

# 16×16 SDI Seamless Matrix Switcher API Guide

V3.1

## 1. Communication Model

### 1.1. Model I

Interface: RS422

Baud Rate: 9600

Port Settings: Bps 9600, Data bits 8, Parity None, Stop Bits 1, Flow Control None

### 1.2. Model II

Interface: LAN

Communication Protocol: UDP Broadcast

Destination Port: 7000

Noted: The serial port and the network will search once to get the information of the device, and the serial port can generally ignore the search.

### 1.3. Example

#### 1.3.1. PC send (RS422)

a5 6c 1b 00 ff ff 00 00 00 00 00 00 00 00 00 00 ff 19 05 30 04 15 22 03 b5 04 ae

Command after 0xff indicate year, month, day, week, hour, minute, and second, to synchronize device information.

#### 1.3.2. UDP send 255.255.255.255:7000 (LAN)

a5 6c 1b 00 ff ff 01 00 00 00 00 00 00 00 00 00 ff 19 05 30 04 15 22 03 b6 04 ae

Command after 0xff indicate year, month, day, week, hour, minute, and second, to synchronize device information.

Matrix switcher Return via LAN (LAN example only)

A5 6C 24 00 83 FF 01 00 00 00 00 00 00 00 00 00 FF 00 4D 53 53 31 36 31 31 53 2D 1D 2D 43 04  
49 65 32 07 AE

Noted:

0x83 Indicate the device is 16x16 seamless matrix switcher

0xff Indicate search

0x00 Indicate data return succeed.

0x4d 0x53 .....0x53 Indicate factory mark, pointless

0x2d 0x1d 0x2d Indicate version number

0x43 0x04.....0x65 Indicate chip ID

The IP address of the returned packet is the IP address of Matrix switcher

## 2. Communication Protocol,

The protocol has 3 formats as below. It is sent as **ASCII Code** and not processed back (Return - none).

Format	Example	Description
[x]v [y].	1v2.	Connect Input 1 with Output 2
[x]v[y],[z].	1v2,3,4,5.	Input 1 to Outputs 2,3,4,5
[x]All.	3All.	Connect Input 3 with all Outputs
All#.	All#.	All channels correspond one by one

Noted:

- All instructions must end with a “.”
- With the “v” format multiple outputs can be assigned to a single input. Only one Input can be routed with each command line
- “All” always represents Output Channels

## 3. New function

### 3.1. Serial protocol format (Packets are sent in Hex format)

#### 3.1.1. Send from PC to Matrix switcher

Data Packet	Value (hex)	Byte Length	Description
Packet Header	0xa5 0x6c	2	The beginning of data packet
Data Length	0x0000~0x0420	2	The length of the entire data packet from packet header to end (including header and end). The lower byte stays head.
Device Type	0x00~0xff	1	Definition of device type, 0xff means broadcast.
Device ID	0x00~0xff	1	A distinguishing of the device when there are several devices in a same LAN at same time. 0xFF means broadcast.
Interface Type	0x00~0xff	1	0x00:UART (serial port) 0x01: LAN
Reserve	0x00	9	For reserve.
Command	0x00~0xff	1	Command for each function.
Packet Data	.....	Variable length	<= 1024
Checksum	0x0000~0xffff	2	The algebraic sum of all bytes from packet header to checksum (including the packet header but excluding the checksum). Take 2 bytes, other parts omitted. The lower byte stays ahead.
Packet End	0xae	1	The end of the packet.

### 3.1.2. Response from Matrix switcher to PC

Data Packet	Value (hex)	Byte Length	Description
Packet Header	0xa5 0x6c	2	The beginning of data packet.
Data Length	0x0000~0xffff	2	The length of the entire data packet from packet header to end (including the packet header and end). The lower byte stays ahead.
Device Type	0x00~0xff	1	Definition of device type, OXFF means broadcast.
Device ID	0x00~0xff	1	A distinguishing of the device when there are several devices in a same LAN at same time. OXFF means broadcast.
Interface Type	0x00~0xff	1	0x00: UART (serial port); 0x01: LAN
Reserve	0x00	9	Reserve. This device is not reserved.
Command	0x00~0xff	1	Command for each function.
Response Status	0x00 ~ 0xff	1	0x00: Succeed; 0x01: Error; Other data undefined.
Response Content		Variable length	Reserve. The length of response content is variable when backward reading command, and it is consistent with the format of "packet data".
Checksum	0x0000~0xffff	2	The algebraic sum of all bytes from packet header to checksum (including the packet header but excluding the checksum). Take 2 bytes, other parts omitted. The lower byte stays ahead.
Packet End	0xae	1	The end of the packet.

Note: Send = CMD + data; Return = CMD + status + data

### 3.2. Function & Command

#### 3.2.1. Command list

Function	Command (hex)	Description
Read Status of Switcher	0x53	Read the current status of switcher, including IP status, input and output information, and device name.
Read Status of LCD	0x50	Read the current status of LCD information, including LCD backlight time and LCD brightness.
Setting Device Name	0x0f	Send the device name (max 16 character) by Unicode
Setting LCD Backlight Time	0x51	0: 15s Dim 1: 60s Dim 2: 15s Off 3: 60s Off 4: Always On
Setting LCD Brightness	0x52	Set the LCD brightness between 10-100. (Device type: 0x03)
Setting IP between Static and Dynamic	0x05	The 13th byte of the data bit 0x01: Dynamic IP; 0x00: Static IP
Setting output resolution	0x19	The resolution refer to table 3.2.2 Only work to seamless Matrix switcher
Software LOCK status	0x50	0x01 Lock, 0x00 Unlock

Note: When reading the LCD and setting the parameters of the LCD, the operation is for the LCD, the device type needs to fill 0x03

Table 3.2.2 Output Resolution List

Output Resolution	Value (hex)	Output Resolution	Value (hex)
1080p60	0x07	720p60	0x0e
1080p59.94	0x17	720p59.94	0x1e
1080p50	0x0b	720p50	0x06
1080p30	0x03	720p30	0x0a
1080p29.97	0x13	720p29.97	0x1a
1080p25	0x0d	720p25	0x02
1080p24	0x05	720p24	0x0c
1080p23.98	0x15	576i50	0x04
1080i60	0x09	480i60	0x08
1080i59.94	0x19	480i59.94	0x18
1080i50	0x01		



#### 4.4. Set LCD Backlight Time

Set LCD Backlight Time to “Always On

PC send

a5 6c 15 00 03 ff 01 00 00 00 00 00 00 00 00 00 00 51 04 7e 02 ae

Matrix switcher return

a5 6c 15 00 03 01 02 00 00 00 00 00 00 00 00 00 52 00 7e 01 ae

#### 4.5. Set LCD Brightness

Set LCD Brightness to 100

PC send

a5 6c 15 00 03 ff 01 00 00 00 00 00 00 00 00 00 00 52 64 df 02 ae

0x64 Indicate LCD Brightness is 100

Matrix switcher return

a5 6c 15 00 03 01 02 00 00 00 00 00 00 00 00 00 52 00 7e 01 ae

**Note:** When setting the LCD function, the LCD returns the confirmation status command is 0x52

#### 4.6. Set output resolution

Set output resolution to 1080p24

PC send

a5 6c 16 00 83 ff 01 00 00 00 00 00 00 00 00 00 00 19 00 05 c8 02 ae

0x00 After 0x19 indicate reserve

0x05 Indicate the actual resolution

Matrix switcher return

a5 6c 15 00 83 ff 01 00 00 00 00 00 00 00 00 00 00 19 00 c2 02 ae

#### 4.7. Modify the IP address

set the network to a static connection and set the IP address 192.168.1.219

PC send

A5 6C 21 00 83 FF 01 00 00 00 00 00 00 00 00 00 05 C0 A8 01 DB 00 00 00 00 00 00 00 00 00 00 FE  
04 AE

Data analysis:

A5 6C 21 00 83 FF 01 00 00 00 00 00 00 00 00 00 00 Packet Header

05 Command

C0 A8 01 DB FF FF FF 00 F0 A8 01 01 Set parameters: IP address, subnet mask, gateway

00 Indicate acquisition method, if 0x01 (automatic acquisition), the parameter part set in the previous meaning has no meaning. If 0x00 (static), the matrix IP is set to the previous parameter. indicate

64 09 AE Packet End

Matrix switcher return

a5 6c 15 00 82 ff 01 00 00 00 00 00 00 00 00 00 00 05 00 ad 02 ae

#### 4.8. Set Matrix switcher LOCK status

Change to lock status

PC send

a5 6c 15 00 83 ff 01 00 00 00 00 00 00 00 00 00 50 01 fa 02 ae

Matrix switcher return

a5 6c 15 00 83 ff 01 00 00 00 00 00 00 00 00 00 50 00 f9 02 ae