



SDM-HBT3-TRX

HDBaseT3 Full 4K SDM Transceiver Module

OPERATION MANUAL

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Version 1.1

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SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
v1.00	23/07/2024	Initial release

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1. INTRODUCTION

The SDM-HBT3-TRX is an HDBaseT3 transceiver SDM module, capable of being configured as a transmitter or receiver.

It is compatible with CYP's SDM input and output module platform and can be installed in products like the OR-32SDMI and OR-PIP42SDMO or other core platforms in the SDM range.

Users can easily switch the module card's mode by switching the TX and RX slide physical switch on the interface. While the module card is in transmitter mode, it is able to transmit HDMI signals from host products inputs, to a compatible HDBaseT3 receiver.

When in receiver mode, it receives a signal from a compatible HDBaseT3 transmitter and integrates this signal into the host products structure to be outputted by the host products outputs.

This module card supports point to point HDMI video and audio signals extension. The distance is up to 40 metres with resolutions up to 4K@60 via a category 6A/7 cables.

2. APPLICATIONS

- /// Household entertainment sharing and control
- /// Lecture room display and control
- /// Showroom display and control
- /// Meeting room presentation and control
- /// Classroom display and control

3. PACKAGE CONTENTS

- /// 1xHDBaseT Transceiver Module
- /// 1xMounting Screws (Set of 2)
- /// 1xOperation Manual

4. SYSTEM REQUIREMENTS

- /// Must be installed into a product with an available compatible CYP Module Slot

Note: Despite appearances, this card is NOT designed for installation into a PC's PCIe card slot and should only be installed in officially compatible products.

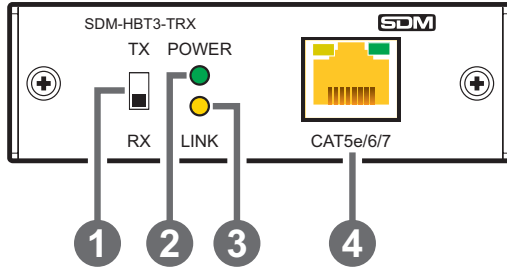
- /// A compatible HDBaseT Transmitter or Receiver with self-power support is required.
- /// Industry standard CAT. 5e/6/7 Ethernet cable is required.

5. FEATURES

- /// HDMI 2.0 and HDCP 1.x and 2.2 compatible
- /// SDM Input/output transceiver module, for use with CYP's SDM host products
- /// HDBaseT3 is designed to be used with other HDBaseT3 products for full 4K compatibility but is also backwards compatible with HDBaseT spec 2.0 and spec 1.0 products
- /// Transceiver Module, can be easily switch from TX to RX mode via physical switch Supports input and output resolutions up to 4K@60Hz 4:4:4
- /// Supports HDR10 and Dolby Vision video formats The distance is up to 40 metres with resolutions up to 4K@60 via a category 6A/7 cables

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



- 1 **TX/RX:** This switch toggles the unit's mode between transmitter mode and receiver mode.
- 2 **POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.
- 3 **LINK LED:** This LED will illuminate solidly when a live connection with a compatible transmitter/receiver is active.
- 4 **CAT. 5e/6/7 Port:** Connect to a compatible HDBaseT transmitter/receiver with a single CAT.5e/6/6A/7 cable for transmission of all data signals.

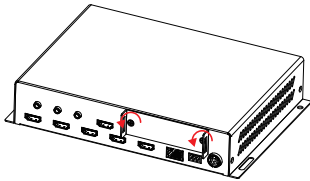
6.2 Card Installation

6.2.1 Transmitter Mode

To install this module card into your unit, it must have at least one available CYP Module Slot.

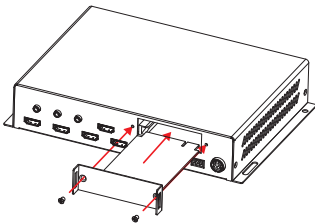
Ensure that the anti-static procedure is completed before handling the module card.

- (1) Prior to the installation, power off the unit completely.

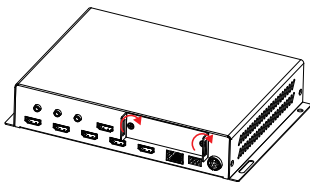


- (2) Remove the dummy faceplate that is covering the card module slot by unscrewing both screws.

Note: Be sure to store the dummy faceplate and its screws in somewhere safe, in case you need to use them again later.



- (3) Align the card with the guiderails to each side of the module slot, gently slide the module card into the slot until its faceplate is flush with the back of the unit.



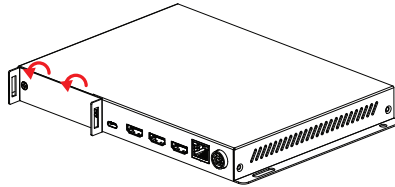
- (4) Secure the module card to the unit by using the supplied screws.
- (5) The unit may now be powered on. The card's power LED will light up to indicate while it's receiving power. In most cases, the card will be automatically detected by the unit and be available to use.

6.2.2 Receiver Mode

To install this module card into your unit, it must have at least one available CYP Module Slot.

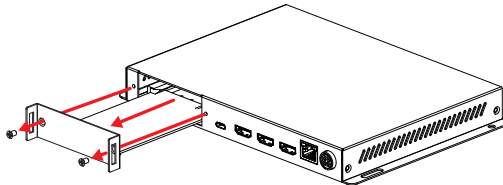
Ensure that the anti-static procedure is completed before handling the module card.

- (1) Prior to removal, power the unit completely off.

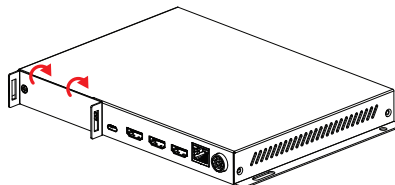


- (2) Remove the dummy faceplate that is covering the card module slot by unscrewing both screws.

Note: Be sure to store the dummy faceplate, and its screws, somewhere safe, in case you need to use them again later.



- (3) Align the card with the guiderails to each side of the module slot, and gently slide the module card into the slot until its faceplate is flush with the back of the unit.

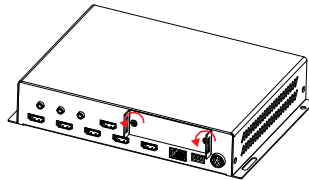


- (4) Secure the module to the unit by using the supplied screws.
- (5) The unit may now be powered back on. The card's power LED will light up to indicate it is receiving power. In most cases, the card will be automatically detected by the unit and be available for use.

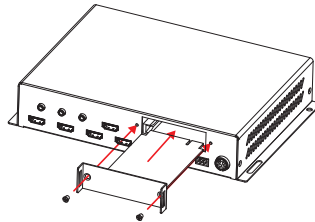
6.3 Card Removal

6.3.1 Transmitter Mode

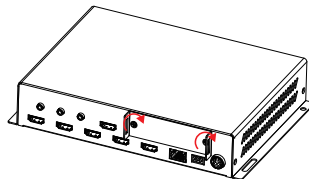
- (1) Prior to removal, power off the unit completely.



- (2) Completely unscrew both screws.



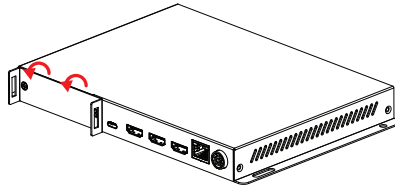
- (3) Gently pull the card straight out of the module slot using the provided handles.



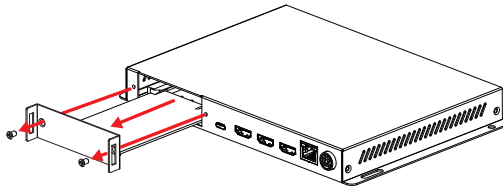
- (4) Cover the module slot with a dummy faceplate and tighten both screws.
- (5) The unit may now be powered back on.

6.3.2 Receiver Mode

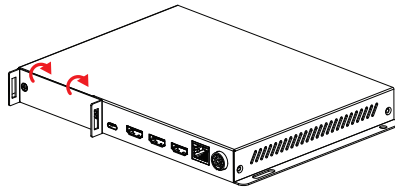
(1) Prior to removal, power the unit completely off.



(2) Completely unscrew both screws.



(3) Gently pull the card straight out of the module slot using the provided handles.



(4) Cover the module slot with a dummy faceplate and tighten both screws.

(5) The unit may now be powered back on.

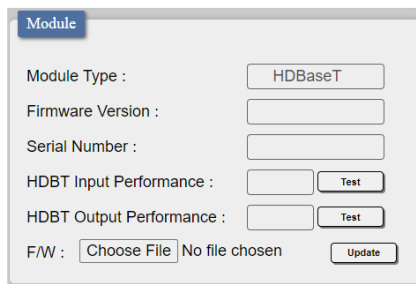
6.4 WebGUI Control

6.4.1 CYP Module Platform

The SDM branded module card(s) can be installed in the compatible module platform. It provides a user-friendly access of some additional functions for the module card within its own WebGUI, improving unit integration.

6.4.2 Module Tab (Transmitter Mode)

This tab displays the module's module type, current firmware version and serial number, as well as provides a way to update firmware.



The screenshot shows a web interface titled "Module" with the following elements:

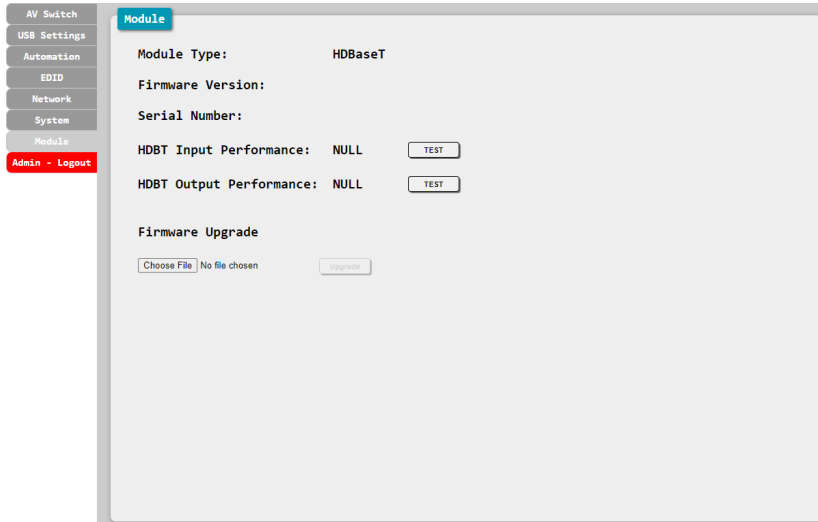
- Module Type :** A dropdown menu currently showing "HDBaseT".
- Firmware Version :** An empty text input field.
- Serial Number :** An empty text input field.
- HDBT Input Performance :** A text input field followed by a "Test" button.
- HDBT Output Performance :** A text input field followed by a "Test" button.
- F/W :** A "Choose File" button, the text "No file chosen", and an "Update" button.

Note: The WebGUI design might be vary from the compatible platform.

- 1) Module Type:** Displays the module's module type.
- 2) Firmware Version:** Displays the module's firmware version.
- 3) Serial Number:** Displays the module's serial number.
- 4) HDBT Input/Output Performance:** Provides a simple diagnostic for HDBaseT input and output performances.
- 5) Firmware Upgrade:** To update the module's firmware, click the "Choose File" button to open the file selection window and then select the firmware update file (*.bin format) located on your local PC. After selecting the file, click the "Upgrade" button to begin the firmware update process. After the upgrade is complete, the unit will reboot automatically.

6.4.3 Module Tab (Receiver Mode)

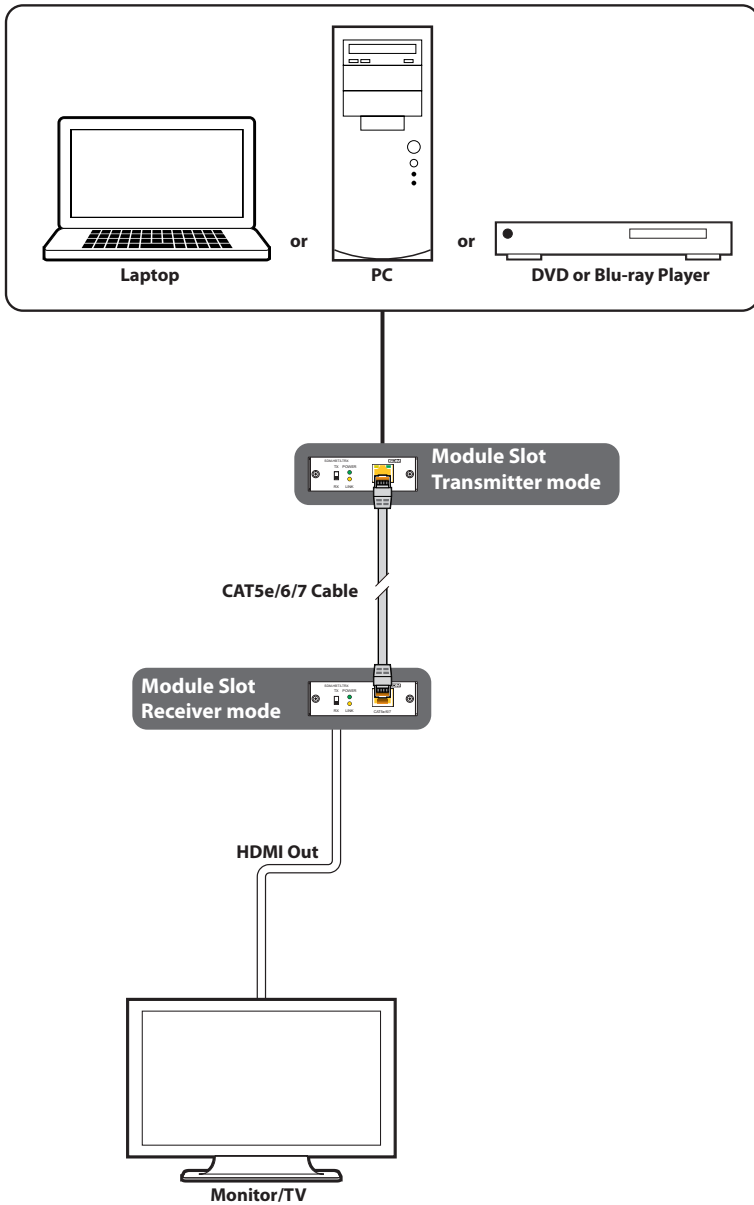
This tab displays the module's module type, current firmware version and serial number, as well as provides a way to update firmware.



Note: The WebGUI design might be vary from the compatible platform.

- 1) **Module Type:** Displays the module's module type.
- 2) **Firmware Version:** Displays the module's firmware version.
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7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

HDBaseT Bandwidth	10.2Gbps
Card Slot Format	1× CYP Module (Edge Connector)
Bi-directional Port	1× HDBaseT (RJ-45)
Control Ports	1× Slide Switch
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	128mm×25mm×75mm [Case Only] 128mm×25mm×75mm [All Inclusive]
Weight	72g
Chassis Material	Metal (Steel)
Chassis Colour	Black
Operating Temperature	0°C – 40°C/32°F – 104°F
Storage Temperature	-20°C – 60°C/-4°F – 140°F
Relative Humidity	20 – 90% RH (Non-condensing)

8.2 Video Specifications

Supported Resolutions (Hz)	Input		Output	
	Card Slot	HDBT	Card Slot	HDBT
720×400p@70/85	✓	✓	✓	✓
640×480p@60/72/75/85	✓	✓	✓	✓
720×480i@60	✓	✓	✓	✓
720×480p@60	✓	✓	✓	✓
720×576i@50	✓	✓	✓	✓
720×576p@50	✓	✓	✓	✓
800×600p@56/60/72/75/85	✓	✓	✓	✓
848×480p@60	✓	✓	✓	✓
1024×768p@60/70/75/85	✓	✓	✓	✓
1152×864p@75	✓	✓	✓	✓
1280×720p@50/60	✓	✓	✓	✓
1280×768p@60/75/85	60/75	60/75	60/75	60/75
1280×800p@60/75/85	60RB/60	60RB/60	60RB/60	60RB/60
1280×960p@60/85	✓	✓	✓	✓
1280×1024p@60/75/85	✓	✓	✓	✓
1360×768p@60	✓	✓	✓	✓
1366×768p@60	✓	✓	✓	✓
1400×1050p@60	✓	✓	✓	✓
1440×900p@60/75	✓	✓	✓	✓
1600×900p@60RB	✓	✓	✓	✓
1600×1200p@60	✓	✓	✓	✓
1680×1050p@60	✓	✓	✓	✓
1920×1080i@50/60	✓	✓	✓	✓

Supported Resolutions (Hz)	Input		Output	
	Card Slot	HDBT	Card Slot	HDBT
1920×1080p@24/25/30	✓	✓	✓	✓
1920×1080p@50/60	✓	✓	✓	✓
1920×1200p@60RB	✓	✓	✓	✓
2560×1440p@60RB	✓	✓	✓	✓
2560×1600p@60RB	✓	✓	✓	✓
2048×1080p@24/25/30	✓	✓	✓	✓
2048×1080p@50/60	✓	✓	✓	✓
3840×2160p@24/25/30	✓	✓	✓	✓
3840×2160p@50/60 (4:2:0)	✓	✓	✓	✓
3840×2160p@24, HDR10	✓	✓	✓	✓
3840×2160p@50/60 (4:2:0), HDR10	✓	✓	✓	✓
3840×2160p@50/60	✓	✓	✓	✓
4096×2160p@24/25/30	✓	✓	✓	✓
4096×2160p@50/60 (4:2:0)	✓	✓	✓	✓
4096×2160p@24, HDR10	✓	✓	✓	✓
4096×2160p@50/60 (4:2:0),HDR10	✓	✓	✓	✓
4096×2160p@50/60	✓	✓	✓	✓

8.3 Audio Specifications

8.3.1 Digital Audio

Card Slot	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

8.4 Cable Specifications

Cable Length	HD	FHD	4K UHD	4K UHD+	8K UHD
Ethernet Cable					
Cat.5e/6		60m		40m	×
Cat.6A/7		70m		40m	×

Bandwidth Category Examples:

/// HD Video

- 720p@60Hz
- HDMI transmission rates lower than 3Gbps
- HD-SDI (SMPTE 292M, 1.485Gbps)

/// FHD Video

- 1080p@60Hz
- HDMI transmission rates between 3Gbps and 5.3Gbps
- 3G-SDI (SMPTE 424M, 2.970Gbps)

/// 4K UHD Video

- 4K@24/25/30Hz (8-bit colour) & 4K@50/60Hz (4:2:0, 8-bit colour)
- HDMI transmission rates between 5.3Gbps and 10.2Gbps
- 6G-SDI (SMPTE ST 2081, 6Gbps)

/// 4K UHD+ Video

- 1080p@120Hz (10/12-bit HDR)
- 4K@50/60Hz (4:4:4, 8-bit) & 4K@50/60Hz (4:2:0, 10/12-bit HDR)
- HDMI transmission rates between 10.2Gbps and 18Gbps
- 12G-SDI (SMPTE ST 2082, 12Gbps)

/// 8K UHD Video

- 4K@120Hz (10/12-bit HDR)
- 8K@24/25/30Hz (10/12-bit HDR) & 8K@50/60Hz (4:2:0, 8-bit colour)
- HDMI transmission rates between 18Gbps and 48Gbps
- 24G-SDI (SMPTE ST 2083, 24Gbps)

8.5 HDBaseT Features

HDBaseT Feature Set	Transmitter Mode
Video & Audio Extension	Supported
LAN Extension	Unsupported
Send power to Receiver	Unsupported
Accept power from Receiver	Unsupported
IR Extension	Unsupported
RS-232 Extension	Unsupported
USB 2.0 Extension	Unsupported

HDBaseT Feature Set	Receiver Mode
Video & Audio Extension	Supported
LAN Extension	Unsupported
Send power to Transmitter	Unsupported
Accept power from Transmitter	Unsupported
IR Extension	Unsupported
RS-232 Extension	Unsupported
USB 2.0 Extension	Unsupported

9. ACRONYMS

ACRONYM	COMPLETE TERM
ADC	Analogue-to-Digital Converter
ASCII	American Standard Code for Information Interchange
Cat.5e	Enhanced Category 5 cable
Cat.6	Category 6 cable
Cat.6A	Augmented Category 6 cable
Cat.7	Category 7 cable
CEC	Consumer Electronics Control
DAC	Digital-to-Analogue Converter
dB	Decibel
DHCP	Dynamic Host Configuration Protocol
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
GbE	Gigabit Ethernet
Gbps	Gigabits per second
GUI	Graphical User Interface
HD	High-Definition
HDBT	HDBaseT
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
HDTV	High-Definition Television
IP	Internet Protocol
IR	Infrared
kHz	Kilohertz

ACRONYM	COMPLETE TERM
LAN	Local Area Network
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
MAC	Media Access Control
MHz	Megahertz
PD	Powered Device
PoH	Power over HDBaseT
PSE	Power Sourcing Equipment
S/PDIF	Sony/Philips Digital Interface Format
SDTV	Standard-Definition Television
SNR	Signal-to-Noise Ratio
TCP	Transmission Control Protocol
THD+N	Total Harmonic Distortion plus Noise
TMDS	Transition-Minimised Differential Signaling
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array
Ω	Ohm



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