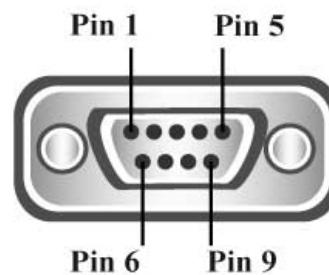


Serial Interface Communication Protocol [PA Series G-version]

RS232

Pin 1	DCD
Pin 2	RXD
Pin 3	TXD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI

RS232 Pinout (9 Pin Male)



◆ 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 a external equipment

Female Pin number	male Pin number
2 <----->	2
3 <----->	3
5 <----->	5

4. Hardware Protocol

Baud rate : 9600 bps

Data bits : 8 bit

Parity bits : None

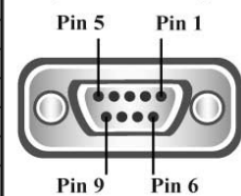
Stop bits : 1 bit

Handshake : None

[Display side]

Pin 1	RI
Pin 2	TXD
Pin 3	RXD
Pin 4	DSR
Pin 5	GND
Pin 6	DTR
Pin 7	CTS
Pin 8	RTS
Pin 9	Power Input /DCD

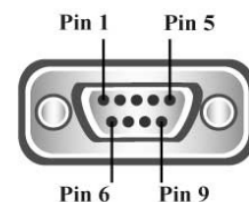
RS232 Pinout (9 Pin Female)



[PC side]

Pin 1	DCD
Pin 2	RXD
Pin 3	TXD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI

RS232 Pinout (9 Pin Male)



5. Transmission Formats

This is the format that the computer will send to the display to execute commands . The format for this command transmission is as follows: (total 13 byte)

ex) <STX>001PWRWOFF0<ETX> (Set ID : 1 , Power Off Send)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	0	0	1	P	W	R	W	O	F	F	0	0x0d
Hex	ASCII (capital letter)										Hex	

- STX : Start of Text (0x0f)
- ID1 ~ ID3 : Set ID (001~100) , 000 : wild card
- CM1 ~ CM3 : Command (PWR, RMT, MIN ...)
- R/W : Read/Write(R,W)
- DA1 ~ DA3 : Data (Values)
- IND : Index
- ETX : End of Text (0x0d)

6. OK Acknowledgement

The acknowledgement will be sent by the display to the computer to verify that the command has been successfully received and executed. This format for this acknowledgement is as follows:

ex) <STX>001PWR#-ON#<ETX> (Set ID : 1 , Power Acknowledgement)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	0	0	1	P	W	R	#	-	O	N	#	0x0d
Hex	ASCII (capital letter)										Hex	

7. Error Acknowledgement

The Error Values will be sent by the display to the computer to verify that the command has been successfully received and executed. This format for this Error Values is as follows:

ex) <STX>001PWRERROR<ETX> (Set ID : 1 , Power Off Error)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	0	0	1	P	W	R	E	R	R	O	R	0x0d
Hex	ASCII (capital letter)										Hex	

How to choose display ID number

◆ Read Set ID Number

* Attention : “Read Set ID” Function requires requires serial connection to only one display (no serial daisy-chain or distribution)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	F	F	F	S	I	D	R	0	0	0	0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : “FFF” (Set ID)

- DA1 ~ DA3 : “000” (Don’t care)

Ex) <STX>FFFSIDR0000<ETX> (Read Set ID)

Acknowledgement => <STX>001SID#001#<ETX> (Set ID : 1)

◆ Write Set ID Number

* Attention : “Write Set ID” Function requires serial connection to only one display (no serial daisy-chain or distribution)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	F	F	F	S	I	D	W				0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : “FFF” (Set ID)

- DA1 ~ DA3 : “001” (Set ID Number “001 ~100”)

Ex) <STX>FFFSIDW0010<ETX> (Write Set ID : 1)

Acknowledgement => <STX>001SID#001#<ETX>

8. Command List

◆ Set Power On/Off (PWR)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				P	W	R	W				0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : Set ID (001~100)
- DA1 ~ DA3 : “-ON” : Power On
“OFF” : Power Off

Note: Do not substitute “R” for “W” in the “R/W” column in order to read display power state.. Please see NEXT page for “Get Power State (PWS)” read command.

Ex) <STX>001PWRWOFF0<ETX> (ID:001 , Power Off)
Acknowledge => <STX>001PWR#OFF#<ETX>

◆ Get Power State (PWS)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				P	W	S	R	0	0	0	0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : Set ID (001~100)
- DA1 ~ DA3 : “000” (don’t care)
- IND : “0” (don’t care)

Ex) <STX>001PWSR0000<ETX> (ID:001 , Get Power Status)
Acknowledge => <STX>001PWS#OFF#<ETX>

- DA1 ~ DA3 : “-ON” : Power On
“OFF” : Power Off

◆ Set Virtual Remote Control (RMT)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				R	M	T	W				0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : Set ID (001~100)
- DA1 ~ DA3 : “MEN” (Menu)
“-UP” (Up)
“DOW” (Down)
“EXI” (Select)
- IND : “0” (don’t care)

Ex) <STX>001RMTWSOU0<ETX> (Remote Source Button)
Acknowledge => <STX>001RMT#SOU#<ETX>

◆ Set Source Change (MIN)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				M	I	N	W					0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : Set ID (001~100)
- DA1 ~ DA3 : “-PC” : VGA
 - “HD1” : HDMI1
 - “HD2” : HDMI2
 - “HD3” : DiplayPort
- IND : “0” (don’t care)

Ex) <STX>001MINWHD10<ETX> (Source HDMI1)
 Acknowledge => <STX>001MIN#HD1#<ETX>

◆ Get Source State (MIS)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				M	I	S	R	0	0	0	0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : Set ID (001~100)
- DA1 ~ DA3 : “000” (don’t care)
- IND : “0” (don’t care)

Ex) <STX>001MISR0000<ETX> (ID: 001 , Get Source Status)
 Acknowledge => <STX>001MIS#COM#<ETX>
 -DA1 ~ DA3 : “-PC” : VGA

- “HD1” : HDMI1
- “HD2” : HDMI2
- “HD3” : DiplayPort

◆ Get Signal State (SGS)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				S	G	S	R	0	0	0	0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : Set ID (001~100)
- DA1 ~ DA3 : “000” (don’t care)
- IND : “0” (don’t care)

Ex) <STX>001SGSR0000<ETX> (ID: 001 , Get Signal Status)
 Acknowledge => <STX>001SGS#COM#<ETX>

- DA1 ~ DA3 : “000” : Power Off, “001” : Normal, “002” : No Signal , “003” : DPMS

◆ Set Volume Adjust (VOL)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				V	O	L	W				0	0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "000" ~ "100" (Mute : When Volume "000")
- IND : "0" (don't care)

Ex) <STX>001VOLW1000<ETX> (ID:001, Volume 100)
 Acknowledge => <STX>001VOL#100#<ETX>

◆ Get Volume State (VOS)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				V	O	S	R	0	0	0	0	0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "000" (don't care)
- IND : "0" (don't care)

Ex) <STX>001VOSR0000<ETX> (ID:001, Get Volume)
 Acknowledge => <STX>001VOS#050#<ETX>

- DA1 ~ DA3 : Volume Value

◆ Set Mute On/Off (MUT)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				M	U	T	W				0	0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "-ON" : Mute On,
"OFF" : Mute Off
- IND : "0" (don't care)

Ex) <STX>001MUTWOFF0<ETX> (ID:001, Mute Off)
 Acknowledge => <STX>001MUT#OFF#<ETX>

◆ Set Auto Adjust (AUT)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				A	U	T	W				0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "-PC" – PC Auto Adjust
- IND : "0" (don't care)

Ex) <STX>001AUTW-PC0<ETX> (ID:001, PC Auto Adjust)
 Acknowledge => <STX>001AUT#-PC#<ETX>

◆ Set Dimming Setting (DIM)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				D	I	M	W				0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "000" ~ "100"
- IND : "0" (don't care)

Ex) <STX>001DIMW1000<ETX> (ID:001, Dimming 100)
 Acknowledge => <STX>001DIM#100#<ETX>

◆ Get Dimming Setting (DIS)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				D	I	S	R	0	0	0	0	0x0d
Hex	ASCII (capital letter)										Hex	

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "000" (don't care)
- IND : "0" (don't care)

Ex) <STX>001DISR0000<ETX> (ID:001, Read Dimming)
 Acknowledge => <STX>001DIS#100#<ETX>