# HDMI (HDBaseT) Matrix Switcher Series

## ITEM NO.: HE04M 4 x 4 HDMI (HDBaseT) Matrix Switcher

With the latest and more affordable HDBaseT technology extend HDMI sources up to 100M at 1080p or 1920x1200. HE04M HDMI 4 by 4 Matrix Switcher allows for effortless control of up to 4 devices through IR remote control, RS-232 and the front panel.



## HE04M 4 x 4 HDMI (HDBaseT) Matrix Switcher

◆ 4 x HDMI inputs , 4 x HDMI Outputs Matrix switcher
◆ Dual Output: local HDMI port or remote RJ45 termination
◆ Work with HE02ER, HE02R receiver at each monitor up to 100 meters over CAT5e/6.
◆ Work with HE02EIR receiver at each monitor up to 70 meters over CAT6a cable.
◆ Three control option: Front panel button, IR remote control, RS232 through remote PC.
◆ Support local/remote IR control to select input/output.
◆ Built in RS232 console port to select input/output.
◆ **Built 1 in 4 out IR distributor function**, **allow the HE04M control each monitor and also could be using the IR remote control to select the input source from the monitor side**.
◆ Uncompressed high definition video 1080p@60Hz 12 bit and 3D capable
◆ HDMI 1.4 video features supported, HDCP compliant.
◆ Built in 4 channel IR & RS232 extender (work with Receiver: HE02EIR, HE02ER,)
◆ Input/Output status could be displayed at front panel LCM & LED.

◆ **Optional Model:**
   RC04 : 4 x 4 Keypad remote control (select HE04M input/output)



◆ **Optional CAT5E/CAT6 Receiver Model:**
   HE02ER:   100m HDMI Receiver
   HE02R :    100m HDMI, IR and RS232 Receiver
   HE02EIR:   70m HDMI with IR Receiver



1

## HE04M Panel View:



## HE04M Connection View:



IR01

RS232 Control

BD PLAYER

IR Remote Control

IR Emitter Cable (IR-CT01)

IR Receiver Cable (IR-CR01)

RS232 *4     IR  TX     IR  RX     IR Receiver

CONSOLE RS232

| 1 | 2 | 3 | 4 | HDMI | HDBaseT | HDMI | HDBaseT | HDMI | HDBaseT | HDMI | HDBaseT |
|---|---|---|---|------|---------|------|---------|------|---------|------|---------|

HDMI IN     OUTPUT 1     OUTPUT 2     OUTPUT 3     OUTPUT 4

**100M**     **100M**     **100M**     **100M**

SOURCE     TV     HE02R     TV     HE02R     TV     HE02R     TV     HE02R     PC、KEYPAD

TV     TV     TV     TV

RS232     RS232     RS232     RS232

IR     IR     IR     IR
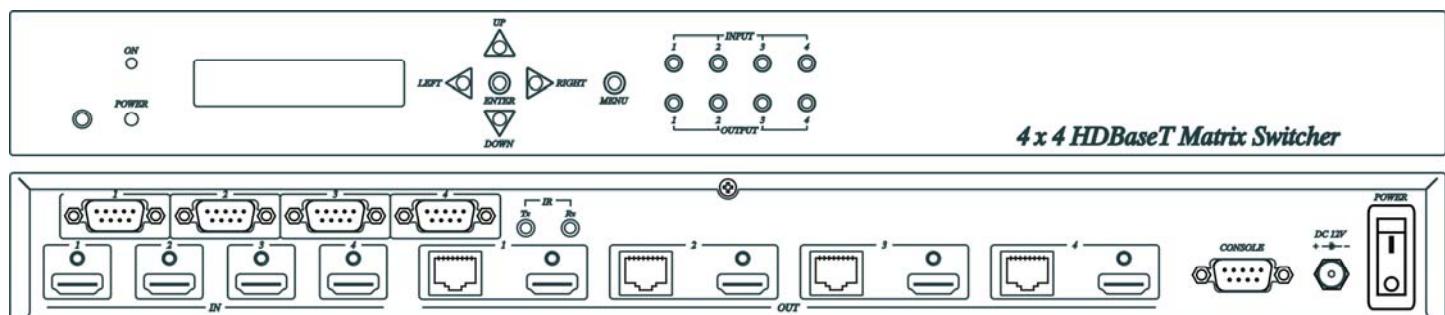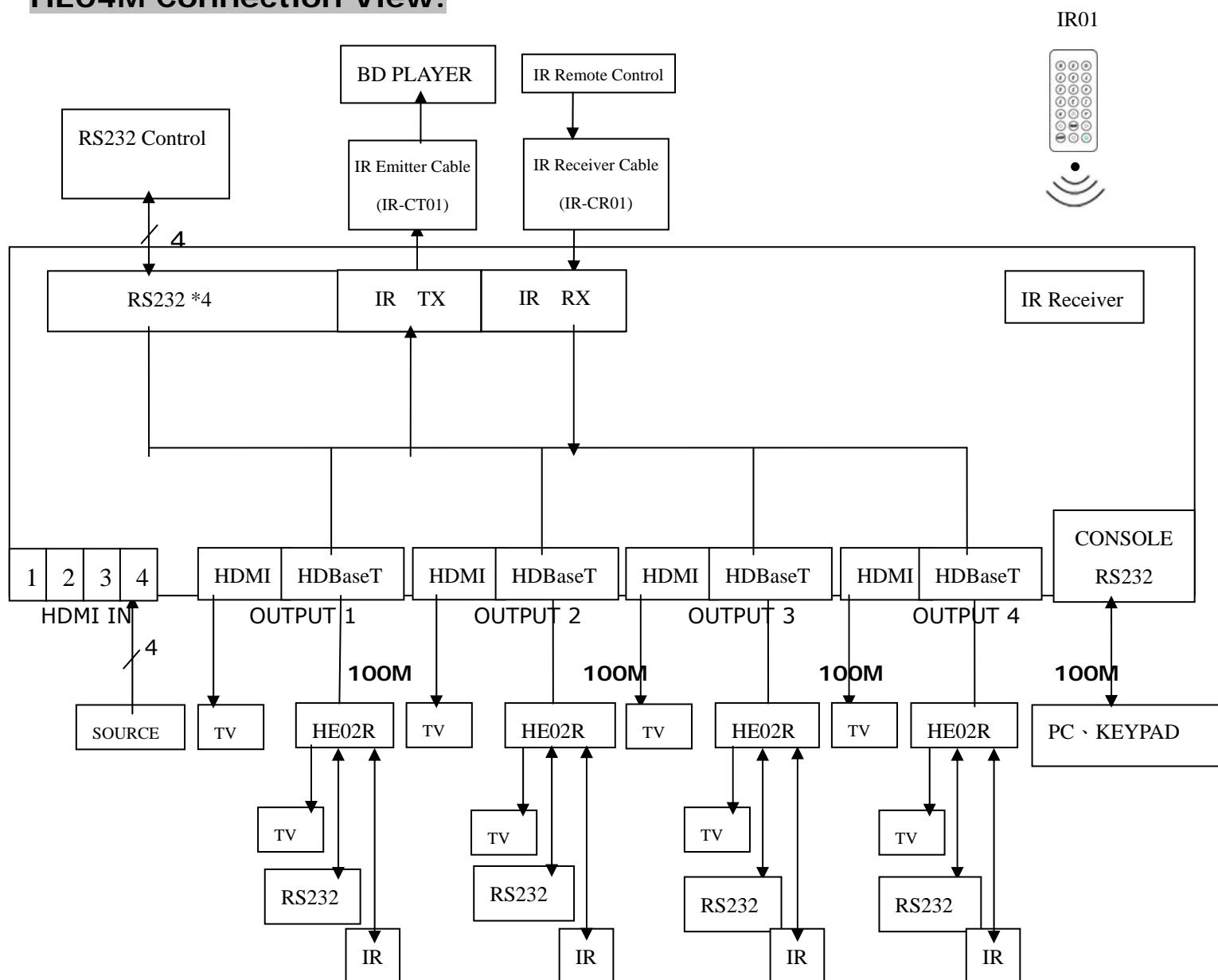
**\* Under dual Output connection:   local HDMI port or remote RJ45 termination**
   **Once you link both HDMI & HDBaseT connection, the output will be effected HDMI port only.**
   **For HDBaseT output must disconnection HDMI link.**

2

**Back Panel Switch:**

POWER                    LED on              Power on
                         LED off             Power off


**Front LED Indication:**

ON                       BLUE                Power on
                         RED                 Standby
                         LED off             Power Off


INPUT    1, 2, 3, 4      BLUE                Input Indication
                         LED off             SOURCE no signal


OUTPUT   1, 2, 3, 4      BLUE                HDMI output indications
                         RED                 HDBaseT output indication
                         LED off             Output unlink

● **Standby mode: The IR Remote only could control POWER on/off.**


**Front Button Function:**

Power                         Power on/standby
UP                             up
DOWN                          down
LEFT                           left
RIGHT                          right
ENTER                         select confirm key
MENU                          back to main menu


*When the sub-menu setting changed, press the ENTER key to complete the setting.  If no
 press ENTER key, then the setting will be failed.


## LCM Panel Function:
**4X4 HDMI MATRIX: Power on Main Screen**
  * When the power on the main screen appears, press the MENU key to enter the main menu

# Main MENU Option:

* SWITCH SETTING
  RS232 SETTING
  IR TX SETTING
  IR RX SETTING
  HDBaseT IR ID
  MATRIX IR ID
  EDID
  FIRMWARE VER.
  KEYLOCK

## Operation:

- Press UP or DOWN key to move * to select an item for setting and press ENTER key into subpage.
- When the selected sub-page setting is completed, press the MENU button to return to the main page

# LCM Main MENU Function Operation:

**SWITCH SETTING : (Default: 1 2 3 4)**

```
OUTPUT  1  2  3  4
 INPUT  1  2  3  4
```

This function is used to switch the input/output port, enter the SWITCH SETTING menu.  To press the ENTER key, then the LCM second line INPUT 1 will flash, to press UP or Down button to select the input port, to press LEFT or RIGHT button to select the modified output, after that press ENTER to confirm setting.

At HDBaseT port could use IR01 remote control to do a quick input selection
①~④ represent select HDMI input ports 1~4.  Press ⏻ or ⓪ turn off the video output.
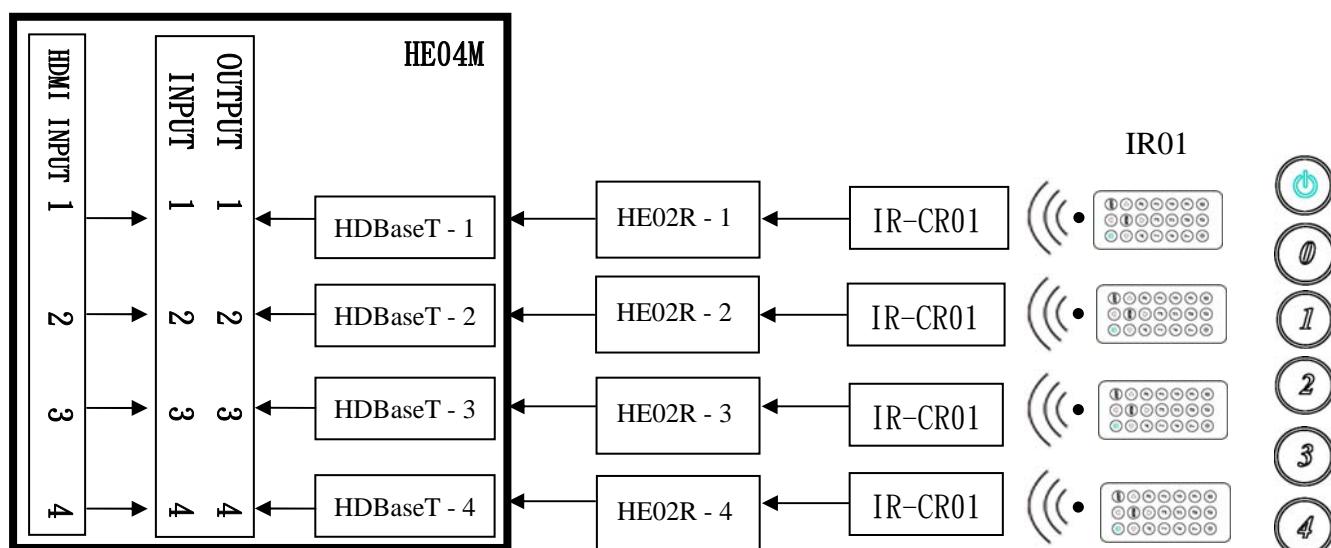
## RS-232 SETTING：(Default: FIX MODE)

HDBaseT RS-232 extender function with two mode, enter RS-232 SETTING MENU，press ENTER, the ＊ will flash, then press UP or DOWN button to select FIX MODE or MATRIX MODE, press ENTER key to confirm setting.

◆ FIX MODE is one to one transmission, RS-232 port 1 only work with HDBaseT port 1, RS-232 port 2 only work with HDBaseT port 2, and so on…

```
＊   FIX    MODE
   MATRIX   MODE
```

**HE04M**

| PC | ↔ | RS232 - 1 | ↔ | HDBaseT - 1 | ↔ | HE02R - 1 | RS232 Cable ↔ | Projector |
| PC | ↔ | RS232 - 2 | ↔ | HDBaseT - 2 | ↔ | HE02R - 2 | RS232 Cable ↔ | Projector |
| PC | ↔ | RS232 - 3 | ↔ | HDBaseT - 3 | ↔ | HE02R - 3 | RS232 Cable ↔ | Projector |
| PC | ↔ | RS232 - 4 | ↔ | HDBaseT - 4 | ↔ | HE02R - 4 | RS232 Cable ↔ | Projector |
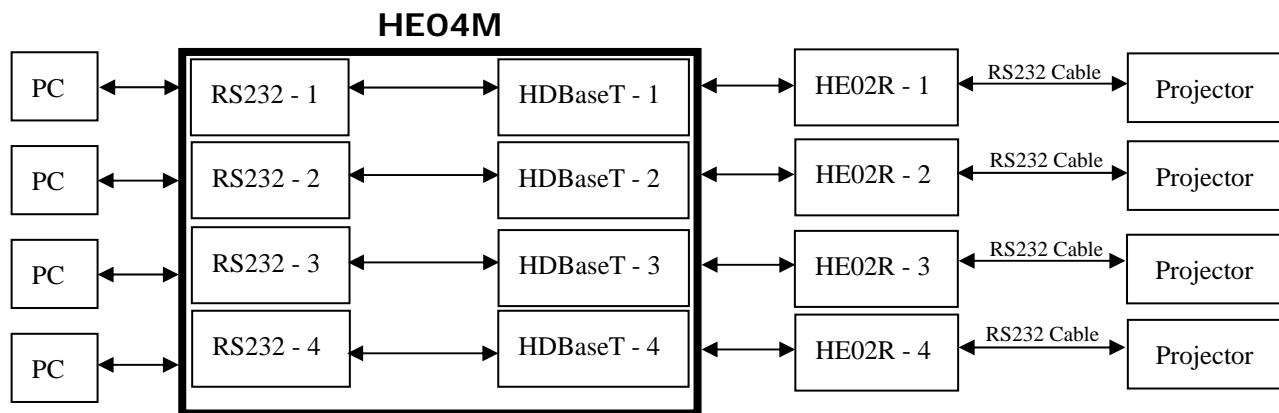
**RS-232 SETTING : FIX MODE**

--------------------------------------------------------------------

◆ RS-232 MATRIX MODE based on SWITCH SETTING to do RS-232 transmission, RS-232 port 1 work with HDMI input 1，RS-232 port 2 work with HDMI 2 and so on…

```
    FIX    MODE
＊ MATRIX   MODE
```

**Connect To**
HDBaseT - 1
HDBaseT - 2
HDBaseT - 3

**HE04M**

| PC 1 | ↔ | HDMI - 1 / RS232 - 1 | OUTPUT INPUT 1 2 3 4 / 1 1 1 4 | HDBaseT - 1 | ↔ | HE02R - 1 | RS232 Cable ↔ | Projector Connect To PC 1 |
| PC 2 | ✗ | HDMI - 2 / RS232 - 2 | | HDBaseT - 2 | ↔ | HE02R - 2 | RS232 Cable ↔ | Projector Connect To PC 1 |
| PC 3 | ✗ | HDMI - 3 / RS232 - 3 | | HDBaseT - 3 | ↔ | HE02R - 3 | RS232 Cable ↔ | Projector Connect To PC 1 |
| PC 4 | ↔ | HDMI - 4 / RS232 - 4 | | HDBaseT - 4 | ↔ | HE02R - 4 | RS232 Cable ↔ | Projector Connect To PC 4 |

**Connect To**
HDBaseT - 4
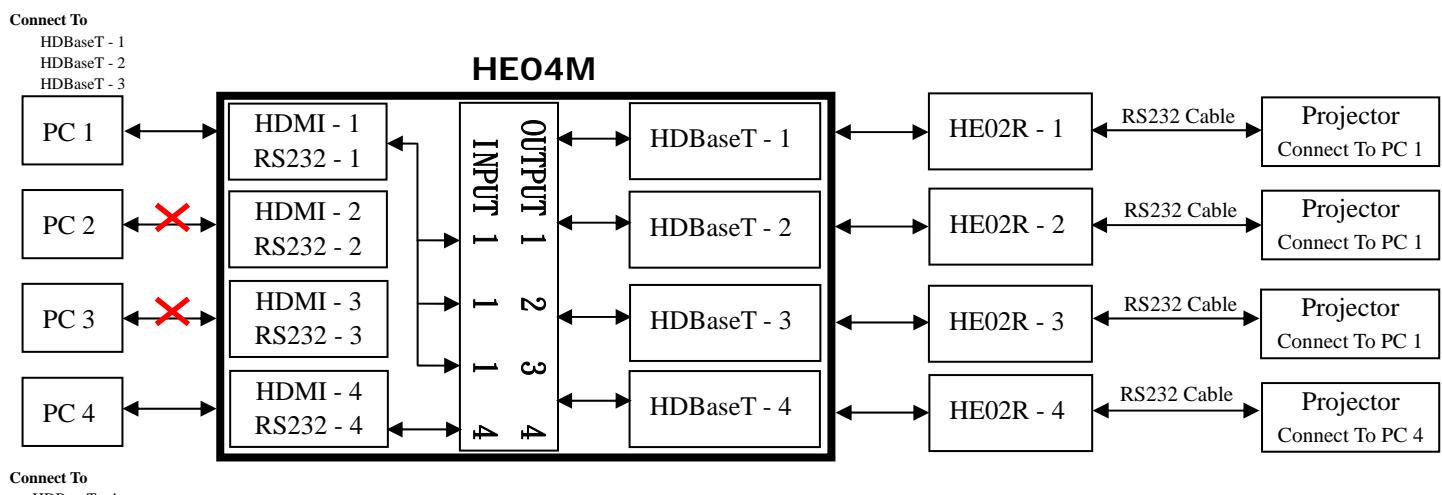
**RS-232 SETTING : MATRIX MODE**

5

## IR TX SETTING : (Default IR TX:   O   O   O   O)

This function could setup the IR signal whether from MATRIX sent to HDBaseT port.   To control remote device, setting O is on, X is off.

After entering IR TX SETTING menu, press ENTER, then LCM second line of text will flash, to press UP or DOWN button to select O or X, press ENTER to confirm setting.

| HDBaseT | 1 | 2 | 3 | 4 |
|---------|---|---|---|---|
| IR TX   | O | X | O | X |

**O : on      X : off**
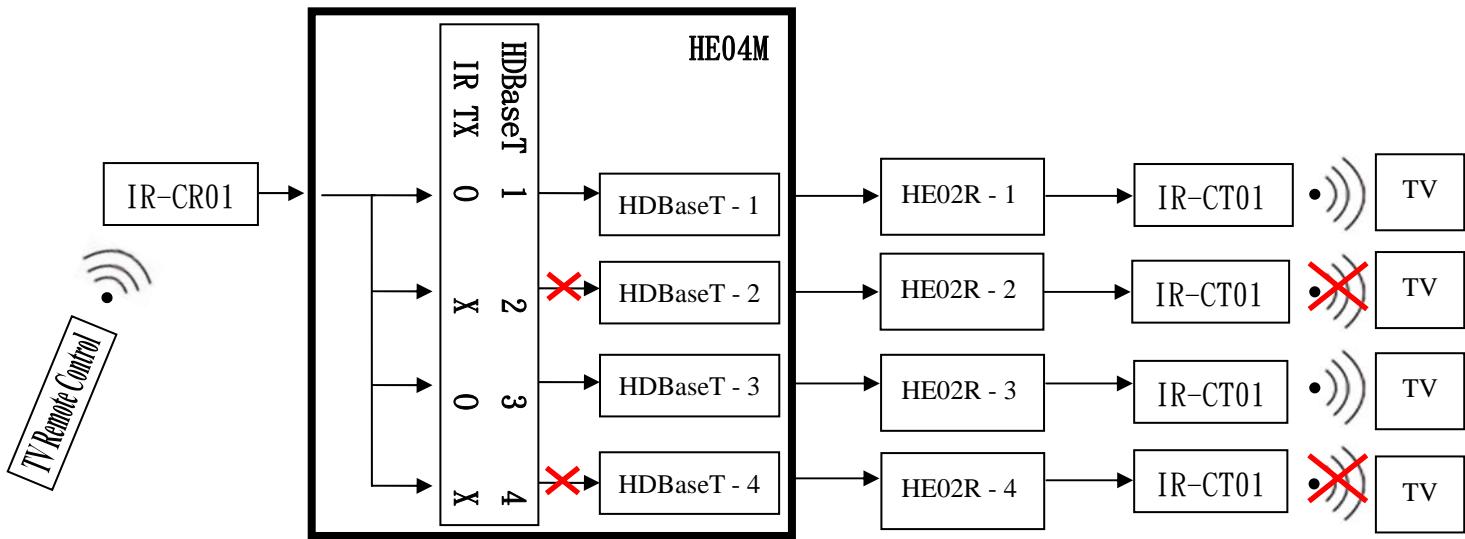
**IR RX SETTING : (Default IR RX:　O　O　O　O)**

This function could setup the IR signal whether from HDBaseT sent to MATRIX to control local device, O is on, X is off.

After entering IR RX SETTING menu, press ENTER, then LCM second line of text will flash, to press UP or DOWN button to select O or X, press ENTER to confirm setting.

```
HDBaseT  1   2   3   4
 IR RX    O   X   O   X
```

**O : on      X : off**
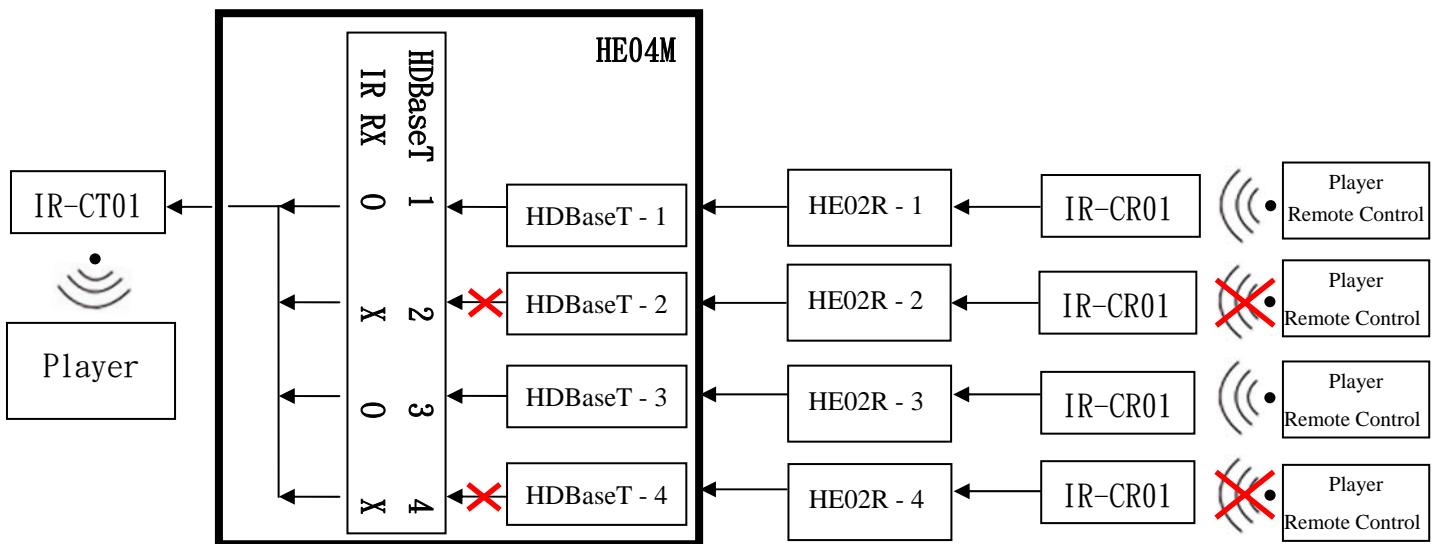
## HDBaseT IR ID：(Default IR ID: 5 5 5 5)

| HDBaseT | 1 | 2 | 3 | 4 |
|---------|---|---|---|---|
| IR ID   | 0 | 1 | 2 | 3 |

This function could be set to different ID to avoid HDBaseT remote control (IR01) conflicts with other devices remote control.

After entering HDBaseT IR ID menu, press ENTER, then LCM second line of text will flash, to press UP or DOWN button to select, press ENTER to confirm setting.

When finish HDBaseT IR ID setting, HDBaseT remote control ( IR01) must also set the same ID in order to operation in normal.

Remote IR ID setting mode: To press and hold the POWER button, then press the number button which can be set from 0 to 9, total 10 groups.

★ First time to use the remote control or replace new batteries of remote control need to re-set the remote control IR ID.
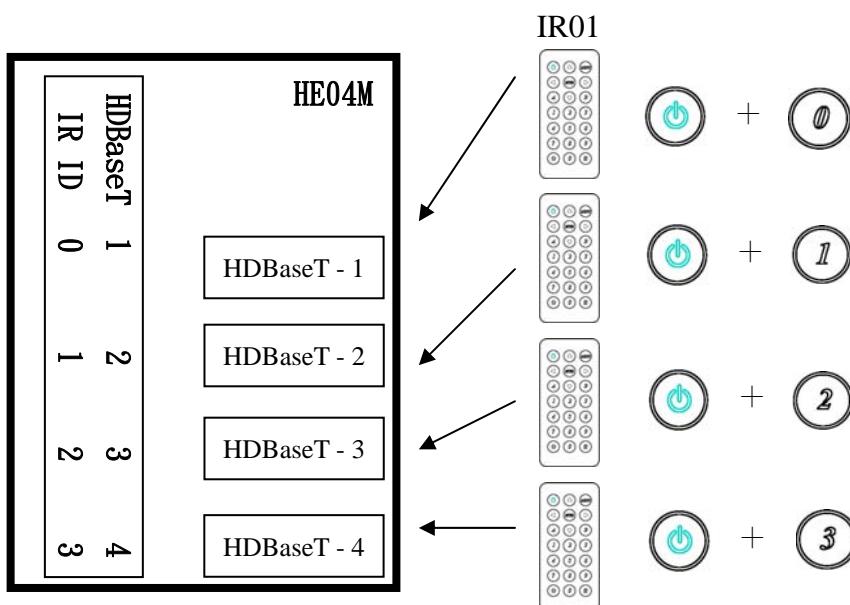
## MATRIX IR ID：(Default IR ID： 4)

```
MATRIX IR ID   4
```

This function could be set to different ID to avoid Matrix remote control (IR01) conflicts with other devices remote control.

After entering MATRIX IR ID menu, press ENTER, then LCM second line of text will flash, to press UP or DOWN button to select, press ENTER to confirm setting.

When finish MATRIX IR ID setting, MATRIX remote control ( IR01) must also set the same ID in order to operation in normal.

Remote Control IR ID setting mode: To press and hold the POWER button, then press the Number buttons which can be set from 0 to 9, total 10 groups.

★ First time to use the remote control or replace new batteries of remote control need to re-set the remote control IR ID.

IR01

HE04M

MATRIX IR ID 4
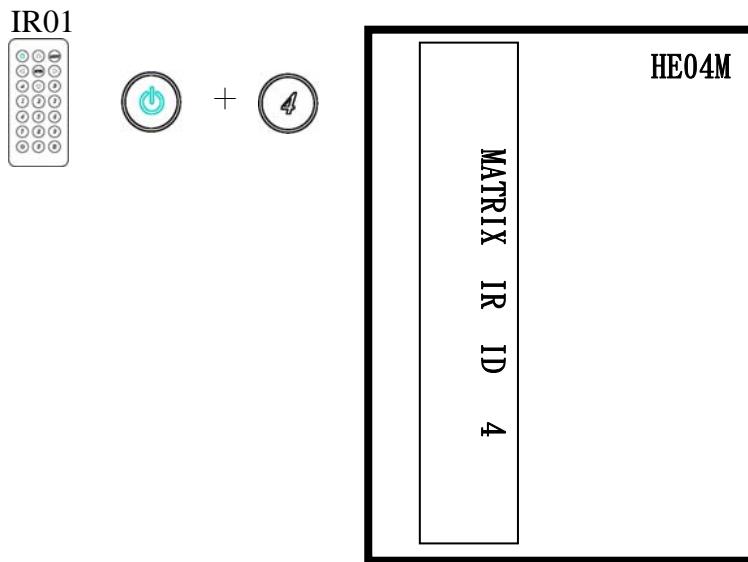
## EDID：(Default: LPCM-2CH)

Because the player output display resolution will be based on TV EDID , this Matrix provides two default EDID mode: ＂BUILD-IN MODE＂ and "COPY MODE".

```
BUILD-IN MODE
   COPY MODE
```

-------------------------------------------------------------------
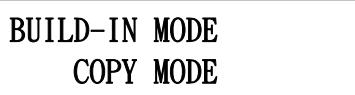
## BUILD-IN MODE：

This mode supports video resolution 480p, 720p, 1080i / p @ 24/50/60Hz, support LPCM two-channel audio and 5.1 channel . After enter BUILD-IN MODE menu, press UP or DOWN key to select LPCM-2CH or LPCM-5.1CH, press ENTER to confirm setting.

```
LPCM-2CH
LPCM-5.1CH
```



-------------------------------------------------------------------
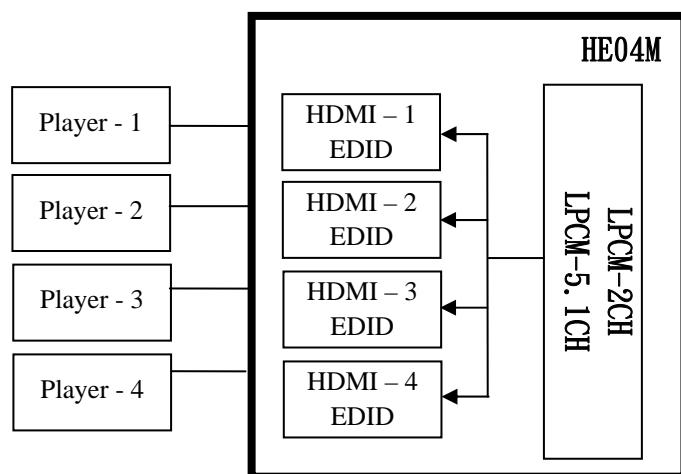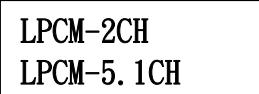
## COPY MODE：

To fully support the TV resolution and audio mode, the matrix provided copy mode to copy TV EDID for input source reference. When use the copy mode, recommend to copy the lowest resolution TV EDID. Otherwise it may cause no picture display if the TV resolution not able to support the higher resolution.

After entering COPY MODE menu, press UP or DOWN button and then select From OUTPUT to INPUT.  After setting, press ENTER to confirm.

```
From OUTPUT : 1
   To INPUT : 1
```
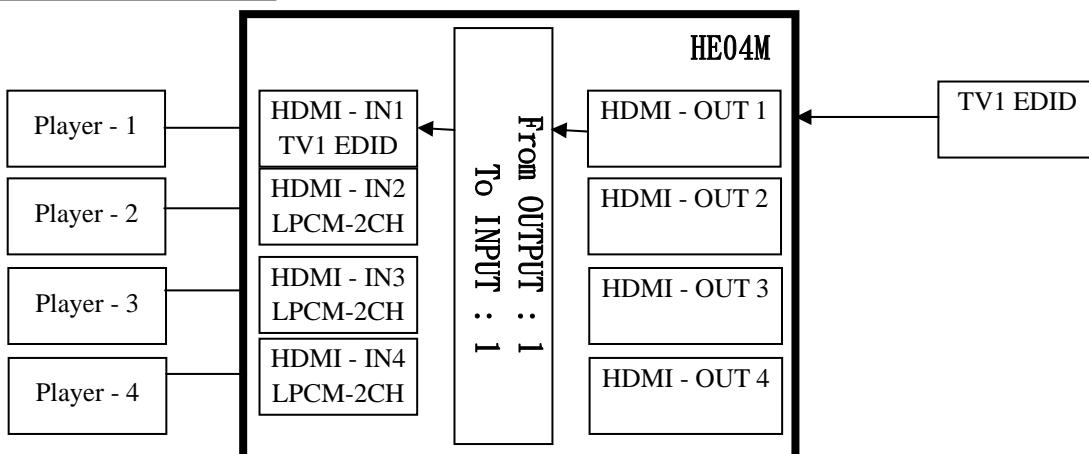
**FIRMWARE VER. :**
Display HE04M Matrix firmware version

**KEYLOCK :**
KEYLOCK function is to avoid any wrong button press.  Under keylock mode press "POWER + MENU" to unlock

**Remote Control Function ( IR01):**
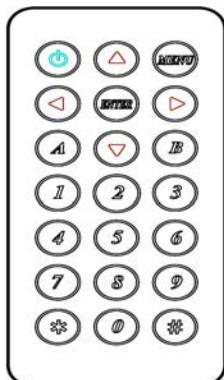
Setup the remote control IR ID same as the this Matrix,  first time to use the remote control or replace new batteries of remote control need to re-set the remote control IR ID.

- Local side(HE04M Matrix) IR ID default is 4
- Remote side(HDBaseT) IR ID default is 0
- To avoid the remote control conflicts with other devices remote control, please use HDBaseT/MATRIX IR ID SETTING to set the IR ID.
- IR remove control ID setup : press and hold POWER button , then press Number keys

**Remote control button define :**

| Symbol | Local Side | Remote Side |
|---|---|---|
| Power | ON/Standby(same as Matrix) | off output |
| LEFT | left(same as Matrix) | no function |
| RIGHT | right(same as Matrix) | no function |
| UP | up(same as Matrix) | no function |
| DOWN | down(same as Matrix) | no function |
| ENTER | confirm (same as Matrix) | no function |
| MENU | menu(same as Matrix) | no function |
| | Quick   key1 | select input 1 |
| | Quick   key2 | select input 2 |
| | Quick   key3 | select input3 |
| | Quick   key4 | select input4 |
| | no function | no function |

| | | |
|---|---|---|
| ⑥ | no function | no function |
| ⑦ | no function | no function |
| ⑧ | no function | no function |
| ⑨ | no function | no function |
| ⓪ | turn off output | turn off output |

Local side (HE04M Matrix) Remote control Quick key operation:
For example: the output port 1 connect to output port 4 , press the quick key 1 (OUTPUT 1) and then press the quick key 4 (INPUT 4).

Remote side (HDBaseT) remote control quick key operation: press 1 – 4 to select source input, press 0 to turn off the output.

＊ Under using quick key operation, LCM screen will jump to the output / input setting page, it won't allow to use the front panel button to operate the HE04M Matrix.

# Computer Local Control Function：（CONSOLE）

CONSOLE
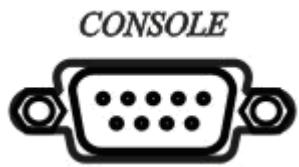
This Matrix communication format is 9600,8, N, 1 (9600 bps, 8 data bits, no parity check, 1 stop bit)

## Operation Instruction format:

Command + Space + parameters + Enter

TX[x] [y] output x port switch to input y port
PWR [z]

| [SYMBOL] | [PARAMETER] | |
|----------|-------------|---|
| x | 1 \| 2 \| 3 \| 4 | Output 1~4 |
| y | 01 \| 02 \| 03 \| 04 \| 00 | Input 1~4, 00: Off |
| z | 00 \| 01 | 00: Standby, 01: On |

## Example:

**TX1   04    Output 1 switch to input 4**
**PWR   01    turn off**

\* The Matrix will reply OK message once correct input, wrong input will reply NG message.

# RS-232 Extender function：(Default: FIX MODE)

*Cable connection please refer to the connection view page.
\* Transmission baud rate up to 115200 bps.

**Remote side IR Extender Function:**
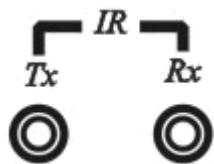


◆ **Tx Function:**
Receiving IR signal from 4 sets HDBaseT ports, send out the signal by Tx (connect with 3.5ψ IR Emitter) to control source devices.

◆ **Rx Function :**
Receiving IR signal from Rx (connect 3.5ψ IR Receiver cable) to control remote monitors at 4 sets HDBaseT ports at the same time.

**HDBaseT IR Function:**

1. Use IR01 (remote control) to control the Matrix input port switching from receiver side. (Work with IR-CR01 IR receiver cable)

2 . Using remote control of source device or TV, to control source device or TV. (Work with IR-CT01 IR emitter cable, IR-CR01 IR receiver cable).

**HDBaseT linking cable:**
Recommend to use high quality Cat.5e、Cat.6、Cat.6a  UTP / STP  or FTP cable.

**HDBaseT transmission distance:**

Transmission distances up to 100 meters, using a lower resolution won't extend to longer distance.

 If the CAT5e/6 cable connections go through wall socket from the wall outlet to HE02R receiver, the cable length must less 5 meters between HE02R receiver and wall socket. The wiring diagram as below:
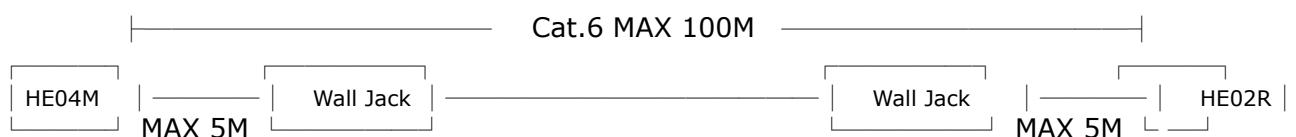
## HDBaseT RJ45 Pin Define:

Video Link ( TIA/EIA-568-B )
1. Orange-white    DATA0 +
2. Orange          DATA0 -
3. Green-white     DATA1 +
4. Blue           DATA2 +
5. Blue-white      DATA2 -
6. Green          DATA1 -
7. Brown-white    DATA3 +
8. Brown         DATA3 -

## Caution:

1. First time to use HE04M remote control or change new batteries, must set up IR ID.
2. The wiring must away from any equipment with electromagnetic wave, i.e.: microwave, mobile phone, radio equipment, high voltage, Fluorescent light fixtures, power lines, etc.
3. HDBaseT not regular network device, do not connect with any networking equipments to avoid damage.

## HE04M Standard Package Include:

HE04M Matrix x 1 pcs
IR01 IR Remote Control x 1 pcs
Power Adapter x 1 pcs

## HE04MEK Package Include:

HE04M Matrix x 1 pcs
HE02R HDMI Receiver x 4 pcs
IR01 IR Remote Control x 5 pcs
Power Adapter x 5 pcs
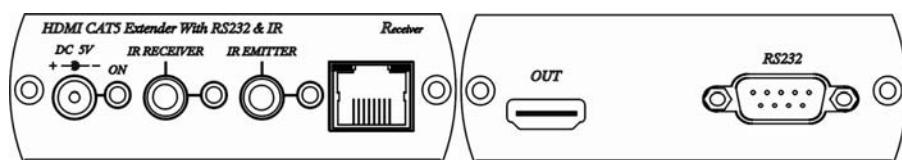


## HE04MEK Package Include:

HE04M Matrix x 1 pcs
HE02ER HDMI Receiver x 4 pcs
IR01 IR Remote Control x 1 pcs
Power Adapter x 5 pcs
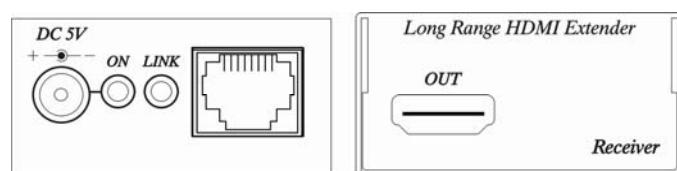


## HE04MEIK Package Include:

HE04M Matrix x 1 pcs
HE02EIR HDMI Receiver x 4 pcs
IR01 IR Remote Control x 5 pcs
IR Emitter Cable x 4 pcs
IR Receiver Cable x 4 pcs
Power Adapter x 5 pcs
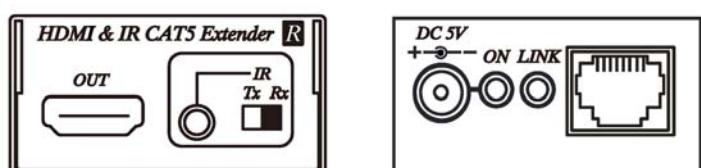
## Specification:

| Item No. | HE04M |
|---|---|
| HDMI Input Max. Resolution | 1080p @ 60Hz 12bi, 3D |
| Video Input | HDMI Type A x 4 |
| HDBaseT RJ45 output Max. Resolution | 1080p at 60Hz 12bit |
| HDBaseT Max. Distance | 100 Meters |
| Video Output | HDMI Type A x 4 and RJ45 x4 |
| HDBaseT RJ45 output Max Distance | 100 meters |
| IR Input/Output | Phone Jack x 2 |
| HDBaseT IR Carrier Frequency | 30-60Khz |
| HDBaseT IR Angle | Tx : ±30d degree , Rx : ±55 degree |
| HDBaseT IR Distance | 5m |
| HE04M IR Receive Angle | ±45 degree |
| HE04M IR Receive Distance | 5M |
| RS232 Input/Output | DB9 x 5 |
| Power Adapter | DC 12V 4.2 Amp |
| Power Consumption | 2.6 Amp (Max) |
| Temperature | Operation: 0 to 55℃, Storage: -20 to 85℃, Humidity: up to 95% |
| Dimension         mm | 483 x 197 x 44 |
| Weight            kg | 2400 |

| ITEM NO. | HE02R   (HE04MK Kit receiver, Optional CAT5E Receiver) |
|---|---|
| Resolution | Up to 1080p / 60Hz / 48 bit |
| Distance | 100M (Max) |
| HDMI Connector | Type A |
| RS-232 Baud Rate | Up to 115200 bps / Full Duplex |
| RS-232 Connector | DB9 Male |
| IR Carrier | 30-60Khz / ±10° / 5M / 2 Way |
| Power Supply | DC 5V 2AMP Regulated |
| Power Consumption | 1200mA (Max) |
| Temperature | Operation: 0 to 55℃, Storage: -20 TO 85℃, Humidity: up to 95% |
| Dimensions | 88 x 130 x 30 |
| Weight | 270 |

| Item No. | HE02ER (HE04MEK Kit receiver, Optional CAT5E Receiver) | HE02EIR (HE04MEIK Kit receiver, Optional CAT5E Receiver) |
|---|---|---|
| Resolution | Up to 1080p / 60Hz / 12 bit | |
| Distance | 100 m (Max) | 50 m by CAT5e/6, 70 m by CAT6a |
| Video Output | HDMI Type A x 1 | |
| IR Carrier Frequency | X | 30-60KHz |
| IR Angle | X | ±55 |
| IR Distance | X | 5m |
| Power Supply | Regulated DC5V 2A | |
| Power Consumption | 1200mA (Max) | 820mA (Max) |
| Temperature | Operation: 0 to 55℃, Storage: -20 TO 85℃, Humidity: up to 95% | |
| Dimensions         mm | 49 x 92.3 x 25 | |
| Weight             g | 135 | 135 |

RoHS CE FC ⊘

Rev. B