User Manual

HDBaseT HDMI Distribution Amplifier

1x4 / 1x8 / 1x16

HS-Exx(P) / Sxx(P) Series

V.2015HDMI-ExxSxx(P).00

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BEFORE YOU BEGIN

- Follow all instructions marked on the device during using.
- Provide proper ventilation and air circulation and do not use near water.
- It is better to keep it in a dry environment.
- Place the device on a stable surface (example cart, stand, table, etc.).
- The system should be installed indoor only. Install either on a sturdy rack or desk in a well-ventilated place.
- Make sure the rack is level and stable before extending a device from the rack.
- Make sure all equipments installed on the rack including power strips and other electrical connectors are properly grounded.
- Only use the power cord supported with the device.
- Do not use liquid or aerosol cleaners to clean the device.
- Always unplug the power to the device before cleaning.
- Unplug the power cord during lightning or after a prolonged period of non-use to avoid damage to the equipment.
- Do not stand on any device while installing the device to the rack.
- Do not attempt to maintain the device by yourself, any faults, please contact your vendor.
- Save this manual properly for future reference.

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CHAPTER 1 SWITCHER SYSTEM OVERVIEW

1.1 Introduction

The HS-Exx (P)/Sxx (P) is an HDBaseT HDMI Distribution Amplifier over one single CATx cable each port with local output provides the most flexible solution by which the UltraHD 4K x 2K video and high quality audio can be transmitted and extended to up to 4/8/16 different locations over a long distance with zero compression.

Through a HDMI source, you can transmit the signal to separate output equipments, thereby minimizing signal attenuation and ensuring high definition, integrating high fidelity graphics and audio signal output. Through the extensible accessory devices, the HS-Exx (P)/Sxx (P) can transmit data or detect signal to over long distances about 100 or 70 meters.

The HS-Exx (P)/Sxx (P) is used mainly in TV broadcasting projects, multimedia conference halls, and large display performances, TV teaching and command control centers. It boasts features of power interruption protection during the power surge as well as the digital audiovisual signal flawlessly broadcasting and zero compression extension. The HS-Exx (P)/Sxx (P) supports a HDMI Type A for input, a HDMI Type A for output and x4/x8/x16 HDBaseT output connectors. Besides, it also supports IR modules for one on one or one on all IR remote control through IR Blasters or IR receivers. Better yet, the HS-Exx (P)/Sxx (P) series even supports the “Power over Cable” functionality to get rid of up to 4/8/16 power adapters’ annoying wirings!

Figure 1-1 HS-E8P HDMI Distribution Amplifier

1.2 Packing

	HS-Exx (P)/Sxx (P) *1
	Power Cord *1
	IR Receiver Cable*1
	IR Blaster Cable*1
	Rack-Mount Bracket *2
	Screws (for Brackets) *6
	Software CD *1 (Includes User Manual)

CHAPTER 2 FEATURES

- Supports 1 HDMI connector for input and 4/8/16 RJ-45 connectors for HDBaseT output interfaces
- Supports 1 HDMI connector for output display identical image on local side
- Easily applying a single HDMI cable and multiple CATx cables for flawlessly broadcasting and zero compression extension.
- Supports HDMI Receiver
    - HX-RUW (100M) for HS-Exx
    - HX-RPUW (100M) for HS-ExxP
    - HX-SRUW (70M) for HS-Sxx
    - HX-SRPUW (70M) for HS-SxxP
- HDBaseT Output supports the long-distance transmission via a 100m or 70m CATx cable
- HDCP Compliant
- Supports resolution up to UltraHD 4K x 2K@30Hz, 8-bit or 1080P@60Hz, 12-bit
- Supports original 3D pass through
- Supports High Definition Audio (Dolby TrueHD, Dolby Digital Plus and DTS-HD MA)
- IR pass-through supports all IN and OUT ports
- IR pass-through supports all kinds of IR frequency band
- IR pass-through supports Bi-directional transmission between IN and OUT ports
- IR pass-through supports One way (Forward) IR (IR IN on transmitter side, and IR Out on receiver side)
- Supports IR remote control
- Supports Power over Cable
- Internal universal power supply
- 1U rack design.

CHAPTER 3 SPECIFICATIONS

Hardware	
Input Connector	HDMI Type A Female x 1
Output Connector	HDMI Type A Female (Local Video Output) x 1
Output Connector	RJ-45 x 4/8/16
All IR Input Port	3.5ψ Stereo Port x 1
All IR Output Port	3.5ψ Stereo Port x 1
IR IN1~IN4/IN8/IN16 Ports	3.5ψ Stereo Ports x 4/8/16
Power	100VAC~240VAC, 50/60Hz, internal
LED Indicator	LED indicator specified for the power status x 1
Housing	Metal
Mounting	Rack mountable (1U-rack-mount kit)
Weight	HS-E4/S4: 3.90kg HS-E8/S8: 4.06kg HS-E16/S16: 4.97kg
	HS-E4P/S4P: 4.45kg HS-E8P/S8P: 4.54kg HS-E16P/S16P: 5.67kg
Dimensions (LxWxH)	341x440x44 mm (full rack wide without grips)
Multimedia	
Max. Resolution	UltraHD 4K x 2K@30Hz, 8-bit
Highest TMDS Frequency	300MHz
Control Information	
HDMI Cable Distance	10 meters (At least)
Cat.5e Cable Distance	100 meters (Max.) for HS-Exx (P) Series 70 meters (Max.) for HS-Sxx (P) Series
Remote Control	IR Receiver, IR Blaster

CHAPTER 4 DEVICE INSTALLATION

HS-Exx (P)/Sxx (P) has a black metallic housing. It can be placed on a sturdy desk directly or installed on a bracket. See Figure 4-1 below:

Figure 4-1 Mount HS-ExxP on a Standard Bracket with 1U Rack-moun

CHAPTER 5 FRONT/REAR PANELS

5.1 Front Panel

Figure 5-1 HS-ExxP Series Front Panel

The HS-Exx (P)/Sxx (P) supports a power switch on the front panel to power ON or OFF HS-Exx (P)/Sxx (P). And a clear LED indicator designed for the status of the power.

5.2 Rear Panel

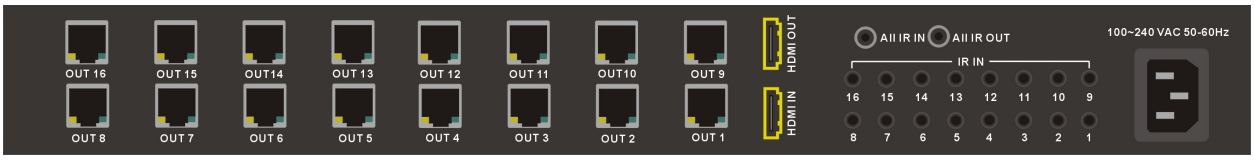


Figure 5-2 HS Series Rear Panel for E16 (P)

HS-Exx (P)/Sxx (P) supports up to 4/8/16 output jacks (RJ-45) on the rear panel, each female terminal separately form the output jacks. HS-Exx (P)/Sxx (P) terminal channels numbered as OUT1~16 are for signal outputs. The input terminal supplies you to connect to different equipment including CD/DVD player, Blu-ray player, PS3, Video Camera, STB and so on. Another output terminal with **"HDMI OUT"** jack allows you to connect to the projectors, video recorders, displays and multiplexers and so on.

- **Power port:** The Power Port is applicable for 100~240VAC, 50~60Hz connected to the outlet of power source. Refer to *6.3 Power Connection*.
- **All IR OUT Port:** Used to connect to the IR Blaster cable for IR pass-through.

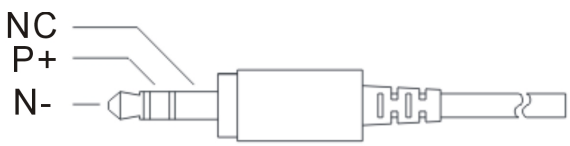


Figure 5-3 IR Blaster Pin Definitions

- **All IR IN Port**: Used to connect to the IR Receiver cable for IR pass-through.

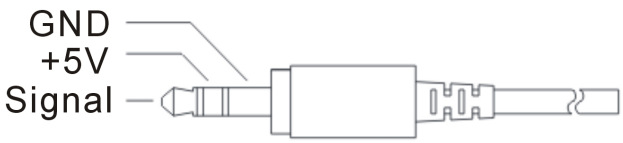


Figure 5-4 IR Receiver Pin Definitions

- **IR IN Ports:** These are used for connecting the IR Receiver.
- **HDMI OUT connector:** This is connected to the A/V or HDTVs.
- **HDMI IN connector:** This is connected to the CD/DVD player, Blu-ray player, PS3, Video Camera, STB and so on.
- **HDBaseT OUT Ports (OUT1~4/8/16):** You can use the output jacks for over long connections via the extensible accessory devices.
  - HS-Exx Series → HX-RUW (100M)
  - HS-ExxP Series → HX-RPUW (100M)
  - HS-Sxx Series → HX-SRUW (70M)
  - HS-SxxP Series → HX-SRPUW (70M)

5.3 IR Remote Control

The HS-ExxP/SxxP supports IR Remote Control to allow you to switch the signal output channel through infrared sensor upon an extended connection – Receiver (HX-RPUW/HX-SRPUW). The signal comes from the DVD player controller is only available to the IR Receiver connected to the IR IN port of Receiver (HX-RPUW /SRPUW).

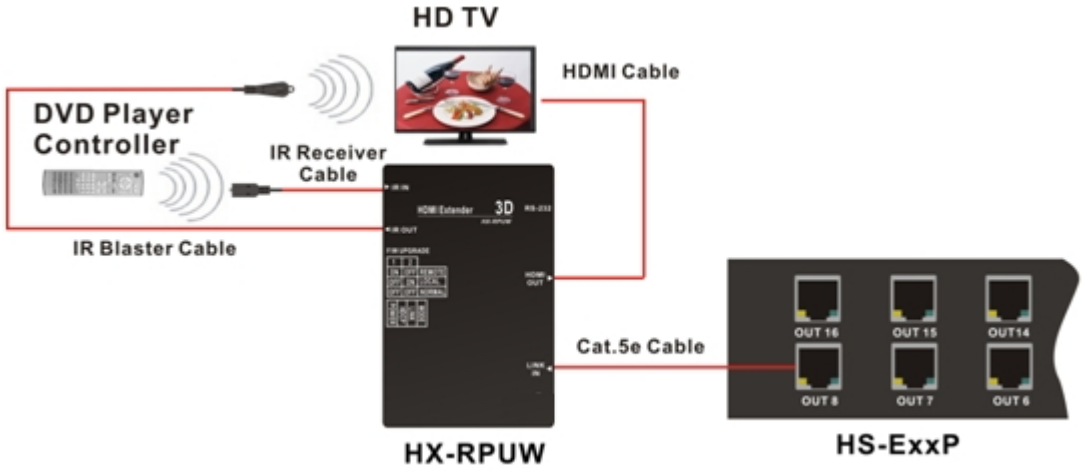


Figure 5-5 IR Remote Control through Receiver (HX-RPUW) IR IN port

Through the IR Receiver and All IR IN port located on your HS-Exx (P)/Sxx (P), using one remote controller to control ALL displays simultaneously if the frequency and coding were the same.

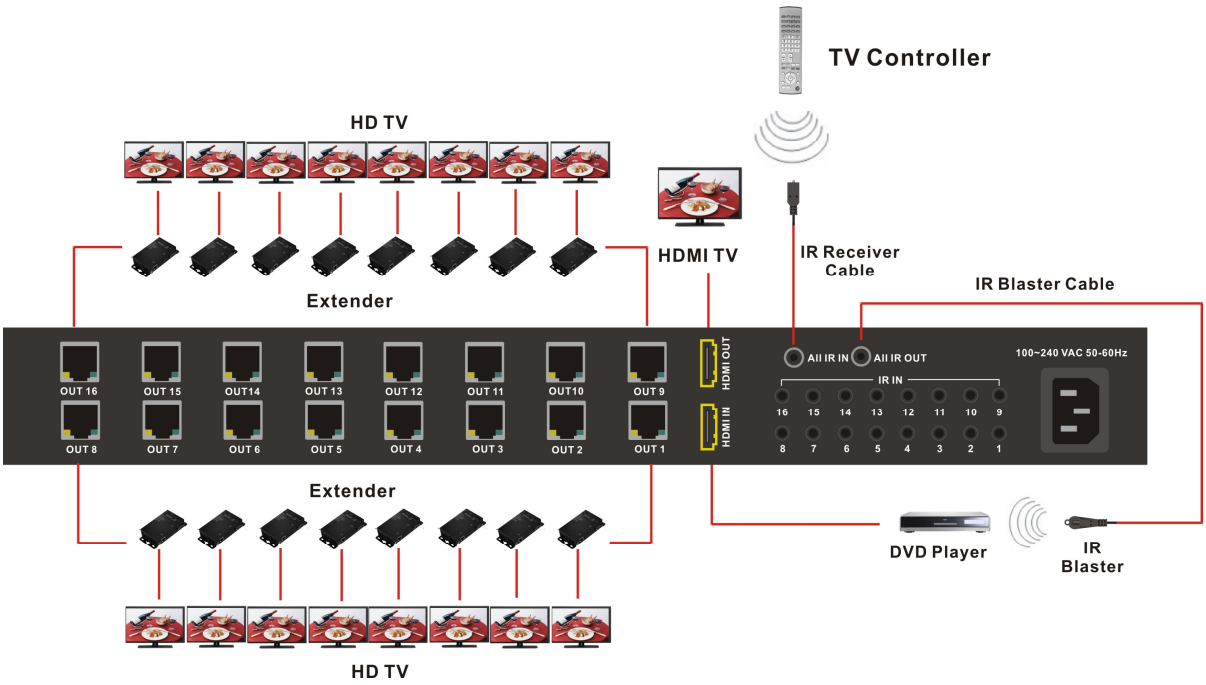


Figure 5-6 IR Remote Control through All IR IN Port

You can also use the single IR IN port to transmit the IR signal to a specified output display. As the picture below, only the OUT5 is specified for a signal display.

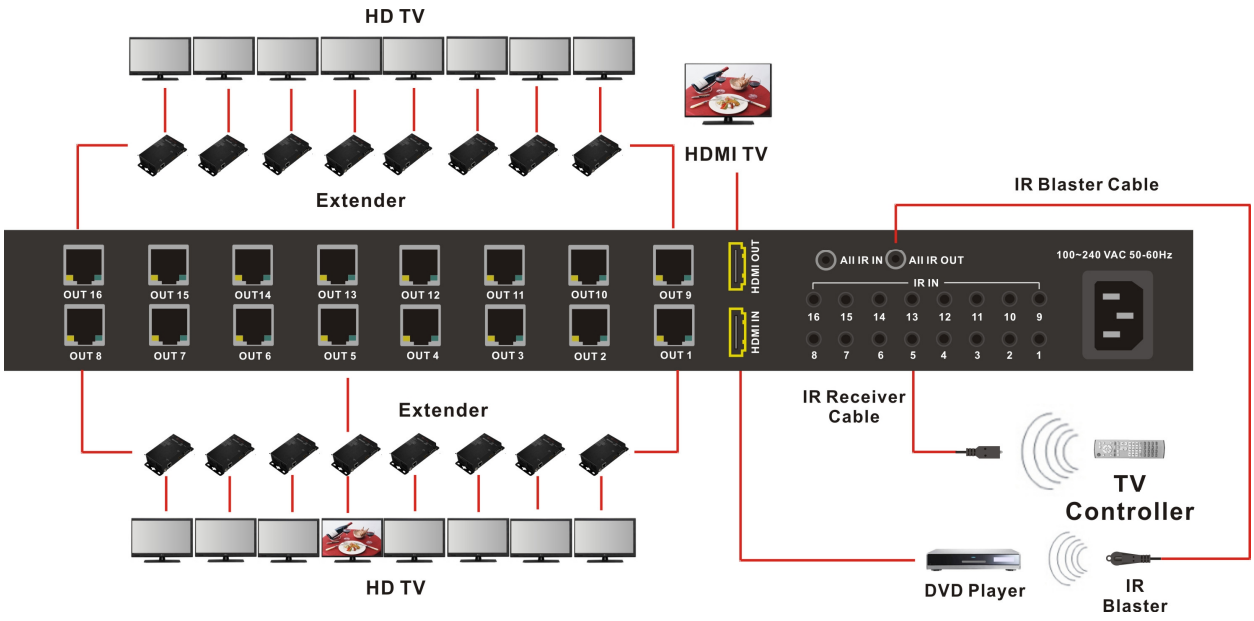


Figure 5-7 IR Remote Control through Single IR IN Port

CHAPTER 6 CONNECTIONS

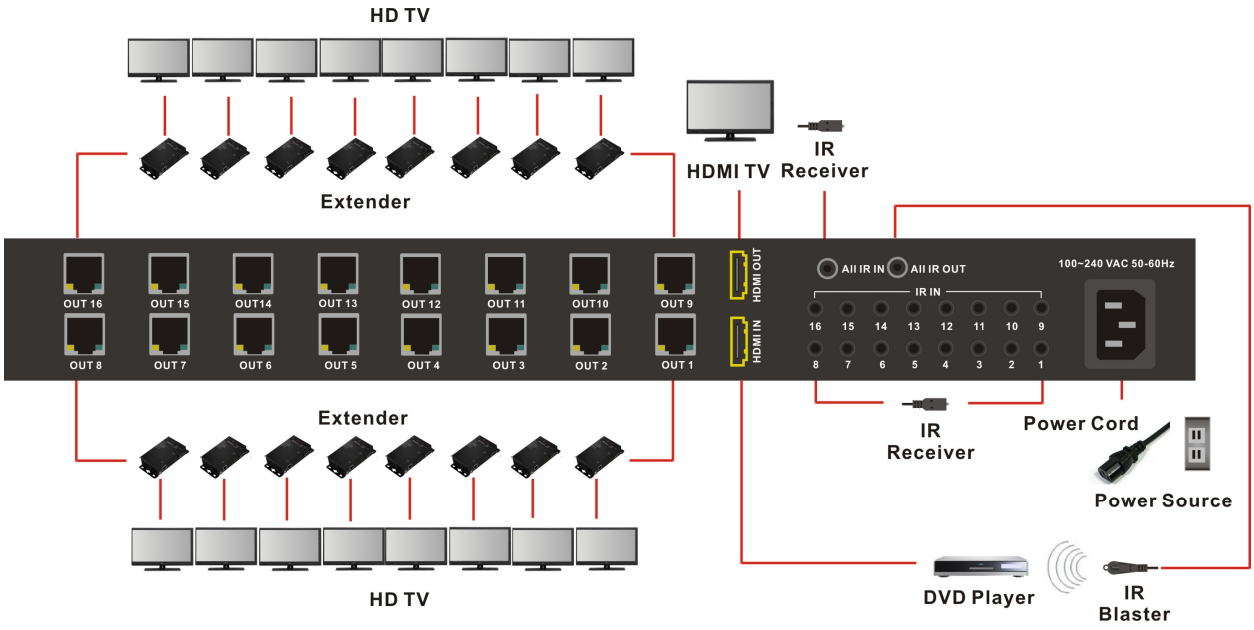


Figure 6-1 HS Series Connections

6.1 Input/Output Connections

Use the HDMI connecting cable to connect the Input serial jack (HDMI IN) to the HDMI jack of the Blu-ray/DVD player/graphics workstations/number displays. Use the Cat.5e cable to connect the output RJ-45 jack (OUT1 ~ OUT4, 8 or 16) to the LINK IN jack of Receiver. Through the Receiver, you can extend the connection of projector, video recorder, display or multiplexer to your HS-Exx (P)/Sxx (P).

Figure 6-2 Input Connection

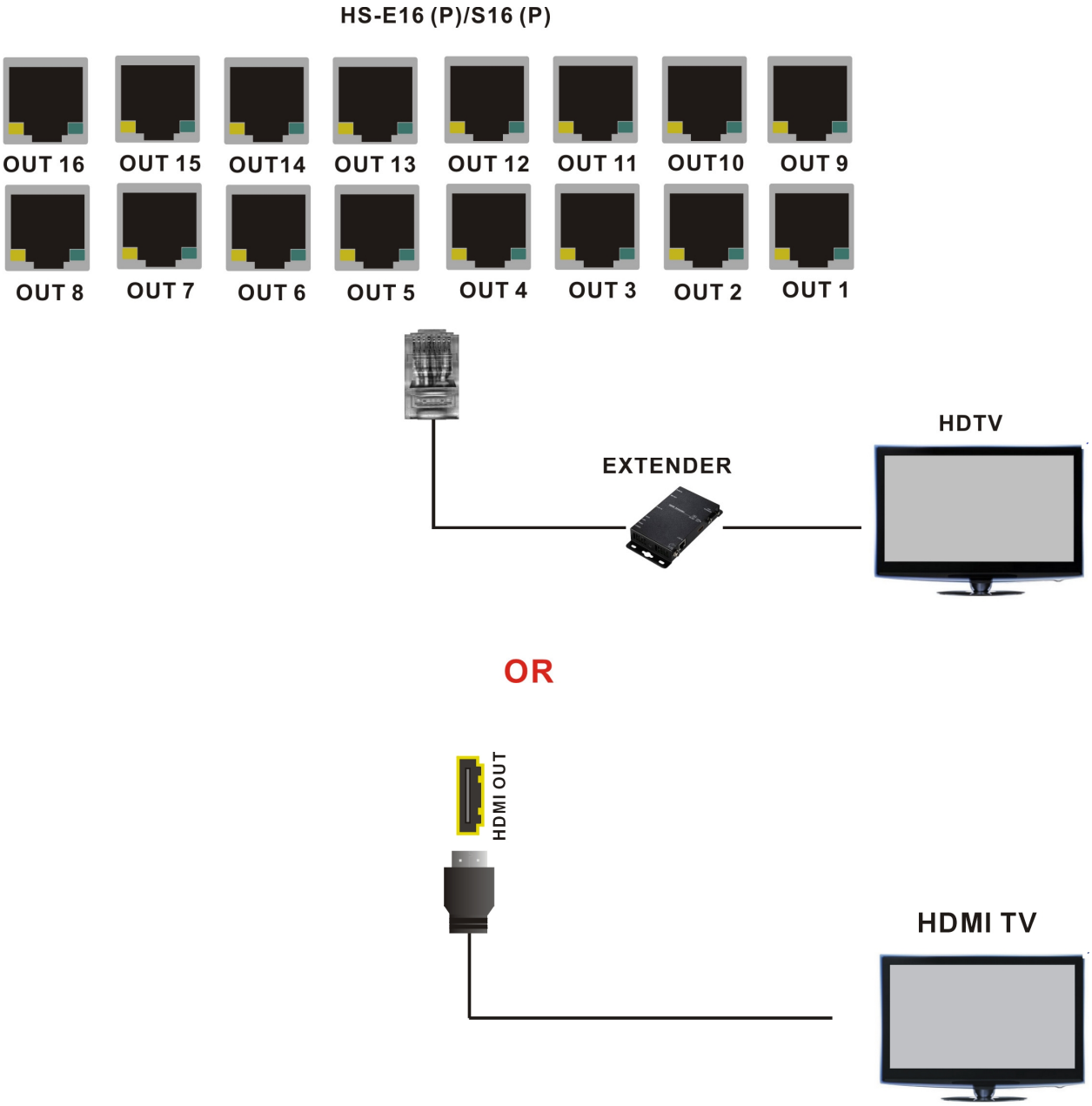
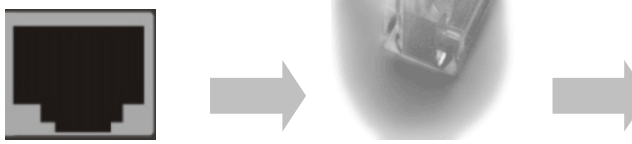


Figure 6-3 Output Connections

6.1.1 HDBaseT Output Port

HS-Exx (P)/Sxx (P) supports RJ-45 registered jacks using 8P8C modular connector, which specifies the physical male and female connectors as well as the pin assignments of the wires in a telephone cable. (A common LAN cable is available.)

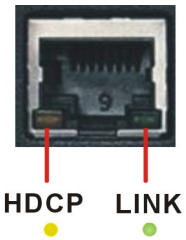


Pin	Pair	Wire	Color
1	2	1	white/orange
2	2	2	orange
3	3	1	white/green
4	1	2	blue
5	1	1	white/blue
6	3	2	green
7	4	1	white/brown
8	4	2	brown

Figure 6-4 LAN (HDBT) Port

6.1.2 Output LED

HS-Exx (P)/Sxx (P) supports HDBaseT output for a long distance signal transmission. Output connector is RJ-45 jack with two LED indicators. The LED indicators show you the status of output transmission.



* The left of RJ-45 output jack is specified for HDCP LED (Yellow).
* The right of RJ-45 output jack is specified for LINK LED (Green).

☞ The LED indicators are only designed for the Output – RJ-45 jack of HS-Exx (P)/ HS-Sxx (P).

LED Indicators:

LED	Off	Blink	On
LINK (Green)	No Link	Low Power Mode	HDBaseT Link
HDCP (Yellow)	No HDMI Signals	No Encryption	HDCP Encryption

6.1.3 Output Cable

HDBaseT was designed to provide UltraHD performance up to 100/70 meters of Cat.5e or superior cables. In a typical installation, the cable is stretched to its full length between the HDBaseT Transmitter device and the HDBaseT Receiver device. However sometimes, especially, in demonstrations or in a lab environment, the cable is rolled randomly in small turns for convenience. The randomly rolled UTP cable suffers additional signal impairments (compared to straight cable) and therefore the maximal operating reach might be reduced. When a CATx cable is randomly rolled, it is recommended to limit its length to approximate 50 meters. Rolling a CATx cable around a 70cm fixed diameter plastic drum has just a minor effect on the FEXT (Far End Cross Talk) when compared to a fully stretched cable.

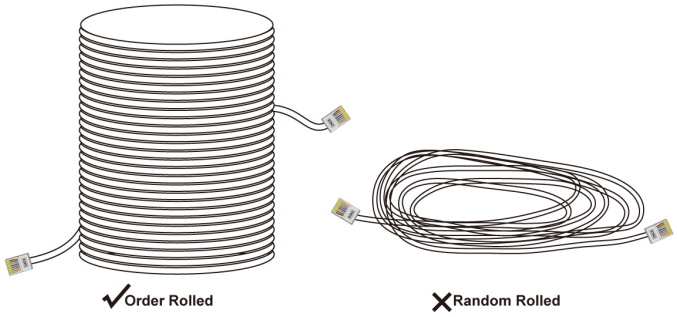


Figure 6-5 Output LAN Cable

The VS100 family features the following:

When the VS100 is in low power mode (LPPF1/2), the sample rate of the PDIF channel is reduced to 100 KHz. This implies that high data rates may not be used when the VS100 is in LPPF.

- Enables 10.2 Gbps of HDMI 1.4 traffic (including HDCP) and 100Mbps Ethernet in parallel over a single LAN cable according to the following specifications:

Cable Type	Range	Supported Video
CAT5e/CAT6	100 meters	Most common full HD formats: - Up to 1080P, 60Hz, 36bpp - Data rates lower than 5.3 Gbps or below 225 MHz TMDS clock
	70 meters	Ultra HD video formats: Deep color: 1080P, 60Hz, 48bpp UltraHD 4K x 2K Data rates higher than 5.3 Gbps or above 225MHz TMDS clock
CAT6a/CAT7	100 meters	

- Full HD support: 1080P@60Hz@48b/pixels, 3D, UltraHD 4K x 2K

The VS010 family features the following:

Enables 10.2 Gbps of HDMI 1.4 traffic (including HDCP) over a single LAN cable according to the following specifications:

Cable Type	Range	Supported Video
CAT5e/CAT6	60 meters	Most common full HD formats: - Up to 1080P, 60Hz, 36bpp - Data rates lower than 5.3 Gbps or below 225 MHz TMDS clock
CAT6a/CAT7	70 meters	
CAT5e/CAT6	35 meters	Ultra HD video formats: - Deep color: 1080P, 60Hz, 48bpp - UltraHD 4K x 2K - Data rates higher than 5.3 Gbps or above 225MHz TMDS clock
CAT6a/CAT7	40 meters	

6.2 IR Pass-Through Connection

HS-Exx (P)/Sxx (P) provides an IR Receiver cable and IR Blaster cable accessories for IR pass-through. IR Receiver cable can be connected to All IR IN port or IR IN ports on the rear panel. On the other hand, IR Blaster cable can be connected to All IR OUT port on the rear panel.

- Supports you an IR channel to control the player from TV or control the TV from player.
- Supports all kinds of IR frequency band
- IR pass-through switch (channel) is based on HDMI switched (channel)

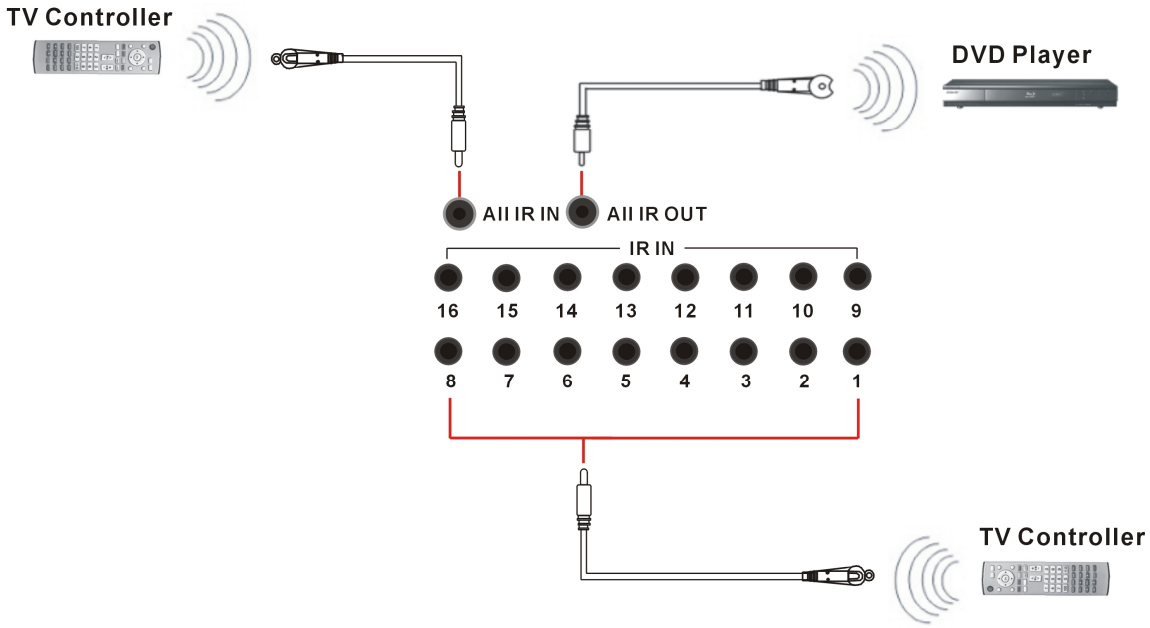


Figure 6-6 IR Extended Aiming - Multimedia

6.3 Power Connection

Use the included power cord to connect the power source from the power port on the rear panel of HS-Exx (P)/Sxx (P) to the outlet.

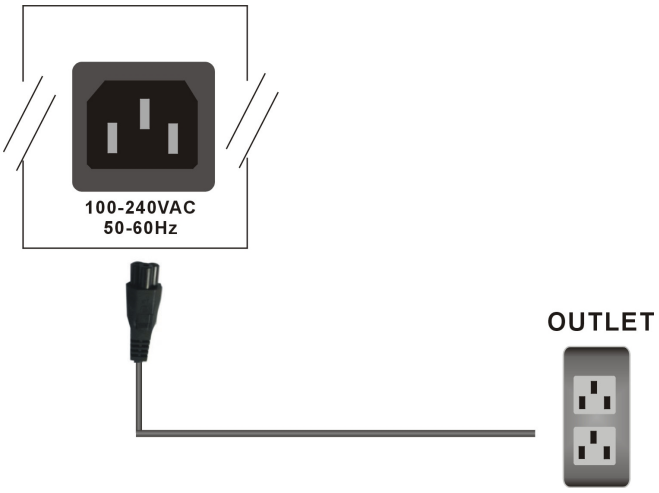


Figure 6-7 Power Connection

CHAPTER 7 TROUBLESHOOTING

1. What to do if LED is fail in display?

Answer: Check the connection of power cord is not loosening and the power cord is in a good status having no any damage. Check the power source is normally.

2. What to do if you sense the power leakage during plugging or unplugging of the input/output ports?

Answer: It could be that the equipment power is not properly grounded. You must properly ground your equipment; otherwise product life can easily be shortened.

3. What to do if operation and function failure occurred?

Answer: Check if the equipment and the splitter or D.A system are in proper connection. If the problem persists, send the product to the maintenance center for repair.

4. How to avoid the equipment failure due to the high temperature?

Answer: Place the equipment in a ventilate location. If it is still not to be improved, please check with the build-in fan whether is damaged. Or contact your agency for helping.

5. What to do if IR function failure occurred?

Answer: Check the battery of remote controller is NOT running low and the IR connector is not loosening. Check whether the remote controller is aiming at the IR receiver accurately.

APPENDIX A HDBASET FIRMWARE UPGRADE

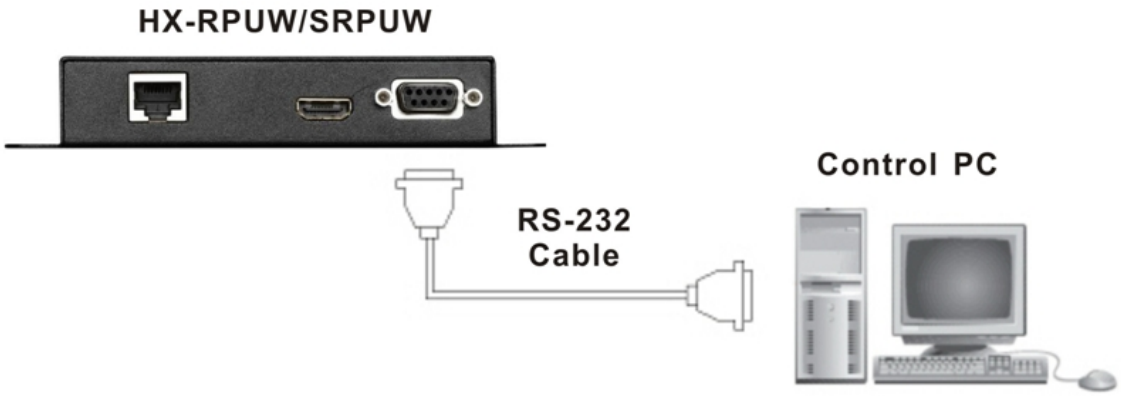
Process the Update TX_xxx.bat or UpdateRX_xxx.bat file to upgrade firmware. (xxx is specified for firmware version) These files are used for upgrading the VS100TX/VS100RX or VS010TX/VS010RX IC in your devices.

- The UpdateTX_xxx.bat file is used to upgrade the splitter or D.A system (the VS100TX/VS100RX IC in your HS-Exx (P)/HX-RPUW and HX-RUW) firmware.
- The UpdateRX_xxx.bat file is used to upgrade the Receiver (the VS010TX/VS010RX IC in your HS-Sxx (P)/HX-SRPUW/HX-SRUW) firmware.

HX-RPUW/SRPUW HDBaseT F/W Upgrade

Follow the steps as below to upgrade the Receiver firmware:

1. Connect the control PC and HX-RPUW/SRPUW with a RS-232 cable.

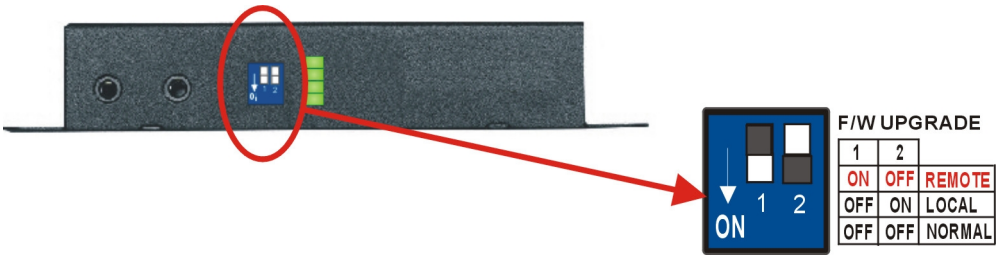


2. Connect the LAN cable to the LINK IN port on the panel of HX-RPUW/SRPUW. The other end of the LAN cable connected to the OUTPUT port of HS-ExxP/SxxP. Through the LAN cable connection, the HX-RPUW/SRPUW will process the firmware upgrade.

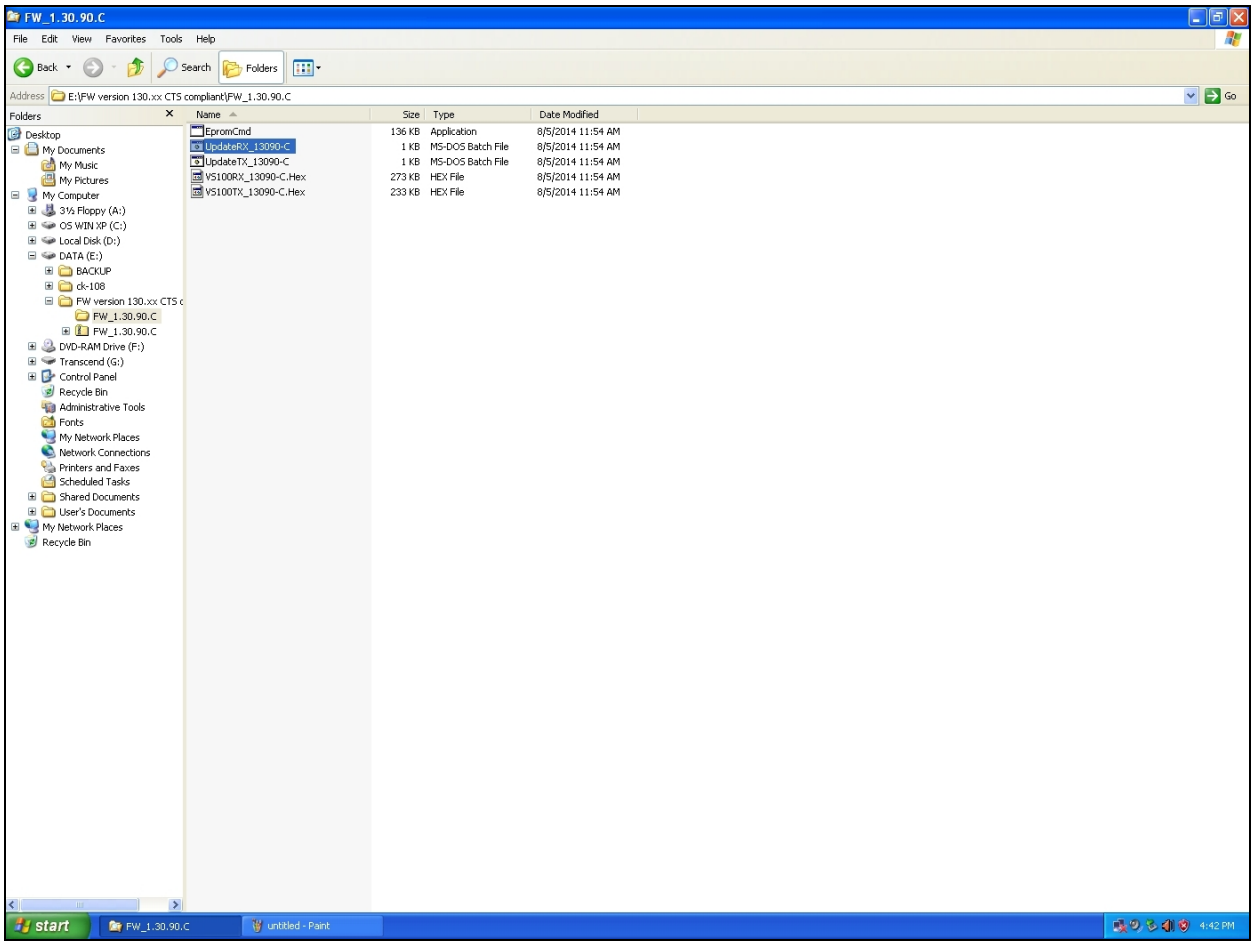
3. Enable the HS-ExxP/SxxP power.
4. Adjust the F/W DIP switch on the Receiver.

Remote (Receiver) Firmware Upgrade

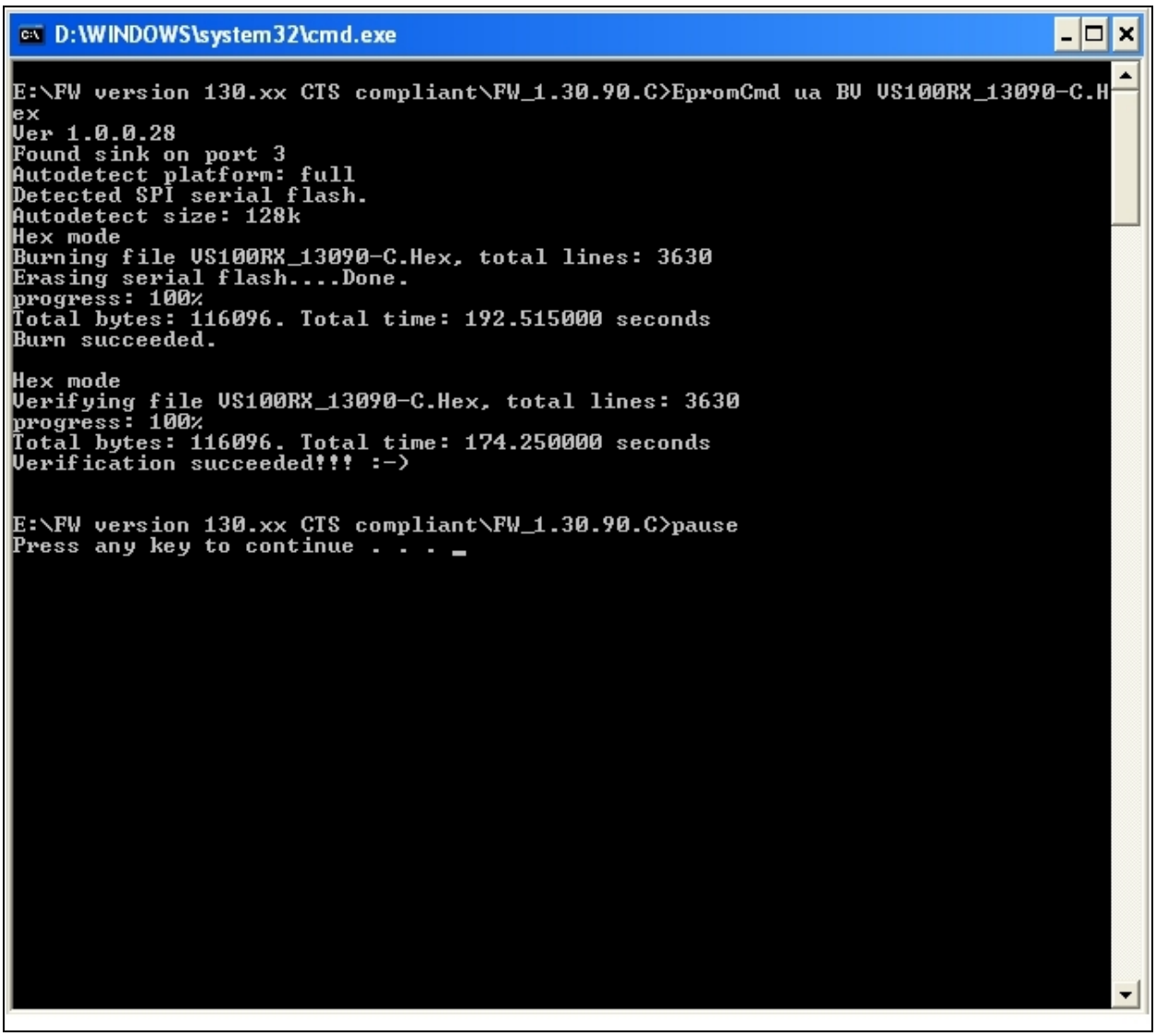
	Pin 1	Pin 2
REMOTE	ON	OFF



5. On the control PC, process the UpdateRX_13090-C.bat file to upgrade firmware. (The update file name is only for reference, it will be different based on version.)



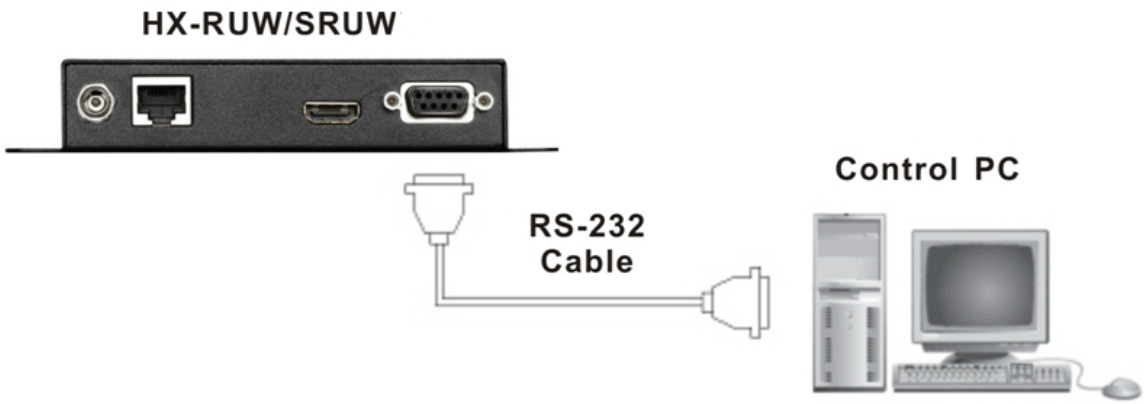
6. Final, the update is finished as below.



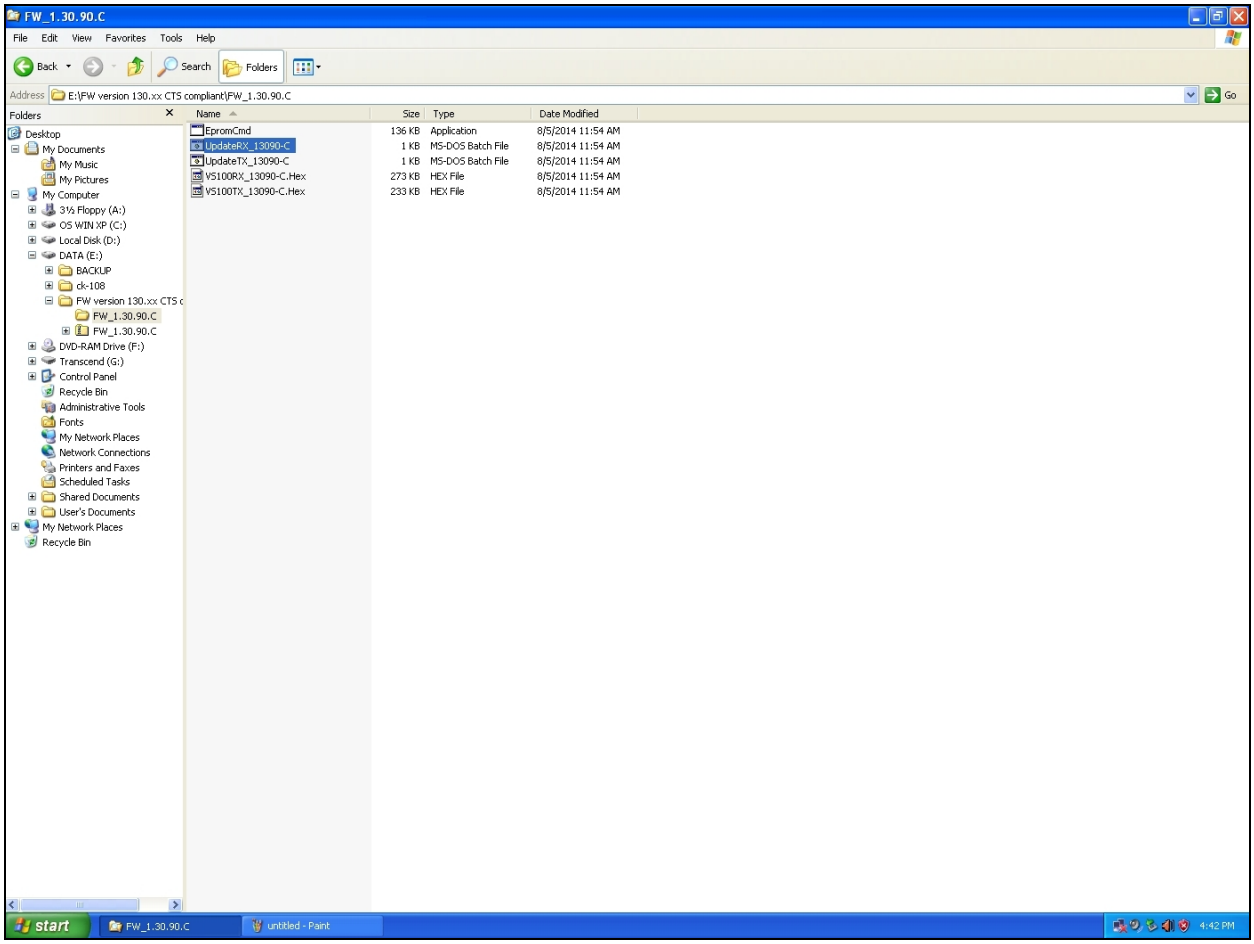
HX-RUW/SRUW HDBaseT F/W Upgrade

Follow the steps as below to upgrade the Receiver firmware:

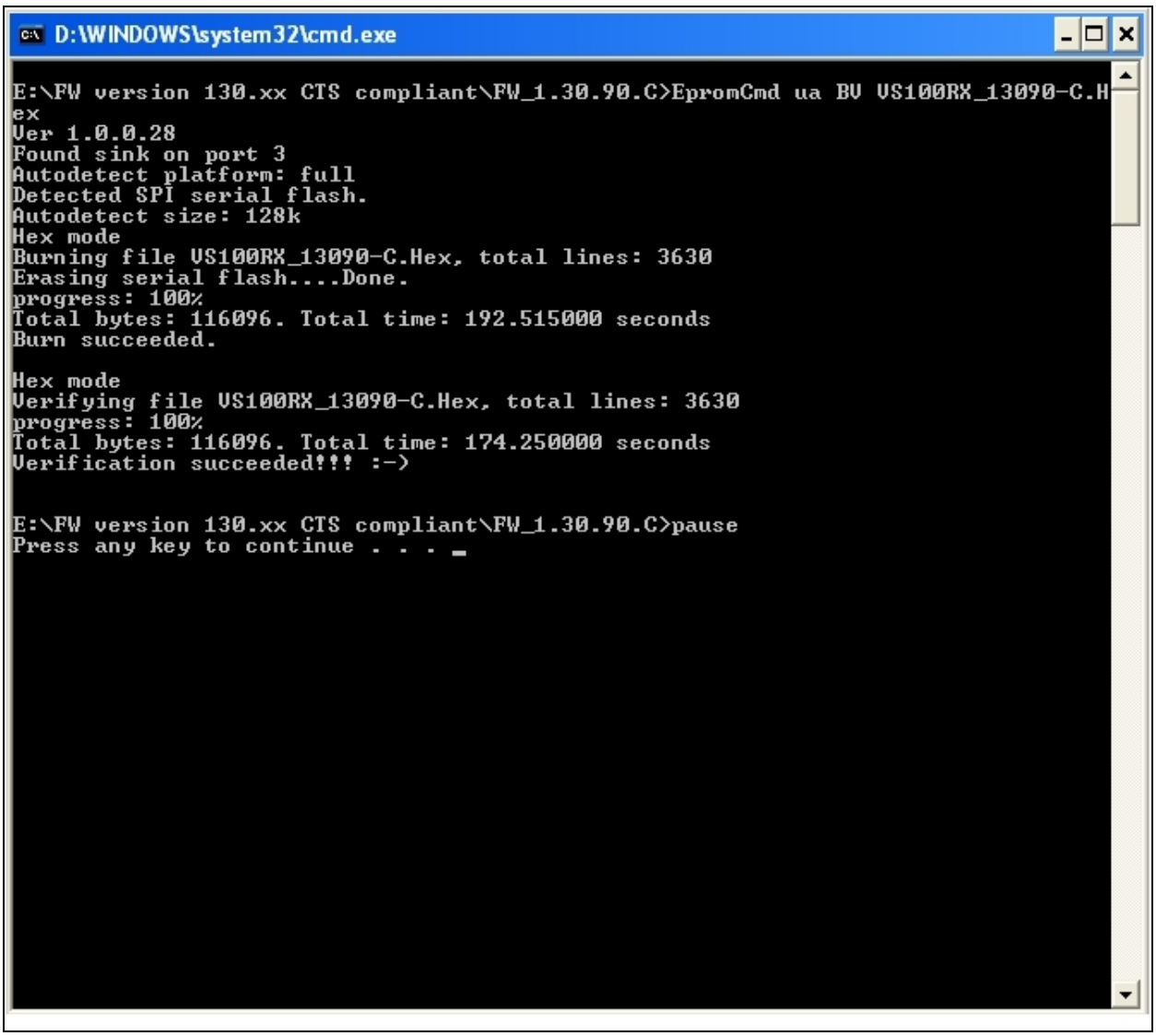
1. Connect the control PC and HX-RUW/SRUW with a RS-232 cable.



2. Connect the DC 12V adapter.
3. On the control PC, process the UpdateRX_13090-C.bat file to upgrade firmware. (The update file name is only for reference, it will be different based on version.)



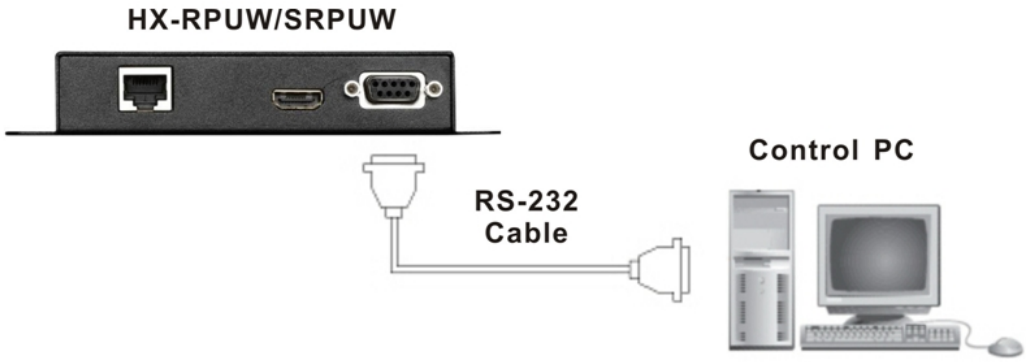
4. Final, the update is finished as below.



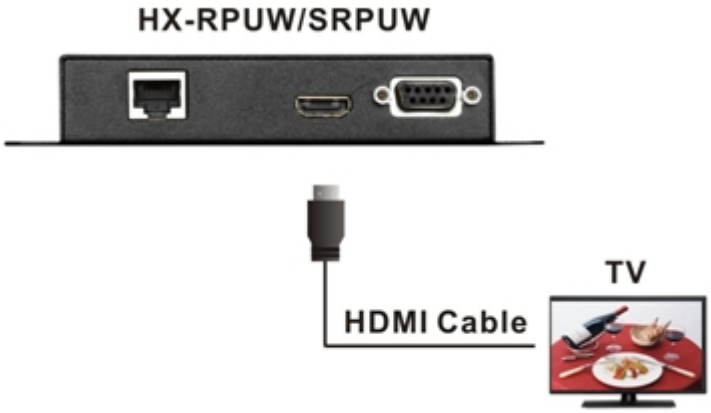
HS-ExxP/SxxP HDBaseT F/W Upgrade

Follow the steps as below to upgrade the HS-ExxP/SxxP firmware:

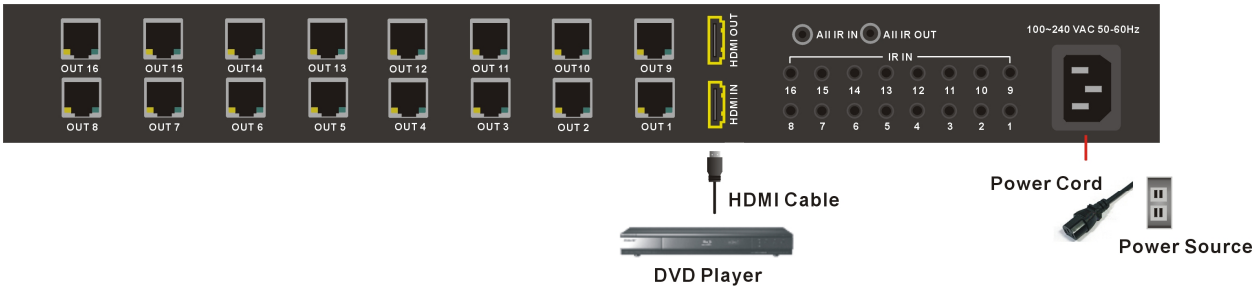
1. Connect the control PC and HX-RPUW/SRPUW with a RS-232 cable.



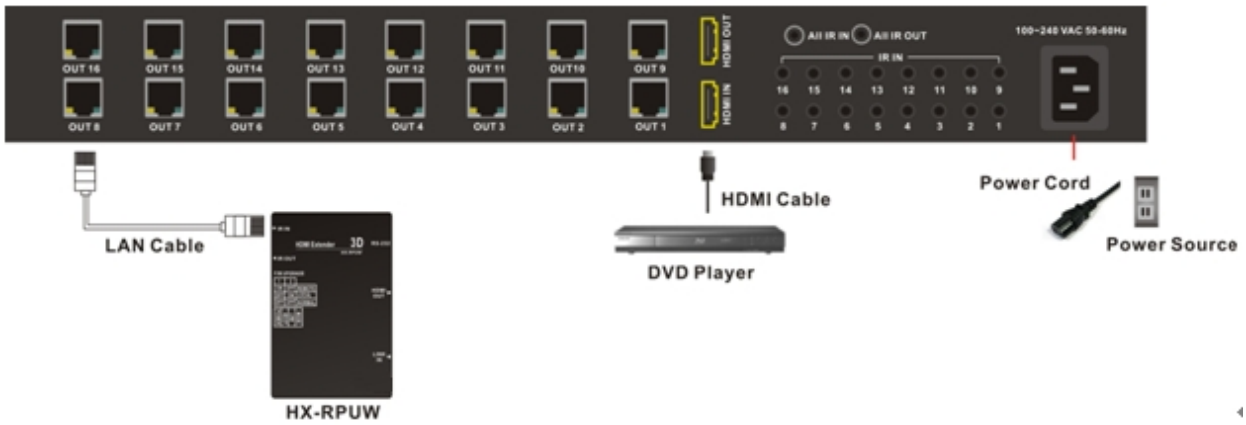
2. Connect the TV and HX-RPUW/SRPUW with a HDMI cable.



3. Connect the DVD Player and HS-ExxP/SxxP with a HDMI cable.



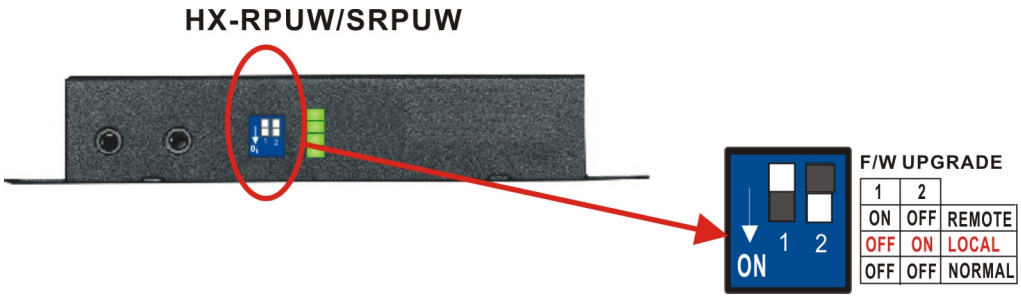
4. Connect the LAN cable to the LINK IN port on the panel of HX-RPUW/SRPUW. The other end of the LAN cable connected to the OUTPUT port of HS-ExxP/SxxP. Through the LAN cable connection, the HX-RPUW/SRPUW will process the firmware upgrade.



5. Adjust the HX-RPUW/SRPUW F/W Upgrade switcher to LOCAL mode.

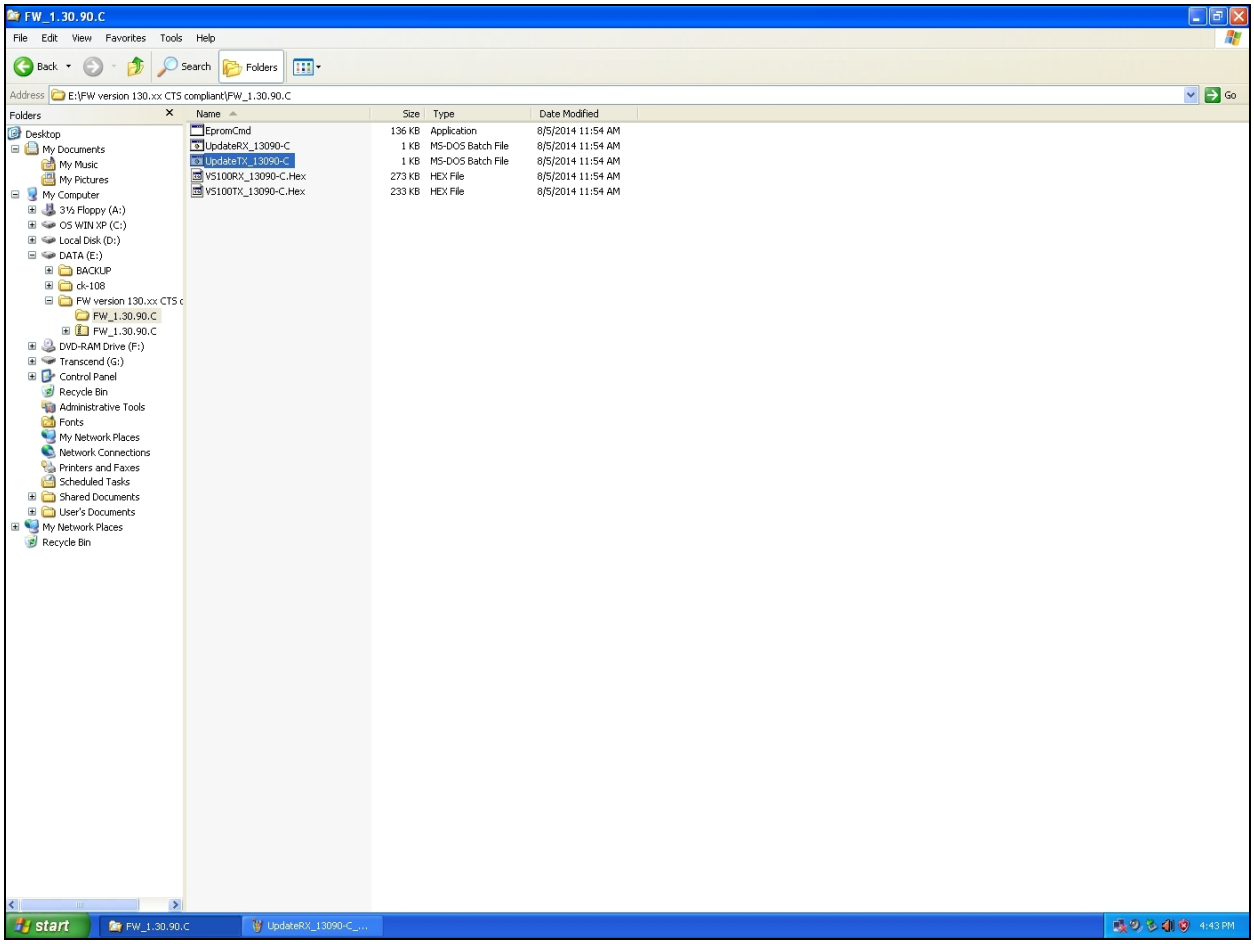
Local (HS-ExxP/SxxP Splitter) Firmware Upgrade

	Pin 1	Pin 2
LOCAL	OFF	ON

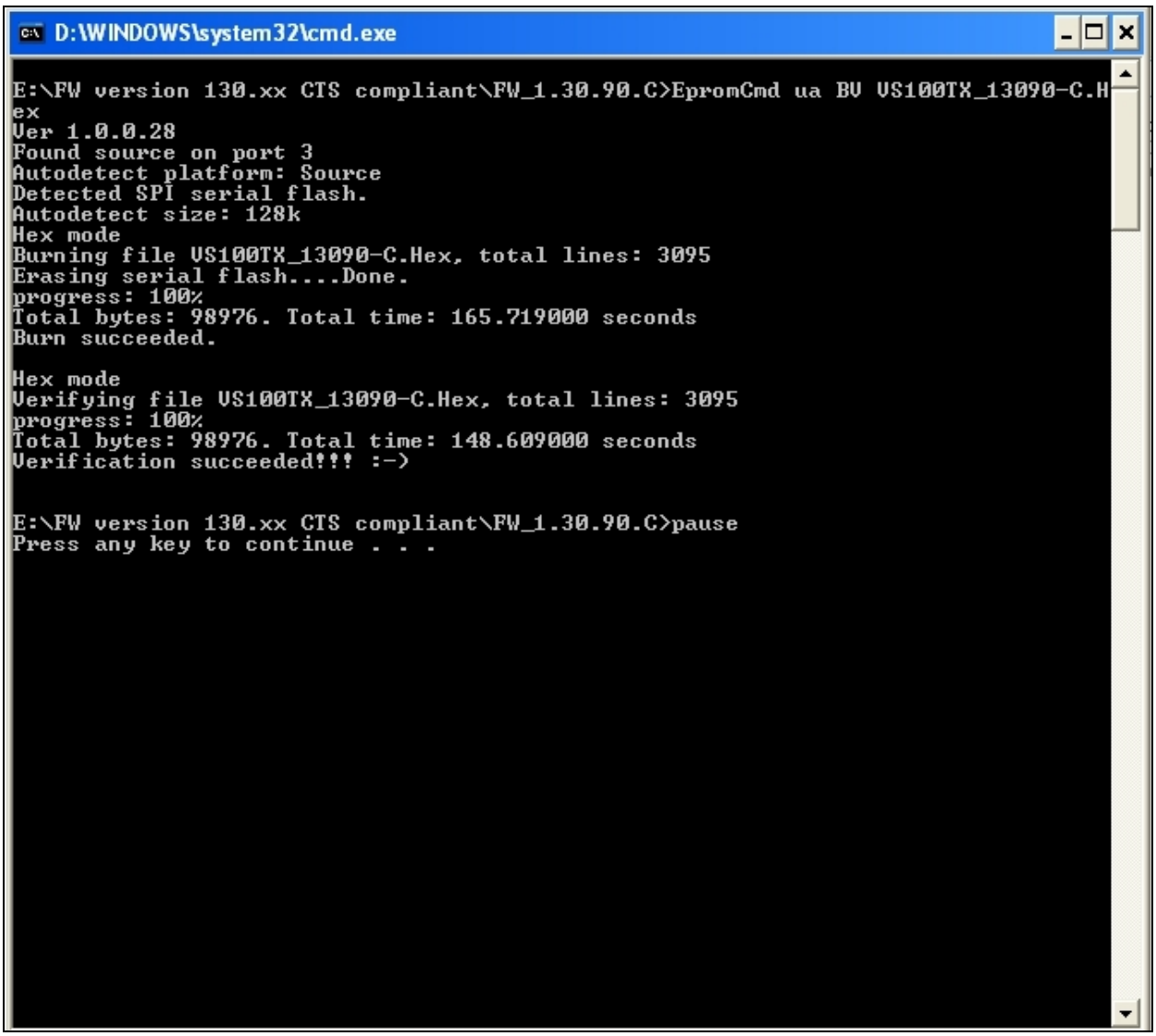


6. Enable the HS-ExxP/SxxP, TV and DVD player power, and play the video comes from the DVD Player.

7. On the control PC, process the UpdateTX_13090-C.bat file to upgrade firmware. (The update file name is only for reference, it will be different based on version.)



8. Final, the update is finish as below.



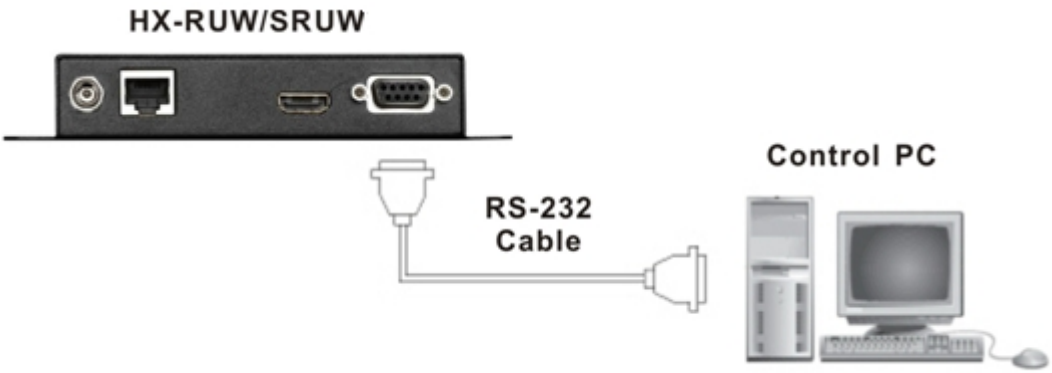
9. Each procedure only updates one port; please follow the same procedures to update other OUT ports.

☞ Implementation of HS-ExxP/SxxP HDBaseT F/W Upgrade should be at the active status (the video playing on TV is normal display). Otherwise, it will enter power-saving mode.

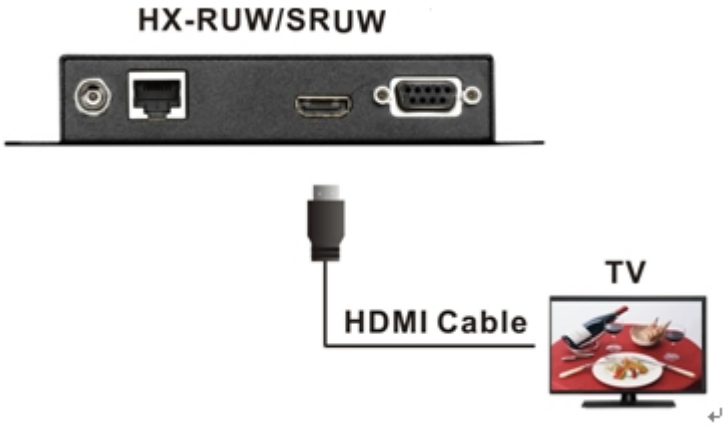
HS-Exx/Sxx HDBaseT F/W Upgrade

Follow the steps as below to upgrade the HS-Exx/Sxx firmware:

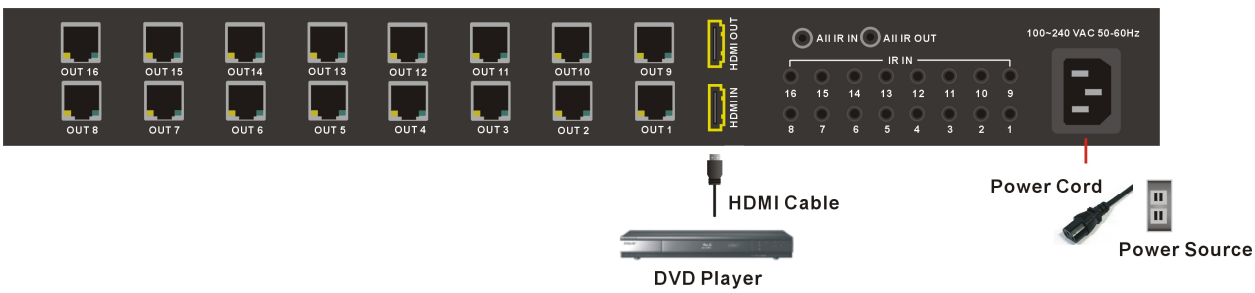
1. Connect the control PC and HX-RUW/SRUW with a RS-232 cable.



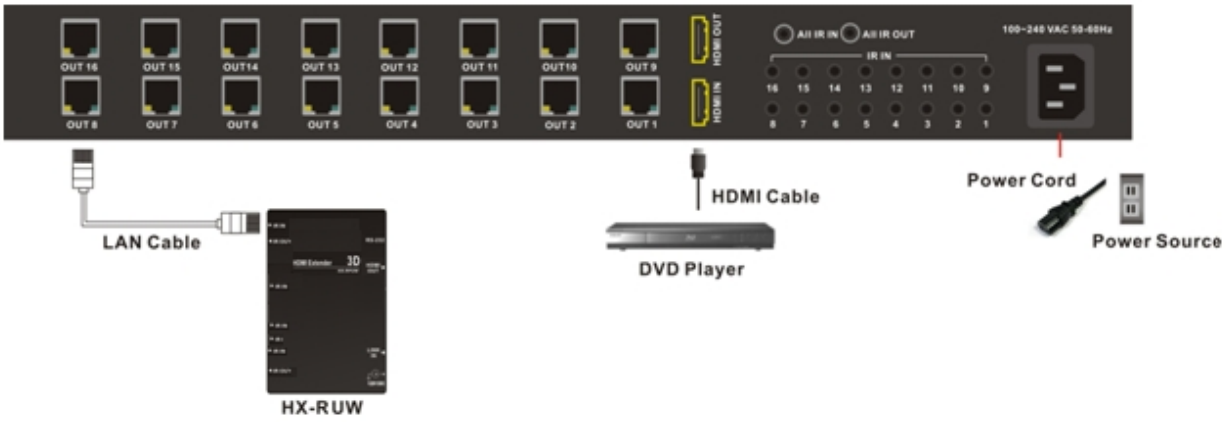
2. Connect the TV and HX-RUW/SRUW with a HDMI cable.



3. Connect the DVD Player and HS-Exx/Sxx with a HDMI cable.

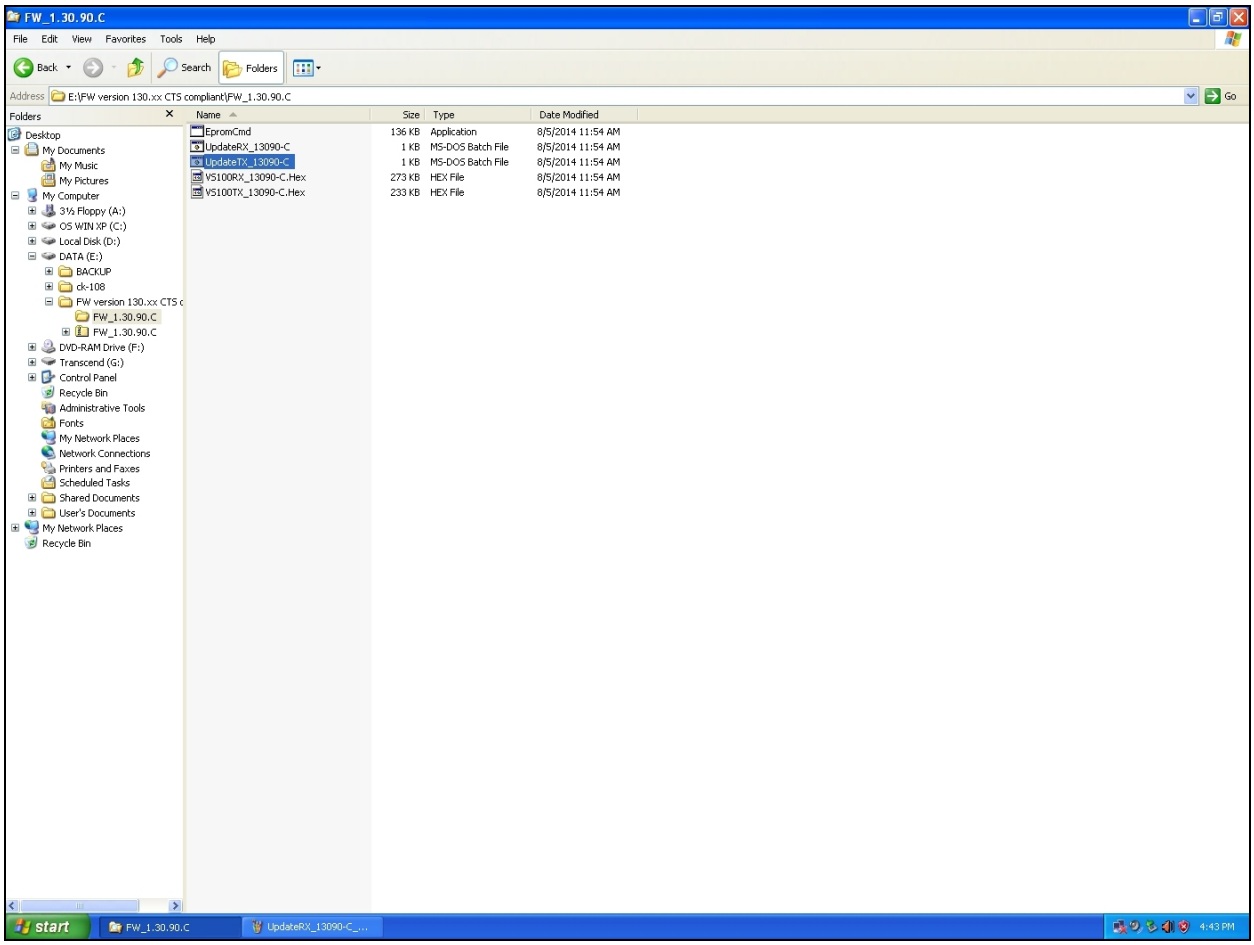


4. Connect the LAN cable to the LINK IN port on the panel of HX-RUW/SRUW. The other end of the LAN cable connected to the OUTPUT port of HS-Exx/Sxx. Through the LAN cable connection, the HX-RUW/SRUW will process the firmware upgrade.

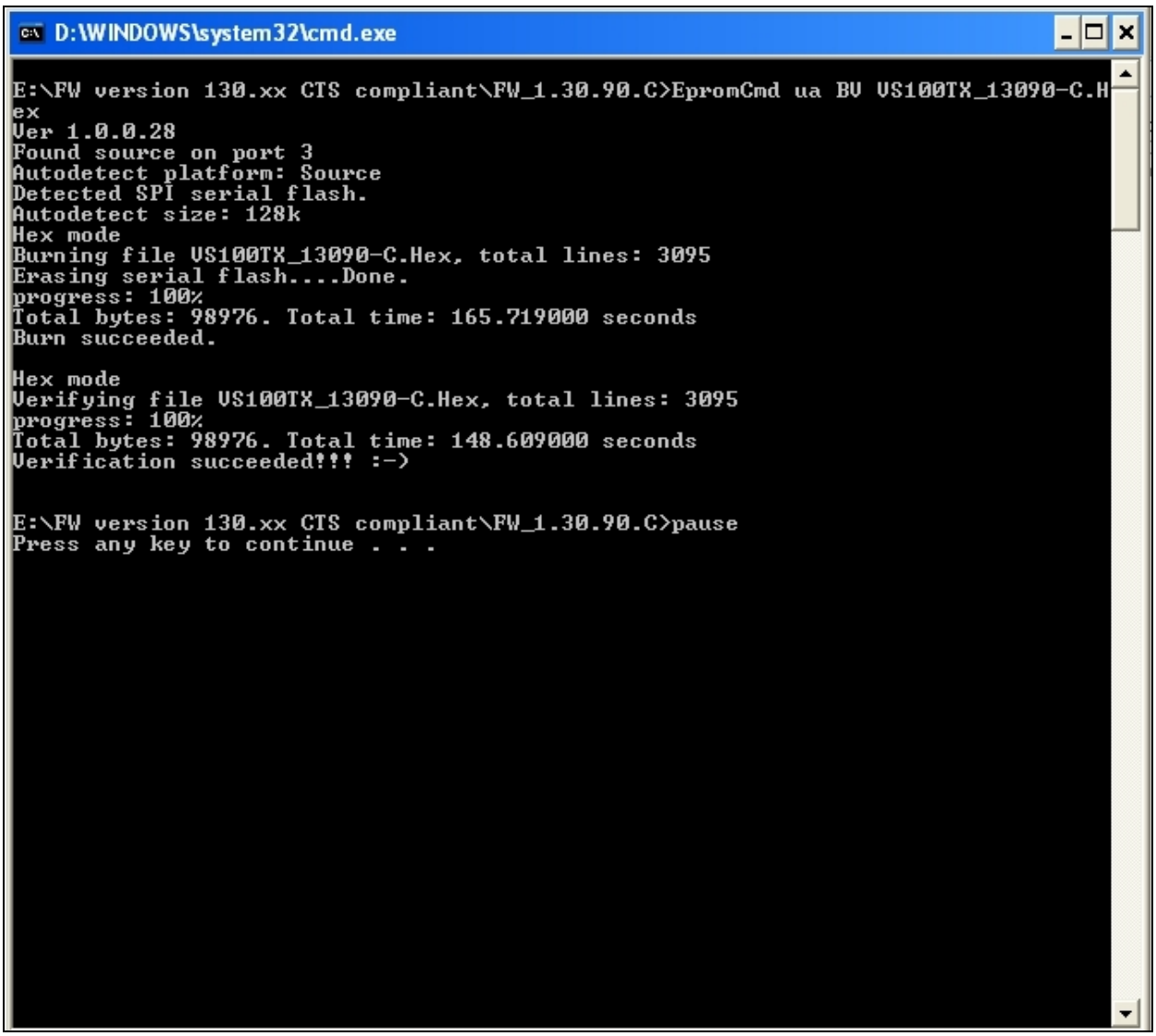


5. Connect the DC 12V adapter to HX-RUW/SRUW DC Jack.

6. Enable the HS-Exx/Sxx, TV and DVD player power, and play the video comes from the DVD Player.
7. On the control PC, process the UpdateTX_13090-C.bat file to upgrade firmware. (The update file name is only for reference, it will be different based on version.)



8. Final, the update is finish as below.



9. Each procedure only updates one port; please follow the same procedures to update other OUT ports.

☞ Implementation of HS-Exx/Sxx HDBaseT F/W Upgrade should be at the active status (the video playing on TV is normal display). Otherwise, it will enter power-saving mode.

APPENDIX B RECEIVER

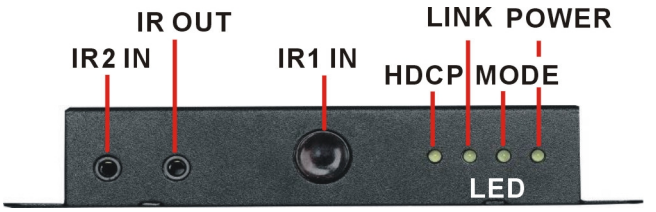
The extension of HDMI video signal device supports up to 100/70 meter away by using a Receiver and Cat.5e cable.

- HS-Exx Series → HX-RUW (100M)
- HS-ExxP Series → HX-RPUW (100M)
- HS-Sxx Series → HX-SRUW (70M)
- HS-SxxP Series → HX-SRPUW (70M)

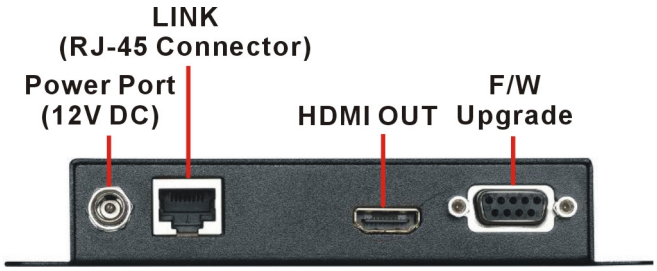
HDMI Receiver is ideal for:

- Test bench facilities
- Data Center
- Help desks

HS-Exx/Sxx Series: HX-RUW/SRUW Receiver

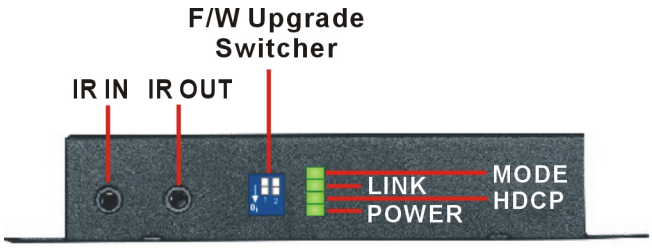


Side View

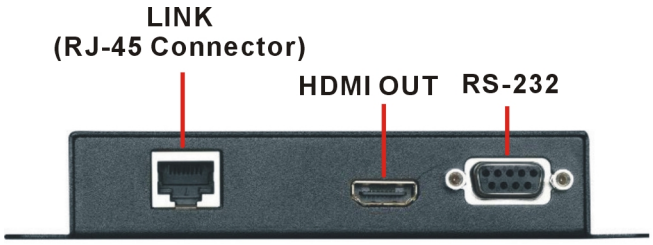


Side View

HS-ExxP/SxxP Series: HX-RPUW/SRPUW Receiver



Side View



Side View

LED Indicators (Green):

LED	Off	Blink	On
MODE	-	Power Connected	-
LINK	No Link	Low Power Mode	HDBaseT Link
HDCP	No HDMI Signals	No Encryption	HDCP Encryption
POWER	Power Off	-	Power On

HX-RPUW/SRPUW Receiver: F/W Upgrade Switcher (2-Pin)

	Pin 1	Pin 2	Description
REMOTE	ON	OFF	Through the RS-232 connection to upgrade Receiver unit.
LOCAL	OFF	ON	Through the LAN Connection to upgrade Transmitter (HS-ExxP/SxxP).
NORMAL	OFF	OFF	Extend the RS-232 Signal Transmission

Features

- Through the Receiver, you can use the output of HS-Exx (P)/Sxx (P) to display identical image and extension of HDMI signal up to 100/70 meters on HDTV
- HDCP Compliant
- Supports F/W Upgrade (only for HS-ExxP/SxxP)
- Supports 3D pass-through
- Supports all frequency band IR pass-through
- Supports IR/RS-232 extension function.
- One Cat.5e cable extension
- Supports resolution up to UltraHD 4K x 2K
- HDBaseT technology
- Use CATx cable to install easily

Specifications

Hardware	
HDMI OUT	HDMI A-Type Female x 1
LINK	RJ-45 Connector x 1
IR OUT	3.5ψ Stereo Jack x 1
IR2 IN (IR IN)	3.5ψ Stereo Jack x 1
2 Pins Dip Switch (For HS-E4P/E8P/E16P Series)	F/W Upgrade Setting
RS-232 Connector	DB9 Female x 1 (For HS-E4P/E8P/E16P Series that can used to F/W Upgrade)
LED indicators	MODE/LINK/HDCP/POWER
Power Supply	DC 12V with Lock
Housing	Metal
Weight	HX-RUW/SRUW:308g
	HX-RPUW/SRPUW: 330g
Dimensions (LxWxH)	150x80x35mm
Multimedia	
Max. Resolution	UltraHD 4K x 2K@30Hz, 8-bit
Highest TMDS Frequency	300MHz
Control Information	
HDMI Cable Distance	10 meters (At least)
Cat.5e Cable Distance	100/70 meters (Max.)
Remote Control	IR Receiver, IR Blaster

Installation

1. Turn off the HDTV.
2. Connect the HDMI cable between the HDTV and the **"HDMI OUT"** port of Receiver.
3. Connect the CATx cables between Matrix Output port and the **"LINK"** port of Receiver.
4. Connect the power cord and turn on the Receiver.
5. Turn on the HDTV.

IR Receiver Cable Directions

Put IR Receiver cable into the Receiver **"IR2 IN (IR IN)"** port and place the IR Receiver Cable, so that you can aim at it easily with your IR remote controller.

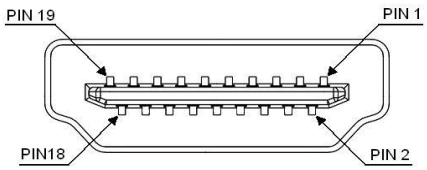
IR Receiver Cable:

IR Blaster Cable Directions

Plug IR Blaster cable into Receiver **"IR OUT"** port located on the front-panel.

IR Blaster Cable:

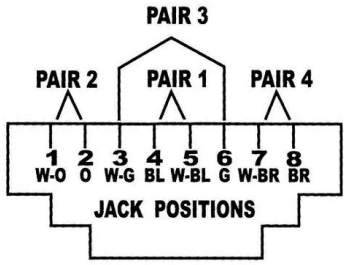
HDMI Output Connector



HDMI Type A Connector host assignment:

Pin #	Signal	Pin #	Signal
1	TMDS Data 2+	**11**	TMDS Clock Shield
2	TMDS Data 2 Shield	**12**	TMDS Clock -
3	TMDS Data 2-	**13**	NC
4	TMDS Data 1+	**14**	NC
5	TMDS Data 1 Shield	**15**	DDC SCL
6	TMDS Data 1-	**16**	DDC SDA
7	TMDS Data 0+	**17**	DDC/CEC Ground
8	TMDS Data 0 Shield	**18**	+5V Power
9	TMDS Data 0-	**19**	Hot Plug Detect
10	TMDS Clock+		

Wiring Information for Link Connector



Conductor Identification	RJ-45 Pin Assignment	Color Code for Conductor
Pair 1	5	White-Blue
	4	Blue
Pair 2	1	White-Orange
	2	Orange
Pair 3	3	White-Green
	6	Green
Pair 4	7	White-Brown
	8	Brown