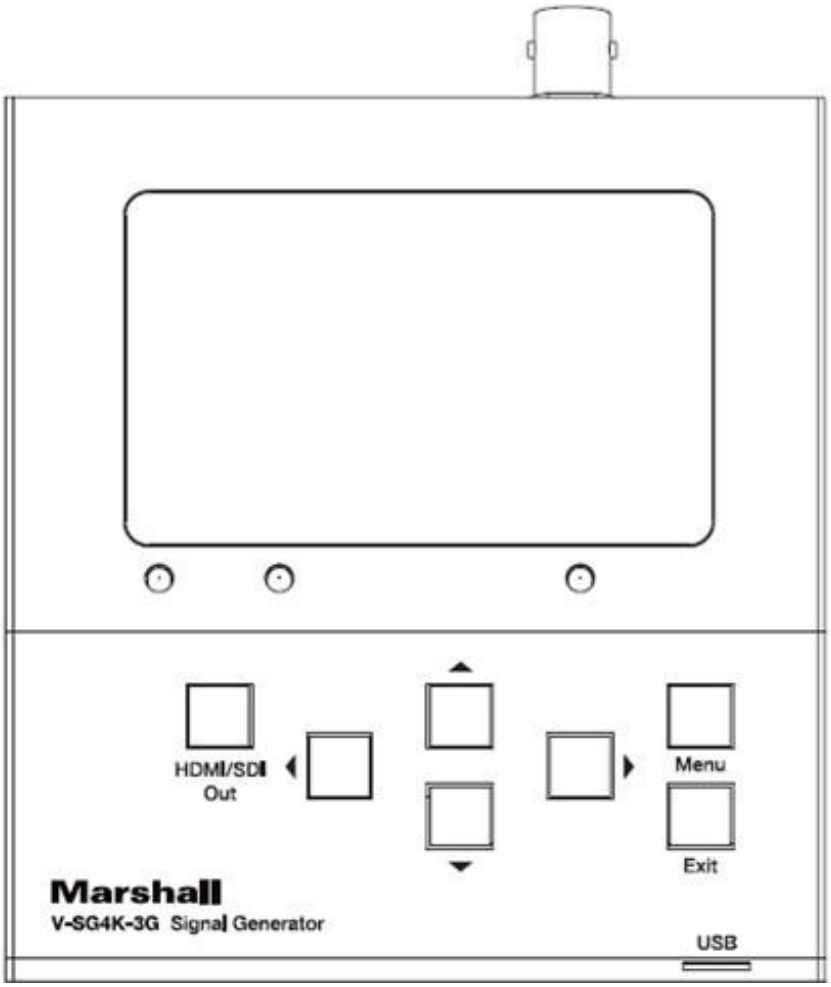
Marshall

Broadcast A/V Division




# V-SG4K-3G

## UART Command Protocol

日本語版

# UART Setting

| | |
|---|---|
| Baud Rate: | 115200 bps |
| Data bits: | 8 bits |
| Parity: | None |
| Stop bits: | 1 bit |
| Flow control: | None |

# Command Format (protocol)

| | Header | | Length | Group Address | Device Address | Keyword | Data | Check Sum |
|---|---|---|---|---|---|---|---|---|
| **Value** | AA (from PC to device)/AB (from device to PC) | DEVICE ID(see note1) | Byte number except header | See note2 | See note2 | See table 2 | | |
| **Byte Number** | 1 | 2 | 2 | 1 | 1 | 2(lower byte first) | | 1 |

Note:

1. 信号発生器のデバイスIDは0x0000です。

2. 各デバイスには個別のアドレスを割り当てることができます。
   アドレスには2バイトが含まれます。 使用可能なグループアドレスとデバイスは0x01～0xfeです。
   アドレスが0x0000の場合、このデバイスにはアドレスが割り当てられていません。
   0x0000はブロードキャストアドレスです。
   コンピュータがアドレス0x0000でコマンドを送信すると、すべてのデバイスがコマンドを受信して実行します。
   0xffffは別のブロードキャストアドレスです。
   すべてのデバイスは、アドレス0xffffでコマンドを受信して実行する必要がありますが、データをコンピューターにフィードバックしません。

デバイスアドレスはOLEDパネルのOSDメニューに表示できます。XX:01H~FEH

| Group Address | Device Address | Description |
|---|---|---|
| 00H | FFH | Invalid (reserved) |
| XXH | FFH | Broadcast command to all the devices with the group address xxH(Device will not feedback any message to the controller) |
| FFH | FFH | Broadcast to all devices (No feedback from device) |
| 00H | 00H | Broadcast address (With feedback from device) |

| | | |
|---|---|---|
| **XXH** | **00H** | **Broadcast to devices with the group address XXH.(with feedback from device)** |
| FFH | 00H | Invalid (reserved) |
| 00H | XXH | Invalid (reserved) |
| FFH | XXH | Invalid (reserved) |
| XXH | YYH | Send command to the device with the address XX YY H. (With feedback from device) |

*Table-1*

Command List:

| Keyword | Function | Length | Description | Note |
|---|---|---|---|---|
| 0061H | Change Timing | 1BYTE | See table-4 | |
| 0062H | Change Pattern | 1BYTE | See table-5 | |
| 0063H | Change ColorSpace | 1BYTE | See table-7 | |
| 0064H | DeepColor setting | 1BYTE | See table-8 | |
| 0065H | HDCP on/off | 1BYTE | See table-9 | |
| 0066H | Set HDMI or DVI output | 1BYTE | See table-10 | |
| 0067H | Audio Sampling | 1BYTE | See table-11 | |
| 0068H | Audio bit | 1BYTE | See table-12 | |
| 0069H | Audio source(embedded or from external stereo analog audio | 1BYTE | See table-13 | |
| 006Ah | Audio channel number | 1BYTE | See table-21 | |
| 006BH | Setting Audio Speaker Placement | 1Byte | Refer to Table28 | |
| 006DH | Volume | 1Byte | 0~10 | |
| 0082H | Switch out type | 1byte | Refer to Table 29 | |
| 00a0H | User define timing | 20BYTE | See table-14 | |
| 00AAH | Save SINK EDID to memory | 1BYTE | See table-26 | |
| 00ABH | Power on/off the output | | See table-27 | |
| 7801H | Address setting | 2BYTE | See table-16 | |
| 7802H | Reset all settings | | | |
| | | | | |
| 8061H | Read Timing status | | | Device will reply as table-3 |

| | | | | |
|---|---|---|---|---|
| **8062H** | **Read Pattern status** | | | **Device will reply as table-4** |
| 8063H | Read ColorSpace status | | | Device will reply as table-7 |
| 8064H | Read DeepColor status | | | Device will reply as table-8 |
| 8065H | Read HDCP status | | | Device will reply as table-9 |
| 8066H | Read HDMI/DVI status | | | Device will reply as table-10 |
| 8067H | Read Audio Sampling satus | | | Device will reply as table-11 |
| 8068H | Read Audio bit status | | | Device will reply as table-12 |
| 8069H | Read audio source status(embedded or from external stereo audio) | | | Device will reply as table-13 |
| 806AH | Read Audio channel number | | | Device will reply as table-21 |
| 806DH | Read Audio volume | 1BYTE | | |
| 80a0H | Read user define timing data | 1BYTE | USER INDEX 0~9 | Device will reply as table-14 |
| 80a1H | Read TX NATIVE TIMING | | | Device will reply as table-22 |
| 80a9H | Read output status | | | When the device is in AUTO mode, the device will reply colorspace,colordepth etc. Please refer to table-23 |
| 80AAH | Read stored EDID from memory | 1BYTE | See table-26 | Note3 |
| 80abH | Read output on/off status | | | Device will reply as table-27 |
| B838H | Read EDID from the sink device | 1BYTE | See table-18 | Note2 |
| B839H | Read HPD status of sink device | | | Device will reply as table-24 |
| F801H | Read address of the device | 0BYTE | | Device will reply as table-16 |

*Table-2*

Note:

1. T 0x8000未満のキーワードは設定用です。0x8000より大きいキーワードはステータス読み取り用です。
2. EDID読み取りのコマンド例：

   PC->デバイス：AA + ID + 06 00 00 00 38 B8 01+チェックサム

   デバイスがシンクデバイスからEDIDデータを読み取ることができない場合、デバイスは次のようにデータをPCにフィードバックします：デバイス-> PC：AB + ID + 06 00 00 00 38B8 00+ checksum

   デバイスがシンクデバイスからEDIDデータを読み取ることができる場合、次のようにデータをPCにフィードバックします：MCU-> PC：AB + ID + 05 01 00 00 38 B8 ~~~~~~（256BYTE）+ checksum
3. メモリに保存されている最初のEDIDからEDIDを読み取るコマンドの例。
   PC-> MCU：AA + ID + 06 00 00 00 aa 80 01+ checksum

   MCU-> PC：AB + ID + 06 01 00 00 aa 80 01 ~~~~~~（256BYTE）+ checksum

4. PCが設定コマンド（0x8000未満）をデバイスに送信すると、デバイスはキーワードの位置にFFFFHを返します。キーワードの後には、3つのパラメーターがあります。
   最初はPCからデバイスに送信されるキーワードの下位バイト、2番目はキーワードの上位バイト、3番目はコマンドに関連するステータスです（下の表3を参照してください）。

   次に例を示します。PCがコマンドを送信する場合AA 00 00 06 00 00 00 00 61 00 00 EF
   （タイミングを最初のタイミング640x480に設定）

   デバイスは応答します：AB 00 00 08 00 00 00 FF FF 61 00（61 00はキーワード）00（00は正しく実行されたことを意味します）EE（checksum）

| **Parameter** | **Description** | **Note** |
|---|---|---|
| 1 | Low byte of keyword | |
| 2 | High byte of keyword | |
| 3 | Status relate to the command | 0-Execute correctly<br>1-Checksum error<br>3-Faild to execute the command<br>4-The command is invalid for the current working mode. |

*Table-3*

| **Parameter** | **Description** | **Note** |
|---|---|---|
| 1 | Timing index | The index to the timing details, please refer to table-6 |

*Table-4*

| **Parameter** | **Description** | **Note** |
|---|---|---|
| 1 | Pattern index | 0~32 |

*Table-5*

| Timing | Timing Description | Note |
|---|---|---|
| 0H | VESA640x480P_60HZ | |
| 1H | VESA800x600P_60HZ | |
| 2H | VESA1024x768P_60HZ | |
| 3H | VESA1280x768P_60HZ | |
| 4H | VESA1360x768P_60HZ | |
| 5H | VESA1280x960P_60HZ | |
| 6H | VESA1280x1024P_60HZ | |
| 7H | VESA1400x1050P_60HZ | |
| 8H | VESA1600x1200P_60HZ | |
| 9H | VESA1920x1200P_60HZ | |
| aH | CEAVIC1440x480I_60HZ | |
| bH | CEAVIC720x480P_60HZ | |
| cH | CEAVIC1280x720P_60HZ | |
| dH | CEAVIC1280x720P_59.94HZ | |
| eH | CEAVIC1920x1080I_60HZ | |
| fH | CEAVIC1920x1080I_59.94HZ | |
| 10H | CEAVIC1920x1080p_30HZ | |
| 11H | CEAVIC1920x1080p_29.97HZ | |
| 12H | CEAVIC1920x1080P_24HZ | |
| 13H | CEAVIC1920x1080P_23.976HZ | |
| 14H | CEAVIC1920x1080P_60HZ | |
| 15H | CEAVIC1920x1080P_59.94HZ | |
| 16H | CEAVIC1440x576I_50HZ | |
| 17H | CEAVIC720x576P_50HZ | |
| 18H | CEAVIC1280x720P_50HZ | |
| 19H | CEAVIC1920x1080I_50HZ | |
| 1aH | CEAVIC1920x1080p_25HZ | |
| 1bH | CEAVIC1920x1080P_50HZ | |
| 1cH | HDMIVIC4Kx2K_30HZ | |
| 1dH | HDMIVIC4Kx2K_29.97HZ | |
| 1eH | HDMIVIC4Kx2K_25HZ | |
| 1fH | HDMIVIC4Kx2K_24HZ | |
| 20H | HDMIVIC4Kx2K_23.98HZ | |
| 21H | SMPTE4Kx2K_24HZ | |

| | | |
|---|---|---|
| 22H | H20_4KYUV420_60HZ | |
| 23H | H20_4KYUV420_59.94HZ | |
| 24H | H20_4KYUV420_50HZ | |
| 25H | FP3D_1280x720P_60HZ | |
| 26H | FP3D_1280x720P_59.94HZ | |
| 27H | FP3D_1920x1080P_24HZ | |
| 28H | FP3D_1920x1080P_23.976HZ | |
| 29H | FP3D_1280x720P_50HZ | |
| 2AH | SBSHALF3D_1280x720P_59HZ, | |
| 2BH | SBSHALF3D_1920x1080I_59.94HZ, | |
| 2CH | SBSHALF3D_1920x1080P_59.94HZ, | |
| 2DH | SBSHALF3D_1920x1080P_23.976HZ, | |
| 2EH | SBSHALF3D_1280x720P_50HZ, | |
| 2FH | SBSHALF3D_1920x1080I_50HZ, | |
| 30H | SBSHALF3D_1920x1080P_50HZ, | |
| 31H | TAB3D_1280x720P_59.94HZ, | |
| 32H | TAB3D_1920x1080P_59.94HZ, | |
| 33H | TAB3D_1920x1080P_23.976HZ, | |
| 34H | TAB3D_1280x720P_50HZ, | |
| 35H | TAB3D_1920x1080P_50HZ, | |
| 36H | AUTO | |
| 37H | User1 define | |
| 38H | User2 define | |
| 39H | User3 define | |
| 3AH | User4 define | |
| 3BH | User5 define | |
| 3CH | User6 define | |
| 3DH | Use7 define | |
| 3EH | User8 define | |
| 3FH | User9 define | |
| 40H | User10 define | |

*Table-6*

| Parameter | Description | Note |
|---|---|---|
| 1 | ColorSpace index | 0. RGB444<br>1. YUV444<br>2. YUV422<br>3. AUTO<br>4. YUV420(Note: colorspace 420 can only be set automatically in 4K 50/60Hz mode.) |

*Table-7*

| Parameter | Description | Note |
|---|---|---|
| 1 | DeepColor index | 0. 24BIT<br>1. 30BIT<br>2. 36BIT<br>3. 48BIT<br>4. AUTO |

*Table-8*

| Parameter | Description | Note |
|---|---|---|
| 1 | HDCP enable | 0. OFF<br>1. ON |

*Table-9*

| Parameter | Description | Note |
|---|---|---|
| 1 | HDMI/DVI output setting | 0. DVI<br>1. HDMI<br>2. AUTO |

*Table-10*

| Parameter | Description | Note |
|---|---|---|
| 1 | Audio Sampling | 0. 32K<br>1. 44.1K<br>2. 48K<br>3. 88K<br>4. 96K<br>5. 176K<br>6. 192K<br>7. AUTO |

*Table-11*

| Parameter | Description | Note |
|---|---|---|
| 1 | Audio bit | 0. 16BIT<br>1. 20BIT<br>2. 24BIT<br>3. AUTO |

*Table-12*

| Parameter | Description | Note |
|---|---|---|
| 1 | External audio | 0. OFF<br>1. ON |

*Table-13*

| Parameter | Description | Note |
|---|---|---|
| 1 | User index | 0~9 |
| 2 | CLK low byte | CLK=PIXEL CLK/10000, PIXEL CLK. The maximum is 300M<br>Please refer to note-1 following this table |
| 3 | CLK high byte | |
| 4 | General Flag | • Bit0-interlace mode, 1-interlace, 0-progressive<br>• Bit1-Hsync polarity ,1-positive, 0-negative<br>• Bit2-Vsync polarity ,1-positive, 0-nagative |
| 5 | HACTIVE low byte | |
| 6 | HACTIVE high byte | |
| 7 | HBANK low byte | |
| 8 | HBANK high byte | |
| 9 | HFRONT PORCH low byte | |
| 10 | HFRONT PORCH high byte | |
| 11 | HSYNC TIME low byte | |
| 12 | HSYNC TIME high byte | |
| 13 | VACTIVE low byte | |
| 14 | VACTIVE high byte | |
| 15 | VBANK low byte | |
| 16 | VBANK high byte | |
| 17 | VFRONT PORCH low byte | |
| 18 | VFRONT PORCH high byte | |
| 19 | VSYNC TIME low byte | |
| 20 | VSYNC TIME high byte | |

*Table-14*

Note:

1. たとえば、ピクセルクロックが148.5MHzの場合、CLK = 148500000/10000 = 14850、CLKの下位バイトは02、上位バイトは3Aです。

| Parameter | Description | Note |
|---|---|---|
| 1 | Group address | 01H~FEH<br>Can set the address to 0 when want to delete the address for this device. |
| 2 | Device address | |

*Table-16*

| Parameter | Description | Note |
|---|---|---|
| 1 | Audio channel number | 0. 2CH<br>1. 3CH<br>2. 4CH<br>3. 5CH<br>4. 6CH<br>5. 7CH<br>6. 8CH<br>7. AUTO |

*Table-21*

| Parameter | Description | Note |
|---|---|---|
| 1 | Release | 0 |
| 2 | CLK low byte | CLK=PIXEL CLK/10000, the maximum PIXEL CLK is 300MHz |
| 3 | CLK high byte | |
| 4 | General Flag | • Bit0-interlace mode, 1-interlace, 0-progressive<br>• Bit1-Hsync polarity ,1-positive,0-negative<br>• Bit2-Vsync polarity ,1-positive, 0-nagative |
| 5 | HACTIVE low byte | |
| 6 | HACTIVE high byte | |
| 7 | HBANK low byte | |
| 8 | HBANK high byte | |
| 9 | HFRONT PORCH low byte | |
| 10 | HFRONT PORCH high byte | |
| 11 | HSYNC TIME low byte | |
| 12 | HSYNC TIME high byte | |
| 13 | VACTIVE low byte | |
| 14 | VACTIVE high byte | |
| 15 | VBLANK low byte | |
| 16 | VBLANK high byte | |
| 17 | VFRONT PORCH lowbyte | |
| 18 | VFRONT PORCH high byte | |
| 19 | VSYNC TIME low byte | |
| 20 | VSYNC TIME high byte | |

*Table-22*

| Parameter | Description | Note | |
|---|---|---|---|
| 1 | Color space | Will reply base on table-7 | When in 'AUTO' mode, if there is sink device connected and HPD is high, all information will feedback to PC. If the HPD is low in 'AUTO' mode, will only reply the status of AUTO |
| 2 | DeepColor | Will reply base on table-8 | |
| 3 | HDMI/DVI | Will reply base on table-10 | |
| 4 | Audio Sampling | Will reply base on table-11 | |
| 5 | Audio sample bit | Will reply base on table-12 | |
| 6 | Audio channel number | Will reply base on table-21 | |

*Table-23*

| Parameter | Description | Note |
|---|---|---|
| 1 | HPD Status | 0. low<br>1. high |

*Table-24*

| Parameter | Description | Note |
|---|---|---|
| 1 | EDID Buffer Index | 0~9 |

*Table-26*

| Parameter | Description | Note |
|---|---|---|
| 1 | Power on or power off the output port | 0. Normal<br>1. Output in Standby mode |

*Table-27*

| Parameter Number | Parameter Description | Notes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Speaker placement State | (Hex) | | | | | | | | |
| | | | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| | | 00 | - | - | - | - | - | - | FR | FL |
| | | 01 | - | - | - | - | - | LFE | FR | FL |
| | | 02 | - | - | - | - | FC | - | FR | FL |
| | | 03 | - | - | - | - | FC | LFE | FR | FL |
| | | 04 | - | - | - | RC | - | - | FR | FL |
| | | 05 | - | - | - | RC | - | LFE | FR | FL |
| | | 06 | - | - | - | RC | FC | - | FR | FL |
| | | 07 | - | - | - | RC | FC | LFE | FR | FL |
| | | 08 | - | - | RR | RL | - | - | FR | FL |
| | | 09 | - | - | RR | RL | - | LFE | FR | FL |
| | | 0A | - | - | RR | RL | FC | - | FR | FL |
| | | 0B | - | - | RR | RL | FC | LFE | FR | FL |
| | | 0C | - | RC | RR | RL | - | - | FR | FL |
| | | 0D | - | RC | RR | RL | - | LFE | FR | FL |
| | | 0E | - | RC | RR | RL | FC | - | FR | FL |
| | | 0F | - | RC | RR | RL | FC | LFE | FR | FL |
| | | 10 | RRC | RLC | RR | RL | - | - | FR | FL |
| | | 11 | RRC | RLC | RR | RL | - | LFE | FR | FL |
| | | 12 | RRC | RLC | RR | RL | FC | - | FR | FL |
| | | 13 | RRC | RLC | RR | RL | FC | LFE | FR | FL |
| | | 14 | FRC | FLC | - | - | - | - | FR | FL |
| | | 15 | FRC | FLC | - | - | - | LFE | FR | FL |
| | | 16 | FRC | FLC | - | - | FC | - | FR | FL |
| | | 17 | FRC | FLC | - | - | FC | LFE | FR | FL |
| | | 18 | FRC | FLC | - | RC | - | - | FR | FL |
| | | 19 | FRC | FLC | - | RC | - | LFE | FR | FL |
| | | 1A | FRC | FLC | - | RC | FC | - | FR | FL |
| | | 1B | FRC | FLC | - | RC | FC | LFE | FR | FL |
| | | 1C | FRC | FLC | RR | RL | - | - | FR | FL |
| | | 1D | FRC | FLC | RR | RL | - | LFE | FR | FL |
| | | 1E | FRC | FLC | RR | RL | FC | - | FR | FL |
| | | 1F | FRC | FLC | RR | RL | FC | LFE | FR | FL |

*Table-28*

| Parameter Number | Description | Note |
|---|---|---|
| 1 | Switch output type | 0. HDMI PORT<br>1. SDI PORT |

*Table-29*