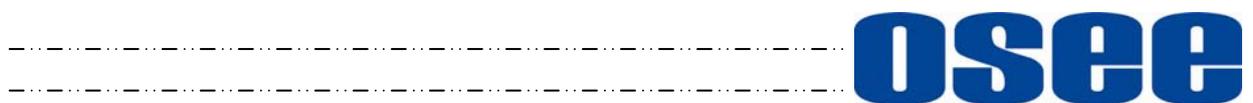


IRS Series

Intelligent Matrix Switcher

USER MANUAL



Product Information

Model: IRS Series Intelligent Matrix Switcher
Version: V010001
Release Date: April 29th, 2015

Company

OSEE TECHNOLOGY CO., LTD.

Contact Information

Address: No.22 Building, No.68 zone, Beiqing Road, Haidian District,
Beijing, China
Post Code: 100094
Tel: (+86) 010-62434168
Fax: (+86) 010-62434169
Web: <http://www.osee-dig.com/>
E-mail: sales@osee-dig.com

About The USER MANUAL

The user manual applies to the following device types:

- IRS1616-K-3G 16X16-3G Matrix Switcher with control panel
- IRS1616-K-HD 16X16-HD Matrix Switcher with control panel
- IRS1616-K-SD 16X16-SD Matrix Switcher with control panel
- IRS1616-3G 16X16-3G Matrix Switcher
- IRS1616-HD 16X16-HD Matrix Switcher
- IRS1616-SD 16X16-SD Matrix Switcher
- IRS1608-K-3G 16X8-3G Matrix Switcher with control panel
- IRS1608-K-HD 16X8-HD Matrix Switcher with control panel
- IRS1608-K-SD 16X8-SD Matrix Switcher with control panel
- IRS1608-3G 16X8-3G Matrix Switcher
- IRS1608-HD 16X8-HD Matrix Switcher
- IRS1608-SD 16X8-SD Matrix Switcher
- IRS16004-K-3G 16X4-3G Matrix Switcher with control panel
- IRS1604-K-HD 16X4-HD Matrix Switcher with control panel
- IRS1604-K-SD 16X4-SD Matrix Switcher with control panel
- IRS1604-3G 16X4-3G Matrix Switcher
- IRS1604-HD 16X4-HD Matrix Switcher
- IRS1604-SD 16X4-SD Matrix Switcher
- IRS1616-RCP 16X16 Remote panel module
- IRS1608-RCP 16X8 Remote panel module
- IRS1604-RCP 16X4 Remote panel module
- IRS1601-RCP Single busbar remote control panel
- IRSPGM/PST-RCP PGM/PST remote control panel

Any of the different specifications between the device types are elaborated. Before reading the manual, please confirm the device type.

Note: The specs are subject to change without prior notice!

Content

Chapter 1 Overview	1
Introduction.....	1
Feature.....	1
Main Function.....	2
Chapter 2 Safety Precaution for Use	3
Chapter 3 Unpackaging and installation	4
Chapter 4 Description of product structure	5
4.1 Size	5
4.2 Product Appearance.....	7
Chapter 5 Signal Flow Graph	10
Signal Flow Graph for Matrix Switcher	10
Signal Flow Graph for Remote Control Panel	10
Chapter 6 Usage	11
6.1 Before Use the Device	11
6.2 Explanation for PGM/PST matrix panel.....	12
6.3 Description of the Panel Keys	12
6.4 Explanation for XY panel and single bus panel	15
6.5 Description of the Panel Keys	16
6.6 Description of other keys.....	19
Chapter 7 Network Control	20
7.1 STATUS.....	21
7.2 Setup for Matrix Switcher	23
7.3 Remote control panel	24
7.4 SYSTEM Setup	26
Chapter 8 Specification	27
8.1 Description for Specification.....	27
8.2 RS422 Control Protocol Definition.....	28
Chapter 9 Appendix - RS422 NetWork Control	28
9.1 Serial port configuration	28
9.2 Switching command	28
9.3 X-point Status.....	30
9.4 Output Locking	30
9.5 Matrix Switcher REQUEST	31

IRS Series Intelligent Matrix Switcher

Chapter 1 Overview

Introduction

The IRS Series products include 16X16/16X8/16X4 intelligent matrix switchers, matrix switchers with control panels, and remote panel modules. The variety of standard models can meet the different needs of users.

The IRS series of intelligent, HD/SD small matrix switcher are high-performance matrix products for small and medium-sized broadcast system. This series of products can support up to 16 embedded digital HD/SD signal output switching. They can fully meet the needs of small and medium-sized signal scheduling system.

The products with the input signal source status display function and misuse protection mechanism would make the broadcast system more secure and stable. And, the series products support network control. As the simple operation, the users can simply operate the switchers without mistake.

The IRS Series products can be applied to the broadcast system on the carrier signal scheduling, are suitable for broadcast room, master control room, studio, and other areas of a variety of real-time applications, to switch the SDI input signal to the output signal.

Feature

- ◆ The intelligent matrix switchers would monitor and text the each channel input signal. The button is tri-color key. Normal signal lights GREEN while the non-normal signal lights RED. And PGM output signal is YELLOW. It visually shows the reality of the current work status of each signal.
- ◆ The IRS series support intelligent protection function in order to avoiding "misuse". When the input signal is detected abnormal, the switching operation for output would be invalid.
- ◆ The IRS1604 matrix switcher series have the automatic switching function. Each switching matrix switcher has a direct access to BYPASS input signal. When the PGM main output signal is abnormal, the output will automatically switch to the BYPASS signal.
- ◆ IRS series matrix switchers have the alarm function for following anomalies: 1) loss of synchronization; 2) PGM output signals abnormal; 3) the host and the remote control panel switching detection timeout.
- ◆ The IRS series matrix switchers have a comprehensive detection function and the test content including INPUT signal status, synchronization status, and device temperature, etc.
- ◆ Dual redundant power modular design and the input cable equalization automatically.
- ◆ Support NETWORK protocol, which enables network control.

Main Function

1. Display the status of the signal source.

The matrix switcher would detect each input signal. Tri-color operation panel keys show the status of each input signal. Each color represents a state of the input signal source. For example, "Green" means the channel signal is "normal" and "Red" means the signal is "abnormal". And "Yellow" means it is the current bus output channel. Matrix operator can clearly know the status of each input signal by the Matrix panel.

2. Misoperation protection mechanism.

The matrix switcher can open the Misoperation protection mechanism by software. When the function is enabled, the operator can not switch to the channel signal which is abnormal. This function prevents the operator misuse in the matrix panel switching operation.

3. Permanent source anomaly alarm.

In the broadcast system, there are server permanent signal channels. These channels should be normal for per-output. The matrix switcher can set up one channel to be permanent channel. When the channel source is detected be abnormal, the red key would be flashing. On the matrix panel, the red flashing indicating key reminds the channel signal is abnormal. The system should be checked.

4. Conform to the user operation habit of PGM/PST operation panel.

It has "PGM / PST" operation panel to intelligent switching matrix operation, easy to operate using.

5. Full support for SNMP protocol.

The matrix switcher can provide comprehensive and detailed source and parameters via SNMP protocol. It also supports for third-party monitoring system through the NETWORK.

6. Secure BACKUP signal.

The series matrix switcher support one-channel of BACKUP signal. When the matrix breaks down, the BACKUP signal would be output with power-down.

7. Control Mode.

The series products support RS23/RS422 serial port control mode. Remote control panel use the RS485 control communicating with the host. It also supports the Ethernet control mode and supports for the third-party control software. It uses the NETWORK matrix switching control protocol. So it can use all the NETWORK matrix control software which is under the NETWORK matrix control protocol.

Chapter 2 Safety Precaution for Use

Read and keep these instructions. Heed all warnings. Follow all instructions.

About the Position

1. Do not block any ventilation openings.
2. Do not use this unit near water.
3. Do not expose the unit to rain or moisture.
4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that product heat.
5. A nameplate indicating operating voltage, etc., is located on the rear panel. Install only in accordance with the instructions in Chapter 3 “Unpacking and Installation”.
6. The socket-outlet shall be installed near the equipment and shall be easily accessible.

About the Power-supply Cord

1. Do not defeat the safety purpose of the polarized or grounding-type plug.
2. Do not damage the power cord, place the heavy objects on the power cord, stretch the power cord, or bend the power cord.
3. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the unit.
4. If the power cord is damaged, turn off the power immediately. It is dangerous to use the unit with a damaged power cord. It may cause fire or electric shock.
5. Unplug this apparatus during lightning storms or when unused for long periods of time.
6. Disconnect the power cord from the AC outlet by grasping the plug, not by pulling the cord.
7. Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.

About the AC-DC Power Adapter

1. Please use the supplied 12V 5A power adapter.
2. Do not use the AC-DC power adapter to any other device outside the specified device.
3. Set the AC-DC power adapter from the power outlet when it is not in use for a long period of time.
4. Do not put anything else on the AC-DC power adapter.
5. Do not use the AC-DC power adapter in the outdoor.
6. If the AC-DC power adapter failure or damaged, do not attempt to repair it yourself.
7. Do not try to open the shell of the AC-DC power adapter.
8. Do not use water or a damp cloth to wipe the AC-DC power adapter.

About the device

1. Do not beat with a hard object or scratch it.
2. Install in accordance with the manufacturer’s instructions
3. Refer all servicing to qualified service personnel. Servicing will be required under all of the following conditions:
 - The unit has been exposed to rain or moisture.

- Liquid had been spilled or objects have fallen onto the unit.
 - The unit has been damaged in any way, such as when the power-supply cord or plug is damaged.
 - The unit does not operate normally.
4. Clean only with dry cloth.
 5. Specifications are subject to change without notice.

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Chapter 3 Unpackaging and installation

Opening the box, please check whether the device has been damaged during transport. Check all the things listed on the packing list are received. If there is any missing, contact your distributors or OSEE for it.

We recommend that you should save the packing materials for future needs.

The IRS series produces are standard 1U chassis size, can also be applied to standard cabinet.

1. Install the pedestal following the installation instructions.
2. Put the device on the position you need for installing, and connect the power. Please make sure the place you put is safety.

3. Connect a standard signal lines to the corresponding input port. All BNC connector impedance must be 75Ω.

Note: Please use the power adapter supplied to avoid unnecessary trouble.

4. Use the power adapter and cord to connect single-phase three-wire AC power or following the local power supply conditions. Make sure the power cord grounding well.
5. Finally, turn on the power switch, so that the device will be ready for work.

Note: The chassis and the BNC connectors would heat when the device is power on and run for some time. As the metal casing and BNC connectors have good heat conducting properties, the temperature may up to 40 ° C to 60 ° C. When the device has been powered running for some time, do not directly touch the equipment chassis or BNC connector by hand to avoid burns.

Table2-1: Packing List:

NO.	Detail list		Quantity
1	host		1
2	Accessory	warranty card	1
		the base installation instruction	1
		User manual	1
3	The electric accessory	12V adapter	2
		Power cord with fastening	2
4	Others	Key cap	X

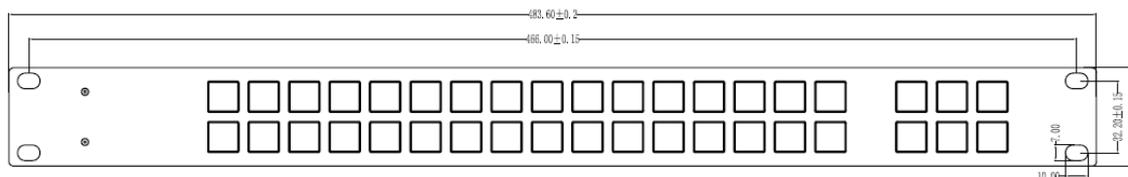
Note: The keys which has a transparent color key cap on the switchers with control panel or the remote control panels. Please do not disassemble the key cap after installation in order to avoid damage.

Chapter 4 Description of product structure

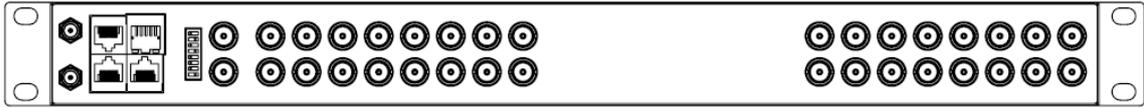
4.1 Size

The IRS series products use the same chassis structure. For example, IRS1616-K will be described following.

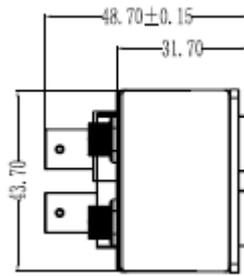
Front panel (Unit: mm) (As the following figure)



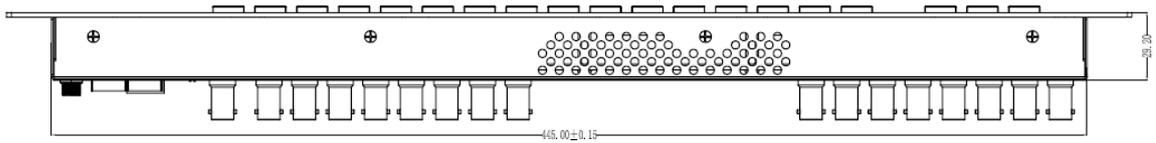
Rear panel (Unit: mm) (As the following figure)



Side view (Unit: mm) (As the following figure)



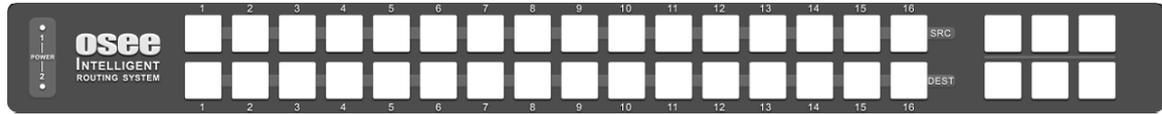
Top view (Unit: mm) (As the following figure)



4.2 Product Appearance

The series products use different labels. Detail introductions are as following.

Front label of IRS1616-RCP (As the following figure)



Front label of IRS1608-RCP (As the following figure)



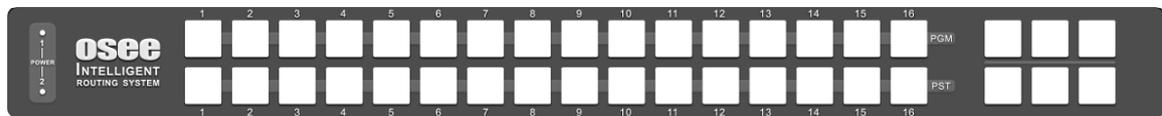
Front label of IRS1604-RCP (As the following figure)



Front label of IRS1601-RCP (As the following figure)



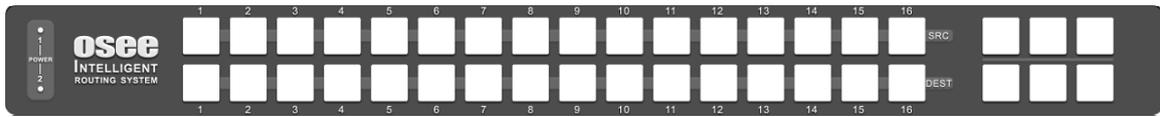
Front label of IRSPGM/PST-RCP (As the following figure)



Rear label of RCP Series (As the following figure)



Front label of IRS1616-K (As the following figure)



Rear label of IRS1616-K (As the following figure)



Front label of IRS1616 (As the following figure)



Rear label of IRS1616 (As the following figure)



Front label of IRS1608-K (As the following figure)



Rear label of IRS1608-K (As the following figure)



Front label of IRS1608 (As the following figure)



Rear label of IRS1608 (As the following figure)



Front label of IRS1604-K (As the following figure)



Rear label of IRS1604-K (As the following figure)



Front label of IRS1604 (As the following figure)

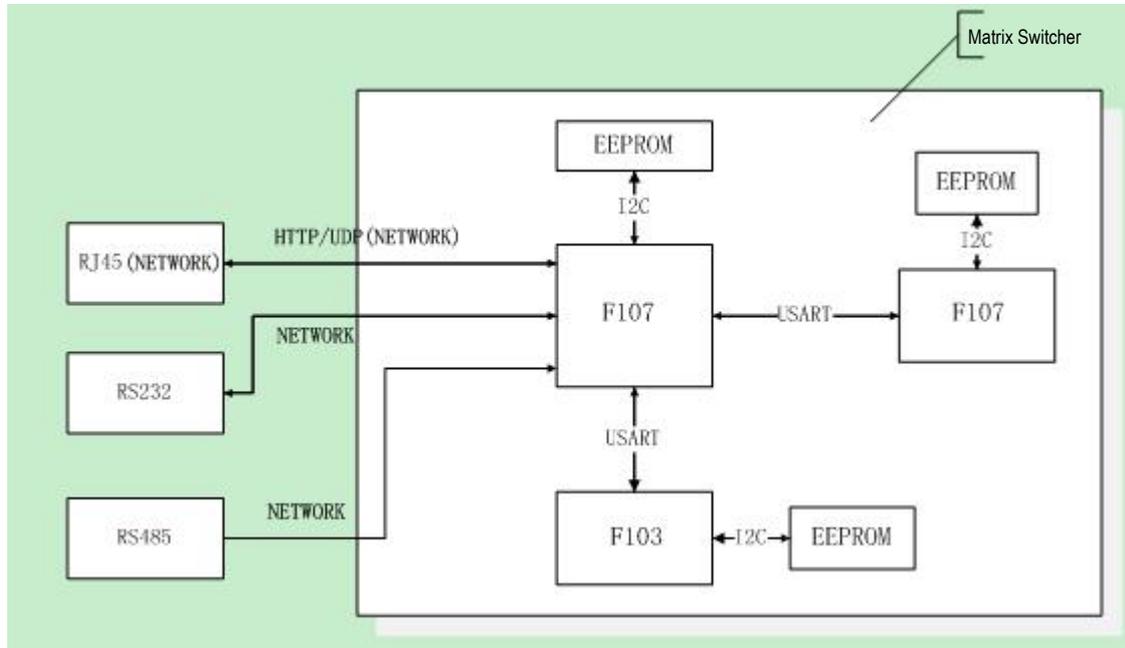


Rear label of IRS1604 (As the following figure)

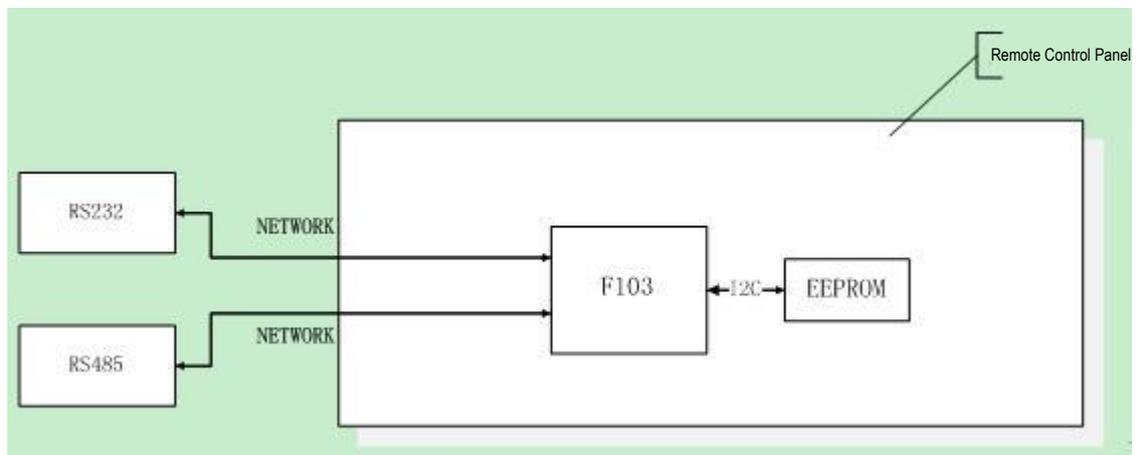


Chapter 5 Signal Flow Graph

Signal Flow Graph for Matrix Switcher



Signal Flow Graph for Remote Control Panel



Chapter 6 Usage

6.1 Before Use the Device

1. There are two ways for connecting between the host and the swithers.
 - 1) Connect by RS485 interface. The devices connected via BNC interface. And in this way, the remote control panel should use an external power adapter.
 - 2) Connect by RJ45 interface. In this way, the remote control panel does not require an external power supply.
2. If the matrix switcher would be used as the host, the ID of it must be set to 0, and there is only one host device in a system.
3. When the matrix switcher and the remote control panel are used in a group, each device has one ID, and the DIP switch range is 0 to 15.
4. A crossover cable should be used between the host matrix switcher and the matrix switcher of the first-level cascade, while the connection between the matrix switchers in the next cascade level would use a straight-through cable. The Line orders of the crossover cable are 3 to 5, and 4 to 6.
5. The matrix switchers and the remote control panels are required cascading by the RS485 interface and the cascaded remote control panels use the straight-through cable.
6. Only through the IP of the host, the entire system network page could be viewed. Viewing the IP of the slave device, only the information of the slave device could be seen.
7. The matrix switchers with control panel are X/Y panel type. And the remote control panels contain X/Y panel and PGM/PST panel two types. The two types of remote control panel can be set in the WEB. The functions of the keys on the panel can also be defined through the WEB.
8. The produces support up to 16-channel HD/SD/3G input signals. If the synchronize switch is required, the synchronization reference signal should be inputed.
9. The produces support up to 16-channel HD/SD/3G input signals. If the synchronize switch is required, the synchronization reference signal should be inputed.
10. The matrix switchers with control panel are X/Y type panel. The keys contents SRC key, DST key, target protective key, targeting key, and panel lock key.
11. Device Address: matrix switchers or remote control panels have an eight-digit DIP switch. The last four digits used to set the device address. And thr range is 0 to 15. 0 indicates the host matrix switcher; the other address indicates the other matrix switchers or the remote control panel. If the first four positions are set on 1 at the same time, the matrix switcher would restore to the default value and default IP: 192.168.1.86.
12. The two RS485 interface are used to install the Network connection between the matrix switchers and the remote panels and the baud rate is 115200 bps. The RS422 interface is used to receive serial network control data and the baud rate is 19200 bps.
13. When a matrix switcher and a remote control panel are used, the address of the matrix switcher must be appropriated on to 0, and the remote control panel would be 1 to 15. For one-to-one

3. Tally Description

The Tally is divided into two states: Active, and Inactivea.

In Active, the Tally color is yellow.

In Inactivea, the Tally is in off, on the PGM/PST Panel with Backup Control panel.

On PGM/PST Panel with Signal Monitoring and Backup panel, there are two cases in Inactivea:

1): Inactivea and Signal to normal: Normal Signal. The Tally color is green.

2): Inactivea and No signal: No signal. The Tally color is red.

➤ PST (1-16): PST Output source selection key

1. Key Description

Each channel key can select the PST output source signal. Each button has two states.

Active: The PST output signal.

Inactivea: The non-current output signal.

2. Instructions

- Press the key in "Inactivea", it will trigger the following actions:
The channel signal becomes the the PST output signal.
The key state changes from "Inactivea"to "Active".
The Tally color of the key changes from the state of "Inactivea" to the state of "Active".
The Tally color of the original PGM output channel key changes from the state of "Active" to the state of "Inactivea".
- Pressing the key in "Inactivea", will not trigger any action operations.

3. Tally Description

The Tally is divided into two states: Active, and Inactivea.

In Active, the Tally color is yellow.

In Inactivea, the Tally is in off, on the PGM/PST Panel with Backup Control panel.

On PGM/PST Panel with Signal Monitoring and Backup panel, there are two cases in Inactivea:

1): Inactivea and Signal to normal: Normal Signal. The Tally color is green.

2): Inactivea and No signal: No signal. The Tally color is red.

➤ TAKE key

1. Key Description

Note: IRS1604 series support TAKE key function.

Change PGM output to the PST output channel.

The key has two states: "Active" and "Inactivea".

2. Instructions

When the PGM and PST current output is not the same channel, Press the TAKE key and it will trigger the following actions:

The PGM output channel switches to current PST output channel.

The Tally state of the PGM output channel changes from the color in "Inactivea" to the color

in "Active".

The original PGM output Tally changes to the color in "Inactivea".

The PST channel "Active" output remains unchanged.

3. Tally Description

The TAKE key has two states: "Active" and "Inactivea".

The Tally color is yellow in "Active".

The Tally color is green in "Inactivea".

➤ BACKUP key

1. Key Description

It is BACKUP bypass signal output select key.

Manually switch the BACKUP bypass signal to the PGM output by pressing this key.

The key has two states: "Active" and "Inactivea".

In Active, the PGM output channel is the BACKUP bypass signal.

In Inactivea, the PGM output channel is not the BACKUP bypass signal.

2. Instructions

- Pressing BACKUP key will trigger the following actions:
BACKUP key status changes to "Active".
The Tally color of Backup key, changes from "Inactivea" to "Active".
The original PGM output channel state changes from "Active" to "Inactivea".
- Pressing the key in "Inactivea", will not trigger any action operations. It would return to the pristine PGM channel.

3. Tally Description

The BACKUP key has two states: "Active" and "Inactivea".

The Tally color is yellow in "Active".

The Tally color is green in "Inactivea".

➤ PGM OUT 1 / PGM OUT2

1. Key Description

When the PGM/PST panel is applied to the IRS1604 matrix switcher, selected PGM OUT 1, the DEST 1 would be set as PGM channel and the DEST 2 would be set as PST channel.

Select the PGM OUT 2, 3 and 4 channels would be PGM/PST.

This button would make the 1604 matrix switcher as two 1602.

This button has two states:

"Active": The panel controls the corresponding bus signal of the current PGMOUT.

"Inactivea": The panel doesn't control the corresponding bus signal of the current PGMOUT.

2. Instructions

- Pressing PGM OUT 1/2 key in "Inactivea", will trigger the following actions:
The matrix switcher PGM/PST output bus signal is the corresponding to the T signal of

current PGM OUT 1/2.

The status of PST/PGM signal would change to the current status of the corresponding PGM OUT 1/2.

The Tally color of PGMOUT 1/2 changes to the "Active" color - yellow. The original PGM OUT 1/2 changes to the state of "Inactive" color.

- Pressing PGM OUT 1/2 in "Active", will not trigger any action operations.

3. Tally Description

The key has two states: "Active" and "Inactive".

The Tally color is yellow in "Active".

The Tally color is green in "Inactive".

➤ PNL LOCK key

1. Key Description

Lock or start the panel.

In LOCK state, the matrix panel can not enable any operation. This button has two states: "Active" and "Inactive".

To change the panel operational status, you need to long press the button for 3 seconds.

"Active": the panel is locked; the default Tally state is red.

"Inactive": the panel is activated; the default Tally state is green.

2. Instructions

- In "Inactive", pressing the button will trigger the following actions:
Press it and the Tally color changes from "Inactive" to "Active".
The panel changes state from "start" to "lock".
In addition to this key, all the other keys on the panel can not be changed.
- In "Active", pressing the button will trigger the following actions:
Press it and the Tally color changes from "Active" to "Inactive".
The panel changes state from "lock" to "start".
All the other keys on the panel are enabled.

3. Tally Description

The PNL LOCK key has two states: "Active" and "Inactive".

The Tally color is red in "Active".

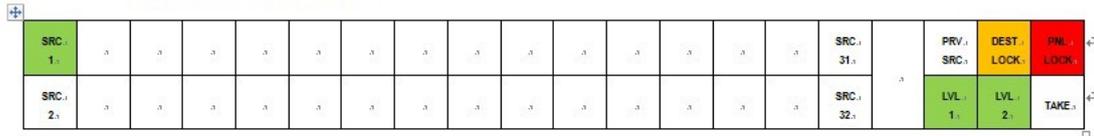
The Tally color is green in "Inactive".

6.4 Explanation for XY panel and single bus panel

SRC 1															SRC 16		DEST Prot ect	DEST LOCK	PNL LOCK
DEST 1															DEST 16		LVL 1	LVL 2	TAKE

XY Panel Diagram (As the following figure)

Single Bus Panel 32X1



Single Bus Panel Diagram (As the following figure)

6.5 Description of the Panel Keys

➤ PNL LOCK key

1. Key Description

Lock or start the panel.

In LOCK state, the matrix panel can not enable any operation. This button has two states: "Active" and "Inactive".

To change the panel operational status, you need to long press the button for 3 seconds.

"Active": the panel is locked; the default Tally state is red.

"Inactive": the panel is activated; the default Tally state is green.

2. Instructions

- In "Inactive", pressing the button will trigger the following actions:
Press it and the Tally color changes from "Inactive" to "Active".
The panel changes state from "start" to "lock".
In addition to this key, all the other keys on the panel can not be changed.
- In "Active", pressing the button will trigger the following actions:
Press it and the Tally color changes from "Active" to "Inactive".
The panel changes state from "lock" to "start".
All the other keys on the panel are enabled.

3. Tally Description

The PNL LOCK key has two states: "Active" and "Inactive".

The Tally color is red in "Active".

The Tally color is green in "Inactive".

➤ SRC 1-16 source selection key

1. Key Description

1-16 source selection keys, each key corresponds to one input signal. The corresponding signal source has two states.

Active: the current SRC output signal.

Inactive: the non-current output signal.

2. Instructions

Pressing the key in "Inactive", will trigger the following actions:

Change the current DEST output channel as the selected SRC channel.

After selecting SRC, the Tally color changes from "Inactivea" to "Active".

The original "DEST" output changes as "SRC" and the Tally color changes to "Inactivea".

3. Tally Description

The Tally color is red in "Active".

The Tally is off in "Inactivea".

➤ DEST 1-16 Destination selection key

1. Key Description

Select the DEST source.

Each DEST key corresponds to one output bus signal.

Each output DEST key has two states:

"Active": "DEST", then the operation for this channel is enabled.

"Inactivea: non-current "DEST".

2. Instructions

In "Inactivea", pressing this key will trigger the following actions:

Select DEST, the status change to "Active". And the the original "Active" DEST "changes to" Inactivea ".

The Tally of the selected "DEST" changes from "Inactivea" to "Active".

The Tally of the original "DEST" changes from "Active" to "Inactivea".

3. Tally Description

The Tally color is red in "Active".

The Tally is off in "Inactivea".

➤ "Destination Lock" key

1. Key Description

"Destination Lock" key, lock, when the selected purposes, the local panel and all panels on the network can not change the source of the channel.

The key has two states: "Active" and "Inactivea".

2. Instructions

- In "Inactivea", pressing Destination Lock key will trigger the following actions:
The current "DEST" changes into lockdown mode. In this mode, the current "DEST" can not be changed the input source "SRC" by the local or network panel.
The state of the Destination Lock key changes from "Inactivea" to "Active".
The Tally color changes from "Inactivea" to "Active".
- In "Active", pressing Destination Lock key will trigger the following actions:
The current "DEST" changes into un-lockdown mode. In this mode, the current "DEST" can be changed the input source "SRC" by the local or network panel.
The state of the Destination Lock key changes from "Active" to "Inactivea".
The Tally color changes from "Active" to "Inactivea".

3. Tally Description

The Tally color is red in "Active".

The Tally is off in "Inactivea".

➤ "Destination Protect" key

1. Key Description

The function of this key is similar with the Destination Lock key. The Destination Lock key does not allow changing the source locked by local panel or any remote control panel. And the Destination Protect key disables the operation for the selected DEST by other panels, but it allows the operation by local panel.

The key has two states: "Active" and "Inactivea".

2. Instructions

In "Inactivea", pressing the key will trigger the following actions:

When the current "DEST" is in the Protect mode, the current "DEST" can not be changed the input source by the remote control panel, and "SRC" can only be enabled. The local panel can operate for "SRC".

The Destination Protect key color would change from "Inactivea" to "Active".

The Tally would change from "Inactivea" to "Active".

3. Tally Description

The Tally color is red in "Active".

The Tally is off in "Inactivea".

➤ LVL key

1. Key Description

When the system contents a plurality of matrix switchers, there would be a plurality of matrix panel to control the devices. The LVL keys are required. Each panel can define up to 1-4 LVL key. Each LVL key can mapping a host matrix switcher by the software.

The key has two states:

"Active": The corresponding matrix switcher is enabled. And the panel controls the corresponding matrix switchers.

"Inactivea": The corresponding matrix switcher is disabled.

2. Instructions

- In "Inactivea", pressing the key will trigger the following actions:
The LVL state changes from "Inactivea" to "Active".
The control of the corresponding matrix switcher by the LVL key is enabled.
The Tally of LVL key changes from "Inactivea" to "Active".
- In "Active", pressing the key will trigger the following actions:
The LVL state changes from "Active" to "Inactivea".
The control of the corresponding matrix switcher by the LVL key is disabled.

The Tally of LVL key changes from "Active" to "Inactive".

3. Tally Description

The Tally color is red in "Active".

The Tally is off in "Inactive".

6.6 Description of other keys

➤ Poll source output status inquiry key

1. Key Description

Inquire SRC Input signal source and the output state.

Using this key, you can view the SRC input signal and the corresponding output DEST.

The button has two states:

Red: the selected state. The switcher inquires the Poll output source status.

Green: non-selected state. The switcher is in normal mode.

2. Instructions

Press POLL key, then the POLL key changes from green to red.

In addition to the POLL key, all the rest of the SRC and DEST keys change to green. Select the SRC source selected to be inquired. At this time the selected SRC key would change from green to red. All the corresponding DEST output would change to red.

Press the SRC button directly to view the other source signal.

Press POLL key again to exit POLL mode. At this time, the POLL key changes from red to green.

Remote control panel would return to the state before entering into POLL mode. The system would not impact the DEST output when it is in POLL mode.

➤ BYPASS key

1. Key Description

Note: Only the IRS1604 series support this function.

BYPASS signal output selection.

Manually switch BYPASS signal to the PGM output.

The key has 5 states:

- Red: PGM output is BYPASS output signal.
- Green: BYPASS input signal is normal. Automatically switching function is turned on. When the PGM output signal is detected unnormal, it would automatically switch to BYPASS signal.
- Yellow: BYPASS input signal is normal. Automatically switching function is turned off. When the PGM output signal is detected unnormal, it would manually switch to BYPASS signal.
- Green/yellow flashing: The channel signal is ready for switching. Then press the TAKE button. Main PGM output signal would switch to BYPASS signal.
- OFF: The channel is empty; you can not do any operation.

2. Instructions

When it needs to manually switch to the channel, the BYPASS signal status must be green or yellow.

Press this button. The BYPASS key would be green or yellow flashing.

Press the button to switch, the BYPASS key is red. The PGM output signal switches to the BYPASS signal. PGM output and SRC would change from red to green.

When the automatic switching state is turned on (using the combination key SHIFT + BYPASS to turned on/off the automatic switching), the current SRC input signal source is detected un-normal, then the signal would automatically switch to the BYPASS channel. The BYPASS key changes from green to red.

➤ SHIFT Combination key

1. Key Description

Note: Only the IRS1604 series support this function.

It can be used with some of the original function key. SHIFT + BYPASS, turn on / turn off the automatic switching function.

Standby signal loss alarm: SHIFT + SRC key.

2. Instructions

Press the Shift + SRC keys. At this time, the SRC button state would change from the previous color to red flashing. Then press the TAKE button. The SRC channel keys will be defined as standby signal, and when the signal is lost, the key would be yellow flashing to alarm.

Chapter 7 Network Control

The default IP is 192.168.1.86.

STATUS:	Display the status.
ROUTER:	Setup the Matrix switcher.
REMOTER:	Setup the remote control panel.
SYSTEM:	Setup thesystem.

7.1 STATUS

ROUTER

STATUS | ROUTER | REMOTER | SYSTEM
Refresh

Status:

Name: noname router			
ID	0	Type	16*16
Temperature	0	Sync	Unsynchronization
Detection	Undetection	Mode	Disable
IP	0.0.0.1	Alarm	0.0.0.4:5

Remoter:

XY 16*16 Version: 0-0-0																		
DEST 16	DEST 15	DEST 14	DEST 13	DEST 12	DEST 11	DEST 10	DEST 9	DEST 8	DEST 7	DEST 6	DEST 5	DEST 4	DEST 3	DEST 2	DEST 1	DEST PRO	DEST PRO	DEST PRO
SRC 16	SRC 15	SRC 14	SRC 13	SRC 12	SRC 11	SRC 10	SRC 9	SRC 8	SRC 7	SRC 6	SRC 5	SRC 4	SRC 3	SRC 2	SRC 1	DEST PRO	DEST PRO	DEST PRO

Remoter list:				
ID	Name	IP	Type	Version
1	noname	146.187.202.136	XY 16*16	0-0-0
2	noname	146.187.202.136	Single Bus 32*1	0-0-0

Router list:			
ID	Name	IP	Type
8	noname	146.187.202.136	16*16
9	noname	146.187.202.136	16*8
10	noname	146.187.202.136	16*4

➤ Status

Name: noname router			
ID	0	Type	16*16
Temperature	0	Sync	Unsynchronization
Detection	Undetection	Mode	Disable
IP	0.0.0.1	Alarm	0.0.0.4:5

- Name: The name of the Matrix Switcher
- ID: The ID of the Matrix Switcher
- Type: 16*16, 16*4, 16*8
- Temperature: 40~60℃
- Sync: Synchronization, Unsynchronization
- Detection: Detection, Undetection
- Mode: Protected or non-protected mode of operation
- IP: The IP of the Matrix Switcher.
- Alarm: The IP and interface which receive the alarm information.

➤ Setup for remote control panel

XY 16*16 Version: 0-0-0																			
DEST 16	DEST 15	DEST 14	DEST 13	DEST 12	DEST 11	DEST 10	DEST 9	DEST 8	DEST 7	DEST 6	DEST 5	DEST 4	DEST 3	DEST 2	DEST 1		DEST PRO	DEST PRO	DEST PRO
SRC 16	SRC 15	SRC 14	SRC 13	SRC 12	SRC 11	SRC 10	SRC 9	SRC 8	SRC 7	SRC 6	SRC 5	SRC 4	SRC 3	SRC 2	SRC 1		DEST PRO	DEST PRO	DEST PRO

Show the information of the remote control panel, such as:

The panel type, the model, the version of the matrix switcher, the information of the key, the description of the function keys.

➤ Remote control panel

Remoter list:				
ID	Name	IP	Type	Version
1	noname	146.187.202.136	XY 16*16	0-0-0
2	noname	146.187.202.136	Single Bus 32*1	0-0-0

If the panels are in networking, the information list will be displayed as shown above.

➤ List of the Matrix Switcher

Router list:			
ID	Name	IP	Type
8	noname	146.187.202.136	16*16
9	noname	146.187.202.136	16*8
10	noname	146.187.202.136	16*4

If the matrix switchers are in networking, the information list will be displayed as shown above.

7.2 Setup for Matrix Switcher

ROUTER

STATUS | **ROUTER** | REMOTER | SYSTEM Refresh

Name: ID: 0 Type: 16*16

Feature	
Detection	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Protect	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

IP	
IP:	<input type="text" value="0.0.0.1"/>
Mask	<input type="text" value="0.0.0.2"/>
Getway	<input type="text" value="0.0.0.3"/>
Alarm IP	<input type="text" value="0.0.0.4"/>
Alarm Port	<input type="text" value="5"/>

Color			
Detection Enabled		Detection Disabled	
Source	Destination / Function	Source	Destination / Function
Current output	<input type="text" value="Green"/> Activation <input type="text" value="Green"/>	Current output	<input type="text" value="Green"/> Activation <input type="text" value="Green"/>
Normal	<input type="text" value="Yellow"/> Unactivated <input type="text" value="Off"/>	Non current output	<input type="text" value="Off"/> Unactivated <input type="text" value="Off"/>
Abnormal	<input type="text" value="Red"/>		

- Setup for the name

Name: ID: 0 Type: 16*16

- Setup for the funcation

Feature	
Detection	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Protect	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

- Setup for the IP

IP	
IP:	<input type="text" value="0.0.0.1"/>
Mask	<input type="text" value="0.0.0.2"/>
Getway	<input type="text" value="0.0.0.3"/>
Alarm IP	<input type="text" value="0.0.0.4"/>
Alarm Port	<input type="text" value="5"/>

- Setup for the KEY

Color			
Detection Enabled		Detection Disabled	
Source	Destination / Function		
Current output	Green	Activation	Green
Normal	Yellow	Unactivated	Off
Abnormal	Red		
Default			

Detection Enabled: Enable the setup for the color of the source detection key.

Detection Disabled: Disabled the setup for the color of the source detection key.

Press the Default button to restore the default setup.

Note: all the setup would be enabled after pressing SAVE button.

7.3 Remote control panel

ROUTER

STATUS | ROUTER | REMOTER | SYSTEM
Refresh

ID:0 Type:XY 16*16

DEST 16	DEST 15	DEST 14	DEST 13	DEST 12	DEST 11	DEST 10	DEST 9	DEST 8	DEST 7	DEST 6	DEST 5	DEST 4	DEST 3	DEST 2	DEST 1	DEST PRO	DEST PRO	DEST PRO
SRC 16	SRC 15	SRC 14	SRC 13	SRC 12	SRC 11	SRC 10	SRC 9	SRC 8	SRC 7	SRC 6	SRC 5	SRC 4				DEST PRO	DEST PRO	DEST PRO

Save

Name: noname ID:1 Type:XY 16*16

DEST 16	DEST 15	DEST 14	DEST 13	DEST 12	DEST 11	DEST 10	DEST 9	DEST 8	DEST 7	DEST 6	DEST 5	DEST 4	DEST 3	DEST 2	DEST 1	DEST PRO	DEST PRO	DEST PRO
SRC 16	SRC 15	SRC 14	SRC 13	SRC 12	SRC 11	SRC 10	SRC 9	SRC 8	SRC 7	SRC 6	SRC 5	SRC 4	SRC 3	SRC 2	SRC 1	DEST PRO	DEST PRO	DEST PRO

Save

Name: noname ID:2 Type:Single Bus 32*1

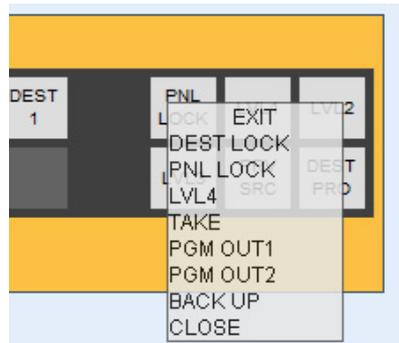
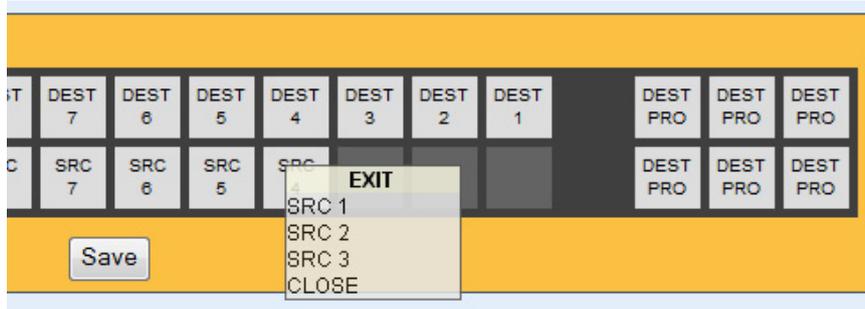
SRC 16	SRC 15	SRC 14	SRC 13	SRC 12	SRC 11	SRC 10	SRC 9	SRC 8	SRC 7	SRC 6	SRC 5	SRC 4	SRC 3	SRC 2	SRC 1	DEST PRO	DEST PRO	DEST PRO
SRC 16	SRC 15	SRC 14	SRC 13	SRC 12	SRC 11	SRC 10	SRC 9	SRC 8	SRC 7	SRC 6	SRC 5	SRC 4	SRC 3	SRC 2	SRC 1	DEST PRO	DEST PRO	DEST PRO

Save

- Setup the local panel as following.



1. Right-press the page to display the setup list.



2. Select the items to setup the function of the keys. Press EXIT to exit the menu.



3. Press SAVE to enable the setup.

- Setup for the networking panels.

Name: ID:1 Type:XY 16*16

DEST 16	DEST 15	DEST 14	DEST 13	DEST 12	DEST 11	DEST 10	DEST 9	DEST 8	DEST 7	DEST 6	DEST 5	DEST 4	DEST 3	DEST 2	DEST 1	DEST PRO	DEST PRO	DEST PRO
SRC 16	SRC 15	SRC 14	SRC 13	SRC 12	SRC 11	SRC 10	SRC 9	SRC 8	SRC 7	SRC 6	SRC 5	SRC 4	SRC 3	SRC 2	SRC 1	DEST PRO	DEST PRO	DEST PRO

The setup is similar as the setup for local panels. Only add the name setup function.

7.4 SYSTEM Setup

ROUTER

STATUS | ROUTER | REMOTER | **SYSTEM**

Name:noname remote ID:0 Type:XY 16*16 Level: Enable Disable

Level 1	<input type="text"/>		<input type="button" value="Select all"/> <input type="button" value="Unselect all"/>
Level 2	ID:8 Name:noname	<input checked="" type="checkbox"/> DES1 <input type="checkbox"/> DES2 <input type="checkbox"/> DES3 <input type="checkbox"/> DES4 <input type="checkbox"/> DES5 <input type="checkbox"/> DES6 <input type="checkbox"/> DES7 <input type="checkbox"/> DES8 <input type="checkbox"/> DES9 <input type="checkbox"/> DES10 <input type="checkbox"/> DES11 <input type="checkbox"/> DES12 <input type="checkbox"/> DES13 <input type="checkbox"/> DES14 <input type="checkbox"/> DES15 <input type="checkbox"/> DES16	<input type="button" value="Select all"/> <input type="button" value="Unselect all"/>
Level 3	<input type="text"/>		<input type="button" value="Select all"/> <input type="button" value="Unselect all"/>
Level 4	ID:0 Name:noname router	<input checked="" type="checkbox"/> DES1 <input type="checkbox"/> DES2 <input type="checkbox"/> DES3 <input type="checkbox"/> DES4 <input type="checkbox"/> DES5 <input type="checkbox"/> DES6 <input type="checkbox"/> DES7 <input type="checkbox"/> DES8 <input type="checkbox"/> DES9 <input type="checkbox"/> DES10 <input type="checkbox"/> DES11 <input type="checkbox"/> DES12 <input type="checkbox"/> DES13 <input type="checkbox"/> DES14 <input type="checkbox"/> DES15 <input type="checkbox"/> DES16	<input type="button" value="Select all"/> <input type="button" value="Unselect all"/>

Name:noname ID:1 Type:XY 16*16 Level: Enable Disable

Level 1	<input type="text"/>		<input type="button" value="Select all"/> <input type="button" value="Unselect all"/>
Level 2	ID:8 Name:noname	<input checked="" type="checkbox"/> DES1 <input type="checkbox"/> DES2 <input type="checkbox"/> DES3 <input type="checkbox"/> DES4 <input type="checkbox"/> DES5 <input type="checkbox"/> DES6 <input type="checkbox"/> DES7 <input type="checkbox"/> DES8 <input type="checkbox"/> DES9 <input type="checkbox"/> DES10 <input type="checkbox"/> DES11 <input type="checkbox"/> DES12 <input type="checkbox"/> DES13 <input type="checkbox"/> DES14 <input type="checkbox"/> DES15 <input type="checkbox"/> DES16	<input type="button" value="Select all"/> <input type="button" value="Unselect all"/>
Level 3	<input type="text"/>		<input type="button" value="Select all"/> <input type="button" value="Unselect all"/>
Level 4	ID:0 Name:noname router	<input checked="" type="checkbox"/> DES1 <input type="checkbox"/> DES2 <input type="checkbox"/> DES3 <input type="checkbox"/> DES4 <input type="checkbox"/> DES5 <input type="checkbox"/> DES6 <input type="checkbox"/> DES7 <input type="checkbox"/> DES8 <input type="checkbox"/> DES9 <input type="checkbox"/> DES10 <input type="checkbox"/> DES11 <input type="checkbox"/> DES12 <input type="checkbox"/> DES13 <input type="checkbox"/> DES14 <input type="checkbox"/> DES15 <input type="checkbox"/> DES16	<input type="button" value="Select all"/> <input type="button" value="Unselect all"/>

This function is set for the panel level. There are four-levels for a panel and each level corresponds to a matrix switcher.

A line on the map table is a level set.

- Description for each line:

Level 1	<input type="text"/>	<input type="button" value="Select all"/> <input type="button" value="Unselect all"/>
---------	----------------------	---

The first series: ID of the LEVEL.

The second series: Matrix Switcher LIST

The third series: All the Matrix Switcher OUTPUT

The fourth series: The function key for the third series

- Operation Mode

- 1: Select a matrix switcher from the list.
- 2: Select the controlled output.
- 3: Save the setup.

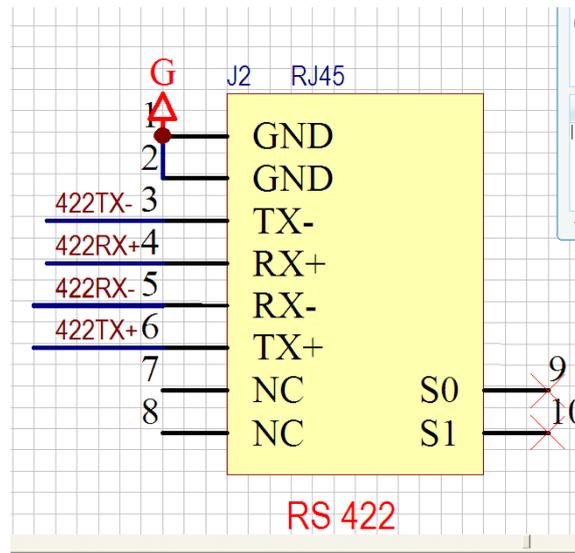
Chapter 8 Specification

8.1 Description for Specification

3G-SDI /HD-SDI /SDI-SDI Input/ Output:

Connector	BNC per IEC 169-8
Impedance	75 ohms
Return Loss	>18 dB 5 to 270 MHz >15 dB 270 MHz to 1.5 GHz >10 dB up to 3 GHz
Maximum Signal Level	800 mV pk-pk 10%
Signal Amplitude	800 mV pk-pk 10%
DC Offset	0 V \pm 0.5 V
Overshoot	<10%
Total Jitter	<0.2 UI
Rise and Fall Time	<700 ps for SD <270 ps for 1.5 Gb/s HD <135 ps for 3 Gb/s HD
Wavelength	1310 nm \pm 30 nm FP, 1270 nm, 1290 nm, 1310 nm, 1330 nm, 1350 nm, 1370 nm, 1430 nm, 1450 nm, 1470 nm, 1490 nm, 1510 nm, 1530 nm, 1550 nm, 1570 nm, 1590 nm, 1610 nm DFB
Extinction Ratio	>8
Back Reflection	<-14 dB

8.2 RS422 Control Protocol Definition



- 1, 2 pin: Ground;
- 3, 4, 5, 6 pin: Data transceiver;
- 7, 8 pin: Defined.

Chapter 9 Appendix - RS422 NetWork Control

Note: This series of matrix support NETWORK Protocol.

9.1 Serial port configuration

Baud rate: 19200 bps
Data length: 8 bit
Stop bit: 1 bit
Odd-even check: NO
Data flow control: NO

9.2 Switching command

- Sending the Switching command

3.2 Video X-point set

Only for use with video routers.

Command for setting of video X-points:

Header: 0xAn

1	0	1	0	Address
---	---	---	---	---------

Byte 2:

0	Output
---	--------

Byte 3:

0	Input
---	-------

Where;

- Address (n) can be 0 – 15, corresponding with level 1 - 16
- Output is the number of the output that shall be controlled, ranging from 00h – 7Fh representing outputs 0 – 127 (= 128 outputs)
- Input is the number of the input that shall be connected to the chosen output, ranging from 00h – 7Fh, representing inputs 0 – 127 (= 128 inputs)

● Receiving the Switching command

4.1.2 Video X-point acknowledge

Only for use with video routers.

Command for acknowledge setting of video X-points:

Header: 0xBn

1	0	1	1	Address
---	---	---	---	---------

Byte 2:

0	Output
---	--------

Byte 3:

0	Input
---	-------

Where;

- Address can be 0 – 15, corresponding with level 1 - 16
- Output is the number of the output that shall be controlled, from 0 – 127 (= output 1 – output 128)
- Input is the number of the input that shall be connected to the chosen output, from 0 - 127

9.3 X-point Status

- X-point Status request

3.3 X-point status request

This command is used for status request on both audio and video routers.

Command for status request:

Header: 0xCn

1	1	0	0	Address
---	---	---	---	---------

Byte 2:

0	No information carried here (normally 00h, but no function associated with it)
---	--

Crosspoint status request response command: Return to the N-channel input signal source corresponding to the output. N is outputs of the matrix switchers.

4.1.2 Video X-point acknowledge

Only for use with video routers.

Command for acknowledge setting of video X-points:

Header: 0xBn

1	0	1	1	Address
---	---	---	---	---------

Byte 2:

0	Output
---	--------

Byte 3:

0	Input
---	-------

Where;

- Address can be 0 – 15, corresponding with level 1 - 16
- Output is the number of the output that shall be controlled, from 0 – 127 (= output 1 – output 128)
- Input is the number of the input that shall be connected to the chosen output, from 0 - 127

9.4 Output Locking

4.1.3 Output locking

This command is used to lock an output. A locked output cannot be switched to another input.

Command for locking an output:

Header: 0xEn

1	1	1	0	Address			
---	---	---	---	---------	--	--	--

Byte 2:

0	Output					
---	--------	--	--	--	--	--

Byte 3:

0	Ack	Request	A/V	Future use		Lock
---	-----	---------	-----	------------	--	------

Ack	Request	Message type
0	0	Command
0	1	Request
1	0	Acknowledge / Response
1	1	Undefined

Bit	Usage
Ack	Lock/unlock acknowledge from router
Request	Locking request
A/V	Audio/Video selection; 0 = Video / 1 = Audio
Lock	Locking flag; 0 = unlocked / 1 = locked
Future use	Future use; set to 0.

9.5 Matrix Switcher REQUEST

4.1.4 Router request

This command is used to get information about the routers. The command can be sent with four different data types, one for sending a request and three for sending responses. When a router receives a request, it responds with three commands, one for each response type, and then repeating the command.

A router will not accept more than one request on each level for each 100ms. If a new request is received before this timeout, no responses are transmitted and the command is not repeated. This will prevent requests from looping on the bus.

When a router receives a response that could have been generated by itself, it is not repeated. When it receives a response that couldn't have been generated by itself, it is repeated. This will prevent responses from looping on the bus.

Command for router request:

Header: 0xDF

1	1	0	1	1	1	1	1
---	---	---	---	---	---	---	---

Byte 2:

0	Data type	A/V	Address
---	-----------	-----	---------

Bit	Usage
A/V	Audio/Video selection; 0 = Video / 1 = Audio

Data type:

Value	Type
0	Input
1	Output
2	Format
3	Request

Note: The specs are subject to change without prior notice!