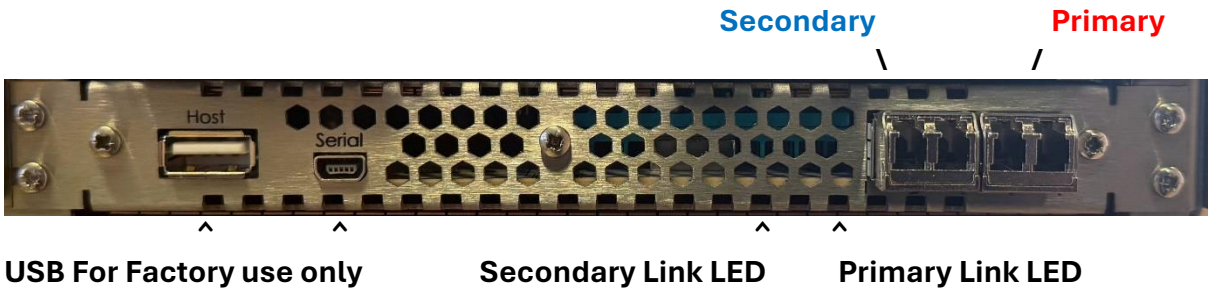
MatchBox ST 2110 Rear Operator's Manual

Software Version V1.12.4

Overview

This is a supplementary manual to the main SDI based MatchBox operator's manual. MatchBox features, operation and Licencing are largely identical between the SDI and ST 2110 options. The details here focus solely on the operation of the features that exist specific to operation with ST 2110 and details any limitations on features that may exist.

Rear View:



Hardware & Software Support & Updates

Similar to the SDI MatchBoxes; the ST 2110 MatchBox solution consists of a card and a rear installed into a Hitomi modular xFrame. The rear is fixed to the back of the xFrame the card is installed into the front behind the xFrames front panel. An xFrame can host up to 4 MatchBox cards in any mixture of SDI and ST 2110. All ST 2110 functionality is provided by the xFrame rear; supported by the software running on the main front card. The software is common between the SDI and ST 2110 MatchBox versions.

MatchBox Generator and Analyser software support for the ST 2110 rear started from V1.12.2. It is highly recommended the first operation should be to upgrade the MatchBox software. The latest package can be found https://hitomi.tv/support/ ; registration is required to access the upgrades.

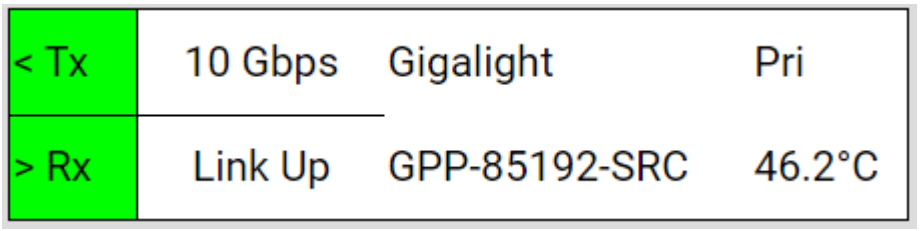
***Caution**: The modularity of the front card and rear in the xFrame is a design feature to aid serviceability. The interface between the card and rear is not intended for regular use. Repeated mating cycles of the card and rear will reduce the life of the product.*

Media Network Interface

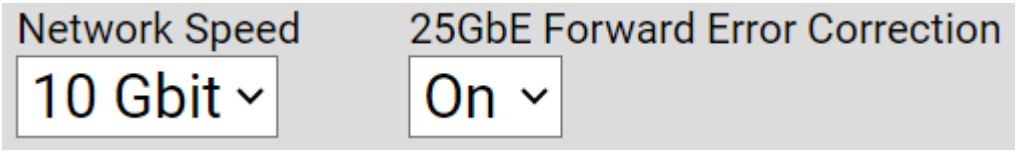
The ST 2110 MatchBox has dual media network interfaces. They are provided purely for redundancy and if both are used, they must be connected to different network domains.

Network Connection and Status

The SFP and link status for both media networks is shown on the System page.

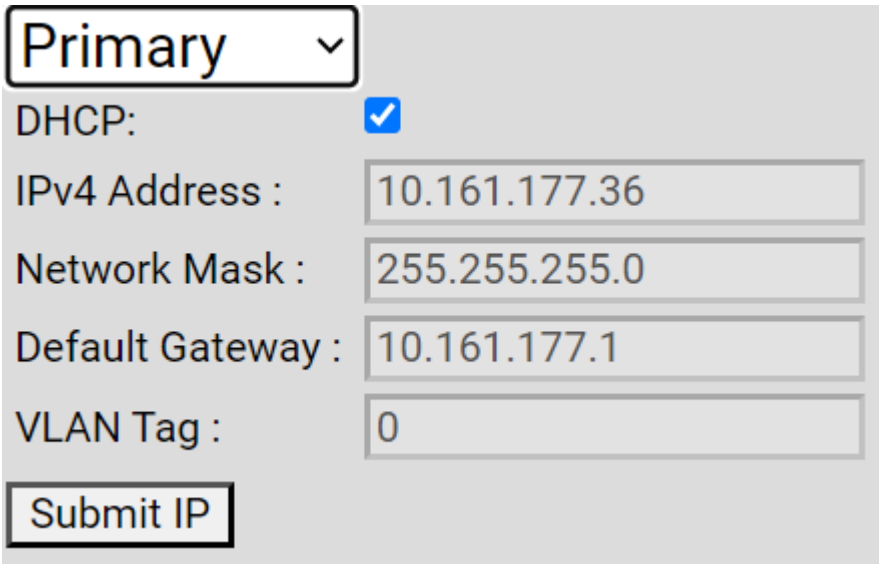


The MatchBox can be configured for either 25GE or 10GE operation on the System>Network & Time page. This network speed applies to both network interfaces. The MatchBox requires some recovery time after applying network settings including speed. For 25GE networks set FEC On or Off as appropriate for your infrastructure.



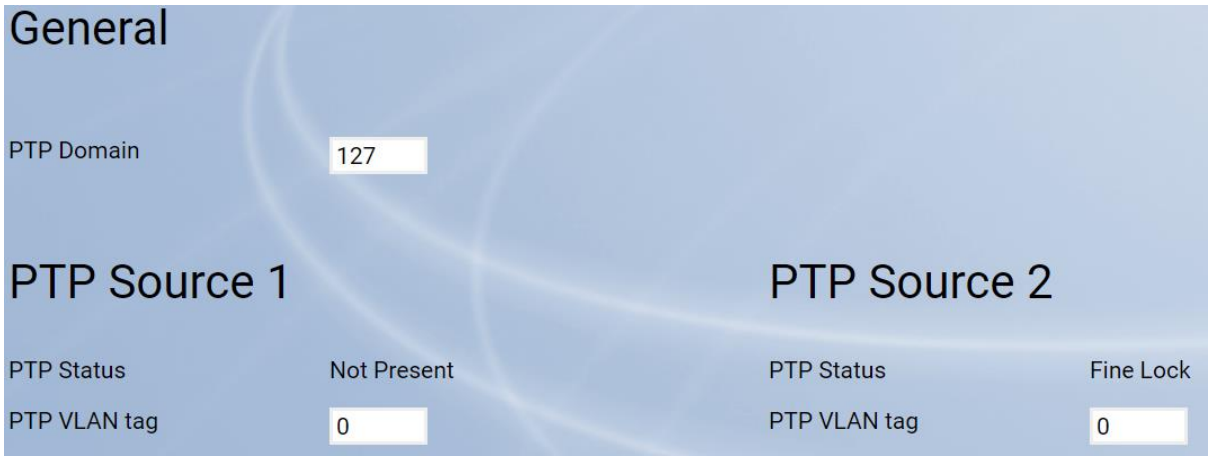
IP Address Configuration

DHCP and Static IP address configuration for the Primary and Secondary interfaces is available in on the System>Network & Time page.



ST 2110 PTP

ST 2110 requires a PTP time reference on the media network. The PTP domain and VLAN tag can be configured from the web GUI under ST2110>Network. Lock status is also provided on this page indicating if the MatchBox achieved Fine or Coarse Lock, or No Lock at all. It can take over 10 seconds for the status to settle down on first connection.

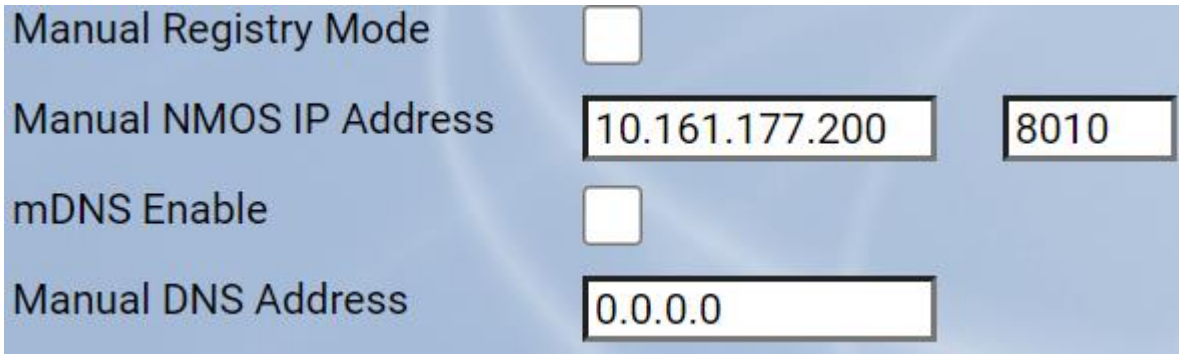


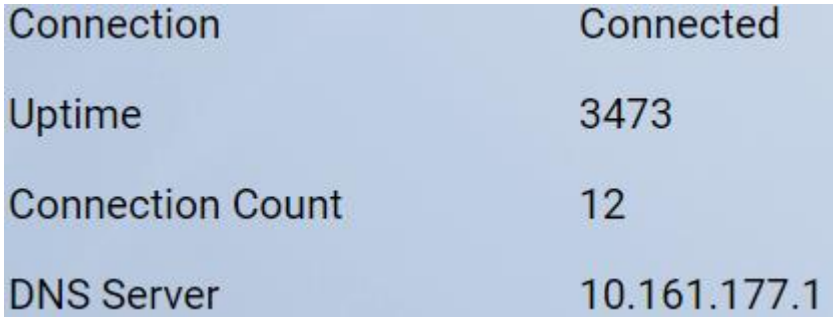
The Save button must be clicked after making changes to apply them.

NOTE: The configuration above is different to that of the time server settings on the System>Network & Time page; which are only for the RJ45 xFrame ethernet connection to support MatchBox features; particularly Latency. The System>Network & Time settings do not relate to ST 2110 time references. ST 2110 time reference settings must be on the media network and configured through the ST 2110 web page.

ST 2110 NMOS

The MatchBox can be configured to register itself in NMOS controlled systems. This can be done from the web GUI under ST2110>NMOS. This page also provides status of the discovery and connection to the NMOS server.





Setting 'Manual Registry Mode; allows enables the MatchBox to use the 'Manual NMOS IP Address' field for the MNOS server IP address.

The 'Manual DNS Address' field can be setup if this is not provided by DHCP; otherwise, it can be left as 0.0.0.0.

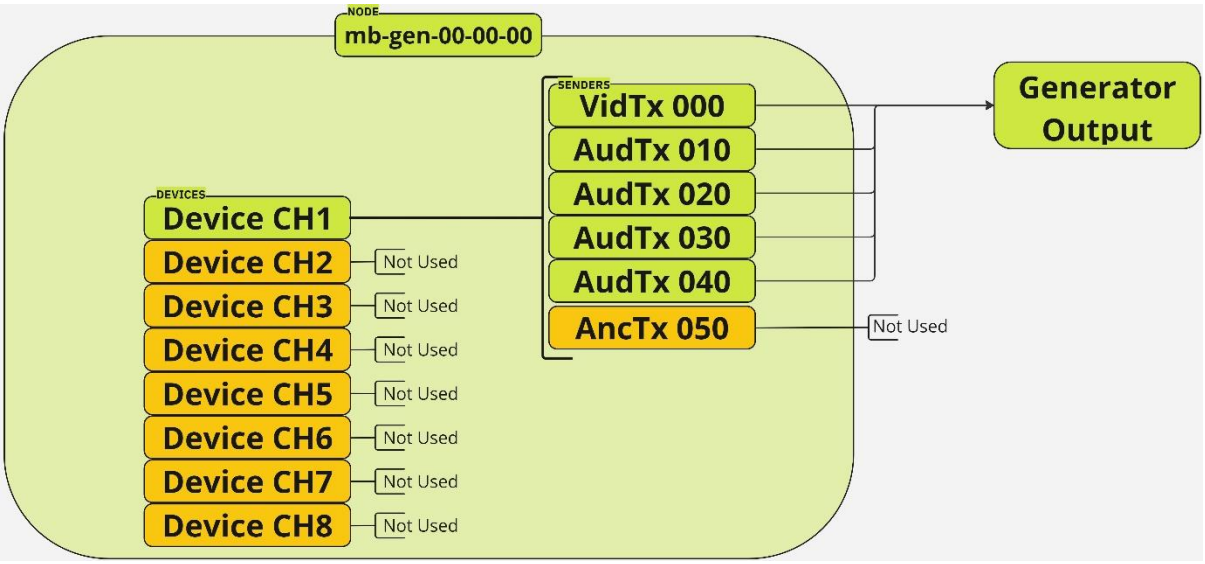
Use of mDNS can be enabled and disabled here also.

The Save button must be clicked after making changes to apply them.

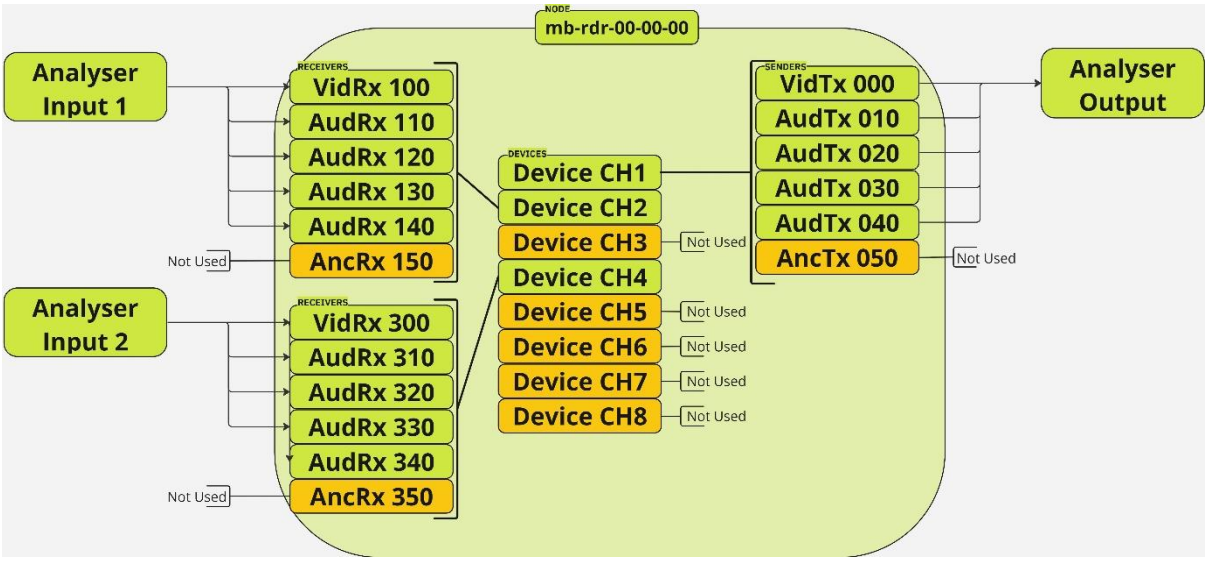
MatchBox Senders & Receivers on NMOS

Within NMOS a MatchBox Generator and Analyser will appear as a Node with 8 Devices. Each Device will contain either 6 Senders or 6 Receivers. Only Device CH1 is applicable for the Generator and Analyser Senders. Only Device CH2 and Device CH4 are applicable for the Analyser inputs. All other devices are unused.

MatchBox Generator



MatchBox Analyser



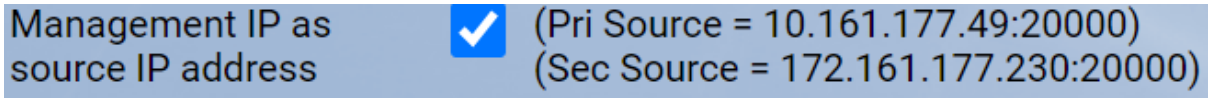
ST 2110 Video and Audio I/O Configuration

Configuration of ST 2110 multicast senders and receivers can be performed via NMOS control, or directly in the main MatchBox web GUI on the ST 2110 Page.

Video Senders

A single sender can be configured from the ST2110>Senders page. The Video flow must be enabled to allow the audio flows.

Enabling 'Management IP as source IP address' will set the multicast's source IP to that of the management interface addresses, otherwise it will be unspecified; 0.0.0.0.



The Save button must be clicked after making changes to apply them.

Video Receivers

Each receiver flow is configured as a video flow and four audio flows. The video format of the video receiver must be set appropriately for the sender of the multicast.

The Save button must be clicked after making changes to apply them.

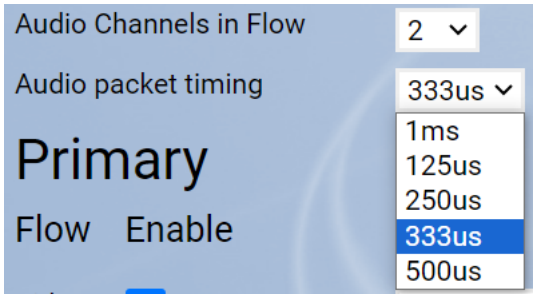
ST2022-7 Hitless Redundancy

Primary (Red) and Secondary (Blue) enable controls are available for Senders and receivers. ST 2022-7 is supported with two network interfaces (SFPs) are available and the Primary and Secondary Flows have been configured.

The Save button must be clicked after making changes to apply them.

Audio Senders & Receivers

When the video sender is enabled, four audio senders are available to be individually enabled. There are also four audio receiver flows available on the MatchBox Analyser.



Audio flows can be configured to map 2, 4, 8 or 16 of the MatchBox audio channels. Packet timing can also be configured, and this applies to all audio flows and must be configured separately for senders and receivers.

The MatchBox automatically maps the 16 audio output channels to the first 16 channels in the ST 2110 Senders. Therefore if 8 Audio Channels in Flow is selected only the first two sender flows will be carrying audio, and if 16 Audio Channels in Flow is selected only the first sender flow will carry audio.

The audio receivers mirror this functionality; so, the first 16 audio receiver channels are taken from the flows to be analysed.

The Save button must be clicked after making changes to apply them.

Specification

IP Media Port(s)	1- 2 × 10GE SFP+ OR 1- 2 × 25GE SFP28.
Hitless redundancy support (SMPTE ST 2022-7)	Supported through dual physical links (to both RED and BLUE networks) SMPTE ST 2022-7 applies to receiver and sender streams. Class D and A.
Senders /Receivers:	Generator Senders: 1 x SMPTE ST 2110-20 4 x SMPTE ST 2110-30 Analyser Receivers: 2 x SMPTE ST 2110-20 4 x SMPTE ST 2110-30 per ST 2110-20 Analyser Senders: 1 x SMPTE ST 2110-20 4 x SMPTE ST 2110-30
FEC	Reed Solomon (for 25GE only).
Supported formats	HD & 3G Only (see main MatchBox Manual for full list)
PTP support	SMPTE ST 2110-10 (AES-R16-2016).
Traffic Shaping	Senders: Narrow Gapped. Receivers: Narrow Gapped, Narrow Linear & Wide. Note: V1.12.2 AV and latency timing only validated for Narrow Gapped
Audio Packet time	Note: V1.12.2 fixed at 4 channels 1ms packet timing Full configuration will be available in a future release
Audio PCM sample rate	48KHz.
FEC SMPTE ST 2022-5	Not available.
Management	IPv4, In-band through Media ports.
DHCP support	RFC-2131 specification.
LLDP	IEEE- 802.1AB.
IGMP	V2 and V3 (RFC-2236 and RFC-3376).
Multicast streams	RTP - RFC 5771.
Unicast streams	RTP
NMOS	IS-04 (Discovery) v1.2 IS-05 (Routing) v1.0 IS-08 (Audio Mapping) v1.0 IS-09 (System) - client only AMWA BCP-002-01 (Essence Grouping) TR-1001 Recommendation: System environment and device behaviours
Packet jitter tolerance	Class A (10ms) -7 gap between both signal + jitter on signal maximum of 10ms.

Revisions

Ver	Date	Description
V1.12.2	22/04/2024	Original
V1.12.3	14/06/2024	• Added Generator & Analyser IS-04 I/O illustration • Coloured Primary & Secondary interfaces to indicate red/blue redundant feeds • Added caution over repeated card-rear mating cycles
V1.12.1	18/07/2024	• Updated ST 2110 Network screenshot for PTP timeserver settings. • Updated source IP address screen capture • Separated Video and Audio I/O descriptions • Added Audio Channel and packet timing control descriptions • Added ST 2022-7 Hitless redundancy description