

*HD-UHD Commercial Display*

# ***DID 2K/4K***

## **Serial Control Protocol**

*Digital Video Image LCD Monitor  
Control Protocol*

*v07*

The information given in this document is carefully checked and believed to be reliable. However, we take no responsibility for any failure or product damage caused by the application of this information.

**All information is subject to change without notification.**

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## **WARNING**

*Before operating the set, please read this manual carefully.*

### **WARNING :**

To reduce the risk of electric shock, do not remove back cover. No user serviceable parts inside. Refer servicing to qualified service personnel. To prevent fire or shock hazard, do not expose the monitor to rain or moisture. Do not rub or strike the LCD with anything hard, as this may scratch, mark, or damage the LCD permanently.

### **CAUTION:**

Unauthorized tampering with the inside of the monitor invalidates the warranty. The manufacturer shall not warrant any damage caused by improper maintenance and/or repair work by third parties.

### **Important safeguards for you and your new product:**

Your product has been manufactured and tested with your safety in mind. However, improper use can result in potential electrical shock or fire hazards. To avoid defeating the safeguards that have been built into your new product, please read and observe the following safety points when installing and using your new product and save them for future reference.

#### **1. Read Instructions**

#### **2. Follow Instructions**

All operating and use instructions should be followed.

#### **3. Retain Instructions**

The safety and operating instructions should be retained for future reference.

#### **4. Heed Warnings**

All warnings on the product and in the operating instructions should be adhered to.

#### **5. Cleaning**

Disconnect the unit from the electricity supply before cleaning. Do not use abrasive cleaners. Use a damp cloth for cleaning.

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## **6. Water and Moisture**

Do not use this apparatus near water.

## **7. Transporting Product**

A product and cart combination should be moved with care. Quick stops, excessive force and uneven surfaces may cause the product and cart combination to overturn.

## **8. Attachments**

Do not use attachments not recommended, as they may cause hazards.

## **9. Ventilation**

Do not block any of the ventilation openings.  
Install in accordance with the manufacturer's instructions.

## **10. Power Sources**

This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your location, consult your supplying dealer.

## **11. Power Lead Polarization**

This product is equipped with a three-wire grounding-type cord. This is a safety feature. Do not defeat the safety purpose of the grounding-type cord.

## **12. Power Cord Protection**

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

## **13. Lightning**

For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will help prevent possible damage to the monitor due to lightning and power-line surges.

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## **14. Grounding the product**

This product must be earthed properly to comply with the safety regulations in the country of use. If you are unsure of these regulations, please consult a qualified electrician.

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## **15. Servicing**

Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltages or other hazards. Refer all servicing to qualified service personnel. If the unit does not operate properly, switch it off and call your dealer.

## **16. Damage Requiring Service**

Isolate this product from the mains supply and refer servicing to qualified service personnel under the following conditions:

- a. If the power-supply cord or plug is damaged.
- b. If the glass front has been damaged.
- c. If there is ingress of water into the LCD screen.
- d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- e. If the product has been dropped or the cabinet has been damaged.
- f. If the product exhibits a distinct change in performance.

## **17. Safety Check**

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition and the cabinet is intact.

## **18. Mounting**

The product should be mounted on a wall only as recommended in the instructions.

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## **19. Power**

This set operates on an AC supply; the voltage is as indicated on the rear label and Manual. This appliance must be earthed at all times through the chassis as well as through the power lead.

## **20. Location**

Do not install on an unstable location with support area smaller than the DID monitor. Please secure enough space to safely use.

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## 1. SERIAL CONTROL PROTOCOL.

### 1) Serial Setup

| Item           | Settings |
|----------------|----------|
| Baud rate      | 19200bps |
| Data Bit       | 8bit     |
| Stop Bit       | 1bit     |
| Parity Bit     | None     |
| Stream Control | None     |

### 2) Serial Cable between PC and AD BOARD (simple null modem cable)

| CONNECTOR1 | CONNECTOR2 | FUNCTION                 |  |    |
|------------|------------|--------------------------|--|----|
| 2          | 3          | RX                       |  | TX |
| 3          | 2          | TX                       |  | RX |
| 5          | 5          | SIGNAL GROUND            |  |    |
| 9          | 9          | IR LOOP THROUGH FUNCTION |  |    |

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3) Protocols - By DSUB9P Serial Port  
Virtual Remote Control

Setting Parameters to Monitor

Data setting only ( Not adjust function for speed)

Read Parameters from Monitor

4) Protocols - By Ethernet Port (Option - Network Sub Board)  
To set up the parameters to monitor, transfer the following instruction.

- Transport Layer : TCP
- Port : 5000
- Command : DCOM (Ethernet CMD) + Serial CMD
  - > ASCII : DCOM
  - HEX : 0x44 0x43 0x4F 0x4D

Virtual Remote Control

Example ) Key Power - Set ID 01

Setting Parameters to Monitor

Example ) Switch to DP source - Set ID 01

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Read Parameters from Monitor

Example ) Check Current Source - Set ID 01 (DP)

## 5) Control Command Packet

Virtual RCU (Remote Control Unit) : Emulates the Infra Red Remote Control

| <b>CMD</b>     | <b>Data1</b>  | <b>Data2</b> | <b>Data3</b>          | <b>Description</b> | <b>Data4</b>    |
|----------------|---------------|--------------|-----------------------|--------------------|-----------------|
| <b>Command</b> | <b>Target</b> | <b>ID</b>    | <b>CMD</b>            |                    | <b>Key Code</b> |
| <b>0xF4</b>    | <b>0x88</b>   | <b>0xXX</b>  | <b>0xFD<br/>(RCU)</b> | KEY_POWER          | <b>0x11</b>     |
|                |               |              |                       | KEY_INPUT          | <b>0x13</b>     |

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|                 |  |             |  |                  |      |
|-----------------|--|-------------|--|------------------|------|
| (Start Sending) |  | (0x00~0xFE) |  | KEY_MENU         | 0x43 |
|                 |  |             |  | KEY_EXIT         | 0x50 |
|                 |  |             |  | KEY_UP           | 0x47 |
|                 |  |             |  | KEY_DOWN         | 0x4B |
|                 |  |             |  | KEY_LEFT(VOL -)  | 0x57 |
|                 |  |             |  | KEY_RIGHT(VOL +) | 0x53 |
|                 |  |             |  | KEY_ENTER        | 0x04 |
|                 |  |             |  | KEY_MUTE         | 0x03 |
|                 |  |             |  | KEY_STILL        | 0x0A |
|                 |  |             |  | KEY_INFO         | 0x06 |
|                 |  |             |  | KEY_SLEEP        | 0x0B |
|                 |  |             |  | SET ID           | 0x51 |
|                 |  |             |  | SET ID EXIT      | 0x55 |
|                 |  |             |  |                  |      |

## System Parameter Direct Settings/Read Packet

| CMD | Data1 | Data2 | Data3 | Data4 | Data5 | Description | Range (HEX) |
|-----|-------|-------|-------|-------|-------|-------------|-------------|
|-----|-------|-------|-------|-------|-------|-------------|-------------|

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| Command                                                      | Target                                     | ID                         | CMD                               | Param       | Value                                                                        |    |             |
|--------------------------------------------------------------|--------------------------------------------|----------------------------|-----------------------------------|-------------|------------------------------------------------------------------------------|----|-------------|
| <b>0xF5</b><br>(Start Set)<br><br><b>0xF4</b><br>(Start Get) | <b>0x88</b> (Set)<br><br><b>0x89</b> (Get) | <b>0xXX</b><br>(0x00~0xFE) | <b>0xFE</b><br>Set /Get<br>Param. | <b>0x00</b> | LANGUAGE                                                                     | 0  | English     |
|                                                              |                                            |                            |                                   |             |                                                                              | 1  | Français    |
|                                                              |                                            |                            |                                   |             |                                                                              | 2  | Español     |
|                                                              |                                            |                            |                                   |             |                                                                              | 3  | Deutsch     |
|                                                              |                                            |                            |                                   |             |                                                                              | 4  | Italiano    |
|                                                              |                                            |                            |                                   | <b>0x01</b> | MINERVA<br>[0 ~ 5]<br>LINKER<br>[1 ~ 2]<br>LINKER 2<br>[1 ~ 4 : 4 - HDBaseT] | 0  | VGA         |
|                                                              |                                            |                            |                                   |             |                                                                              | 1  | DP          |
|                                                              |                                            |                            |                                   |             |                                                                              | 2  | HDMI1       |
|                                                              |                                            |                            |                                   |             |                                                                              | 3  | HDMI2       |
|                                                              |                                            |                            |                                   |             |                                                                              | 4  | HDMI3       |
|                                                              |                                            |                            |                                   |             |                                                                              | 5  | DVI         |
|                                                              |                                            |                            |                                   | <b>0x03</b> | COLOR TEMP                                                                   | 0  | 3200K       |
|                                                              |                                            |                            |                                   |             |                                                                              | 1  | 5600K       |
|                                                              |                                            |                            |                                   |             |                                                                              | 2  | 6500K       |
|                                                              |                                            |                            |                                   |             |                                                                              | 3  | 7800K       |
|                                                              |                                            |                            |                                   |             |                                                                              | 4  | 9300K       |
|                                                              |                                            |                            |                                   | <b>0x04</b> | CONTRAST                                                                     | 0  | 0           |
|                                                              |                                            |                            |                                   |             |                                                                              | 64 | 100         |
|                                                              |                                            |                            |                                   | <b>0x05</b> | BRIGHTNESS                                                                   | 0  | 0           |
|                                                              |                                            |                            |                                   |             |                                                                              | 64 | 100         |
|                                                              |                                            |                            |                                   | <b>0x06</b> | HUE<br>(Only YPbPr Input)                                                    | 0  | 0           |
|                                                              |                                            |                            |                                   |             |                                                                              | 64 | 100         |
|                                                              |                                            |                            |                                   | <b>0x07</b> | SHARPNESS                                                                    | 0  | 0           |
|                                                              |                                            |                            |                                   |             |                                                                              | 64 | 100         |
|                                                              |                                            |                            |                                   | <b>0x0F</b> | Aspect Ratio                                                                 | 0  | Full Screen |
|                                                              |                                            |                            |                                   |             |                                                                              | 1  | Auto        |
|                                                              |                                            |                            |                                   |             |                                                                              | 2  | 4:3         |
|                                                              |                                            |                            |                                   |             |                                                                              | 3  | 5:4         |
| 4                                                            | 16:9                                       |                            |                                   |             |                                                                              |    |             |
| <b>0x10</b>                                                  | User Red Gain                              | 0                          | 0                                 |             |                                                                              |    |             |
|                                                              |                                            | FF                         | 255                               |             |                                                                              |    |             |
| <b>0x11</b>                                                  | User Green Gain                            | 0                          | 0                                 |             |                                                                              |    |             |
|                                                              |                                            | FF                         | 255                               |             |                                                                              |    |             |
| <b>0x12</b>                                                  | User Blue Gain                             | 0                          | 0                                 |             |                                                                              |    |             |
|                                                              |                                            | FF                         | 255                               |             |                                                                              |    |             |
| <b>0x13</b>                                                  | PIP<br>[HIGH Version]                      | 0                          | PIP Disable                       |             |                                                                              |    |             |
|                                                              |                                            | 1                          | PIP Enable                        |             |                                                                              |    |             |
| <b>0x14</b>                                                  | PIP Input<br>[HIGH Version]                | 0                          | DP                                |             |                                                                              |    |             |
|                                                              |                                            | 1                          | HDMI                              |             |                                                                              |    |             |
| <b>0x15</b>                                                  | PIP Type                                   | 0                          | PIP                               |             |                                                                              |    |             |



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|  |  |  |  |      |  |                              |    |      |
|--|--|--|--|------|--|------------------------------|----|------|
|  |  |  |  | 0x3F |  |                              | B4 | 60   |
|  |  |  |  | 0x40 |  | FAN HYSTERESIS               | 0  | 0    |
|  |  |  |  | 0x42 |  |                              | 14 | 10   |
|  |  |  |  | 0x43 |  | FAN_CONTROL                  | 0  | Off  |
|  |  |  |  | 0x44 |  |                              | 1  | On   |
|  |  |  |  | 0x45 |  |                              | 2  | Auto |
|  |  |  |  | 0x46 |  | X POSITION                   | 1  | 1    |
|  |  |  |  | 0x47 |  |                              | 0A | 11   |
|  |  |  |  | 0x48 |  | Y POSITION                   | 1  | 1    |
|  |  |  |  | 0x49 |  |                              | 0A | 11   |
|  |  |  |  | 0x4A |  | X MAX                        | 1  | 1    |
|  |  |  |  | 0x4B |  |                              | 0B | 11   |
|  |  |  |  | 0x4C |  | Y MAX                        | 1  | 1    |
|  |  |  |  | 0x4D |  |                              | 0B | 11   |
|  |  |  |  | 0x4E |  | XGAP <sup>(9)</sup>          | 0  | 0    |
|  |  |  |  | 0x4F |  |                              | 64 | 100  |
|  |  |  |  | 0x50 |  | Y GAP <sup>(9)</sup>         | 0  | 0    |
|  |  |  |  | 0x51 |  |                              | 64 | 100  |
|  |  |  |  | 0x52 |  | TEMP_SHUTDOWN <sup>(5)</sup> |    | TBD  |
|  |  |  |  | 0x53 |  |                              |    | TBD  |
|  |  |  |  | 0x54 |  | 3200K Red Gain               | 0  | 0    |
|  |  |  |  | 0x55 |  |                              | FF | 255  |
|  |  |  |  | 0x56 |  | 3200K Green Gain             | 0  | 0    |
|  |  |  |  | 0x57 |  |                              | FF | 255  |
|  |  |  |  | 0x58 |  | 3200K Blue Gain              | 0  | 0    |
|  |  |  |  | 0x59 |  |                              | FF | 255  |
|  |  |  |  | 0x5A |  | 5600K Red Gain               | 0  | 0    |
|  |  |  |  | 0x5B |  |                              | FF | 255  |
|  |  |  |  | 0x5C |  | 5600K Green Gain             | 0  | 0    |
|  |  |  |  | 0x5D |  |                              | FF | 255  |
|  |  |  |  | 0x5E |  | 5600K Blue Gain              | 0  | 0    |
|  |  |  |  | 0x5F |  |                              | FF | 255  |
|  |  |  |  | 0x60 |  | 6500K Red Gain               | 0  | 0    |
|  |  |  |  | 0x61 |  |                              | FF | 255  |
|  |  |  |  | 0x62 |  | 6500K Green Gain             | 0  | 0    |
|  |  |  |  | 0x63 |  |                              | FF | 255  |
|  |  |  |  | 0x64 |  | 6500K Blue Gain              | 0  | 0    |
|  |  |  |  | 0x65 |  |                              | FF | 255  |
|  |  |  |  | 0x66 |  | 7800K Red Gain               | 0  | 0    |
|  |  |  |  | 0x67 |  |                              | FF | 255  |
|  |  |  |  | 0x68 |  | 7800K Green Gain             | 0  | 0    |
|  |  |  |  | 0x69 |  |                              | FF | 255  |
|  |  |  |  | 0x6A |  | 7800K Blue Gain              | 0  | 0    |
|  |  |  |  | 0x6B |  |                              |    |      |

0xF5  
(Start Set)  
  
0xF4  
(Start Get)

0x88(Set)  
  
0x89(Get)

0xXX  
(0x00~0xFE)

0xFE  
Set /Get  
Param.

0x00~0xFF  
(By Min-Max)  
**Not Send  
in Get Mode**



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Ex) Desired Ambient is 10000 Lux, Setting is 100 (= 10000 / 100)

## (3) MIN\_ILLUMINACE Settings

Setting Value = Ambient Level (by LUX) / 10

Ex) Desired Ambient is 200 Lux, Setting is 20 (= 200 / 10)

## (4) DIM\_LEVEL Settings

Dimming is controlled by Brightness Settings.

## (5) TEMPERATURE Settings

Setting Value = Desired temperture(by Celsius) x 2 + 60

Ex) Desired temperature is 60? , Setting is 180 (= 60 x 2 + 60)

## (6) TEMP\_HYSTERESIS Settings

Setting Value = Desired Hysteresis(by Celsius) x 2

Ex) Desired Hysteresis is 2? , Setting is 4 (= 2 x 2)

## (8) Read only Command

Active

Gap

## (9) Gap Settings

Setting Value =(int) (1000 \* Gap / Active)

## 6) Control Command Packet

5-1)Set Input Source to HDMI Input

5-2)Read Power State