

875760 HDbaseT/HDMI/Audio Matrix 4x4

Manual



Thank you for purchasing this product. For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

SURGE PROTECTION DEVICE RECOMMENDED

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

SAFETY AND NOTICE

1. The transmission distances of HDMI over UTP cables are measured using TE CONNECTIVITY 1427071-6
2. **EIA/TIA-568-B termination** (T568B) and “**AWG24/1 solid wire**” for CAT cables is recommended for best performance.
3. **DO NOT use 568A/568B standard mixed CAT cable** (cross-over cable) because there are 2 pairs swapped, this will make POE OVER-CURRENT and damage POE components. Please use straight-through CAT cable (both RJ45 headers are 568A or 568B standard).
4. It is recommended that power up the device after connections of source, sink and CAT cable.
5. To reduce the interference among the unshielded twisted pairs of wires in CAT cable, do not run HDBaseT / Zone Cat5e/6/6a cabling with or in close parallel proximity to mains power cables. Shielded CAT cables can be used to improve EMI problems, which is worsen in long transmission.
6. Because the quality of the CAT cables has the major effect on how long the transmission limit can achieve and how good is the received picture quality, the actual transmission range is subject to one's choice of CAT cables.
7. **Do not substitute or use any other Power Supply other than the enclosed unit, or a TLS electronics GmbH approved Replacement Part. Doing so will void the warranty and potentially expose the user to dangerous voltages resulting in an electrical shock.**
8. Do not disassemble the device for any reason. Doing so will void the manufacturer's warranty. Also, our unique case is an integral part of the design of this unit and is responsible for cooling and circuitry shielding. Any modifications to this case will potentially cause malfunction and product failure.
9. Do not expose the device to water, moisture, or liquids. Possible electric shock may result as well as failure of the unit to operate.

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Introduction:

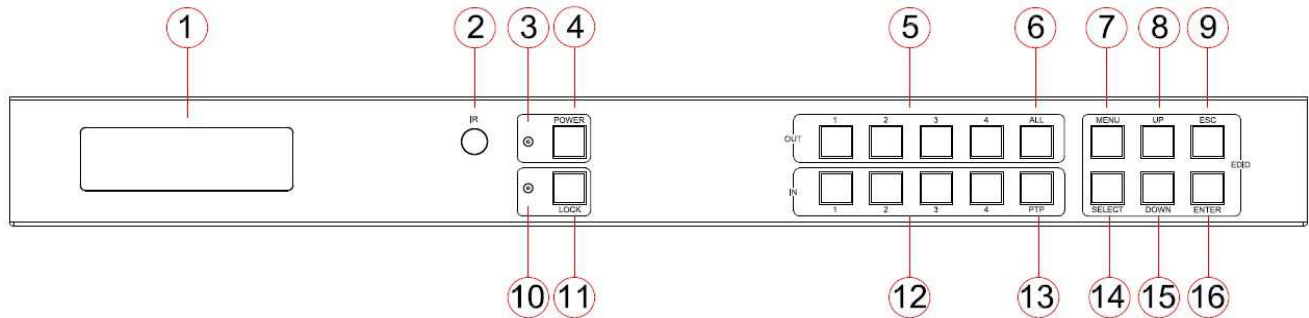
The HDBaseT/HDMI/Audio Matrix 4x4 routes four Hi-Def sources to any four HDTV displays, supporting 1080p Full HD up to 4K@30Hz UHD plus all 3D formats, along with multichannel digital audio formats such as Dolby® True HD and DTS-HD® Master Audio™. Embedded audio extractors can extract the audio and output via L/R or Coaxial. Volume can be controlled for analogue audio out. Based on HDBaseT Lite chipset inside, the output distance can reach up to 70m via Cat5e/Cat6. Each source can be routed to any display using the front-panel push buttons, IR remote control, RS-232 interface, or via TCP/IP.

Features:

- HDCP 2.2 compliant
- Supports resolutions up to 1080p@60Hz, 4K@30Hz, 36-bit deep color
- HDBaseT Lite chipset inside for the output distance up to 70m.
- Matrix can power the remote receivers, with POH, no power supply needed for the receivers.
- Allows any source to be displayed on multiple displays (HDBaseT & HDMI) at the same time
- Allows any HDMI display to view any HDMI source at any time
- Dolby TrueHD and DTS-HD master audio pass through HDMI output
- Volume control with Telnet and RS232 on deembedded audio
- Advanced EDID management for rapid integration of sources and displays
- Front-panel LCD display for status feedback
- Multiple switching mode: push-in button, IR remote control, RS-232 control, and TCP/IP control
- Easy installation with rack-mounting ears
- Full 3D pass- through.

Panel Descriptions

Front Panel

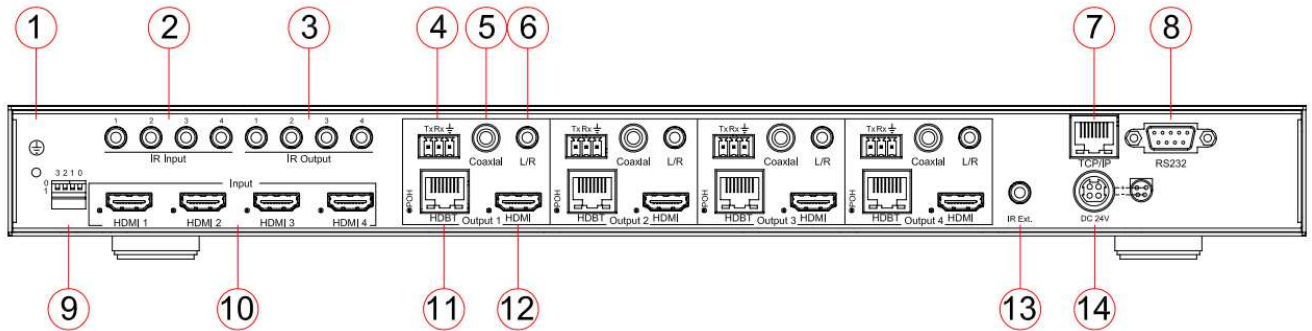


1. LCD display---Show the status of input-output selection, EDID info and so on.
2. IR receiver window----Receive the IR from the remote control.
3. Power LED indicator---Indicate the status of the power for the matrix.
4. Power button---Press to power on/off the matrix.
5. HDMI output selection button 1 to 4---First Press - select the output from button 1 to button 4
12. HDMI input selection button 1 to 4---Second Press - select the input from button 1 to button 4
6. All button for HDMI outputs---Press to select all of the outputs from 1 to 4.
7. Menu button---Press to enter EDID set mode. Three EDID segments will display on the LCD panel formatted as: INPUT VIDEO AUDIO, for example: IN1 1080P 2.0CH, means to set 1080P 2.0CH EDID to INPUT1. The blinking segment is the one can be changed currently. Segment content items as below:

INPUT	VIDEO	AUDIO	Note
IN1	1080I	2.0CH.	
IN2	1080P	5.1CH	
IN3	3D	7.1CH	
IN4	D1024		D1024=DVI 1024 x 768
IN5	D1080		D1080=DVI 1920 x 1080
IN6	D1200		D1200=DVI 1920 x 1200
IN7	OUT1		OUT1=Copy OUTPUT1 EDID to INPUTx
ALL	OUT2		ALL=Set EDID to ALL INPUTs OUT2=Copy OUTPUT2 EDID to INPUTx
	OUT3		OUT3=Copy OUTPUT3 EDID to INPUTx
	OUT4		OUT4=Copy OUTPUT4 EDID to INPUTx
	OUT5		OUT5=Copy OUTPUT5 EDID to INPUTx
	OUT6		OUT6=Copy OUTPUT6 EDID to INPUTx
	OUT7		OUT7=Copy OUTPUT7 EDID to INPUTx
	OUT8		OUT8=Copy OUTPUT8 EDID to INPUTx

8. Up selection button--- Press to change segment's value.
9. ESC---Press to quit EDID set mode.
10. Lock LED indicator---Indicate the status of Lock.
11. Lock button---Press to lock the buttons of the front panel.
12. HDMI input selection button 1 to 4---Press to select the input from 1 to 4.
13. PTP button---Press to mirror all inputs and outputs (e.g. output 1 to input1, output 2 to input2 and so on).
14. Selection button---Press to select segment to change setting. Selected segment will be blinking.
15. Down selection button---Press to change segment's value.
16. Enter button--- Press to set EDID to specified INPUT or copy EDID from specified OUTPUT to specified INPUT.

Back Panel



1. GND --- Connect to ground.
2. IR inputs 1 to 4 --- 3.5mm stereo phone-jack, work with control processor.
3. IR outputs 1 to 4 --- 3.5mm mono phone-jack, connect to IR transmitter cable.
4. RS232 port with each HDBT out--- Connect to PC, and work with the remote receiver.
5. Coaxial digital audio output --- Extracted audio corresponding with the HDMI video output
6. L/R analog audio output --- Extracted audio corresponding with the HDMI video output.
7. TCP/IP port – TCP/IP control
8. RS232 port – For control the matrix from PC or control processor

9. DIP switch – Used for global EDID settings

3	2	1	0	EDID type
Combination of DIP positions				
0	0	0	0	1080P 2.0CH
0	0	0	1	1080P 5.1CH
0	0	1	0	1080P 7.1CH
0	0	1	1	1080i 2.0CH
0	1	0	0	1080i 5.1CH
0	1	0	1	1080i 7.1CH
0	1	1	0	3D 2.0CH
0	1	1	1	3D 5.1CH
1	0	0	0	3D 7.1CH
1	0	0	1	4K 2.0CH
1	0	1	0	4K 5.1CH
1	0	1	1	4K 7.1CH
1	1	0	0	DVI 1280x1024
1	1	0	1	DVI 1920x1080
1	1	1	0	DVI 1920x1200
1	1	1	1	Software Control EDID

10. HDMI inputs 1 to 4--- Connect HDMI sources

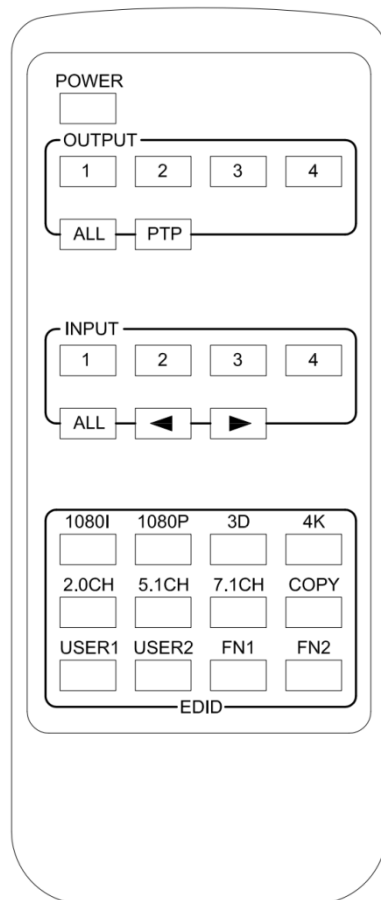
11. HDBT outputs 1 to 4--- Work with remote receivers for long distance transmission.

12. HDMI outputs 1 to 4--- Output for displays, AVR etc.

13. IR extension receiver input --- 3.5mm stereo phone-jack, connect to IR receiver cable to receive the IR from remote of the matrix.

14. Power port--- Use included 24V/3.5A DC adaptor to power the matrix.

Remote Control Description



Output and Input select

A. OUTPUT-X select INPUT-Y:

1. Press OUTPUT-X (X means 1 to 4 of outputs) → Press INPUT-Y (Y means 1 to 4 of inputs)
2. Press OUTPUT-X (X means 1 to 4 of outputs) → press the left and right arrow buttons to select the input.

B. All outputs select INPUT-Y: Press ALL button in zone OUTPUT → Press INPUT-Y button (Y means 1 to 4 of inputs), then INPUT-Y switched to ALL OUTPUTS

C. Mirror all inputs and outputs (Ex. Input 1 to output 1, input 2 to output 2, etc): Press PTP button in Zone OUTPUT

EDID Set Up

A. Fixed EDID to INPUT-Y/ALL

Press 1080I/1080P/3D/4K → Press 2.0CH/5.1CH/7.1CH → INPUT-Y/ALL button in Zone INPUT

B. Copy EDID of OUTPUT-X to INPUT-Y/ALL

Press COPY button → Press OUTPUT-X button → Press INPUT-Y/ALL button

C. User defined EDID to INPUT-Y/ALL

Press USER1/USER2 button → Press INPUT-Y/ALL

NOTE: Pressing button sequence should be finished in 5 seconds, otherwise, operation discarded.

Manual Output and Input select

First Press: OUTPUT select, output button 1 to 4

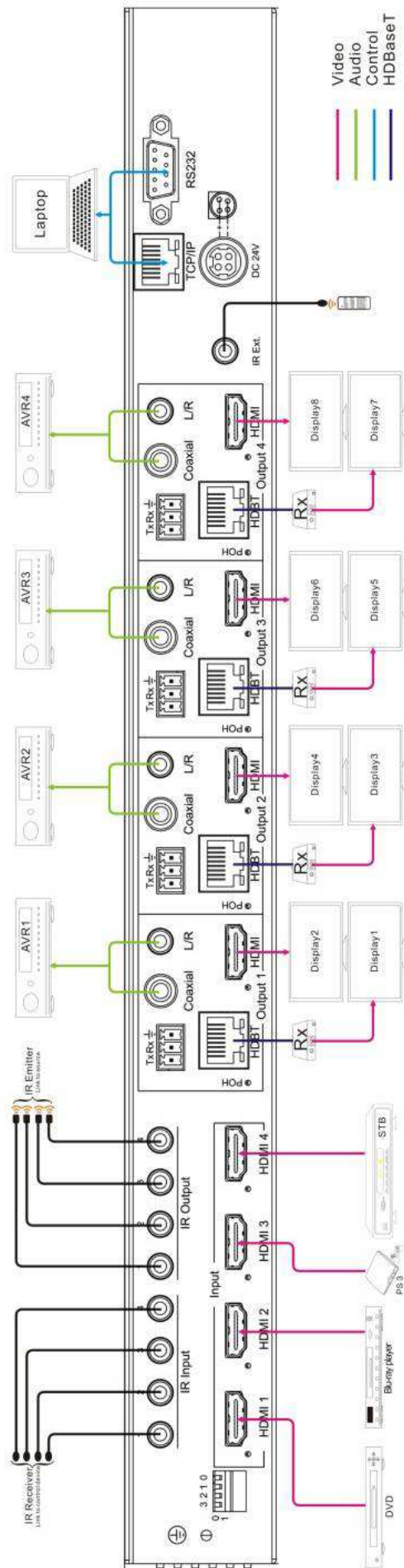
Second Press: INPUT select, output button 1 to 4

Specifications:

Bandwidth	2.97Gbps per color
Video Input Connectors	4x HDMI Type A, 19-pin, female
Video Output Connectors	4x HDMI Type A, 19-pin, female, 4x RJ45 Connector
Audio Output Connectors	4x RCA(SPDIF), 4x L/R
RS232 Serial port	DB-9, female
TCP/IP Control	1x RJ45, female
IR input ports	5x3.5mm stereo jack
IR output ports	4x3.5mm mono stereo jack
Rack-Mountable	rack ears included
Dimensions(Lx Wx D)	428mm x 235mm x 43mm, w/o feet
Shipping Weight	2.7KG
Operating Temperature	32°F to 104°F (0°C to 40°C)
Storage Temperature	-4°F to 140°F (-20°C to 60°C)
Power Supply	24V/3,5A DC

Application

Diagram



Package Contents:

- 1) 1x 875760 HDBaseT/HDMI Audio Matrix 4x4
- 2) 1x 24V/3.5A DC power supply
- 3) 1x Remote control
- 4) 4x IR Transmitter,
- 5) 5x IR Receiver.
- 6) 1x mounting kit.

RS-232 Pin Assignment

875760		Remote Control Console	
PIN	Assignment	PIN	Assignment
1	NC	1	NC
2	Tx	2	Rx
3	Rx	3	Tx
4	NC	4	NC
5	GND	5	GND
6	NC	6	NC
7	NC	7	NC
8	NC	8	NC
9	NC	9	NC

Baud Rate: 57600 bps

Data Bit: 8-bit

Parity: None

Stop Bit: 1-bit

Flow Control: None

RS232 and Telnet Commands

No.	Command	Action
0	?	Print Help Information
1	HELP	Print Help Information
2	STATUS	Print System Status And Port Status
3	PON	Power On, System Run On Normal State
4	POFF	Power Off, System Run On Power Save State
5	IR ON/OFF	Set System IR Control On Or Off (Only for IR Extension)
6	KEY ON/OFF	Set System KEY Control On Or Off
7	DBG ON/OFF	Set Debug Mode On Or Off
8	BEEP ON/OFF	Set Onboard Beep On Or Off
9	LCD ON/OFF	Set LCD Always On Or Auto Turn Off When Power On
10	RESET	Reset System To Default Setting, Should Type 'Yes' To Confirm, 'No' To Discard
11	OUT xx ON/OFF	Set OUTPUT:xx On Or Off
12	OUT xx FR yy	Set OUTPUT:xx From INPUT:yy
13	POH xx ON/OFF	Set OUTPUT:xx POH On Or Off xx=00: Select All OUTPUT Port xx=[01...04]: Select One OUTPUT Port yy=[01...04]: Select One INPUT Port
14	EDID xx CP	Set Input:xx EDID Copy From Output:yy
15	EDID xx DF zz	Set Input:xx EDID To Default EDID:zz xx=00: Select All INPUT Port xx=[01...04]: Select One INPUT Port yy=[01...04]: Select One OUTPUT Port zz=00: HDMI 1080p@60Hz, Audio 2CH PCM zz=01: HDMI 1080p@60Hz, Audio 5.1CH PCM/DTS/DOLBY zz=02: HDMI 1080p@60Hz, Audio 7.1CH PCM/DTS/DOLBY/HD zz=03: HDMI 1080i@60Hz, Audio 2CH PCM zz=04: HDMI 1080i@60Hz, Audio 5.1CH PCM/DTS/DOLBY zz=05: HDMI 1080i@60Hz, Audio 7.1CH PCM/DTS/DOLBY/HD zz=06: HDMI 1080p@60Hz/3D, Audio 2CH PCM zz=07: HDMI 1080p@60Hz/3D, Audio 5.1CH PCM/DTS/DOLBY zz=08: HDMI 1080p@60Hz/3D, Audio 7.1CH PCM/DTS/DOLBY/HD zz=09: HDMI 4K2K, Audio 2CH PCM zz=10: HDMI 4K2K, Audio 5.1CH PCM/DTS/DOLBY zz=11: HDMI 4K2K, Audio 7.1CH PCM/DTS/DOLBY/HD zz=12: DVI 1280x1024@60Hz, Audio None zz=13: DVI 1920x1080@60Hz, Audio None zz=14: DVI 1920x1200@60Hz, Audio None zz=15: User EDID 1 zz=16: User EDID 2 zz=17: GUI Download EDID

16	MUTE mm TX yy	Set Output(TX):yy Audio Mute ON Or OFF
17	VOL xx TX yy	Set Output(TX):yy Audio Volume to xx (only for analog Outputs!) xx=[00...30]: Volume Value xx=+: Volume Increase xx=-: Volume Decrease mm=ON: Mute On mm=OFF: Mute Off yy=00: Select All OUTPUT Port yy=[01...04]: Select One OUTPUT Port
18	NET DHCP ON/OFF	Set Auto IP(DHCP) ON Or OFF
19	NET IP xxx.xxx.xxx.xxx	Set IP Address
20	NET GW xxx.xxx.xxx.xxx	Set Gateway Address
21	NET SM xxx.xxx.xxx.xxx	Set Subnet Mask Address
22	NET RB	Set Network Reboot and Apply New Config!!!

GUI Control

PC System: Microsoft Windows Operation System

Installation

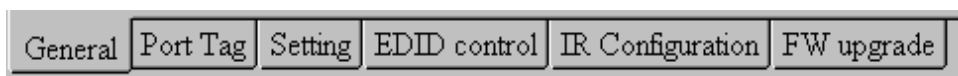
4x4 HDMI Matrix controller is a green software. You just need to copy “4x4 HDMI Matrix Controller vx.x.exe” to the PC which is used to control the Matrix by RS232 COM or TCP to complete installation.

Preparation

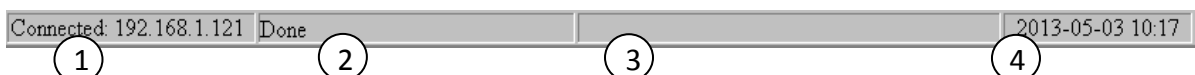
1. Connect PC and Matrix by RS232 cable or UTP cable
2. Power up Matrix (It will take about 5 seconds to be ready with “Di” beep sound)
3. Double click “4x4 HDMI Matrix Controller vx.x.exe” icon to run it

How to control Matrix

Common information

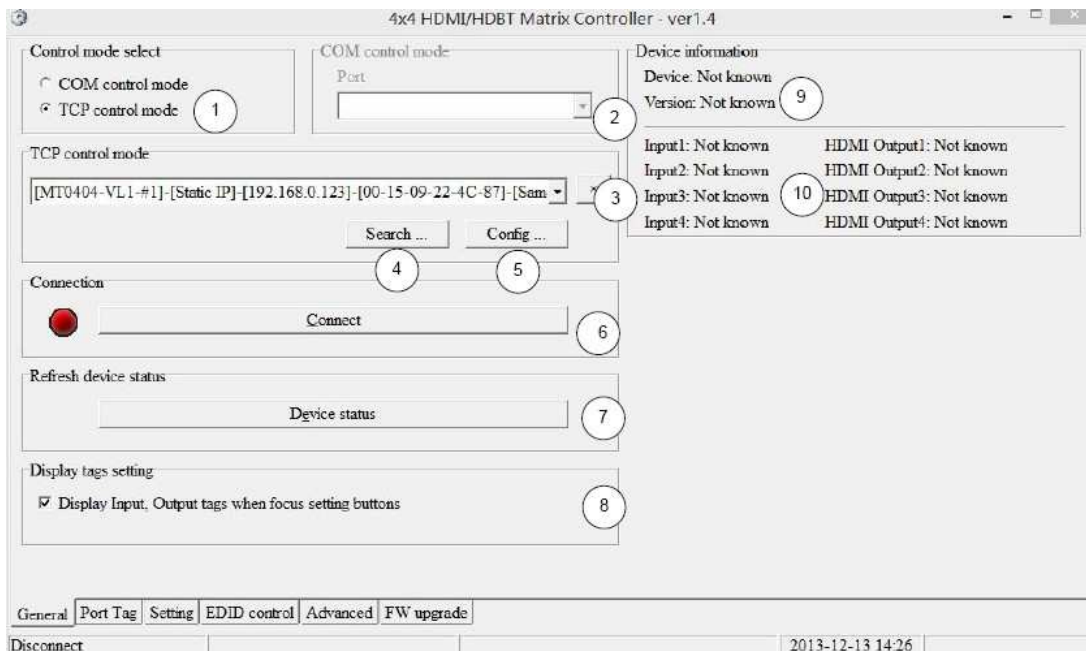


Click to select tab page



1. COM port or TCP connect status
2. Control command process status
3. Prompt message display area
4. Date and Time display

“General” page



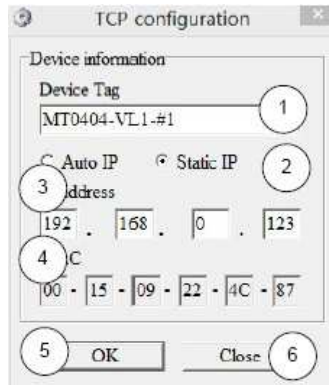
1. Select control mode: RS232 COM mode (Auto COM ports detected) or TCP mode
2. List detected COM ports
3. List all Matrix devices after search operation
4. Click to search all Matrix devices that connected in same subnet
5. Click to configuration the selected Matrix's TCP control configurations
6. Click to connect or disconnect PC and Matrix (Connection will be established automatically before control commands sending)
7. Click to refresh device status: include device information displayed in ⑨ area and Input/output port connection status in ⑩ area.

NOTE: Tab pages cannot be changed during control command is processing.

8. To enable or disable Input/output tags displaying when setting buttons on “Setting” page focused
9. Device information display area
10. Input/output port connection status

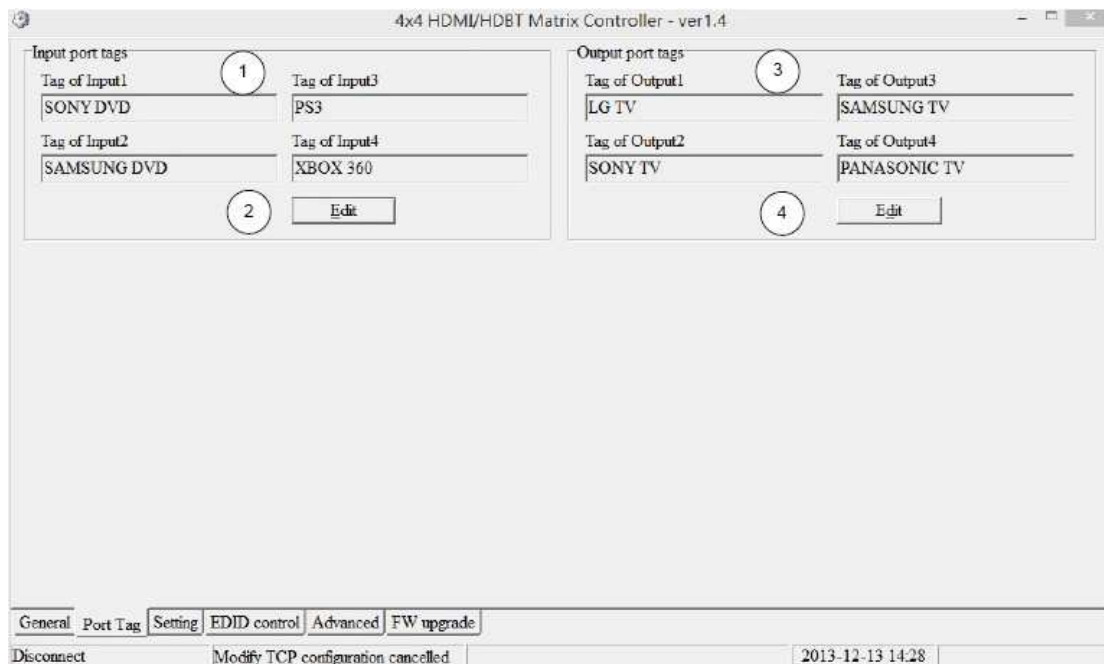
Set TCP control configuration

Click Config button to show TCP configuration window.



- ① Set tag to identify Matrix device
- ② Set IP mode: Subnet should support DHCP protocol when set Auto IP mode, then Matrix device will obtain IP automatically. Otherwise, set Static IP mode and designate a useable IP for Matrix device
- ③ Set IP address, not editable when Auto IP mode selected. **Note:** The last IP BYTE's range is 2-252.
- ④ Matrix device MAC address
- ⑤ Click OK to set configuration. If configuration is set OK, Matrix devices will be searched out again
- ⑥ Click to Close the window and configuration cancelled

“Port Tag” page



1. Input port tags
2. Click to edit Input port tags
3. Output port tags
4. Click to edit Output port tags

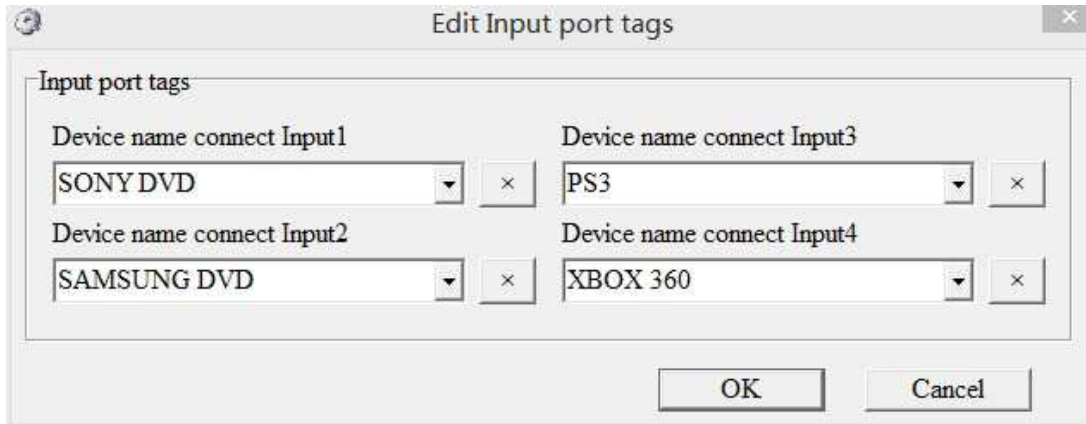
NOTE: Edit boxes are read only, click “Edit” button to pop up window to edit the tags.

One set of Input/output port tags can be set for Matrix device when COM control mode selected.

Input/output port tags can be set for respective Matrix device according to device’s MAC address.

Edit Input port tags

After action of ②, edit form will pop-up as below:

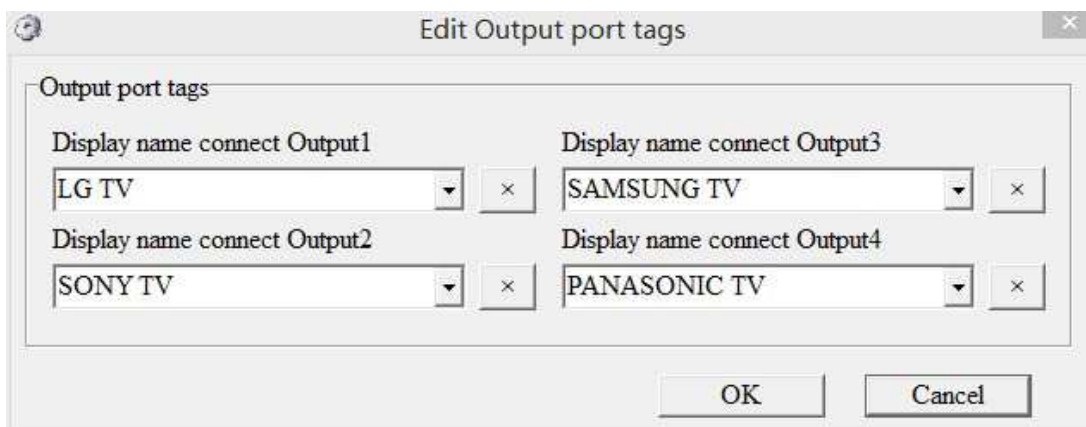


Define tags for respective Input port, then devices connect the Input ports can be easily remembered.

Click buttons with “x” caption to delete tag which is no use any more, if tag is still used by any other Input port, delete action will be discarded.

Edit Output port tags

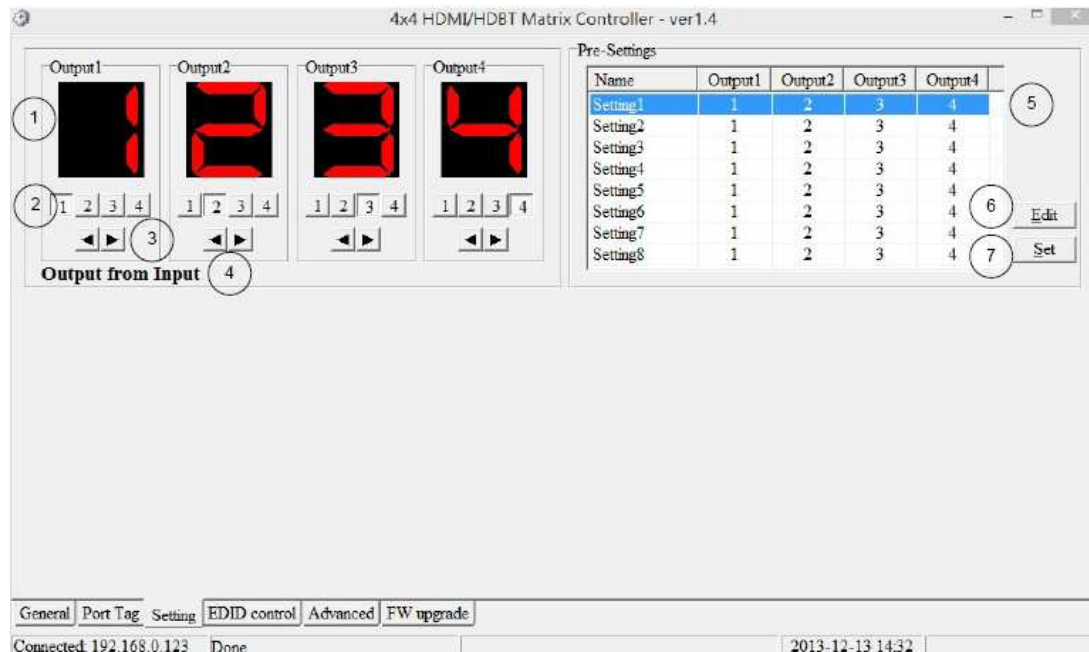
After action of ④, edit form will pop-up as below:



Define tags for respective Output port, then displays connect the Output ports can be easily remembered.

Click buttons with “x” caption to delete tag which is no use any more, if tag is still used by any other Output port, delete action will be discarded.

“Setting” page

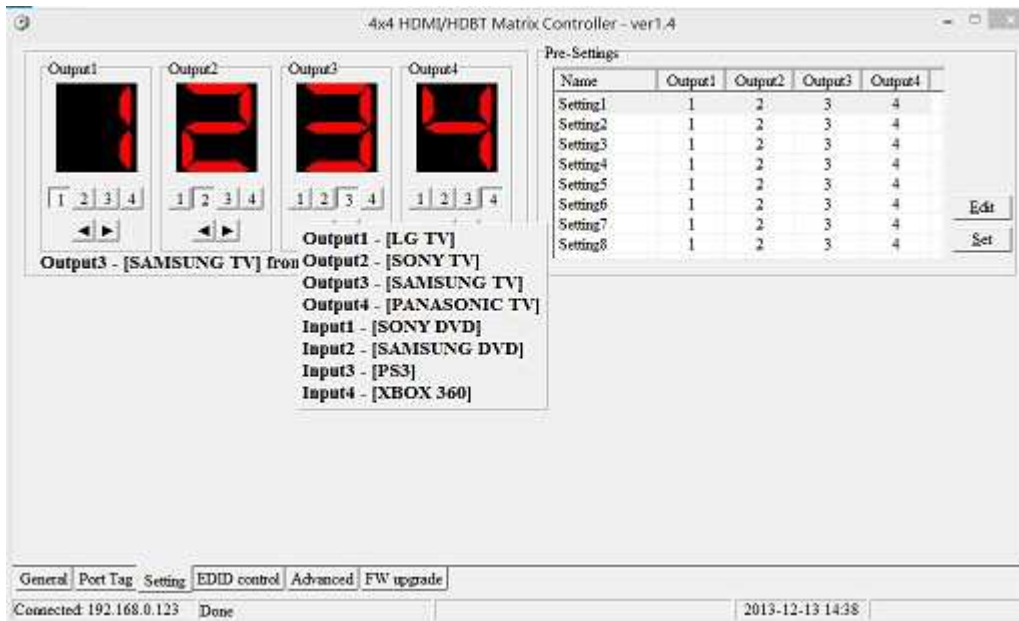


1. LED which displays Input number for respective Output port
2. Click to select Input port for respective Output port
3. Click to select previous or next Input port for respective Output port
4. Display Output from Input with tag information when mouse moves over ② buttons
5. Pre-Setting items: Default is Port to Port
6. Click to edit selected pre-setting item
7. Set selected pre-setting item to Matrix

NOTE: When Change to this “Setting” page, software will try to refresh source selection status of Output port.

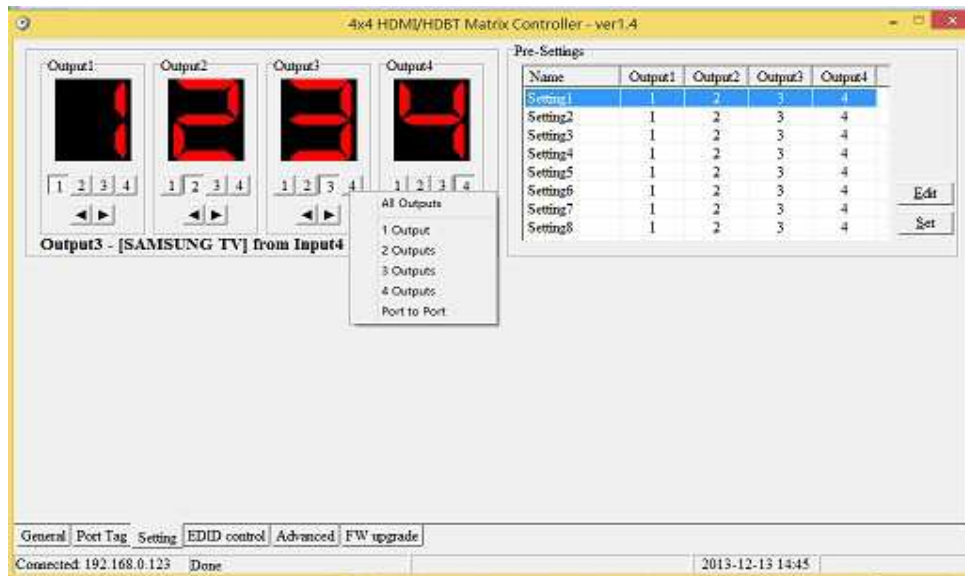
Pop-up tag messages

When “Display Input, Output tags when focus setting buttons” checkbox on “General” page is checked and Input/output port tag has been defined, tag messages will pop up like as:



Pop-up Menu

When mouse moves over ② setting buttons, and click mouse right button, menu will pop up like as:



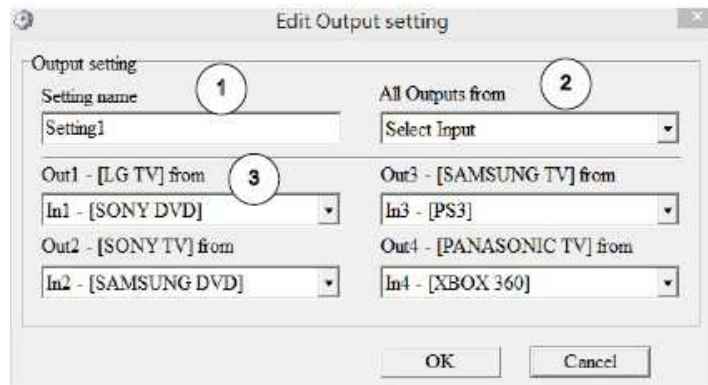
All Outputs: All Outputs from same Input

“1 Output” to “4 Outputs”: Set current Output (where mouse right clicked) and the next x-1 (x range is from 1 to 4, set total x Outputs at the same time) Output(s) from same Input

Port to Port: Output1 from Input1, Output2 from Input2, Output3 from Input3, etc.

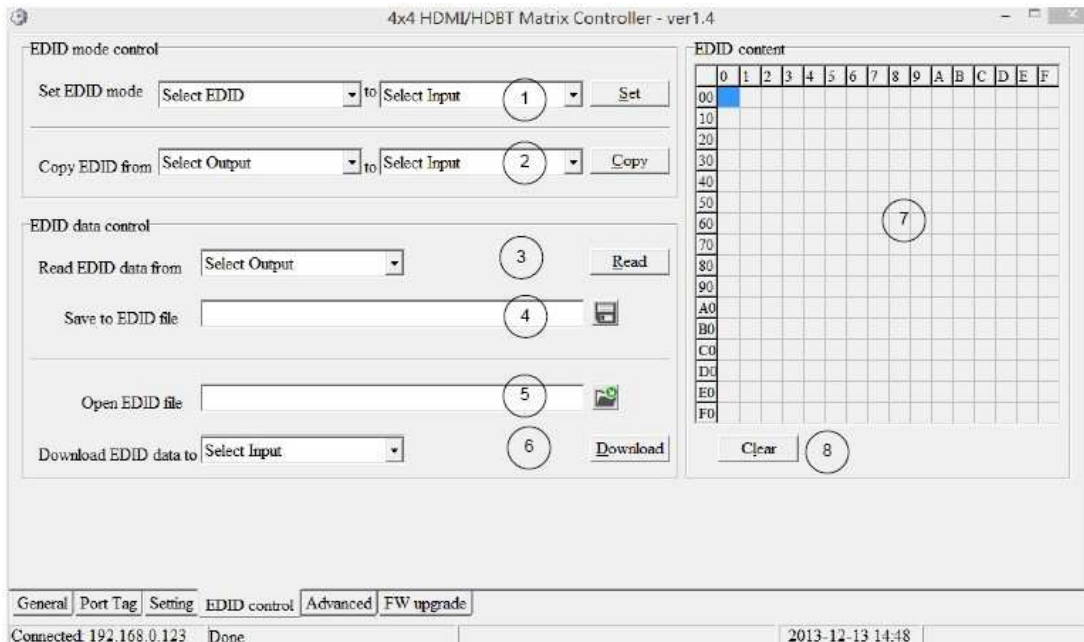
Edit selected pre-setting item

After action of ⑥, edit form will pop-up as below:



1. Pre-Setting name
2. Set all Output ports from same Input
3. Select Input for respective Output

“EDID control” page



1. Set EDID mode for selected Input port or All Input ports, click “Set” button to complete action.

NOTE: When set User1/User2 EDID mode, should Download EDID

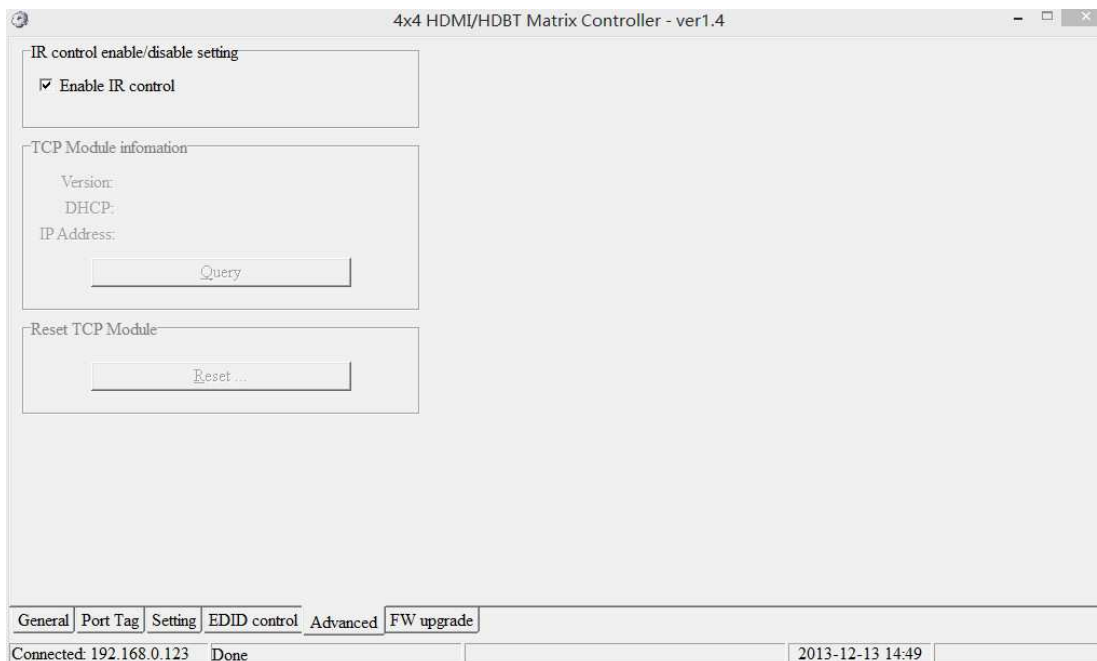
content to User1 Memory/User2 Memory first. User1/User2 default EDID content is 1080p, Stereo Audio 2.0.

2. Copy EDID from Output port to selected Input port or All Input ports, click “Copy” button to complete action.
3. Read EDID content from Output port and display in grid, click “Read” button to complete action.
4. Save EDID content which displayed in grid to binary file (file extension is “.bin”)
5. Open EDID binary file and display in grid
6. Download EDID content which displayed in grid to selected Input port or All Input ports, click “Download” button to complete action. When User1 Memory/User2 Memory selected, download EDID content to respective memory then User1/User2 EDID mode can be set.
7. EDID content displaying grid

NOTE: EDID content displayed in grid is read only.

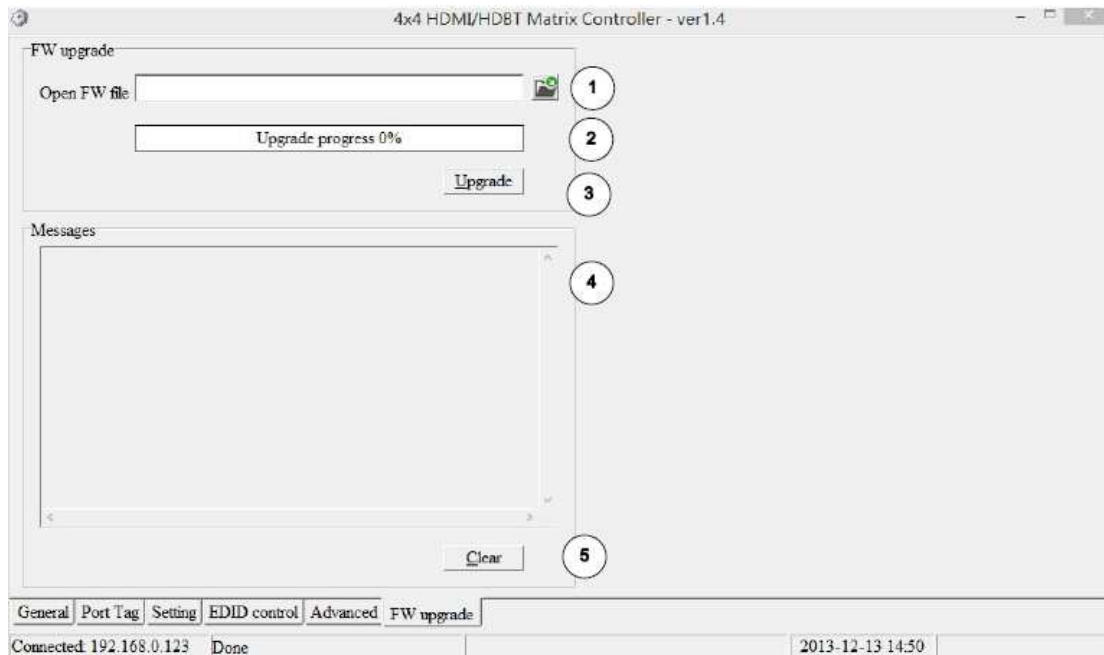
8. Click to clear EDID content displayed in grid

“IR Configuration” page



To enable or disable IR control function. When box checked, IR control function enabled, otherwise, IR control function disabled. This setting is not memorized. IR control function is always enabled after power up.

“FW upgrade” page



1. Click to open firmware file (file extension is “.fw”).
2. Firmware upgrade progress
3. Click the button to upgrade firmware.

NOTE: If failure occurs during upgrading firmware process, the following steps SHOULD be done sequentially to establish next upgrading procedure:

1. Power down the Matrix
2. Close the 4x4 Matrix Controller
3. Re-power up the Matrix, then wait for 10 seconds to ensure the Matrix is ready
4. Run 4x4 Matrix Controller, open firmware file and upgrade again
4. Firmware upgrading messages display

Click to clear the messages displayed in the memo box.

Maintenance

Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner or benzene to clean this unit.

Warranty Policy

TLS electronics GmbH products are warranted against defects in material and workmanship for two years from the date of shipment. During the warranty period, TLS will, at its option, repair or replace products that prove to be defective. Repairs are warranted for the remainder of the original warranty or a 90 day extended warranty, whichever is longer.

For equipment under warranty, the owner is responsible for freight to TLS and all related customs, taxes, tariffs, insurance, etc. TLS is responsible for the freight charges only for return of the equipment from the factory to the owner. TLS electronics GmbH will return the equipment by the same method (i.e., Air, Express, Surface) as the equipment was sent to TLS.

All equipment returned for warranty repair must have a valid RMA number issued prior to return and be marked clearly on the return packaging. TLS electronics GmbH strongly recommends all equipment be returned in its original packaging.

TLS electronics obligations under this warranty are limited to repair or replacement of failed parts, and the return shipment to the buyer of the repaired or replaced parts.

Limitations of Warranty

The warranty does not apply to any part of a product that has been installed, altered, repaired, or misused in any way that, in the opinion of TLS electronics GmbH, would affect the reliability or detracts from the performance of any part of the product, or is damaged as the result of use in a way or with equipment that had not been previously approved by TLS.

The warranty does not apply to any product or parts thereof where the serial number or the serial number of any of its parts has been altered, defaced, or removed.

The warranty does not cover damage or loss incurred in transportation of the product.

The warranty does not cover replacement or repair necessitated by loss or damage from any cause beyond the control of TLS electronics GmbH, such as lightning or other natural and weather related events or wartime environments.

The warranty does not cover any labor involved in the removal and or reinstallation of warranted equipment or parts on site, or any labor required to diagnose the necessity for repair or replacement.

The warranty excludes any responsibility by TLS for incidental or consequential damages arising from the use of the equipment or products, or for any inability to use them either separate from or in combination with any other equipment or products.

A fixed charge established for each product will be imposed for all equipment returned for warranty repair where TLS electronics GmbH cannot identify the cause of the reported failure.

Exclusive Remedies

TLS electronics GmbH's warranty, as stated is in lieu of all other warranties, expressed, implied, or statutory, including those of merchantability and fitness for a particular purpose. The buyer shall pass on to any purchaser, lessee, or other user of TLS's products, the aforementioned warranty, and shall indemnify and hold harmless TLS from any claims or liability of such purchaser, lessee, or user based upon allegations that the buyer, its agents, or employees have made additional warranties or representations as to product preference or use.

The remedies provided herein are the buyer's sole and exclusive remedies. TLS electronics GmbH shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

RMA Policy

When returning product to TLS electronics GmbH for any reason, the customer should fill out the official RMA form to obtain a RMA number. Without the permission or approval, TLS will be no responsible for any return.

This can be initiated by emailing or calling your related sales.

All requests are processed within 48 hours.

Standard Replacement

For customers that agree to return defective product to TLS electronics GmbH first, a Standard Replacement option is available.

An RMA number must first be issued by sales. This RMA number will need to be referenced on the outside of the return shipment.

Upon receipt of the defective product, TLS electronics GmbH will, at its discretion, either repair or replace the product and ship it out in the most expeditious manner possible. Subject to availability, the replacement product will be shipped on the business day following receipt of the defective product.

In the event the product returned to TLS electronics GmbH has been discontinued (i.e. the product is no longer being manufactured by TLS but is still under warranty), TLS will, at its discretion, either repair or replace with recertified product.

Once you have obtained an RMA number

After obtaining an RMA number from TLS electronics GmbH, you must send the product - freight prepaid - to TLS. The TLS RMA number must be prominently displayed on the outside of your package. If you send your product to TLS electronics GmbH without the RMA number prominently displayed on the outside of the package, it will be returned to you unopened.

Please use a shipping company that can demonstrate proof of delivery. TLS electronics GmbH does not accept responsibility for any lost shipments unless proof of delivery to TLS is provided.

Please note:

Product shipped to TLS electronics GmbH must be properly packaged to prevent loss or damage in transit.

Shipping your RMA to TLS using regular mailing envelopes is not acceptable, as they do not protect the product from damage during shipping.

TLS electronics GmbH will not repair or replace a module that is shipped in such a way that the product is not properly protected.

TLS will not accept any product that has been damaged as a result of accident, abuse, misuse, natural or personal disaster, or any unauthorized disassemble, repair or modification.