SEC- VD- DSW Multiple Display Control - 0008

Ver. 1.1

2011- 09- 26

Multiple Display Control Protocol

for SyncMaster 400EX(n)
460EX(n)
550EX(n)

SAMSUNG

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Status : Prepared
Subject : Technical Writer, Programmer, Developer
Outline : Protocol type document of Multiple Display Control 1.0
History :

Version	Date	Content	Prepared by	Compared by
1.0	**2010. 05. 06**	**Make New Document for LED LFD (400EXn,460EXn,550EXn) (refer "MDC_SyncMaster_CXn-2_DXn-2_UXn-2_650MP_Protocol_Ver-32-eng.pdf")**	**J.H. Jeong**	
1.1	**2010. 11. 30**	**Add a connecting type (Ethernet)**	**T.H. Kim**	
	2011. 09. 26	**Add models**	**T.H. Kim**	

1. INTERFACE

1.1. Connecting Method

There are 2 available ways of connecting. one is RS232, the other is RJ45.

1) Connecting method(with RS232)

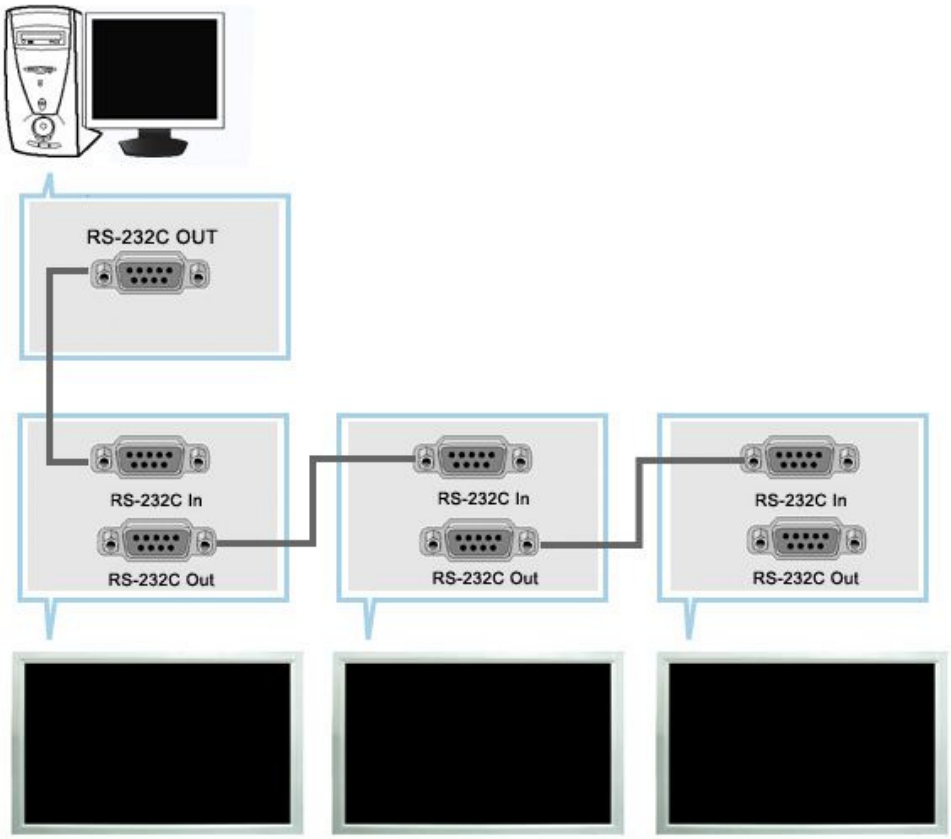
- As of Figure 1-1, connect RS232-In(9Pin) to Personal Computer, connect the next TV of Display to be connected from RS232-Out (9Pin).

- In doing so, each TV or Monitor ID can be given from 0 to 99.

- ID cannot be given duplicated.

- When granting ID, it does not need to be given out in the connecting order.

Figure1-1 PC,TV or Monitor connecting method(with RS232)



2) Connecting method(with RJ45)

- There are several ways to connect Personal Computer and TV(or Monitor).

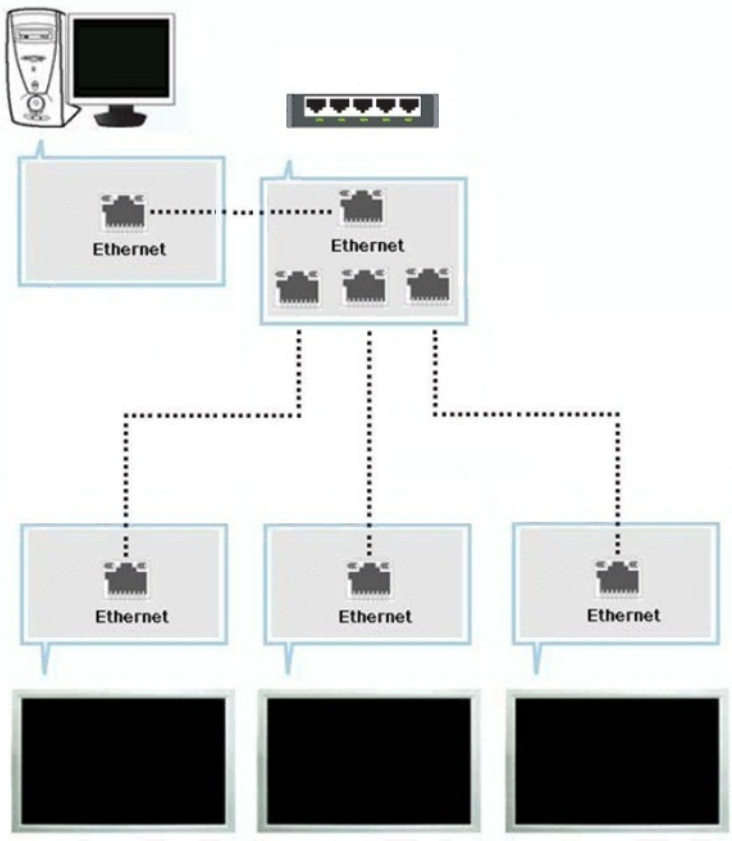
- As of Figure 1-2, connect Hub and Personal Computer(using Ethernet). connect each TV of Display to be connected to the Hub.

- In doing so, each TV or Monitor must have an IP address.

- TV or Monitor connected by protocol's IP address must have the same ID with the protocol's ID.

- Each TV or Monitor ID can be duplicated.

Figure1-2 PC,TV or Monitor connecting method(with RJ45)



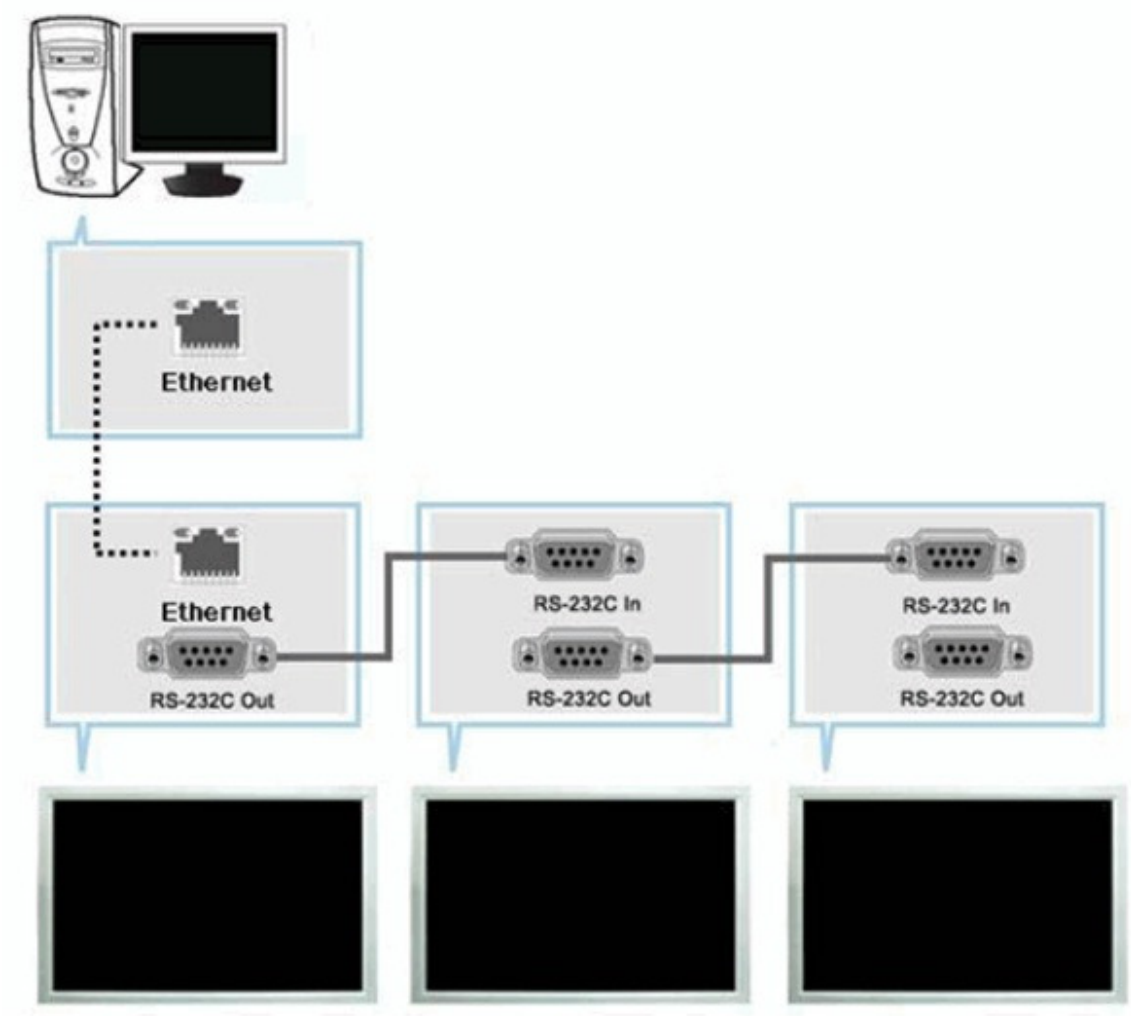
- As of Figure 1-3, connect TV and Personal Computer(using Ethernet), connect the next TV of Display to be connected from RS232-Out (9Pin).

- In doing so, only TV(connected to Personal Computer) needs an IP address. and each TV or Monitor ID can be given from 0 to 99.

- ID cannot be given duplicated.

- When granting ID, it does not need to be given out in the connecting order.

Figure1-3 PC,TV or Monitor connecting method(with RJ45)



1.2. Connection Spec.

1) RS232 Connection Spec.

- Interactive communications using RS232.

- Of RS232 standards, three signals RxD(No.2), TxD(No.3) and GND(No.5) are used → Refer to Figure 1

- Limit the distance between devices to less than 4m.

- Currently, out of 9 PIN RS232 terminal, PINS in use are numbers 2, 3 and 5.

- **ID should show hexadecimal value of assigned ID, but ID 0 should be 0xFF.**

- **Every communication will be made in hexadecimals and Checksum is the sum of all remainings. If it exceeds two digits, for example, it is 11+FF+01+01=112, discard the number in the first digit like below.**

example) Power On & ID=0

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x11		1	**Power**	

→

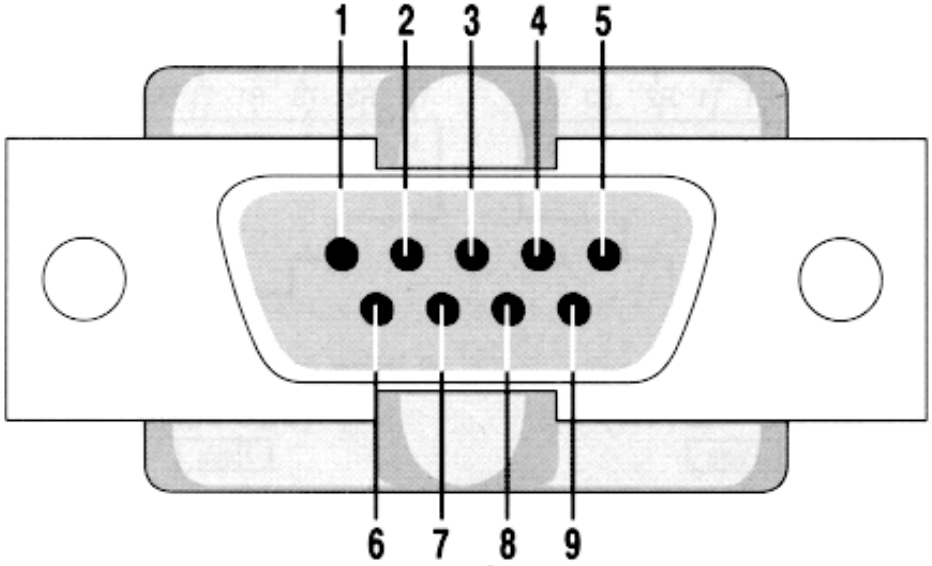
Header	Command	0xFF	Data Length	Data 1	12
0xAA	0x11		1	**1**	

- **If you want to control every mechanism connected with Serial Cable regardless of its ID, set ID part to "0xFE" and send commands. At the time, each SET will follow commands but it will not respond with ACK.**

Table 2-1 RS232 Network spec

Bits Rate	9600 bps
Data Bits	8 bits
Parity	None
Stop Bits	1 bit
Flow Control	None

Figure 2-1 RS-232 pin out DB-9 pin used for Asynchronous Data



Pin	Signal	Pin	Signal
1	Data Carrier Detect	6	Data Set Ready
2	Received Data	7	Request to Send
3	Transmitted Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicator
5	Signal Ground		

2) RJ45 Connection Spec.

- Interactive communications using RJ45.

- Transmit the MDC protocol using TCP/IP Format. the protocol information is stored in data area.

- The protocol information format is the same as RS232's.

example) Power On & ID=0

Header	Command	ID	Data Length	Data1	Checksum
0xAA	0x11		1	Power	

TCP		UDP	
IP	ICMP	ARP	RARP
Hardware Interface(Ethernet, PPP etc.)			

→

Header	Command	0xFF	Data Length	Data1	12
0xAA	0x11		1	1	

TCP		UDP	
IP	ICMP	ARP	RARP
Hardware Interface(Ethernet, PPP etc.)			

- default ip : 192.168.0.10 PORT : 1515

- The RJ45 plug has 8-Pins as below.

Table 2-2 RJ45 plug 8-Pins

RJ45 PIN#	Wire Color(T568A)	10Base-T Signal 100Base-TX Signal	1000Base-T Signal
1	White/Green	Transmit+	BI_DA+
2	Green	Transmit-	BI_DA-
3	White/Orange	Receive+	BI_DB+
4	Blue	Unused	BI_DC+
5	White/Blue	Unused	BI_DC-
6	Orange	Receive-	BI_DB-
7	White/Brown	Unused	BI_DD+
8	Brown	Unused	BI_DD-

2. Commanding words

No	Command Type	Command	Value Range
1	Status Control	0x00	-
2	Time Control	0x01	-
3	On Time Control	0x02	-
4	Off Time Control	0x03	-
5	Video Control	0x04	-
6	Audio Control	0x05	-
7	RGB Control	0x06	-
8	PIP Status Control	0x07	-
9	Maintenance Control	0x08	-
10	Serial Number Control	0x0B	-
11	Display Status Control	0x0D	-
12	Software Version Control	0x0E	-
13	Auto Motion Plus	0x0F	
14	Model Number Control	0x10	-
15	Power Control	0x11	0 ~ 1
16	Volume Control	0x12	0 ~ 100
17	Mute Control	0x13	0 ~ 1
18	Input Source Control	0x14	-
19	Picture sizes Control	0x15	-
20	Direct Channel Control	0x17	-
21	Screen Mode Control	0x18	-
22	Screen Size Control	0x19	0 ~ 255
23	Red Offset Control	0x1A	0 ~ 100
24	Green Offset Control	0x1B	0 ~ 100
25	Blue Offset Control	0x1C	0 ~ 100
26	MDC Connection Type	0x1D	
27	Image Retention Free	0x1E	
28	Contrast Control	0x24	0 ~ 100
29	Brightness Control	0x25	0 ~ 100
30	Sharpness Control	0x26	0 ~ 100

31	Color Control	0x27	0 ~ 100
32	Tint Control	0x28	0 ~ 100
33	Red Gain Control	0x29	0 ~ 100
34	Green Gain Control	0x2A	0 ~ 100
35	Blue Gain Control	0x2B	0 ~ 100
36	Treble Control	0x2C	0 ~ 100
37	Bass Control	0x2D	0 ~ 100
38	Coarse Control	0x2F	0 ~ 1
39	Fine Control	0x30	0 ~ 1
40	H-Position Control	0x31	0 ~ 1
41	V-Position Control	0x32	0 ~ 1
42	Clear Menu Control	0x34	0
43	Remote Control	0x36	0 ~ 1
44	RGB Contrast Control	0x37	0 ~ 100
45	RGB Brightness Control	0x38	0 ~ 100
46	PIP On/Off Control	0x3C	0 ~ 1
47	Auto Adjustment Control	0x3D	0
48	Color Tone Control	0x3E	0 ~ 4
49	Color Temperature Control	0x3F	0 ~ 10
50	PIP Source Control	0x40	-
51	Main-PIP Swap Control	0x41	0 ~ 1
52	PIP Size Control	0x42	-
53	PIP Locate Control	0x43	0 ~ 4
54	Sound Select Control	0x47	0 ~ 1
55	Pixel Shift Control	0x4C	-
56	Video Wall Control	0x4F	-
57	Auto Lamp Control	0x57	-
58	Manual Lamp Control	0x58	0 ~ 100
59	Safety Screen Run Control	0x59	0 ~ 6
60	Safety Screen Control	0x5B	-
61	Video Wall Mode Control	0x5C	0 ~ 1
62	Safety Lock	0x5D	0 ~ 1
63	Panel Lock	0x5F	0 ~ 1
64	Channel Up/Down	0x61	

65	OSD On/OFF	0x70	0 ~ 1
66	P. Mode Control	0x71	-
67	S. Mode Control	0x72	0 ~ 4
68	NR Mode Set	0x73	0 ~ 1
69	PC Color Tone Control	0x75	0 ~ 3
70	Auto AutoAdjustment Enable/Disable	0x76	0 ~ 1
71	All Keys Lock	0x77	0 ~ 1
72	SRS TSXT Control	0x78	0 ~ 1
73	Film Mode	0x79	0 ~ 1
74	Signal Balance	0x7A	0 ~ 1
75	SB Gain	0x7E	0 ~ 100
76	SB Red Gain	0x7B	0 ~ 100
77	SB Green Gain	0x7C	0 ~ 100
78	SB Blue Gain	0x7D	0 ~ 100
79	SB Sharpness	0x7F	0 ~ 100
80	Panel On Time	0x83	-
81	Video Wall On	0x84	0 ~ 1
82	Temperature Control	0x85	0 ~ 125
83	Brightness Sensor	0x86	0 ~ 1
84	Dynamic Contrast	0x87	0 ~ 1
85	Safety Screen On	0x88	1 ~5
86	Video Wall User Control	0x89	-
87	Model Name	0x8A	-
88	HDMI Black Level Control	0x94	
89	RJ45 setting refresh	0xA2	
90	Timer1 Control	0xA4	
91	Timer2 Control	0xA5	
92	Timer3 Control	0xA6	
93	Clock Control	0xA7	
94	Holiday Add/Delete Control	0xA8	
95	Holiday Get Control	0xA9	
96	Panel On/Off	0xF9	0 ~ 1

"-" indicates multiple setting items-refer to "2.1. Command Detailed Explanation" for more details.

2.1. Command Detailed Explanation

* Status Control

- Function

  Personal Computer shows current setting condition of TV / Monitor.

- Get Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x00		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	
0xAA	0xFF		9	'A'	0x00	**Power**	**Volume**	

Val 3	Val 4	Val 5	Val 6	Val 7	Check Sum
Mute	**Input**	**Aspect**	**N Time NF**	**F Time NF**	

Power : Power code to be set on TV / Monitor

Volume : Volume value code (0 ~ 100) to be set on TV / Monitor

Mute : Mute code to be set on TV / Monitor

Input : Input Source code to be set on TV/Monitor

Aspect : Image Size code to be set on TV/Monitor

N Time NF : OnTime ON/OFF value of time to set TV/Monitor(old type Timer)

F Time NF : OffTime ON/OFF value of time to set TV/Monitor(old type Timer)

→ **It was supported for old type Timer. Now, It is always 0x00.**

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x00	**ERR**	

ERR : Error code that shows what occurred error is

0	Check Sum Error
1	etc.

* Video Control (ATV, DTV, AV, S-Video, Component, HDMI Only)

- Function

  Personal Computer shows the screen condition of TV / Monitor.

- Get Video Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x04		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2
0xAA	0xFF		0x0A	'A'	0x04	**Contrast**	**Brightness**

Val 3	Val 4	Val 5	Val 6	Val 7	Val 8	Check Sum
Sharpness	**Color**	**Tint**	**ColorTone**	**ColorTemp**	**0**	

Contrast, Brightness, Sharpness, Color, Tint, ColorTone, ColorTemp :
Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x04	**ERR**	

ERR : Error code that shows what occurred error is

* Audio Control

- Function

  Personal Computer shows the sounds condition of TV / Monitor.

- Get Audio Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x05		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2
0xAA	0xFF		0x05	'A'	0x05	**Treble**	**Bass**

Val 3	Check Sum
Balance	

Treble, Bass, Balance : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x05	**ERR**	

ERR : Error code that shows what occurred error is

* RGB Control (PC, BNC, DVI Only)

- Function

  Personal Computer shows screen condition of TV / Monitor.

- Get Video Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x06		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2
0xAA	0xFF		0x0A	'A'	0x06	**Contrast**	**Brightness**

Val 3	Val 4	Val 5	Val 6	Val 7	Val 8	Check Sum
ColorTone	**ColorTemp**	**0**	**Red Gain**	**Green Gain**	**Blue Gain**	

Contrast, Brightness, ColorTone, ColorTemp, Red, Green, Blue : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x06	**ERR**	

ERR : Error code that shows what occurred error is

* PIP Status Control

- Function

  The PC displays the PIP settings of a TV or monitor.

- Get the PIP Status

Header	Command	ID	Data Length	Checksum
0xAA	0x07		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	
0xAA	0xFF		6	'A'	0x07	**P.Size**	**P.Source**	

Val 3	Val 4	Checksum
0	**0**	

P.Size: The PIP size code set for the TV or monitor.

0x00	PIP Off
0x06	Large
0x08	Small
0x04	Double 1
0x05	Double 2
0x09	Double 3

P.Source: The PIP source code set for the TV or monitor.

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'N'	0x07	**ERR**	

ERR: The error code indicating which error occurred.

* Maintenance Control

- Function

  Personal Computer shows maintenance state of TV / Monitor.

  - Get Maintenance Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x08		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2
0xAA	0xFF		0x15	'A'	0x08	**Power**	**P.Size**

Val 3	Val 4	Val 5	Val 6	Val 7	Val 8	Val 9	Val 10
P.Source	**LMax_H**	**LMax_M**	**LMax_AP**	**LMaxValue**	**LMin_H**	**LMin_M**	**LMin_AP**

Val 11	Val 12	Val 13	Val 14	Val 15	Val 16
LMinValue	**LampValue**	**ScreenInterval**	**ScreenTime**	**ScreenType**	**V.Wall**

Val17	Val 18	Val19	Check Sum
V.WallFormat	**V.WallDivid**	**V.WallSet**	

Power : Power code set on TV / Monitor
P.Size : P.Size value code set on TV / Monitor
P.Source : Source value code set on TV / Monitor
LMax_H : Auto Lamp Max Time Hour (1 ~ 12) set on TV / Monitor
LMax_M : Auto Lamp Max Time Minute (0 ~ 59) set on TV / Monitor
LMax_AP : Auto Lamp Max Time AM/PM set on TV / Monitor
LMaxValue : Auto Lamp Max value (0 ~ 100) set on TV / Monitor
LMin_H : Auto Lamp Min Time Hour (1 ~ 12) set on TV / Monitor
LMin_M : Auto Lamp Min Time Minute (0 ~ 59) set on TV / Monitor
LMin_AP : Auto Lamp Min Time AM/PM set on TV / Monitor
LMinValue : Auto Lamp Min value (0 ~ 100, 0xFF) set on TV / Monitor
LampValue : Manual Lamp Control value (0 ~ 100, 0xFF) set on TV / Monitor
ScreenInterval : Safety Screen Interval (Per Hour, 0(0ff)~10) set on TV / Monitor
ScreenTime : Safety Screen Time (Per Second, 0(off) ~5) set on TV / Monitor
ScreenType : Safety Screen Type (3 ~ 6) set on TV / Monitor
V.Wall : Video Wall Mode code set on TV / Monitor
V.WallFormat : Video Wall Format code set on TV / Monitor
V.WallDivid : Video Wall Divider code set on TV / Monitor
V.WallSet : Video Wall Set Number code set on TV / Monitor
Caution : If LMinValue is **Returned to 0xFF** then Auto Lamp Control is OFF.
If LampValue is **Returned to 0xFF** then Manual Lamp Control is OFF.

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x08	**ERR**	

ERR : Error code that shows what occurred error is

* Serial Number Control

- Function

  Personal Computer controls serial number of TV / Monitor.

- Get SerialNum Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x0B		0	

- Ack SerialNum

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2
0xAA	0xFF		**0x14**	'A'	0x0B	**Data1**	**Data2**

Val 3	Val 4	Val 5	Val 6	Val 7	Val 8	Val 9	Val 10
Data3	**Data4**	**Data5**	**Data6**	**Data7**	**Data8**	**Data9**	**Data10**

Val 11	Val 12	Val 13	Val 14
Data11	**Data12**	**Data13**	**Data14**

Val 11	Val 12	Val 13	Val 14	Check Sum
Data15	**Data16**	**Data17**	**Data18**	

Data1 ~ Data14 : Serial Number set on TV / Monitor.

Data15 ~ Data18 : Reserved

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x0B	**ERR**	

ERR : Error code that shows what occurred error is

* Display Status Control

- Function

  Personal Computer shows display condition of TV / Monitor.

- Get Maintenance Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x0D		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2
0xAA	0xFF		**0x08**	'A'	0x0D	**Lamp**	**Temperature**

Val 3	Val 4	Val 5	Val 6	Check Sum
Bright_Sensor	**No_Sync**	**Cur_Temp**	**FAN**	

Lamp : Lamp Error code (0 : Normal, 1 : Error) to be set on TV / Monitor

Temperature : Temperature Error code (0: Normal, 1: Error) to be set on TV / Monitor

Bright_Sensor : Brighte Sensor Error code (0: Normal, 1: Error) to be set on TV/Monitor

No_Sync: Sync Error code(0: Normal, 1: Error, No Sync) to be set on TV / Monitor

Cur_Temp : Current temperature of TV / Monitor

FAN : Fan Error code (0 : Normal, 1 : Error) to be set on TV / Monitor

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x0D	**ERR**	

ERR : Error code that shows what occurred error is

* SW Version Control

- Function

  Personal Computer shows version information of TV / Monitor.

- Get Version Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x0E		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2
0xAA	0xFF		**0x14**	'A'	0x0E	**Version1**	**Version2**

Val 3	Val 4	Val 5	Val 6	Val 7	Val 8	Val 9	Val 10
Version3	**Version4**	**Version5**	**Version6**	**Version7**	**Version8**	**Version9**	**Version10**

Val 11	Val 12	Val 13	Val 14	Val 15	Val 16
Version11	**Version12**	**Version13**	**Version14**	**Version15**	**Version16**

Val 17	Val 18	Check Sum
Version17	**Version18**	

Version1 ~ **Version12** : Project Info. of TV/Monitor

Version13 ~ Version18 : Software version of TV/Monitor

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x06	**ERR**	

ERR : Error code that shows what occurred error is

Auto Motion Plus

- Function

  Personal Computer controls the Auto Motion Plus that TV / Monitor.

  (It is dependent on Product Specifications- 120Hz Panel.)

- Get Auto Motion Plus Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x0F		0x00	

- Set Auto Motion Plus Status

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Check Sum
0xAA	0x0F		0x03	**Mode**	**Blur Reduction**	**Judder Reduction**	

Mode :

0x00	Off
0x01	Clear
0x02	Standard
0x03	Smooth
0x04	Custom
0x05	Demo

Blur reduction:

It is only for "Mode: Custom". If "Mode" is not custom, then it is "don't care".

0 ~ 10

Judder reduction:

It is only for "Mode: Custom". If "Mode" is not custom, then it is "don't care".

0 ~ 10

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	Val 3	Check Sum
0xAA	0xFF		0x05	'A'	0x0F	**Mode**	**Blur Reduction**	**Judder Reduction**	

Mode : Same as above

Blur Reduction, Judder Reduction :

For Set command Type, Data2 and Data3 is same with Set command.

For Get command Type, Date2 and Data2 is LFD's Value.(even If "Mode" is not custom.)

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0x0F	**ERR**	

ERR : Error code that shows what occurred error is

* Model Number Control

- Function

  Personal Computer shows Model Number of TV / Monitor.

- Get Model Number Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x10		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	Val 3	Check Sum
0xAA	0xFF		0x05	'A'	0x10	**Species**	**Model**	**TV**	**0**

Species : TV / Monitor 's Panel Type.

0x01	PDP
0x02	LCD
0x03	DLP

Model : TV / Monitor's Model Number.

0x01	PPM50H2	0x15	SyncMaster 400DX(n) SyncMaster 460DX(n) SyncMaster 700DX(n) SyncMaster 820DX(n)
0x02	PPM42S2		
0x03	PS-42P2ST		
0x04	PS-50P2HT		
0x05	SyncMaster 400T	0x16	SyncMaster 460TX(n)
0x06	SyncMaster 403T	0x17	SyncMaster 400UX(n) SyncMaster 460UX(n)/460DR(n)
0x07	PPM42S3, SPD-42P3SM		
0x08	PPM50H3, SPD-50P3HM	0x18	SyncMaster 42TS/42PS SyncMaster P42HP
0x09	PPM63H3, SPD-63P3HM		
0x0A	PS-42P3ST	0x19	SyncMaster P50Hn
0x0B	SyncMaster 323T	0x1A	SyncMaster P50F(n)/P50FP
0x0C	SyncMaster 403T - CT40CS(N)	0x1B	SyncMaster P63F(n)/P63FP
		0x1C	SyncMaster 320MX(n)
0x0D	PPMxxM5x	0x1D	SyncMaster 400CX(n) SyncMaster 400MX(n) SyncMaster 400MP(n)
0x0E	SyncMaster 320P(n) SyncMaster 400P(n) SyncMaster 460P(n)		
		0x20	SyncMaster 460CX(n) SyncMaster 460MP(n)
0x10	SyncMaster 320PX SyncMaster 400PX(n) SyncMaster 460PX(n)	0x21	SyncMaster 520DX(n)
		0x22	SyncMaster 400UXn-UD SyncMaster 460UXn-UD
0x13	SyncMaster 400TX(n)		
0x14	SyncMaster 570DX	0x23	SyncMaster 400FX(n)
0x15	SyncMaster 320DX	0x24	SyncMaster 460DRn-A

0x25	SyncMaster 460UTn-UD	0x26	SyncMaster 460UT(n)
0x27	SyncMaster 320MX(n)-2/MP-2	0x28	SyncMaster 400MX(n)-2/FP(n)-2
0x29	SyncMaster 460MX(n)-2/FP(n)-2	0x2A	SyncMaster P42H-2
0x2B	SyncMaster P50HP	0x2C	SyncMaster P50FP
0x2D	SyncMaster P63FP	0x2E	SyncMaster 460Rn-S
0x2F	SyncMaster 400DXn-S	0x30	SyncMaster 460DXn-S
0x31	SyncMaster 400CX(n)-2/460CX(n)-2	0x32	SyncMaster 400DX(n)-2/460DX(n)-2/700DX(n)-2/820DX(n)-2 SyncMaster 650MP(n)
0x33	SyncMaster 400UX(n)-2/ SyncMaster 460UX(n)-2	0x34	SyncMaster 700DRn
0x35	SyncMaster 230TSn/230MXn	0x36	SyncMaster 460DMn
0x37	SyncMaster 400UXn-UD2/460UXn-UD2	0x38	SyncMaster P50HP-2
0x39	SyncMaster P63FP-2	0x3A	400EXn
0x3B	460EXn	0x3C	550EXn
0x3D	SyncMaster 460UT(n)-2	0x3E	SyncMaster 550DX(n)
0x3F	SyncMaster 460CX(n)-3 / SyncMaster 400CX(n)-3 / SyncMaster 320CX(n)-3	0x40	SyncMaster 520LD
0x41	SyncMaster 400BX / SyncMaster 460/400 UX(n)-3	0x42	SyncMaster 460/400 TS(n)-3
0x43	SyncMaster 460UT(n)-UD2	0x44	UE46A/UE55A / ME40A/ME46A/ME55A
0x45	SyncMaster UD55A SyncMaster 320MX-3 SyncMaster 700DX-3 SyncMaster 820DX-3 SyncMaster 460DR		

TV : TV / Monitor's TV support/not support.

0x00	TV not supported
0x01	TV supported

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x10	**ERR**	

ERR : Error code that shows what occurred error is

* Power Control

- Function

  Personal Computer turns TV / Monitor power ON/OFF.

- Get Power ON/OFF Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x11		0	

- Set Power ON/OFF

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x11		1	**Power**	

Power : Power code to be set on TV / Monitor

1	Power ON
0	Power OFF

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x11	**Power**	

Power : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x11	**ERR**	

ERR : Error code that shows what occurred error is

* Volume Control

- Function

  Personal Computer changes volume of TV / Monitor.

- Get Volume Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x12		0	

- Set Volume

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x12		1	**Volume**	

Volume : Volume value code to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x12	**Volume**	

Volume : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x12	**ERR**	

ERR : Error code that shows what occurred error is

* Mute Control

- Function

  Personal Computer turns TV / Monitor mute ON/OFF.

- Get Mute ON/OFF Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x13		0	

- Set Mute ON/OFF

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x13		1	**Mute**	

Mute : Mute code to be set on TV / Monitor

1	Mute ON
0	Mute OFF

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x13	**Mute**	

Mute : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x13	**ERR**	

ERR : Error code that shows what occurred error is

* Input Source Control

- Function

  Personal Computer changes input source of TV / Monitor.

- Get Input Source Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x14		0	

- Set Input Source

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x14		1	**Input**	

Input : Input Source code to be set on TV / Monitor

0x14	PC
0x1E	BNC
0x18	DVI
0x0C	AV
0x04	S-Video
0x08	Component
0x20	MagicNet
0x1F	DVI_VIDEO
0x30	RF(TV)
0x40	DTV
0x21	HDMI
0x22	**HDMI_PC**

Caution : **DVI_VIDEO, HDMI_PC → Get Only**

In the case of MagicNet, only possible with models include MagicNet.

In the case of TV, only possible with models include TV.

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x14	**Input**	

Input : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x14	**ERR**	

ERR : Error code that shows what occurred error is

* Picture Size Control

- Function

  Personal Computer changes Picture Size of TV / Monitor.

  Cannot control when Video Wall is on.

- Get Picture Size Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x15		0	

- Set Picture Size

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x15		1	**Aspect**	

Aspect : Picture Size code to be set on TV / Monitor

PC1, PC2, DVI, BNC,HDMI_PC	
0x10	16 : 9
0x18	4 : 3
AV, S-VIdeo, Component,DVI_Video,HDMI_Video	
0x00	Auto Wide
0x01	16 : 9
0x04	Zoom
0x05	Zoom1
0x06	Zoom2
0x09	**Just Scan**
0x31	Wide Zoom
0x0B	4 : 3
0x0C	**Wide Fit**

Caution :**For some Image, Picture sizes are not supported depending on some input signals (720p, 1080i).**

For MFM model only possible for those include Europe TV if size is Auto Wide.

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x15	**Aspect**	

Aspect : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x15	**ERR**	

ERR : Error code that shows what occurred error is

* Direct Channel Control (DTV)

Caution : Only works with models include TV.

- Function

  Personal Computer can control TV Channel.

- Get Channel

Header	Command	ID	Data Length	Check Sum
0xAA	0x17		0	

- Set Channel

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Data 4
0xAA	0x17		0x0A	**Country**	**ATV_DTV**	**AirCable**	**CH_NUM (Hgh)**

Data 5	Data 6	Data 7	Data 8	Data 9	Data 10	Check Sum
CH_NUM (Low)	**Sel_Minor**	**Minor_CH (Hgh)**	**Minor_CH (Low)**	**Reserved**	**Reserved**	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2
0xAA	0xFF		0x0C	'A'	0x17	**Country**	**ATV_DTV**

Val 3	Val 4	Val 5	Val 6	Val 7	Val 8	Val 9
AirCable	**CH_NUM (Hgh)**	**CH_NUM (Low)**	**Sel_Minor**	**Minor_CH (Hgh)**	**Minor_CH (Low)**	**Reserved**

Val 10	Check Sum
Reserved	

Country : Select the country to be set on TV / Monitor (0 : Korea, 1: USA, ...)

ATV_DTV : Select Analog TV and DTV to be set on TV / Monitor (0 : Analog TV, 1: Digital TV)

AirCalbe : Select if TV is cabled or general (0 : general, 1: cabled)

CH_NUM : TV channel number to be set on TV / Monitor (Analog TV : 1 ~ 135 , Digital TV : 0 ~ 999)

Sel_Minor : Select minor channel when DTV is to be set on TV / Monitor(0 : minor channel not selected. 1: minor channel selected.)

Minor_CH : Select minor channel number when DTV is to be set on TV / Monitor (0 ~ 999.)

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check

0xAA	0xFF		3	'N'	0x17	**ERR**	Sum

ERR : Error code that shows what occurred error is

* *Screen Mode Control*

- Function

  Personal Computer changes screen mode of TV

  Cannot control when Video Wall is on and only operates when Picture Size is Auto Wide.

  Caution : Only works with models include TV.

- Get Screen Mode Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x18		0	

- Set Picture Size

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x18		1	**ScrMode**	

ScrMode : Screen Mode Code to be set on TV / Monitor

0x01	16 : 9
0x04	Zoom
0x31	Wide Zoom
0x0B	4 : 3

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x18	**ScrMode**	

ScrMode : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x18	**ERR**	

ERR : Error code that shows what occurred error is

* *Screen Size Control*

- Function

  Personal Computer recognizes the screen size of TV / Monitor.

- Get Screen Size Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x19		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x19	**Screen Size**	

Screen Size : Screen size of TV / Monitor (Range: 0 ~ 255, Unit: Inch)

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x19	**ERR**	

ERR : Error code that shows what occurred error is

* *Red Offset Control*

- Function

  Personal Computer changes R Offset from Signal Control function of TV / Monitor.

  ※ Signal Control R Offset Control only operates when Signal Balance is on and current input source is PC and BNC.

- Get Signal Control R Offset Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x1A		0	

- Set Signal Control R Gain

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x1A		1	**R Offset**	

R Offset : R Gain value to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x1A	**R Offset**	

R Offset : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x1A	**ERR**	

ERR : Error code that shows what occurred error is

* *Green Offset Control*

- Function

  Personal Computer changes G Offset from Signal Control function of TV / Monitor.

  ※ Signal Control G Offset Control only operates when Signal Balance is on and current input source is PC and BNC.

- Get Signal Control G Offset Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x1B		0	

- Set Signal Control G Gain

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x1B		1	**G Offset**	

G Offset : G Offset value to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x1B	**G Offset**	

G Offset : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x1B	**ERR**	

ERR : Error code that shows what occurred error is

* *Blue Offset Control*

- Function

  Personal Computer changes B Offset from Signal Control function of TV / Monitor.

  ※ Signal Control B Offset Control only operates when Signal Balance is on and current input source is PC and BNC.

- Get Signal Control B Offset Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x1C		0	

- Set Signal Control B Offset

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x1C		1	**B Offset**	

B Offset : B Offset value to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x1C	**B Offset**	

B Offset : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x1C	**ERR**	

ERR : Error code that shows what occurred error is

MDC Connection Type

- Function

  Personal Computer get MDC Connection Type of TV / Monitor.

  (It is dependent on Product Specifications- RJ45 MDC Connection)

  (It is Get Commnad Only.)

- Get MDC Connection Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x1D		0x00	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'A'	0x1D	**Connection Type**	

Connection Type

0x00	RS232C MDC
0x01	RJ45 MDC

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0x1D	**ERR**	

ERR : Error code that shows what occurred error is

Image Retention Free

- Function

  Personal Computer turns TV / Monitor Image Retention Free ON/OFF.

  (It is dependent on Product Specifications.)

- Get **Image Retention Free** Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x1E		0x00	

- Set **Image Retention Free** Status

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x1E		0x01	Image Retention Free	

Image Retention Free

0x00	Off
0x01	On

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'A'	0x1E	Image Retention Free	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0x1E	**ERR**	

ERR : Error code that shows what occurred error is

* Contrast Control (ATV, DTV, AV, S- Video, Component, HDMI Only)

- Function

  Personal Computer changes contrast of TV / Monitor.

- Get Contrast Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x24		0	

- Set Contrast

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x24		1	**Contrast**	

Contrast : Contrast value code to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x24	**Contrast**	

Contrast : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x24	**ERR**	

ERR : Error code that shows what occurred error is

* Brightness Control (ATV, DTV, AV, S- Video, Component, HDMI Only)

- Function

  Personal Computer changes brightness of TV / Monitor.

- Get Brightness Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x25		0	

- Set Brightness

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x25		1	**Brightness**	

Brightness : Brightness value code to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x25	**Brightness**	

Brightness : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x25	**ERR**	

ERR : Error code that shows what occurred error is

* Sharpness Control (ATV, DTV, AV, S- Video, Component, HDMI Only)

- Function

  Personal Computer changes sharpness of TV / Monitor의.

- Get Sharpness Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x26		0	

- Set Sharpness

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x26		1	**Sharpness**	

Sharpness : Sharpness value code to be set on TV/Monitor (0 ~ 100)

Caution : **Increment level depends on the model's specification.**

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x26	**Sharpness**	

Sharpness : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x26	**ERR**	

ERR : Error code that shows what occurred error is

* Color Control (ATV, DTV, AV, S-Video, Component, HDMI Only)

- Function

  Personal Computer changes the color of TV / Monitor.

- Get Color Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x27		0	

- Set Color

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x27		1	**Color**	

Color : Color value code to be set on TV/Monitor(0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x27	**Color**	

Color : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x27	**ERR**	

ERR : Error code that shows what occurred error is

* Tint Control (ATV, DTV, AV, S-Video, Component, HDMI Only)

- Function

  Personal Computer changes tint of TV / Monitor when visual display is NTSC.
  Does not operate with PAL signals.

- Get Tint Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x28		0	

- Set Tint

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x28		1	**Tint**	

Tint : Tint value code to be set on TV/Monitor (0 ~ 100)

R	**Tint** Value
G	(100 - **Tint**) Value

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x28	**Tint**	

Tint : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x28	**ERR**	

ERR : Error code that shows what occurred error is

* Red Gain Control

- Function

  Personal Computer changes Red Gain of TV / Monitor.

- Get Red Gain Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x29		0	

- Set Red Gain

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x29		1	**Red**	

Red : Red Gain value code to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x29	**Red**	

Red : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x29	**ERR**	

ERR : Error code that shows what occurred error is

* Green Gain Control

- Function

  Personal Computer changes Green Gain of TV / Monitor.

- Get Green Gain Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x2A		0	

- Set Green Gain

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x2A		1	**Green**	

Green : Green Gain value code to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x2A	**Green**	

Green : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x2A	**ERR**	

ERR : Error code that shows what occurred error is

* Blue Gain Control

- Function

  Personal Computer changes Blue Gain of TV / Monitor.

- Get Blue Gain Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x2B		0	

- Set Blue Gain

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x2B		1	**Blue**	

Blue : Blue Gain value code to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x2B	**Blue**	

Blue : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x2B	**ERR**	

ERR : Error code that shows what occurred error is

* Treble Control

- Function

  Personal Computer changes Treble of TV / Monitor.

- Get Treble Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x2C		0	

- Set Treble

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x2C		1	**Treble**	

Treble : Treble value code to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x2C	**Treble**	

Treble : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x2C	**ERR**	

ERR : Error code that shows what occurred error is

* Bass Control

- Function

  Personal Computer changes Bass of TV / Monitor.

- Get Bass Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x2D		0	

- Set Bass

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x2D		1	**Bass**	

Bass : Bass value code (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x2D	**Bass**	

Bass : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x2D	**ERR**	

ERR : Error code that shows what occurred error is

* Balance Control

- Function

  Personal Computer changes Balance of TV / Monitor.

- Get Balance Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x2E		0	

- Set Balance

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x2E		1	**Balance**	

Balance : Balance value code to be set on TV/Monitor (0 ~ 100)

L	(100 - **Balance**) Value
R	**Balance** Value

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x2E	**Balance**	

Balance : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x2E	**ERR**	

ERR : Error code that shows what occurred error is

* Coarse Control (PC, BNC Only)

- Function

  Personal Computer adjusts Coarse of TV / Monitor.

- Get Coarse Status

  None

- Set Coarse

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x2F		1	**Coarse**	

Coarse : Coarse Increase/Decrease code to be set on TV/Monitor

1	Increase
0	Decrease

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x2F	**Coarse**	

Coarse : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x2F	**ERR**	

ERR : Error code that shows what occurred error is

* Fine Control (PC, BNC Only)

- Function

  Personal Computer adjusts Fine of TV / Monitor.

- Get Fine Status

  None

- Set Fine

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x30		1	**Fine**	

Fine : Phase Increase/Decrease code

1	Increase
0	Decrease

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x30	**Fine**	

Fine : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x30	**ERR**	

ERR : Error code that shows what occurred error is

* H- Position Control (PC, BNC Only)

- Function

  Personal Computer adjusts Horizontal Position of TV / Monitor.

- Get H-Position Status

  None

- Set H-Position

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x31		1	**H-Pos**	

H-Pos : H-Position Increase/Decrease code to be set on TV/Monitor

1	Move to Right
0	Move to Left

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x31	**H-Pos**	

H-Pos : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x31	**ERR**	

ERR : Error code that shows what occurred error is

* V- Position Control (PC, BNC Only)

- Function

  Personal Computer adjusts Vertical Position of TV/Monitor.

- Get V-Position Status

  None

- Set V-Position

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x32		1	**V-Pos**	

V-Pos : V-Position Increase/Decrease code to be set on TV/Monitor

1	Move Down
0	Move Up

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x32	**V-Pos**	

V-Pos : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x32	**ERR**	

ERR : Error code that shows what occurred error is

* Clear Menu Control

- Function

  Personal Computer removes Menu OSD left in TV / Monitor.

- Get Clear Menu Status

  None

- Set Clear Menu

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x34		1	**Clear**	

Clear : 0x00 (Always)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x34	**Clear**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x34	**ERR**	

ERR : Error code that shows what occurred error is

* Remote Control

- Function

Personal Computer enables/disables IR receiving function of TV/Monitor/
Can operate regardless of whether power is ON/OFF

- Get Remote Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x36		0	

- Set Remote Enable/Disable

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x36		1	**RMC**	

RMC : Power code to be set on TV/Remocon

1	Remocon Enable
0	Remocon Disable

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x36	**RMC**	

RMC : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x36	**ERR**	

ERR : Error code that shows what occurred error is

* RGB Contrast Control (PC, BNC, DVI Only)

- Function

  Personal Computer changes contrast of TV / Monitor when Input Source is PC.

- Get Contrast Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x37		0	

- Set Contrast

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x37		1	**Contrast**	

Contrast : RGB Contrast value code to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x37	**Contrast**	

Contrast : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x37	**ERR**	

ERR : Error code that shows what occurred error is

* RGB Brightness Control (PC, BNC, DVI Only)

- Function

  Personal Computer changes Brightness when Input Source of TV / Monitor is PC.

- Get Brightness Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x38		0	

- Set Brightness

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x38		1	**Brightness**	

Brightness : RGB Brightness value code to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x38	**Brightness**	

Brightness : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x38	**ERR**	

ERR : Error code that shows what occurred error is

* PIP On / Off Control

- Function

  The PC turns the PIP function of a TV or monitor on/off.

  This does not operate in MagicInfo mode.

- Get the PIP ON/OFF Status

Header	Command	ID	Data Length	Checksum
0xAA	0x3C		0	

- Set the PIP ON/OFF

Header	Command	ID	Data Length	Data 1	Checksum
0xAA	0x3C		1	**PIP**	

PIP: The PIP On/Off code to set for the TV or monitor.

1	PIP ON
0	PIP OFF

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'A'	0x3C	**PIP**	

PIP: Same as above.

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'N'	0x3C	**ERR**	

ERR: The error code indicating which error occurred.

* Auto Adjustment Control (PC, BNC Only)

- Function

  Personal Computer controls PC system screen automatically.

- Get Auto Adjustment Status

  None

- Set Auto Adjustment

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x3D		1	**Auto**	

Auto : 0x00 (Always)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x3D	**Auto**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x3D	**ERR**	

ERR : Error code that shows what occurred error is

* Color Tone Control (ATV, DTV, AV, S-Video, Component, HDMI Only)

- Function

  Personal Computer changes Color Tone of TV / Monitor.

- Get Color Tone Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x3E		0	

- Set Color Tone

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x3E		1	**Color Tone**	

Color Tone : Color Tone value code to be set on TV/Monitor (0 ~ 4)

0x00	Cool 2
0x01	Cool 1
0x02	Normal
0x03	Warm 1
0x04	Warm 2
0x50	Off

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x3E	**Color Tone**	

Brightness : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x3E	**ERR**	

ERR : Error code that shows what occurred error is

* Color Temperature Control

- Function

  Personal Computer changes Color Temperature value of TV / Monitor.

  Only operates when Color Tone is set to Off.

- Get C_Temp Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x3F		0	

- Set C_Temp

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x3F		1	C_Temp	

C_Temp : Color Temperature value code to be set on TV/Monitor

0xFE	3000K
0xFF	4000K
0 ~ 10	5000K ~ 15000K

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x3F	C_Temp	

C_Temp : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x3F	ERR	

ERR : Error code that shows what occurred error is

* PIP Source Control

- Function

  The PC changes the PIP source of a TV or monitor.

  This only operates for a TV or monitor where PIP is set to On.

  This does not operate in MagicInfo mode.

- Get the PIP Source Status

Header	Command	ID	Data Length	Checksum
0xAA	0x40		0	

- Set the PIP Source

Header	Command	ID	Data Length	Data 1	Checksum
0xAA	0x40		1	**P.Source**	

P.Source: The input source code to set for the TV or monitor.

Caution : The PIP source swap may not function according to the main source.

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'A'	0x40	**P.Source**	

P.Source: Same as above.

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'N'	0x40	**ERR**	

ERR: The error code indicating which error occurred.

* Main- PIP Swap Control

- Function

  The PC swaps the main and PIP screens.

  This does not operate in MagicInfo mode.

- Get the Main-PIP Swap Status

  N/A

- Set the Main-PIP Swap

Header	Command	ID	Data Length	Data 1	Checksum
0xAA	0x41		1	**Swap**	

Swap: 0x00 (Always)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'A'	0x41	**Swap**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'N'	0x41	**ERR**	

ERR: The error code indicating which error occurred.

* PIP Size Control

- Function

  The PC changes the PIP size of a TV or monitor.

  This does not operate in MagicInfo mode.

- Get the PIP Size Status

Header	Command	ID	Data Length	Checksum
0xAA	0x42		0	

- Set the PIP Size

Header	Command	ID	Data Length	Data 1	Checksum
0xAA	0x42		1	**P.Size**	

P.Size: The PIP size code set for the TV or monitor.

0x00	PIP Off
0x06	Large
0x08	Small
0x04	Double 1
0x05	Double 2
0x09	Double 3

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'A'	0x42	**P.Size**	

P.Size: Same as above.

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'N'	0x42	**ERR**	

ERR: The error code indicating which error occurred.

* PIP Locate Control

- Function

  The PC adjusts the PIP position of a TV or monitor.

  This does not operate in MagicInfo mode.

- Get the PIP Locate Status

  N/A

- Set the PIP Locate

Header	Command	ID	Data Length	Data 1	Checksum
0xAA	0x43		1	**P.Locate**	

P.Locate : The PIP Locate Increase/Decrease code to set for the TV or monitor.

0	PIP Off(Get Only)
1	Upper Left
2	Upper Right
3	Lower Right
4	Lower Left

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'A'	0x43	**P.Locate**	

P.Locate: Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'N'	0x43	**ERR**	

ERR: The error code indicating which error occurred.

* Sound Select Control

- Function

  The PC changes the sound when the PIP of a TV or monitor is set to On.

- Get the Sound Select

Header	Command	ID	Data Length	Checksum
0xAA	0x47		0	

- Set the Sound Select

Header	Command	ID	Data Length	Data 1	Checksum
0xAA	0x47		1	**S.Selct**	

S.Select: The Sound Select code to set for the TV or monitor

1	Main
0	Sub

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'A'	0x47	**S.Select**	

S.Select: Same as above.

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Checksum
0xAA	0xFF		3	'N'	0x47	**ERR**	

ERR: The error code indicating which error occurred.

* Pixel Shift Control

- Function

  Personal Computer controls Pixel Shift function of TV / Monitor.

  Cannot control when Video Wall is on or when Zoom(0x39) is set or when Input Signal is VESA Mode in DVI.

- Get Pixel Shift Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x4C		0	

- Set Pixel Shift

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Data 4	
0xAA	0x4C		0x04	**Shift**	**H.Dot**	**V.Line**	**S.Time**	

Check Sum

Shift : Pixel Shift On/Off Code to be set on TV/Monitor

Caution : **If Shift value is off, H.Dot, V.Line, S.Time values are ignored in TV / Monitor.**

1	ON
0	OFF

H.Dot : Horizontal Dot value code set on TV/Monitor (0 ~ 4)

V.Line : Vertical Line value code set on TV/Monitor (0 ~ 4)

S.Time : Shift Time value code set on TV/Monitor (1 ~ 4)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	
0xAA	0xFF		0x06	'A'	0x4C	**Shift**	**H.Dot**	

Val 3	Val 4	Check Sum
V.Line	**S.Time**	

Shift, H.Dot, V.Line, S.Time : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x4C	**ERR**	

ERR : Error code that shows what occurred error is

* Auto Lamp Control

- Function

  Personal Computer sets Auto Lamp Function of TV / Monitor.

  When Manual Lamp Control is on, Auto Lamp Control will automatically turn off.

- Get Auto Lamp

Header	Command	ID	Data Length	Check Sum
0xAA	0x57		0	

- Set Auto Lamp

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Data 4	
0xAA	0x57		8	**LMax_H**	**LMax_M**	**LMax_AP**	**LMaxValue**	

Data 5	Data 6	Data 7	Data 8	Check Sum
LMin_H	**LMin_M**	**LMin_AP**	**LMinValue**	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	
0xAA	0xFF		0x0A	'A'	0x57	**LMax_H**	**LMax_M**	

Val 3	Val 4	Val 5	Val 6	Val 7	Val 8	Check Sum
LMax_AP	**LMaxValue**	**LMin_H**	**LMin_M**	**LMin_AP**	**LMinValue**	

LMax_H : Auto Lamp Max Time Hour set on TV/Monitor (1 ~ 12)

LMax_M : Auto Lamp Max Time Minute set on TV/Monitor (0 ~ 59)

LMax_AP : Auto Lamp Max Time set on TV/Monitor AM/PM

LMaxValue : Auto Lamp Max Value set on TV/Monitor (0 ~ 100)

LMin_H : Auto Lamp Min Time Hour set on TV/Monitor (1 ~ 12)

LMin_M : Auto Lamp Min Time Minute set on TV/Monitor (0 ~ 59)

LMin_AP : Auto Lamp Min Time set on TV/Monitor AM/PM

LMinValue : Auto Lamp Min Value set on TV/Monitor (0 ~ 100)

Caution: When LMinValue is **Returned** to **0xFF**, Auto Lamp Control is off.

When Dynamic contrast is on, Auto Lamp Control does not operate.

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x57	**ERR**	

ERR : Error code that shows what occurred error is

* Manual Lamp Control

- Function

  Personal Computer sets Manual Lamp Function of TV / Monitor.

  When Auto Lamp Control is on, Manual Lamp Control will automatically turn off.

- Get Manual Lamp Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x58		0	

- Set Manual Lamp

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x58		1	**LampValue**	

LampValue : Manual Lamp value to be set on TV/Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x58	**LampValue**	

LampValue : Same as above

Caution : When LampValue is **Returned** to **0xFF,** Manual Lamp Control is off.
When Dynamic contrast is on, Manual Lamp Control does not operate.

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x58	**ERR**	

ERR : Error code that shows what occurred error is

* Safety Screen Run Control

- Function

  Personal Computer will make Safety Screen function to operate immediately, not by Timer operation.

- Get **Safety Screen Run** Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x59		0	

- Set **Safety Screen Run**

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x59		1	**Safety Screen Type**	

Safety Screen Type : Safety Screen Type to be set on TV/Monitor (1~6)

0	Off
1	Signal Pattern
2	All White
3	Scroll
4	Bar
6	Eraser

Caution : 1, 2 only works with PDP models

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x59	**Safety Screen Type**	

Safety Screen Type : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x59	**ERR**	

ERR : Error code that shows what occurred error is

* SBP Timer Control (TV)

- Function

  Personal Computer sets Screen Burn Protection Timer of TV/Monitor.

- Get SBP Timer Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x5B		0	

- Set SBP Timer

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Check Sum
0xAA	0x5B		3	**Timer**	**T.Period**	**T.Time**	

Timer : SBP Timer code to be set on TV/Monitor

0	Off
1	Signal Pattern
2	All White
3	Scroll
4	Bar
6	Eraser

Caution : 1, 2 only works with PDP models

T.Period : SBP Timer Period value code to be set on TV/Monitor (1~24 Hr.)

T.Time : SBP Timer Time value code set on TV/Monitor (1~30 min.)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	
0xAA	0xFF		5	'A'	0x5B	**Timer**	**T.Period**	

Val 3	Check Sum
T.Time	

Timer, T.Period, T.Time : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x5B	**ERR**	

ERR : Error code that shows what occurred error is

* Video Wall Mode Control

- Function

  Personal Computer converts Video Wall Mode of TV / Monitor when Video Wall is ON.

  Only works with TV/Monitor where Video Wall is on.

  Does not operate in MagicNet.

- Get Video Wall Mode

Header	Command	ID	Data Length	Check Sum
0xAA	0x5C		0	

- Set Video Wall Mode

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x5C		1	**WallMode**	

WallMode : Video Wall Mode code to be set on TV/Monitor

1	Full
0	Natural

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x5C	**WallMode**	

WallMode : same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x5C	**ERR**	

ERR : Error code that shows what occurred error is

* Safety Lock

- Function

Personal Computer turns Safety Lock function of TV/Monitor On/Off.

Can operate regardless of whether power is on/off.

- Get Safety Lock Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x5D		0	

- Set Safety Lock Enable/Disable

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x5D		1	**Lock**	

Lock : Lock code to be set on TV/Monitor

1	On
0	Off

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x5D	**Lock**	

Lock : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x5D	**Lock**	

ERR : Error code that shows what occurred error is

* Panel Lock

- Function

  Personal Computer turns Panel function Key Lock of TV/Monitor On/OFF.

  Can operate regardless of whether power is on/off.

- Get Panel Lock Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x5F		0	

- Set Panel Lock

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x5F		1	**Panel Lock**	

Panel Lock : Panel Key Lock On/Off code to be set on TV/Monitor

1	Lock
0	Unlock

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x5F	**Panel Lock**	

Panel Lock : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x5F	**ERR**	

ERR : Error code that shows what occurred error is

* Channel Up/Down

- Function

  Caution : Only works with models include TV.

  Personal Computer can control TV Channel.

- Set TV Channel Up/Down

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x61		1	**Channel Up/Down**	

Channel Up/Down: Channel UP or Down to be set on TV / Monitor (0~1)

0	Up
1	Down

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x61	**Channel Up/Down**	

Channel Up/Down : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x61	**ERR**	

ERR : Error code that shows what occurred error is

* OSD On/Off

- Function

  Personal Computer turns OSD of TV / Monitor On/Off.

  When OSD is on, OSD will be shown on screen

  When OSD is off, OSD will not shown on screen at all

- Get OSD Enable Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x70		0	

- Set OSD Enable/Disable

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x70		1	**OSD**	

OSD : OSD On/Off code to be set on TV/Monitor

1	OSD On
0	OSD Off

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x70	**OSD**	

OSD : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x70	**ERR**	

ERR : Error code that shows what occurred error is

* P.Mode Control

- Function

  Personal Computer changes Picture Mode of TV / Monitor.

- Get PMode Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x71		0	

- Set PMode

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x71		1	**PMode**	

PMode : Picture Mode code to be set on TV/Monitor

Source	Data	Mode
AV S-Video Component HDCP (TV)	0x00	Dynamic
	0x01	Standard
	0x02	Movie
	0x03	Custom
	0x50	Off
PC BNC DVI (MagicInfo)	0x10	Entertain
	0x11	Internet
	0x12	Text
	0x13	Custom
	0x50	Off

Caution : Dynamic Contrast will not operate in any other mode except Off mode.

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x71	**PMode**	

PMode : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x71	**ERR**	

ERR : Error code that shows what occurred error is

* S.Mode Control

- Function

  Personal Computer changes Sound Mode of TV / Monitor.

- Get SMode Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x72		0	

- Set SMode

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x72		1	**SMode**	

SMode : Sound Mode code to be set on TV/Monitor

Data	Mode
0x00	Standard
0x01	Music
0x02	Movie
0x03	Speech
0x04	Custom

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x72	**SMode**	

SMode : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x72	**ERR**	

ERR : Error code that shows what occurred error is

* NR Mode Set (ATV, DTV, AV, S-Video, Component, HDMI Only)

- Function

  Personal Computer changes Digital NR mode.

- Get NR Mode Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x73		0	

- Set NR Mode

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x73		1	**NR Mode**	

NR Mode : NR Mode On/Off code to be set on TV/Monitor

1	NR Mode On
0	NR Mode Off

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x73	**NR Mode**	

NR Mode : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x73	**ERR**	

ERR : Error code that shows what occurred error is

* PC Color Tone Control (PC, BNC, DVI Only)

- Function

  Personal Computer can change color tone of Monitor.

- Get Color Tone Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x75		0	

- Set Color Tone

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x75		1	**Color Tone**	

Color Tone : Color Tone value code to set on TV/Monitor (0 ~ 3)

Source	Data	Mode
PC DVI BNC	0x00	Custom
	0x01	Cool
	0x02	Normal
	0x03	Warm
	0x50	Off

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x75	**Color Tone**	

Color Tone : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x75	**ERR**	

ERR : Error code that shows what occurred error is

* Auto AutoAdjustment Enable/Disable

- Function

  Personal Computer can Enable/Disable Auto Adjustment function.

  If this value is Disable. then Auto Adjustment is not work.

- Get A.Adjustment Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x76		0	

- Set A.Adjustment

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x76		1	**A.Adjustment**	

A.Adjustment : Auto Auto Adjustment Enable/Disable Value Code to be set on TV/Monitor

1	Enable
0	Disable

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x76	**A.Adjustment**	

A.Adjustment : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x76	**ERR**	

ERR : Error code that shows what occurred error is

* All Keys Lock

- Function

  Personal Computer turns both REMOCON and Panel Key Lock function on/off.

  Can operate regardless of whether power is on/off.

- Get All Key Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x77		0	

- Set All Key Lock/Unlock

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x77		1	**All Key**	

All Key : Lock On/Off code of every Key to be set on TV/Monitor

1	Lock
0	Unlock

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x77	**All Key**	

All Key : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x77	**ERR**	

ERR : Error code that shows what occurred error is

* SRS TS XT Control

- Function

  Personal Computer turns SRS TS XT of TV / Monitor on/off.

  Can only operate with TV/Monitor that has SRS TS XT function.

- Get SRS TS XT Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x78		0	

- Set SRS TSXT

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x78		1	**SRS**	

SRS : SRS TS XT code to be set on TV/Monitor

1	SRS ON
0	SRS OFF

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x78	**SRS**	

SRS : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x78	**ERR**	

ERR : Error code that shows what occurred error is

* Film Mode Control

- Function

  Personal Computer turns Film Mode of TV / Monitor on/off.

- Get Film Mode Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x79		0	

- Set Film Mode

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x79		1	**FMode**	

FMode : Film Mode code to be set on TV/Monitor

1	Film Mode ON
0	Film Mode OFF

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x79	**FMode**	

FMode : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x79	**ERR**	

ERR : Error code that shows what occurred error is

* Signal Balance (PC, BNC Only)

- Function

  Personal Computer turns Signal Balance of TV / Monitor ON/OFF.

- Get Signal Balance Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x7A		0	

- Set Signal Balance

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x7A		1	**SBalance**	

SBalance : Signal Balance code to be set on TV/Monitor

1	Signal Balance ON
0	Signal Balance OFF

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x7A	**SBalance**	

SBalance : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x7A	**ERR**	

ERR : Error code that shows what occurred error is

* SB Red Gain (PC, BNC Only)

- Function

  Personal Computer changes Red Gain value of Monitor Signal Balance.

- Get SB Red Gain Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x7B		0	

- Set SB Red Gain

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x7B		1	**SB R Gain**	

SB R Gain : Phase B value code of Signal Balance to be set on Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x7B	**SB R Gain**	

SB R Gain : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x7B	**ERR**	

ERR : Error code that shows what occurred error is

* SB Green Gain(PC, BNC Only)

- Function

  Personal Computer changes Green Gain value of Monitor Signal Balance.

- Get SB Green Gain Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x7C		0	

- Set SB Green Gain

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x7C		1	**SB G Gain**	

SB G Gain : Phase B value code of Signal Balance to be set on Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x7C	**SB G Gain**	

SB G Gain : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x7C	**ERR**	

ERR : Error code that shows what occurred error is

* SB Blue Gain(PC, BNC Only)

- Function

  Personal Computer changes Blue Gain value of Monitor Signal Balance.

- Get SB Blue Gain Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x7D		0	

- Set SB Blue Gain

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x7D		1	**SB B Gain**	

SB G Gain : Phase B value code of Signal Balance to be set on Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x7B	**SB B Gain**	

SB B Gain : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x7C	**ERR**	

ERR : Error code that shows what occurred error is

* SB Sharpness (PC, BNC Only)

- Function

  Personal Computer changes Sharpness value of Monitor Signal Balance.

- Get SBSharpness Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x7F		0	

- Set SBSharpness

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x7F		1	SBSharpness	

SBSharpness : Signal Balance Sharpness value code to be set on Monitor (0 ~ 100)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x7F	SBSharpness	

SBSharpness : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x7F	ERR	

ERR : Error code that shows what occurred error is

* Panel On Time

- Function

  Personal Computer shows Panel On Time of TV / Monitor.

- Get Panel On Time Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x83		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	
0xAA	0xFF		**0x05**	'A'	0x83	**PTime_ H**	**PTime_L**	

Check Sum

PTime_H : Panel On Time High.

PTime_L : Panel On Time Low.

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x83	**ERR**	

ERR : Error code that shows what occurred error is

* Video Wall On

- Function

  Personal Computer turns Video Wall of TV / Monitor ON/OFF.

  Does not operate in MagicInfo source.

- Get Video Wall On/Off Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x84		0	

- Set Video Wall On/Off

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x84		1	**V.Wall_On**	

V.Wall_On : Video Wall Code to set on TV / Monitor

1	Video Wall ON
0	Video Wall OFF

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x84	**V.Wall_On**	

V.Wall_On : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x84	**ERR**	

ERR : Error code that shows what occurred error is

* Temperature Control

- Function

  Personal Computer sets the maximum value of TV / Monitor temperature.

  Only supports models with Temperature notification function.

- Get Temperature Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x85		0	

- Set Temperature Status

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x85		1	**Temperature**	

Temperature : Temperature code to be set on TV/Monitor

Data	45 ~ 125(℃)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x85	**Temperature**	

Temperature : Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x85	**ERR**	

ERR : Error code that shows what occurred error is

* Brightness Sensor

- Function

  Personal Computer turns Brightness Sensor of TV / Monitor on/off.

  Only supports models with Brightness Sensor.

  PDP Model is not available it.

- Get Brightness Sensor ON/OFF Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x86		0	

- Set Brightness Sensor ON/OFF

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x86		1	**BR_Sensor**	

BR_Sensor : Brightness Sensor Code to be set on TV/Monitor

1	Brightness Sensor ON
0	Brightness Sensor OFF

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x86	**BR_Sensor**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x86	**ERR**	

ERR : Error code that shows what occurred error is

* Dynamic Contrast

- Function

  Personal Computer turns Dynamic Contrast of TV / Monitor on/off.

  PDP Model is not available it.

- Get Dynamic Contrast ON/OFF Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x87		0	

- Set Dynamic Contrast ON/OFF

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x87		1	**DY_Cont**	

DY_Cont : Dynamic Contrast code to be set on TV/Monitor

1	Dynamic Contrast ON
0	Dynamic Contrast OFF

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0x87	**DY_Cont**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x87	**ERR**	

ERR : Error code that shows what occurred error is

* Video Wall User Control

- Function

  Personal Computer turns Video Wall function of TV / Monitor on/off.

  Does not operate in MagicInfo mode.

- Get Video Wall Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x89		0	

- Set Video Wall

Header	Command	ID	Data Length	Data 1	Data 2	Check Sum
0xAA	0x89		2	**Wall_Div**	**Wall_SNo**	

Wall_Div : Video Wall Divider code set on TV/Monitor

(It is dependent on Product Specifications.)

- **5x5 Video Wall Model** :
- **10x10 Video Wall Model** :

V / H	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
OFF	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
1	0x11	0x12	0x13	0x14	0x15	0x16	0x17	0x18	0x19	0x1A	0x1B	0x1C	0x1D	0x1E	0x1F
2	0x21	0x22	0x23	0x24	0x25	0x26	0x27	0x28	0x29	0x2A	0x2B	0x2C	0x2D	0x2E	0x2F
3	0x31	0x32	0x33	0x34	0x35	0x36	0x37	0x38	0x39	0x3A	0x3B	0x3C	0x3D	0x3E	0x3F
4	0x41	0x42	0x43	0x44	0x45	0x46	0x47	0x48	0x49	0x4A	0x4B	0x4C	0x4D	0x4E	0x4F
5	0x51	0x52	0x53	0x54	0x55	0x56	0x57	0x58	0x59	0x5A	0x5B	0x5C	0x5D	0x5E	0x5F
6	0x61	0x62	0x63	0x64	0x65	0x66	0x67	0x68	0x69	0x6A	0x6B	0x6C	0x6D	0x6E	0x6F
7	0x71	0x72	0x73	0x74	0x75	0x76	0x77	0x78	0x79	0x7A	0x7B	0x7C	0x7D	0x7E	N/A
8	0x81	0x82	0x83	0x84	0x85	0x86	0x87	0x88	0x89	0x8A	0x8B	0x8C	N/A	N/A	N/A
9	0x91	0x92	0x93	0x94	0x95	0x96	0x97	0x98	0x99	0x9A	0x9B	N/A	N/A	N/A	N/A

10	0xA1	0xA2	0xA3	0xA4	0xA5	0xA6	0xA7	0xA8	0xA9	0xAA	N/A	N/A	N/A	N/A	N/A
11	0xB1	0xB2	0xB3	0xB4	0xB5	0xB6	0xB7	0xB8	0xB9	N/A	N/A	N/A	N/A	N/A	N/A
12	0xC1	0xC2	0xC3	0xC4	0xC5	0xC6	0xC7	0xC8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	0xD1	0xD2	0xD3	0xD4	0xD5	0xD6	0xD7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14	0xE1	0xE2	0xE3	0xE4	0xE5	0xE6	0xE7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	0xF1	0xF2	0xF3	0xF4	0xF5	0xF6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Wall_SNo : TV/Monitor Number code set on TV/Monitor
(It is dependent on Product Specifications.)

- **5x5 Video Wall Model** : (1 ~ 25)

Set Number	Data
1	0x01
2	0x02
...	...
24	0x18
25	0x19

- **10x10 Video Wall Model** : (1 ~ 100)

Set Number	Data
1	0x01
2	0x02
...	...
99	0x63
100	0x64

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	Check Sum
0xAA	0xFF		4	'A'	0x89	**Wall_Div**	**Wall_SNo**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0x89	**ERR**	

ERR : Error code that shows what occurred error is

* Model Name Control

- Function

  Personal Computer grasps TV / Monitor Model Name and display.

- Get Model Number Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x8A		0	

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	
0xAA	0xFF		**Length**	'A'	0x8A	**M_Name1**	**M_Name2**	

Val 3	Val 4	Val 5	Val 6	Val 7	Val 8	Val 9	Val 10
M_Name3	**M_Name4**	**M_Name5**	**M_Name6**	**M_Name7**	**M_Name8**	**M_Name9**	**M_Name10**

Val 11	Val 12	Val 13	Val 14	Val 15	Val 16
M_Name11	**M_Name12**	**M_Name13**	**M_Name14**	**M_Name15**	**M_Name16**

Val 17	Val ...	Check Sum
M_Name17	**M_Name...**	

M_Name1 ~ M_Name... : TV / Monitor's Model Name.

Length : Length means number of **M_Name** elements & Ack/Nak & r-CMD.

M_Name1	'S'
M_Name2	'y'
M_Name3	'n'
M_Name4	'c'
M_Name5	'M'
M_Name6	'a'
M_Name7	's'
M_Name8	't'
M_Name9	'e'
M_Name10	'r'
M_Name11	'4'
M_Name12	'0'
M_Name13	'0'
M_Name14	'D'
M_Name15	'X'
M_Name16	'n'

* HDMI Black Level Control

- Function

  Personal Computer turns HDMI Black Level function of TV / Monitor.

- Get HDMI Black Level Status

Header	Command	ID	Data Length	Check Sum
0xAA	0x94		0x00	

- Set HDMI Black Level

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0x94		0x01	**HDMI_b**	

HDMI_b : HDMI Black Level Control code set on TV/Monitor

0	Normal
1	Low

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'A'	0x94	**HDMI_b**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0x94	**ERR**	

ERR : Error code that shows what occurred error is

* RJ45 setting refresh

- Function

  Personal Computer controls Ethernet Converter IC Reset.

- Set RJ45 setting Refresh Status

Header	Command	ID	Data Length	Data	Check Sum
0xAA	0xA2		0x01	**Reset Command**	

Reset Command: Reset Ethernet Converter IC on TV/Monitor

0x01	Reset

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Data	Check Sum
0xAA	0xFF		0x03	'A'	0xA2	**Reset Command**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0xA2	**ERR**	

ERR : Error code that shows what occurred error is

* Timer1 Control

- Function:

  Personal Computer controls the Timer1 that TV / Monitor.

  (It is dependent on Product Specifications.)

- Get Timer1 Status

Header	Command	ID	Data Length	Check Sum
0xAA	0xA4		0	

- Set Timer1

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Data 4	Data 5	
0xAA	0xA4		0x0D	**On H**	**On M**	**On AM/PM**	**On_Act**	**Off H**	

Data 6	Date 7	Data 8	Data 9	Data 10	Data 11	Data 12	Data 13	Check Sum
Off M	**Off AM/PM**	**Off_Act**	**Repeat**	**Manual Weekday**	**Volume**	**Source**	**Holiday Apply**	

On H : On Time Hour value to be set on TV/Monitor (1 ~ 12)

On M : On Time Minute value to be set on TV/Monitor (0 ~ 59)

On AM/PM :On Time AM/PM value to be set on TV/Monitor (0~1)

0x00	PM
0x01	AM

On_Act : On Time Inactivated /Activated to be set on TV/Monitor (0(off)~1(on))

Off H : Off Time Hour value to be set on TV/Monitor (1 ~ 12)

Off M : Off Time Minute value to be set on TV/Monitor (0 ~ 59)

Off AM/PM : Off Time AM/PM value to be set on TV/Monitor (0~1)

0x00	PM
0x01	AM

Off_Act : Off Time Inactivated /Activated to be set on TV/Monitor (0(off)~1(on))

Repeat : Repeat value to be set on TV/Monitor (0~5)

0:Once 1:Everyday 2:Mon~Fri 3:Mon~Sat 4:Sat~Sun 5:Manual Weekday

ManualWeekday : Weekday value to be set on TV/Monitor.

BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
X	Sat	Fri	Thu	Wed	Tue	Mon	Sun

BIT7 : Don't care

Volume : Volume to be set on TV/Monitor.

Source : Source to be set on TV/Monitor.

Holiday Apply : Holiday Apply/Don't Apply to be set on TV/Monitor. (0~1)

0x00	Dont't Apply
0x01	Apply

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	Val 3	
0xAA	0xFF		0x0F	'A'	0xA4	**On H**	**On M**	**On AM/PM**	

Val 4	Val 5	Val 6	Val 7	Val 8	Val 9	Val 10	Val 11	Val 12	Val 13	Check Sum
On_Act	**Off H**	**Off M**	**Off AM/PM**	**Off_Act**	**Repeat**	**Manula Weekday**	**Volume**	**Source**	**Holiday Apply**	

Val1 ~ Val13: Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0xA4	**ERR**	

ERR : Error code that shows what occurred error is

* Timer2 Control

- Function:

  Personal Computer controls the Timer2 that TV / Monitor.

  (It is dependent on Product Specifications.)

- Get Timer2 Status

Header	Command	ID	Data Length	Check Sum
0xAA	0xA5		0	

- Set Timer2

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Data 4	Data 5	
0xAA	0xA5		0x0D	**On H**	**On M**	**On AM/PM**	**On_Act**	**Off H**	

Data 6	Date 7	Data 8	Data 9	Data 10	Data 11	Data 12	Data 13	Check Sum
Off M	**Off AM/PM**	**Off_Act**	**Repeat**	**Manual Weekday**	**Volume**	**Source**	**Holiday Apply**	

On H : On Time Hour value to be set on TV/Monitor (1 ~ 12)

On M : On Time Minute value to be set on TV/Monitor (0 ~ 59)

On AM/PM :On Time AM/PM value to be set on TV/Monitor (0~1)

0x00	PM
0x01	AM

On_Act: On Time Inactivated /Activated to be set on TV/Monitor (0(off)~1(on))

Off H : Off Time Hour value to be set on TV/Monitor (1 ~ 12)

Off M : Off Time Minute value to be set on TV/Monitor (0 ~ 59)

Off AM/PM : Off Time AM/PM value to be set on TV/Monitor (0~1)

0x00	PM
0x01	AM

Off_Act : Off Time Inactivated /Activated to be set on TV/Monitor (0(off)~1(on))

Repeat : Repeat value to be set on TV/Monitor (0~5)

0:Once 1:Everyday 2:Mon~Fri 3:Mon~Sat 4:Sat~Sun 5:Manual Weekday

ManualWeekday : Weekday value to be set on TV/Monitor.

BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
X	Sat	Fri	Thu	Wed	Tue	Mon	Sun

BIT7 : Don't care

Volume : Volume to be set on TV/Monitor.

Source : Source to be set on TV/Monitor.

Holiday Apply : Holiday Apply/Don't Apply to be set on TV/Monitor. (0~1)

0x00	Dont't Apply
0x01	Apply

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	Val 3	
0xAA	0xFF		0x0F	'A'	0xA5	**On H**	**On M**	**On AM/PM**	

Val 4	Val 5	Val 6	Val 7	Val 8	Val 9	Val 10	Val 11	Val 12	Val 13	Check Sum
On_Act	**Off H**	**Off M**	**Off AM/PM**	**Off_Act**	**Repeat**	**Manula Weekday**	**Volume**	**Source**	**Holiday Apply**	

Val1 ~ Val13: Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0xA5	**ERR**	

ERR : Error code that shows what occurred error is

* Timer3 Control

- Function:

  Personal Computer controls the Timer3 that TV / Monitor.

  (It is dependent on Product Specifications.)

- Get Timer3 Status

Header	Command	ID	Data Length	Check Sum
0xAA	0xA6		0	

- Set Timer3

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Data 4	Data 5	
0xAA	0xA6		0x0D	**On H**	**On M**	**On AM/PM**	**On_Act**	**Off H**	

Data 6	Date 7	Data 8	Data 9	Data 10	Data 11	Data 12	Data 13	Check Sum
Off M	**Off AM/PM**	**Off_Act**	**Repeat**	**Manual Weekday**	**Volume**	**Source**	**Holiday Apply**	

On H : On Time Hour value to be set on TV/Monitor (1 ~ 12)

On M : On Time Minute value to be set on TV/Monitor (0 ~ 59)

On AM/PM :On Time AM/PM value to be set on TV/Monitor (0~1)

0x00	PM
0x01	AM

On_Act : On Time Inactivated /Activated to be set on TV/Monitor (0(off)~1(on))

Off H : Off Time Hour value to be set on TV/Monitor (1 ~ 12)

Off M : Off Time Minute value to be set on TV/Monitor (0 ~ 59)

Off AM/PM : Off Time AM/PM value to be set on TV/Monitor (0~1)

0x00	PM
0x01	AM

Off_Act : Off Time Inactivated /Activated to be set on TV/Monitor (0(off)~1(on))

Repeat : Repeat value to be set on TV/Monitor (0~5)

0:Once 1:Everyday 2:Mon~Fri 3:Mon~Sat 4:Sat~Sun 5:Manual Weekday

ManualWeekday : Weekday value to be set on TV/Monitor.

BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
X	Sat	Fri	Thu	Wed	Tue	Mon	Sun

BIT7 : Don't care

Volume : Volume to be set on TV/Monitor.

Source : Source to be set on TV/Monitor.

Holiday Apply : Holiday Apply/Don't Apply to be set on TV/Monitor. (0~1)

0x00	Don't Apply
0x01	Apply

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	Val 3	
0xAA	0xFF		0x0F	'A'	0xA6	**On H**	**On M**	**On AM/PM**	

Val 4	Val 5	Val 6	Val 7	Val 8	Val 9	Val 10	Val 11	Val 12	Val 13	Check Sum
On_Act	**Off H**	**Off M**	**Off AM/PM**	**Off_Act**	**Repeat**	**Manula Weekday**	**Volume**	**Source**	**Holiday Apply**	

Val1 ~ Val13: Same as above

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0xA6	**ERR**	

ERR : Error code that shows what occurred error is

* Clock Control

- Function

  Personal Computer controls current time of TV / Monitor.

  (It is dependent on Product Specifications.)

- Get Clock Status

Header	Command	ID	Data Length	Check Sum
0xAA	0xA7		0x00	

- Set Clock

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Data 4	
0xAA	0xA7		0x07	**Day**	**Hour**	**Minute**	**Month**	

Data 5	Data 6	Data 7	Check Sum
Year1	**Year2**	**AmPm**	

Day : Day value to be set on TV/Monitor (1 ~ 31)

Month : Month value to be set on TV/Monitor (1 ~ 12)

Year1 : Year value to be set on TV/Monitor (High Byte)

Year2 : Year value to be set on TV/Monitor (Low Byte)

ex) Current year is 2010.

2010(Dec) → 0x07DA(Hex)

Year1: 0x07

Year2: 0xDA

Hour : Hour value to be set on TV/Monitor (1 ~ 12)

Minute : Minute value to be set on TV/Monitor (0 ~ 59)

AmPm : AM/PM value to be set on TV/Monitor (0 ~ 1)

0x00	PM
0x01	AM

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	
0xAA	0xFF		0x09	'A'	0xA7	**Day**	**Hour**	

Val 3	Val 4	Val 5	Val 6	Val 7	Check Sum
Minute	**Month**	**Year1**	**Year2**	**AmPm**	

Hour, Minute : Same as above

Note : **Hour, Minute** if current time was not set on Monitor, 0xFF

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0xA7	**ERR**	

ERR : Error code that shows what occurred error is

* Holiday Add/Delete Control

- Function

  Personal Computer controls Holiday List of TV / Monitor.

  (It is dependent on Product Specifications.)

- Set Holiday Status

Header	Command	ID	Data Length	Data 1	Data 2	Data 3	Data 4	
0xAA	0xA8		0x05	**Management command**	**Month_S**	**Day_S**	**Month_E**	

Data 5	Check Sum
Day_E	

Management Command: Adjust Command Holiday List of TV / Monitor.

0x00	Add Holiday
0x01	Delete Holiday
0x02	Delete All

Add Holiday : Add New Holiday Information "Month_S/Day_S ~ Month_E/Day_E".

Delete Holiday : Delete one Holiday Information "Month_S/Day_S ~ Month_E/Day_E".

Delete All : Delete All Holiday Information.("Data2 ~ Data5" must be 0x00.)

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2	
0xAA	0xFF		0x07	'A'	0xA8	**Management command**	**Month_S**	

Val 3	Val 4	Val 5	Check Sum
Day_S	**Month_E**	**Day_E**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0xA8	**ERR**	

ERR : Error code that shows what occurred error is

* Holiday Get Control

- Function

  Personal Computer get Holiday List of TV / Monitor.

  (It is dependent on Product Specifications.)

- Get Total Number of Holiday

  Request Total number of Holiday information of TV/Monitor.

Header	Command	ID	Data Length	Check Sum
0xAA	0xA9		0x00	

- Get Holiday Date

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0xA9		0x01	**Index**	

Index : Index value on Holiday List.

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Val 2
0xAA	0xFF		0x07	'A'	0xA9	**Index**	**Month_S**

Val 3	Val 4	Val 5	Check Sum
Day_S	**Month_E**	**Day_E**	

Rule of Ack Command.

Command Type	Index(Ack)	Month_S(Ack)	Day_S(Ack)	Month_E(Ack)	Day_E(Ack)
Get Number of Holiday	Total number	0x00	0x00	0x00	0x00
Get Holiday Date (If there is holiday information)	Index	Month_S (Index's data)	Day_S (Index's data)	Month_E (Index's data)	Day_E (Index's data)
Get Holiday Date (If there is no holiday information)	Index	0xFF	0xFF	0xFF	0xFF

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		0x03	'N'	0xA9	**ERR**	

ERR : Error code that shows what occurred error is

* Panel On/Off

- Function

  Personal Computer turns Panel of TV / Monitor on/off.

  When input signal is changed, Panel turns on, (PN_State turns to PANEL ON, too.)

- Get Panel ON/OFF Status

Header	Command	ID	Data Length	Check Sum
0xAA	0xF9		0	

- Set Dynamic Contrast ON/OFF

Header	Command	ID	Data Length	Data 1	Check Sum
0xAA	0xF9		1	**PN_State**	

PN_State : Panel ON/OFF code to be set on TV/Monitor

1	PANEL OFF
0	PANEL ON

- Ack

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'A'	0xF9	**PN_State**	

- Nak

Header	Command	ID	Data Length	Ack/Nak	r-CMD	Val 1	Check Sum
0xAA	0xFF		3	'N'	0xF9	**ERR**	

ERR : Error code that shows what occurred error is