

User Manual

MFT21

2 Input / 1 Output Multi-Format Transmitter

HDMI and VGA inputs with
HDBaseT output

4K UHD

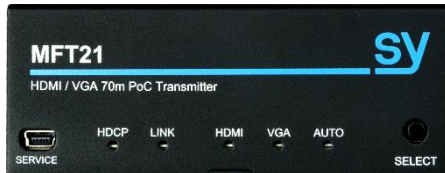
The MTF21 is a 2-input to 1 output Multi-Format Switcher HDBaseT Transmitter. The HDBaseT output can broadcast up to 70m @ 1080p or 40m @ 4K 30Hz using cat6a cable.

It provides the following features:

- 1 HDMI input
- 1 VGA input
- 1 HDBaseT output
- 1 x RS232-CTL – For control
- 1 x RS232 port for HDBT data pass through
- Bi-directional IR input/output
- External contact closure / pushbutton interface
- EDID Management

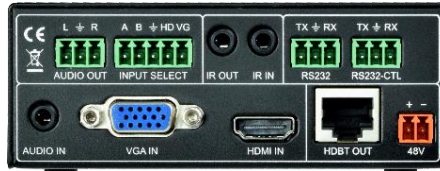
The two inputs can be selected using the front panel button, RS232 commands (RS232-CTL) or external contact closure / push-buttons.

Front Panel



Name	Description
Service	Mini USB for firmware upgrades only
HDCP	Solid – Transmitter Receiver pair are linked
LINK	Solid – HDCP ON Flashing – HDCP OFF
HDMI, VGA	Solid – Currently selected input is active Flashing – No video on currently selected input
AUTO	Solid – Auto mode OFF – Manual mode
SELECT button	Input selection for HDMI or VGA. > 3S for Auto mode

Rear Panel



Name	Description
VGA IN	VGA input connector
Audio In	Analogue audio input for VGA IN
HDMI In	HDMI Input connector
HDBT Out	HDBaseT Output connector
Audio Out	Stereo analogue audio output from selected Local input
Input Select	External pushbutton (push-to-make) interface for input selection
IR Out	IR output to control local devices from the remote location
IR In	IR input from IR eye to control devices at the remote location
RS232	Pass-through RS232 between HDBaseT output and the receiver
RS232-CTL	RS232 for controlling the MFT21
48V	48V DC power input

Using the MFT21

1. Connect the video inputs.
2. Connect the HDBT output to an SY-HDBT-SLIM-70SR receiver.
3. Power up the MFT21.
4. Press the SEELCT button to select an input to display.
5. To use Auto input detection, press and hold either the SELECT until the AUTO LED is lit (~ 3S). Auto Input detection is cancelled when the SELECT button is pressed.
6. An external pushbutton interface to the INPUT SELECT connector may also be used to select either of the two inputs.

Cascade Mode

Cascade mode can be enabled/disabled via RS232 commands (SET CAS EN, SET CAS DIS), using RS232-CTL port. This may speed up the overall system switching speed when several devices are cascaded together (such as MFT21 to MSUHD88 to Apollo 4K to.....).

De-embedded Audio output

The Remote HDBaseT output is de-embedded and presented on the phoenix L/R Stereo output. Only PCM stereo audio streams are extracted in this way.

RS232-CTL Commands

All commands are sent at 57600 baud, 8 data bits, no parity and one stop bit.

Commands are not case sensitive, but must always be followed by a carriage-return (0x0d).

All responses are in uppercase and provide an acknowledgement of the command or reply with the requested data, and are terminated with a carriage-return & line-feed (0x0d 0x0a).

System Commands

RS232 Command	Command Details
H	Help
STA	Show Global System Status
SET RST	Reset to Factory Defaults
SET ADDR xx	Set System Address to xx, where xx is in the range [00~99]. The factory default is 00
SET CAS EN	Set Cascade Mode Enable
SET CAS DIS	Set Cascade Mode Disable
GET ADDR	Get System Address
GET CAS	Get Cascade Mode Status
GET STA	Get System Status

Output Setup Commands

SET OUT1 VS INy	Set HDBT Output To Input y Input y is: 1 = HDMI input 2 = VGA input
GET OUT1 VS	Get Output x Video Routing
SET OUT EXA EN	Enable Ex-Audio Output
SET OUT EXA DIS	Disable Ex-Audio Output
GET OUT EXA	Get Ex-Audio Output Enable/Disable Status

Auto Mode Commands

SET HD AUTO EN	Enable Auto Mode.
SET HD AUTO DIS	Disable Auto Mode.
GET HD AUTO	Get output Auto mode status.

RS232-CTL to Remote HDBT Commands

SET SEPM x EN/DIS	Set data (8bit, no parity, 1 stop) Baud rate, and Enable or Disable x is: 0 = 57600 1 = 1200 2 = 2400 3 = 4800 4 = 9600 5 = 14400 6 = 19200 7 = 38400 8 = 56000 9 = 115200
GET SEPM	Get RS232 Enable/Disable state

Input EDID Setup Commands

RS232 Command	Command Details
SET IN1 EDID y	<p>Set HDMI Input EDID to the built-in EDID y</p> <p>EDID y is one of the following:</p> <ul style="list-style-type: none"> 0: 1080P_2CH(PCM) 1: 1080P_6CH 2: 1080P_8CH 3: 1080P_3D_2CH(PCM) 4: 1080P_3D_6CH 5: 1080P_3D_8CH 6: 4K30Hz_3D_2CH(PCM) 7: 4K30Hz_3D_6CH 8: 4K30Hz_3D_8CH 9: 4K60Hz(Y420)_3D_2CH(PCM) 10: 4K60Hz(Y420)_3D_6CH 11: 4K60Hz(Y420)_3D_8CH 12: 1080P_2CH(PCM)_HDR 13: 1080P_6CH_HDR 14: 1080P_8CH_HDR 15: 1080P_3D_2CH(PCM)_HDR 16: 1080P_3D_6CH_HDR 17: 1080P_3D_8CH_HDR 18: 4K30Hz_3D_2CH(PCM)_HDR 19: 4K30Hz_3D_6CH_HDR 20: 4K30Hz_3D_8CH_HDR 21: 4K60Hz(Y420)_3D_2CH(PCM)_HDR 22: 4K60Hz(Y420)_3D_6CH_HDR 23: 4K60Hz(Y420)_3D_8CH_HDR 24: USER1_EDID 25: USER2_EDID 26: USER3_EDID
SET IN2 EDID y	<p>Set Input VGA EDID</p> <p>Where y is: 0 = VGA1080P 1 = USER1_EDID 2 = USER2_EDID 3 = USER3_EDID</p>
SET INx EDID CY OUT1	<p>Copy Output 1 EDID To Input x (USER1 Buffer)</p> <p>Input x is: 1 = HDMI input 2 = VGA input</p>
SET INx EDID Uy DATAz	<p>Write EDID data z To User y Buffer of the Input x</p> <p>Input x is: 1 = HDMI input 2 = VGA input</p> <p>EDID Buffer y is: 1 = USER1_EDID, 2 = USER2_EDID, 3 = USER3_EDID</p> <p>z is the EDID data. Must be valid EDID data in a single 256 byte block</p>
GET INx EDID	<p>Get Input x EDID Index</p> <p>Input x is: 1 = HDMI input 2 = VGA input</p>
GET IN1 EDID y DATA	<p>Get HDMI Input EDID y Data</p> <p>y = 0 – 26 (as per SET IN1 EDID y)</p>

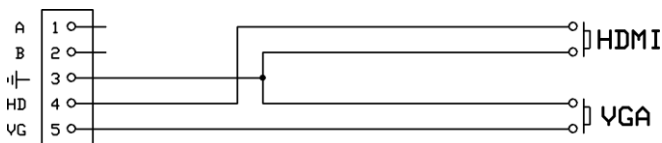
GET IN2 EDID y DATA	Get VGA Input EDID y Data y = 0 – 3 (as per SET IN2 EDID y)
GET OUTx EDID DATA	Get Output x EDID DATA Output x is: 1 = Local HDMI output 2 = Remote HDBaseT output

Specification

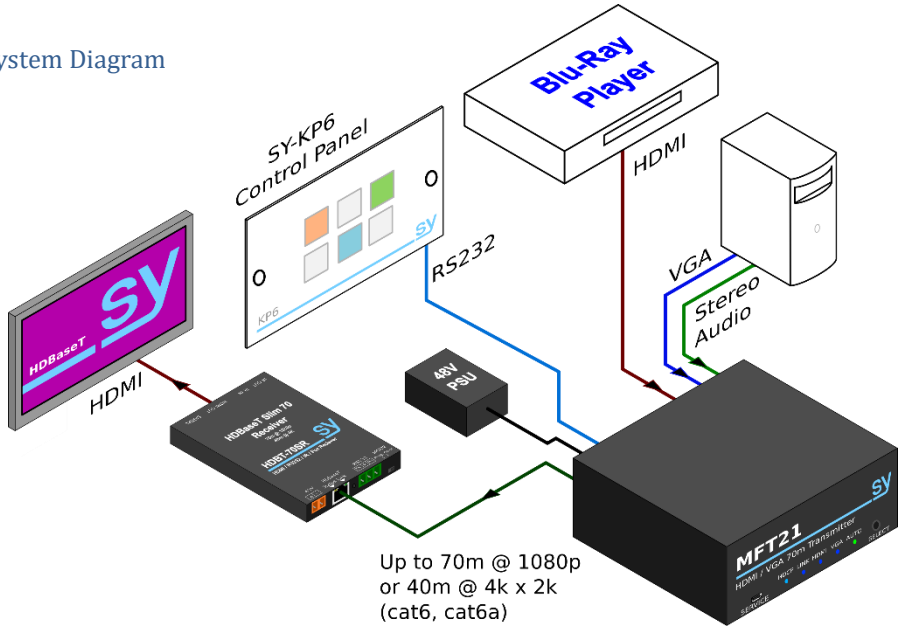
Items	Description
HDMI Video Input/output	VESA and SMPTE 480p to 2160p (4K UHD) with 3D. (All resolutions to: 4096x2160p @60Hz 4:2:0 8bit, 3840x2160p @30Hz 4:4:4 8bit) All PC resolutions to 1920x1200
VGA Video Input	The following VGA resolutions are supported: 800x600, 1024x768, 1280x768, 1280x800, 1280x1024, 1400x1050, 1600x1200, 1920x1080 and 1920x1200.
HDMI Audio Input/output	Pass through: All HDMI audio formats including Dolby D (TrueHD) / DTS (HD-Master Audio) / PCM Channel count: from 2-8 (2.0 to 7.1) Sample rates: 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz and 192 kHz
HDBaseT output	Max 70m (230feet) of cat6a, @ 1080p. HDMI video, RS232, IR control, PoC PoC is available only when SY-HDBT-SLIM-70SR is detected on the HDBT output.
De-embedded Audio out	PCM 2.0 channel from HDBT output, onto 3 pin Phoenix connector. Stereo L/R, 0.7V Rms – 20Hz-20KHz
Control	RS232 & IR Full function pass though RS232-CTL port – 57,600 Baud, no Parity, 1 Stop bit
Power Supply	48V DC @ 0.5A max.
Power Consumption	9.6W with one receiver
Dimensions	108 x 111 x 40mm
Case Materials	Metal chassis
Weight	470g

Using an External Keypad

The MFT21 has an interface for a simple external keypad for controlling the MFT21. The external keypad consists of a normally open momentary push button and an LED for each input as shown in the following schematic:

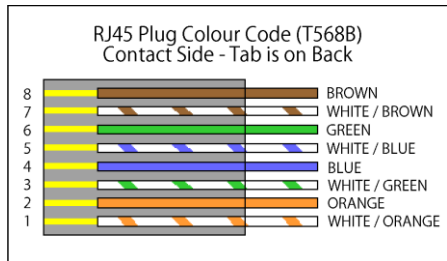
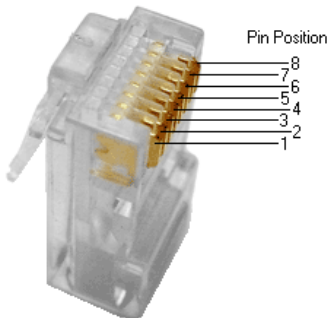


System Diagram



RJ45 Wiring

Both connectors must be wired identically, to T568B standard.



Note: You may use cat5e, cat6 UTP (cat6 preferred) in conjunction with the HDBaseT output; however for best performance use cat6a or cat7 (particularly in electrically noisy environments). The maximum distances & transmission performance for HDMI and HDBT may be compromised by cable quality, patch panels, poor termination, wall plates, cable kinks and electrical interferences. Generally ensure the cat cable is solid copper core of 23AWG (avoid CCA type), in one straight run (avoid/minimise patches) and avoid close proximity to any noisy electrical sources.

Safety Instructions

To ensure reliable operation of this product as well as protecting the safety of any person using or handling these devices while powered, please observe the following instructions.

1. Use the power supplies provided. If an alternate supply is required, check Voltage, polarity and that it has sufficient power to supply the device it is connected to.
2. Do not operate either of these products outside the specified temperature and humidity range given in the above specifications.
3. Ensure there is adequate ventilation to allow this product to operate efficiently.
4. Repair of this equipment should only be carried out by qualified professionals as this product contains sensitive devices that may be damaged by any mistreatment.
5. Only use this product in a dry environment. Do not allow any liquids or harmful chemicals to come into contact with this product.

After Sales Service

1. Should you experience any problems while using this product, firstly refer to the Troubleshooting section in this manual before contacting SY Technical Support.
2. When calling SY Technical Support, the following information should be provided:
 - Product name and model number
 - Product serial number
 - Details of the fault and any conditions under which the fault occurs.
3. This product has a two year standard warranty, beginning from the date of purchase as stated on the sales invoice. For full details please refer to our Terms and Conditions.
4. SY Product warranty is automatically void under any of the following conditions:
 - The product is already outside of its warranty period
 - Damage to the product due to incorrect usage or storage
 - Damage caused by unauthorised repairs
 - Damage caused by mistreatment of the product
5. Please direct any questions or problems you may have to your local dealer before contacting SY Electronics