Serial Interface Communication Protocol

[Easy 4K Series_Rev2.0]

-by RS232 and Ethernet-

SICP (Serial Interface Communication Protocol)

This document defines all the command and messages exchanged between the Master (a PC or the other controller) and the Slave (the displays).
It also describes the ways to send or read the commands or the messages.

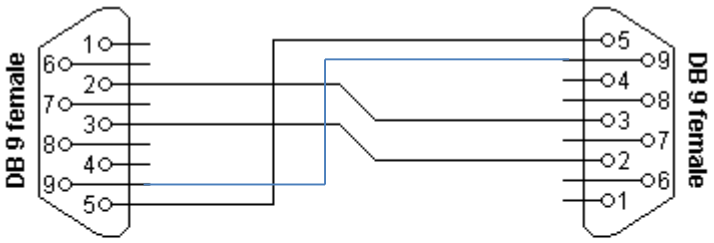
1. Protocol definition

SICP stands for “Serial Interface Communication Protocol”.
The protocol is specifically designed to allow data communication in half duplex multi-point environments, but it can also be used for half duplex point-to-point RS-232C communication.

2. Communication characteristics

A half duplex communication is implemented starting from the concept of a master-slave structure, where the display is supposed to be the slave.
The first action is always taken by the master, which can be either a PC or any controlling device (acting as server) interfaced to the monitor. After sending a command or a request in the appropriate format the master receives from the slave an acknowledgement, which tells the transmitter whether the command is not valid (or not executable, anyway) or it is accepted. In case of a request, the requested information is sent back and it becomes the acknowledgement by itself.

3. How to connect control devices (simple null modem cable)



Connector 1	Connector 2	Function
2	3	Rx ← Tx
3	2	Tx → Rx
5	5	Signal ground

*9-9: IR LOOP signal

4. Hardware Protocol

Baud rate : 19200 bps
Data bits : 8 bit
Parity bits : None
Stop bits : 1 bit
Handshake : None

5. Protocols Formats *by DSUB 9Pin RS232 Serial Port*

This is the format that the computer will send to the display to execute commands.
The format for this command transmission is as follows

♦ Setting Command to Display (5bytes)

STX	R/W	ID	CON	COM	Value
0xF5	0x88	Set ID (0x00~0x63)	0xFE	0xXX	0xXX

STX : Start of Text (0xFX)
F = Command Start Sending, X = Number of Byte to Send
Example (0xF4) : Start Sending 4 Bytes of Packet Data
(Using for Parameter Reading or Virtual Remote Control)
(0xF5) : Start Sending 5 Bytes of Packet Data
(Using for Parameter Setting)
R/W : Read and Write Protocol
0x88 = Write (Command for Setting)
ID : SET ID Number (Set ID 0~99
0x00 = Wildcard (All Sets)
0x01 (Set ID# 1), 0x02 (Set ID# 2), 0x0C (Set ID# 12), 0x10 (Set ID# 16),
CON : Control Command
0xFE = Set Command Control, 0xFD = Set Virtual Remote Control
COM : COMMAND (ex, 0xFE : Power , 0x01 : Input source…)
Value : COMMAND VALUE (ex 0x00 : POWER OFF, 0x01 : POWER ON)

Acknowledgement

0xF1	Check Sum

♦ Read Command from Display(4bytes)

STX	R/W	ID	CON	COM
0xF4	0x89	Set ID (0x00~0x63)	0xFE	0xXX

STX: 0xF4 (start sending 4 bytes of packet data)
R/W: Read and Write Protocol
0x89 = Read (Command for getting)
ID : SET ID Number (Set ID 0~99)
0x01 (Set ID# 1), 0x02 (Set ID# 2), 0x0C (Set ID# 12), 0x10 (Set ID# 16)
CON : Control Command
0xFE = Set Command Control, 0xFD = Set Virtual Remote Control

COM : COMMAND (ex, 0xFE : Power , 0x01 : Input source…)

Acknowledgement

0xF1	Value

5. Protocols Formats *by DSUB 9Pin RS232 Serial Port*

♦ Virtual Remote Control(4bytes)

STX	R/W	ID	CON	Value
0xF4	0x88	Set ID (0x00~0x63)	0xFD	KEY CODE

STX : Start of Text (0xFX)
F = Command Start Sending, X = Number of Byte to Send
Example (0xF4) : Start Sending 4 Bytes of Packet Data
(Using for Parameter Reading or Virtual Remote Control)
(0xF5) : Start Sending 5 Bytes of Packet Data
(Using for Parameter Setting)
R/W : Read and Write Protocol
0x88 = Write (Command for Setting)
ID : SET ID Number (Set ID 0~99
0x00 = Wildcard (All Sets)
0x01 (Set ID# 1), 0x02 (Set ID# 2), 0x0C (Set ID# 12), 0x10 (Set ID# 16),
CON : Control Command
0xFE = Set Command Control, 0xFD = Set Virtual Remote Control
Value : Key code
(ex. KEY POWER = 0x11. KEY INPUT = 0x13 etc)

Acknowledgement 0xF0

Button	Key Code
KEY_POWER	0x11
KEY_INPUT	0x13
KEY_MENU	0x43
KEY_EXIT	0x50
KEY_UP	0x47
KEY_DOWN	0x4B
KEY_LEFT(VOL -)	0x57
KEY_RIGHT(VOL +)	0x53
KEY_ENTER	0x04
KEY_MUTE	0x03
KEY_STILL	0x0A
KEY_INFO	0x06
KEY_SLEEP	0x0B
SET ID	0x51
SET ID EXIT	0x55

6. Protocols Formats ***by Ethernet Port***

To set up the parameters to Displays, transfer the following instruction.

Transport Layer : TCP
Port : 5000
Command : *Ethernet Command + **Serial Command
**** Ethernet CMD : ASCII : DCOM***
HEX : 0x44 0x43 0x4F 0x4D

♦ Setting Commands to Displays

Ethernet CMD				Serial CMD					
DA 1	DA2	DA3	DA4	STX	R/W	ID	CON	CMD	Value
D	C	O	M	0xF5	0x88	Set ID (0x00~0x63)	0xFE	0xXX	0xXX
ASCII				Hex					

*** Ethernet Command**

DA1~DA4: Ethernet Command
ASCII Code: DCOM
Hex Code: 0x44 0x43 0x4F 0x4D

*** Serial Command**

STX : Start of Text (0xFX)
F = Command Start Sending, X = Number of Byte to Send
Example (0xF4) : Start Sending 4 Bytes of Packet Data
(Using for Parameter Reading or Virtual Remote Control)
(0xF5) : Start Sending 5 Bytes of Packet Data
(Using for Parameter Setting)
R/W : Read and Write Protocol
0x88 = Write (Command for Setting)
ID : SET ID Number (Set ID 0~99
0x00 = Wildcard (All Sets)
0x01 (Set ID# 1), 0x02 (Set ID# 2), 0x0C (Set ID# 12), 0x10 (Set ID# 16),
CON : Control Command
0xFE = Set Command Control, 0xFD = Set Virtual Remote Control
COM : COMMAND (ex, 0xFE : Power , 0x01 : Input source…)
Value : COMMAND VALUE (ex 0x00 : POWER OFF, 0x01 : POWER ON)

❖ ***Acknowledgement;***

Ethernet CMD(4bytes)				Serial CMD(1byte)
D	C	O	M	0xF0

- **Example**

Switch to DP source – Set ID # 01

Ethernet CMD				Serial CMD					
DA 1	DA2	DA3	DA4	STX	R/W	ID	CON	CMD	Value
0x44	0x43	0x4F	0x4D	0xF5	0x88	0x01	0xFE	0x01	0x01

Acknowledgement

DA 1	DA2	DA3	DA4	Value
0x44	0x43	0x4F	0x4D	0xF0

6. Protocols Formats *by Ethernet Port*

♦ Read Command from Display

Ethernet CMD				Serial CMD				
DA 1	DA2	DA3	DA4	STX	R/W	ID	CON	CMD
D	C	O	M	0xF4	0x89	Set ID (0x00~0x63)	0xFE	0xXX
ASCII				Hex				

* Ethernet Command

DA1~DA4: Ethernet Command
ASCII Code: DCOM
Hex Code: 0x44 0x43 0x4F 0x4D

* Serial Command

STX: 0xF4 (start sending 4 bytes of packet data)
R/W: Read and Write Protocol
0x89 = Read (Command for getting)
ID : SET ID Number (Set ID 0~99)
0x01 (Set ID# 1), 0x02 (Set ID# 2), 0x0C (Set ID# 12), 0x10 (Set ID# 16)
CON : Control Command
0xFE = Set Command Control, 0xFD = Set Virtual Remote Control
COM : COMMAND (ex, 0xFE : Power , 0x01 : Input source…)

❖ ***Acknowledgement;***

Ethernet CMD				Serial CMD	
D	C	O	M	0xF1	Value

- **Example**

Check Current Source – Set ID # 01 (DP)

DA 1	DA2	DA3	DA4	STX	R/W	ID	CON	CMD
D	C	O	M	0xF4	0x89	0x01	0xFE	0x01

❖ ***Acknowledgement***

DA 1	DA2	DA3	DA4	CMD	Value
0x44	0x43	0x4F	0x4D	0xF1	0x01

6. Protocols *by Ethernet Port*

♦ VIRTURAL remote

Ethernet CMD(4bytes)				Serial CMD(4bytes)				
DA 1	DA2	DA3	DA4	STX	R/W	ID	CON	CMD
D	C	O	M	0xF4	0x88	Set ID (0x00~0x63)	0xFD	KEY CODE
ASCII				Hex				

*** Ethernet Command**

ASCII Code: DCOM

Hex Code: 0x44 0x43 0x4F 0x4D

*** Serial Command**

STX : Start of Text (0xFX)

F = Command Start Sending, X = Number of Byte to Send

Example (0xF4) : Start Sending 4 Bytes of Packet Data

(Using for Parameter Reading or Virtual Remote Control)

(0xF5) : Start Sending 5 Bytes of Packet Data

(Using for Parameter Setting)

R/W : Read and Write Protocol

0x88 = Write (Command for Setting)

ID : SET ID Number (Set ID 0~99

0x00 = Wildcard (All Sets)

0x01 (Set ID# 1), 0x02 (Set ID# 2), 0x0C (Set ID# 12), 0x10 (Set ID# 16),

CON : Control Command

0xFE = Set Command Control, 0xFD = Set Virtual Remote Control

Value : Key code

(ex. KEY POWER = 0x11. KEY INPUT = 0x13 etc)

❖ ***Acknowledgement;***

Ethernet CMD(4bytes)				Serial CMD(1byte)
D	C	O	M	0xF0

- **Example**

Check Current Source – Set ID # 01

DA 1	DA2	DA3	DA4	STX	R/W	ID	CON	CMD
D	C	O	M	0xF4	0x88	0x01	0xFD	11

❖ ***Acknowledgement***

Ethernet CMD(4bytes)				Serial CMD(1byte)
D	C	O	M	0xF0

Button	Key Code
KEY_POWER	0x11
KEY_INPUT	0x13
KEY_MENU	0x43
KEY_EXIT	0x50
KEY_UP	0x47
KEY_DOWN	0x4B
KEY_LEFT(VOL -)	0x57
KEY_RIGHT(VOL +)	0x53
KEY_ENTER	0x04
KEY_MUTE	0x03
KEY_STILL	0x0A
KEY_INFO	0x06
KEY_SLEEP	0x0B
SET ID	0x51
SET ID EXIT	0x55

7. Command List

7.1 Main Function Settings

♦ Set Power On/Off (0xFE)

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0xFE	0xXX

STX : Start of Text (0xFX)
0xF5 : Start Sending 5 Bytes of Packet Data
R/W : Read and Write Protocol
0x88 = Write (Command for writing Protocol)
ID : SET ID Number (Set ID 0~99)
0x00 = Wildcard (All Sets)
0x01 (Set ID# 1), 0x02 (Set ID# 2), 0x0C (Set ID# 12), 0x10 (Set ID# 16),
CON : 0xFE (Set Control command)
COM : 0xFE for Power ON/OFF Command
Value : 0x00 (OFF), 0x01 (ON)

♦ Read(Get) Power Status(0xFE)

STX	R/W	ID	CON	CMD
0xF4	0x89	0x00 – 0x63	0xFE	0xFE

STX: 0xF4 (start sending 4 bytes of packet data)
R/W: Read and Write Protocol
0x89 = Read (Command for getting protocol)
ID : SET ID Number (Set ID 0~99)
0x01 (Set ID# 1), 0x02 (Set ID# 2), 0x0C (Set ID# 12), 0x10 (Set ID# 16)
CON : Control Command
0xFE = Set Command Control
COM : 0xFE (Power on/off command)

♦ Remote Control Lock On/Off

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x36	0xXX

- CMD: 0x36 for command of Remote Control Lock
- Value: 0x00 for OFF
  0x01 for ON

♦ Source Change

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x01	0xXX

- CMD: 0x01 for command of Video Input Source
- Value: 0x01 for Display Port
  0x02 for HDMI

♦ Temperature Reading

STX	R/W	ID	CON	CMD
0xF4	0x89	0x00 – 0x63	0xFC	0x3C

- CMD: 0x3C for Current Temperature Reading
- Value = Actual Temperature (by Celsius) x 2 + 60
  Ex) If reading value is 122 (0x7A),
  Actual Temperature = (122 – 60) / 2 = 31°C

♦ Temperature Shutdown Setting

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x48	0xXX

- CMD: 0x48 for Shutdown Temperature setting
- Value = desired shutdown temperature (by Celsius) x 2 + 60
  Ex) If desired shutdown temperature is 60°C,
  Setting Value = 60 x 2 + 60 = 180 (0xB4)

♦ MFC Setting (Motion Flow Compensation)

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x6A	0xXX

- CMD: 0x6A for MFC Setting (Motion Flow Compensation)
- Value: 0x00 (OFF), 0x01 (LOW), 0x02 (MIDDLE), 0x03 (HIGH)

7.2 Video wall Settings (Multi Vision)

♦ Write Set ID Number

* Attention : Write Set ID Function must be only one connect Monitor (1 pc : 1 monitor)

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x2A	0xXX

ID : SET ID Number (Set ID 0~99)
0x01 (Set ID# 1), 0x02 (Set ID# 2), 0x0C (Set ID# 12), 0x10 (Set ID# 16)R/W: 0xFE (Set Parameter Value)
CMD: 0x2A for SETID
Value: 0x00 – 0x63 (0 – 99)

♦ Horizontal Set Max Count

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x44	0xXX

CMD: 0x44 for X max
Value: 0x01 – 0x0B (1 – 11)

♦ Vertical Set Max Count

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x45	0xXX

Param: 0x45 for Y max
Value: 0x01 – 0x0B (1 – 11)

♦ Horizontal Set Position

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x42	0xXX

CMD: 0x42 for X Position
Value: 0x01 – 0x0B (1 – 11)

♦ Vertical Set Position

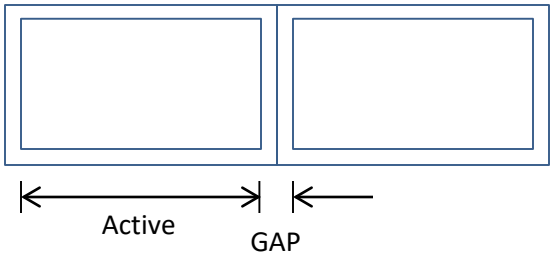
STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x43	0xXX

CMD: 0x43 for Y Position
Value: 0x01 – 0x0B (1 – 11)

♦ **Horizontal Gap Adjust**

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x46	0xXX

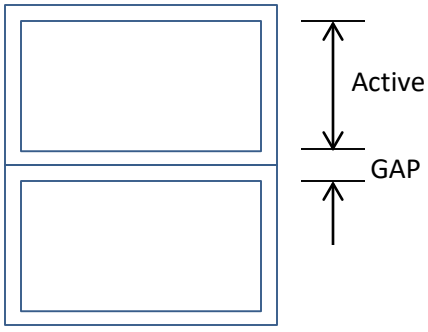
- CMD: 0x46 for X GAP
- Value: 0x03 for UNB (3.5mm B2B)
  0x02 for ENB (1.8mm B2B)



♦ **Vertical Gap Adjust**

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x47	0xXX

- CMD: 0x47 for Y GAP
- Value: 0x05 for UNB (3.5mm B2B)
  0x03 for ENB (1.8mm B2B)



Example) 55” UNB Videowall Display (2x2)

SetID#1	SetID#2
SetID#3	SetID#4

1. **Set ID must be set before Videowall Display installation**
2. Set Videowall mode for 2x2 configuration
3. Command set for Set ID 1
   - 0xF5 0x88 0x01 0xFE 0x44 0x02 (X Max=2)
   - 0xF5 0x88 0x01 0xFE 0x45 0x02 (Y Max=2)
   - 0xF5 0x88 0x01 0xFE 0x42 0x01 (X POS=1)
   - 0xF5 0x88 0x01 0xFE 0x43 0x01 (Y POS=1)
   - 0xF5 0x88 0x01 0xFE 0x46 0x03 (X GAP=3)
   - 0xF5 0x88 0x01 0xFE 0x47 0x05 (Y GAP=5)
4. Parameter set for Set ID 2
   - 0xF5 0x88 0x02 0xFE 0x44 0x02 (X Max=2)
   - 0xF5 0x88 0x02 0xFE 0x45 0x02 (Y Max=2)
   - 0xF5 0x88 0x02 0xFE 0x42 0x02 (X POS=2)
   - 0xF5 0x88 0x02 0xFE 0x43 0x01 (Y POS=1)
   - 0xF5 0x88 0x02 0xFE 0x46 0x03 (X GAP=3)
   - 0xF5 0x88 0x02 0xFE 0x47 0x05 (Y GAP=5)
5. Parameter set for Set ID 3
   - 0xF5 0x88 0x03 0xFE 0x44 0x02 (X Max=2)
   - 0xF5 0x88 0x03 0xFE 0x45 0x02 (Y Max=2)
   - 0xF5 0x88 0x03 0xFE 0x42 0x01 (X POS=1)
   - 0xF5 0x88 0x03 0xFE 0x43 0x02 (Y POS=2)
   - 0xF5 0x88 0x03 0xFE 0x46 0x03 (X GAP=3)
   - 0xF5 0x88 0x03 0xFE 0x47 0x05 (Y GAP=5)
6. Parameter set for Set ID 4
   - 0xF5 0x88 0x04 0xFE 0x44 0x02 (X Max=2)
   - 0xF5 0x88 0x04 0xFE 0x45 0x02 (Y Max=2)
   - 0xF5 0x88 0x04 0xFE 0x42 0x02 (X POS=2)
   - 0xF5 0x88 0x04 0xFE 0x43 0x02 (Y POS=2)
   - 0xF5 0x88 0x04 0xFE 0x46 0x03 (X GAP=3)
   - 0xF5 0x88 0x04 0xFE 0x47 0x05 (Y GAP=5)

7.3 Picture Control Settings

♦ Contrast

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x04	0xXX

- CMD: 0x04 for Contrast
- Value: 0x00 – 0x64 (0 – 100)

♦ Brightness

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x05	0xXX

- CMD: 0x05 for Brightness
- Value: 0x00 – 0x64 (0 – 100)

♦ Sharpness

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x07	0xXX

- CMD : 0x07 for Sharpness
- Value: 0x00 – 0x64 (0 – 100)

♦ Aspect Ratio

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x0F	0xXX

- CMD : 0x0F for Aspect Ratio
- Value: 0x01 (Full Screen), 0x02 (4:3), 0x03 (5:4), 0x04 (16:9), 0x05 (1:1, no aspect ratio change)

♦ Auto Dimming

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x3A	0xXX

- CMD : 0x3A for Auto Dimming Mode
- Value: 0x00 (OFF), 0x01 (ON)

♦ Dimming Control

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x3B	0xXX

- CMD: 0x3B for DIM LEVEL control
- Value: 0x00 – 0x64 (0 – 100)
  0 -> Min Brightness
  100 -> Max Brightness

♦ Max Ambient Illuminance

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x38	0xXX

- CMD: 0x38 for MAX AMBIENT ILLUMINANCE Setting
- Value: 0x02– 0x00 (2 – 255 = 200 - 25000)
  Setting Value = Ambient Level (by LUX) / 100

Ex) Desired Ambient is 10000Lux, setting value is 100 (0x64) (= 10000 / 100)

♦ Min Ambient Illuminance

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x39	0xXX

- CMD: 0x39 for MIN AMBIENT ILLUMINANCE Setting
- Value: 0x01– 0x00 (1 – 255 = 10 - 2550)
  Setting Value = Ambient Level (by LUX) / 10

Ex) Desired Ambient is 200Lux, setting value is 20 (0x14) (= 200 / 10)

7.4 Color Control Settings

♦ Color Temperature

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x03	0xXX

- CMD: 0x03 for Color Temperature Control
- Value: 0x00 (3200K), 0x01 (5600K), 0x02 (6500K),
  0x03 (7800K), 0x04 (9300K),
  0x05 (USER) : user setting will use RGB gain setting values.

7.5 Timer Setting

♦ Current Hour

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x32	0xXX

- CMD: 0x32 for Current Time Hour
- Value: 0x00 – 0x17 (0 – 23)

♦ Current Minute

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x33	0xXX

- CMD: 0x33 for Current Time Minute
- Value: 0x00 – 0x3B (0 – 59)

♦ On Time Hour

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x23	0xXX

- CMD: 0x23 for On Time Hour
- Value: 0x00 – 0x23 (0 – 17)

♦ On Time Minute

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x24	0xXX

- CMD: 0x24 for On Time Minute
- Value: 0x00 – 0x3B (0 – 59)

♦ On Time ON/OFF

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x25	0xXX

- CMD: 0x25 for On Time ON/OFF control
- Value: 0x00 (OFF), 0x01 (ON)

♦ Off Time Hour

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x27	0xXX

- CMD: 0x27 for Off Time Hour
- Value: 0x00 – 0x23 (0 – 17)

♦ Off Time Minute

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x28	0xXX

- CMD: 0x28 for Off Time Minute
- Value: 0x00 – 0x3B (0 – 59)

♦ Off Time ON/OFF

STX	R/W	ID	CON	CMD	Value
0xF5	0x88	0x00 – 0x63	0xFE	0x29	0xXX

- CMD: 0x29 for Off Time ON/OFF control
- Value: 0x00 (OFF), 0x01 (ON)

Supported Timing: UHD (HDMI, DP)

Resolution	H–Frequency (kHz)	V-Frequency (Hz)	Pixel Frequency (MHz)	Comment
640x480	31.469	59.94	25.175	
640x480	37.500	75.0	31.5	
800x600	37.879	60.317	40.0	
800x600	46.875	75.0	49.5	
1024x768	48.780	60.001	64.11	
1024x768	56.476	70.069	75.0	
1024x768	60.030	75.029	78.75	
1280x720	47.760	60.0	74.481	
1280x720	52.500	70.0	89.040	
1280x768	60.150	75.0	102.977	
1280x1024	63.600	60.0	108.883	
1360x768	47.700	60.0	84.700	
1600x1200	75.000	60.0	162.000	
720x576	15.735	50.0	13.595	
720x480	31.469	59.94	25.175	
1280x720	44.964	59.94	74.176	
1920x1080	33.750	60.0	74.25	
1920x1080	31.250	50.0	72.000	
1920x1080	56.3	50	148.5	
1920x1080	67.5	60	148.5	
3840x2160	67.5	30	297	
3840x2160	135	60	594	

Specifications

Support Signals

Items		Specifications
Supported Signals	UHD INTERFACE HDMI, DP	H Frequency Range : 20~82 kHz
		V Frequency Range : 55 ~ 90 Hz (VESA standard)
		Maximum resolution : 3840x2160@60Hz
		Maximum pixel rate : 594 MHz
	HD-SDI (Optional)	HD-SDI : 2.970Gbps SD-SDI : 270Mbps

Supported 4K Format

	HDMI Input				DP Input			
	8bit	10bit	12bit	16bit	8bit	10bit	12bit	16bit
4K 2K@30Hz	RGB 4:4:4	RGB 4:4:4	RGB 4:4:4 4:2:2	RGB 4:4:4	RGB 4:4:4	RGB 4:4:4	RGB 4:4:4 4:2:2	RGB 4:4:4
4K 2K @60Hz	4:2:0	4:2:0	4:2:2 4:2:0	4:2:0	RGB 4:4:4 4:2:0	4:2:0	4:2:2 4:2:0	4:2:0