

MSM2

MIL-SPEC MONITOR SERIES II: D, R, V AND VR



USER MANUAL

6.5" - 8.4" - 10.4" - 12.1" - 15.0" TFT RUGGED LCD DISPLAYS

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OWNER RECORD

We recommend an easy-to-locate place to record the Display’s serial number and warranty period. The serial number label is on the back of the enclosure. That label’s date code starts the Display’s warranty period.

If the Display ever requires service, please refer to this information when contacting the **DSE Service Center at 480.515.1110.**

PRODUCT	SERIAL NUMBER					MANUFACTURE DATE
MSM2						

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MSM2 SERIES

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WELCOME.



With this purchase of this Mil-Spec Monitor (MSM) Series II, we welcome you to Digital System Engineering's family of harsh-duty mobile products.

You will soon become familiar with the quality difference in this bright sunlight-readable Display (5 to 800 nits), specifically designed for mobile computing. DSE has incorporated the latest optical engineering to achieve optimal viewability in all lighting conditions.

The MSM2 handles a wide-range of severe environments, making it the first selection of many industries for their mobile applications. Designed to be rugged, this Flat Panel LED LCD Display is engineered to thrive in adverse environments. With integrated internal heater(s), critically low operational temperatures are manageable, as low as -40°C (-40°F).

Housed in a milled billet aluminum case, the slim-profile MSM2 is light weight and water-tight (IP67/NEMA 6) with Mil-C connectors. Engineered to operate on low power consumption, the MSM2D (DVI) manages Digital Video Input signal, the MSM2R (RGB) manages Analog Video Input signal. The MSM2V (Video) offers a Video IN connector. The MSM2VR offers both RGB and Video connectors.

You may have purchased the MSM2 with the optional Analog Resistive Touch Screen (available with R and VR). Another option is Night Vision (NVIS) compatibility.

We are Digital Systems Engineering, keeping rugged **Technology in Motion**. Our Digital Technology Team is at the ready to support your system projects. We also value your satisfaction and encourage your feedback. Please visit our Customer Feedback page at www.digitalsys.com, under Support.

GENERAL SAFETY

SAFETY ICONS

Safety icons are inserted throughout the MSM Series II User Manual to draw attention to specific User Caution and Warning instructions.



WARNING! SHOCK HAZARDS

This icon warns user of a potential risk of electrical shock.



CAUTION! INSTRUCTIONAL

This icon is intended to tell the user of important operating and/or maintenance instructions.

GENERAL SAFETY INSTRUCTIONS

- Before operating the MSM2 Display, read this User Manual thoroughly
- Keep this User Manual for future use
- Verify the system capability (see System Set-up) to ensure operation of the Display
- For expeditious installation, follow these User Manual instructions in sequence
- Adhere to all Caution and Warnings on system and as stated in this User Manual
- User Manual instructions for installation and operation should be followed precisely
- Adjust only those controls covered by the User Manual's operating instructions; improper adjustment of other controls voids the Display's warranty and may result in Display damage, and
- Adhere to local installation codes.



GENERAL SAFETY PRECAUTIONS

- Power cable must be connected to a properly wired and grounded power source
- Any equipment to which the Display is attached must also be connected to properly wired and grounded power sources
- To avoid possibility of electrical shock, damage to electrical components or scratching the Display surface, do not open (no serviceable parts), disassemble or modify, and
- Disassembly of Display voids warranty.

GENERAL DISPLAY SAFETY

- Always disconnect Display from power source before cleaning
- Do not operate Display with a damaged cable, and
- Do not operate if Display has been dropped or damaged. Unit should be inspected by qualified DSE Service Personnel.



FLUIDS FROM LCD DISPLAY

- If Display is shattered, do not touch fluids from the LCD Screen
- If fluid should get on hands or clothing, immediately wipe off with liquid soap or rubbing alcohol with a clean towel; wash with water; immediately consult with a doctor, and
- If fluid gets in eyes, flush immediately with water for a minimum of 15 minutes; then immediately consult with a doctor.

ELECTRICAL SAFETY

ELECTRICAL

INSTALLING CABLES

- Pre and post installation, verify Display's power input connector is securely seated
- Install power cable so as not to come in contact with hot surfaces
- Do not allow anything to rest on power cable, and
- Protect power cable from extreme heat sources.

POWER SOURCE

- Always connect to a properly grounded DC (standard) power source
- Any equipment to which Display is attached must also be connected to properly wired and grounded power sources
- Operational voltage is 10 - 36 VDC (Input is 12, 24, 28 VDC nominal), and
- Power Consumption is: 6 - 20 Watts maximum for MSM206, 208, 210 and 212 and 6 - 40 Watts for MSM215.



WARNING! POWER CONSUMPTION

WARNING!

*MSM206, 208, 210, 212 are listed at 6 - 20 Watts maximum.
MSM215 is listed at 5 - 40 Watts maximum.*

SERVICING

USER

- User Servicing is limited to cleaning the Display and screen
- Do not disassemble or modify the Display to avoid the possibility of electrical shock, damage to its electrical components or scratching the Display surface, and
- Disassembly voids the warranty.

Should a product be retired, dispose responsibly through a technology electronic (E-waste) recycler.

DSE

DSE Qualified Service Personnel may be required to service the Display if:

- Does not operate normally when installation instructions are followed
- Does not operate normally when operating instructions are followed
- Has been dropped or damaged, or
- Exhibits a distinct change in performance, indicating a need for service.

SHIPPING TO A DSE SERVICE CENTER

If Display should need to be shipped to the DSE Service Center, the original packing material or similar should be used to ensure safety of Display in shipping. Repack Display as it was originally received. Protect the Display screen.

PRODUCT CARE AND MAINTENANCE

PRODUCT CARE

This MSM2 Display is designed to provide optimum performance and service without any required scheduled maintenance other than occasional cleaning. Prior to use, remove the protective film from the Display screen.

DISPLAY SCREEN CLEANING

The Display Screen is a glass-based product. Power OFF the unit prior to cleaning.

- With a slightly damp cloth, lightly wipe down screen to remove dust and grit; always use a fresh side of cleaning cloth to avoid scratching
- Follow with a fresh cloth dampened slightly with cleaner
- A vinegar-based cleaner is recommended; this prevents streaking and degradation of coatings, or use a nonabrasive glass cleaner such as a professional foam glass cleaner
- Wipe left to right or right to left row patterns; swirling is not recommended
- To minimize risk of abrasion to Display screen, air drying is recommended.

TOUCH SCREEN CLEANING

- Touch Screen (optional): Use a special screen cleaning tissue or a solution specifically formulated for antistatic coatings. Follow the manufacturer's instructions, or
- Lightly dampen a soft clean cloth with water or a general purpose mild detergent solution
- On screen, always use a fresh side of cleaning cloth to avoid scratching, and
- To minimize risk of abrasion to Display screen, air drying is recommended.

DISPLAY ENCLOSURE

- Clean enclosure with a soft clean cloth lightly dampened with a general purpose mild detergent solution
- Wipe down with clean water, and
- Dry with a soft clean cloth.



WARNING!

WARNING! SHOCK HAZARDS

Disconnect from power source before cleaning screen or enclosure.



CAUTION!

CAUTION! INSTRUCTIONAL

- Do not use abrasive cleaners or solvent-based (flammable) cleaners on screen, its enclosure or any other electrical connection
- Do not use paper products; they may scratch the screen, and
- Do not directly apply cleaning solutions to screen.



USER TIP

USER TIP

In marine or similar environments, an added benefit of a vinegar-based cleaner is its effectiveness in dissolving mineral and salt deposits.

PRODUCT CARE AND MAINTENANCE (CONTINUED)

LONG-TERM STORAGE

- For long-term storage, Display should be stored in an ambient indoor environment
- Display screen be protected from accidental damage
- For Pedestal Mount, disconnect cable(s) and loosen arm adjustment to where ball can be removed from arm, or
- For Flush or Panel Mount, cover Display with a protective covering that will not scratch or transfer dyes to Display screen.

MAINTENANCE



WARNING!

WARNING! POWER CABLE

To avoid shock and fire hazards, replace the Display's power cable if:

- Insulation becomes damaged, or
- A loose connection is suspected.

OTHER MAINTENANCE

Only DSE Qualified Service Personnel should perform other maintenance aside from cleaning and Power Cable replacement described within.



WARNING!

WARNING! SHOCK HAZARD

To avoid risk of electrical shock, do not disassemble Display's enclosure. There are no user-serviceable parts in the Display. User maintenance is restricted to cleaning or power cable replacement as explained. Disassembling the Display voids the warranty.

SYSTEM SET-UP

SYSTEM REQUIREMENTS

The system the MSM2R or VR is connected to must have the following capability:

- Computer setting with a minimum resolution of 640 x 480 pixels, and
- If optional Touch Screen Display is ordered, an available COM or USB port for connection is required, depending on the Display configuration ordered.

SHIPPING BOX

The MSM2 is shipped in custom packaging. The installer should save the box and all packaging materials in case the Display would need to be returned to the DSE Service Center.

INSTALLATION

The MSM2 may be mounted in three configurations, decided at time of order: with a universal ball-and-socket mounting kit, in a Flat Panel or optional Flush Mount configuration.

OPTIONAL PEDESTAL MOUNT

Optional is a RAM® universal ball-and-socket system mounting kit (Figure 1). By installing the Display with this kit, User can adjust the viewing angle to improve viewability in changing environments. This ball-and-socket system has proven to be successful in supporting an extreme amount of weight in high vibration and difficult-mount applications. Visit www.digitalsys.com for product mounting diagrams.

Locate the ball-and-socket system in shipping box. The kit consists of two RAM balls on mounting plates and a RAM arm with an adjustable T-knob with a packet of three (3) M4 x 10 counter-sunk stainless screws for mounting. (Figures 1 - 3)



FIGURE 1

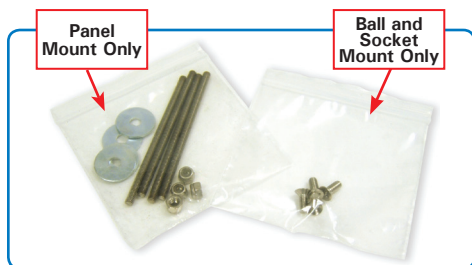


FIGURE 2

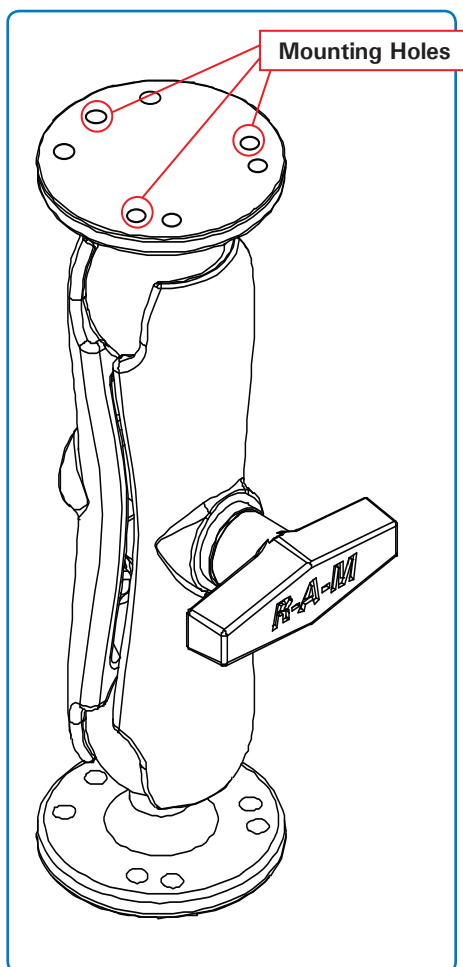


FIGURE 3

INSTALLATION (CONTINUED)

There are three mounting holes in the back of the Display for attachment of a ball mounting plate. Take care not to strip the screw holes or over tighten. (Figure 4) It is recommended the remaining ball be mounted on a flat surface. Because of various surface substrates where the Display is mounted, the installer provides the screws to mount the other ball.

- Note the location of the three mounting holes on a ball mounting plate (Figure 3)
- With three (3) M4 x 10 counter-sunk stainless screws (Figure 2) attach mounting plate to the back of the MSM2 (Figure 1)
- Mount second ball mounting plate on surface where the Display is to be installed
- Insert each ball into the RAM arm
- Lightly tighten the arm around the balls using the T-knob on the arm (Figure 1, 3)
- Adjust the Display to the viewing preference, and
- Tighten the T-knob to hold the Display in position.

PANEL MOUNT

Panel Mount installation should be specified at time of order; the ball-and-socket mount system will not be included in shipping box. (Figure 4) There are four tapped mounting holes on four corners of the Display's rear panel. A mounting hardware packet is included with product accessories in the shipping box. This packet includes four (4) M4 stainless steel threaded studs, 7.6cm (3" long), four (4) Nylock self-locking nuts and four (4) flat washers.

Installer should refer to product drawings on DSE's web site, www.digitalsys.com for exact measurements of Display's rear panel. These should be helpful when installer cuts the required installation opening.

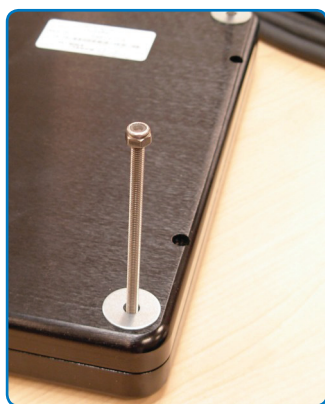


FIGURE 4

FLUSH MOUNT WITH OPTIONAL BEZEL

With Flush Mount Bezel, the Display may be mounted flush with mounting surface; this should be specified at time of order as ball-and-socket mount system or any mounting hardware will not be included in the shipping box. Installer needs to supply screws for this installation.

Installer should refer to product drawings on DSE's web site, www.digitalsys.com for exact measurements of Display. Note: Locations of milled holes in Flush Mount Bezel. Drill corresponding holes into the substrate where Display is to be mounted.

PRESSURE EQUALIZER VALVE

There is a Pressure Equalizer Valve on the chassis. (Figure 5) In the final installation, do not block or constrain this valve.

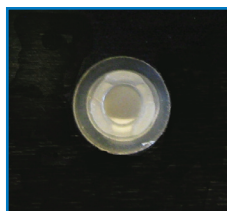


FIGURE 5



CAUTION!

CAUTION!

Enclosure is aluminum; do not over tighten screws or strip screw holes.
Do not block or constrain the Pressure Equalizer Valve.

DISPLAY CONNECTORS - SERIES D (DVD)

CABLES

All cables are supplied by end user; the MSM2D is not shipped with cables.

CONNECTORS

There are two (2) MIL-C connectors on the MSM2D: Power Input and Video Input. Connectors are located on bottom of Display housing. From left to right: Power Input (J1), a 3-Pin Connector and Video Input (J2), a 13-Pin Connector.



FIGURE 6

J1 Power Input
J2 Video Input

POWER INPUT (J1)

The Power Amphenol Connector (J1) is a MIL-C-26482 Series I Connector.

- Pin-out is listed in Table 1
- Line up with Connector # J1 in Figure 6
- Add a turn to lock
- End User supplies Power Cable

***PIN C. No Connect, Chassis GND (if applicable)**

**POWER CABLE
3-PIN PLUG (J1)
MIL-C-26482 SERIES I**

PIN	SIGNAL
A	28 Volt DC
B	28 Volt RTN
C	No Connect*
AMPH	71-533721-33P
MATE	PT06E833SSR
STRAIN	Included

TABLE 1

DISPLAY CONNECTORS - SERIES D (CONTINUED)

VIDEO INPUT (J2)

The Video Amphenol Connector (J2) is a MIL-C-38999 Series I Connector. See Table 2.

- Pin-out is listed in Table 2
- Line up with Connector # J2 in Figure 6
- Add a turn to lock
- End User supplies Video Cable

VIDEO CABLE 19-PIN PLUG MIL-C-38999 SERIES I	
PIN	SIGNAL
1	DVI RX2 +
2	DVI RX2-
3	DVI RX1 +
4	USB0+ /RS232 RXD
5	USB0-/RS232 TXD
6	DVI RX1-
7	GND
8	REMOTE ON/OFF OPTIONAL
9	GND
10	DVI + 5V
11	DVI RX0 +
12	DVI RX0-
13	DVI HOT PLUG DETECT
14	DVI DDC SDA
15	DVI RXC +
16	GND
17	DVI DDC SCL
18	GND
19	DVI RXC-
AMPH	2M803-005-07NF9-19PN
MATE	2M803-002-06NF9-19SN
STRAIN	390MS077NF0904

TABLE 2



CAUTION!

CAUTION!

Use care when inserting or removing connector.
Do not force mating.

This section is intentionally left blank.

DISPLAY CONNECTORS - SERIES R (RGB)

CABLES

All cables are supplied by end user; the MSM2R is not shipped with cables.

CONNECTORS

There are two (2) MIL-C connectors (IP67 rated) on the MSM2R: Power Input and Video Input. Connectors are located on bottom of Display housing. From left to right: Power Input (J1), a 3-Pin Connector and Video Input (J2), a 13-Pin Connector.

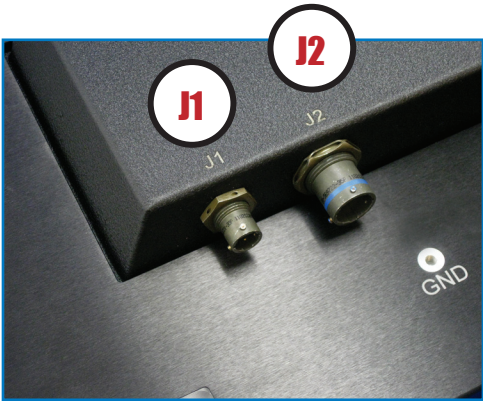


FIGURE 7

J1 Power Input
J2 Video Input

POWER INPUT (J1)

The Power Amphenol Connector (J1) is a MIL-C-26482 Series I Connector.

- Pin-out is listed in Table 3
- Line up with Connector # J1 in Figure 7
- Add a turn to lock
- Connector is sealed (IP67)
- End User supplies Power Cable

**PIN C. No Connect, Chassis GND (if applicable)*

POWER CABLE 3-PIN PLUG MIL-C-26482 SERIES I	
PIN	SIGNAL
A	28 Volt DC
B	28 VVlt RTN
C	No Connect*
AMPH	71-533721-33P
MATE	PT06E833SSR
STRAIN	Included

TABLE 3

DISPLAY CONNECTORS - SERIES R (CONTINUED)

VIDEO INPUT (J2)

The Video Amphenol Connector (J2) is a MIL-C Series Connector. See Table 4.

- Pin-out is listed in Table 4
- Line up with Connector # J2 in Figure 7
- Add a turn to lock
- Connector is sealed (IP67)
- End User supplies Video Cable

VIDEO CABLE 13-PIN PLUG MIL-C-38999 SERIES I	
PIN	SIGNAL
1	Red Video Signal
2	Red Video Ground
3	Green Video Signal
4	Green Video Ground
5	Blue Video Signal
6	Blue Video Ground
7	H-SNYC
8	V-SNYC
9	H/V SYNC Ground
10	USB + /RS232 RXD
11	USB-/RS232 TXD
12	Digital Ground
13	RI-OUT
AMPH	88-569722-35P
MATE	MS27467E11B35S
STRAIN	M85049/49-2-10W

TABLE 4



CAUTION!

CAUTION!

Use care when inserting or removing connector.
Do not force mating.

DISPLAY CONNECTORS - SERIES V (VIDEO)

CABLE AND CONNECTOR

All cables are supplied by end user; the MSM2V is not shipped with cables. The MSM2V has one MIL-C Connector (MIL-C-38999 Series III) for Video Input (J1). (Figure 8). Video Input 13-Pin Connector is located on bottom of rear pod housing.

J2 Video Input



FIGURE 8

VIDEO INPUT

The Video Input (J2) is an Amphenol Connector, a MIL-C-38999 Series III.

- Connector is sealed (IP67)
- Option One pin-out is for units with one connector for (3) composite inputs
- Option Two pin-out is for units with a single S-Video and single RS-170 input
- End User supplies Video Cable

***PIN 11. No Connect, Chassis GND (if applicable)**

OPTION ONE: RS-170 INPUTS (3)

TABLE 5

VIDEO INPUT 13 PIN PLUG MIL-C-38999 SERIES III	
PIN	SIGNAL
1	NTSC/PAL Video Signal
2	NTSC/PAL Video Ground
3	NTSC/PAL Video Signal
4	NTSC/PAL Video Ground
5	NTSC/PAL Video Signal
6	NTSC/PAL Video Ground
7	+ 28 VDC
8	+ 28 VDC
9	+ 28 VDC Ground
10	+ 28 VDC Ground
11	No Connect*
12	Video Out (Signal)
13	Video Out (Ground)
AMPH	91-569782-35P
MATE	D38999/26FB35SN
STRAIN	M85049/38-11N

OPTION TWO: S-VIDEO (1), RS-170 (1)

TABLE 6

VIDEO INPUT 13 PIN PLUG MIL-C-38999 SERIES III	
PIN	SIGNAL
1	S-Video C Signal
2	S-Video C Ground
3	S-Video Y Signal
4	S-Video Y Ground
5	NTSC/PAL Video Signal
6	NTSC/PAL Video Ground
7	+ 28 VDC
8	+ 28 VDC
9	+ 28 VDC Ground
10	+ 28 VDC Ground
11	No Connect*
12	No Connect
13	No Connect
AMPH	91-569782-35P
MATE	D38999/26FB35SN
STRAIN	M85049/38-11N

DISPLAY CONNECTORS - SERIES VR (VIDEO/RGB)

CABLES

All cables are supplied by end user; the MSM2VR is not shipped with cables.

CONNECTORS

There are two (2) MIL-C connectors on the MSM2VR: Power Input (J1) and Video Input (J2). There are three (3) BNC connectors (C1-3). Connectors are located on bottom of Display housing. From left to right: Power Input, a 3-Pin Connector and Video Input, a 13-Pin Connector, then three (3) BNC connectors. See Figure 9.



FIGURE 9

J1	Power Input
J2	Video Input
C3	BNC Connector
C2	BNC Connector
C1	BNC Connector

POWER INPUT (J1)

The Power Amphenol Connector (J1) is a MIL-C-26482 Series I Connector.

- Pin-out is listed in Table 7
- Line up with Connector # J1 in Figure 9
- Add a turn to lock
- Connector is sealed (IP67)
- End User supplies Power Cable

**PIN C. No Connect, Chassis GND (if applicable)*

POWER CABLE 3-PIN PLUG MIL-C-26482 SERIES I	
PIN	SIGNAL
A	28 Volt DC
B	28 Volt RTN
C	No Connect*
AMPH	71-533721-33P
MATE	PT06E833SSR

TABLE 7

DISPLAY CONNECTORS - SERIES VR (CONTINUED)

VIDEO INPUT

The Video Input Amphenol Connector (J2) is a MIL-C-38999 Series I.

- Pin-out is listed in Table 8
- Line up with Connector # J2 in Figure 9
- Add a turn to lock
- Connector is sealed (IP67)
- End User supplies Video Cable

VIDEO INPUT 13-PIN PLUG MIL-C-38999 SERIES I	
PIN	SIGNAL
1	Red Video Signal
2	Red Video Ground
3	Green Video Signal
4	Green Video Ground
5	Blue Video Signal
6	Blue Video Ground
7	H-SNYC
8	V-SNYC
9	H/V SYNC Ground
10	USB + /RS232 RXD
11	USB-/RS232 TXD
12	Digital Ground
13	RI-OUT
AMPH	88-569722-35P
MATE	MS27467E11B35S

TABLE 8

VIDEO INPUT THROUGH BNC CONNECTOR

There are three (3) Video Input through BNC Connectors.

- Pin-out is listed in Table 9
- Line up with Connector # C1-3 in Figure 9
- Add a turn to lock
- Connector is sealed (IP67)
- End User supplies Video Cable

BNC C1, C2, C3	
PIN	SHELL
CENTER	VID_IN
SHELL	VID_GND

TABLE 9



CAUTION!

Use care when inserting or removing connector.
Do not force mating.

OPERATOR CONTROLS (MSM2D AND MSM2R)

The Display bezel has six (6) Operator Control buttons (Figure 10).

POWER ON/OFF BUTTON

Note: Display defaults to an AUTO-OFF state when power is applied.

- POWER ON/OFF button is identified with I/O (Input/Output) symbol
- Momentarily pressing powers ON or OFF the Display
- Blue LEDs illuminate behind the buttons when the Display is powered ON, and
- Rapid power cycling (ON/OFF/ON) is not supported.



BRIGHTNESS BUTTON

The Brightness toggle button is second; it controls the brightness of the Display.

- LARGE SUN: when repeatedly pressed or held down, will cause Display's backlight brightness to incrementally step up to brightest setting,
- SMALL SUN: when repeatedly pressed or held down, will cause Display's backlight brightness to incrementally step down to its lowest setting,
- Lowest Setting is almost total black, suitable in very subdued light, as in night time operations,
- Adjusted settings are maintained during power cycles (ON/OFF)



FIGURE 10



SELECT BUTTON

The SELECT Button is used to enter the On-Screen Display Menu (OSD). This button also allows for navigation within the various OSD Menus. (See On-Screen Display Menu)



UP ARROW BUTTON

The UP Arrow Button is an adjustment tool in the OSD Menu. (See OSD Menu Categories.)



DOWN ARROW BUTTON

The DOWN Arrow Button is an adjustment tool in the OSD Menu. (See OSD Menu Categories.)



DAY/NIGHT BUTTON

The DAY/NIGHT button toggles the display's backlight between the lowest (minimum) setting for Day, and the brightest (maximum) setting for Night.



OPERATOR CONTROLS (MSM2V AND MSM2VR)

The Display bezel has seven (7) Operator Control buttons (Figure 11).

POWER ON/OFF BUTTON

Note: Display defaults to an AUTO-OFF state when power is applied.

- POWER ON/OFF button is identified with I/O (Input/Output) symbol
- Momentarily pressing powers ON or OFF the Display, and
- Blue LEDs illuminate behind the buttons when the Display is powered ON.



BRIGHTNESS BUTTON

The Brightness toggle button is second; it controls the brightness of the Display.

- LARGE SUN: when repeatedly pressed or held down, will cause Display's backlight brightness to incrementally step up to brightest setting,
- SMALL SUN: when repeatedly pressed or held down, will cause Display's backlight brightness to incrementally step down to its lowest setting,
- Lowest Setting is almost total black, suitable in very subdued light, as in night time operations,
- Adjusted settings are maintained during power cycles (ON/OFF)



FIGURE 11

SELECT BUTTON

The SELECT Button is used to enter the On-Screen Display Menu (OSD). This button also allows for navigation within the various OSD Menus. (See On-Screen Display Menu)



UP ARROW BUTTON

The UP Arrow Button is an adjustment tool in the OSD Menu. (See OSD Menu Categories.)



DOWN ARROW BUTTON

The DOWN Arrow Button is an adjustment tool in the OSD Menu. (See OSD Menu Categories.)



SOURCE BUTTON

The SOURCE Button allows the user to toggle between various inputs of video feed. The sources available are controlled by the display model.



ON-SCREEN DISPLAY MENU

The On-Screen Display (OSD) User Interface is where Display adjustments are made. With its user-friendly graphical interface, the OSD Menu provides access to fine-tuning the Display according to the user's preferences.

OSD MENU ACTIVATION

To activate the OSD menu, press and release SELECT Button.

Note: OSD Menu closes after 30 seconds of inactivity. This setting may be adjusted in the OSD Menu: Tools: OSD Timeout.

OSD MENU CATEGORIES

The OSD Menu is comprised of five icons and an Exit Button; each icon represents a distinct menu category with its corresponding functions. (Figure 12)

Note: OSD Menu selections are indicated by icon only; there is no text.



FIGURE 12

GENERAL OPERATING INSTRUCTIONS

- To open the OSD Menu, press (once) the SELECT Button
- Use UP or DOWN Button to move across Menu; selected icon turns yellow (Figure 13)
- As Main Menu icon is highlighted, its Submenu appears in OSD dialogue box
- Press (once) SELECT Button to enter highlighted icon's Submenu
- A highlight bar is superimposed over the first menu item
- Press UP or DOWN Button to move the highlight bar through the Submenu
- Press (once) SELECT Button to activate the highlighted Submenu item
- To Change values: press UP or DOWN Buttons, which increases (UP) or decreases (DOWN) the value of parameter as indicated in dialogue box; hold down Button to fast forward



FIGURE 13

ON-SCREEN DISPLAY MENU (CONTINUED)

- Press (once) SELECT Button to go to a new menu item (Figure 14), or
- Press (once) SELECT Button to save new value or wait for OSD to timeout; it will auto-close, saving all changes
- To choose another menu item, use UP or DOWN Button to move across Main Menu; repeat instructions, and
- To Exit, use UP or DOWN Button to move across OSD Menu to highlight Exit Sign icon; press (once) SELECT Button to Exit; upon Exit, all changes are saved.

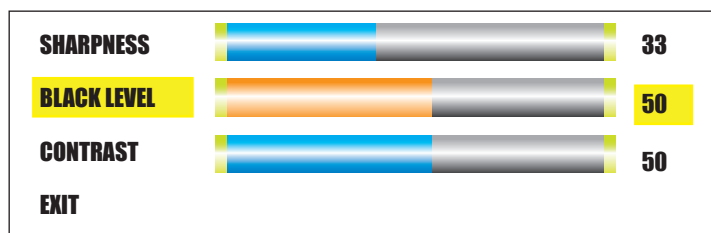


FIGURE 14



CAUTION!

SAVING CHANGES

- Exit Button saves adjustments made to OSD then exits the Menu, or
- If OSD times out, any adjustments made will automatically be saved, then the Menu closes.

OSD MENU CATEGORIES



INPUT SELECTION

The Input Selection Menu enables a selection of three Composite video input signals. Selection is based on Display configuration and its dependency upon a specific signal source. Main power recycle resets input source to default, C Video 1 (Composite).

Note: The **SOURCE** Button on the Display allows for moving through various video input signals without accessing the OSD Menu.

C VIDEO 1

Select for first Input Signal. Select Exit Button to save.

C VIDEO 2

Select for second Input Signal. Select Exit Button to save.

C VIDEO 3

Select for third Input Signal. Select Exit Button to save.

ON-SCREEN DISPLAY MENU (CONTINUED)



EXIT

Select Exit Button to save changes and exit from OSD Menu.



IMAGE ENHANCEMENT

The Image Enhancement Menu enables adjustments of Image Enhancement values.

SHARPNESS

Select Sharpness to adjust Sharpness of displayed image. Use UP (right) or DOWN (left) Button to adjust in preset increments. Select Exit to save.

Composite input signal factory default is 33 within a range of 0 - 100.

BLACK LEVEL

Select Black Level to adjust Black Level of input Composite Signal. Factory default is 50 within a range of 0-100. Use UP (increase) or DOWN (decrease) Button to adjust in individual increments. Select Exit Button to save.

CONTRAST

Select Contrast to adjust difference in brightness between light and dark areas of Display pixels. Factory default is 50 within a range of 0 - 100. Use UP (increase) or DOWN (decrease) Button to adjust in individual increments. Select Exit Button to save.



EXIT

Select Exit Button to save changes and exit from OSD Menu.



COLOR

The Color Menu enables adjustments of Color Parameters of the Display image.

COMPOSITE INPUT SIGNAL

HUE

Select Hue to adjust shading (gradation) within colors. Factory default is 50 within range of 0 - 100. Use UP (increase) or DOWN (decrease) Button to adjust in individual increments. Select Exit Button to save.

SATURATION

Select Saturation to adjust intensity or vividness (saturation) of color. Factory default is 50 within range of 0 - 100. Use the UP (increase) or DOWN (decrease) Button to adjust in individual increments. Select Exit Button to save.

OSD MENU CATEGORIES (CONTINUED)

COLOR RESET

Select Color Reset to reset active Composite signal Color parameters Hue and Saturation to factory default values (50). Select Exit Button to save.

Note: *Color parameters will reset active Composite Video Input Signal only.*



EXIT

Select Exit Button to save changes and exit from OSD Menu.



IMAGE SETTINGS

The Image Setting Menu enables Display screen adjustments if Display is set-up for a VGA Input Signal.

Note: *Composite: Icon will be grayed, as it is unavailable.*



TOOLS

The Tool Menu enables adjustment of miscellaneous parameters.

OSD TIMEOUT

Factory default OSD Timeout setting is 30 seconds. Interval selections are Off, 5, 15, 30 and 60 seconds. Select to adjust time elapse between last Menu activity and when Menu exits. Use the UP (increase) or DOWN (decrease) Buttons to change the values. Select Exit Button to save.

Note: *Any changes made in will be saved upon Timeout Exit.*

NVIS Green / NVIS Red (Optional)

If unit is equipped with NVIS Green/NVIS Red Option, user has to set the NVIS Modes to ACTIVE at Power ON. Display will default to that NVIS color theme at Power ON.

Use the DOWN Arrow Button to select NVIS Green; use the UP Arrow Button to select NVIS Red.

PICTURE-IN-PICTURE (PIP) MENU (NOT AVAILABLE WITH "R" SERIES; NO VIDEO FEED)

The User may view a second video source in addition to the default signal source by utilizing the Picture-in-Picture (PIP) feature.

The PIP Menu has two selections: PIP Source; PIP Mode.

ON-SCREEN DISPLAY (CONTINUED)

PIP SOURCE

PIP Source allows User to select the Composite Video Source (C 1 - 3) for the PIP.

PIP MODE

PIP Mode allows User to select Display Video Source viewing modes of OFF or PIP.

- OFF: turns off the PIP setting
- PIP: turns on the PIP view
- Settings are maintained during power cycles (ON/OFF Button), and
- Settings return to factory default at main power recycle.

FACTORY RESET

Select Factory Reset to reset Display screen adjustments Color Settings (**Sharpness, Black Level, Contrast**) and Color (**Hue, Saturation**) to factory default values (50). Select Exit Button to save.



CAUTION!

FACTORY RESET

Factory Reset will reset all OSD changes made to Video set-ups with the exception of the PIP settings.



EXIT

Select Exit Button to save changes and exit from OSD Menu.

This section is intentionally left blank.

INTERNAL HEATER

INTERNAL HEATER

The Internal Heater automatically brings the Display up to standard operating temperature if below operational temperature when powered on.

OPERATIONS

- The flashing blue LED behind the Power Button indicates the Display is in heating mode, bringing the Display up to operational temperature
- Once the Display is up to operational temperature, the flashing LED becomes a constant blue illumination and the Display automatically powers on
- Maximum time for the Display to reach operational temperature is approximately 12 minutes (15 minutes for 15" Display), and
- There are no user adjustments for the Internal Heater function.

OPTIONAL NVIS

NVIS GREEN / RED

NVIS Green / Red option allows interfacing with Night Vision devices without adverse effects. The Display will automatically power on in NVIS mode. Daylight mode can be displayed by pushing the UP ARROW Button. This button allows user to toggle between Day Mode and NVIS Mode.

User selects either NVIS Green or NVIS Red in the OSD menu. Once saved in the OSD, the UP / DOWN ARROW Buttons will toggle between that selection (Green or Red) and Day Mode; both NVIS colors are not available at the same time.

OPTIONAL AC POWER ADAPTER

OPTIONAL AC POWER ADAPTER

- Optional AC Power Adapter Cable set: 3 m (10 ft) cable with an IP68 sealed connector, power adapter and 1.8 m (6 ft) common AC power cord
- Adapter accepts voltage from 110 to 250 VAC and frequency from 47 to 63Hz
- AC power cord plug is a North American standard for 120 VAC/60Hz

Note: Optional AC Power Adapter is not an off-the-shelf item. It is equipped with a specific connector for integration with the MSM2 Display.

This section is intentionally left blank.

OPTIONAL TOUCH SCREEN DISPLAY

TOUCH SCREEN INSTALLATION

Touch Screen Installation instructions are available from the Digital Systems Engineering web site, www.digitalsys.com.

If hurdles are encountered during an installation, contact DSE's Service Center at 480.515.1110 x111; e-mail Service@digitalsys.com; or visit www.digitalsys.com.

TSHARC TOUCH CONTROLLER DRIVER/WINDOWS OPERATING SYSTEMS

The monitor's touch screen function requires the download of a TSHARC Touch Controller Driver application installed on the device where the monitor is connected. To download the latest compatible drivers, go to www.digitalsys.com.

Operating Systems compatible with TSHARC Touch Controller Driver are: Microsoft's® XP, 7, 8 and 10 (32 and 64-bit); with RS232 and USB options. If other MS O/S are installed, contact Service@digitalsys.com for assistance. **Note: TSHARC Touch Controller Driver is not compatible with Microsoft® Vista.**



TSHARC Touch Screen Controller Driver is not compatible with Vista.

CAUTION!

PREVIOUS VERSIONS OF TOUCH SCREEN CONTROLLER DRIVERS

Previous versions of ANY Touch Screen Controller Driver must be removed before installing the latest version of the TSHARC™ Touch Screen Controller Driver.

If a different T/S Controller Driver (not TSHARC) is on the device it must be removed before installing the TSHARC drivers. Note: A typical driver uninstall program utility of Microsoft's® does not remove all traces of a T/S Driver installation. *Contact manufacturer of previously installed driver program to learn how to uninstall their product. These instructions may be available from the manufacturer's web site.*

NEW MONITOR INSTALLATION WITH EXISTING DEVICE

Whenever a new monitor is installed to an existing device (equipped with TSHARC driver), *Touch Screen calibration is always required.* The Touch Screen driver resides on the system device, not the monitor.



CALIBRATE!

CAUTION!

ALWAYS CALIBRATE! *When adding a monitor to a new or different device, always calibrate to that device; Calibration settings reside on the device, NOT the monitor.*

NEW OPERATING SYSTEM INSTALLATION

If installing a new operating system (O/S), do not install Touch Screen Controller Driver until O/S is installed and system's video display settings have been verified. Touch Screen Controller Driver uses system's O/S display driver settings to accurately configure T/S Controller Driver files.

APPENDIX A

MECHANICAL DRAWINGS

Mount diagrams and dimensions may be of assistance in installation. Overview drawings may be found on the corresponding product page on the DSE website (www.digitalsys.com). When on the product page, scroll down and select the Download tab and follow instructions.

APPENDIX B

TROUBLESHOOTING

SYMPTOM: NO LIGHT BEHIND BUTTON LEDS

Possible Problem	Solution
No power, loose power connection	Confirm the Display is properly connected to a DC or AC power source. Verify the power source is live or try another battery or AC power outlet. Verify the Display is powered on.
Reverse polarity	Check polarity of the power connection.

SYMPTOM: LIGHT BEHIND BUTTON LEDS, NO IMAGE OR "NO SIGNAL" ERROR MESSAGE AND/OR NO IMAGE ON THE DISPLAY

Possible Problem	Solution
Power on, no video signal	Verify the video cable is plugged into the System Input video connector. Verify a video signal is coming out of the system (i.e., Plug into a known good display source). Verify the incoming signal source selected matches the System Monitor signal source. Check the Brightness front panel (LCD) adjustment on the Display. This may be set too low. Check the Brightness and Contrast controls in the OSD. These may be set too low. System may have gone into power management stand-by. Press any key on the keyboard, move the mouse or cursor, or if there is a Touch Screen, touch to wake the system.

APPENDIX B (CONTINUED)

SYMPTOM: DISPLAY HAS ROLLING “BARS” ACROSS THE SCREEN OR VERTICAL SHADED BARS ON THE IMAGE.

Possible Problem	Solution
System video display is not set to view at 800 x 600 pixels or 1024 x 768 pixels	Verify system video display is set at 800 x 600 pixels (1024 x 768 pixels).
Defective video cable	On a known good display source, confirm the video cable is not defective.
Interference from adjacent equipment	For proper grounding and shielding verify installation is with a proper video cable. Keep the cable away from sources of EMI such as electric motors, or unshielded RFI sources such as radar and microwaves.
Horizontal size is not adjusted	In the OSD, adjust the horizontal size control.

SYMPTOM: PICTURE QUALITY, IMAGE STABILITY IS DISTORTED.

Possible Problem	Solution
Not working in 800 x 600 pixel resolution or 1024 x 768 pixel resolution	Verify system video display is set at 800 x 600 pixels (1024 x 768 pixels).
Proper cable grounding and shielding	Verify the use of a proper video cable with suitable grounding and shielding. Keep the video cable away from sources of EMI and RFI.
Improper video display settings	Check signal source for a proper signal. Verify system video display is set at 800 x 600 pixels (1024 x 768 pixels). Verify the display refresh rate: 60 – 75Hz.
Display unit is farther than 3m (10 ft) from signal source	Single cable lengths in excess of the standard 3 m (10 ft) cable should be of high quality shielded System Input cable. Contact DSE for information on custom cables.
Multiple Monitors are driven from the same signal source.	Splitting the video signal divides the strength of the signal. A video signal booster (line driver) is recommended if installation requires more than one Display driven from a single video source.
Display has incorrect or bad sync signals.	Check for proper video cable installation, or replace suspected faulty cable. Verify system video display is set at 800 x 600 pixels (1024 x 768 pixels) and at a 60 - 75Hz refresh rate.

SYMPTOM: DISPLAY IMAGE IS NOT PROPERLY SIZED

Possible Problem	Solution
OSD adjustments need to be made	Adjust the vertical and horizontal size controls through the OSD.
Improper video display settings	Verify system video display is set at 800 x 600 pixels (1024 x 768 pixels) and at a 60 - 75Hz refresh rate.

APPENDIX B (CONTINUED)

SYMPTOM: TOUCH SCREEN (T/S) DOES NOT RESPOND

Possible Problem	
T/S cable is not plugged in	Verify the connections between the T/S and the system.
T/S cable is installed in a different COM port than installed by the software	Install the T/S into another COM port. If using a laptop, verify the COM port(s) is enabled.
T/S Controller driver has not been installed	Install the TSHARC Controller driver.
Hardware failure	Contact a DSE Technical Support Technician (480.515.1110).

SYMPTOM: T/S MOVES, BUT DOES NOT FOLLOW A FINGER OR STYLUS

Possible Problem	Solution
Controller is not calibrated	Run the calibration in the TSHARC Control Panel software.
T/S Controller Driver is not installed	Install the TSHARC Controller Driver.
T/S cable is not installed correctly	Verify the T/S cable is installed correctly.

SYMPTOM: "ERROR IN CALIBRATION" MESSAGE APPEARS

Possible Problem	Solution
The T/S Controller Driver is not installed correctly	<p>Uninstall the driver using "TSUN10.exe". If a previous T/S Controller Driver was installed, all footprints must be removed. Go to the T/S manufacturer's or contact the manufacturer for instructions to uninstall driver.</p> <p>Reinstall the TSHARC Driver software.</p>

This section is intentionally left blank.

NOTES

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