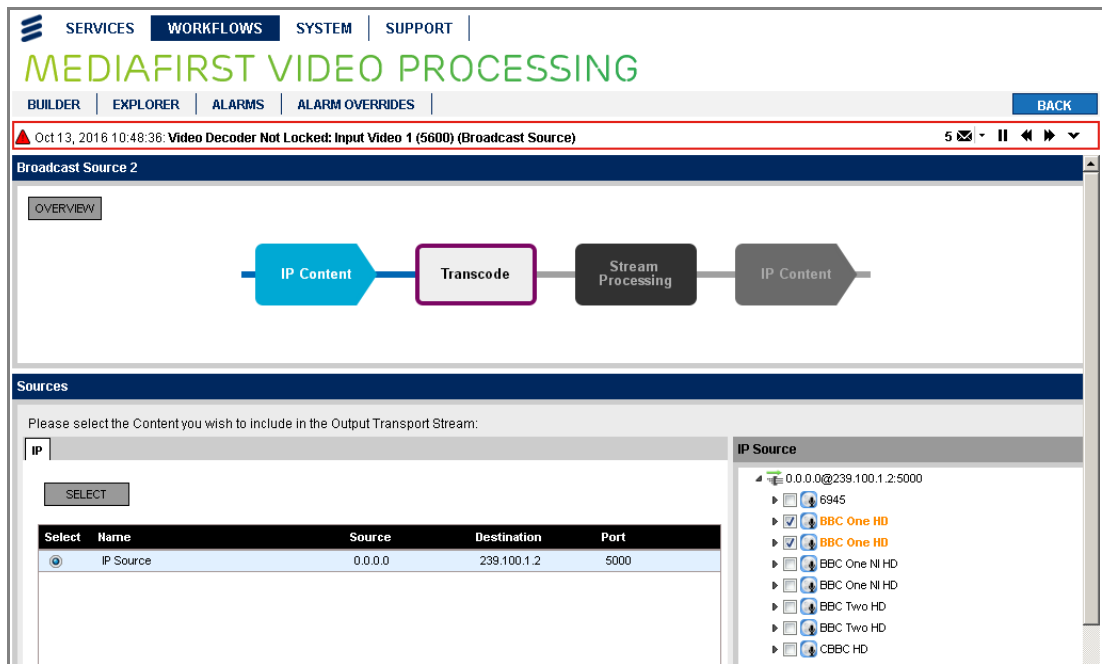


Figure 5.52 IP Content (In) – IP Tab

5.3.2.9 Transcode Block (Filter)

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **Transcode** functional block is selected and the **Filter** sub-block is clicked.

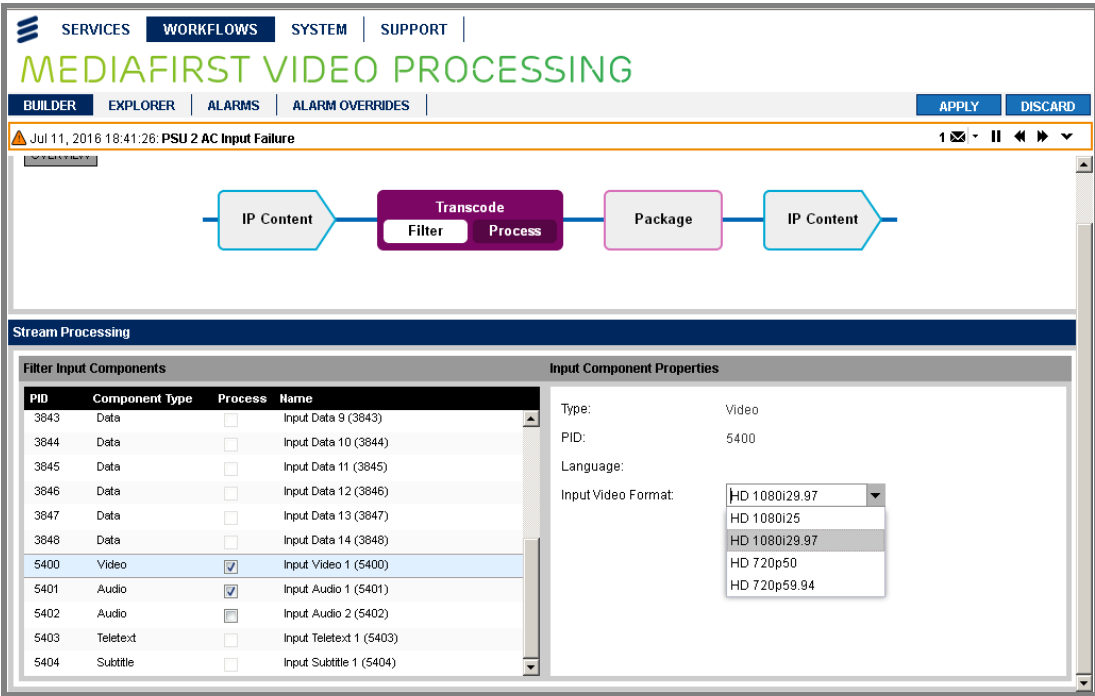


Figure 5.53 Transcode Block (Filter)

5.3.2.9.1 Filter Input Component Properties

Video, audio and data components from the configured source are listed on the left-hand side of the screen. They can be selected or deselected for processing by placing a check mark in the **Process** check box. Properties for the selected component are shown on the right-hand side of the screen.

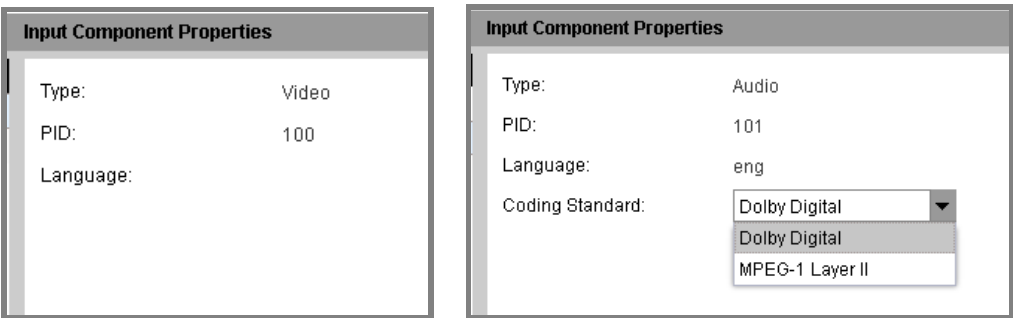


Figure 5.54 Transcode Filter - Video and Audio Properties

5.3.2.10 Transcode Block (Process)

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **Transcode** functional block is selected and the **Process** sub-block is clicked.

'Fewer Properties' are displayed by default in the **Stream Processing** widget. For more settings, click on **More Properties** on the right-hand side of the widget. These are shown in 5.3.2.11 *Transcode Block (Process) - More Properties*.

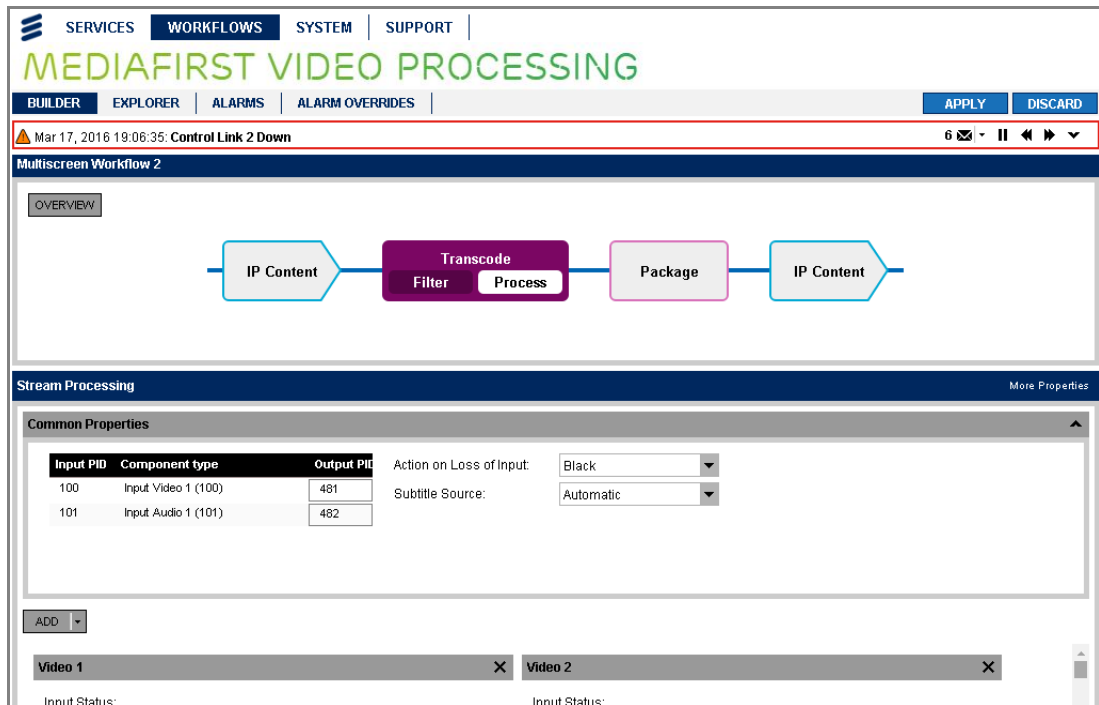


Figure 5.55 Transcode Block (Filter)

5.3.2.10.1 Common Properties Panel

The **Common Properties** accordion panel displays properties common to all the components (video, audio and data) that are detailed in the panels below. The panel enables selection and modifying of properties:

- **Output PID** – Sets the output Packet Identifier. Type the required PID directly into the field.
- **Action on Loss of Input** – Sets the automatic action to be taken when the input source has been lost. Select from the drop-down menu.
- **Subtitle Source** – Sets the source of subtitles to be used with the component. Select from the drop-down menu.

5.3.2.10.2 Add Button

The **ADD** button enables you to add video, audio and data components for transcoding in a Multiscreen Workflow.

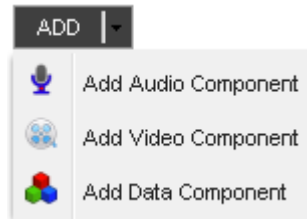


Figure 5.56 Add Component Menu

5.3.2.10.3 Video Panels

Eight **Video** components for transcoding/ABR use are automatically created (and numbered) when a Multiscreen Workflow is created. These are pre-populated with (resolution and bit rate) settings useful for providing a typical range of ABR applications. Settings can be modified and customized for individual use, and video components may be deleted or added (up to a maximum of 10).

Note: If the transcoding demands placed on the unit are too great, one or more **Invalid configuration parameter** warnings will be displayed on the Alarm Newsfeed and you will not be able to **Apply** the configuration. To remove these warnings and restore operation you must reduce the overloading by selecting lesser values for **MPEG-4 AVC Profile Level**, **Output Frame Rate** and /or **Output Resolution**. Only valid frame rates are displayed determined by the **Filter** selection made previously.

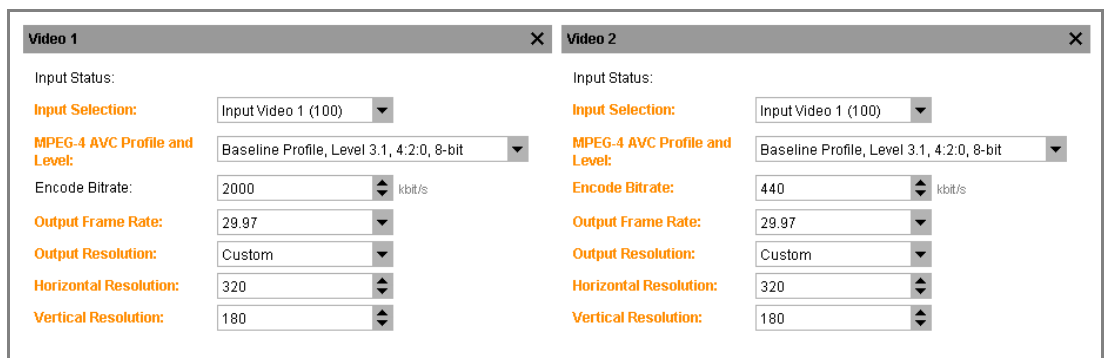


Figure 5.57 Video Component Settings

Each video component panel enables selection and modifying of properties:

- **Input Status** – Displays the status of the video input.
- **Input Selection** – Selects the required video input component. Select an option from the drop-down list.
- **MPEG-4 AVC Profile and Level** – Sets the MPEG-4 Advanced Video Coding profile and level. Select an option from the drop-down list.

- **Encode Bitrate** – Sets the encode bit rate. Use the up/down arrow buttons to modify the setting (in kbps).
- **Output Frame Rate** – Sets the output frame rate. Select an option from the drop-down list.
- **Output Resolution** – Sets the output resolution. Select an option from the drop-down list or select **Custom** to configure your own.
- **Horizontal Resolution** – Sets the horizontal screen resolution. Select an option from the drop-down list.
- **Vertical Resolution** – Sets the vertical screen resolution. Select an option from the drop-down list.

5.3.2.10.4

Audio Panels

One **Audio** component for transcoding/ABR use is automatically created (and numbered) when a Multiscreen Workflow is created. This is pre-populated with (resolution and bit rate) settings useful for providing a typical range of ABR applications. Settings can be modified and customized for individual use, and audio components may be deleted or added (up to a maximum of 16).

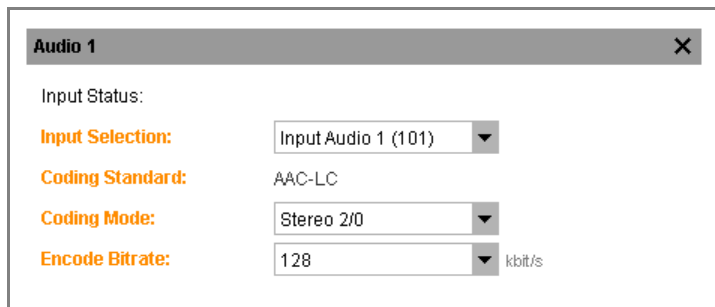


Figure 5.58 Audio Component Settings

Each audio component panel enables selection and modifying of properties:

- **Input Status** – Displays the status of the audio input.
- **Input Selection** – Selects the required audio input component. Select an option from the drop-down list.
- **Coding Standard** – Displays the audio coding standard to be used.
- **Coding Mode** – Sets audio coding mode to be used.
- **Encode Bitrate** – Sets the encode bit rate. Use the up/down arrow buttons to modify the setting (in kbps).

5.3.2.10.5 Data (SCTE-35) Panels

One **SCTE-35** component for transcoding/ABR use is automatically created (and numbered) when a Multiscreen Workflow is created. Settings can be modified and customized for individual use, and data components may be deleted or added (up to a maximum of 1).

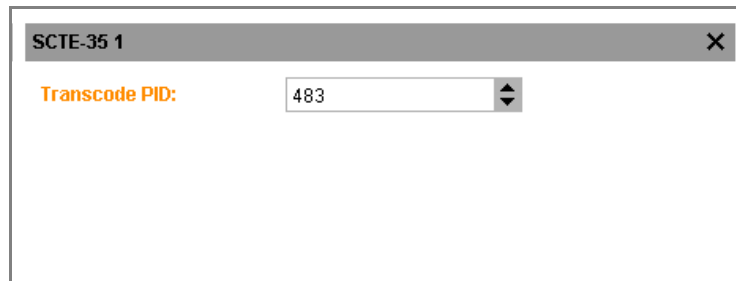


Figure 5.59 Data (SCTE-35) Component Settings

Each data component panel enables selection and modifying of properties:

- **Transcode PID** – Sets the Packet Identifier for the data component.

5.3.2.11 Transcode Block (Process) - More Properties

'Fewer Properties' are displayed by default in the **Stream Processing** widget. For a simplified range of settings, click on **Fewer Properties** on the right-hand side of the widget. These are shown in section 5.3.2.10 *Transcode Block (Process)*.

5.3.2.11.1 Video Tab

With **More Properties** selected on the **Stream Processing** widget, components for transcoding are displayed as separate tabs.

Stream Processing

Video 1
Audio 1

Processing Node: Device 0, Core 1

Coding Standard: MPEG-4 AVC

MPEG-4 AVC Profile and Level: High Profile, Level 4.0, 4:2:0, 8-bit ▼

Bitrate: 2000 kbit/s

Output Resolution: 1920 x 1080

Horizontal Resolution: 640

Vertical Resolution: 360

Preprocessing

Input Source: Transport Stream Component ▼

Adaptive Pre-processing Filter: ☐

Horizontal Bandwidth Filter: 100% ▼

Encoder Processing

In-Loop Deblocking Filter: Auto ▼

GOP

Nominal GOP Length: 24

GOP Structure Mode: Flexible ▼

Closed GOP: Off

Sub GOP Structure: Auto Fixed ▼

Closed Captions

Closed Captions Output Format: ATSC A/53 ▼

Reflex

Reflex: ☐ Off ☒ On

Reflex Group: Reflex Group 4 ▼

Figure 5.60 Video Component Settings - More Properties

Each video component panel enables selection and modification of properties:

- **Coding Standard** – Displays the coding standard to be used.
- **MPEG-4 AVC Profile and Level** – Sets the MPEG-4 Advanced Video Coding profile and level. Select an option from the drop-down list.
- **Bitrate** – Sets the encode bit rate. (in kbps).
- **Output Resolution** – Sets the output resolution. Select an option from the drop-down list or select **Custom** to configure your own.



- **Horizontal Resolution** – Sets the horizontal screen resolution.
- **Vertical Resolution** – Sets the vertical screen resolution.

Preprocessing

- **Input Source** – Sets the pre-processing input source for the component. Select an option from the drop-down list.
- **Adaptive Pre-processing Filter** – Sets the Adaptive Pre-Processing Filter (APF) aims to soften the image where motion is likely to be dominant in some parts of the scene.
- **Horizontal Bandwidth Filter** – Controls the horizontal bandwidth filter. 100% corresponds to no reduction in bandwidth.

Encoder Processing

- **In-Loop Deblocking Filter** – Sets the encoding loop deblocking filter to control the sharpness at the expense of macro-blockiness.

GOP

- **Nominal GOP Length** – Defines the nominal duration of a GOP, in frames, output by the encoder. Note that for the Capped GOP Structure mode this is the maximum GOP length. For the Flexible GOP structure, it is the 'normal' GOP length in the absence of scene transitions. Not applicable for ABR.
- **GOP Structure Mode** – Sets the GOP Structure Mode to one of the following options:
 - **Flexible** – The GOP length will normally be set at the specified nominal GOP length but may be foreshortened or extended by the action of the underlying algorithms.
 - **Capped** – The GOP length cannot exceed the specified nominal GOP length but may be foreshortened by the underlying encoder algorithm.
 - **Fixed** – The GOP length is fixed at a specified number of frames and will not be extended or foreshortened by any mechanisms other than Splicing.
- **Closed GOPs** – Set the GOP to closed GOPs, available when the GOP Structure Mode is set to Fixed.
- **Sub GOP Structure** – Sets the number of B frames between reference frames.
- **Closed Captions**
- **Closed Captions Output Format** – Sets the output format for closed captions used with the video component. Select an option from the drop-down list.

Reflex

- **Reflex** – Off/On. This is not the recommended way of enabling reflex; we recommend to set the Reflex Group as part of the **SYSTEM > REFLEX** page.

- **Reflex Group** – Assigns the video Component to a Reflex Group. This is not the recommended way of enabling reflex; we recommend to set the Reflex Group as part of the **SYSTEM > REFLEX** page.

5.3.2.11.2

Audio Tab

With **More Properties** selected on the **Stream Processing** widget, components for transcoding are displayed as separate tabs.



The screenshot displays the 'Audio 1' tab within the 'Stream Processing' interface. The settings are organized into several sections:

- Processing Node:** DSP 0, Core 1
- Output Coding Standard:** AAC-LC
- Coding Mode:** Stereo 2/0
- Bitrate:** 128 kbps
- Language:**
 - Language Descriptor: Follow Input
 - ISO-639-2 Language Code: English (eng)
 - User Defined Language Code: eng
- Input:**
 - Input Source: Transport Stream Component
 - Input Selection: Input Audio 1 (5401)
 - Input Coding Standard: Dolby Digital
 - Audio Gain Adjustment: 0 dB
- Signal Adjustment:**
 - AAC Encapsulation: ☒ MPEG-2 ADTS, ☐ MPEG-4 LATM / LOAS
 - Temporal Noise Shaping (TNS): ☐
- Lip Synchronization:**
 - Lip Sync Adjustment: 0 ms
- Audio Loudness Control (ALC):**
 - ALC Preset: Standard
 - ALC Measurement: ☒
 - Short Term Loudness Control:**
 - ALC Short Term Loudness Control: ☐
 - ALC Target Level: -23 LUFS (LUFS)
 - ALC Maximum Attenuation: 10 dB
 - ALC Peak Limit: -10 dBFS
 - Long Term Loudness Control:**
 - ALC Long Term Loudness Control: ☐
 - ALC Time Period: 1 minutes
 - ALC Maximum Gain: 10 dB
 - ALC Dynamic Range Control Mode: Line Out Mode -31 dBFS
 - ALC Override Dolby Digital E-Stream Metadata: ☐
- Dolby Digital:**
 - Dolby Metadata Override: None
 - Dolby Metadata Override Preset: Preset 1
 - Dolby Metadata Reversion Mode: ☒ Last Used, ☐ Preset
 - Dolby Digital Descriptor Syntax: DVB
- Downmix:**
 - Downmix User-Defined Properties:**
 - Downmix Type: ☒ LoRo, ☐ LtRt
 - Center Mix Level: ☒ 0.707 (-3.0 dB), ☐ 0.595 (-4.5 dB), ☐ 0.500 (-6.0 dB)
 - Surround Mix Level: ☒ 0.707 (-3.0 dB), ☐ 0.500 (-6.0 dB), ☐ 0 (-inf dB)
 - Downmix Metadata Overrides:**
 - Override Downmix Type: Off
 - Override Downmix Mix Levels: Off
 - Reversion Mode: ☐ Always Use User-Defined, ☒ Prioritise last received from Metadata in preference to User-Defined

Figure 5.61 Audio Component Settings - More Properties

Each audio component panel enables selection and modifying of properties:

- **Transcode PID** – Sets the transcode Packet Identifier for the component.



- **Output Coding Standard** – Displays the output coding standard to be used.
- **Coding Mode** – Sets the audio coding mode. Select an option from the drop-down list.
- **Bitrate** – Sets the encode bit rate. Use the up/down arrow buttons to modify the setting (in kbps).

Language

- **Language Descriptor** – Sets the language descriptor to be used. Select an option from the drop-down list.
- **ISO-639-2 Language Code** – Displays the language code to be used
- **User Defined Language Code** – Displays the language code defined from the audio component.

Input

- **Input Source** – Sets the input source for the transcoded audio component. Select an option from the drop-down list.
- **Input Coding Standard** – Sets the input coding standard to be used for the audio component. Select an option from the drop-down list.
- **Audio Gain Adjustment** – Sets the gain adjustment (in dB) for the transcoded audio component. Use the up/down arrow buttons to modify the setting.

Signal Adjustment (Only applicable when the Output Coding Standard is set to AAC-LC or HE-AAC)

- **AAC Encapsulation** – Sets the Advanced Audio Coding encapsulation format. Select an option from the drop-down list.
- **Temporal Noise Shaping (TNS)** – Enables temporal noise shaping, by placing a check mark in the checkbox.

Lip Synchronisation

- **Lip Sync Adjustment** – Sets the lip synchronization adjustment (in ms). Use the up/down arrow buttons to modify the setting.

Audio Loudness Control (ALC)

- **ALC Preset** – Displays the Audio Loudness Control preset.

ALC Measurement

- **ALC Loudness Measurement** – Enables Audio Loudness Control measurement, by placing a check mark in the checkbox.

Short Term Loudness Control

- **ALC Short Term Loudness Control** – Displays whether short-term Audio Loudness Control is used.
- **ALC Target Level** – Displays the Automatic Loudness Control target level (in LKFS/LUFS).
- **ALC Maximum Attenuation** – Displays the Audio Loudness Control maximum attenuation (in dB).
- **ALC Peak Limit** – Displays the Audio Loudness Control peak limit (in dBFS).

Long Term Loudness Control

- **ALC Long Term Loudness Control** – Displays whether short-term Audio Loudness Control is used.
- **ALC Time Period** – Displays the Automatic Loudness Control time period (in minutes).
- **ALC Maximum Gain** – Displays the Audio Loudness Control gain (in dB).
- **ALC Override Dolby Digital Dialnorm Metadata** – Displays whether Dolby Digital Dialnorm metadata is overridden.

Dolby Digital (Only applicable when the Output Coding Standard is set to Dolby Digital or Dolby Digital Plus)

- **Dolby Metadata Override** – Controls the overriding of incoming live Dolby metadata parameters with those in the preset (metadata override mode).

Table 5.2 *Dolby Metadata Override Properties*

Dolby Metadata Override	Action
None	Do not override any live metadata parameters.
All	Override all live metadata parameters with those in the preset.
Comp Profile	Override only the line mode compression profile and RF mode compression profile parameters in the live metadata with those in the preset.
Dial Norm	Override the dialogue normalization parameter in the live metadata with the parameter in the preset.
Comp Profile & Dial Norm	Override the line mode compression profile, RF mode compression profile and dialogue normalization parameters in the live metadata with those in the preset.

- **Dolby Metadata Override Preset** – Sets the metadata preset to be used when the metadata override mode is configured to use an override. The metadata presets are set in the **SYSTEM > DOLBY DIGITAL PRESETS** page.
- **Dolby Metadata Reversion Mode** – control the encoder behavior on loss of live metadata (metadata reversion mode).
- **Dolby Digital Descriptor Syntax** – Sets the Output Descriptor Syntax to DVB, ATSC or DVB & ATSC

Downmix User-defined Properties

- **Downmix Type** – Enables selection of downmix type (Lo/Ro or Lt/Rt).
- **Center Mix Level** – Enables selection of center mix level (0.707, 0.595 or 0.500).
- **Surround Mix Level** – Enables surround mix level (0.707, 0.500 or 0).

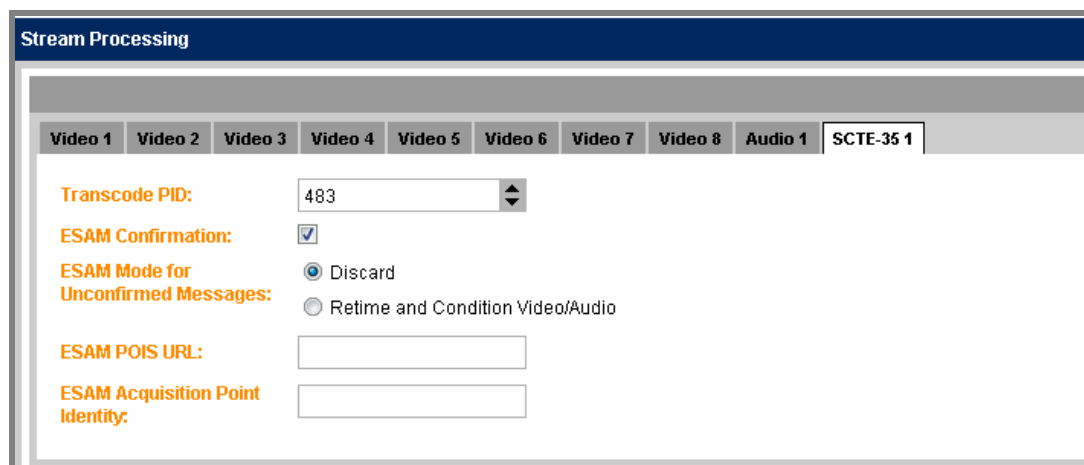
Downmix Metadata Overrides

- **Override Downmix Type** – Sets override downmix type. Select an option from the drop-down list.
- **Override Downmix Mix Levels** – Sets override downmix mix level. Select an option from the drop-down list.
- **Reversion Mode** – Enables selection of reversion mode (Always Use User-Defined or Prioritise last received from Metadata in preference to User-Defined).

5.3.2.11.3

Data (SCTE-35) Tab

With **More Properties** selected on the **Stream Processing** widget, components for transcoding are displayed as separate tabs.



The screenshot shows the 'Stream Processing' widget with the 'Data (SCTE-35)' tab selected. The tab is part of a series of tabs including Video 1 through Video 8, Audio 1, and SCTE-35 1. The settings for the selected tab are as follows:

- Transcode PID:** 483
- ESAM Confirmation:** ☒
- ESAM Mode for Unconfirmed Messages:** ☒ Discard, ☐ Retime and Condition Video/Audio
- ESAM POIS URL:**
- ESAM Acquisition Point Identity:**

Figure 5.62 Data (SCTE-35) Component Settings - More Properties

Each video component panel enables selection and modifying of properties:

- **Transcode PID** – Sets the transcode Packet Identifier for the component.

- **ESAM Confirmation** – Enables Event Signalling and Management , by placing a check mark in the checkbox.
- **ESAM Mode for Unconfirmed Messages** – Enables selection of the action to take when unconfirmed messages are received (Discard or Retime and Condition Video/Audio).
- **ESAM POIS URL** – Sets the URL to be used for the Event Signalling and Management Placement Opportunity Information Server. Type the URL into the blank field.
- **ESAM Acquisition Point Identity** – Sets the URL to be used for the Event Signaling and Management acquisition point identity. Type the URL into the blank field.

5.3.2.12 Package Block

When editing a Multiscreen Workflow configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **Package** functional block is selected.

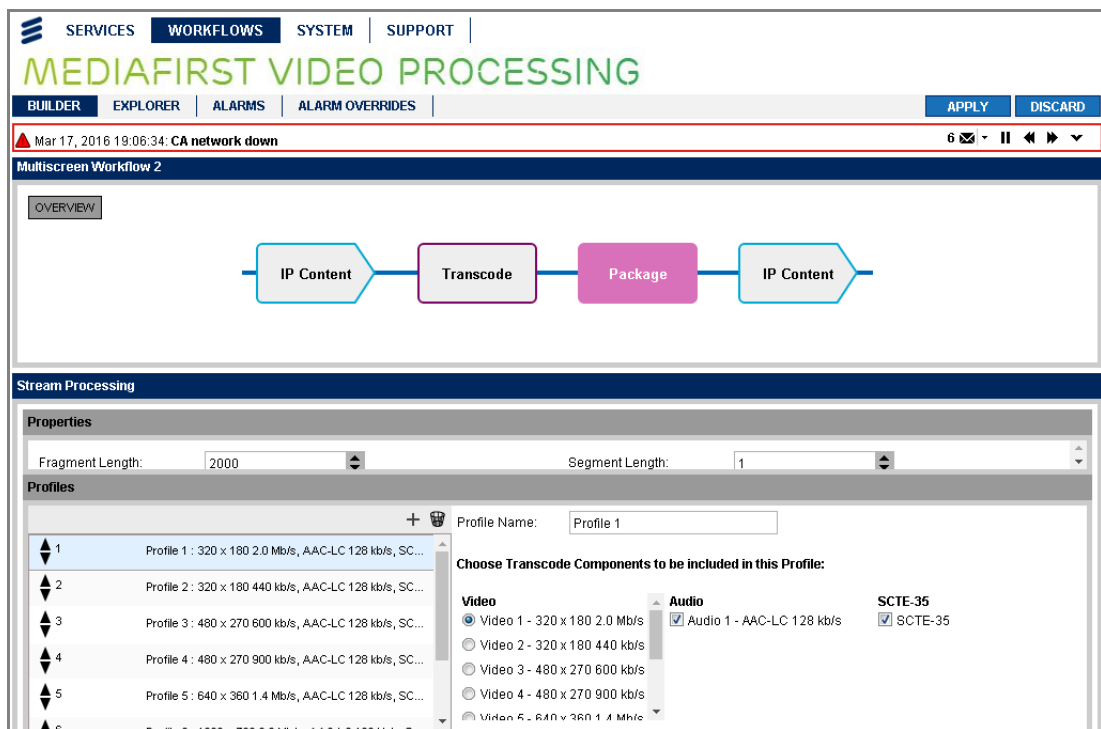


Figure 5.63 Package Block

5.3.2.12.1 Properties Panel

The **Properties** panel enables selection and modifying of general properties:

- **Fragment Length** – Sets the fragment length of the transcoded package. Use the up/down arrow buttons to increment/decrement the displayed value.

- **Segment Length** – Sets the segment length of the transcoded package. Use the up/down arrow buttons to increment/decrement the displayed value.

5.3.2.12.2

Profiles Panel

The **Profiles** panel displays the profiles created for each video (this will take a few seconds to generate and display). A separate profile is automatically created for each of the video components created using the **Transcode** function, see section 5.3.2.10.3.

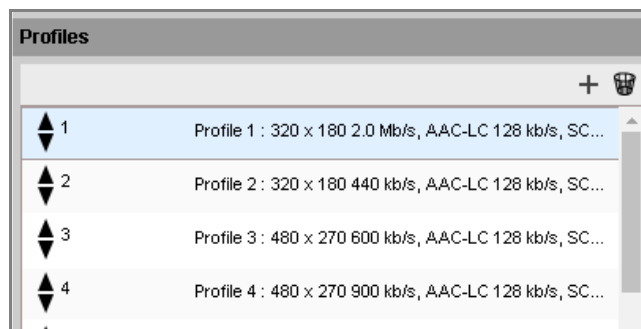




Figure 5.64 Transcoded Profiles

The following icons are provided:

- The plus icon  enables new profiles to be created and added to the list.
- The wastebasket icon  enables selected profiles to be deleted from the list. A confirmation dialog will be displayed.

Details of the selected profile are shown on the right-hand side of this screen, which may be modified to change the name of the profile and select the transcode components to be included in the profile.

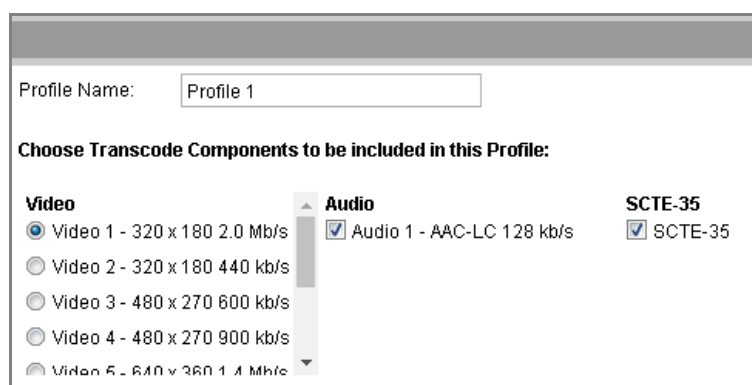


Figure 5.65 Transcoded Profiles

5.3.2.13 IP Content (Out) Block

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **IP Content (Out)** functional block is selected.

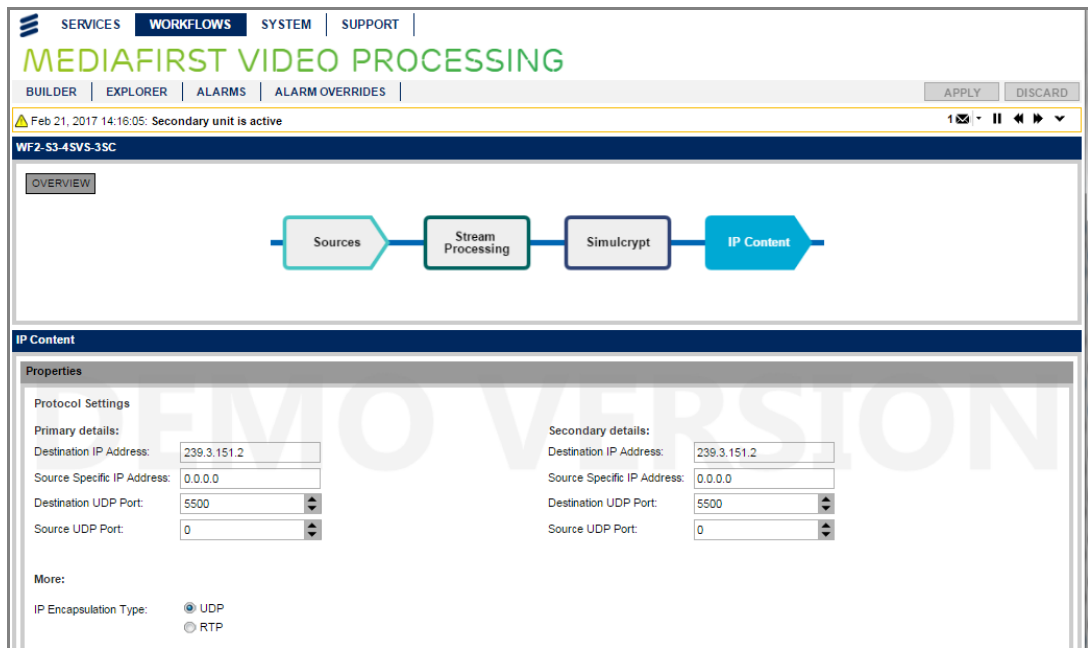


Figure 5.66 IP Content (Out)

5.3.2.13.1 Properties Panel

The **Properties** panel displays the IP Content properties of the selected output stream. The properties displayed will depend on the type of workflow selected.

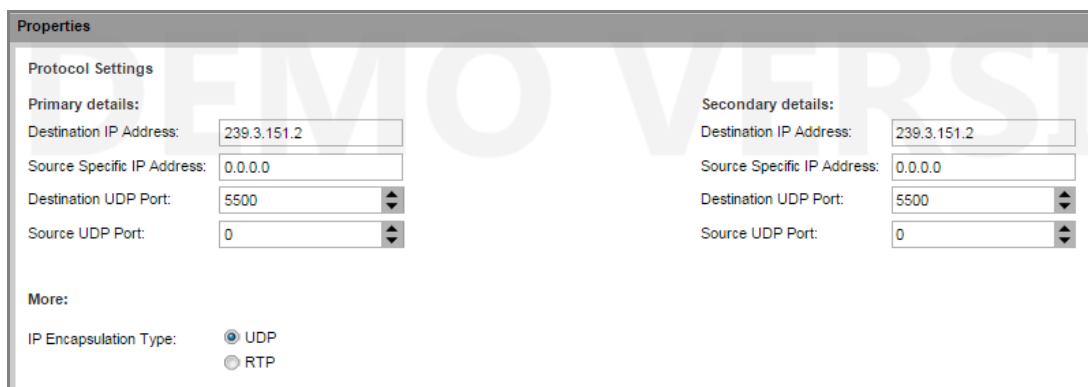


Figure 5.67 IP Content (Out) Properties

The panel enables selection of IP Content properties for the primary and secondary:

- **Destination IP Address** – Sets the destination IP address. Type the IP address directly into the field.

- **Source Specific IP Address** – Sets the source specific IP address. Type the IP address directly into the field.
- **Destination UDP Port** – Sets the destination UDP port number. Type the port number directly into the field or use the increment/decrement arrows.
- **Source Specific IP Address** – Sets the source specific UDP port. Type the port number directly into the field or use the increment/decrement arrows.
- **IP Encapsulation Type** – Sets the IP network protocol. Select either UDP (User Datagram Protocol) or RTP (Real-time Transport Protocol).

5.3.2.14

ASI Content Block

When editing a configuration using the **WORKFLOWS > EXPLORER** tab page (or creating a new one using **WORKFLOW > BUILDER**), the following screen is displayed when the **ASI Content** functional block is selected.

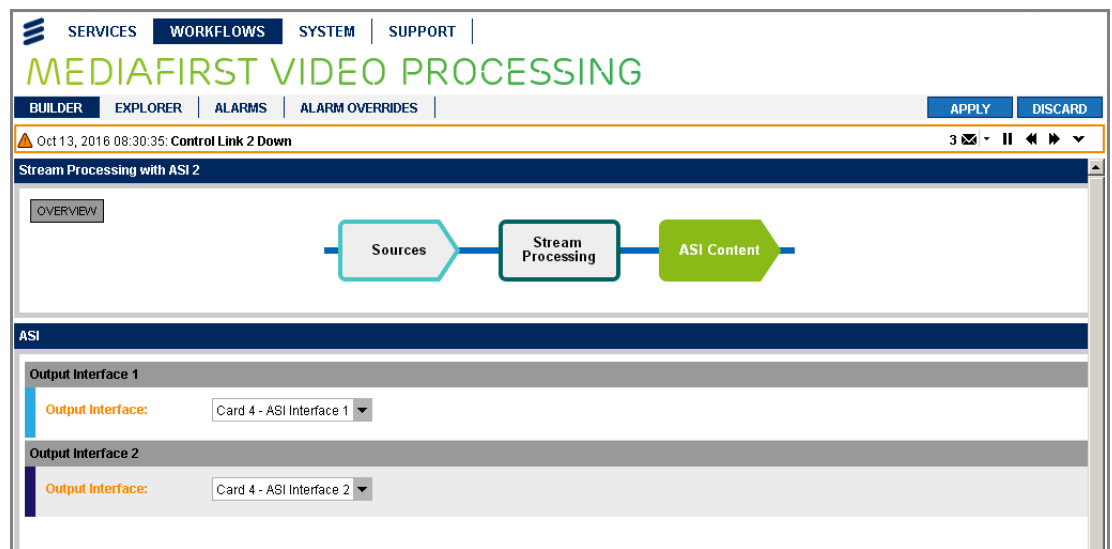


Figure 5.68 ASI Content

5.3.2.14.1

ASI Widget

The Output Interfaces are selectable via a drop-down list from each of the installed option cards.

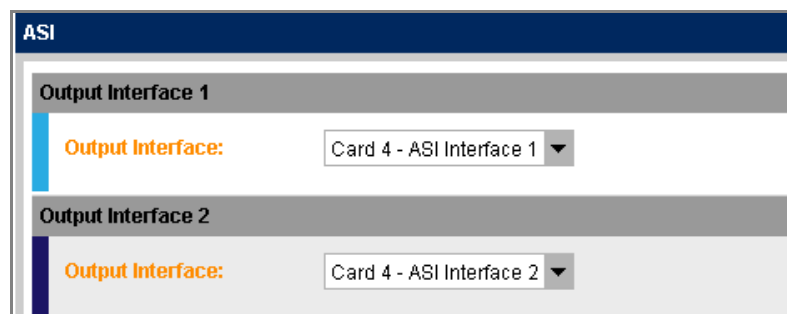


Figure 5.69 ASI Widget

5.3.3 WORKFLOWS > ALARMS Page

The **ALARMS** tab page provides status information about the operation of the unit and provides access to the **Active Alarms** or **Alarm History**.

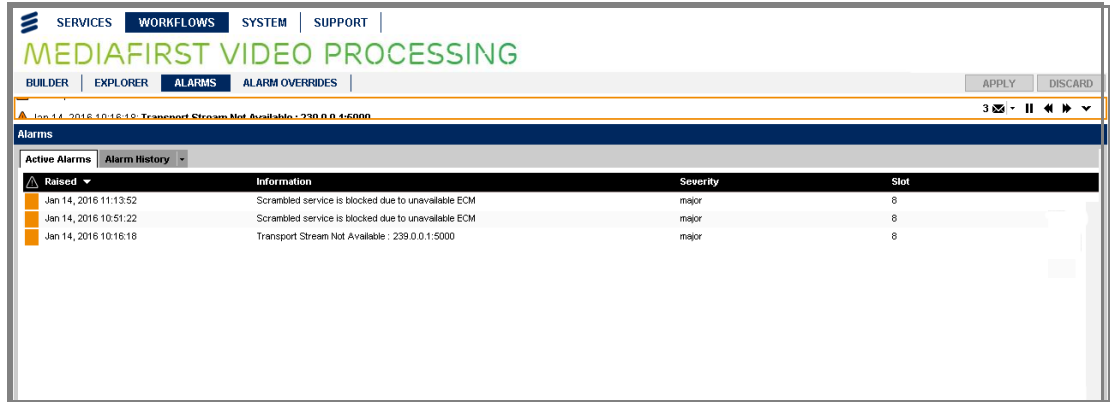
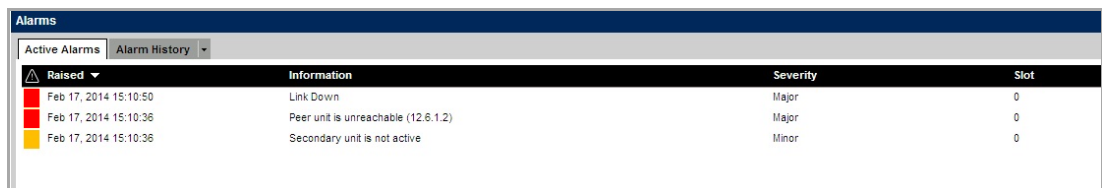


Figure 5.70 WORKFLOWS > ALARMS Page

5.3.3.1 Active Alarms Panel

All current active alarms are listed, including information about the date and time the alarm was raised, an alarm description, the severity of the alarm and which card slots are affected by it.



The screenshot shows the 'Active Alarms' panel with a table of active alarms. The table has columns: Raised, Information, Severity, and Slot. It contains three entries, all with a severity of 'Major' or 'Minor' and affecting slot 0.

Raised	Information	Severity	Slot
Feb 17, 2014 15:10:50	Link Down	Major	0
Feb 17, 2014 15:10:36	Peer unit is unreachable (12.6.1.2)	Major	0
Feb 17, 2014 15:10:36	Secondary unit is not active	Minor	0

Figure 5.71 Active Alarms Panel

The panel tabulates the information in the following columns:

- **Symbol** – Displays a colored symbol identifying the severity of the alarm message:
 - **Red** – Critical alarm.
 - **Dark Orange** – Major alarm.
 - **Light Orange** – Minor alarm.
 - **Yellow** – Warning message.
 - **Green** – Information message.
- **Raised** – Displays the month, day, year, and time (hh:mm:ss) that the alarm was detected.
- **Information** – Displays a description of the alarm message.
- **Severity** – Displays the severity of the alarm:

- **Critical** – critical error condition that may affect unit operation (Red).
 - **Major** – serious error condition (Dark Orange).
 - **Minor** – significant error condition (Light Orange).
 - **Warning** – warning condition (Yellow).
 - **Informational** – information only message (Green).
- **Slot** – Displays the slot (Card) number associated with the alarm.

5.3.3.2

Alarm History Panel

A detailed record of previous alarms are listed, including information about the date and time the alarm was raised, an alarm description, the severity of the alarm and which card slots are affected by it.

Alarms				
Active Alarms Alarm History				
Raised	Cleared	Information	Severity	Slot
Feb 17, 2014 15:11:08	Feb 17, 2014 15:11:08	TS Missing on Input	major	0
Feb 17, 2014 15:10:53	Feb 17, 2014 15:11:07	No TS Lock on L-Band Input	critical	1
Feb 17, 2014 15:10:50		Link Down	major	0
Feb 17, 2014 15:10:48	Feb 17, 2014 15:10:52	Build Version Mismatch: Slot 1	minor	0
Feb 17, 2014 15:10:36		Peer unit is unreachable (12.6.1.2)	major	0
Feb 17, 2014 15:10:36		Secondary unit is not active	minor	0
Feb 17, 2014 15:10:36	Feb 17, 2014 15:10:50	Link Down	major	0
Feb 17, 2014 15:10:36	Feb 17, 2014 15:10:39	Link Down	major	0
Feb 17, 2014 15:10:36	Feb 17, 2014 15:10:39	Link Down	major	0
Feb 17, 2014 15:10:36	Feb 17, 2014 15:10:39	Link Down	major	0
Feb 17, 2014 15:10:35	Feb 17, 2014 15:10:39	Link 1 of control network down	warning	0
Feb 17, 2014 14:39:08	Feb 17, 2014 14:39:23	Link Down	major	0

Figure 5.72 Alarm History Panel

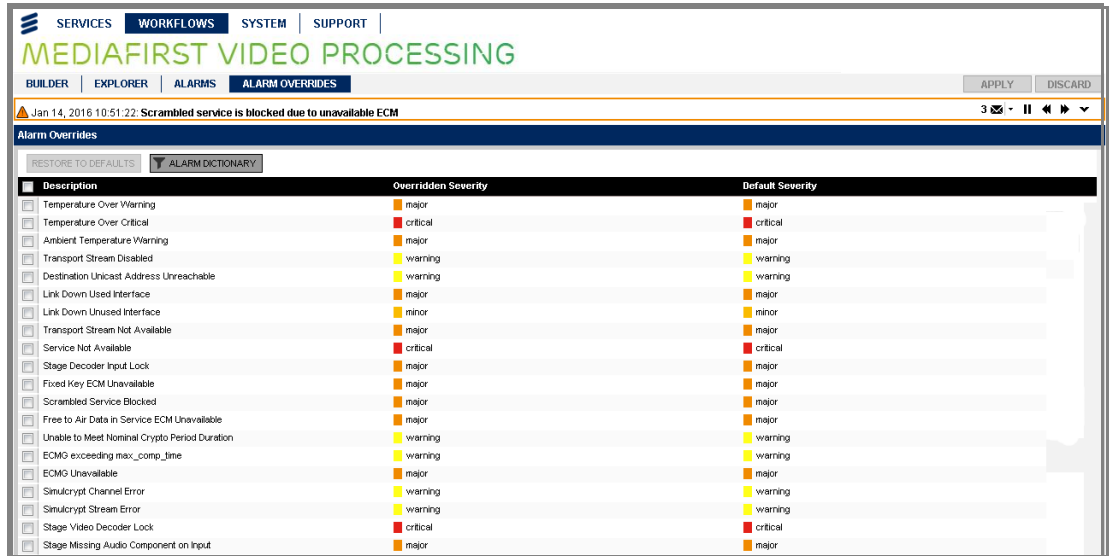
The panel tabulates the information in the following columns:

- **Raised** – Displays the month, date, year and time (hh:mm:ss) that the alarm was detected.
- **Cleared** – Displays the month, date, year and time (hh:mm:ss) that the alarm condition was resolved.
- **Information** – Displays a description of the alarm message.
- **Severity** – Displays the severity of the alarm message.
- **Slot** – Displays the associated slot number, if relevant.

5.3.4

WORKFLOWS > ALARM OVERRIDES Page

The **ALARM OVERRIDES** tab page provides the facility to mask alarms or to modify their severity. All possible alarms are listed, along with their current and default severity settings.



Description	Overridden Severity	Default Severity
<input type="checkbox"/> Temperature Over Warning	major	major
<input type="checkbox"/> Temperature Over Critical	critical	critical
<input type="checkbox"/> Ambient Temperature Warning	major	major
<input type="checkbox"/> Transport Stream Disabled	warning	warning
<input type="checkbox"/> Destination Unicast Address Unreachable	warning	warning
<input type="checkbox"/> Link Down Used Interface	major	major
<input type="checkbox"/> Link Down Unused Interface	minor	minor
<input type="checkbox"/> Transport Stream Not Available	major	major
<input type="checkbox"/> Service Not Available	critical	critical
<input type="checkbox"/> Stage Decoder Input Lock	major	major
<input type="checkbox"/> Fixed Key ECM Unavailable	major	major
<input type="checkbox"/> Scrambled Service Blocked	major	major
<input type="checkbox"/> Free to Air Data in Service ECM Unavailable	major	major
<input type="checkbox"/> Unable to Meet Nominal Crypto Period Duration	warning	warning
<input type="checkbox"/> ECMG exceeding max_comp_time	warning	warning
<input type="checkbox"/> ECMG Unavailable	major	major
<input type="checkbox"/> Simulcrypt Channel Error	warning	warning
<input type="checkbox"/> Simulcrypt Stream Error	warning	warning
<input type="checkbox"/> Stage Video Decoder Lock	critical	critical
<input type="checkbox"/> Stage Missing Audio Component on Input	major	major

Figure 5.73 WORKFLOWS > ALARMS OVERRIDES Page

A menu is displayed in the **Overridden Severity** column when you click on the current severity, enabling you to override the current setting.

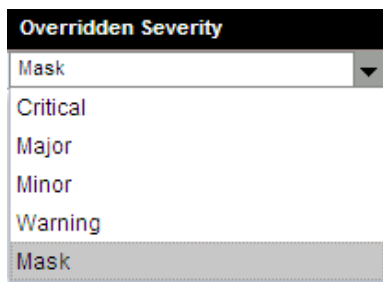


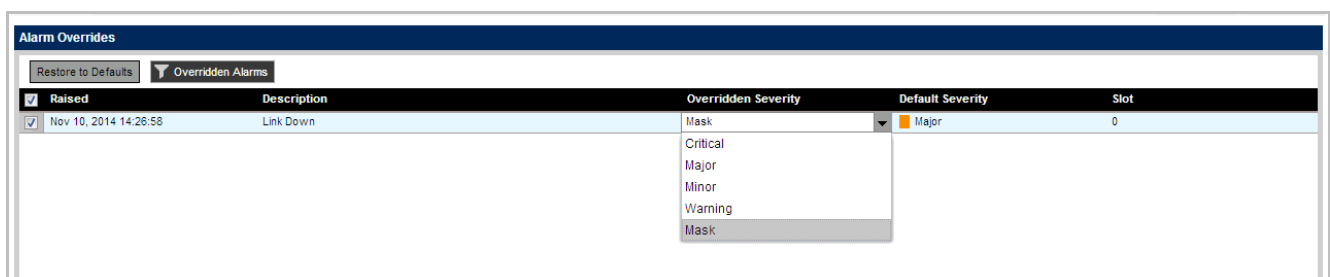
Figure 5.74 Overridden Severity Menu

Restore to Defaults Button

A **Restore to Defaults** button at the top of the widget enables you to quickly reset all the alarms back to their default values by a single click of the button.

Alarm Dictionary Button

An **Alarm Dictionary** filter button, when clicked, removes all the unaltered alarms from the list and displays only the alarms that have been overridden.



Raised	Description	Overridden Severity	Default Severity	Slot
<input checked="" type="checkbox"/>	Nov 10, 2014 14:26:58 Link Down	Mask	Major	0

Figure 5.75 Overridden Alarms Filter

5.4 SYSTEM Page

The **SYSTEM** page provides system information for the unit and provides access to the following tabs:

- **DEVICE** (see section 5.4.1)
- **SOURCES** (see section 5.4.2)
- **REFLEX** (see section 5.4.3)
- **SIMULCRYPT** (see section 5.4.4)
- **DOLBY DIGITAL PRESETS** (see section 5.4.5)
- **REDUNDANCY** (see section 5.4.6)
- **NETWORK** (see section 5.4.7)
- **LICENSES** (see section 5.4.8)

5.4.1 SYSTEM > DEVICES Page

The **DEVICES** tab page provides access to details of option card location and properties.

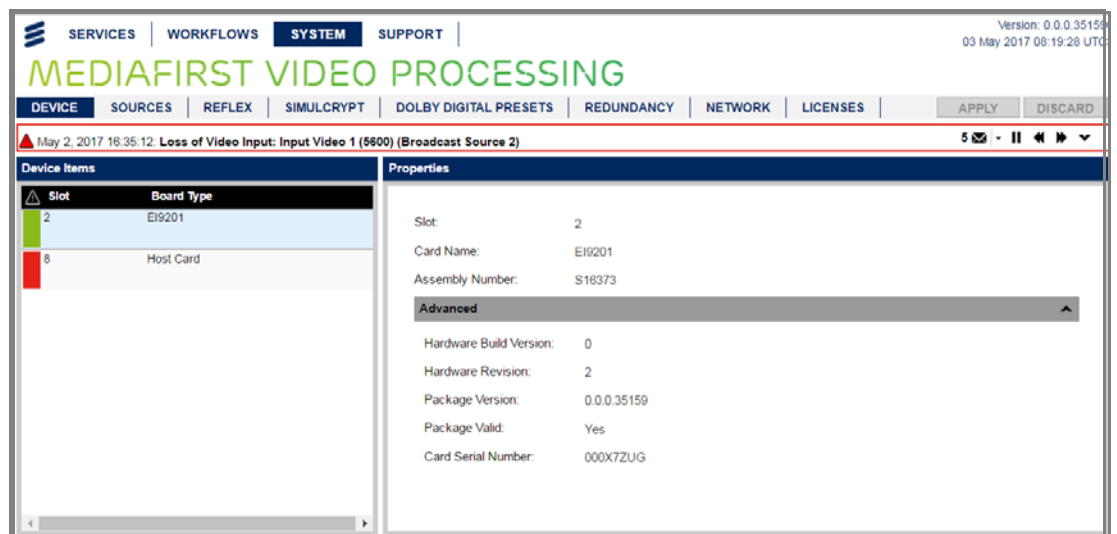


Figure 5.76 SYSTEM > DEVICES Page

5.4.1.1 Device Items Widget

The **Device Items** widget displays a list of the available Card Slots, in the unit. When a particular slot is selected, the properties of the card, fitted in that slot, are displayed in the **Properties** widget.

Slot 0 or 8 corresponds to the Unit Host Card, i.e. the unit Motherboard.

Slots 1 - 6 correspond to the Option Cards that may be fitted to the rear panel of the unit.

Device Items	
Slot	Board Type
2	EI9201
8	Host Card

Figure 5.77 Device Items Widget

5.4.1.2 Properties Widget

The **Properties** widget displays the properties of any cards selected in the **Device Items** widget.

Host Card

The Host Card properties are displayed when selected in the **Device Items** widget.

Properties

Slot: 8

Card Name: Host Card

Assembly Number: S15561

Advanced

Hardware Build Version: 0

Hardware Revision: 3

Hardware Modification ID: 0

Hardware Modification Revision: 3

Hardware Modification Strike: 0

CPLD Version: version 0.6.3, build 18489

Package Version: 0.0.0.35159

Package Valid: Yes

Host Card Serial Number: 0

License ID: 49EC33B2CB33

PSU 1 Present: Present

PSU 2 Present: Not Present

Chassis Serial Number: 00226

Accept Slot Configuration

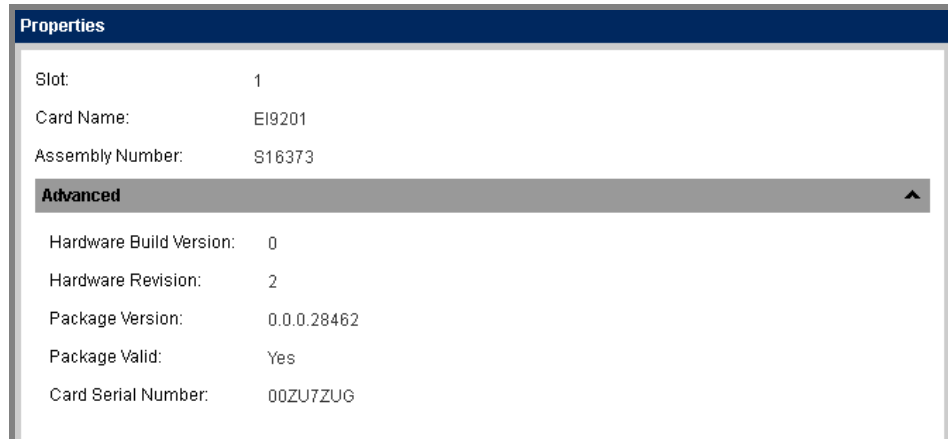
To save the current slot configuration with the current cards, click the button below:

ACCEPT SLOT CONFIGURATION

Figure 5.78 Device Properties Widget – Host Card

EI9201 Card

The EI9201 Card properties are displayed when selected in the **Device Items** widget.



Properties	
Slot:	1
Card Name:	EI9201
Assembly Number:	S16373
Advanced	
Hardware Build Version:	0
Hardware Revision:	2
Package Version:	0.0.0.28462
Package Valid:	Yes
Card Serial Number:	00ZU7ZUG

Figure 5.79 Device Properties Widget – EI9201 Card

IO Hub Card

The IO Hub Card properties are displayed when selected in the **Device Items** widget.



Properties	
Assembly Number:	S16402
Card Name:	IO HUB CARD
Ericsson Serial Number:	00058090
Hardware Build Version:	0
Hardware Revision:	3
Package Valid:	Yes
Package Version:	0.0.0.28339
Serial Number:	5
Slot:	4

Figure 5.80 Device Properties Widget – IO Hub Card

5.4.2 SYSTEM > SOURCES Page

The **SOURCES** tab page enables you to view the system primary and backup input sources and adjust settings as required for input source management.

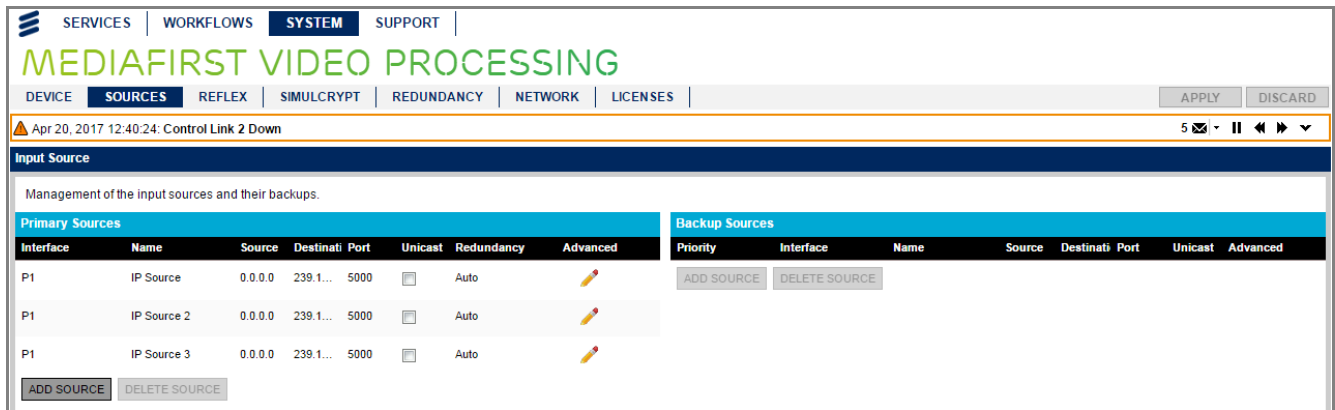


Figure 5.81 SYSTEM > SOURCES Page

5.4.2.1 Primary Sources Panel

The **Primary Sources** panel enables input Transport Streams to be added, or deleted, as primary sources using the **ADD SOURCE** and **DELETE SOURCE** buttons. Address details for the source, destination, port, unicast and advanced are displayed.

Primary Sources							
Interface	Name	Source	Destination	Port	Unicast	Redundancy	Advanced
P1	IP Source	0.0.0.0	239.1...	5000	<input type="checkbox"/>	Auto	
P1	IP Source 2	0.0.0.0	239.1...	5000	<input type="checkbox"/>	Auto	
P1	IP Source 3	0.0.0.0	239.1...	5000	<input type="checkbox"/>	Auto	
<div>ADD SOURCE</div> <div>DELETE SOURCE</div>							

Figure 5.82 Primary Sources Panel

Clicking the **Advanced** icon displays a further page for management of the input sources and their backups, enabling you to select between **CBR** (constant bit rate, i.e. includes a PCR), **VBR** (variable bit rate) and **No PCR** (does not include a Program Clock Reference).

Figure 5.83 Primary Sources - Advanced

5.4.2.2 Backup Sources Panel

The **Backup Sources** panel enables input Transport Streams to be added, or deleted, as backup sources using the **ADD SOURCE** and **DELETE SOURCE** buttons. Address details for the source, destination, port, unicast and advanced are displayed. In addition, the priority for the backup is also displayed.



Figure 5.84 Backup Sources Panel

5.4.3 SYSTEM > REFLEX Page

The **REFLEX** tab page enables you to configure the reflex settings for efficient use of bandwidth.

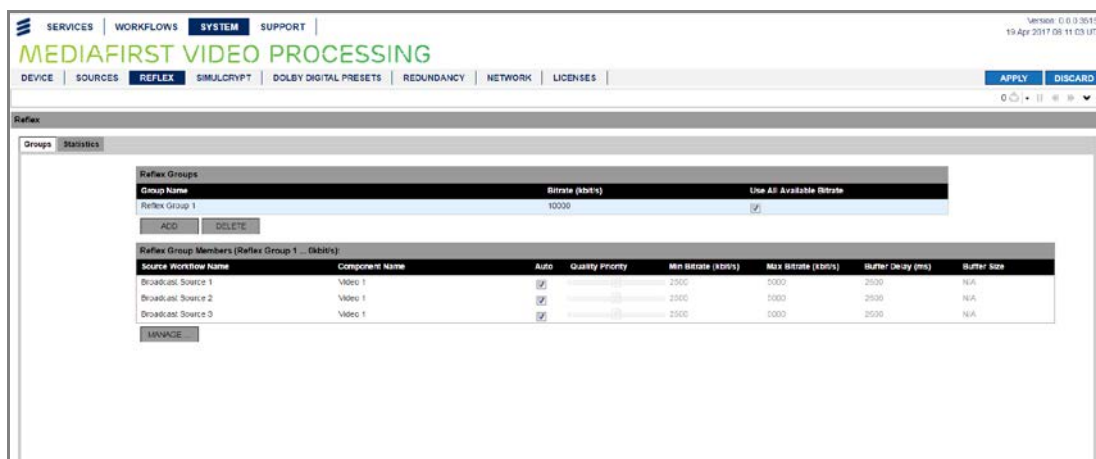


Figure 5.85 SYSTEM > REFLEX Page

Groups Tab

The **Groups** Tab displays several tables:

- **Reflex Groups** – displays the groups that have been created. The naming of the group is automatic. This table provides two editable columns:
 - **Bitrate** – enables you to set the bitrate to be used by the video components specified in the Reflex Group (in kbps).

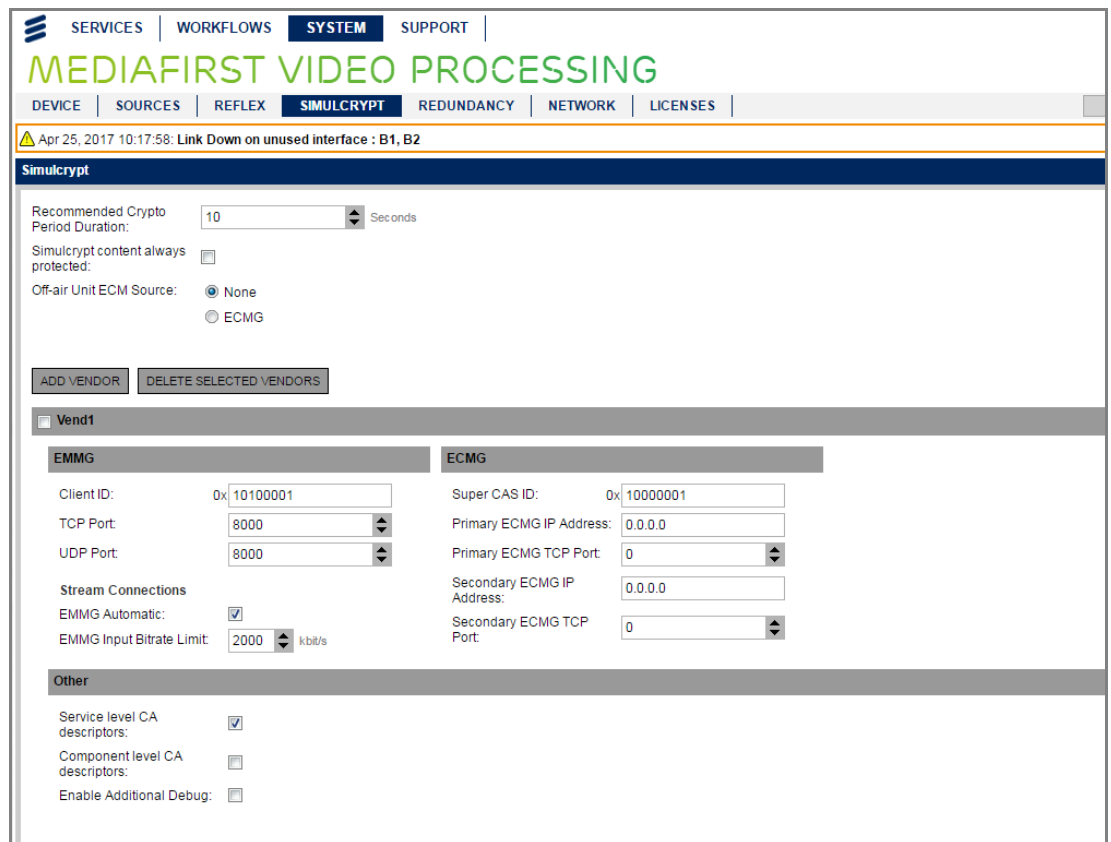
- **Use All Available Bitrate** – a checkbox enables all available bitrate to be used for members of the group.
- **Reflex Group Members** – list the video components that are members of the group and enables control over quality and bitrate:
 - **Source Workflow Name** – The name of the Broadcast source selected for the Reflex Group.
 - **Component Name** – The name of the video component selected for the Reflex Group.
 - **Auto** – If selected, enables the automatic allocation of bitrate and picture quality for the video component.
 - **Quality Priority** – If Auto is deselected, enables manual selection of picture quality for the video component.
 - **Min Bitrate** – If Auto is deselected, enables manual selection of minimum bitrate (in kbps) to be used for the video component.
 - **Max Bitrate** – If Auto is deselected, enables manual selection of maximum bitrate (in kbps) to be used for the video component.
 - **Buffer Delay** – If Auto is deselected, enables manual selection of buffer delay given to the video component.
 - **Buffer Size** – If Auto is deselected, enables manual selection of buffer size allocated to the video component.

Statistics Tab

The Statistics Tab is not supported in the current release.

5.4.4 SYSTEM > SIMULCRYPT Page

The **SIMULCRYPT** tab page enables you to configure the encryption settings.

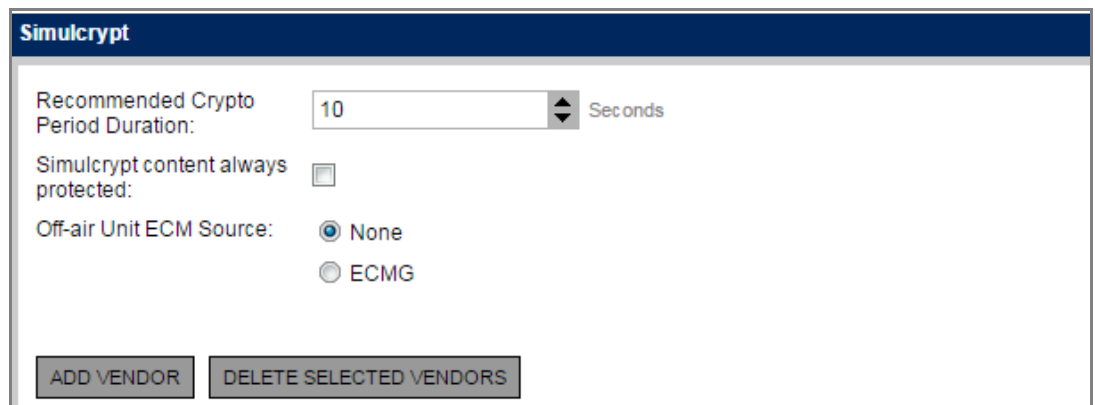


The screenshot shows the 'SYSTEM > SIMULCRYPT' page. At the top, there's a navigation bar with 'SERVICES', 'WORKFLOWS', 'SYSTEM' (selected), and 'SUPPORT'. Below this is a header 'MEDIAFIRST VIDEO PROCESSING' and a sub-header with tabs: 'DEVICE', 'SOURCES', 'REFLEX', 'SIMULCRYPT' (selected), 'REDUNDANCY', 'NETWORK', and 'LICENSES'. A warning message is displayed: 'Apr 25, 2017 10:17:58: Link Down on unused interface : B1, B2'. The main section is titled 'Simulcrypt'. It contains a 'Recommended Crypto Period Duration' set to 10 seconds. There are checkboxes for 'Simulcrypt content always protected:' and 'Off-air Unit ECM Source:' with radio buttons for 'None' (selected) and 'ECMG'. Below these are buttons for 'ADD VENDOR' and 'DELETE SELECTED VENDORS'. A section for 'Vend1' is expanded, showing two columns: 'EMMG' and 'ECMG'. The 'EMMG' column has fields for 'Client ID' (0x10100001), 'TCP Port' (8000), 'UDP Port' (8000), 'Stream Connections' (checked), 'EMMG Automatic' (checked), and 'EMMG Input Bitrate Limit' (2000 kbit/s). The 'ECMG' column has fields for 'Super CAS ID' (0x10000001), 'Primary ECMG IP Address' (0.0.0.0), 'Primary ECMG TCP Port' (0), 'Secondary ECMG IP Address' (0.0.0.0), and 'Secondary ECMG TCP Port' (0). At the bottom, there's an 'Other' section with checkboxes for 'Service level CA descriptors:', 'Component level CA descriptors:', and 'Enable Additional Debug:'.

Figure 5.86 SYSTEM > SIMULCRYPT Page

5.4.4.1 Simulcrypt Widget

The **Simulcrypt** widget enables selection of the crypto period duration and enables the addition and deletion of CA vendors from a list of ECMGs available to the unit.



The screenshot shows the 'Simulcrypt' widget. It has a title bar 'Simulcrypt'. Below it, there's a 'Recommended Crypto Period Duration' set to 10 seconds. There are checkboxes for 'Simulcrypt content always protected:' and 'Off-air Unit ECM Source:' with radio buttons for 'None' (selected) and 'ECMG'. At the bottom, there are buttons for 'ADD VENDOR' and 'DELETE SELECTED VENDORS'.

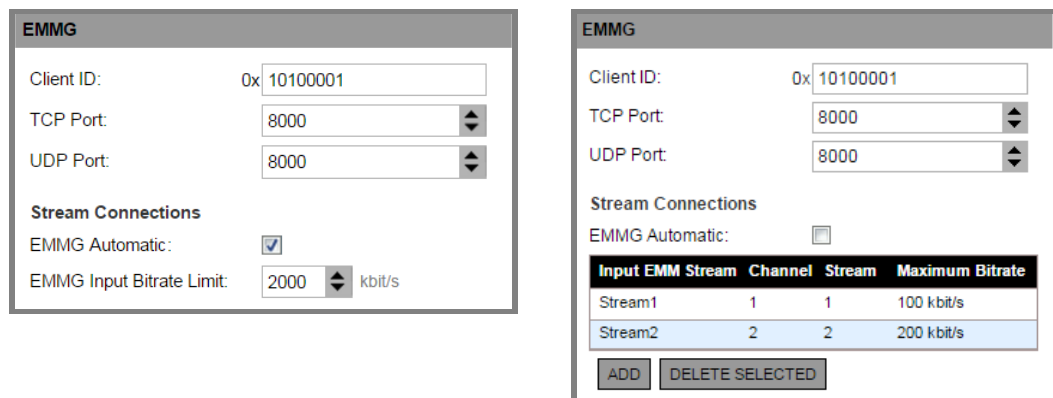
Figure 5.87 Simulcrypt Widget

This top section of the **Simulcrypt** widget enables selection of:

- **Recommended Crypto Period Duration** – Sets the time span during which a specific cryptographic key is authorized for use (in seconds).
- **Simulcrypt content always protected** – Placing a check mark in this box protects the Simulcrypt content.
- **Off-air Unit ECM Source** – When the unit is part of a 1+1 redundant setup and is off-air, this option describes the behavior of the unit connecting to the ECMG. If '**None**' is selected, then the unit will not connect to the ECMG. If '**ECMG**' is connected, the unit will connect to the ECMG.

EMMG Table

An Entitlement Management Message Generator (EMMG) table is shown for the relevant user-entered EMMG name.



EMMG (Automatic)

Client ID: 0x 10100001

TCP Port: 8000

UDP Port: 8000

Stream Connections

EMMG Automatic: ☒

EMMG Input Bitrate Limit: 2000 kbit/s

EMMG (Manual)

Client ID: 0x 10100001

TCP Port: 8000

UDP Port: 8000

Stream Connections

EMMG Automatic: ☐

Input EMM Stream	Channel	Stream	Maximum Bitrate
Stream1	1	1	100 kbit/s
Stream2	2	2	200 kbit/s

ADD DELETE SELECTED

Figure 5.88 EMMG Tables: Automatic (Left) and Manual (Right)

The EMMG table enables selection of:

- **Client ID** – Client identifier.
- **TCP Port** – Transmission Control Protocol Port.
- **UDP Port** – User Datagram Protocol Port.
- **EMMG Automatic** – Checked by default. Uncheck to enable manual addition of EMMG streams.
- **EMMG Input Bitrate Limit** – Maximum bit rate (in kbps).

ECMG Table

An Entitlement Control Message Generator (ECMG) table is shown for the relevant user-entered ECMG name.

Note: Overrides are not supported in this release.

ECMG	
Super CAS ID:	0x 10000001
Primary ECMG IP Address:	0.0.0.0
Primary ECMG TCP Port:	0
Secondary ECMG IP Address:	0.0.0.0
Secondary ECMG TCP Port:	0

Figure 5.89 ECMG Table

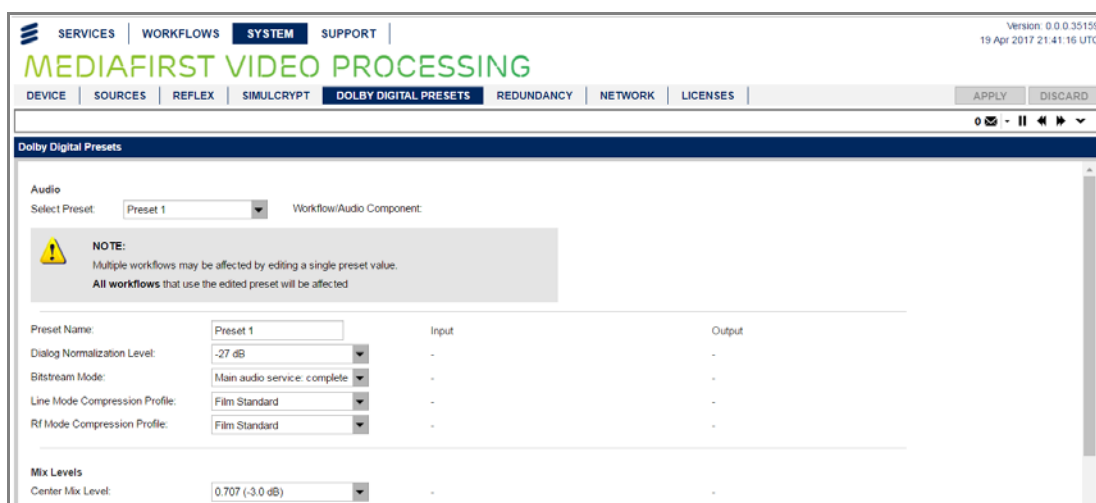
The ECMG table enables selection of:

- **Super CAS ID** – A hex string that identifies the CA vendor.
- **Primary ECMG IP Address** – The highest priority ECMG IP address. Type the address directly into the field.
- **Primary ECMG TCP Port** – The highest priority ECMG Transmission Control Protocol port.
- **Secondary ECMG IP Address** – The backup ECMG IP address. Type the address directly into the field.
- **Secondary ECMG TCP Port** – The backup ECMG Transmission Control Protocol port.

5.4.5

SYSTEM > DOLBY DIGITAL PRESETS Page

The **DOLBY DIGITAL PRESETS** tab page enables you to create configured presets associated with Dolby Digital and Dolby Digital Plus audio. The presets are used when any audio output configured with the output coding standard is set to **Dolby Digital** or **Dolby Digital Plus** and has the **Dolby Metadata Override** parameter set to a value other than **None**.



MEDIAFIRST VIDEO PROCESSING																		
SYSTEM > DOLBY DIGITAL PRESETS																		
<p>Audio</p> <p>Select Preset: Preset 1 Workflow/Audio Component:</p> <p>NOTE: Multiple workflows may be affected by editing a single preset value. All workflows that use the edited preset will be affected</p> <table border="1"> <thead> <tr> <th>Preset Name:</th> <th>Input</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>Dialog Normalization Level:</td> <td>-27 dB</td> <td>-</td> </tr> <tr> <td>Bitstream Mode:</td> <td>Main audio service: complete</td> <td>-</td> </tr> <tr> <td>Line Mode Compression Profile:</td> <td>Film Standard</td> <td>-</td> </tr> <tr> <td>RF Mode Compression Profile:</td> <td>Film Standard</td> <td>-</td> </tr> </tbody> </table> <p>Mix Levels</p> <p>Center Mix Level: 0.707 (-3.0 dB)</p>				Preset Name:	Input	Output	Dialog Normalization Level:	-27 dB	-	Bitstream Mode:	Main audio service: complete	-	Line Mode Compression Profile:	Film Standard	-	RF Mode Compression Profile:	Film Standard	-
Preset Name:	Input	Output																
Dialog Normalization Level:	-27 dB	-																
Bitstream Mode:	Main audio service: complete	-																
Line Mode Compression Profile:	Film Standard	-																
RF Mode Compression Profile:	Film Standard	-																

Figure 5.90 SYSTEM > DOLBY DIGITAL PRESETS Page

The **Dolby Digital Presets** widget displays the following settings:

- **Select Preset** – Selects the preset for customization, via a drop-down menu.
- **Preset Name** – Sets the name for the preset. Type in the field to modify.
- **Dialog Normalization Level** – Sets the dialog normalization level (in dB). Click the drop-down menu to modify.
- **Bitstream Mode** – Flags the type of service in the bitstream. Click the drop-down menu to modify (Main audio service: complete main, music and effects, Associated service: visually impaired, Associated service: hearing impaired, Associated service: dialogue, Associated service: commentary, Associated service: emergency, Associated service: visually impaired, Associated service: karaoke/voiceover).
- **Line Mode Compression Profile** – Alters the dynamic range for line output. Click the drop-down menu to modify (None, Film Standard, Film Light, Music Standard, Music Light, Speech).
- **Rf Mode Compression Profile** – This alters the dynamic range for RF output. The overall level is raised by 11dB. Click the drop-down menu to modify (None, Film Standard, Film Light, Music Standard, Music Light, Speech).
- **Center Mix Level** – Specifies the center mix level. Click the drop-down menu to modify (0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB)).
- **Surround Mix Level** – Specifies the surround mix level. Click the drop-down menu to modify (0.707 (-3.0 dB), 0.500 (-6.0 dB), 0 (-inf dB)).
- **Dolby Surround Mode** – Flags if a two channel encoded stream contains information for a Dolby Pro-logic decode (Lt/Rt). Click the drop-down menu to modify (Not Indicated, Not Encoded, Encoded).
- **Audio Production Information Exists** – Indicates whether the Mixing Level and Room Type parameters exist within the bitstream. Click the drop-down menu to modify (Not indicated, Not encoded, Encoded).
- **Mixing Level** – Indicates the acoustic sound pressure level (in dB) of the dialogue level during the final audio mixing session. Click the drop-down menu to modify (80 to 111 dB).
- **Room Type** – Type and calibration of the mixing room used for the final audio mixing session. Click the drop-down menu to modify (Not indicated, Large room X curve monitor, Small room flat monitor).
- **Copyright Flag** – Indicates if the material is copyright protected. Click the drop-down menu to modify (Off, On).
- **Original Bitstream Flag** – Indicates if source is the original or a copy. Click the drop-down menu to modify (Off, On).
- **Enable Extended Bitstream Information** – Flags if additional information is available for downmixing. Click the drop-down menu to modify (Off, On).



- **Preferred Downmix Mode** – Indicates if the producer would prefer a Lt/Rt or a Lo/Ro downmix. Can be over-riden by the decoder. Click the drop-down menu to modify (Not indicated, Lt/Rt downmix preferred, Lo/Ro downmmix preferred).
- **Lt/rt Center Mix Level** – Indicates the required level reduction of the center channel when mixed with the L& R channels for a Lt/Rt downmix. Similar to 'Center mix level'. Click the drop-down menu to modify (1.414 (+3.0 dB), 1.189 (+1.5 dB), 1.000 (0 dB), 0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)).
- **Lt/rt Surround Mix Level** – Indicates the required level reduction of the surround channels when mixed for a Lt/Rt downmix. Similar to Surround mix level'. Click the drop-down menu to modify (0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)).
- **Lo/ro Center Mix Level** – Indicates the required level reduction of the center channel when mixed with the L& R channels for a Lo/Ro downmix. When present this replaces the value set for the 'Center mix level'. Click the drop-down menu to modify (0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)).
- **Lo/ro Surround Mix Level** – Indicates the required level reduction of the center channel when mixed for Lo/Ro downmix. When present this replaces the value set for the 'Surround mix level'. Click the drop-down menu to modify (0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)).
- **Dolby Surround ExMode** – Flags if the stream has been encoded in Surround Ex. Only used if surround channels are present. Click the drop-down menu to modify (0.841 (-1.5 dB), 0.707 (-3.0 dB), 0.595 (-4.5 dB), 0.500 (-6.0 dB), 0 (-inf dB)).
- **A/d Converter Type** – Indicates type of A/D conversion used. Click the drop-down menu to modify (Standard, HDCD).
- **Bandwidth Low-pass Filter Enable** – Remove high frequency signals before encoding. The filter removes frequencies that would not normally be encoded. Click the drop-down menu to modify (Off, On).
- **Low Frequency Effects Low-pass Filter Enable** – Apply a 120 Hz low pass filter prior to an encode. Should only be switched off if it is known that there are no frequencies above 120 Hz. Click the drop-down menu to modify (Off, On).
- **Surround Attenuation Enable** – Attenuate surround channels by 3 dB before encoding. Theatrical and consumer mixing rooms use different levels for the surround channels, and this can be used to compensate. Click the drop-down menu to modify (Off, On).
- **Surround Phase Shift Enable** – Apply a phase shift of 90 degrees to the surround channels. This simplifies the decode process for producing a 'Lt/Rt' downmix. Click the drop-down menu to modify (Off, On).

5.4.6 SYSTEM > REDUNDANCY Page

The **REDUNDANCY** tab page enables you to view the system redundancy mode and adjust settings as required.

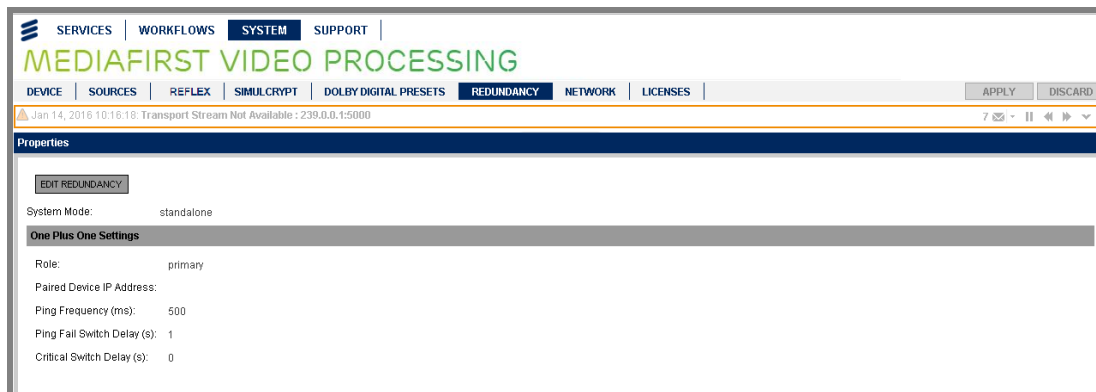


Figure 5.91 SYSTEM > REDUNDANCY Page

5.4.6.1 Properties Widget

The **Properties** widget displays the device redundancy settings.

EDIT REDUNDANCY Button

The **EDIT REDUNDANCY** button, when clicked, enables you to modify the redundancy settings and displays the following screen.

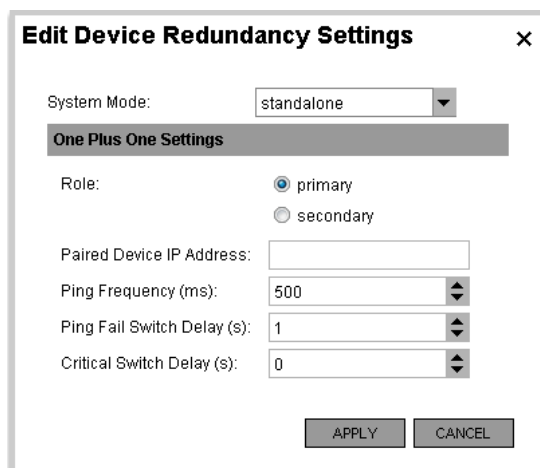


Figure 5.92 Edit Device Redundancy Settings Screen

The following fields are displayed and any changes made to this screen will be displayed on the **Properties** page:

- **System Mode** – A drop-down menu enables you to select the system mode.

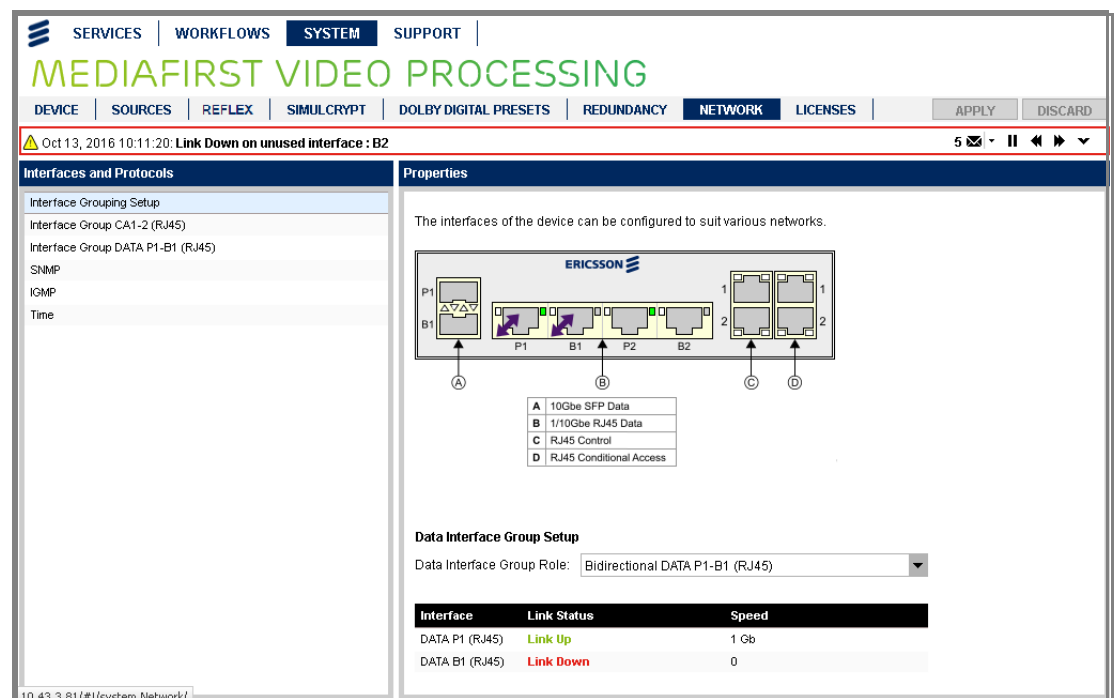
One Plus One Settings

- **Role** – Selecting the **Primary** or **Secondary** button will ensure that the unit operates in that role.
- **Paired Device IP Address** – The IP address of the units when paired.
- **Ping Frequency** – Sets the ping frequency (in milliseconds). Click the increment/decrement buttons to change the setting. This performs a regular check for the presence of the paired unit.
- **Ping Fail Switch Delay** – Sets the ping fail switch delay (in seconds). Click the increment/decrement buttons to change the setting. This determines the time at which the units will be switched if the ping signal is not received.
- **Critical Switch Delay** – Sets the critical switch delay (in seconds). Click the increment/decrement buttons to change the setting. This determines the time at which the units will be switched if the ping signal is not received.

5.4.7

SYSTEM > NETWORK Page

The **NETWORK** tab page displays the network interfaces of the unit and their properties.



The screenshot displays the 'SYSTEM > NETWORK' page. The left sidebar shows 'Interfacing and Protocols' with options like 'Interface Grouping Setup', 'Interface Group CA1-2 (RJ45)', 'Interface Group DATA P1-B1 (RJ45)', 'SNMP', 'IGMP', and 'Time'. The main area is titled 'Properties' and contains a diagram of the device's network interfaces (P1, B1, P2, B2) and a table showing the 'Data Interface Group Setup'.

Data Interface Group Setup

Interface	Link Status	Speed
DATA P1 (RJ45)	Link Up	1 Gb
DATA B1 (RJ45)	Link Down	0

Figure 5.93 SYSTEM > NETWORK Page

5.4.7.1 Interfaces and Protocols Widget

The **Interfaces and Protocols** widget lists the interfaces (data interface groups) provided by the unit. When selected, by clicking on them, their associated properties are displayed in the **Properties** widget.

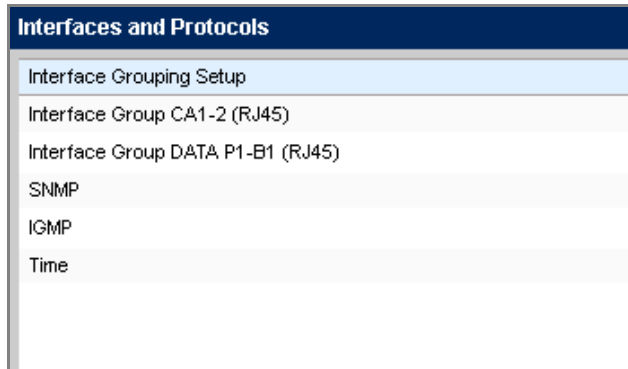


Figure 5.94 Interfaces and Protocols Widget

5.4.7.2 Properties (Interface Grouping Setup) Widget

With the **Interface Grouping Setup** selected, the **Properties** widget displays the associated properties.

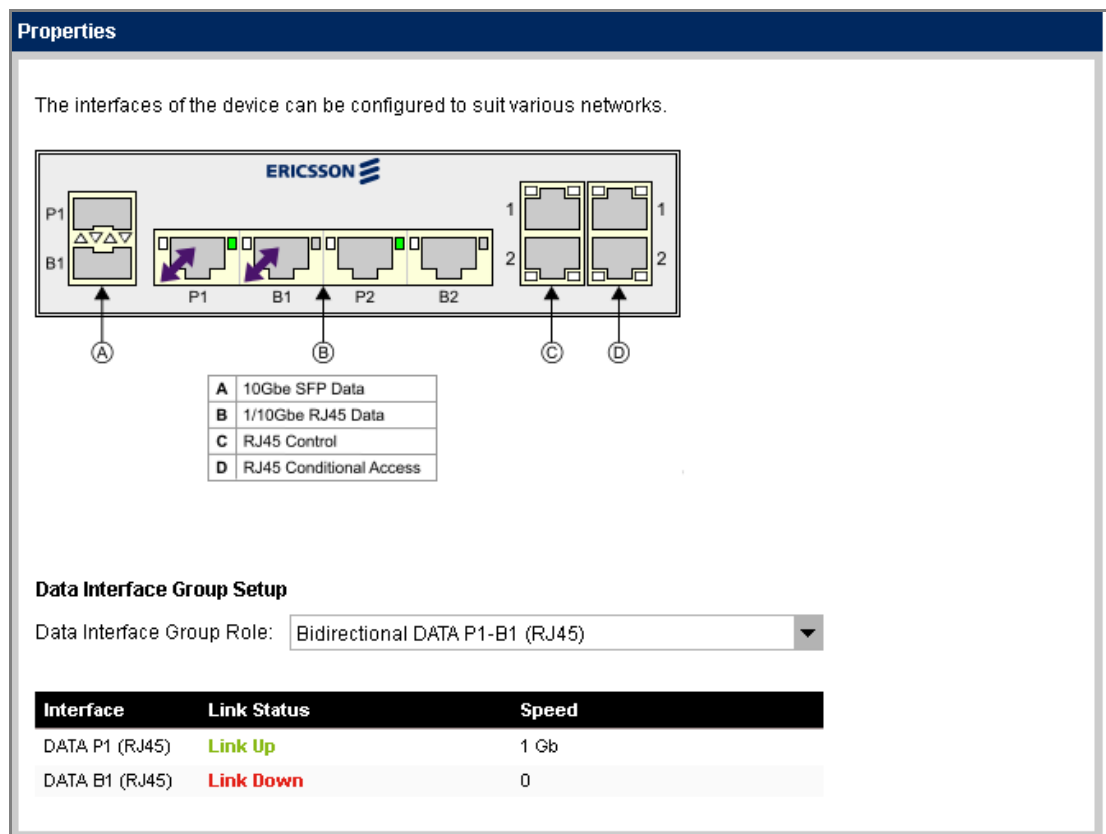


Figure 5.95 Properties (Interface Grouping Setup) Widget

The interfaces of the device can be configured using this widget:

- **Data Interface Group Role** – Enables the role of the data inputs and outputs to be specified for the operation of the unit. Select the required role from the drop-down menu.

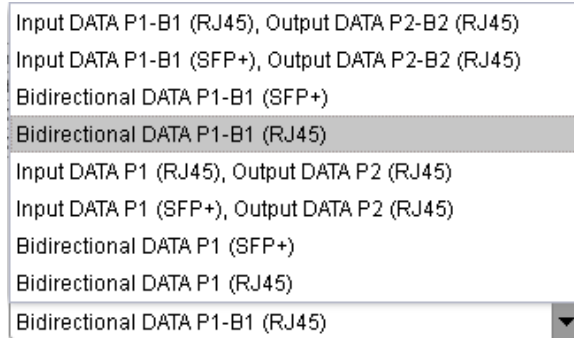


Figure 5.96 Data Interface Group Role Options

Data Interface Group Setup Table

The status of the data interfaces is tabulated in the following columns:

- **Interface** – Displays the name of the interface.
- **Link Status** – Displays the status of the link.
- **Speed** – Displays the current speed of the interface.

5.4.7.3

Properties (Interface Group CA1-2 (RJ45)) Widget

With the **Interface Group CA1-2 (RJ45)** selected, the **Properties** widget displays the associated properties.

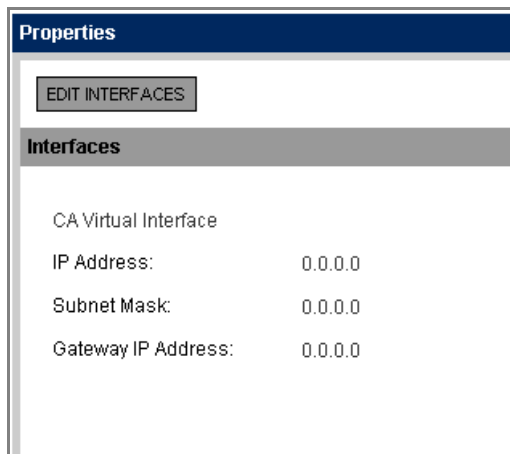


Figure 5.97 Properties (Interface Group CA1-2 (RJ45)) Widget

EDIT INTERFACES Button

The **EDIT INTERFACES** button, when clicked, displays a screen to enable changes to be made to the Conditional Access interface settings displayed on the **Properties** page.

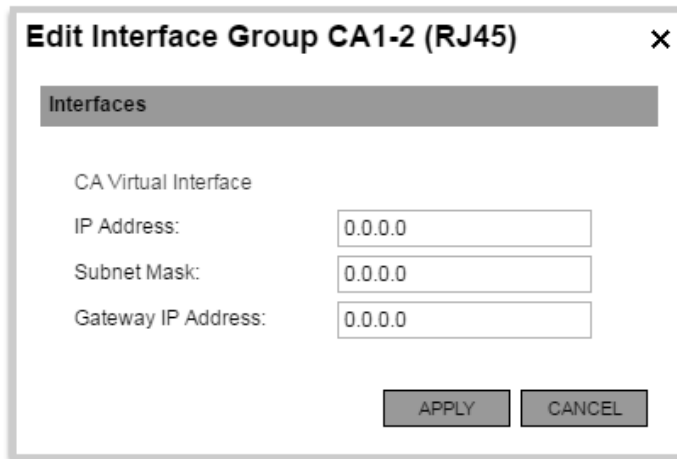


Figure 5.98 Edit Interfaces (CA)

The following options are provided:

- **IP Address** – Enables the IP address for CA to be configured.
- **Subnet Mask** – Enables the subnet mask for CA to be configured.
- **Gateway IP Address** – Enables the Gateway IP address for CA to be configured.

5.4.7.4 Properties (Interface Group DATA P1-B1 (RJ45)) Widget

With the **Interface Group DATA P1-B1 (RJ45)** selected, the **Properties** widget displays the associated properties.

Properties

EDIT INTERFACES

Interfaces

DATA P1 (RJ45)

Physical IP Address: 192.168.60.202
Physical Subnet Mask: 255.255.240.0
Physical Gateway IP Address: 0.0.0.0
Physical MAC Address: 00:20:aa:7b:43:63
Link Status: Link Up (1 Gb)
TX Packets: 22543
RX Packets: 183121
Block ARP: No
Block Ping: No
Connector Direction: Bidirectional
Connector Type: Electrical

DATA B1 (RJ45)

Physical IP Address: 0.0.0.0
Physical Subnet Mask: 0.0.0.0
Physical Gateway IP Address: 0.0.0.0
Physical MAC Address: 00:20:aa:7c:43:63
Link Status: Link Down
TX Packets: 0
RX Packets: 0
Block ARP: No
Block Ping: No
Connector Direction: Bidirectional
Connector Type: Electrical

Figure 5.99 Properties (Interface Group DATA P1-B1 (RJ45)) Widget

EDIT INTERFACES Button

The **EDIT INTERFACES** button enables the configuration of the interface.

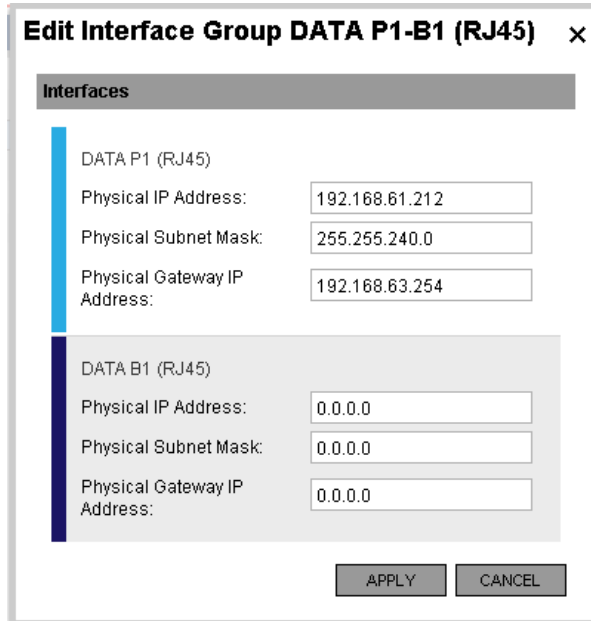


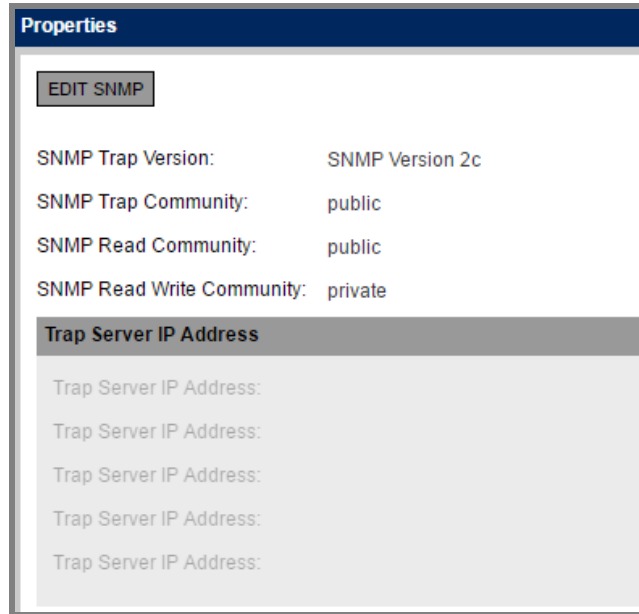
Figure 5.100 Edit Interface Settings (DATA)

The following options are provided for Data Interface P1/B1 and P2/B2:

- **Physical IP Address** – Enables the physical IP address of the interface to be configured.
- **Physical Gateway IP Address** – Enables the physical gateway IP address of the interface to be configured.
- **Physical Subnet Mask** – Enables the physical subnet mask address of the interface to be configured.
- **Physical MAC Address** – Enables the assigned MAC address to be configured.
- **Block ARP** – Enables/disables Address Resolution Protocol (ARP) blocking to restrict user access.
- **Block Ping** – Enables/disables ping requests blocking.
- **Connector Direction** – Enables the connector direction (input/output) of the interface to be specified.
- **Connector Type** – Enables the connector type of the interface to be specified.

5.4.7.5 Properties (SNMP) Widget

When **SNMP** is selected, the **Properties** widget displays the associated properties.



The **Properties** widget has a dark blue header with the title "Properties". Below the header is a button labeled "EDIT SNMP". The main area contains the following settings:

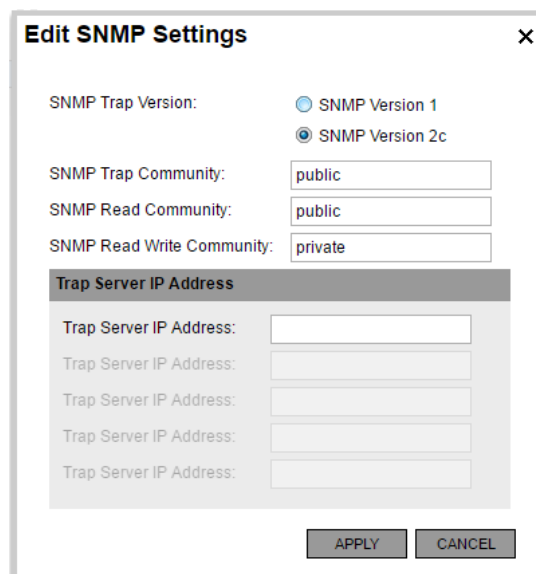
- SNMP Trap Version: SNMP Version 2c
- SNMP Trap Community: public
- SNMP Read Community: public
- SNMP Read Write Community: private

Below these settings is a section titled "Trap Server IP Address" with a grey background. It contains five input fields, all of which are currently empty.

Figure 5.101 Properties (SNMP) Widget

EDIT SNMP Button

The **EDIT SNMP** button, when clicked, display a screen to enable changes to be made to the settings displayed on the **Properties** page.



The **Edit SNMP Settings** dialog box has a title bar with the text "Edit SNMP Settings" and a close button (X). The settings are as follows:

- SNMP Trap Version: Two radio buttons are present. "SNMP Version 1" is unselected, and "SNMP Version 2c" is selected.
- SNMP Trap Community: public
- SNMP Read Community: public
- SNMP Read Write Community: private

Below these settings is a section titled "Trap Server IP Address" with a grey background. It contains five input fields, all of which are currently empty.

At the bottom of the dialog are two buttons: "APPLY" and "CANCEL".

Figure 5.102 Edit SNMP Settings

The following options are provided:

- **SNMP Trap Version** – Selects the SNMP Version (SNMP versions 1 and 2c are supported). The General Ericsson Television MIB is also supported.
- **SNMP Trap Community** – Sets the SNMP community string for traps.

- **SNMP Read Community** – Sets the read-only SNMP community string.
- **SNMP Write Community** – Sets the read/write SNMP community string.
- **Trap Server IP Address** – Enables the Trap server address to be entered. Up to five IP addresses assigned for any SNMP Trap message to be sent. The default is 000.000.000.000, which causes the SNMP traps to be sent to the last SNMP master. See *Chapter 6, Video Processing and Networking* for further information.

5.4.7.6 Properties (IGMP) Widget

When **IGMP** is selected, the **Properties** widget displays the associated properties for Internet Group Management Protocol.

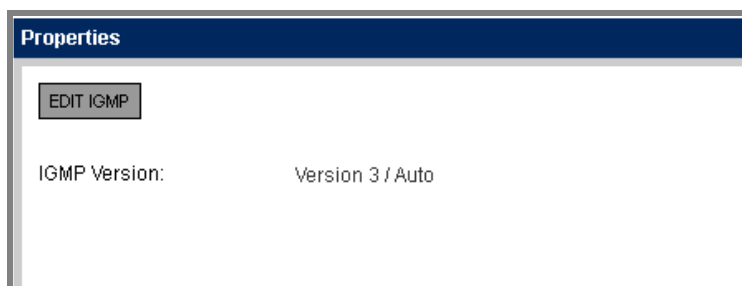


Figure 5.103 Properties (IGMP) Widget

EDIT IGMP Button

The **EDIT IGMP** button, when clicked, display a screen to enable changes to be made to the IGMP Version displayed on the **Properties** page.

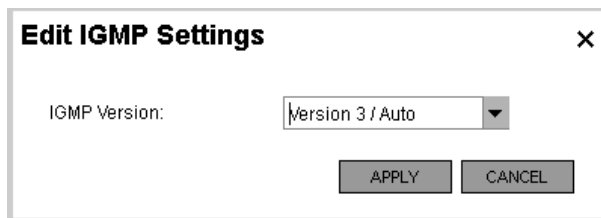


Figure 5.104 Edit IGMP Settings

The following options are provided:

- **IGMP Version** – Sets the version number.

5.4.7.7 Properties (Time) Widget

When **Time** is selected, the **Properties** widget displays the associated properties from Simple Network Time Protocol.

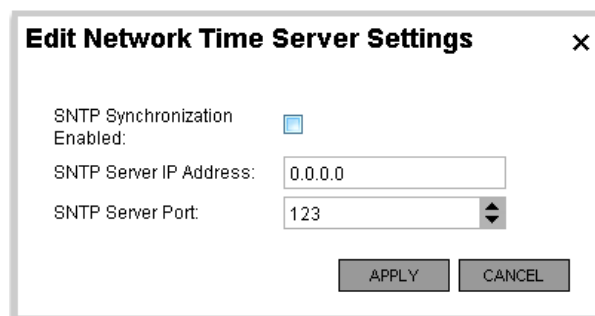


The screenshot shows a 'Properties' window with a dark blue header. Below the header is a button labeled 'EDIT SNTP'. The main area contains several settings: 'SNTP Synchronization Enabled:' with a value of 'No'; 'SNTP Server IP Address:' with a value of '0.0.0.0'; 'SNTP Server Port:' with a value of '123'; 'In Sync:' with a value of 'No'; 'Last Sync Time:' (empty); 'NTP Enabled:' with a value of 'No'; 'Poll Interval:' with a value of '0' and the unit 'seconds'; 'Server Connected:' with a value of 'No'; and 'Current Time:' with a value of 'Oct 13, 2016 11:45:47'.

Figure 5.105 Properties (Time) Widget

EDIT SNTP Button

The **EDIT SNTP** button, when clicked, display a screen to enable changes to be made to the settings displayed on the **Properties** page.



The screenshot shows a dialog box titled 'Edit Network Time Server Settings' with a close button (X) in the top right corner. Inside the dialog, there are three settings: 'SNTP Synchronization Enabled:' with an unchecked checkbox; 'SNTP Server IP Address:' with a text input field containing '0.0.0.0'; and 'SNTP Server Port:' with a spin box containing '123'. At the bottom of the dialog are two buttons: 'APPLY' and 'CANCEL'.

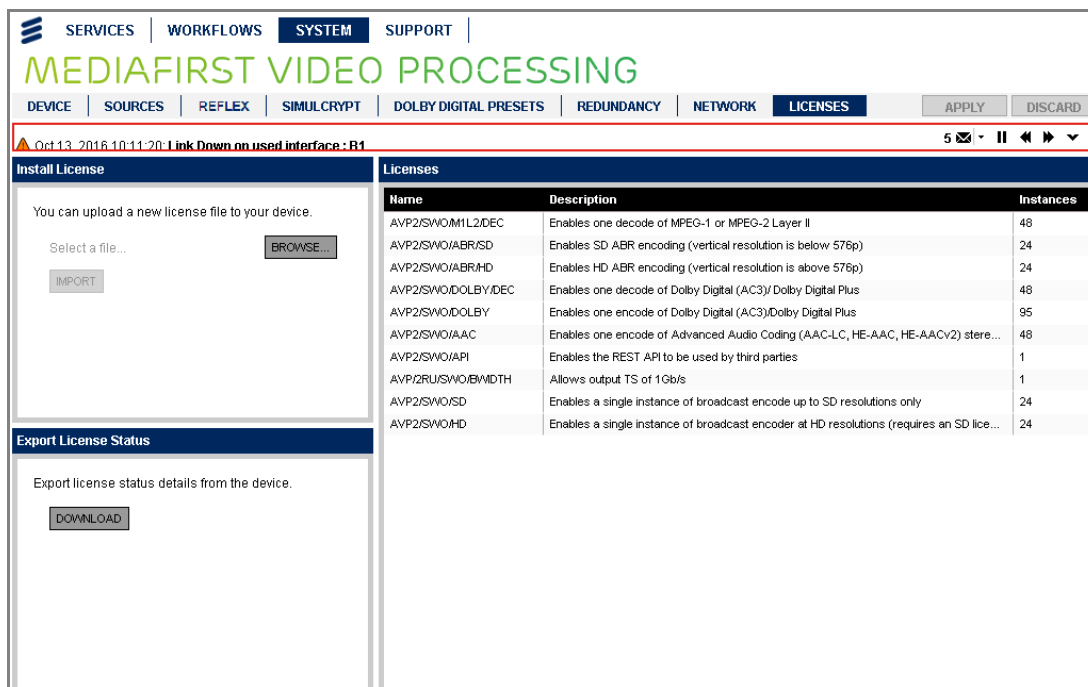
Figure 5.106 Edit Network Time Server Settings

The following options are provided:

- **SNTP Synchronization Enabled** – Enables/disables Simple Network Time Protocol (SNTP) synchronization.
- **SNTP Server IP Address** – Enables the IP address for SNTP to be configured.
- **SNTP Server Port** – Enables the the server port number for the SNTP server to be configured. Use the increment/decrement buttons to make changes.

5.4.8 SYSTEM > LICENSES Page

The **LICENSES** tab page enables you to upload licenses to the unit and also gives details of licenses already installed.



The screenshot shows the 'SYSTEM > LICENSES' page. The top navigation bar includes 'SERVICES', 'WORKFLOWS', 'SYSTEM' (selected), and 'SUPPORT'. Below this is the 'MEDIAFIRST VIDEO PROCESSING' header. The main navigation bar includes 'DEVICE', 'SOURCES', 'REFLEX', 'SIMULCRYPT', 'DOLBY DIGITAL PRESETS', 'REDUNDANCY', 'NETWORK', and 'LICENSES' (selected). There are 'APPLY' and 'DISCARD' buttons on the right. A status bar at the top shows 'Oct 13 2016 10:11:20 Link Down on used interface : B1' and a notification icon.

The 'Install License' widget on the left contains the text 'You can upload a new license file to your device.' and a 'Select a file...' input field with a 'BROWSE...' button. Below this is an 'IMPORT' button. The 'Export License Status' section below it contains the text 'Export license status details from the device.' and a 'DOWNLOAD' button.

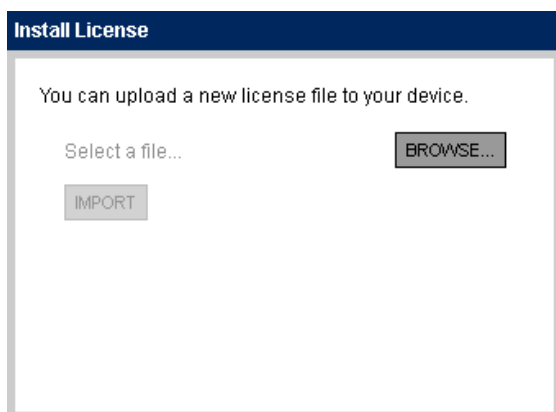
The 'Licenses' table on the right lists installed licenses with columns for Name, Description, and Instances.

Name	Description	Instances
AVP2/SWO/M1L2/DEC	Enables one decode of MPEG-1 or MPEG-2 Layer II	48
AVP2/SWO/ABR/SD	Enables SD ABR encoding (vertical resolution is below 576p)	24
AVP2/SWO/ABR/HD	Enables HD ABR encoding (vertical resolution is above 576p)	24
AVP2/SWO/DOLBY/DEC	Enables one decode of Dolby Digital (AC3)/Dolby Digital Plus	48
AVP2/SWO/DOLBY	Enables one encode of Dolby Digital (AC3)/Dolby Digital Plus	95
AVP2/SWO/AAC	Enables one encode of Advanced Audio Coding (AAC-LC, HE-AAC, HE-AACv2) stere...	48
AVP2/SWO/API	Enables the REST API to be used by third parties	1
AVP2/RU/SWO/BWIDTH	Allows output TS of 1Gb/s	1
AVP2/SWO/SD	Enables a single instance of broadcast encode up to SD resolutions only	24
AVP2/SWO/HD	Enables a single instance of broadcast encoder at HD resolutions (requires an SD lice...	24

Figure 5.107 SYSTEM > LICENSES Page

5.4.8.1 Install License Widget

The **Install License Widget** enables you to upload new licenses as required. See *Chapter 3, Getting Started* for details of how to install licenses.



The screenshot shows the 'Install License' widget. It has a dark blue header with the text 'Install License'. Below the header, it says 'You can upload a new license file to your device.' There is a 'Select a file...' input field with a 'BROWSE...' button to its right. Below this is an 'IMPORT' button.

Figure 5.108 Install License Widget

5.4.8.2 Export License Widget

The **Export License Widget** enables you to download new licenses as required. See *Chapter 3, Getting Started* for details of how to install licenses.

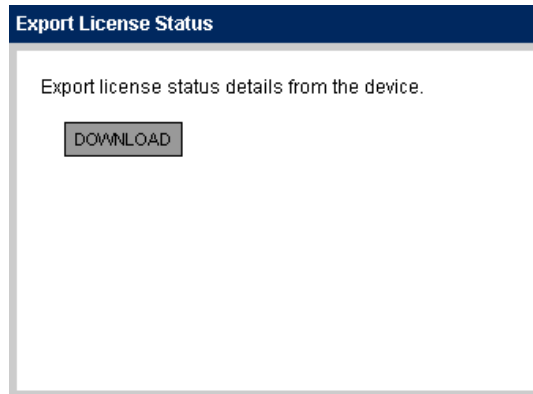


Figure 5.109 Export License Status Widget

5.4.8.3 Licenses Widget

The **Licenses** widget displays details of all installed licenses, including whether licenses have expired or active.

Licenses		
Name	Description	Instances
AVP2/SWO/M1L2/DEC	Enables one decode of MPEG-1 or MPEG-2 Layer II	48
AVP2/SWO/ABR/SD	Enables SD ABR encoding (vertical resolution is below 576p)	24
AVP2/SWO/ABR/HD	Enables HD ABR encoding (vertical resolution is above 576p)	24
AVP2/SWO/DOLBY/DEC	Enables one decode of Dolby Digital (AC3)/Dolby Digital Plus	48
AVP2/SWO/DOLBY	Enables one encode of Dolby Digital (AC3)/Dolby Digital Plus	95
AVP2/SWO/AAC	Enables one encode of Advanced Audio Coding (AAC-LC, HE-AAC, HE-AACv2) stere...	48
AVP2/SWO/API	Enables the REST API to be used by third parties	1
AVP2RU/SWO/BWMDTH	Allows output TS of 1Gb/s	1
AVP2/SWO/SD	Enables a single instance of broadcast encode up to SD resolutions only	24
AVP2/SWO/HD	Enables a single instance of broadcast encoder at HD resolutions (requires an SD lice...	24

Figure 5.110 Licenses Widget

The widget tabulates the information in the following columns:

- **Name** – Displays the marketing code for the license.
- **Description** – Displays a text description of the license.
- **Instances** – Details the number of instances of the license that are installed on the unit.

5.5 SUPPORT Page

The **SUPPORT** page provides administrative information for managing the unit and its configurations. Currently, three tabs are provided:

- **BACKUP/RESTORE** (see section 5.5.1)
- **LOGS** (see section 5.5.2)
- **DIAGNOSTICS** (see section 5.5.3)

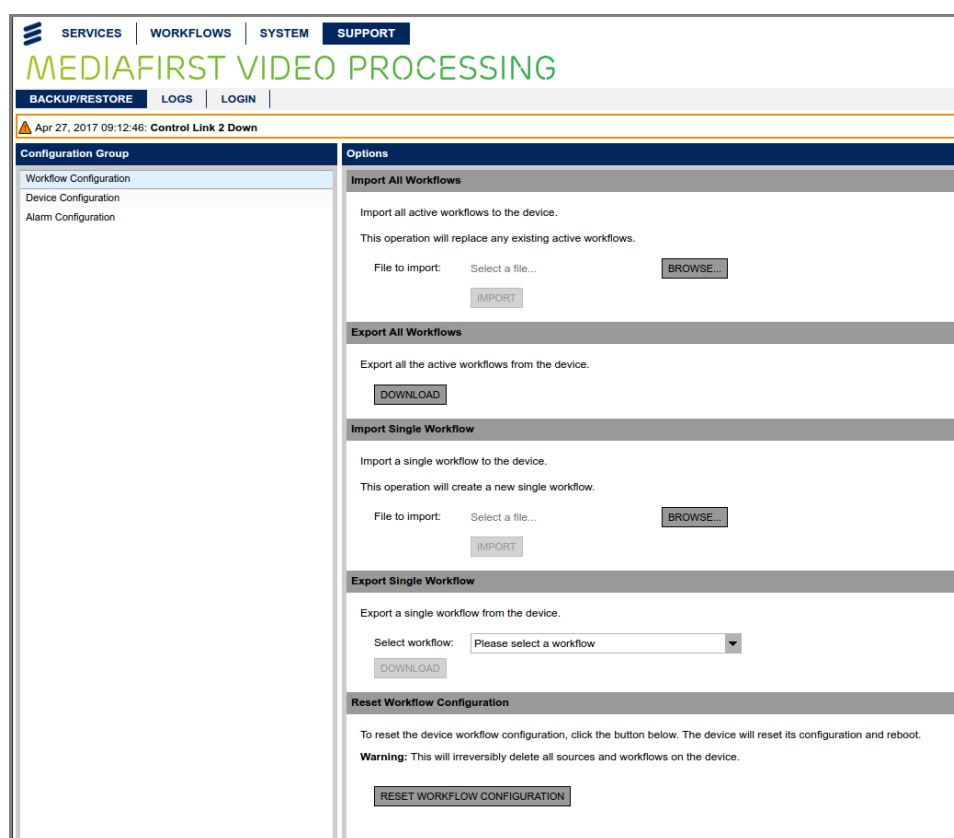
5.5.1 SUPPORT > BACKUP/RESTORE Page

The **BACKUP/RESTORE** tab page provides options for:

- Workflow Configuration
- Device Configuration
- Alarm Configuration

5.5.1.1 Workflow Configuration

Selecting the **Workflow Configuration** option, in the **Configuration Group** widget, displays options for workflow backup and restore.



The screenshot displays the 'SUPPORT' page with the 'BACKUP/RESTORE' tab selected. The page title is 'MEDIAFIRST VIDEO PROCESSING'. The sidebar shows the 'Configuration Group' with 'Workflow Configuration' selected. The main content area contains the following options:

- Import All Workflows:** Import all active workflows to the device. This operation will replace any existing active workflows. File to import: Select a file... (BROWSE... button) (IMPORT button)
- Export All Workflows:** Export all the active workflows from the device. (DOWNLOAD button)
- Import Single Workflow:** Import a single workflow to the device. This operation will create a new single workflow. File to import: Select a file... (BROWSE... button) (IMPORT button)
- Export Single Workflow:** Export a single workflow from the device. Select workflow: Please select a workflow (dropdown menu) (DOWNLOAD button)
- Reset Workflow Configuration:** To reset the device workflow configuration, click the button below. The device will reset its configuration and reboot. **Warning:** This will irreversibly delete all sources and workflows on the device. (RESET WORKFLOW CONFIGURATION button)

Figure 5.111 SUPPORT > BACKUP/RESTORE - Workflow Configuration

Import All Workflows Panel

With **Workflow Configuration** selected, the **Options** widget displays the **Import All Workflows** panel enabling the import of all workflows to this device.

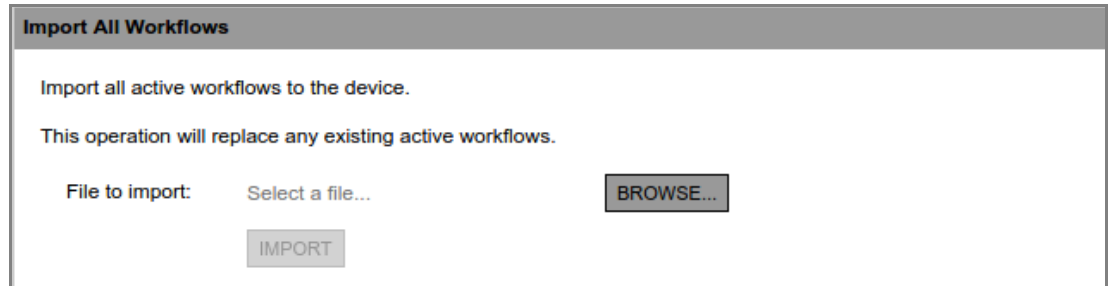


Figure 5.112 Import All Workflows Panel

The following buttons are provided:

- **BROWSE** – Clicking this button displays a dialog that enables you to navigate to the location of the workflow file to be imported.
- **IMPORT** – Clicking this button imports the workflow file that has been selected using the **BROWSE** button. All existing active workflows will be replaced.

Export All Workflows Panel

With **Workflow Configuration** selected, the **Options** widget displays the **Export All Workflows** panel which enabling the export of all workflows from this device.

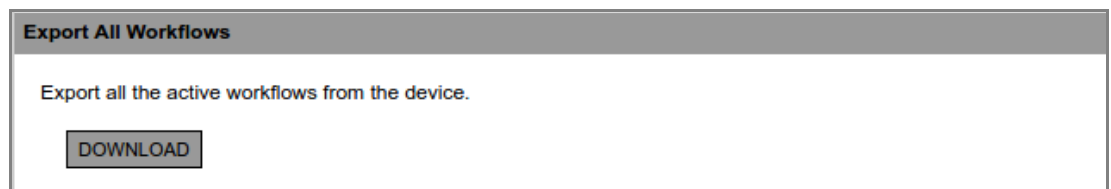


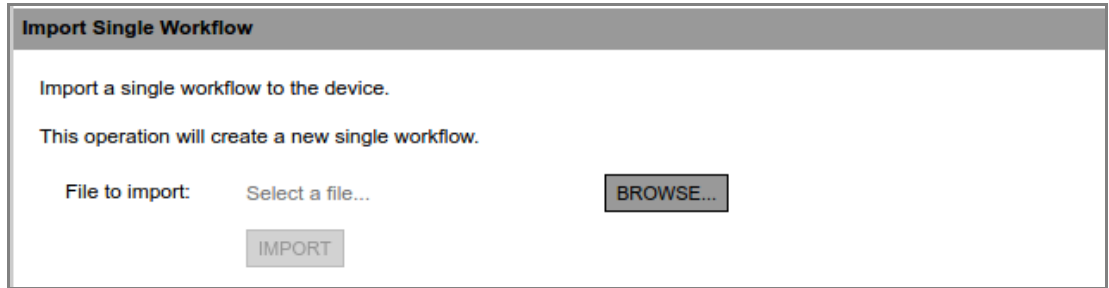
Figure 5.113 Export All Workflows Panel

The following buttons are provided:

- **DOWNLOAD** – Clicking this button displays a dialog that enables you to select a location to download the unit workflow file.

Import Single Workflow Panel

With **Workflow Configuration** selected, the **Options** widget displays the **Import Single Workflow** panel enabling the selection and import of a single workflow to this device.



Import Single Workflow

Import a single workflow to the device.

This operation will create a new single workflow.

File to import:

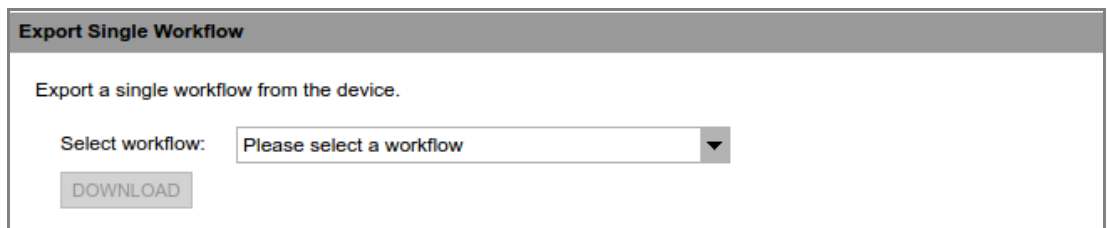
Figure 5.114 Import Single Workflow Panel

The following buttons are provided:

- **BROWSE** – Clicking this button displays a dialog that enables you to navigate to the location of the workflow file to be imported.
- **IMPORT** – Clicking this button imports the workflow file that has been selected using the **BROWSE** button.

Export Single Workflow Panel

With **Workflow Configuration** selected, the **Options** widget displays the **Export Single Workflow** panel enabling the selection and export of a single workflows from this device.



Export Single Workflow

Export a single workflow from the device.

Select workflow: ▼

Figure 5.115 Export Single Workflow Panel

The following buttons are provided:

- **Select workflow** – Clicking this drop-down list enables you to select a workflow.
- **DOWNLOAD** – Clicking this button displays a dialog that enables you to select a location to download the unit workflow file.

Reset Workflow Configuration Panel

With **Workflow Configuration** selected, the **Options** widget displays the **Reset Workflow Configuration** panel enabling the deletion of all sources and workflows from the device.

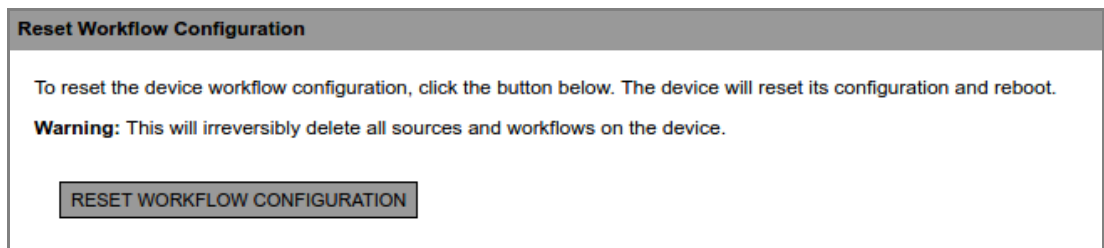


Figure 5.116 Export Single Workflow Panel

The following buttons are provided:

- **RESET WORKFLOW CONFIGURATION** – Clicking this button deletes of all sources and workflows from the device and will reboot the device.

Note: Remember to save (export) any workflow configurations that you may require before using this feature, in order that they may be imported back to the device.

5.5.1.2

Device Configuration

Selecting the **Device Configuration** option, in the **Configuration Group** widget, displays options for device backup and restore.

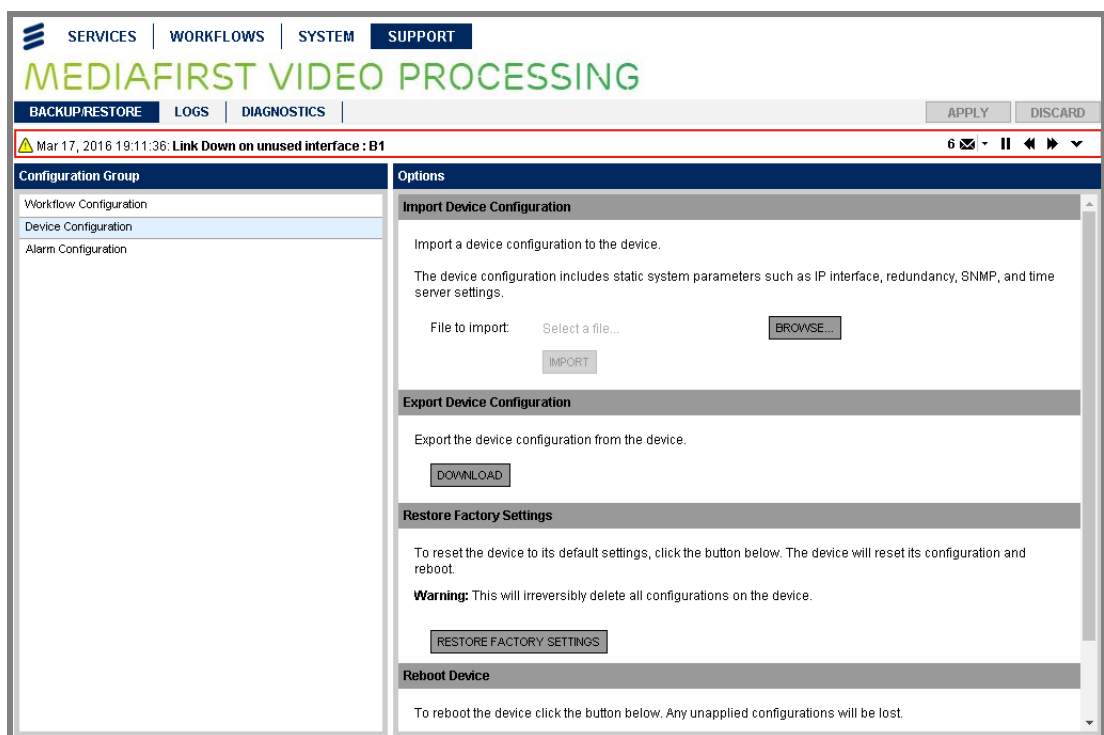


Figure 5.117 SUPPORT > BACKUP/RESTORE - Device Configuration

Import Device Configuration Panel

The **Import Device Configuration** panel enables the selection and import of a configuration file to the device.

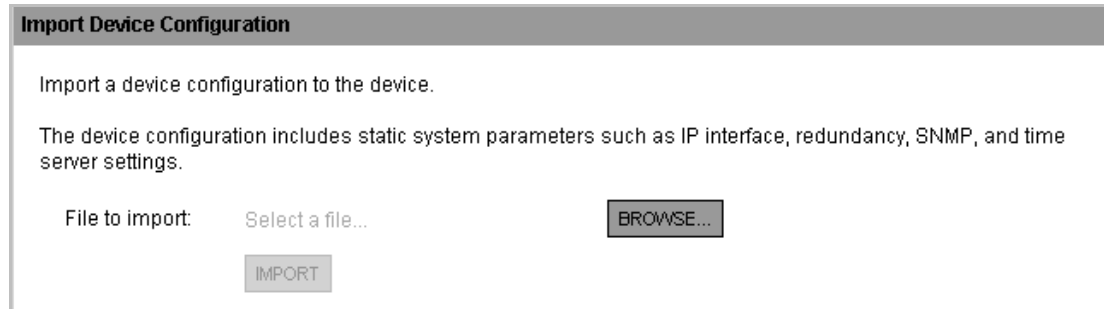


Figure 5.118 Import Device Configuration Panel

The following buttons are provided:

- **BROWSE** – Clicking this button displays a dialog that enables you to select a location to download the unit configuration file. The file is displayed as the file to import.
- **IMPORT** – Clicking this button imports the selected file.

Export Device Configuration Panel

The **Export Device Configuration** panel enables a base profile (does not include configuration settings or control port settings) to be exported as a file.

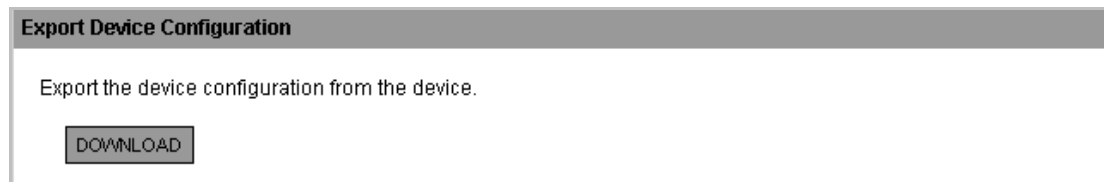


Figure 5.119 Export Device Configuration Panel

The following buttons are provided:

- **DOWNLOAD** – Clicking this button displays a dialog that enables you to select a location to download the unit configuration file.

Restore Factory Settings Panel

The **Restore Factory Settings** panel enables a restore all configuration to the factory defaults (control interface settings will be preserved) and a reboot into the factory default configuration will follow.

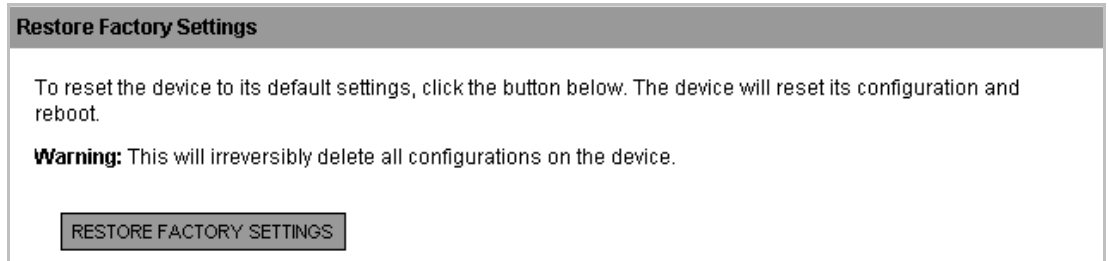


Figure 5.120 Restore Factory Settings Panel

The following buttons are provided:

- **RESTORE FACTORY SETTINGS** – Clicking this button initiates the restore to factory settings. A confirmation dialog will be displayed.

Reboot Device Panel

The **Reboot Device** panel will be reboot the device into its currently selected configuration.

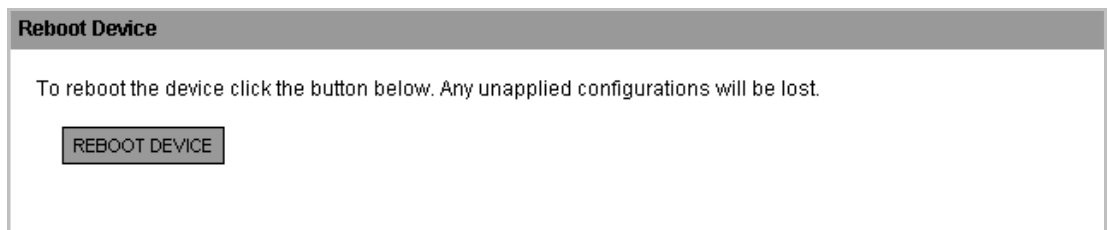


Figure 5.121 Reboot Device Panel

The following buttons are provided:

- **REBOOT DEVICE** – Clicking this button reboots the device. A confirmation dialog will be displayed. Any unapplied configurations will be lost.

Identify Device Panel

The **Identify Device** panel will enable flashing of the front panel LCD and alarm LED to help with identification of the unit when remotely sited in an equipment room.

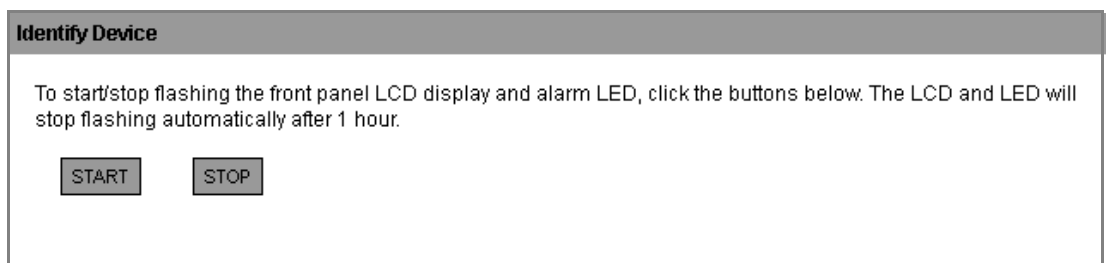


Figure 5.122 Identify Device Panel

The following buttons are provided:

- **START** – Clicking this button starts the flashing of the front panel LCD and LED. If the **STOP** button is not activated, flashing will stop automatically after 1 hour.
- **STOP** – Clicking this button stops the flashing of the front panel LCD and LED.

5.5.1.3 Alarm Configuration

Selecting the **Alarm Configuration** option, in the **Configuration Group** widget, displays options for alarm overrides backup and restore.

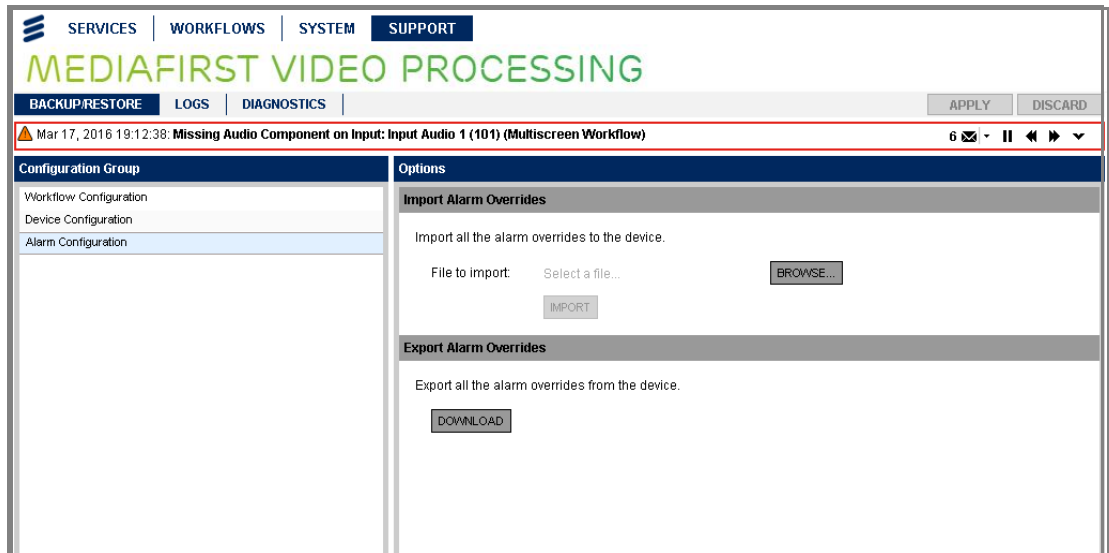


Figure 5.123 SUPPORT > BACKUP/RESTORE - Alarm Configuration

Import Alarm Overrides Panel

The **Import Alarm Overrides** panel enables the selection and import of an alarm overrides file to the device.

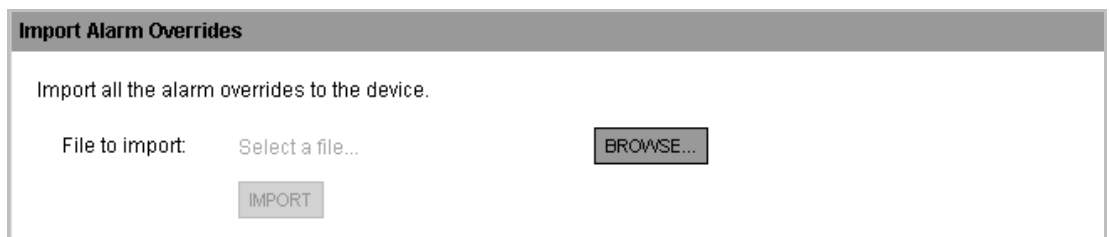


Figure 5.124 Import Alarm Overrides Panel

The following buttons are provided:

- **BROWSE** – Clicking this button displays a dialog that enables you to select a location to download the alarm configuration file. The file is displayed as the file to import.
- **IMPORT** – Clicking this button imports the selected file.

Export Alarm Overrides Panel

The **Export Alarm Overrides** panel enables the alarm overrides to be exported as a file.

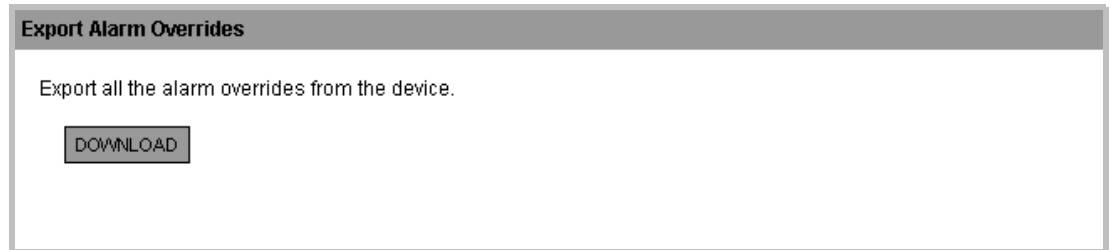


Figure 5.125 Export Alarm Overrides Panel

The following buttons are provided:

- **DOWNLOAD** – Clicking this button displays a dialog that enables you to select a location to download the unit configuration file.

5.5.2

SUPPORT > LOGS Page

The **LOGS** tab page enables you to generate log files from the unit.

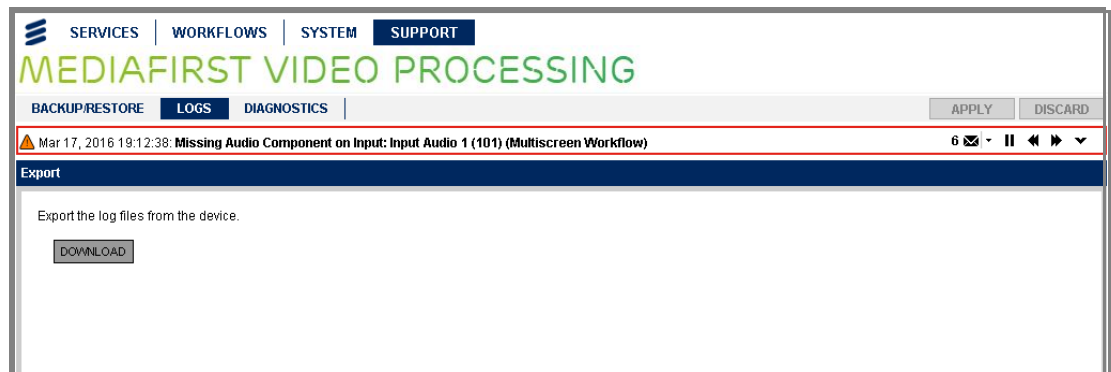


Figure 5.126 SUPPORT > LOGS Tab

The following buttons are provided:

- **DOWNLOAD** – Clicking this button will download the log file type selected in the Log file menu. The log file will be stored, by default, on the hard disk but you may navigate to a different location, if required, in the displayed dialog.

5.5.3

SUPPORT > DIAGNOSTICS Page

The **SUPPORT > DIAGNOSTICS** page displays debug information for the selected workflow.

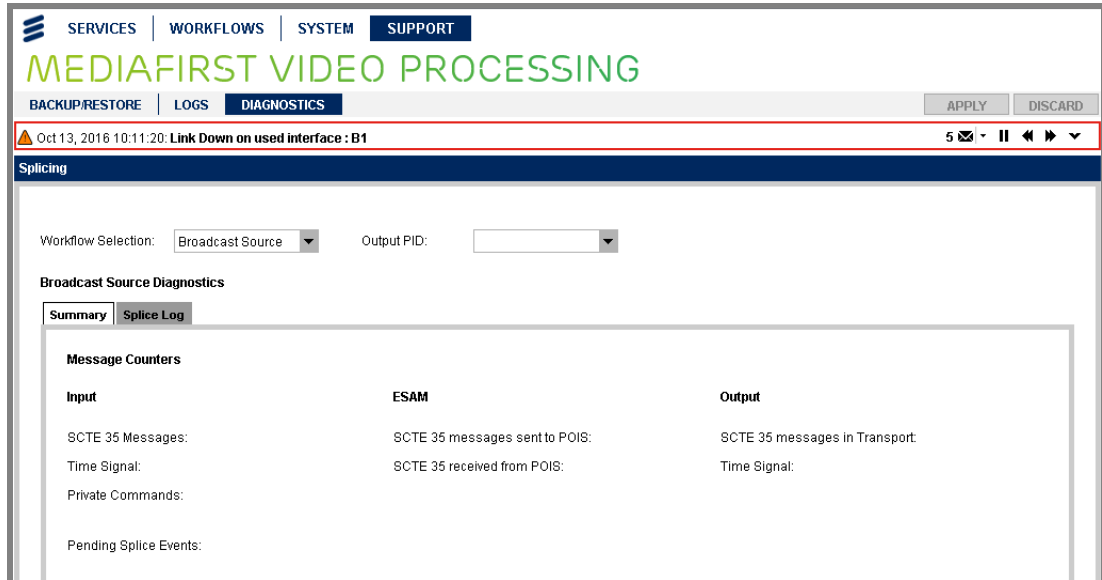


Figure 5.127 SUPPORT > DIAGNOSTICS Page

Splicing Widget

The following options are provided on the **Splicing** widget:

- **Workflow Selection** – Enables selection of the workflow for debug. Further details will be displayed on the screen below, consisting of **Summary** and **Splice Log** tab pages.
- **Output PID** – Enables selection of the workflow output packet identifier (PID), if applicable, to enable the relevant debug details to be displayed below.

Broadcast Source Diagnostics - Summary Tab

Summary log details are displayed on this tab page.

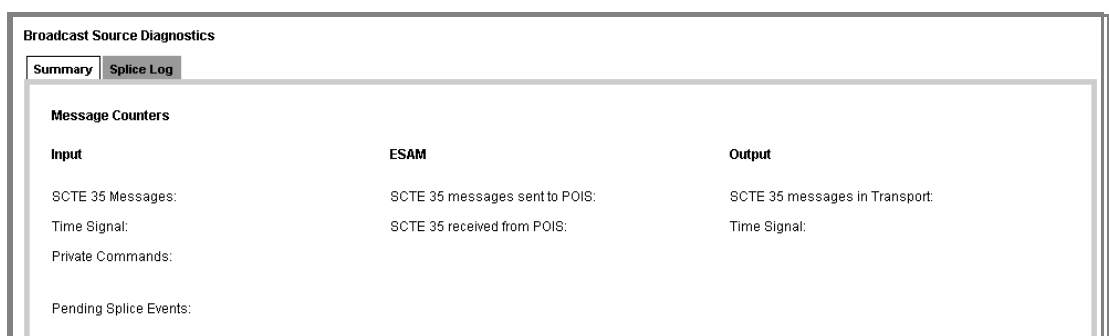


Figure 5.128 Summary Tab

The following buttons are provided on the **Summary** tab:

- **Input** – details the number of SCTE-35 messages, Time Signals, Private commands and Pending Slice Events received.

- **ESAM** – details the SCTE-35 messages sent and received to/from the Placement Opportunity Information Server (POIS) responsible for identifying and managing the splice points.
- **Output** – details the number of SCTE-35 message in the Transport and Time Signals in the Transport.
- **REFRESH** – Enables refreshing of the log information displayed on screen.

Broadcast Source Diagnostics - Splice Log Tab

Splice Log details are displayed on this tab page.

Broadcast Source Diagnostics		
<div> Summary Splice Log </div>		
Message Counters		
Input	ESAM	Output
SCTE 35 Messages:	SCTE 35 messages sent to POIS:	SCTE 35 messages in Transport:
Time Signal:	SCTE 35 received from POIS:	Time Signal:
Private Commands:		
Pending Splice Events:		

Figure 5.129 Splice Log Tab

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Networking, Redundancy and Monitoring

Chapter 6

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6.1 Introduction to Transport Streams

6.1.1 IP Encapsulation of MPEG Transport Streams

An MPEG Transport Stream has the following format.

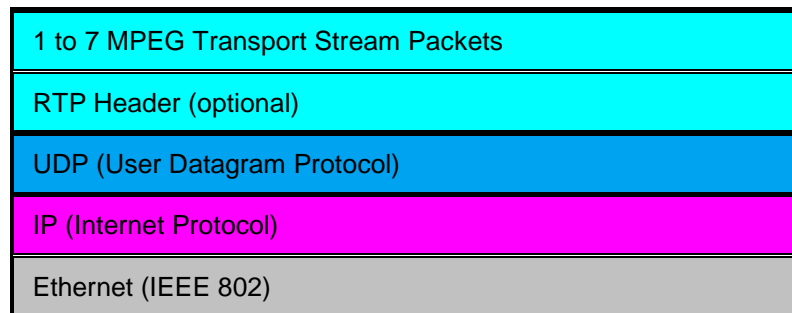


Figure 6.1 Mapping of MPEG-2 TS Packets

Between one and seven MPEG transport stream packets are carried in a UDP packet.

The UDP packet may optionally also contain an Real Time Protocol (RTP) header, which adds additional information such as a sequence number and a timestamp, which can help in the detection of packet loss across a network. The RTP header is 12 bytes long.

The UDP header is 8 bytes long.

The network layer protocol is IPV4, which adds a 20 byte header to every packet.

The physical link layer is then Ethernet at either 1000 Mbps or 10 Gbps.

6.1.2 Mapping of MPEG-2 TS Packets

The mapping of MPEG-2 TS packets into IP data frames is done according to the protocol stack shown in the following illustration.

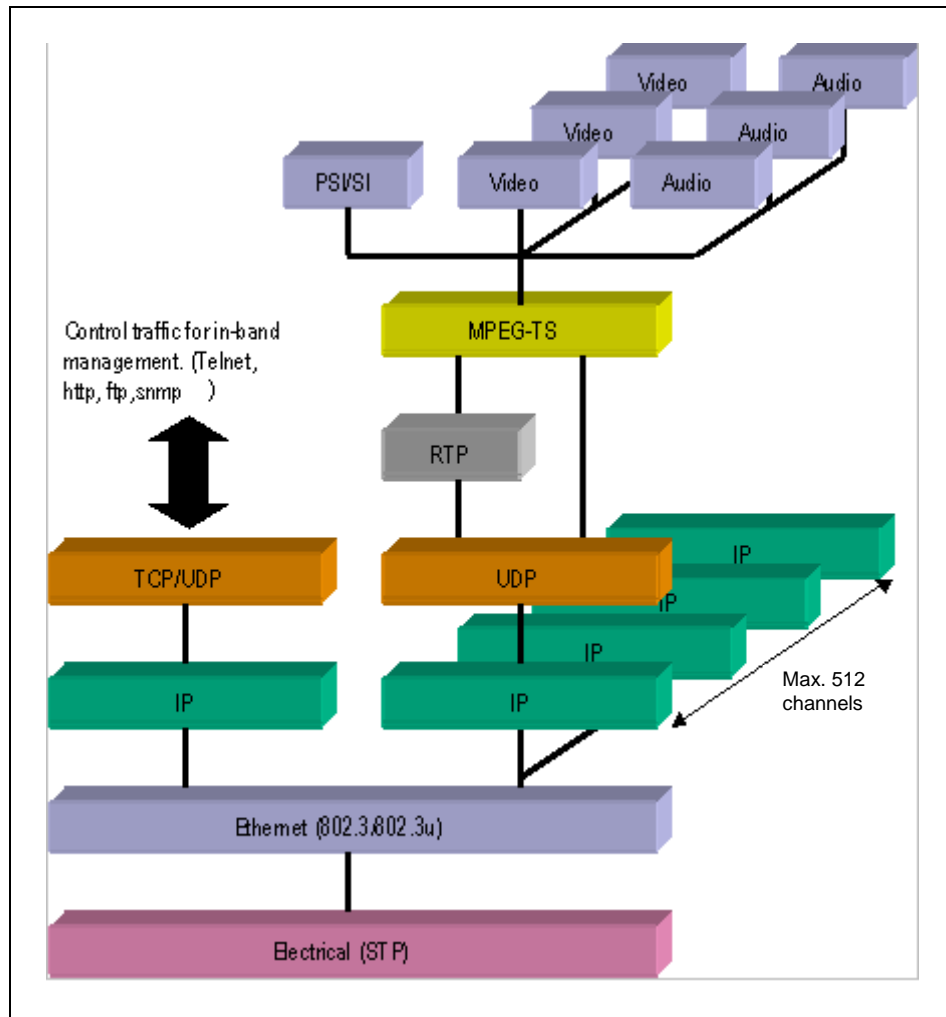


Figure 6.2 Mapping of MPEG-2 TS Packets

6.1.3 MPEG Layer

The MPEG-2/DVB layer is specified in ISO/IEC IS 13818 “Generic Coding of Moving Pictures and Associated Audio”. The main functionality of this layer is to transform MPTS (Multi-Program Transport Streams) into a number of SPTS (Single-Program Transport Streams). A Transport Stream carrying multiple programs is in this way split into a number of ‘mini’ Transport Streams, each carrying a single program. This ensures that the video can be passed through limited bandwidth links such as ADSL further down the transmission path.

6.1.4 RTP Layer

The RTP layer is optional, and will add an 8-byte RTP header to the new packet. This header contains a sequence number and a time stamp.

6.1.5 UDP Layer

The UDP layer is according to RFC768 “User Datagram Protocol”. The user can control the target UDP port number for the MPEG-2 stream. A configurable number of 188-byte long MPEG-2 TS packets are mapped straight into an UDP frame with no additional overhead. The MTU for Ethernet is usually 1500 bytes. This limits the number of MPEG-2 TS packets per UDP frame to lie within 1 to 7. The following illustration shows the mapping of MPEG-2 Transport Streams into UDP packets.

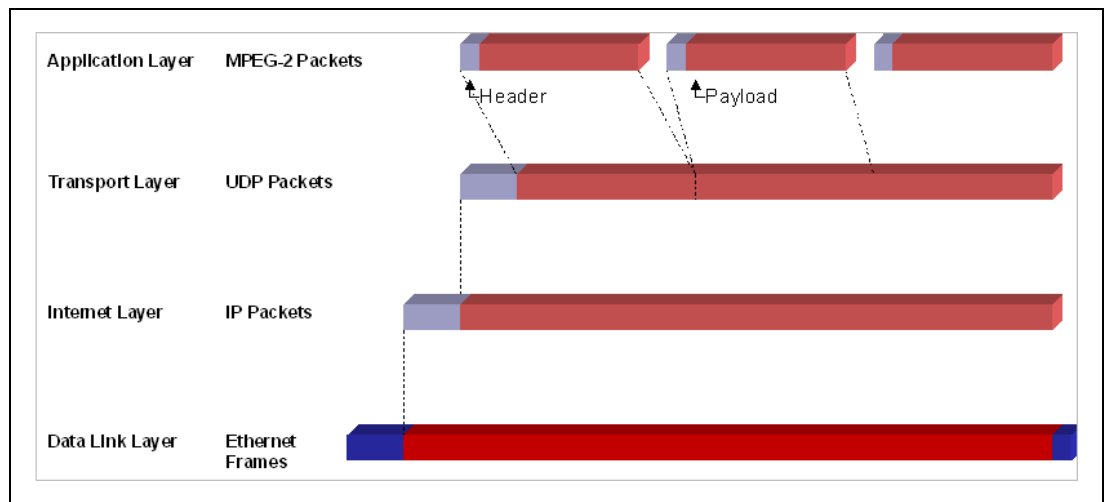


Figure 6.3 Mapping of MPEG-2 TS Packets

6.1.6 IP Layer

The IP layer is according to RFC791 “Internet Protocol Specification”. The user is allowed access to the following IP header fields: IP source address, IP destination address, Time-To-Live field, Type-Of-Service field. Performing static mapping between class-D IP addresses and the corresponding Ethernet multicast MAC addresses supports limited IP Multicasting (Type 1).

6.1.7 Ethernet Layer

IEEE 802.3an/ac-2008 (10GBASE-T 10 Gbps Ethernet over copper twisted pair maximum range 100 m using IEC 60603-7 8P8C (commonly known as RJ45) connectors and Category 6a (ANSI/TIA/EIA-568-C.1) cabling).

IEEE 802.3an/ac-2008 (1000BASE-T 1 Gbps Ethernet over copper unshielded twisted pair (UTP) maximum range 100 m using IEC 60603-7 8P8C (commonly known as RJ45) connectors and Category 5e (ANSI/TIA/EIA-568-A) cabling).

IEEE 802.3ae-2002 (10GBASE-SR 10 Gbps Ethernet over Fiber for LAN maximum range 400 m using SFP+ Connectors and Serial Multi-Mode 850 nm wavelength cabling).

IEEE 802.3ae-2002 (10GBASE-LR 10 Gbps Ethernet over Fiber for LAN maximum range 10 km using SFP+ Connectors and Serial Single-Mode 1310 nm wavelength cabling).

6.1.8 IP Overhead

The IP overhead calculation when mapping MPEG-2 TS packets into IP frames is shown in *Table 6.1*.

Table 6.1 IP Overhead

Item	Overhead factor	Comments
MPEG-2 TS	1.0	
UDP	$1324/1316 = 1.006$	UDP header = 8 bytes
IP	$1344/1324 = 1.015$	IP header = 20 bytes
Ethernet	$1358/1344 = 1.010$	Eth header = 14 bytes

Total overhead factor becomes: $1.006 \times 1.015 \times 1.010 = 1.031$ or 3.1% overhead.

Note: The number of MPEG-2 TS packets one can map down into each UDP frame is variable (between 1 and 7). Usually 7 is used for minimum overhead. This is also used in the above calculation.

6.2 Transport Streams

6.2.1 Overview

6.2.1.1 MPEG-2 Compliancy

The encapsulated Transport Stream packets (video, audio, VBI/ANC data and PCR - 188 bytes), are fully compliant MPEG-2 Transport Streams (all relevant fields completed, continuity counters, PTS/DTS, adaptation fields etc.).

6.2.1.2 Transport Streams

The system can form up to 512 output Transport Streams, with each stream mirrored on the two physical output interfaces.

Transport Streams are encapsulated in either a UDP or a UDP and RTP packet.

6.2.1.3 TS IP Output Parameters

The following parameters can be configured for a Transport Stream to be IP encapsulated and output.



Table 6.2 TS IP Output Parameters

Parameter	Value	Description
TS packets per UDP packet	1 to 7 [Default 7]	Defines the number of Transport Stream packets encapsulated in a UDP packet
TS Mode	CBR	Constant bit rate output
	No PCR	No Program Clock Reference
Output Enable	Off [Default]	IP Output is disabled
	On	IP Output is enabled if the IP destination can be resolved
Dest. IP Address	aaa.bbb.ccc.ddd	The destination IP address
Source IP Port	0 to 65335 [Default = 5500]	Source IP Port number
Dest. IP Port	0 to 65335 [Default = 5500]	Destination IP Port number
Type Of Service	0 to 255 [Default = 4]	ToS value for inclusion in the IP header
Time To Live	0 to 240 [Default = 15]	TTL value for inclusion in the IP header
Encapsulation Type	UDP [Default]	UDP encapsulation of TS packets
	RTP	UDP/RTP encapsulation of RTP Packets

6.2.1.4

Output Data Rate

The system is designed to support a maximum output data rate of 216 Mbps per Transport Stream, up to a nominal total of 2 Gbps (through licensing) per chassis.

Note: The minimum output data rate is 10 kbps.

The bit rate of each output Transport Stream can be individually controlled with a resolution of 1 kbps.

6.2.1.5

IP Port

The IP Encapsulator within the Host Card encapsulates Transport Stream packets in either a UDP or a UDP and RTP packet before transmitting them out of the assigned Data Ethernet port(s).

6.2.1.6

Service Information Tables

The Service Information (SI) tables that the system generates for each individual output Transport Stream comprises the Program Association Table (PAT) and Program Map Table (PMT) by default.



6.2.1.7 Repetition Rate

The repetition rate of Service Information (SI) packets must take into account the output Transport Stream rate, otherwise the jitter introduced by the multiplexing of packets to form the Transport Stream can lead to the SI repetition rate being too low.

6.2.2 Coded Elementary Stream

The compressed output streams from the module are in the form of MPEG-2 transport packets that have been encapsulated into a Transport Stream packet.

6.2.2.1 Output Bit Rate

The output rate of the transport packets is derived from the 27 MHz reference clock and is accurate to within 1 kbps of the configured transport bit rate.

The host supports bit-stuffing to maintain configured bit rate if the operating mode requires it.

6.3 Unit Redundancy

6.3.1 Introduction to Redundancy

The following sections describe the possible operating modes, configurations and network interconnections that may be employed in a redundant system. A combination of techniques is normally required to create a working system.

The unit is capable of providing:

- **Device Redundancy** - using a hot-standby or duplicate device to protect against device failure. If a Chassis Critical alarm is asserted, the unit can hand off all transcodes to a secondary unit using a 1+1 Redundancy Setup. The unit stores a log of events such as power-on, alarm assertion and de-assertion, etc. Every event in the log has a UTC time and date stamp attached to it to a resolution of 1 second.

See *Chapter 5, Web GUI Configuration* for details of how to configure redundancy using the Web GUI.

6.3.2 Control Network Redundancy

The control network is assigned to the physical Ethernet ports **CTRL P1** and **CTRL B1**. **CTRL P1** is considered to be the primary port and **CTRL B1** the backup.

If both control ports have a link up, and Control Port Selection is set to **Automatic Redundant**, the primary port will respond to network traffic but the spare port will not. However, if the link goes down on the primary port, then the spare port will start to respond to network traffic.

6.3.2.1 Automatic Redundancy Mode

In Automatic Redundancy Mode the primary port is used as default. If the primary port link fails, control passes to the secondary port. However, if the primary port link is restored then control passes back to the primary.

6.3.3 Data Network Redundancy

The Custom Hardware 2 has four Data IO ports, arranged as two pairs. Each pair is individually configurable as an input, output or bi-directional port. Each pair is individually configurable to work standalone or as a redundant pair.

Pair 1: 2x 10GbE (10GBASE-SR/LR) on SFP+ or 2 x 10GbE/1GigE (10GBASE-T/1000BASE-T) on RJ45, as a data input, output or input/output port. Redundancy is only available in input/output configuration for SFP+.

Pair 2: 2x 10GbE / 1GigE (10GBASE-T/1000BASE-T) on RJ45 as a data input, output or input/output port.

Each port may have a different IP address, MAC address, subnet mask and default gateway, providing output network redundancy. Both ports are Active

If both ports are configured to be on the same subnet, only one port will respond to ICMP messages.

The data ports can raise an alarm during abnormal operational conditions, see *Chapter 8, Preventive Maintenance and Fault-finding*.

6.3.4 Same Network Mode

In a Same Network Mode (also known as a Same Subnet Mode), both interfaces are connected into the same network segments and must be isolated at the L2 level. In this mode, every multicast uses a common virtual IP address for both interfaces. Both interfaces use the same subnet mask and gateway IP address.

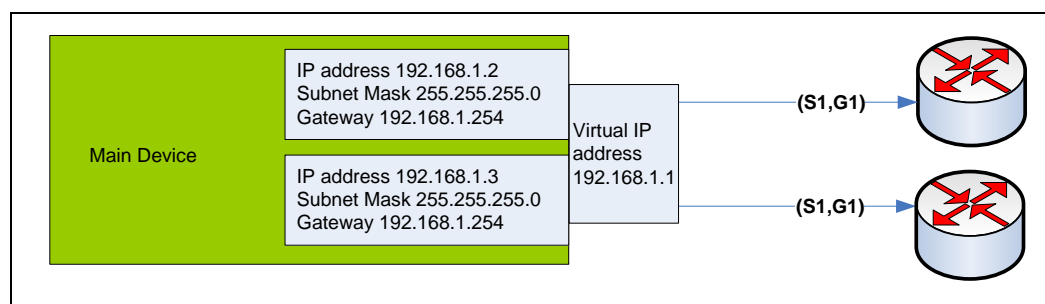


Figure 6.4 Interface Addressing - Same Network Mode

The Internet Group Management Protocol (IGMP) join is made using the physical interface.

Note: Redundant pairs of control interfaces only support same network mode and active/standby mode.

6.3.5 Active/Active Port Mode

An Active/Active Port Mode can be applied to output data interfaces. In this mode, the interfaces are either transmitting or receiving simultaneously.

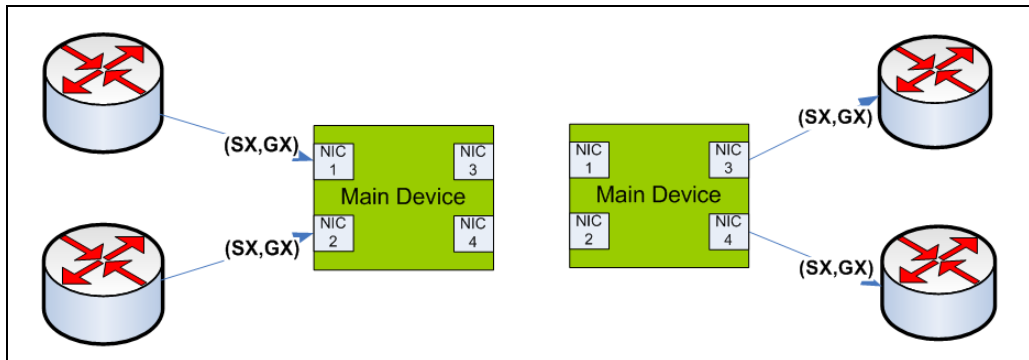


Figure 6.5 Interface Addressing – Active/Active Port Mode

Active/Active interfaces maintain a virtual MAC and virtual IP address at all times.

Automatic failover and automatic revert features are not required on Active/Active interfaces.

6.4 Device Redundancy

6.4.1 Standalone (No Redundancy)

In a Standalone system there is no protection against failure of the device. In the event of a device failure the output profiles will be lost and streaming will be interrupted.

This configuration can only use IP Interface Redundancy, described previously, to provide protection against a network delivery failure.

6.4.2 Dual Active

Dual active means two units running identical configuration and both units are active at the same time. unit does not currently support automatic mirroring of configuration hence, for dual active operation, both units must be individually configured.

6.4.3 Transparent Addressing

Transparent addressing is a method by which all intermediate node addresses are spoofed, so the client and server see each other's addresses and port configurations as if there were no intermediate nodes.

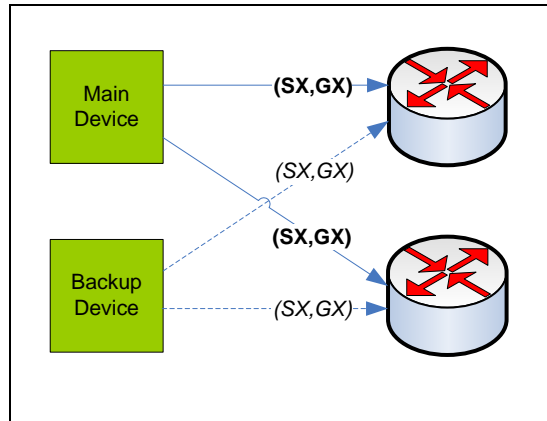


Figure 6.6 Transparent Addressing in Device Redundancy

In normal operation, the main device transmits and the backup device is offline. Main and backup devices will transmit using the same source and destination addresses. Duplicate address protection is provided by either MGP or VLAN control.

The backup device is reconfigured on a redundancy switch. The downstream device does not need to be reconfigured on a redundancy switch.

6.4.4 1+1 On-air/Off-air Device-level Redundancy

The unit supports self-managed 1+1 On-air/Off-air device-level redundancy. This employs the concept of a 1+1 redundant pair, where one device is the on-air device (transmitting) and the other one is the off-air device (not transmitting).

Each device will need to be individually configured with platform-specific settings including physical and pairing IP addresses. This can be achieved through each device's Web GUI (see section 5.4.6).

When the pairing process is complete, workflow configurations need only be configured on the on-air device through its Web GUI. The on-air device will push these configurations to its paired off-air device automatically. The paired devices constantly monitor each other's health and are able to perform an autonomous redundancy switch if a failure occurs. In the event of the on-air device raising a critical alarm or it fails to respond to a health poll, an autonomous switch to the off-air device may result, depending on the status of the off-air device.



6.5 Temperature Monitoring

6.5.1 Host Card Monitoring

The die temperatures of the main components on the Host Card are monitored, to an accuracy of ± 2 °C. If temperature thresholds are exceeded, an alarm is automatically generated.

6.5.2 Option Card Monitoring

Option Cards also monitor the die temperature of their main components to an accuracy of ± 2 °C. If temperature thresholds are exceeded, an alarm is automatically generated.

See *Chapter 8, Preventive Maintenance and Fault finding* for further information.

6.6 Simple Network Time Protocol (SNTP)

The unit can obtain the current time from a network time server using SNTPv4 (RFC 4330) and is capable of working with Microsoft Windows Time, (SNTP as defined in RFC 1767).

6.6.1 Real Time Clock

The Host Controller card has a real time clock, which is battery powered when the chassis is unpowered, so that the time and date is maintained. This clock is designed to be accurate to ± 1 minute per month. The battery is capable of powering the clock for over two years. See *Clock and Timing on page 6-14*.

6.6.1.1 SNTP Time Server

If an SNTP Time Server is selected, and communications are established with it, then the unit uses the time obtained to correct the system's real time clock, and the user cannot set the clock.

If a time server has been configured, but it fails to respond, then an 'SNTP Server Failed To Respond' alarm is generated.

An SNTP server can be configured to update the clock and calendar or else the user can update the time and date. Any changes to the time and date are recorded in the system log.

The real time clock is used to set the time and date when the unit is started, but then its own time and date is maintained, unless a change to the time and date parameters occur, when it will be updated to the new settings.

The system can set or correct its system clock from information received from an SNTP Time Server. More specifically it supports SNTP V4 and also Microsoft Windows Time (W32Time), which means that it supports NTP V3.

The user can enter the IP address of the SNTP server to be used, the **default address is 000.000.000.000**, which indicates to the system that no SNTP server has been defined, and therefore SNTP is disabled.

If an SNTP server is defined, and it fails to respond, then an **SNTP Server Timeout** alarm will be raised. This alarm will be de-asserted either when an SNTP response is received, or the SNTP functionality is disabled.

6.7 Simple Network Management Protocol (SNMP)

6.7.1 Supported Protocols

SNMP versions 1, 2c and 3 are supported, primarily for alarm trap handling. The General Ericsson Television MIB is also supported.

Note: The unit does not support control via SNMP, all remote control is via HTTP or HTTPS.

6.7.2 Operation

The unit's SNMP functionality can be enabled or disabled, with up to five IP addresses assigned for any SNMP Trap message to be sent. The default is 000.000.000.000, which causes the SNMP traps to be sent to the last SNMP master. The SNMP community name can also be set.

The user can control which SNMP traps are generated. The options are:

- Start Messages only
- Fail and Start Messages only
- All Traps

Table 6.3 SNMP Interface Parameters

Parameter	Description
SNMP Read Community	The SNMP community name for read access. default = public.
SNMP Write Community	The SNMP community name for write access. default = private.
SNMP Location	Textual description of the location of the unit.
SNMP Contact	Name of the person responsible for this unit.

Parameter	Description
SNMP Trap Community	The SNMP community name for read access. default = private.
SNMP Trap Destination	The destination IP address for SNMP trap messages. Up to five destinations can be defined, but by default none are assigned.
SNMP Trap Alarm Level	Defines what events trigger the generation of an SNMP trap message. The options are: 'Start Messages Only', i.e. only system start up events. 'Fail and Start Messages only' i.e. start-up events and critical alarms. 'All traps' i.e. start-up events and all alarms and warnings.

6.8 Clock and Timing

The Host Controller card has a real time clock, which is battery powered when the chassis is unpowered, so that the time and date is maintained. This clock is designed to be accurate to ± 1 minute per month. The battery is capable of powering the clock for over two years.

6.8.1 User Configurable Parameters

The user configurable parameters associated with the clock are defined below

Table 6.4 Clock Configurable Parameters

Parameter	Values	Description
Local Time	hh:mm:ss	Current local time in hours minutes and seconds
Local Date	dd:mm:yyyy	Current date in day month and year



Options, Licensing and Upgrades

Chapter 7

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BLANK

7.1 Introduction

This chapter describes the removal and replacement of options. It also describes the procedure for obtaining licenses and how to upgrade your unit.

7.1.1 Available Options for the Custom Hardware 2

The functionality of the unit depends on additional hardware (Option Cards) fitted to the unit in the six slots at the rear of the unit, and the software (licenses) that are installed and enabled.

For an up-to-date list of Option Cards and licenses supported at this release, see the relevant Product Guide on the Ericsson website:

<http://www.ericsson.com/ourportfolio/products/television-and-video>

7.1.2 Available Slots and Slot Numbering

The Custom Hardware 2 provides six slots for Option Cards (modules). Only Option Cards specifically designed for the unit, and supported by the current software release, should be fitted.

The numbering of Option Card slots on the unit is shown in *Figure 7.1*.

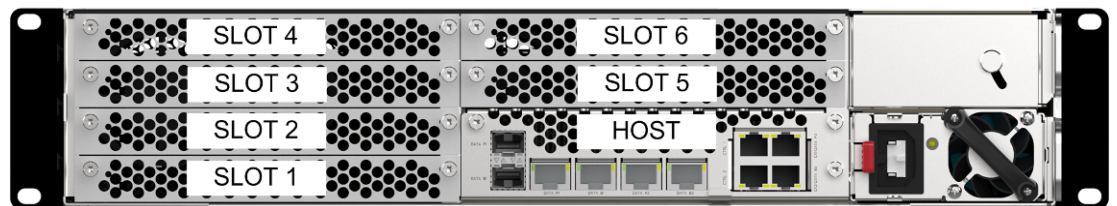


Figure 7.1 Option Card Slot Numbering

7.2 Removal and Replacement of Option Cards

This section describes the handling of Option Cards as they are inserted or removed from the unit.

7.2.1 Handling Option Cards



Caution!

Care must be taken to when inserting or withdrawing Option Cards to avoid damage to components.

Option Cards must be kept orthogonal, i.e. at 90 degrees to the unit, to avoid catching underside components on the chassis.

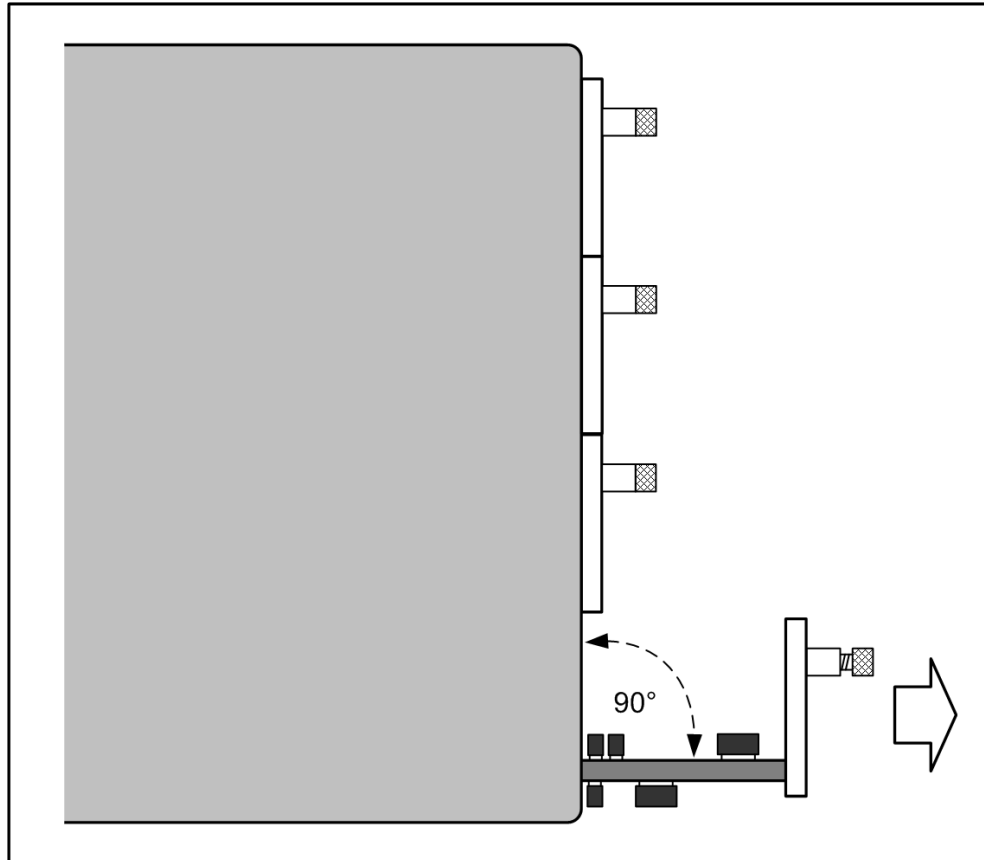


Figure 7.2 Inserting and Withdrawing Option Cards



Caution!

Do not plug in Option Cards with excessive force as this may result in damage to the card connector or other components. If any significant resistance to inserting a card is felt, withdraw the card slightly and check for obstructions.

7.2.2

Electrostatic Discharge



Warning!

Static electricity can damage electronic components. To avoid damage, keep Option Cards in their static-protective package until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Where possible ensure that antistatic protection is worn (for example an earthed antistatic wrist strap, an ankle or heel strap).
- Handle cards carefully, holding them by edges or rear panels.

- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the cards where others can handle and possibly damage them.
- While the card is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body).
- Remove the card from its package and install it directly into your base chassis without setting it down. If it is necessary to set the card down, place it in its static-protective package.
- Take additional care when handling cards during cold weather, because heating reduces indoor humidity and increases static electricity.

7.2.3 Installing a New Option Card

A new Option Card can be inserted when the unit is powered off or on. When inserted and powered, the unit will determine the card capabilities and make it available for configuration. Initially a default set of parameters will be in place. As long as there are licenses available for the features required, the card can then be configured and used immediately.



Caution!

To avoid damaging the Option Card, always handle carefully (see *section 7.2.1*) and avoid electrostatic discharge (see *section 7.2.2*).

To install a new Option Card:

1. Remove the blanking plate from the slot in which the new Option Card is to be fitted.
2. Carefully remove the new card from its anti-static package, and insert it in to the base unit, slotting the Option Card edges in to the card guides.
3. Push the card home, so that the rear panel is flush with the rear of the base unit.
4. Tighten the two captive retaining screws.
5. When the chassis detects a new card fitted, it will be displayed on the **Dashboard**, and an alarm will be raised. If all options are reported correctly, the **Accept Hardware Configuration** needs to be applied. This will accept the new hardware configuration and clear the alarm.

7.2.4 Removing an Option Card



Caution!

To avoid damaging the Option Card, always handle carefully (see *Section 7.2.1*) and avoid electrostatic discharge (see *Section 7.2.2*).

To remove an Option Card:

1. Loosen the two captive screws that retain the Option Card in the base unit.
2. Holding the captive screws, pull the card from the unit and place it in suitable anti-static packaging.
3. Fit a blanking panel in place of the removed card.
4. When the unit detects a card is no longer present, it will be displayed on the **Option Slots** web page, and an alarm will be raised. If all options are reported correctly, the **Accept Option Slot Configuration** needs to be applied. This will accept the new hardware configuration and clear the alarm.

7.2.5 Replacing (Hot-Swapping) an Option Card

An Option Card can be replaced without powering down the base unit, i.e. can be 'hot-swapped'. This will cause services to be allocated to other cards, enabling the removal of the card being replaced. In this way, essential maintenance can be carried out with minimum disruption. To perform a hot-swap, the Option Card should only be unplugged or inserted when the unit is fully booted and configured.

Only ONE Option Card should be 'hot-swapped' at a time, to prevent problems due to inrush current, and to ensure that the host recognizes and configures the new card. If more than one card is being fitted, a wait time of approximately 10 s is recommended between inserting each one.



Caution!

To avoid damaging the Option Card, always handle carefully (see *section 7.2.1*) and avoid electrostatic discharge (see *section 7.2.2*).

The process to replace (hot-swap) an Option Card:

1. Disconnect any cables from the card to be replaced.
2. Loosen the two captive screws that retain the Option Card in the Base Unit.
3. Holding the captive screws, pull the card from the unit, (observe the handling precautions).
4. Carefully remove the replacement card from its anti-static package, and insert it in to the base chassis, slotting the card edges in to the card guides.

5. Push the card home, so that the rear panel is flush with the rear of the base chassis.
6. Tighten the two captive retaining screws.
7. Connect any external cables to the replacement Option Card.

Note: If the replacement card is of the same type as the failed card, then it will be automatically configured to the same settings as the failed card. If the replacement card is of a different type then an alarm will be generated.

The unit regularly monitors to verify card presence and to detect if a card has been removed or added.

When a new card is inserted it will start-up and attempt to link to the host controller. When this link has been established the process of identifying the card and its capabilities begins. Once this is established, the card will be configured with the same configuration as the card that has been replaced (assuming that the replacement card has the same capabilities).

7.3 Obtaining New Licenses

The functionality of the unit depends on the hardware options fitted and the software options installed. Software options are enabled or disabled by means of 'license keys'. A license key is a string of numbers which, when downloaded to a unit, will enable a specific feature or feature set.

License keys can be purchased from your local Ericsson sales representative. License keys may be installed by the user, allowing field upgrading of units to be performed simply.

The unit comes with the Option Cards and licenses, which were ordered, already installed. All licenses are stored on the Host Card.

To verify which licenses are installed and enabled or to order new licenses, see *Chapter 3, Getting Started*.

7.4 Host Card Replacement



Caution!

Static electricity can damage electronic components. It is important that an ESD wrist strap is worn and all ESD precautions are taken during the card removal process. See *section 7.2.2* for further information.

7.4.1 Removing the Host Card & Switch Card

To remove the Host Card:

1. Using a Torx T15 driver, undo the fasteners that secure the Host Card panel to the chassis (see *Figure 7.4*). When all of the fasteners have been fully unscrewed, the Host Card can be removed.

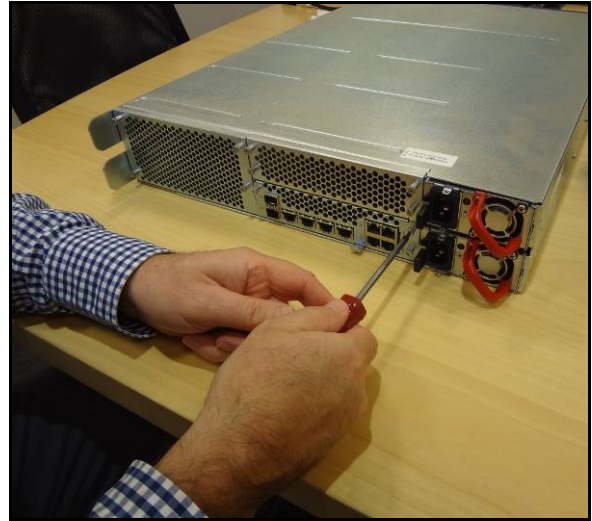


Figure 7.3 Undoing the Host Card Panel Fasteners

2. Using the tab, pull the Host Card rearward to disengage the backplane connector. This can be quite stiff as there are lots of connections to the backplane. If it cannot be removed by pulling on the tab then it can be gently prised out, using a long flat blade screwdriver (see next step).

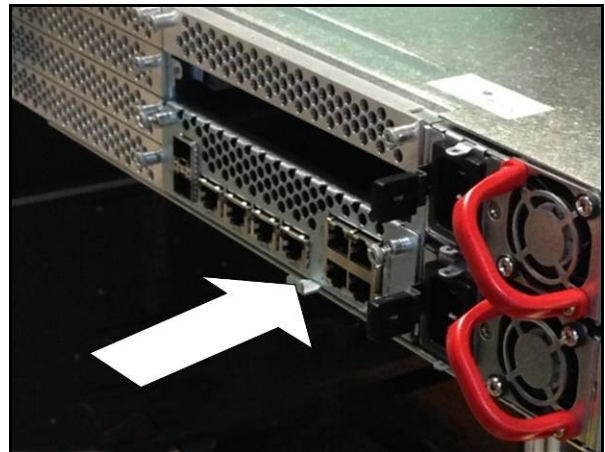


Figure 7.4 The Host Card Tab



Caution!

Take care to avoid damaging the card and chassis if prising the Host Card using a screwdriver. Always use a protective block to spread the load of the screwdriver and avoid damage to the panel.

3. To prise out the Host Card, place a block of wood against the panel above the Host Card (see *Figure 7.5*). Then, using a long flat blade screwdriver, prise out the Host Card by placing the end of the screwdriver in the tab and pushing against the block. This only needs to be done until the card and backplane connectors are pulled apart (about 5mm).

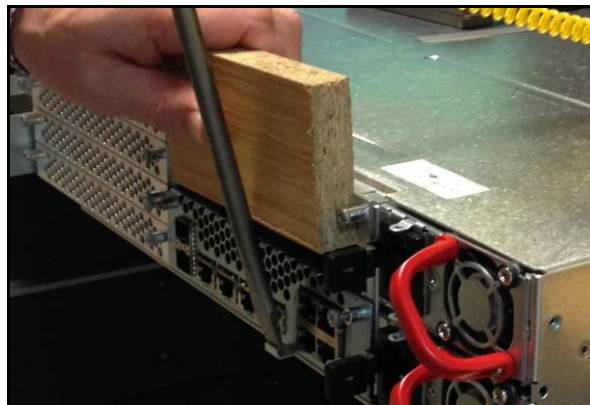


Figure 7.5 Prising Out the Host Card Panel



Caution!

Take care when removing the Host Card to avoid damaging the components.

4. Pull on the tab to remove the Host Card (see *Figure 7.6*) and carefully place to one side. Be careful not to pull on the top of the panel. The panel can be held at the ends to aid removal if necessary. When the Host Card is removed, place it into an antistatic bag.



Figure 7.6 Removing the Host Card

5. Remove the Blank Panel or Option Card fitted above the Host Card (see *Figure 7.7*). For this you will also need the Torx T15 driver. You will then be able to see the Switch Card metalwork.



Figure 7.7 Removing the Blank Panel or Option Card

6. Pull on the handle of the metalwork and slide out until the metal is free from the internal card guides (see *Figure 7.8*). At this point the metalwork must be dropped down so that the PCB does not interfere with the chassis metalwork.

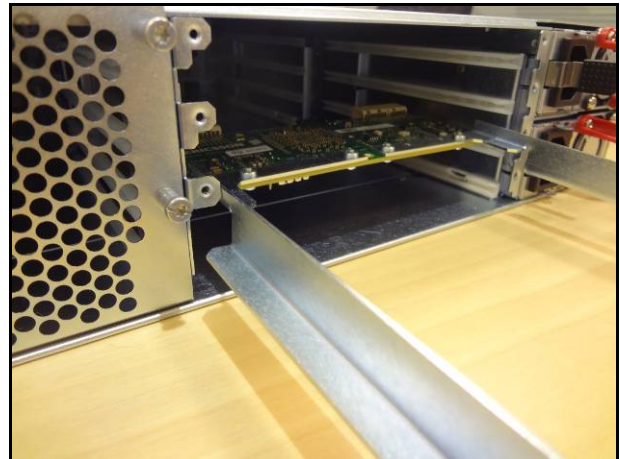


Figure 7.8 Slide out the Metalwork

7. When the PCB is below the bottom fixing lug it can be removed (see *Figure 7.9*). When the Switch Card is removed, place into an antistatic bag.

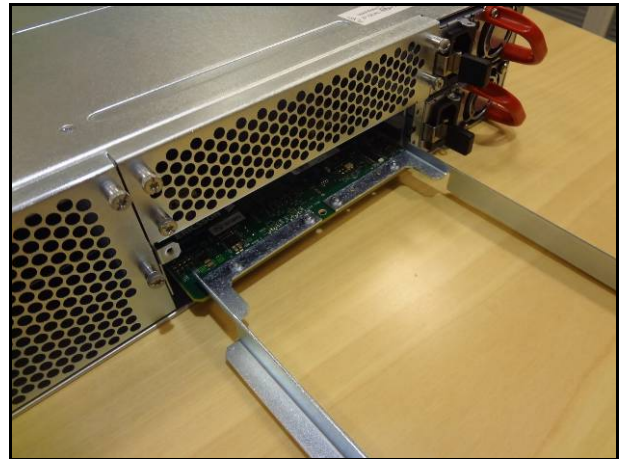


Figure 7.9 Removing the PCB

7.4.2 Inserting the Host Card & Switch Card

To insert the cards back into the chassis:



Caution!

The Switch Card and metalwork must be fitted in the correct position in order to insert the Host Card correctly and to avoid damage to the cards.

1. First insert the Switch Card and metalwork assembly. This is the reverse of the removal process (see *7.4.1 Removing the Host Card & Switch Card*). Ensure that the metal runner section of the handle is inserted into the second row of guides up from the bottom. Also ensure that the PCB is pushed fully into the backplane.



Caution!

Take care when removing the Host Card to avoid damaging the components.

2. Insert the Host Card into the bottom row of guides. Ensure the PCB is kept parallel as it is inserted to avoid damage to components.
-



Caution!

Take care not to push the top of the panel as this may cause it to bend.

3. When the Host Card connectors are mated with the backplane, push firmly on the bottom of the panel so that there is no gap between the panel and the chassis.

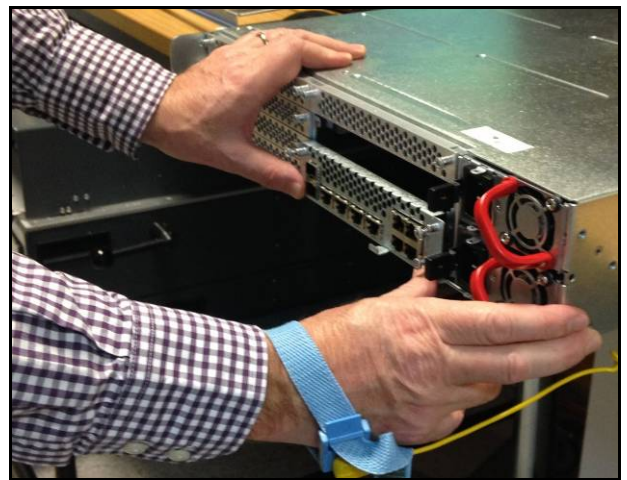


Figure 7.10 Inserting the Host Card

4. Tighten the bottom right fastener first and ensure that all panel fasteners are properly fitted and tightened.

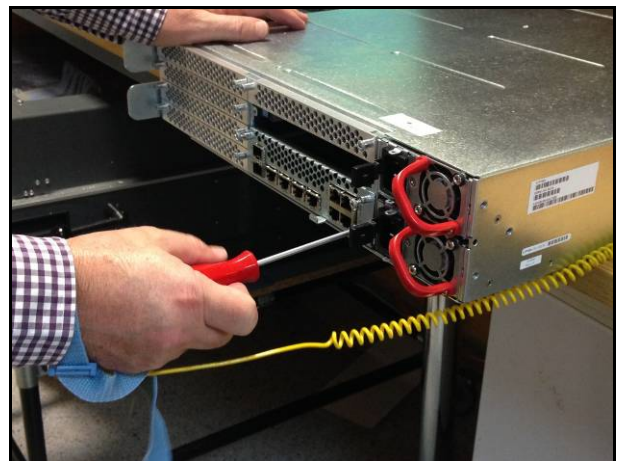


Figure 7.11 Fixing the Panel

7.5 Installing Software and Firmware Upgrades

7.5.1 Upgrading Using the Supplied Files

New software and firmware versions for your Custom Hardware 2 may be supplied, enabling you to upgrade your unit(s) to install bug fixes or add new functionality.

To install a firmware upgrade:

1. Contact your Ericsson representative and specify the upgrade required plus the serial numbers of your unit(s).
2. Your upgrade will be supplied as an EXE file. This is a wizard that will guide you through the installation procedure.
3. Save the file to your computer.
4. Run the EXE file (by double-clicking on it) and follow the on-screen instructions to install the upgrade.

Note: When the software is upgraded, or configurations imported, checks are performed on the equipment's configuration. If there are PID or service ID clashes for output Transport Streams, valid values will automatically be used to enable the configuration to work. Always check the PID and service ID values after performing such an operation.

In the event of a failed upgrade, please contact Customer Support for assistance.

7.5.2 Upgrading Using the Mini-USB

Upgrading is also possible from the front panel USB connector (using a mini-USB adaptor).

To install an upgrade:

1. Contact your Ericsson representative and specify the upgrade required plus the serial numbers of your unit(s).
2. Plug the USB device in with the upgrade files located at the root. The upgrade files will be automatically detected.
3. Follow the on-screen instructions at the front panel display to install the upgrade.

In the event of a failed upgrade, please contact Customer Support for assistance.



Preventive Maintenance and Fault-finding

Chapter 8

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8.1 Introduction

This chapter details the schedules and instructions, where applicable, for routine inspection, cleaning and maintenance of the equipment which should be performed by an operator. It also details basic fault-finding procedures.

8.2 Preventive Maintenance

8.2.1 Routine Inspection

Check cooling fan operation regularly. The fans are temperature controlled so may not be on if the ambient temperature is low. Refer to *Annex B, Technical Specification* for more information.

Note: Failure to ensure a free flow of air around the unit may cause overheating. This condition is detected by a temperature sensor on the Host Card or an Option Card and causes the alarm to be raised.

8.2.2 Cleaning



Caution!

Do not use liquid cleaners or aerosol cleaners.

Unplug the unit from the wall outlet before cleaning the exterior with a damp cloth. Do not use liquid cleaners or aerosol cleaners.

Note: Only the exterior of the case should be cleaned.

8.2.3 Servicing

8.2.3.1 Damage Requiring Service



Warning!

Do not remove the top cover of this equipment. Hazardous voltages are present within this equipment and may be exposed if the top cover is removed. Only Ericsson trained and approved service engineers are permitted to service this equipment.

Unplug the equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:



- When the power supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the product.
- If the product has been exposed to rain or water.
- If the product does not operate normally by following the operating instructions.
- If the product has been dropped or the case has been damaged.
- When the product exhibits a distinct change in performance.

8.2.3.2 Replacement Parts

When replacement parts are required, be sure the service technician has used parts specified by the manufacturer or which have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

8.2.3.3 Checks on Completion of Servicing

Upon completion of any service or repairs to this product, ask the service technician to perform electrical safety checks to determine that the product is in a safe operating condition. Also, performance and EMC checks may be required.

8.3 Maintenance and Support

8.3.1 Introduction

Backed by global presence, proven expertise and competence in life-cycle management, Ericsson offers the best available support for your investment. Our global team of technical support personnel, field service engineers and system specialists are dedicated to helping you maintain the highest levels of product and system availability.

Our Services personnel are the best in the world at solving video compression and delivery problems whenever they arise, 24 hours a days, 365 days a year.

Our support services are designed to help our customers manage risk and reduce their total cost of ownership. We offer support packages that satisfy our customers' operational needs, business requirements and budget.

8.3.2 Warranty

All Ericsson products and systems are designed and built to the highest standards and are covered under a comprehensive 12-month warranty.

8.3.3 Service Level Agreements

Customers may choose one of several Support packages, either as an enhancement during the standard 12-month warranty or as an extension after the warranty has expired.

For standalone equipment, customers may choose either Ericsson's **Extended Hardware Warranty** or **Secure Basic Support**. Extended Hardware Warranty provides hardware repair of covered equipment after the expiration of the standard warranty. Secure Basic Support provides hardware repair, remote diagnostics and support, and 24x7x365 remote support for emergencies.

For systems, along with Secure Basic Support, customers have the option of either **Secure Advanced Support** or **Secure Superior Support**. These support packages provide higher committed response and resolution times, onsite support where necessary, service performance review and a host of other proactive services to help you get the maximum return on your investment in Ericsson solutions.

Call Ericsson Sales for more details.

8.4 Alarms

8.4.1 Alarm Monitoring

Active Alarms

The alarm status of the unit is available on the **Active Alarms** tab of the **Alarms** widget on the **Dashboard**. All currently active alarms are displayed, along with details of the time and date that the alarm was raised, the severity and description of the alarm and which module the alarm is associated with.

Alarm History

A complete history of all alarms raised and cleared since the last power cycle is displayed on the **Alarm History** tab of the **Alarms** widget on the **Dashboard**.

Alarm Masking

The severity of the currently active alarms and those displayed on the History tab can be edited if required. For this, open the required alarm, and change the severity to be a warning, minor, major, critical or masked.

Note: If the alarm is masked it will not be displayed on any of the reporting interfaces, and will not produce an SNMP trap message.
















Alerts are GUI based only (indicate a field has been entered incorrectly for example). Alerts don't generate SNMP traps or get used as a basis for a redundancy switch.


















See *Chapter 3, Getting Started* for details of how to monitor alarms on the Front Panel and web GUI pages.














8.4.2 Alarm Messages and Default Severity















The default settings for alarm severity are shown in *Table 8.1*. Alarm severity is displayed and can be modified, if required, on the **Workflows > Alarm Overrides** web page. See *Chapter 5 Web GUI Control* for details.











Table 8.1 Default Alarm Severity

Alarm Message	Severity	Description
Temperature Over Warning	 major	Check fan operation. Unit may fail soon
Temperature Over Critical	 critical	Check fan operation. Unit failure imminent, consider shutting down.
Ambient Temperature Warning	 major	Ambient temperature too high, move unit to a cooler environment.
Transport Stream Disabled	 warning	Check the configuration has enough bandwidth licenses available
Destination Unicast Address Unreachable	 warning	A transport stream's configured unicast destination address cannot be reached. Check that the address is correct, and that your network is correctly configured.
Link Down on used interface	 major	The interface quoted is in use by the chassis, but is link down (no connection). Check your network
Link Down on unused interface	 minor	The interface on the chassis, but not currently in use, is link down (no connection). Check your network
Chassis Licensed Bitrate Exceeded	 major	The maximum bit rate allowed by the purchased license for the chassis has been exceeded.
Control IP Address Conflict Failure	 major	The control IP address is clashing with another unit on the network. Try finding the rogue unit or changing the control address.
Control IP Address Conflict Defending	 major	The control IP address is clashing with another unit on the network. Try finding the rogue unit or changing the control address.
Control Connection Down	 major	The control IP connection has failed. Check your network.
Control Link 1 Down	 major	The control IP link 1 has failed. Check your network.
Control Link 2 Down	 major	The control IP link 2 has failed. Check your network.
Transport Stream Not Locked	 major	The input Transport Stream specified is present, but the unit cannot lock onto it. Check the Transport Stream does not have excessive PCR jitter or IP jitter.
Service Not Available	 critical	A requested input service cannot be acquired from the configured sources. Check your transport stream inputs.














Alarm Message	Severity	Description
Stage Decoder Input Lock	 major	The decoder on the transcode workflow failed to lock to the incoming video source. Check the source is present and contains a supported video format.
Fixed Key ECM Unavailable	 major	Check vendor settings and network connection. Check for alarms on ECMGs.
Scrambled Service Blocked	 major	This service has never had an ECM and content protection mode is enabled. Check vendor and network settings. Check for alarms on ECMGs.
Free to Air Data in Service ECM Unavailable	 major	This service has never had an ECM and content protection mode is disabled. Check vendor and network settings. Check for alarms on ECMGs.
Unable to Meet Nominal Crypto Period Duration	 warning	The Crypto Period Duration is set to a value that the vendor cannot support. Check with vendors for suitable CP duration.
ECMG exceeding max_comp_time	 warning	The ECMG took too long to respond. Check load on ECMG.
ECMG Unavailable	 major	No connection to the ECMG can be made. Check vendor settings and networking.
Simulcrypt Channel Error	 warning	See logs and check for alarms on ECMG.
Simulcrypt Stream Error	 warning	See logs and check for alarms on ECMG.
Stage Video Decoder Lock	 critical	The decoder on the transcode workflow failed to lock to the incoming video source. Check the source is present and contains a supported video format.
Stage Missing Audio Component on Input	 major	Check the audio component on the incoming service is present.
Stage Incorrect Audio Input CODEC	 major	Check the audio component on the incoming service has an audio codec type that matches the codec type in the configuration.
Stage Audio DSP Computation Overload	 major	Reduce the number of audios used for the service, as this has exceeded the available audio capacity.
Critical Failure	 critical	Capture logs and reboot.
Stage Unsupported Audio Sample Rate	 major	The incoming audio used for transcode has the wrong sample rate. Check the incoming audio has a sample rate of 48KHz.
Stage Missing Closed Captions in Video	 minor	Check the closed captions are present on the incoming video stream
Chassis PSU Failure	 major	Check both power supplies are fitted correctly. Also check the power supply at the back of the unit does not show a red LED which suggests it is faulty.

Alarm Message	Severity	Description
Chassis PSU AC Input Failure	 major	Check the power cable is connected to the fitted power supply.
Chassis PSU Over Temperature Failure	 major	One or both of the power supplies have exceeded their operating temperature. Check the unit is not obstructed at the back of the unit, and check the ambient temperature does not exceed 50 degrees C.
Chassis PSU Fan Failure	 major	One fan or multiple fans at the front of the chassis have failed. Check the fan is rotating correctly, if not, this needs to be replaced.
Chassis PSU Over Current Failure	 major	One or more PSUs is in a failure condition. Please replace the affected PSU(s).
No Transport Streams Available	 critical	None of the source streams in use for the quoted workflow are being received by the unit. Check that the sources are still transmitting, and that the IGMP configuration of the unit matches that of the connected switch (V2 vs V3).
No response from SNTP/NTP server	 major	The unit cannot contact the SNTP server specified in the configuration. Check the SNTP configuration on the unit is correct. Check the external SNTP server is up and running.
Not in sync with SNTP/NTP server	 major	The SNTP server's time is significantly different to that of the unit. The unit will gradually pull its time towards that of the server. No action required.
Card Not Booted	 major	An option card failed to boot. Power cycle the chassis. If the problem persists, replace the card in question.
Service On Backup	 warning	A requested input service is currently being acquired from a non-primary source. This will be due to an earlier failure of the primary.
Failed to acquire license	 major	The configuration requires a license that is not present on the unit. Please check the logs to determine which license is required.
Stage Internal Failure	 critical	One option card has suffered from an internal failure. More details for the failure is specified in the unit log. Grab the log and contact customer support.
Stage Loss of Video Input	 critical	The Video Input stage between the decoder and the encoder is not locked. Check the content of the Video is decodable and the timing of the video component or buffer level are not overrunning or underrunning.
MEZZ video decode license requested but none available	 major	A 4:2:2 source is used, yet the corresponding license is not present on the unit. Check enough AVP2/SWO/MEZZ/DEC licenses are present on the chassis. Otherwise, please contact Ericsson to purchase more licenses.

Alarm Message	Severity	Description
Emm Exceeded Buffer Occupancy	 warning	EMMG is overrating, it will be disconnected from the C2. It will be prevented from connecting for 8 seconds. Check settings on vendor page and EMMG configuration.
Emm Stream Down	 warning	EMMG is not connected. Check vendor settings and EMMG configuration.
Reflex Error	 critical	An internal Reflex error has occurred where either the Apply times are incorrect, Bitrate Ranges are not fulfilled, Set Rates arrive at the wrong order or Set-Rates have Timed out. No action to be taken by the user, the error shall self recover.
Unavailable ASI interface	 critical	Ensure the ASI card is correctly installed in the chassis.
Card Resources Unavailable	 critical	The option card or a device within the option card is failing. The Software has crashed or the card has a hardware issue. The option card needs to be diagnosed.
PID Remapped	 major	No action needed, this is to inform the user a PID has been remapped on the output to avoid it clashing with existing PIDs.
Output Service Disrupted	 critical	The alarm specifies what output services are disrupted as a result of the other two alarms: "Card Resources Unavailable" or "Hardware Mismatch".
Hardware Mismatch	 critical	A card has been removed or added to the unit. Please accept the new slot configuration in the GUI System > Host Card > Accept Slot Configuration.
Stage Video Decoder Lock (Not Referenced In PMT)	 major	The Video component specified is not present on the input source. Check the source configured contains the expected component.
Stage Video Input Component Not Referenced In PMT	 major	The Video component specified is not present on the input source. Check the source configured contains the expected component.
Stage Missing Audio Component on Input (Secondary)	 critical	The Audio component specified is not present on the input source. Check the source configured contains the expected component.
Stage Missing Audio Component (Not Referenced In PMT)	 major	The Audio component specified is not present on the input source. Check the source configured contains the expected component.
Stage Missing Audio Component (Not Referenced In PMT & Secondary)	 major	The Video component specified is not present on the input source. Check the source configured contains the expected component.
Stage Audio Input Component Not Referenced In PMT	 major	The Audio component specified is not present on the input source. Check the source configured contains the expected component.

Alarm Message	Severity	Description
Stage Audio Input Component Not Referenced In PMT (Secondary)	 major	The Audio component specified is not present on the input source. Check the source configured contains the expected component.
Stage SCTE35 Input Component Not Referenced In PMT	 major	The SCTE-35 component specified is not present on the input source. Check the source configured contains the expected component.
PID conflict	 major	Change the output PID of either of the conflicted PIDs to a different value.
Transport Stream Not Present	 major	Check and confirm the TS is playing into the Unit.
Multiple Network Interface Speeds	 critical	Ensure that the unit is connected to ports running at the same connection speed.
Multiple Network Interface Speeds	 critical	None, this is an internal Alarm, which is identical to the above.
Link Down on all output interfaces	 critical	Ensure the data ports are connected to a cable or to the network.
Application Failure	 critical	The unit could not apply the configuration. Check there are no clashes in the configuration.
Duplicate Primary Source	 warning	Check Sources for a duplicated Multicast and change it.
Licensed bitrate exceeded	 major	The output bitrate exceeds that allowed by the current unit licenses. Please reduce the configured output bitrate, or purchase more licenses.
CA link 2 down	 warning	The CA IP link 2 has failed. Check your network.
CA link 1 down	 warning	The CA IP link 1 has failed. Check your network.
CA Connection Down	 critical	The CA IP connection has failed. Check your network.
CA IP Address Conflict Defending	 minor	The CA IP address is clashing with another unit on the network. Try finding the rogue unit or changing the CA address.
CA IP Address Conflict Failure	 critical	The CA IP address is clashing with another unit on the network. Try finding the rogue unit or changing the CA address.
Not Booted From Requested Bank	 minor	The unit has failed to boot the requested bank, and automatically failed back to the previous one. This is likely to be the result of a partial upgrade; reapply the upgrade.
Conflicting Modes	 warning	The peer units are not configured in the same redundancy mode. Please ensure that both are configured the same way.



Alarm Message	Severity	Description
Unrecognized Card	 warning	An unsupported option card has been fitted into the chassis. Check the option card is supported in the manual.
Slow Response	 major	An option card is not responding to the host after a configuration has been applied. Please contact Ericsson support, providing unit logs.
Routing Alarm	 critical	The unit configuration exceeds the capabilities of the hardware. Please ensure that the cards have all booted successfully.
Version Mismatch	 minor	Part of the unit has not upgraded correctly. Run the upgrade utility once again. If the problem persists, check the option cards are all lit with a green LED at the back of the unit. If not, consider replacing the option card.
Secondary is active	 minor	A 1+1 redundancy switch has occurred, and the secondary unit is actively outputting. Determine why this switch has occurred (check alarms on primary). Reverting to primary will clear this alarm, but is not necessary.
Primary not active	 minor	A 1+1 redundancy switch has occurred, and the secondary unit is actively outputting. Determine why this switch has occurred (check alarms on primary). Reverting to primary will clear this alarm, but is not necessary.
Both units active	 major	Both control and data network contact has failed between the 1+1 pair, so both units are outputting. Please check your network connections.
Push configuration failed	 major	1+1 pair configuration are out of sync, due to a failure to apply on the peer unit. Consider rebooting the peer unit.
Peer set mode failed	 major	In a 1+1 pair, the peer unit failed to change output mode. Consider rebooting the peer unit.
Set mode failed	 major	In a 1+1 pair, the current unit failed to change output mode. Consider rebooting the current unit.
Conflicting roles	 major	The peer units are configured in the same redundancy role. Please ensure that there is one primary and one secondary unit.
Parameters not available	 major	The peer unit is not responding to redundancy requests. Check control network connections.
Peer unreachable	 major	The peer unit is not contactable. Check control network connections.



8.4.3 Alarms - Option Cards

The Option Cards self-monitor for correct operation and correct any inconsistencies it finds. This includes the resetting of malfunctioning sub-systems or the whole card if necessary. The cards attempt to maintain correct operation to minimize the effects of faults. All such actions are reported through the alarms/status/logging back to the Host Card.

The Host Card monitors all responses back from the Option Cards and resets it if appropriate. This includes initiating redundancy switches if this results in limiting the error period. All actions are logged by the Host Card. All masking of alarms is handled by the Host Card.

8.5 Fault-finding

8.5.1 Fault-finding Philosophy

It is the objective of this section to provide sufficient information to enable you to rectify apparent faults or else to identify the suspect module, where possible. Some basic procedures are provided to follow in the event of a suspected failure. It is assumed that fault-finding has already been performed at a system level and that other equipment units have been eliminated as the possible cause of the failure.



Warning!

Do not remove the top cover of this equipment. Hazardous voltages are present within this equipment and may be exposed if the top cover is removed. Only Ericsson trained and approved service engineers are permitted to service this equipment.



Caution!

Do not remove the top cover of this equipment as this may invalidate any warranties. Unauthorised maintenance or the use of non-approved replacements may affect the equipment specification and invalidate any warranties.

This Reference Guide does not include any maintenance information or procedures that would require the removal of the top cover.

If the following information fails to clear the abnormal condition, call a Service Engineer or contact Customer Services using the information given in the preliminary pages of this Reference Guide.

8.5.2 Preliminary Checks

Always investigate the failure symptoms fully, prior to taking remedial action. Fault diagnosis for the equipment operator is limited to the following tasks, since the operator should **NOT** remove the covers of the equipment:

1. Check the front panel and web GUI alarm indications to specify the nature of the fault.
2. Confirm that the equipment hardware configuration is suitable for the purpose and has been correctly installed and connected (see *Chapter 2, Installing the Equipment*).
3. Confirm that inappropriate operator action is not causing the problem, and that the equipment software set-up is capable of performing the task being asked of it. If the validity of the configuration, set-up or operation is in doubt, check it (see *Chapter 5, Web GUI Control*).
4. Check that the fans are unobstructed and working correctly.

When the failure condition has been fully investigated, and the symptoms are known, proceed with fault-finding according to the observed symptoms. If the fault persists, and cannot be rectified using the instructions given in this Reference Guide, contact Customer Services. Switch off the equipment if it becomes unusable, or to protect it from further damage.

8.5.3 Power Supply Problems/Unit Not Working

If the unit Status LED is unlit, fault-find the problem as detailed in *Table 8.2*.

Table 8.2 Power Supply Problems/Unit Not Working

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Confirm Status LED. Is the unit working but the display inactive?	If the unit is clearly working normally then the front panel may be at fault. Call a Service Engineer.	Proceed to next step.
2	Check Power Source. Connect a known-working piece of equipment to the power source outlet. Does it work?	The problem lies within the unit or power cable. Proceed to next step.	The problem lies with the power source. Check building circuit breakers, fuse boxes, etc. If problem persists, contact the electricity supplier.
3	Check Power Cable and Fuse. Unplug the power connector from the unit and try it in another piece of equipment. Does it work?	The problem lies within the unit. Proceed to next step.	The problem lies with either the cable itself, or with the fuse in the plug. Replace the fuse or try to substitute another cable.



Step	Action	If Result of Action is Yes...	If Result of Action is No...
4	Check PSU Module(s) and Fuse(s). Ensure the power connector is unplugged. Remove the fuse from the rear panel connector and inspect it. Has the fuse blown?	Replace the fuse with one of the correct type and rating. If the PSU still does not work, unplug the power cable and call a Service Engineer.	Possible problem with the PSU module. Call a Service Engineer.

8.5.3.1 Fuse Replacement

Please refer to the *Installation, Safety and Compliance Information for Ericsson Compression Products Reference Guide* supplied with your product for full details of how to replace the fuse in your product.

8.5.3.2 Lithium Battery

The lithium battery fitted within this product is not user replaceable and as such should only be replaced by qualified service personnel.

8.5.4 Fan(s) Not Working/Overheating

The fan speed can be reduced (set to lowest noise) at low temperatures to allow the unit to quickly attain operational temperature. In the event of overheating problems, refer to *Table 8.3*.

Note: Failure to ensure a free air-flow around the unit may cause overheating. This condition is detected by a temperature sensor; it may be used to trigger an automatic alarm.



Warning!

The fans run at high speeds. DO NOT insert objects into the front of the unit when attempting to confirm fan rotation as this may result in injury or damage to the fans and the unit.

Table 8.3 Fans Not Working/Overheating

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check Fan Rotation. Inspect the fans located at the front of the enclosure. Are the fans rotating? Check Host Card temperature and fan speeds.	Check that the unit has been installed with sufficient space allowed for air-flow (see <i>Chapter 2, Installing the Equipment</i>). If the ambient air is too hot, additional cooling may be required.	Possible break in the DC supply from the PSU module to the suspect fan(s). Call a Service Engineer.

8.5.5 Cannot Access Web GUI

In the event that you cannot access the web GUI, refer to *Table 8.4*.

Table 8.4 Cannot Access Web GUI

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check IP Connectivity. Ping the unit from another device on the same IP subnet using the device command prompt. Does the unit return the ping?	Ensure you are using an appropriate browser. See <i>Chapter 5, Web GUI Control</i> for details. Proceed to next step.	Check you have the correct IP address. See <i>Cannot Ping the Unit</i> , below.
2	Check other unit web GUIs or websites. Does the browser access other IP addresses?	There is a problem with the unit. Proceed to next step.	There is a problem with the computer you are using to access the network, or with the network.
3	Restart the Unit. Can you access the web GUI now?	Check your configuration. You may need to reload a saved configuration to restore your system.	Possible problem with the unit. Call a Service Engineer.

8.5.6 Communications (Control Port/Data Port) Alarms

The control ports can raise an alarm during abnormal operational conditions.

Table 8.5 Control Ports Alarms

Alarm	Description
Ctrl x: Link Down	No link has been established on this Ethernet Control Port.
Ctrl x: Control IP Address Conflict	Another device has responded to an ARP request for this Control port IP address.

The data ports can raise an alarm during abnormal operational conditions.

Table 8.6 Data Ports Alarms

Alarm	Description
Data x: Link Down	No link has been established on this Ethernet Data Port.

8.5.7 Cannot Ping the Unit

'Pinging' a computer is a way to check and see if a computer is on the network. Pings send a network request to a computer asking it to respond (ICMP ECHO_REQUEST).

To ping a computer from a Windows/PC machine, use the MSDOS prompt and type the command: **ping <IP address>**

A successful 'ping' consists of receiving back a copy of a short transmitted test message. The reply will display 'ping statistics' (number of packets sent and received and the time taken, in ms, to receive back those packets).

In the event that you cannot ping your unit, refer to *Table 8.7*.

Table 8.7 Cannot Ping the Unit

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check Connection at back of PC. Is the network connection connected and active?	Possible network or unit problem. Proceed to next step.	Change port/replace cable, if necessary, and check network settings.
2	Check Connection at back of unit. Is the network connection connected and active?	Possible network problem. Proceed to next step.	Change port/replace cable, if necessary, and check network settings.
3	Check network switch operation. Is the network switch connected and active?	Possible network problem. Proceed to next step.	Change port/replace cable/replace network switch, if necessary, and check network settings.

Step	Action	If Result of Action is Yes...	If Result of Action is No...
4	Check network operation. Ping other devices on the same IP subnet using the device command prompt. Can you ping other devices?	Network is operational. Possible unit problem. Call a Service Engineer.	Possible problem with IP switch, router or network. Contact your network administrator.

8.5.8 Configuration Problems

In the event that you have configuration problems, refer to *Table 8.8*.

Table 8.8 Configuration Problems

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check configuration settings. Is your configuration workable?	Proceed to next step.	Adjust settings, if necessary, using Services > Configure web page. Make sure to click the Apply button after making any changes.
2	Check Card health and allocation of resources. Have you got enough Cards fitted and operational?	Proceed to next step.	Install more Cards or try re-allocating resources and re-check.
3	Check configuration file. Have you made any recent changes to the configuration?	Upload a backup (previously saved) configuration file, or upload one from another unit performing a similar function. If this fails to restore operation, call a Service Engineer.	

8.6 SNMP Traps

8.6.1 What Is An SNMP Trap?

This feature enables a management station to be notified of significant events (including alarm events) by sending an SNMP message to a specified IP address. If you have a large number of devices, it may be impractical to poll or request information from every device. This feature enables each 'agent' on the managed device to notify the manager without solicitation. It does this by sending a message known as a 'trap' of the event.



When the SNMP trap is received, the management station displays it and the manager can choose to take an action based on the event, perhaps by polling the agent directly, or by polling other associated device agents to obtain a better understanding of the event. Trap-directed notification can result in substantial savings of network and agent resources by eliminating the need for numerous SNMP requests.

Simple Network Management Protocol (SNMP) is an application layer protocol that facilitates the exchange of management information between network devices. It is part of the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite and is defined in a set of standards (RFC 1065 - RFC 1067, RFC 1155 - RFC 1157, RFC 1213, RFC 1441 - RFC 1452, RFC 1901 - RFC 1910, RFC 2576, RFC 3411 - RFC 3418) published by the Internet Engineering Task Force (IETF).

See *Chapter 6, Networking, Redundancy and Monitoring* for details of SNMP supported protocols, operation and interface parameters.

8.7 Viewing Log Files

The log file records the events on the unit. Extracted from the unit, the log file may contain important information that can facilitate tracking down problems.

The event log is stored on the Host Controller Card (HCC). A log file is generated with a file format as defined by RFC3164. Once the log has filled the space allocated to it, the oldest entries in the log file are overwritten.

Events that are logged include power-on, power on self test (POST) results, warning and alarm assertions and de-assertions, user log ins and log outs. Any changes to the time and date are also recorded in the system log. Each event has a UTC time and date stamp appended to it, with a time resolution of one second.

See *Chapter 3, Getting Started* for details of how to generate a log file.

8.8 Importing and Exporting Configurations

Configuration-related problems may be fixed by importing a unit configuration from an earlier time. We recommend that you make a copy of your unit configuration whenever you make a major change to the unit configuration.

The current settings used by the unit can be exported as an file in XML format, which can then be saved on any digital media. This file can then be imported at a later date, if required, to restore your unit to a previous operational state.

See *Chapter 3, Getting Started* for details of how to import and export unit configurations.

8.9 Calling a Service Engineer

If you cannot resolve a problem with your equipment using the information provided in this chapter, or if you experience technical or operational difficulties, please do not hesitate to contact us to request assistance.

There is a lot of information you can give us that will enable us to diagnose your problem swiftly. When contacting us please provide the following:

- Serial number. To obtain this see the front panel **System > Versions** screen or **System > Device** web GUI page.
- Software version number. To obtain this see the front panel **System > Versions** screen or **System > Device** web GUI page.
- Configuration, both hardware and software. To obtain a copy of your current configuration, go to the **Support > Backup/Restore** web page and obtain an XML file.
- Unit logs, if relevant. To obtain these, go to the **Support > Logs** web GUI page.
- System architecture and environment.
- Description of the symptoms and what diagnosis and tests have already been attempted.
- Any external events that may be related as triggers of the symptoms. If so, at what local time?
- Wireshark IP captures, if relevant.
- System logs from any controlling application software, if relevant.

In addition to the above, please do not forget to provide us with your contact details to enable us to get in touch with you swiftly:

- Name(s).
- Telephone and fax numbers.
- Email address.
- Business address.



BLANK



Glossary

Annex A

The following list covers most of the abbreviations, acronyms and terms as used in Ericsson Manuals, User and Reference Guides. All terms may not be included in this Reference Guide.

μm	Micrometer (former name - micron): A unit of length equal to one millionth (10 ⁻⁶) of a meter.
1000BASE-T	Gigabit Ethernet networking standard interface, for transmitting Ethernet frames at up to 1 Gigabit per second. It uses copper twisted-pair interconnect. This is the most common interface for Gigabit Ethernet. Most gigabit-enabled PCs and equipment use this interface.
10GBASE-T	A 10 Gigabit Ethernet networking standard interface, for transmitting Ethernet frames at up to 10 Gigabits per second. It uses copper twisted-pair interconnect.
3:2 pull-down	A technique used when converting film material (which operates at 24 pictures per second) to 525-line video (operating at 30 pictures per second).
4:2:0	Digital video coding method in which the color difference signals are sampled on alternate lines at half the luminance rate.
4:2:2	Digital video coding method in which the color difference signals are sampled on all lines at half the luminance rate.
422P@ML	422 Profile at Main Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 50 Mbps over various mediums. Used for Contribution and Distribution applications.
ABR	Adaptive Bit Rate.
ADPCM	Adaptive Differential Pulse Code Modulation: An advanced PCM technique that converts analogue sound into digital data and vice versa. Instead of coding an absolute measurement at each sample point, it codes the difference between samples and can dynamically switch the coding scale to compensate for variations in amplitude and frequency.
ACC	Authorization Control Computer.
ADT	Audio, Data And Teletext.

AFC	Automatic Frequency Control.
AFS	Automation File Server.
AGC	Automatic Gain Control.
ALC	Automatic Loudness Control: An audio processing mode for measuring and modifying audio amplitude with the aim of changing the perceived loudness level. It uses a measurement based upon the new standards for measuring audio loudness defined in ITU-R BS.1770-2, this standard forms the measurement basis of the guidelines in EBU R128 and ATSC/A85.
AMOL I and II	Automatic Measure of Line-ups I and II: Used by automated equipment to measure programme-viewing ratings.
ARP	Address Resolution Protocol. A protocol used to "resolve" IP addresses into underlying Ethernet MAC addresses.
ASI	Asynchronous Serial Interface.
ASIC	Application-Specific Integrated Circuit: A customized chip designed to perform a specific function.
Async	Asynchronous.
ATM	Asynchronous Transfer Mode: A connection orientated, cell based, data transport technology designed for Broadband ISDN (B-ISDN). It provides a circuit-switched bandwidth-on-demand carrier system, with the flexibility of packet switching. It offers low end-to-end delays and (negotiable on call set up) Quality of Service guarantees. Asynchronous refers to the sporadic nature of the data being transmitted. Cells are transmitted only when data is to be sent, therefore the time interval between cells varies according to the availability of data.
ATSC	Advanced Television Standards Committee: An organization founded in 1983 to research and develop a digital TV standard for the U.S.A. In late 1996, the FCC adopted the ATSC standard, the digital counterpart of the NTSC standard.
AVP	Advanced Video Processor.
B3ZS	Bipolar with Three Zero Substitution: A method of eliminating long zero strings in a transmission. It is used to ensure a sufficient number of transitions to maintain system synchronization when the user data stream contains an insufficient number of 1s to do so. B3ZS is the North American equivalent of the European HDB3.
Backward Compatibility	Refers to hardware or software that is compatible with earlier versions.
BAT	Bouquet Association Table: Part of the service information data. The BAT provides information about bouquets. It gives the name of the bouquet and a list of associated services.
baud rate	The rate of transfer of digital data when the data comprises information symbols that may consist of a number of possible states. Equivalent to bit rate when the symbols only have two states (1 and 0). Measured in Baud.

BER	Bit Error Ratio: A measure of transmission quality. The rate at which errors occur in the transmission of data bits over a link. It is generally shown as a negative exponent, (e.g., 10^{-7} means that 1 in 10,000,000 bits are in error).
BISS	Basic Interoperable Scrambling System: Non-proprietary encryption from EBU (Tech3290).
Bit rate	The rate of transfer of digital data when the data comprises two logic states, 1 and 0. Measured in bit/s.
Block; Pixel Block	An 8-row by 8-column matrix of luminance sample values, or 64 DCT coefficients (source, quantized, or de-quantized).
Bouquet	A collection of services (TV, radio, and data, or any combination of the three) grouped and sold together, and identified in the SI as a group. A single service may be in several bouquets.
B-Picture; B-Frame	Bi-directionally Predictive Coded Picture/Frame: A picture that is coded using motion-compensated prediction from previous I or P frames (forward prediction) and/or future I or P frames (backward prediction). B frames are not used in any prediction.
BPSK	Binary Phase Shift Keying: A data modulation technique.
Buffer	A memory store used to provide a consistent rate of data flow.
BW	Bandwidth: The transmission capacity of an electronic line such as (among others) a communications network, computer bus, or broadcast link. It is expressed in bits per second, bytes per second or in Hertz (cycles per second). When expressed in Hertz, the frequency may be a greater number than the actual bits per second, because the bandwidth is the difference between the lowest and highest frequencies transmitted. High bandwidth allows fast transmission or high-volume transmission.
Byte-mode	Each byte is delivered separately in the ASI transport stream, with stuffing data added between the Bytes to increase the data rate to 270 Mbps. See DVB Document A010 rev. 1, Section B3.3, (ASI) Layer-2 Transport Protocol.
CA	Conditional Access: The technology used to control the access to viewing services to authorized subscribers through the transmission of encrypted signals and the programmable regulation of their decryption by a system such as viewing cards.
CAT	Conditional Access Table: Part of the MPEG-2 Program Specific Information (PSI) data. Mandatory for MPEG-2 compliance if CA is in use.
C-Band	The portion of the electromagnetic spectrum, which spans the frequency range of approximately 4 GHz to 6 GHz. Used by communications satellites. Preferred in tropical climates because it is not susceptible to fading.
CCIR	See: ITU-R.
CCITT	See: ITU-T.

Channel	<p>a narrow range of frequencies, part of a frequency band, for the transmission of radio and television signals without interference from other channels.</p> <p>In the case of OFDM, a large number of carriers spaced apart at precise frequencies are allocated to a channel.</p>
Channel Coding	<p>A way of encoding data in a communications channel that adds patterns of redundancy into the transmission path in order to improve the error rate. Such methods are widely used in wireless communications.</p>
Chrominance	<p>The color part of a TV picture signal, relating to the hue and saturation but not to the luminance (brightness) of the signal. In a composite-coded color system, the color information (chrominance, often referred to as chroma) is modulated onto a high frequency carrier and added to the monochrome-format video signal carrying the luminance (Y). In a component-coded color system, the two color-difference signals (R-Y)(B-Y) usually referred to as $C_R C_B$ (digital) or $P_R P_B$ (analogue), are used to convey color information. When $C_R C_B$ ($P_R P_B$) is added to the luminance (Y), the complete picture information is conveyed as $Y C_R C_B$ ($Y P_R P_B$).</p>
Closed Captioning	<p>A TV picture subtitling system used with 525-line analogue transmissions.</p>
CODE	<p>Create Once Distribute Everywhere.</p>
Codec	<p>The combination of an Encoder and a complementary Decoder located respectively at the input and output of a transmission path.</p>
COFDM	<p>Coded OFDM: COFDM adds forward error correction to the OFDM transmission consisting of Reed-Solomon (RS) coding followed by convolutional coding to add extra bits to the transmitted signal. This allows a large number of errors at the receive end to be corrected by convolutional (Viterbi) decoding followed by RS decoding.</p>
Composite	<p>CVBS Video Signal, 1 V_{pk-pk}</p>
Compression	<p>Reduction in the number of bits used to represent the same information. For the purposes of a broadcast system, it is the process of reducing digital picture information by discarding redundant portions of information that are not required when reconstituting the picture to produce viewing clarity. Compression allows a higher bite-rate to be transmitted through a given bandwidth.</p>
Compression System	<p>Responsible for compressing and multiplexing the video / audio / data bitstreams, together with the authorization stream. The multiplexed data stream is then ready for transmission.</p>
$C_R C_B$	<p>Digital Color difference signals. These signals, in combination with the luminance signal (Y), define the color and brightness of each picture element (pixel) on a TV line. See: Chrominance</p>
CRC	<p>Cyclic Redundancy Check: A mathematical algorithm that computes a numerical value based on the bits in a block of data. This number is transmitted with the data and the receiver uses this information and the same algorithm to ensure the accurate delivery of data by comparing the results of algorithm and the number received. If a mismatch occurs, an error in transmission is presumed.</p>

CVBS	Chroma Video Burst and Sync: An analogue Video SD resolution signal, such as NTSC or PAL.
dB	Decibels: A ratio of one quantity to another using a logarithmic scale, to give results related to human aural or visual perception. dB is a ratio of two quantities. dBm, for example, is an absolute power level, quoted as a ratio to a fixed power of 1 mW (0 dBm), typically terminated into 50 Ω (RF) or 600 Ω (audio). 0 dBmV is 1 mV across 75 Ω .
DCE	Data Communications Equipment: Typically a modem. It establishes, maintains and terminates a session on a network but in itself is not the source (originator) or destination (end receiving unit) of signals (e.g. a computer, see DTE). A DCE device may also convert signals to comply with the transmission path (network) format.
DCT	Discrete Cosine Transform: A technique for expressing a waveform as a weighted sum of cosines. Raw video data is not readily compressible. DCT is not in itself a compression technique but is used to process the video data so that it is compressible by an encoder. DCT processes the picture on an 8x8-pixel block basis, converting the data from an uncompressible X Y form (as displayed by an oscilloscope) to a compressible frequency domain form (as displayed by a spectrum analyzer). Can be forward DCT or inverse DCT.
DDS	Direct Digital Synthesiser.
Decoder	The unit containing the electronic circuitry necessary to decode encrypted signals. Some Decoders are separate from the receiver but in satellite TV broadcasting, the term is often used interchangeably as a name for an Integrated Receiver Decoder (IRD). The term IRD, or IRD / Decoder, is usually associated with satellite TV broadcasting while Cable systems are based on Converters or on Set-Top Boxes / Converters.
Decoding Time stamp	A field that may be present in a PES packet header that indicates the time that an access unit is to be decoded in the system target Decoder.
DENG	Digital Electronic News Gathering
DID	Data Identifier.
Differential Coding	Method of coding using the difference between the value of a sample and a predicted value.
DiffServ	Differentiated Services. A mechanism used on layer 3 - e.g. the IP layer - to differentiate between traffic of various types. DiffServ is based on the ToS field and provides a mechanism for the network to give e.g. video traffic higher priority than other traffic (for example Internet traffic).
DIL	Dual In Line: The most common type of package for small and medium scale integrated circuits. The pins hang vertically from the two long sides of the rectangular package, spaced at intervals of 0.1 inch.
DIN	Deutsches Institut für Normung: German Standards Institute.

Downlink	The part of the satellite communications circuit that extends from the satellite to an Earth station.
Downconvert	The process by which the frequency of a broadcast transport stream is shifted to a lower frequency range.
DPCM	Differential Pulse Code Modulation: An audio digitization technique that codes the difference between samples rather than coding an absolute measurement at each sample point.
DSNG	Digital Satellite News-Gathering.
DSP	Digital Signal Processor.
DTE	Data circuit Terminating Equipment: A communications device that originates (is the source) or is the end receiving unit (destination) of signals on a network. It is typically a terminal or computer.
DTH	Direct-To-Home. The term used to describe uninterrupted transmission from the satellite directly to the subscriber, that is, no intermediary cable or terrestrial network utilized.
DTMF	Dual-Tone MultiFrequency
DVB	Digital Video Broadcasting: A European project which has defined transmission standards for digital broadcasting systems using satellite (DVB-S), cable (DVB-C) and terrestrial (DVB-T) medium, created by the EP-DVB group and approved by the ITU. Specifies modulation, error correction, etc. (see EN 300 421 for satellite, EN 300 429 for cable and EN 300 744 for terrestrial).
DVB SI	Digital Video Broadcasting Service Information.
DVB-PI	DVB-Professional Interfaces
DWDM	Dense Wavelength Division Multiplexing. A mechanism to utilize existing fiber with even more bandwidth by adding extra signals using other wavelengths/colors
Earth	<p>Technical Earth: Ensures that all equipment chassis within a rack are at the same potential, usually by connecting a wire between the Technical earth terminal and a suitable point on the rack. This is sometimes known as a Functional earth.</p> <p>Protective Earth: Used for electric shock protection. This is sometimes known as a safety earth.</p>
EBU	European Broadcast Union.
ECM	Entitlement Control Message.
EDI	Ethernet Data Input
EIA	Electronics Industries Association (USA).

EIT	<p>Event Information Table: Equipment: A component of the DVB-Service Information (SI) stream generated within an Encoder, containing information about events or programmes such as event name, start time, duration, etc.</p> <p>System: EIT (Present/Following) contains the name of the current and next event. It may include an optional descriptor (synopsis) giving brief details of content. EIT (Schedule) is used to produce a full EPG. The EIT is the only DVB-SI table, which can be encrypted.</p>
Elementary Stream	A generic term for a coded bitstream, be it video, audio or other.
EMC	Electromagnetic Compatibility.
EMM	Entitlement Management Message.
Encryption	Encoding of a transmission to prevent access without the appropriate decryption equipment and authorization.
EPG	Electronic Programme Guide: On-screen programme listing using thumbnail pictures and/or text.
Ethernet	The most widely used local area network (LAN) defined by the IEEE as the 802.3 standard. Transmission speeds vary according to the configuration. Ethernet uses copper or fiber-optic cables.
ETS	European Telecommunications Standard.
ETSI	European Telecommunications Standards Institute.
FBAS	German for CVBS
FCC	Federal Communications Commission.
FDM	Frequency Division Multiplex: A common communication channel for a number of signals, each with its own allotted frequency.
FEC	Forward Error Correction: A method of catching errors in a transmission. The data is processed through an algorithm that adds extra bits and sends these with the transmitted data. The extra bits are then used at the receiving end to check the accuracy of the transmission and correct any errors.
FFT	Fast Fourier Transformation: A fast algorithm for performing a discrete Fourier transform.
FIFO	First In, First Out: A data structure or hardware buffer from which items are taken out in the same order they were put in. Also known as a shelf from the analogy with pushing items onto one end of a shelf so that they fall off the other. A FIFO is useful for buffering a stream of data between a sender and receiver that are not synchronized - i.e. they not sending and receiving at exactly the same rate.
FM	Frequency Modulation: Analogue modulation procedure
Footprint	The area of the Earth's surface covered by a satellite's downlink transmission. Also (generally) the area from which the satellite can receive uplink transmissions.

FTP	File Transfer Protocol: A protocol used to transfer files over a TCP/IP network (Internet, UNIX, etc.). For example, after developing the HTML pages for a Web site on a local machine, they are typically uploaded to the Web server, using FTP. Unlike e-mail programs in which graphics and program files have to be attached, FTP is designed to handle binary files directly and does not add the overhead of encoding and decoding the data.
G.703	The ITU-T standard which defines the physical and electrical characteristics of hierarchical digital interfaces.
GOP	Group of Pictures: MPEG video compression works more effectively by processing a number of video frames as a block. The Ericsson AB Encoder normally uses a 12 frame GOP; every twelfth frame is an I frame.
GUI	Graphical User Interface: The use of pictures rather than just words to represent the input and output of a program. A program with a GUI runs under a windowing system and has a screen interface capable of displaying graphics in the form of icons, drop-down menus and a movable pointer. The on-screen information is usually controlled / manipulated by a mouse or keyboard.
HDTV	High Definition Television.
HPA	High Power Amplifier: Used in the signal path to amplify the modulated and up-converted broadcast signal for feeding to the uplink antenna.
HSYNC	Horizontal (line) SYNCs.
HTTP	HyperText Transfer Protocol. The fundamental protocol used on the Internet for transmission of WEB pages and other data between servers and PCs
HU	Height Unit
Hub	A device in a multi-point network at which branch nodes interconnect.
ICAM	Integrated Conditional Access Module: Embedded in the IRD and responsible for descrambling, plus packet filtering and reception. It also contains the physical interface to the subscriber's viewing card.
ICMP	Internet Control Message Protocol. ICMP messages, delivered in IP packets, are used for out-of-band messages related to network operation or mis-operation
IGMP	Internet Group Management Protocol. IGMP is a protocol used to manage multicasts on the Internet. For a host (receiver unit) to receive a multicast, it needs to transmit IGMP "join" messages on the right format. Three versions exist. IGMPv2 is common today but IGMPv3 is the next step.
IDU	Indoor unit
IEC	International Electrotechnical Committee.
IF	Intermediate Frequency: Usually refers to the 70 MHz or 140 MHz output of the Modulator in cable, satellite and terrestrial transmission applications.

Interframe Coding	Compression coding involving consecutive frames. When consecutive frames are compared, temporal redundancy is used to remove common elements (information) and arrive at difference information. MPEG-2 uses B and P frames, but since they are individually incomplete and relate to other adjacent frames, they cannot be edited independently.
Intraframe Coding	Compression coding involving a single frame. Redundant information is removed on a per frame basis. All other frames are ignored. Coding of a macroblock or picture that uses information only from that macroblock or picture. Exploits spatial redundancy by using DCT to produce I frames; these are independent frames and can be edited.
IP	Internet Protocol: The IP part of TCP/IP. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or sub-network. IP accepts packets from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a datagram to the layer 2 data link protocol. It may also break the packet into fragments to support the Maximum Transmission / Transfer Unit (MTU) of the network.
I-picture; I-frame	Intracoded Picture/Frame: A picture / frame, which is coded using purely intracoding with reference to no other field or frame information. The I frame is used as a reference for other compression methods.
IPPV	Impulse Pay Per View: One-time events, purchased at home (on impulse) using a prearranged SMS credit line.
IRD	Integrated Receiver Decoder: The Receiver with an internal MPEG Decoder, which is connected to the subscriber's TV. The IRD is responsible for receiving and de-multiplexing all signals. The unit receives the incoming signal and if CA is active, decodes the signal when provided with a control word by the viewing card. Domestic IRDs are also known as Set-Top Units or Set-Top Boxes.
IRE	Institute of Radio Engineers: No longer in existence but the name lives on as a unit of video amplitude measurement. This unit is 1% of the range between blanking and peak white for a standard amplitude signal.
ISDN	Integrated Services Digital Network: The basic ISDN service is BRI (Basic Rate Interface), which is made up of two 64 kbps B channels and one 16 kbps D channel (2B+D). If both channels are combined into one, called bonding, the total data rate becomes 128 kbps and is four and a half times the bandwidth of a V.34 modem (28.8 kbps). The ISDN high speed service is PRI (Primary Rate Interface). It provides 23 B channels and one 64 kbps D channel (23B+D), which is equivalent to the 24 channels of a T1 line. When several channels are bonded together, high data rates can be achieved. For example, it is common to bond six channels for quality videoconferencing at 384 kbps. In Europe, PRI includes 30 B channels and one D channel, equivalent to an E1 line.
ISO	International Standards Organisation.
ISOG	Inter-union Satellite Operations Group.

ITS	Insertion Test Signal: A suite of analogue test signals placed on lines in the VBI. Also known as VITS.
ITT	Invitation To Tender.
ITU-R	International Telecommunications Union - Radiocommunications Study Groups (was CCIR).
ITU-T	International Telecommunications Union - Telecommunications Standardization Sector (was CCITT).
JPEG	Joint Photographic Experts Group: ISO/ITU standard for compressing still images. It has a high compression capability. Using discrete cosine transform, it provides user specified compression ratios up to around 100:1 (there is a trade-off between image quality and file size).
kbps	1000 bits per second.
Kbit	1024 bits, usually refers to memory capacity or allocation.
Ku-band	The portion of the electromagnetic spectrum, which spans the frequency range of approximately 12 GHz to 14 GHz. Used by communications satellites. Preferred for DTH applications because this range of frequency is less susceptible to interference.
LAN	Local Area Network: A network, which provides facilities for communications within a defined building or group of buildings in close proximity.
L-band	The frequency band from 950 MHz to 2150 MHz, which is the normal input-frequency-range of a domestic IRD. The incoming signal from the satellite is down-converted to L-band by the LNB.
LED	Light Emitting Diode.
LNB	Low Noise Block Down-Converter: The component of a subscriber satellite transmission receiving dish which amplifies the incoming signal and down-converts it to a suitable frequency to input to the IRD (typically 950 MHz - 1600 MHz).
LO	Local Oscillator.
lsb	Least significant bit.
Luminance	The television signal representing brightness, or the amount of light at any point in a picture. The Y in YCrCb.
LVDS	Low Voltage Differential Signal: LVDS is a generic multi-purpose Interface standard for high speed / low power data transmission. It was standardized in ANSI/TIA/EIA-644-1995 Standard (aka RS-644).

Macroblock	A 16x16-pixel area of the TV picture. Most processing within the MPEG domain takes place with macro blocks. These are converted to four 8x8 blocks using either frame DCT or field DCT. Four 8 x 8 blocks of luminance data and two (4:2:0 chrominance format), four (4:2:2) or eight (4:4:4) corresponding 8 x 8 blocks of chrominance data coming from a 16 x 16 section of the luminance component of the picture. Macroblock can be used to refer to the sample data and to the coded representation of the sample values and other data elements.
Mbps	Mega (million) bits per second.
MCC	Multiplex Control Computer: A component of a System 3000 compression system. The MCC sets up the configuration for the System 3000 Multiplexers under its control. The MCC controls both the main and backup Multiplexer for each transport stream.
MCPC	Multiple Channels Per Carrier.
Meta-data	Meta-data is descriptive data that is "tagged" to a movie or audio clip. Meta-data is essential for the broadcaster.
MMDS	Multichannel Microwave Distribution System: A terrestrial microwave direct-to-home broadcast transmission system.
Motion Compensation	The use of motion vectors to improve the efficiency of the prediction of sample values. The prediction uses motion vectors to provide offsets into the past and/or future reference frames or fields containing previously decoded sample values that are used to form the prediction error signal.
Motion Estimation	The process of estimating motion vectors in the encoding process.
Motion Vector	A two-dimensional vector used for motion compensation that provides an offset from the coordinate position in the current picture or field to the coordinates in a reference frame or field.
MP@ML	Main Profile at Main Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 15 Mbps over various mediums.
MP@HL	Main Profile at High Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 80 Mbps over various mediums.
MPEG	Moving Pictures Experts Group: The name of the ISO/IEC working group which sets up the international standards for digital television source coding.
MPEG-2	Industry standard for video and audio source coding using compression and multiplexing techniques to minimize video signal bit rate in preparation for broadcasting. Specified in ISO/IEC 13818. The standard is split into layers and profiles defining bit rates and picture resolutions.
MPLS	Multi-protocol Label Switching. A Quality of Service mechanism for IP networks that allow IP packets to flow along a predefined path in a network, improving the reliability and robustness of the transmission.

MPM	Media Processing Module.
MPTS	Multi-Program Transport Streams. Transport Streams that carry multiple TV/Radio services.
msb	Most significant bit.
Msymbol/s	(Msym/s) Mega (million) Symbols per second (10^6 Symbols per second).
Multiplex	A number of discrete data streams (typically 8 to 12), from encoders, that are compressed together in a single DVB compliant transport stream for delivery to a Modulator.
Multicast	An IP mechanism that allows transmission of data to multiple receivers. A multicast can also have several transmit sources simultaneously. In video applications, multicast is typically used to distribute a video signal from a central source to multiple destinations.
MUSICAM	Masking pattern adapted Universal Sub-band Integrated Coding And Multiplexing: An audio bit rate reduction system relying on sub-band coding and psychoacoustic masking.
Mux	<p>Multiplexer: Transmission Multiplexer: receives EMMs from the ACC, ECMs from the BCC, video/audio data from the encoders, and the SI stream from the SIC. It then multiplexes them all into a single DVB-compliant transport stream, and delivers the signal to the uplink after modulation.</p> <p>The Multiplexer also contains the cipher card, which scrambles the services according to the control words supplied by the BCC.</p>
Network	In the context of broadcasting: a collection of MPEG-2 transport stream multiplexes transmitted on a single delivery system, for example, all digital channels on a specific cable system.
NICAM	Near Instantaneously Companded Audio Multiplex: Official name is NICAM 728. Used for digital stereo sound broadcasting in the UK employing compression techniques to deliver very near CD quality audio. 728 refers to the bit rate in kbps.
NIT	Network Information Table: Part of the service information data. The NIT provides information about the physical organization of each transport stream multiplex, and the characteristics of the network itself (such as the actual frequencies and modulation being used).
nm	Nanometer: a unit of length equal to one thousand millionth (10^{-9}) of a meter.
NMS	Network Management System. A system used to supervise elements in an IP network. When a device reports an alarm, the alarm will be collected by the NMS and reported to the operator. NMS systems typically collect valuable statistics information about the network performance and can warn the operator early.
NTSC	National Television Systems Committee: The group, which developed analogue standards used in television broadcast systems in the United States. Also adopted in other countries (e.g. Mexico, Canada, Japan). This system uses 525 picture lines and a 59.97 Hz field frequency.

NVOD	Near Video On-Demand: Method of offering multiple showings of movies or events. The showings are timed to start at set intervals, determined by the broadcaster. Each showing of a movie or event can be sold to subscribers separately.
NVRAM	Non-volatile Random Access Memory: Memory devices (permitting random read / write access) that do not lose their information when power is removed. Stores the default configuration parameters set by the user.
ODU	Outdoor Unit
OFDM	Orthogonal Frequency Division Multiplex: A modulation technique used for digital TV transmission in Europe, Japan and Australia; more spectrally efficient than FDM. In OFDM, data is distributed over a large number of carriers spaced apart at precise frequencies. The carriers are arranged with overlapping sidebands in such a way that the signals can be received without adjacent channel interference.
OLED	Organic Light Emitting Diode display.
OPPV	Order ahead Pay Per View: An advance purchase of encrypted one-time events with an expiry date.
OSD	On-screen display: Messages and graphics, typically originating from the SMS, and displayed on the subscriber's TV screen by the IRD, to inform the subscriber of problems or instruct the subscriber to contact the SMS.
Packet	A unit of data transmitted over a packet switching network. A packet consists of a header followed by a number of contiguous bytes from an elementary data stream.
PAL	Phase Alternating Line: A color TV broadcasting system where the phase of the R-Y color-difference signal is inverted on every alternate line to average out errors providing consistent color reproduction.
PAT	Program Association Table: Part of the MPEG-2 Program Specific Information (PSI) data and is mandatory for MPEG-2 compliance. The PAT points (maps) to the PMT.
PCM	Pulse Code Modulation: A process in which a signal is sampled, each sample is quantized independently of other samples, and the resulting succession of quantized values is encoded into a digital signal.
PCR	Program Clock Reference: A time stamp in the transport stream from which the Decoder timing is derived.
PDC	Program Delivery Control: A Teletext service allowing simple programming (i.e. VideoPlus) of VCR recording times. If the desired program is rescheduled, PDC updates the programming information in the VCR.

Pel	Picture Element: Also known as a pixel. The smallest resolvable rectangular area of an image either on a screen or stored in memory. On-screen, pixels are made up of one or more dots of color. Monochrome and grey-scale systems use one dot per pixel. For grey-scale, the pixel is energized with different intensities, creating a range from dark to light (a scale of 0-255 for an eight-bit pixel). Color systems use a red, green and blue dot per pixel, each of which is energized to different intensities, creating a range of colors perceived as the mixture of these dots. If all three dots are dark, the result is black. If all three dots are bright, the result is white.
PES	Packetized Elementary Stream: A sequential stream of data bytes that has been converted from original elementary streams of audio and video access units and transported as packets. Each PES packet consists of a header and a payload of variable length and subject to a maximum of 64 kbytes. A time stamp is provided by the MPEG-2 systems layer to ensure correct synchronization between related elementary streams at the Decoder.
PID	Packet Identifier: the header on a packet in an elementary data stream, which identifies that data stream. An MPEG-2 / DVB standard.
PIN	Personal Identification Number: A password used to control access to programming and to set purchase limits. Each subscriber household can activate several PINs and may use them to set individual parental rating or spending limits for each family member.
Pixel	PIX (picture) Element: The digital representation of the smallest area of a television picture capable of being delineated by the bit-stream. See Pel for more information.
pk-pk	peak to peak: Measurement of a signal or waveform from its most negative point to its most positive point.
PLL	Phase-Locked Loop. A phase-locked loop is a control system which controls the rotation of an object by comparing its rotational position (phase) with another rotating object as in the case of a sine wave or other repeating signal. This type of control system can synchronize not only the speed, but also the angular position of two waveforms that are not derived from the same source.
PMT	Program Map Table: Part of the MPEG-2 Program Specific Information (PSI) data and is mandatory for MPEG-2 compliance. Each service has a PMT, which lists the component parts (elementary streams of video, audio, etc.) for the various services being transmitted.
P-picture/P-frame	A picture / frame produced using forward prediction. It contains predictions from either previous I frames or previous P frames. The P frame is used as a reference for future P or B frames.
ppm	Parts per million.
PPV	Pay Per View: A system of payment for viewing services based on a usage / event basis rather than on on-going subscription. Subscribers must purchase viewing rights for each PPV event that they wish to view. PPV events may be purchased as IPPV or OPPV.

Program	PC - A sequence of instructions for a computer. TV - A concept having a precise definition within ISO 13818-1 (MPEG-2). For a transport stream, the timebase is defined by the PCR. The use of the PCR for timing information creates a virtual channel within the stream.
Programme	A linking of one or more events under the control of a broadcaster. For example, football match, news, film show. In the MPEG-2 concept, the collection of elementary streams comprising the programme, have a common start and end time. A series of programmes are referred to as events.
P_RP_B	Analogue Color difference signals. Refer to C _R C _B for an explanation.
PS	Program Stream: A combination of one or more PESs with a common timebase.
PSI	Program Specific Information: Consists of normative data, which is necessary for the de-multiplexing of transport streams and the successful regeneration of programs (see also: SI).
PSIP	Program System Information Protocol: The ATSC equivalent of SI for DVB.
PSK	Phase Shift Keying: A method of modulating digital signals particularly suited to satellite transmission.
PSR	Professional Satellite Receiver: See also: IRD.
PSU	Power Supply Unit.
QAM	Quadrature Amplitude Modulation: A method of modulating digital signals, which uses combined techniques of phase modulation and amplitude modulation. It is particularly suited to cable networks.
QoS	Quality of Service. A common term for a set of parameters describing the quality you get from an IP network: Throughput, availability, delay, jitter and packet loss.
QPSK	Quadrature Phase Shift Keying: A form of phase shift keying modulation using four states.
QSIF	Quarter Screen Image Format.
Quantise	A process of converting analogue waveforms to digital information. 8-bit quantization as set out in ITU-R Rec. 601. Uses 256 levels in the range 0 – 255 to determine the analogue waveform value at any given point. The value is then converted to a digital number for processing in the digital domain.
RAM	Random Access Memory: A volatile storage device for digital data. Data may be written to, or read from, the device as often as required. When power is removed, the data it contains is lost.
RAS	Remote Authorization System: An Ericsson AB proprietary public-key encryption system used to prevent unauthorized viewing of a TV programme or programmes.

Reflex™	<p>An Ericsson AB proprietary system to provide efficient use of bandwidth by a set of encoders without sacrificing picture quality. A group bit rate is allocated to a set of Encoders and the bit rate for each encoder is allocated according to the requirements of the picture encoding process.</p> <p>The bit rate allocation can be performed externally by a multiplexer, or internally in a unit fitted with multiple VCM's.</p>
RF	Radio Frequency.
RGB	Red, Green, Blue: The Chroma information in a video signal.
RIP2	Routing Information Protocol v2. A protocol used between network routers to exchange routing tables and information.
ROM	Read Only Memory: A non-volatile storage device for digital data. Data has been stored permanently in this device. No further information may be stored (written) there and the data it holds cannot be erased. Data may be read as often as required.
RS	Reed-Solomon coding: An error detection and correction, coding system. 16 bytes of Reed-Solomon Forward Error Correction code are appended to the packet before transmission bringing the packet length to 204 bytes. The 16 bytes are used at the receiving end to correct any errors. Up to eight corrupted bytes can be corrected.
RSVP	ReSerVation Protocol. A Quality-of-service oriented protocol used by network elements to reserve capacity in an IP network before a transmission takes place.
RTP	Real-time Transfer Protocol. A protocol designed for transmission of real-time data like video and audio over IP networks. RTP is used for most video over IP transmissions.
RLC	Run Length Coding: Minimization of the length of a bit-stream by replacing repeated characters with an instruction of the form 'repeat character x y times'.
SBR	Spectral Band Replication.
SCPC	Single Channel Per Carrier.
Spectral Scrambling	A process (in digital transmission) used to combine a digital signal with a pseudo-random sequence, producing a randomized digital signal that conveys the original information in a form optimized for a broadcast channel.
Scrambling	Alteration of the characteristics of a television signal in order to prevent unauthorized reception of the information in clear form.
SDI	Serial Digital Interface.
SDT	Service Description Table: Provides information in the SI stream about the services in the system; for example, the name of the service, the service provider, etc.

SDTI	Serial Data Transport Interface. A mechanism that allows transmission of various types of data over an SDI signal. This may be one or more compressed video signals or other proprietary data types. The advantage of SDTI is that existing SDI transmission infrastructure can be used to transport other types of data.
SELV	Safety Extra Low Voltage (EN 60950).
SFP	Small Form-factor Pluggable module. A standardized mechanism to allow usage of various optical interfaces for Gigabit Ethernet. Several types of SFP modules exist: Single-mode fiber modules for long-distance transmission and multi-mode fiber modules for shorter distances. SFP is also known as "mini-GBIC".
SFP+	Enhanced small form-factor pluggable (SFP+) is an enhanced version of the SFP that can support data rates up to 16 Gbps.
SIP	Session Initiation Protocol. A common acronym for the ongoing effort to standardize signaling over IP networks, i.e. connection set-up and tear-down. SIP makes it possible to "dial" a remote receiver of data and set-up the connection in this way.
STB	Set-Top Box: A box that sits on top of a television set and is the interface between the home television and the cable TV company. New technologies evolving for set-top boxes are video-on-demand, video games, educational services, database searches, and home shopping. The cable equivalent of the IRD.
SFN	Single Frequency Network: The SFN technique allows large geographic areas to be served with a common transmission multiplex. All transmitters in the network are synchronously modulated with the same signal and they all radiate on the same frequency. Due to the multi-path capability of the multi-carrier transmission system (COFDM), signals from several transmitters arriving at a receiving antenna may contribute constructively to the total wanted signal. The SFN technique is not only frequency efficient but also power efficient because fades in the field strength of one transmitter may be filled by another transmitter.
SI	Service Information: Digital information describing the delivery system, content and scheduling (timing) of broadcast data streams. DVB-SI data provides information to enable the IRD to automatically demultiplex and decode the various streams of programmes within the multiplex. Specified in ISO/IEC 13818[1]. (DVB)
Single Packet Burst Mode	A burst of ASI bytes (either 188 or 204, depending on packet length) is contiguously grouped into an MPEG-2 transport stream packet. Stuffing data is added between the packets to increase the data rate to 270 Mbps. See DVB Document A010 rev. 1, Section B3.3, (ASI) Layer-2 Transport Protocol.

Smart Card	A plastic card with a built-in microprocessor and memory used for identification, financial transactions or other authorizing data transfer. When inserted into a reader, data is transferred to and from the host machine or a central computer. It is more secure than a magnetic stripe card and it can be disabled if the wrong password is entered too many times. As a financial transaction card, it can be loaded with digital money and used in the same way as cash until the balance reaches zero. The file protocol is specific to its intended application.
SMATV	Satellite Mast Antenna Television: A distribution system, which provides sound and television signals to the households of a building or group of buildings, typically used to refer to an apartment block.
SMPTE	Society of Motion Picture and Television Engineers.
SMS	Subscriber Management System: A system which handles the maintenance, billing, control and general supervision of subscribers to conditional access technology viewing services provided through cable and satellite broadcasting. An SMS can be an automatic (e.g. Syntellect) system where subscribers order entitlements by entering information via a telephone. Alternatively, an SMS can be a manual system, which requires subscribers to speak with an operator who then manually enters their entitlement requests. Some systems support multiple SMSs.
SNG	Satellite News-Gathering.
SNMP	Simple Network Management Protocol.
SNTP	Simple Network Time Protocol is an Internet protocol used to synchronize the clocks of computers to some time reference. It is a simplified version of the protocol NTP protocol which is too complicated for many systems.
Spatial Redundancy	Information repetition due to areas of similar luminance and/or chrominance characteristics within a single frame. Removed using DCT and Quantization (Intra-Frame Coding).
SPI	Synchronous Parallel Interface.
Statistical Redundancy	Data tables are used to assign fewer bits to the most commonly occurring events, thereby reducing the overall bit rate. Removed using Run Length Coding and Variable Length Coding.
TCP / IP	Transmission Control Protocol/Internet Protocol: A set of communications protocols that may be used to connect different types of computers over networks.
TDM	Time Division Multiplex: One common, communications channel carrying a number of signals, each with its own allotted time slot.
TDT	Time and Date Table: Part of the DVB Service Information. The TDT gives information relating to the present time and date.
Temporal Redundancy	Information repetition due to areas of little or no movement between successive frames. Removed using motion estimation and compensation (Inter-Frame Coding).

Time stamp	A term that indicates the time of a specific action such as the arrival of a byte or the presentation of a presentation unit.
TNS	Temporal Noise Shaping.
TOT	Time Offset Table: This optional SI table supports the use of local offsets as well as the UTC time/date combination. The purpose of the table is to list by country the current offset from UTC and the next expected change to that offset (to track when daylight saving occurs). The offset resolution is to within 1 minute over a range of ± 12 hours from UTC.
Transport Stream	A set of packetized elementary data streams and SI streams, which may comprise more than one programme, but with common synchronization and error protection. The data structure is defined in ISO/IEC 13818-1 [1] and is the basis of the ETSI Digital Video Broadcasting standards.
Transport Stream Packet Header	A data structure used to convey information about the transport stream payload.
TS	Transport Stream.
TSDT	Transport Stream Descriptor Table: A component of the MPEG-2 PSI data. This table describes which type of Transport stream it is in (i.e. DVB, ATSC etc.). It may also contain other descriptors.
TSP	Transport Stream Processor.
U	44.45 mm (rack height standard).
UART	Universal Asynchronous Receiver Transmitter: A device providing a serial interface for transmitting and receiving data.
UDP	User Datagram Protocol. A protocol above the IP layer that provides port multiplexing in addition. In essence, you can transmit IP data packets to several receiving processes in the same unit/device.
Unicast	Point-to-point connection, i.e. the "opposite" of multicast which is one to many (or many to many). In this mode, a transmit unit sends video data direct to a unique destination address.
Upconvert	The process by which the frequency of a broadcast transport stream is shifted to a higher frequency range.
Uplink	The part of the communications satellite circuit that extends from the Earth to the satellite.
UPS	Uninterruptable Power Supply: A method of supplying backup power when the electrical power fails or drops to an unacceptable voltage level. Small UPS systems provide battery power for a few minutes; enough to power down the computer in an orderly manner. This is particularly important where write back cache is used. Write back cache is where modified data intended for the disk is temporarily stored in RAM and can be lost in the event of a power failure. Sophisticated systems are tied to electrical generators that can provide power for days. UPS systems typically provide surge suppression and may provide voltage regulation.
UTC	Universal Time Coordinated: The Coordinated Universal Time and is synonymous with GMT Greenwich Mean Time (GMT).

VCM	Video Compression Module.
VITC	Vertical Interval Time Code.
VITS	Vertical Interval Test Signal: See: ITS.
VLAN	Virtual LAN, a network of units that behave as if they are connected to the same wire even though they may actually be physically located on different segments of a LAN.
VPS	Video Programming System: A German precursor to PDC
WSS	Wide Screen Switching: Data used in wide-screen analogue services, which enables a receiver to select the appropriate picture display mode.
WST	World System Teletext: System B Teletext. Used in 625 line / 50 Hz television systems (ITU-R 653).
XLR	Audio connector featuring three leads, two for signal and one for GND.
XML	eXtensible Markup Language. A very common self-describing text-based data format. Used for many purposes: Meta-data, configuration files, documents, etc. The readability of the format has made it very popular and is now the fundament for many types of WEB services.
XPO	The name given to the second generation Ericsson standard for web pages and additional supporting interfaces.
Y (Luminance)	Defines the brightness of a particular point on a TV line. The only signal required for black and white pictures.
Y/C	Broadcast video with separate color, Y (luminance) and C (Chroma) (sometimes called S-Video).
YUV	Y: Luminance component (Brightness), U and V: Chrominance (Color difference)



Technical Specification

Annex B

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B.1 Control Ethernet Specification

B.1.1 Control Ports

The system has two Ethernet control ports that support IEEE 802.3 100BASE-TX and 1000BASE-T Ethernet protocols. The Control ports are accessible via RJ-45 connectors on the rear panel of the chassis and support IEEE 802.3u auto-negotiation and parallel detection. Also, the ports support Auto-MDIX.

See *Chapter 2, Installing the Equipment* for connector details.

B.1.2 IP Parameters

It is possible to configure the following IP parameters for the Control Port.

Table B.1 IP Parameters (Control Port)

Parameter	Specification
IP Address	xxx.xxx.xxx.xxx (Ipv4)
Network Mask	xxx.xxx.xxx.xxx (Ipv4)
Gateway Address	xxx.xxx.xxx.xxx (Ipv4)

Note: The front panel always provides a way of changing these settings to prevent all control interfaces being disabled.

B.1.3 MAC Address

The MAC address of each Ethernet Control port is read only and cannot be edited.

B.2 Data Ethernet Specification

B.2.1 Data Ports

The unit provides two enhanced small form-factor pluggable (SFP+) optical connectors. 10GBASE-R ports are used to connect the unit to Transport Stream inputs. The ports are individually configurable as input, output or bi-directional. Each pair is configurable to work standalone or as a redundant pair. Supported formats are: 10GBASE-SR Short range, and 10GBASE-LR Long reach.

Also provided are four RJ45 Ethernet connectors arranged as two pairs. IP Transport Stream Ethernet ports are used to connect the equipment to Transport Stream inputs. Each pair of ports is individually configurable as input, output or bi-directional and may also be configured to communicate at 1000BASE-T or 10GBASE-T. Each pair is also configurable to work standalone or as a redundant pair and will respond to ARPs, pings and other low-level Ethernet traffic.

See *Chapter 2, Installing the Equipment* for connector details.

B.2.2 Data Port Parameters

The transport streams output via the IP Outputs contain 188 byte long transport stream packets.

The time that a port has had a link established is recorded to an accuracy of ± 1 second, and the information made available to the user.

The Ethernet Data Ports always respond to ICMP Echo requests to any source IP address assigned to an output transport stream currently being transmitted on that port.

The Ethernet Data Ports respond to all ARP requests

There is hardware filtering of received packets (i.e. a hardware 'firewall') to protect the ports from malicious interference.

B.2.3 IP Parameters

It is possible to configure the following IP parameters for the Data Port.

Table B.2 IP Parameters (Data Port)

Parameter	Specification
IP Address	xxx.xxx.xxx.xxx (Ipv4)
Network Mask	xxx.xxx.xxx.xxx (Ipv4)
Gateway Address	xxx.xxx.xxx.xxx (Ipv4)

The default values for source IP address, subnet mask are those assigned to the ethernet port, or in the case of mirrored mode, those assigned to the primary IP port.

B.2.4 MAC Address

The MAC address of each Ethernet Control port is read only and cannot be edited.

B.3 Transport Stream Output

The following parameters are supported for the IP Transport Stream Output.

Table B.3 Transport Stream Output

Item	Specification	
Optical Connectors	Connector type	SFP+ Optical
	10GBASE-R supported formats	10GBASE-SR Short range, up to 400 m using 850 nm wavelength multi-mode fiber cabling
		10GBASE-LR Long reach, up to 10km using 1310 nm wavelength single-mode fiber cabling
	Connector designation (from top to bottom)	DATA P1 DATA B1
	SFP+DirectAttach supported formats	Active twin-ax cable assembly up to 15 m.
	Pin outs	Single fiber-optic cable
RJ45 Ethernet Connectors	Connector type	RJ45 (1000BASE-T or 10GBASE-T)
	Connector designation (from left to right)	DATA P1 / DATA B1 / DATA P2 / DATA B2
Transport Stream Formats	Transport encapsulation into IP	
	512 streams max.	
	Individual output stream format	SPTS or MPTS
		10 kbps to 216 Mbps in 1 kbps steps
		1 k PIDs from a total of 16 k PIDs
	Multiple Single Program Transport Stream	MPTS as IP/UDP - CBR mode
		MPTS per satellite multiplex as IP/UDP
		2 Gbps throughput
Number of Services per Chassis	512 max.	
Number of Components per Chassis:	16384 max.	
TS Parameters	PCR regeneration	
	PAT, PMT, SDT regeneration	
	PTS, DTS passthrough	

B.4 Control

The following parameters are supported.

Table B.4 Control

Item	Specification
Control Methods	2x Electrical Ethernet (100BASE-TX/1000BASE-T)
	User management via web browser
	Front panel keypad and LCD
	SNMP v1 / v2c for traps and alarms

B.5 Environmental

This unit is for use in non-hostile environments, (i.e. designed for indoor use only with no protection against dust or water ingress).

Table B.5 Environmental

Item	Specification
Operation	
Temperature	0°C to +50°C (14°F to 122°F) ambient with free air-flow. It may require a 10 minute warm-up period before all clocks are within specification if the ambient temperature is less than 0°C.
Humidity	5% to 90% (non-condensing).
Cooling Requirements	Cool air input from front of unit, exhaust from back of unit.
Handling Movement	Designed for stationary or fixed use when in operation.
Transportation (Packaged)	
Temperature	-40°C to +85°C (-40°F to +185°F).
Humidity	5% to 90% (non-condensing).
Storage	
Temperature	-40°C to +85°C (-40°F to +185°F).
Humidity	5% to 90% (non-condensing).

The product requires no special handling or packaging other than normal procedures for Ericsson equipment and is suitable for lifting by one person.