

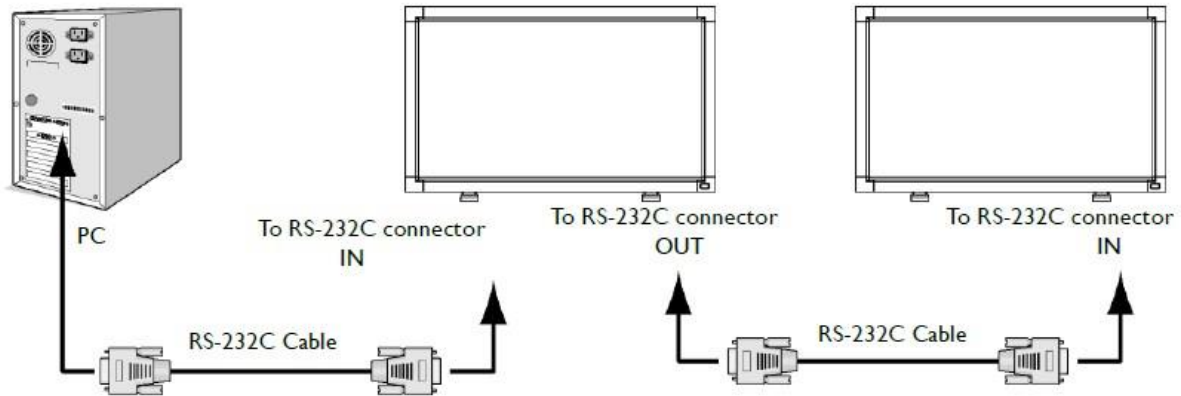


**NSD - 3203/ NSD - 4303/ NSD – 5503 / NSD – 6503
Control Command**

1. INTRODUCTION

1.1 Purpose

The purpose of this document is to explain in detail the commands and steps that can be used to control a display via RS232C.



1.2 Definitions, Abbreviations and Acronyms

PBS	Professional Business Solutions
RC	Remote Control
ACK	Acknowledge
NACK	Not Acknowledge
NAV	Not Available
ID	Identification
0xXX	Hexadecimal notation

2. COMMAND PACKET FORMAT

2.1 Physical Specifications

1. Baud Rate : 9600
2. Data bits: 8
3. Parity : None
4. Stop Bit : 1
5. Flow Control : None
6. The Pin Assignments for DB9 Female Connector:

TBD

P1-Pin #	Signal	P2-Pin #	Remark
1	NC	..	..
2	RXD	2	Input to LCD Monitor
3	TXD	1	Output from LCD Monitor
4	NC	..	..
5	GND	4	..
6	NC	..	..
7	NC	..	..
8	NC	..	..
9	NC	3	..
frame	GND	..	..

2.2 Communication Procedure

Control commands can be sent from a host controller via the RS232/LAN connection. A new command should not be sent until the previous command is acknowledged. However, if a response is not received within 500 milliseconds a retry may be triggered. Every valid command receives an ACK. A command that is valid but not supported in the current implementation will be responded to with a NAV (Not Available). If the command buffer is corrupt (transmission errors) the command will be responded to with a NACK. The display operates according to the received command. If the command is a valid "Get" command, the display responds with the requested info. If the command is a valid "Set" command allowed, the display performs the requested operation.

Figure1 and Figure2 explain the mechanism of the Get and Set commands.

Note: For LAN control, the port number is **5000(default)**.

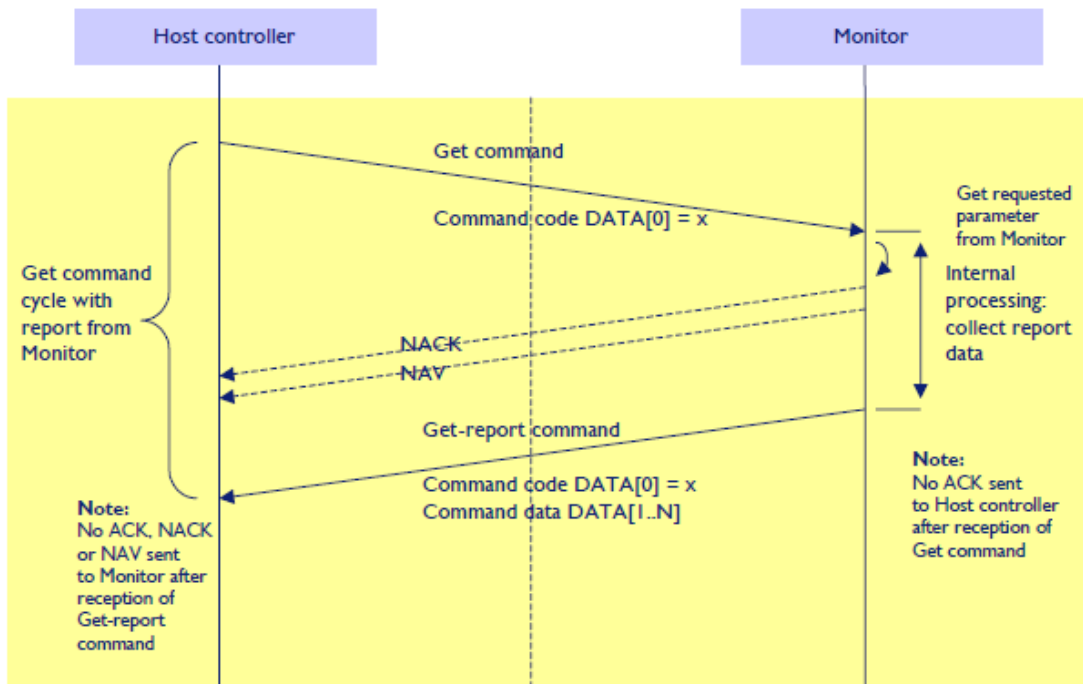


Figure 1: Explanation of mechanism of Get Command.

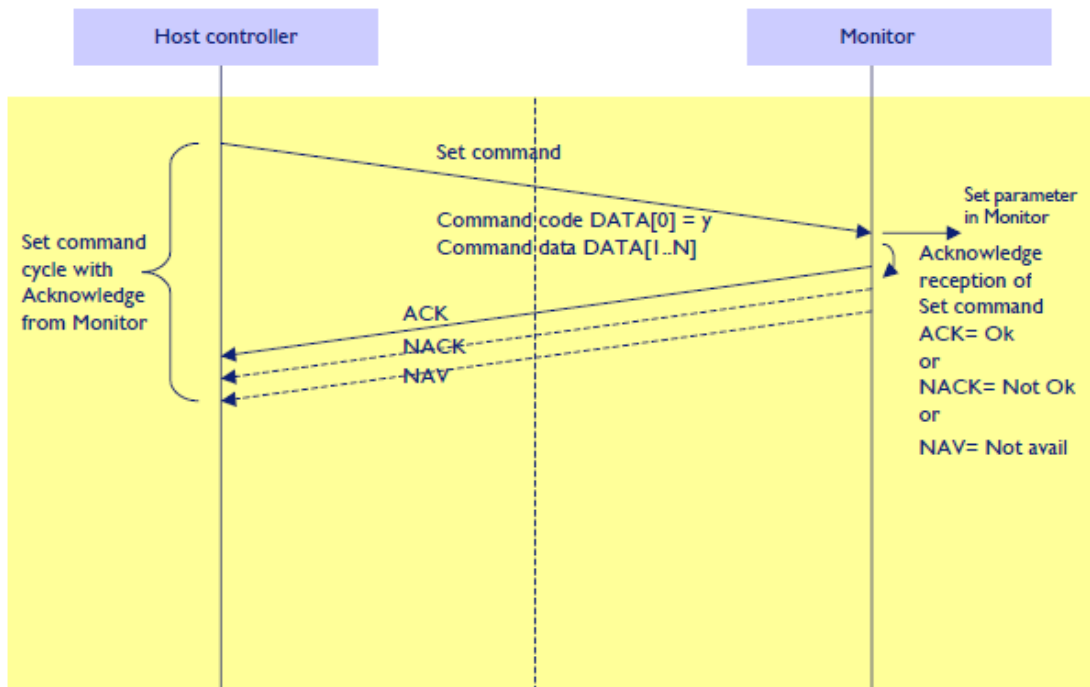


Figure 2: Explanation of mechanism of Set Command.

2.3 Command Format

The control command packet format:

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	...	Data[N]	Checksum
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In detail:

Number of Field	Name of Field	Description
Byte 1	Header	Header = 0xA6
Byte 2	Monitor ID	Monitor ID Range : 1 ~ 255 , 0 : Broadcast mode Signal mode: Display Address range from 1 to 255 Broadcast mode: Display Address is 0 which indicates no ACK or Report is expected.
Byte 3	Category	Category = 0x00 (fixed)
Byte 4	Code0 (Page)	Page = 0x00 (fixed)
Byte 5	Code1 (Function)	
Byte 6	Length	Length has to be calculated in the following way: Length = N + 3
Byte 7	Data Control	Data Control = 0x01 (fixed)
Byte 8 ~ Byte 44	Data[0] ~ Data[N]	This field can be also empty. If not empty then the range of Data Size, N = 0 to 36.
Last Byte	Checksum	Checksum. Range = 0 to 255 (0xFF). Algorithm: The EXCLUSIVE-OR (XOR) of all bytes in the message except the checksum itself. Checksum = [Header] XOR [Monitor ID] XOR ... DATA[0] ... XOR DATA[N]

MESSAGES - SYSTEM

2.4 Communication Control

This defines the feedback command from monitor to host controller when it receives the display command from the host controller, depending on the commands availability, the command reported back to host controller can be one of the ACK(0x00), NACK(0x03) or NAV(0x04)

Note: there is no reply message when the wrong ID address is being used.

2.4.1 Message-Report

Number of Field	Name of Field	Description
Byte 1	Header	Header = 0x21
Byte 2	Monitor ID	Monitor ID Range : 1 ~ 255
Byte 3	Category	Category = 0x00 (fixed)
Byte 4	Code0 (Page)	Page = 0x00 (fixed)
Byte 5	Length	Length = 0x04
Byte 6	Data Control	Data Control = 0x01 (fixed)
Byte 7	Command	0x00(Communication Control)
Byte 8	Status	0x00: Completed Normal response. 0x01: Limit Over The packets were received normally, but the data value was over the upper limit. 0x02: Limit Over The packets were received normally, but the data value was over the lower limit. 0x03: Command canceled The packet is received normally but either the value of data is incorrect or request is not permitted for the current host value. 0x04: Parse Error Received not defined format data or check sum Error.
Byte 9	Checksum	Check Sum The total from Byte1 to Byte8 calculated by XOR

Set Control Command Monitor Reply message.

Example: ACK reply (Display address 01)

Header	Monitor ID	Category	Page	Length	Control	Data	Data	Checksum	Description
0x21	0x01	0x00	0x00	0x04	0x01	0x00	0x00	0x25	Command is well executed.

Example: NACK reply (Display address 01)

Header	Monitor ID	Category	Page	Length	Control	Data [0]	Data [1]	Checksum	Description
0x21	0x01	0x00	0x00	0x04	0x01	0x00	0x03	0x26	No this command code – Data (0), the system will reply “NACK”.

Example: NAV reply: (Display address 01)

Header	Monitor ID	Category	Page	Length	Control	Data [0]	Data [1]	Checksum	Description
0x21	0x01	0x00	0x00	0x04	0x01	0x00	0x04	0x21	1. Checksum error, the system will reply “NAV”. 2. No this parameter – Data (1), the system will reply “NAV”.

3 Platform and Version Labels , Model Number, FW Version, Build date

3.1 Platform and Version Labels

This command provides the SICP protocol version and the display Software version to the host controller.

3.1.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0xA2 = Platform and Version Labels - Get		Request the SICP version.
DATA[1]	Which Label		0x00 = Get SICP implementation version 0x01 = Get the platform label

Example: Get platform label (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0xA2	0x01	0x01

3.1.2 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0xA2 = Platform and Version Label – Report		Request the internal Hardware version.
DATA[1] to DATA[N]	Character[0] to Character[N-1]		36 (0x24) characters maximum. No. of characters, N = 1 to 36 (0x24). The actual size determines the value of the message size byte. Platform label = AGN

Example: Report Platform label (**AGN**)(Display address 01)

Header	Monitor ID	Category	Page	Length	Data Control	Data[0]	Data[1]	Data[2]	Data[3]	Checksum
0x21	0x01	0x00	0x00	0x06	0x01	0xA2	0x41	0x47	0x4E	0xCD

3.1.3 Message-Get (Model Number, FW Version, Build date)

Bytes	Bytes Description	Bits	Description
DATA[0]	0xA1 = Get Model Number & FW version of device with Date		Request the Model Number and FW version of the device
DATA[1] to DATA[N]	Codes to request		0x00 = Model Number 0x01 = FW version 0x02 = Build Date

3.1.4 Message-Get (0xA1 = Model name)

Bytes	Bytes Description	Bits	Description
DATA[0]	0xA1 = Get Model name of device		Request the Model name of the device
DATA[1]	Codes to request		0x00 = Model Name

Example: Get Model name (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0xA1	0x00	0x03

3.1.1 Message-Report (0xA1 = Report Model name)

Bytes	Bytes Description	Bits	Description
DATA[0]	0xA1 = Report - Model Name		Request the Model name
DATA[1] to DATA[N]	Character[0] to Character[N-1]		36 (0x24) characters maximum. No. of characters, N = 1 to 36 (0x24). The actual size determines the value of the message size byte.

Example: Report Model name (**NSD-5503**) (Display address 01)

Header	Monitor ID	Category	Page	Length	Data Control	Data [0]	Data[1]	Data[2]	Data[3]	Data[4]
0x21	0x01	0x00	0x00	0x0B	0x01	0xA1	0x4E	0x53	0x44	0x2D
Data[5]	Data[6]	Data[7]	Data[8]	Checksum						
0x35	0x35	0x30	0x33	0xFC						

4 MESSAGES - GENERAL

4.1 Power state

This command is used to set/get the power state as it is defined as below.

4.1.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0x19 = Power state - Get		Command requests the display to report its current power state

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x19	0xBC

4.1.2 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0x19 = Power State - Report		Command reports Power state
DATA[1]	Power State		0x01 = Sleep 0x02 = On

Example: Power State On (Display address 01)

Header	Monitor ID	Category	Page	Length	Data Control	Data[0]	Data[1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0x19	0x02	0x3E

4.1.3 Message-Set

Bytes	Bytes Description	Bits	Description
DATA[0]	0x18 = Power state - Set		Command to change the Power state of the display
DATA[1]	Power state		0x01 = Sleep 0x02 = On

Example: Power State Deep Sleep (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x18	0x01	0xBB

When System Down after can't get/Set any command via LAN/RS232

4.2 IR Lock Functions

The following commands separately are used to lock/unlock the Remote Control and Keypad.

4.2.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0x1D = Get - Lock Status – IR – Remote Control		Get unlock all /lock all /lock all but power/lock all but volume/

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x1D	0xB8

4.2.2 Message-Report (IR-Remote Control)

Bytes	Bytes Description	Bits	Description
DATA[0]	0x1D = Report - Lock Status – IR – Remote Control		Report unlock all /lock all /lock all but power/lock all but volume/
DATA[1]	Status indicator byte for Remote Control		0x01 = Unlock all 0x02 = Lock all 0x03 = Lock all but Power

Example: Lock Keyboard and unlocked Remote Control (Display address 01)

Header	Monitor ID	Category	Page	Length	Data Control	Data[0]	Data[1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0x1D	0x01	0x39

4.2.3 Message-Set (IR –Remote Control)

Bytes	Bytes Description	Bits	Description
DATA[0]	0x1C = Set - Lock State – IR – Remote Control		Set unlock all/lock all /lock all but power/lock all but volume/
DATA[1]	Status indicator byte for Remote Control		0x01 = Unlock all 0x02 = Lock all 0x03 = Lock all but Power

Example: Unlock local remote control (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x1C	0x01	0xBF

4.3 Lock Functions for Keypad Lock Status

The following commands separately are used to lock/unlock the Remote Control and Keypad.

4.3.1 Message-Get (Keypad)

Bytes	Bytes Description	Bits	Description
DATA[0]	0x1B = Get - Keypad Lock Status		Set unlock all/lock all /lock all but power/lock all but volume/

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x1B	0xBE

4.3.2 Message-Report (Keypad)

Bytes	Bytes Description	Bits	Description
DATA[0]	0x1B = Report - Keypad Status		Report unlock all /lock all/lock all but power/ lock all but Volume
DATA[1]	Status indicator byte for Keypad		0x01 = Unlock all 0x02 = Lock all

Example: Reporting status of Keypad indicating Lock all for (Display address 01)

Header	Monitor ID	Category	Page	Length	Data Control	Data[0]	Data[1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0x1B	0x02	0x3C

4.3.3 Message-Set (Keypad)

Bytes	Bytes Description	Bits	Description
DATA[0]	0x1A = Set – Keypad Lock Status		Report unlock all /lock all/lock all but power/ lock all but Volume
DATA[1]	Status indicator byte for Keypad		0x01 = Unlock all 0x02 = Lock all

Example: Set Lock all on Keypad for (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x1A	0x01	0xB9

5. MESSAGES - INPUT SOURCES

5.1 Input Source

This command is used to change the current input source.

5.1.1 Message-Set

Bytes	Bytes Description	Bits	Description
DATA[0]	0xAC = Input Source – Set		Command requests the display to set the current input source
DATA[1]	Input Source Type		0x05 = VGA 0x06 = HDMI 2 0x0D = HDMI 1 0x0F = HDMI 3 0x10 = BROWSER 0x13 = USB Signage 0x17 = PDF Player 0x18 = Primary CMS 0x19 = Screen Sharing
DATA[2]	Reserved		(Reserved, fixed value is 0)
DATA[3]	Reserved		(Reserved, fixed value is 0)
DATA[4]	Reserved		(Reserved, fixed value is 0)

Example: Set on DVI-D (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x07	0x01	0xAC	0x0E	0x00	0x00	0x00	0x03

5.2 Current Source

5.2.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0xAD = Current Source – Get		Command requests the display to report the current input source in use.

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0xAD	0x08

5.2.2 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0xAD = Current Source – Report		Command reports to the host controller the current input source in use by the display.

DATA[1]	Input Source Type/Number		0x05 = VGA 0x06 = HDMI 2 0x0D= HDMI 1 0x0F = HDMI 3 0x10= BROWSER 0x13= USB Signage 0x17= PDF Player 0x18= Primary CMS 0x19= Screen Sharing
DATA[2]	Reserved		(Reserved, fixed value is 0)
DATA[3]	Reserved		(Reserved, fixed value is 0)
DATA[4]	Reserved		(Reserved, fixed value is 0)

Example: Current Input Source: DVI-D (Display address 01)

Header	Monitor ID	Category	Page	Length	Data Control	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Checksum
0x21	0x01	0x00	0x00	0x07	0x01	0xAD	0x0E	0x00	0x00	0x00	0x85

6. MESSAGES - VIDEO

6.1 Video Parameters

The following commands are used to get/set video parameters as it is defined below.

6.1.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0x35 = Color Temperature – Get		Command requests the display to report its current

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x35	0x90

6.1.2 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0x35 = Color Temperature – Report		Command reports to the host controller the current color
DATA[1]	Color temperature		0x00 = User 0x01 = Native 0x02 = Cool 0x03 = Warm

Example: The current color temperature is set to Nature (Display address 01)

Header	Monitor ID	Category	Page	Length	Data Control	Data[0]	Data[1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0x35	0x01	0x11

6.2.3 Message-Set

Bytes	Bytes Description	Bits	Description
DATA[0]	0x34 = Color Temperature – Set		Command reports to the host controller the current color
DATA[1]	Color temperature		0x00 = User 0x01 = Native 0x02 = Cool 0x03 = Warm

Example: Set color temperature to Nature (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x34	0x01	0x97

6.2 Picture Format

This command is used to control the display screen format.

6.2.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0x3B = Picture Format – Get		Command requests the display to report its current picture format

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x3B	0x9E

6.2.2 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0x3B = Picture Format – Report		Command report to the host controller the current picture format of the display.
DATA[1]	Picture Format*	Bit 7..4	Not used.
		Bit 3..0	Picture Format. 0x00 = Normal (4:3) (HDMI only) 0x03 = Full (USB only) 0x05 = 16:9 (HDMI only) 0x06 = Auto (HDMI only) 0x07 = Scale (USB only)

Example: Current Picture Format is Widescreen on Full Display (Display address 01)

Header	Monitor	Category	Page	Length	Data	Data[0]	Data[1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0x3B	0x03	0x1D

6.2.3 Message-Set

Bytes	Bytes Description	Bits	Description
DATA[0]	0x3A = Picture Format – Set		Command requests the display to set the specified picture format
DATA[1]	Picture Format	Bit 7..4	Not used.
		Bit 3..0	Picture Format. 0x00 = Normal (4:3) (HDMI only) 0x03 = Full (USB only) 0x05 = 16:9 (HDMI only) 0x06 = Auto (HDMI only) 0x07 = Scale (USB only)

Example: Set Picture Format to Widescreen on Full Display (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x3A	0x03	0x9B

7. MESSAGES - AUDIO

7.1 Volume

This command is used to set/get the Volume as it is defined as below.

7.1.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0x45 = Volume – Get		Command requests the display to report its current Volume Level

Example: (Display address 01)

Header	Monitor ID	Categor y	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x45	0xE0

7.1.2 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0x45 = Volume – Report		Command reports current Volume level
DATA[1]	Volume.		0 to 100% (0x00~0x64) of the user selectable range of the display.
DATA[2]	Audio Out Volume level		0 to 100% (0x00~0x64) of the user selectable range of the display.

Example: Current Display settings: Volume: 77 (0x4D), Audio Out:77%(0x4D) (Display address 01)

Header	Monitor	Categor y	Page	Length	Data	Data[0]	Data[1]	Data[2]	Checksum
0x21	0x01	0x00	0x00	0x05	0x01	0x45	0x4D	0x4D	0x61

7.1.3 Message-Set

This command can set volume level for speaker & audio out individually.

Bytes	Bytes Description	Bits	Description
DATA[0]	0x44 = Volume – Set		
DATA[1]	Volume.		0 to 100% (0x00~0x64) of the user selectable range of the display.
DATA[2]	Audio Out Volume level		0 to 100% (0x00~0x64) of the user selectable range of the display.

Example: Set the Display Volume to 77 (0x4D) (Display address 01)

Header	Monitor ID	Categor y	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x05	0x01	0x44	0x4D	0x4D	0xE7

8. MISCELLANEOUS

8.1 Operating Hours

The command is used to record the working hours of the display.

8.1.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0x0F = Misc Info - Get		Command requests the display to report from miscellaneous information parameters
DATA[1]	Item		0x02 = Operating Hours (All other values are reserved)

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x0F	0x02	0xAF

8.1.2 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0x0F = Misc Info – Report		Command reports current Operating Hours
DATA[1] to DATA[2]	Operating Hours		DATA[1] and DATA[2] form the MSByte and LSByte, respectively, of the 16-bit-wide Operational Hours value.

Example: Current Display Operation Hours counter value (Display address 01)

Header	Monitor	Category	Page	Length	Data	Data[0]	Data[1]	Data[2]	Checksum
0x21	0x01	0x00	0x00	0x05	0x01	0x0F	0x4D	0x00	0x66

9. Scheduling

9.1 Scheduling Parameters

The following commands are used to get/set scheduling parameters as it is defined below.

9.1.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0x5B = Scheduling Parameters - Get		Command requests the display to report its current Scheduling parameters
DATA[1]	Page		1 to 7 of the scheduling pages

Example: Page 1 (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
X		X	X	X		X			
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x5B	0x01	0xF8

9.1.2 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0x5B = Scheduling Parameters – Report		Command reports to the host controller the current Scheduling parameters of the display.
DATA[1]	Page		0: Page disable 1: Page enable
DATA[2]	Start time hour		0 to 23 of the start time hour 24: NULL
DATA[3]	Start time minute		0 to 59 of the start time minute 60: NULL
DATA[4]	End time hour		0 to 23 of the end time hour 24: NULL
DATA[5]	End time minute		0 to 59 of the end time minute 60: NULL
DATA[6]	Video source		0 to 100 (%) of the user selectable range of the display. For video source: 0x05 = VGA 0x06 = HDMI 2 0x0D= HDMI 1 0x0F = HDMI 3 0x10= BROWSER 0x13= USB Signage 0x17= PDF Player 0x18= Primary CMS 0x19= Screen Sharing

			0x13= INTERNAL STORAGE 0x14= Reserved 0x15= Reserved 0x16=Media Player 0x17=PDF Player 0x18=Custom
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DATA[7]	Working day(s)		To set the scheduling working days. Bit0 = 1: every week Bit1 = Monday Bit2 = Tuesday Bit3 = Wednesday Bit4 = Thursday Bit5 = Friday Bit6 = Saturday Bit7 = Sunday
DATA[8]	Bookmark/Playlist/File Tag(s)		To set the set Tag from 1 through 7. 0x00 = none 0x01 = Tag 1 0x02 = Tag 2 0x03 = Tag 3 0x04 = Tag 4 0x05 = Tag 5 0x06 = Tag 6 0x07 = Tag 7

Example: Report Enable page1 / HDMI at 06:30 and ends at 22:00 / everyday / no tag.

Header	Monitor ID	Category	Page	Length	Data Control	Data (0)	Data (1)	Data (2)
0x21	0x01	0x00	0x00	0x0B	0x01	0x5B	0x01	0x06
Data (3)	Data (4)	Data (5)	Data (6)	Data (7)	DATA[8]	Checksum		
0x1E	0x16	0x00	0x0D	0xFF	0x00	0x8C		

9.1.3 Message-Set

Bytes	Bytes Description	Bits	Description
DATA[0]	0x5A = Scheduling Parameters – Set		Command to change the current Scheduling parameters
DATA[1]	Page		BIT 7-BIT4: 1 to 7 of the scheduling pages BIT 3-BIT0: 0: Page disable 1: Page enable
DATA[2]	Start time hour		0 to 23 of the start time hour 24: NULL
DATA[3]	Start time minute		0 to 59 of the start time minute 60: NULL
DATA[4]	End time hour		0 to 23 of the end time hour 24: NULL
DATA[5]	End time minute		0 to 59 of the end time minute 60: NULL
DATA[6]	Video source		0 to 100 (%) of the user selectable range of the display. For video source: 0x05 = VGA 0x06 = HDMI 2 0x0D= HDMI 1 0x0F = HDMI 3 0x10= BROWSER 0x13= USB Signage 0x17= PDF Player 0x18= Primary CMS 0x19= Screen Sharing

DATA[7]	Working day(s)		To set the scheduling working days. Bit0 = 1: every week Bit1 = Monday Bit2 = Tuesday Bit3 = Wednesday Bit4 = Thursday Bit5 = Friday Bit6 = Saturday Bit7 = Sunday
DATA[8]	Bookmark/Playlist/File Tag(s)		To set the set Tag from 1 through 7. For Video sources, Media Player, Browser and PDF, only 1~7 are valid and 0 will get error ack. For the reset of video sources like HDMI, DVI and so on, the byte is useless. 0x00 = none 0x01 = Tag 1 0x02 = Tag 2 0x03 = Tag 3 0x04 = Tag 4 0x05 = Tag 5 0x06 = Tag 6 0x07 = Tag 7

Example: Set Disable page1 / HDMI / Start 06:30 and ends at 22:00 / every day / no tag.

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data (0)	Data (1)
0xA6	0x01	0x00	0x00	0x00	0x0B	0x01	0x5A	0x10
Data (2)	Data (3)	Data (4)	Data (5)	Data (6)	Data (7)	Data (8)	Checksum	
0x06	0x1E	0x16	0x00	0x0D	0xFF	0x00	0x1B	

10. Language

10.1 Language Parameters

The following commands are used to get/set scheduling parameters as it is defined below.

10.1.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0xC0 = Language – Get		Command requests the display to report its current Language

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0xC0	0x65

10.1.2 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0xC0 = Language – Report		Command report to the host controller the current language of the display.
DATA[1]	Language		0x00 = ENGLISH 0x01 = GERMAN 0x02= Simple Chinese 0x03 = FRENCH 0x04 = ITALIAN 0x05 = SPANISH 0x06 = RUSSIAN 0x07 = POLSKI 0x08 = TURKISH 0x09 = TRADITIONAL_CHINESE 0x0B= PORTUGUESE 0x0C = ARABIC 0x0D= DANISH 0x0E= SWEDISH 0x0F = FINNISH 0x10= NORWEGIAN 0x11= DUTCH 0x12 = Czech 0x13 = Romanian 0x14 = UKRAINIAN 0x15 = HUNGARIAN

*Languages highlighted in red do not support in NSD-xx03

Example: Current Language is SIMPLIFIED_CHINESE (Display address 01)

Header	Monitor	Categor	Page	Length	Data	Data[0]	Data[1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0xC0	0x02	0xE7

10.1.3 Message-Set

Bytes	Bytes Description	Bits	Description
DATA[0]	0xC1 = Language – Set		Command requests the display to set the specified language
DATA[1]	Language		0x00 = ENGLISH 0x01 = GERMAN 0x02= Simple Chinese 0x03 = FRENCH 0x04 = ITALIAN 0x05 = SPANISH 0x06 = RUSSIAN 0x07 = POLSKI 0x08 = TURKISH 0x09 = TRADITIONAL_CHINESE 0x0B= PORTUGUESE 0x0C = ARABIC 0x0D= DANISH 0x0E= SWEDISH 0x0F = FINNISH 0x10= NORWEGIAN 0x11= DUTCH 0x12 = Czech 0x13 = Romanian 0x14 = UKRAINIAN 0x15 = HUNGARIAN

*Languages highlighted in red do not support in NSD-xx03

Example: Set Language to ENGLISH (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0xC1	0x00	0x63

11.Anti_Burn_In

The command is used to set/get the AntburnInvalue.

11.1.1 Message-Get Anti Burn in

Bytes	Bytes Description	Bits	Description
DATA[0]	0xB1 = anti burn in – Get		Command requests the display to report its current

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0xB1	0x14

11.1.2 Message-Report Anti Burn In

Bytes	Bytes Description	Bits	Description
DATA[0]	0xB1 = Anti Burn In – Report		Command reports Anti Burn in Setting
DATA[1]	Off /secs		0x00 = Off 0x01 = 10 secs 0x02 = 20 secs 0x03 = 30 secs 0x04 = 40 secs ... 0x5A = 900 secs 0x5B = AUTO

Example: Current Display settings: Off and ?? secs (Display address 01)

Header	Monitor	Category	Page	Length	Data	Data[0]	Data[1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0xB1	0x00	0x94
0x21	0x01	0x00	0x00	0x04	0x01	0xB1	0x03	0x97

11.1.3 Message-Set Anti Burn In

Bytes	Bytes Description	Bits	Description
DATA[0]	0xB2 = Anti Burn In– Set		Command to change Anti Burn Insetting of the display
DATA[1]	Off /mins		0x00 = Off 0x01 = 10 secs 0x02 = 20 secs 0x03 = 30 secs 0x04 = 40 secs ... 0x5A = 900 secs 0x5B = AUTO

Example: Set the Display to the following: Anti Burn In 50 secs (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0xB2	0x05	0x15

12. Display Orientation

The command is used to set/get the Display Orientation.

12.1.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0xB3 = Orientation – Get		Command requests the display to report its current Display Orientation

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0xB3	0x16

12.1.2 Message-Report Display Orientation

Bytes	Bytes Description	Bits	Description
DATA[0]	0xB3 = Display Orientation– Report		Command reports Display Orientation
DATA[1]	Display Orientation		0x01 = Landscape (0) 0x02 = Portrait (180) 0x03 = (270)

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Example: The current orientation of the display is landscape (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0x01	0xB3	0x01	0x96

12.1.3 Message-Set

Bytes	Bytes Description	Bits	Description
DATA[0]	0xB4 = Orientation – Set		Command to change the Display Orientation of the display
DATA[1]	Display Orientation		0x01 = Landscape (0) 0x02 = Portrait (180) 0x03 = (270)

Example: Set the current display to Landscape (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0xB4	0x01	0x17

13. IR Remote Controller Functions

13.1 IR Remote Command

The command is used to send IR Key to Control display.

13.1.1 Message-Set

Bytes	Bytes Description	Bits	Description
DATA[0]	0xFD = IR Remote Command		Command to simulate the IR Remote to send IR Key to display
DATA[1]	IR KEY		0xA0: Power 0xA1: Menu 0xA2: Input 0xA3: Vol_Up 0xA4: Vol_Down 0xA5: Mute 0xA6: Cursor_Up 0xA7: Cursor_Down 0xA8: Cursor_Left 0xA9: Cursor_Right 0xB1: OK 0xB2: Return 0xB3: Setting 0xD1: Format 0xD2: Info

Example: Send Power Key (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0xFD	0xA0	0xFF

13.2 Audio Mute

This command is used to set the Volume Mute as it is defined as below.

13.2.1 Message – Set

Bytes	Bytes Description	Bits	Description
Data[0]	0x40 = Audio Mute - Set		Command to set the Audio Mute function of the display.
Data[1]	Audio Mute state		0x00 = Unmute Audio 0x01 = Audio Mute

Example: The monitor to enter the Audio mute - (Display address 01)

Header	Monitor ID	Category	Code [0]	Code [1]	Length	Data Control	Data [0]	Data [1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x40	0x01	0xE3

13.2.2 Message – Get

Bytes	Bytes Description	Bits	Description
Data [0]	0x41 = Audio Mute state - Get		Command requests the display to report its current Audio Mute.

Example: Get the Audio Mute state – (Display address 01)

Header	Monitor ID	Category	Code [0]	Code [1]	Length	Data Control	Data [0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x41	0xE4

13.2.3 Message – Get Report

Bytes	Bytes Description	Bits	Description
Data [0]	0x41 = Audio Mute state - Report		Command reports Audio Mute status.
Data [1]	Audio Mute status		0x00 = Unmute Audio 0x01 = Audio Mute

Example: The current Audio Mute is on - (Display address 01)

Header	Monitor ID	Category	Page	Length	Data Control	Data [0]	Data [1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0x41	0x01	0x65

13.3 Backlight Level

This command is used to set/get the Backlight level as it is defined as below.

13.3.1 Message-Get

Bytes	Bytes Description	Bits	Description
DATA[0]	0x31 = Backlight level – Get		Command requests the display to report its current Backlight level.

Example: (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x31	0x94

13.5.1 Message-Report

Bytes	Bytes Description	Bits	Description
DATA[0]	0x31 = Backlight level – Report		Command reports current Backlight level
DATA[1]	Backlight value		0 to 100 (0x00 ~ 0x64) of the user selectable range of the display.

Example: Backlight:90 (0x5A) (Display address 01)

Header	Monitor ID	Category	Page	Length	Control	Data[0]	Data[1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0x31	0x5A	0x4E

13.5.2 Message-Set

Bytes	Bytes Description	Bits	Description
DATA[0]	0x30 = Backlight level – Set		Command to change the Backlight level of the display.
DATA[1]	Backlight value		0 to 100 of the user selectable range of the display.

Example: Set Backlight:90 (0x5A) (Display address 01)

Header	Monitor ID	Category	Code0	Code1	Length	Data Control	Data[0]	Data[1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x30	0x5A	0XC8

13.4

Serial Code

13.4.1 Message-Get (0x15 = Serial Code)

Bytes	Bytes Description	Bits	Description
DATA[0]	0x15 = Serial Code Get		Command requests the display to report its Serial Code Number (Production code) 14 digits

Example: (Display address 01)

Header	Monitor ID	Category	Code 0	Code1	Length	Data Control	Data[0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x15	0xB0

13.4.2 Message-Report (0x15 = Serial Code)

Bytes	Bytes Description	Bits	Description
DATA[0]	0x15 = Serial Code – Report		Command reports Serial Code
DATA[1]	1 st Character		Character acc. ASCII character map (HEX)
DATA[2]	2 nd Character		
DATA[3]	3 rd Character		
DATA[14]	14 th Character		Character acc. ASCII character map (HEX)
DATA[16]	16 th Character		Character acc. ASCII character map (HEX)

Example: Current Display settings: Serial Code = PDQ65AB123456789

(Display address 01)

Header	Monitor ID	Category	Page	Length	Control	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]
0x21	0x01	0x00	0x00	0x13	0x01	0x15	0x50	0x44	0x51	0x36
Data[5]	Data[6]	Data[7]	Data[8]	Data[9]	Data[10]	Data [11]	Data[12]	Data[13]	Data[14]	Data[15]
0x35	0x41	0x42	0x31	0x32	0x33	0x34	0x35	0x36	0x37	0x38
Data[16]	Checksum									
0x39	0x53									

13.6 Brightness

This command is used to set/get the video brightness level as it is defined as below.

13.6.1 Message – Set

Bytes	Bytes Description	Bits	Description
Data [0]	0x68 = Brightness - Set		Command to change the video brightness level of the display.
Data [1]	Video Brightness		0x00 ~ 0x64 (0 ~ 100) of the user selectable range of the display. OSD: 0 (0x00); OSD: 50 (0x32); OSD: 100 (0x64)

Example: Brightness – Set Brightness to 50 - 0x32 (Display address 01)

Header	Monitor ID	Category	Code [0]	Code [1]	Length	Data Control	Data [0]	Data [1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0x68	0x32	0xF8

13.6.2 Message – Get

Bytes	Bytes Description	Bits	Description
Data [0]	0x69 = Brightness - Get		Command requests the display to report its current video brightness level.

Example: Brightness - Get (Display address 01)

Header	Monitor ID	Category	Code [0]	Code [1]	Length	Data Control	Data [0]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x03	0x01	0x69	0xCC

13.6.4 Message – Get Report

Bytes	Bytes Description	Bits	Description
Data [0]	0x69 = Brightness - Report		Command reports video brightness level.
Data [1]	Video Brightness		0x00 ~ 0x64 (0 ~ 100) of the user selectable range of the display. OSD: 0 (0x00); OSD: 50 (0x32); OSD: 100 (0x64)

Example: Brightness – Get Brightness value: 50 - 0x32 (Display address 01)

Header	Monitor ID	Category	Page	Length	Data Control	Data [0]	Data [1]	Checksum
0x21	0x01	0x00	0x00	0x04	0x01	0x69	0x32	0x7E

13.8 System Power Down

This command is used to set the **System Down** parameters as it is defined as below.

13.8.1 Message – Set

Bytes	Bytes Description	Bits	Description
Data [0]	0xAA = System Down - Set		Command to change the System Down parameters of the display.
Data [1]	System Down		0x01 = System Down

Example: **System** - Set to Down ON – 0x01 (Display address 01)

Header	Monitor ID	Category	Code [0]	Code [1]	Length	Data Control	Data [0]	Data [1]	Checksum
0xA6	0x01	0x00	0x00	0x00	0x04	0x01	0xA8	0x01	0x0B

When System Down after can't get/Set any command via LAN/RS232

13. Command summary

Command name	Set Command	Get Command	Command Code	Remarks	High Priority
Communication Control	√	√	0x00	Generic report	
Platform and version labels		√	0xA2		
Model name & FW version & build date		√	0xA1		v
Power state get		√	0x19	Sleep	v
Power state set	√		0x18	Sleep	v
User Input Control get		√	0x1D		
User Input Control set	√		0x1C		
Input Source set	√		0xAC		v
Current Source get		√	0xAD		v
Color temperature get		√	0x35		
Color temperature set	√		0x34		
Picture Format get		√	0x3B		
Picture Format set	√		0x3A		
Volume get		√	0x45		v
Volume set	√		0x44		v
Miscellaneous info		√	0x0F	Operating hours	
Scheduling get		√	0x5B		v
Scheduling set	√		0x5A		v
Language get		√	0xC0		
Language set	√		0xC1		
Anti Burn In Get		√	0xB1		v
Anti Burn in Set	√		0xB2		v
Display Orientation – get		√	0xB3		
Display Orientation – set	√		0xB4		
Audio Mute Set	√		0x40		
Audio Mute Get		√	0x41		
IR Remote Control	√		0xFD		
Backlight Level get		√	0x31		v
Backlight Level set	√		0x30		v
Serial Code Get		√	0x15		v
Brightness get		√	0x69		
Brightness set	√		0x68		
System Down	√		0xAA		

Revision History

Date	Version	Description
2024/1/5	V1.0	AGN-提供初版Command list
2024/1/16	V2.0	AGN-針對Command Summary做調整，新增/刪減標示為藍字
2024/3/7	V3.0	AGN-針對language set/get新增及刪減語言
2024/3/11	V4.0	AGN-新增IR remote controller的command set-> source及setting兩個
2024/3/12	V5.0	AGN-調整IR remote controller的command set-> setting
2025/3/20	V6.0	AGN-調整Messages-General的Message-Ropet->Power Stste -> sleep AGN-調整Messages-General的Message-Set->Power Stste -> sleep