

## Users Manual



Marine Display Unit:  
**MDU12, MDU15, MDU19, MDU20**

# User Manual MDU Display

MDU12, MDU15, MDU19, MDU20.

Thank you for purchasing a Comark Corporation Marine Display Unit. We at Comark appreciate your business and strive to ensure you receive the highest quality product available to the Marine Industry.

## About Comark Corporation

Comark Corporation has been a leading provider of military computers, LCD displays, enclosures, and distributed I/O platforms for over 35 years.

## Our Commitment To Quality

Comark Corporation designs standard systems suitable for shipboard and mobile automation environments and excels at custom solutions for unique and challenging applications. We utilize high-performance, low-power processing, efficient thermal designs and rugged vibration-resistant enclosures and chassis. We thoroughly test all system designs for EMI, shock, vibration and thermal properties in our on-site testing facilities to ensure that the products we manufacture will function reliably in your application.

Our dedicated team provides in-depth product testing, new product design and part qualification. Comark has the equipment, facilities and experience to design solutions that operate reliably in tough conditions where dust, dirt, water, extreme temperatures, high shock and vibration are part of everyday operations.

With our quality products and outstanding service, we want to guarantee your success.

## Contact Information

**For sales, service and technical support, please contact us at:**

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**Website:** [www.comarkcorp.com](http://www.comarkcorp.com)

## Disclaimers

This manual contains specifications for the electrical, mechanical and input/output signals required for the Comark MDU display. Specifications are subject to change without notice. Please visit our website [www.comarkcorp.com](http://www.comarkcorp.com) for the latest electronic versions of this manual

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## Package Contents

51-0956X-XXX  
50-09563-001  
57-09563-001

Marine Display Unit  
Kit MDUxx Panel Mounting  
Software Distribution CD MDUxx

### AC Input Power Kit Options

50-07613-001  
or  
50-07613-002

Kit Cable VGA and AC Power

Kit Cable VGA, AC Power and Serial TS

### DC Power Kit Options

50-07613-201  
or  
50-07613-202

Kit Cable VGA, DC Power

Kit Cable VGA, DC Power and Serial TS

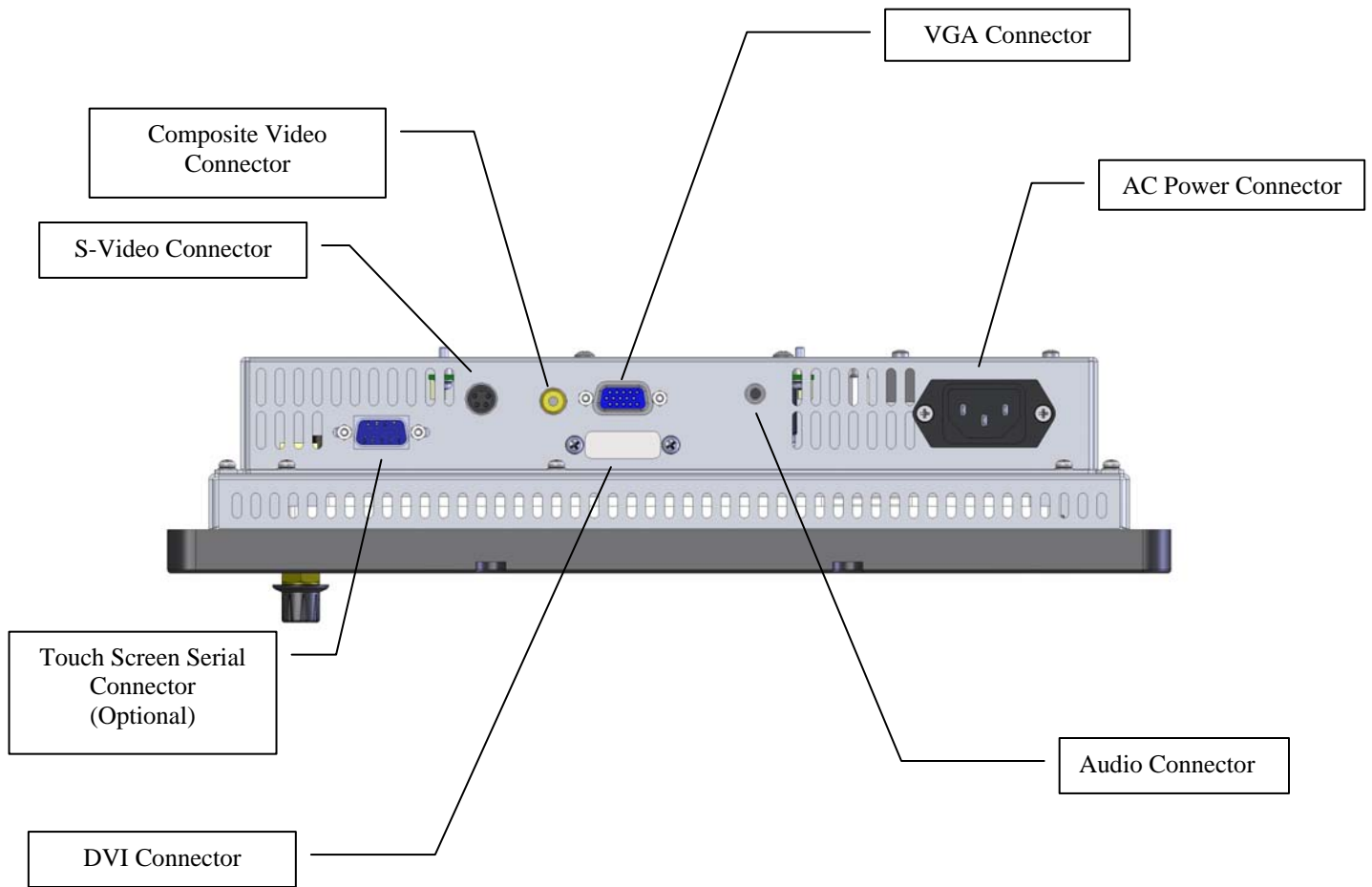
## Optional equipment

50-11750-XXX  
50-09563-1XX

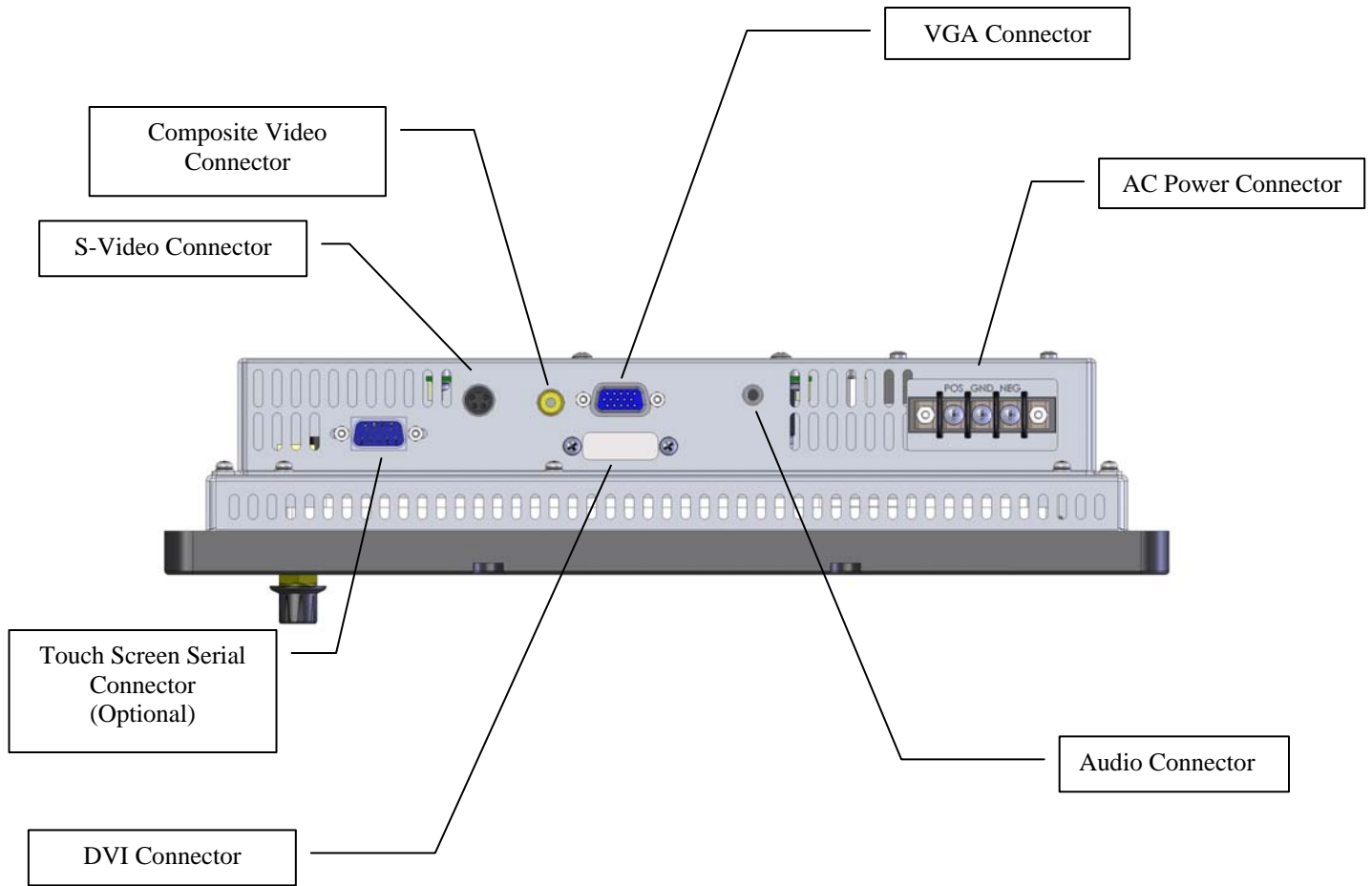
VESA mount bracket  
Desk Top Mounting Bracket

## I/O Connectors

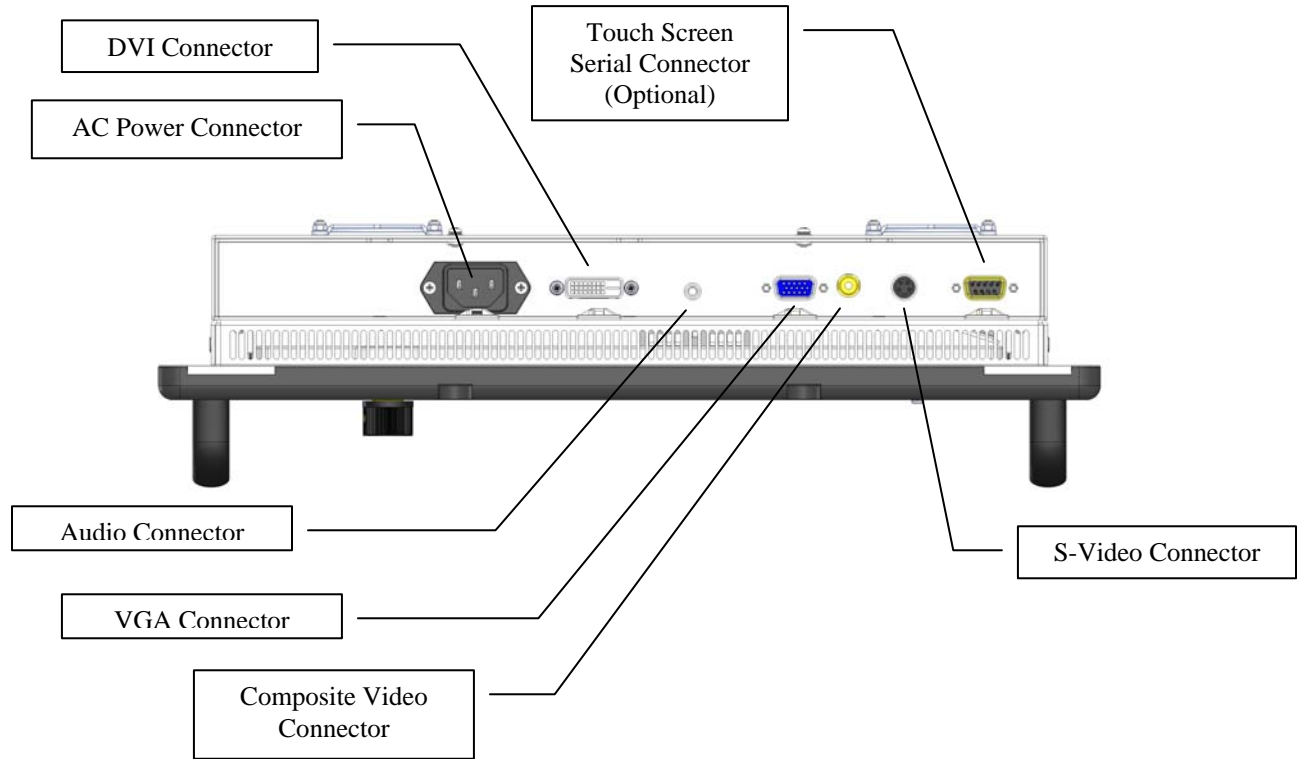
### MDU12 AC Power



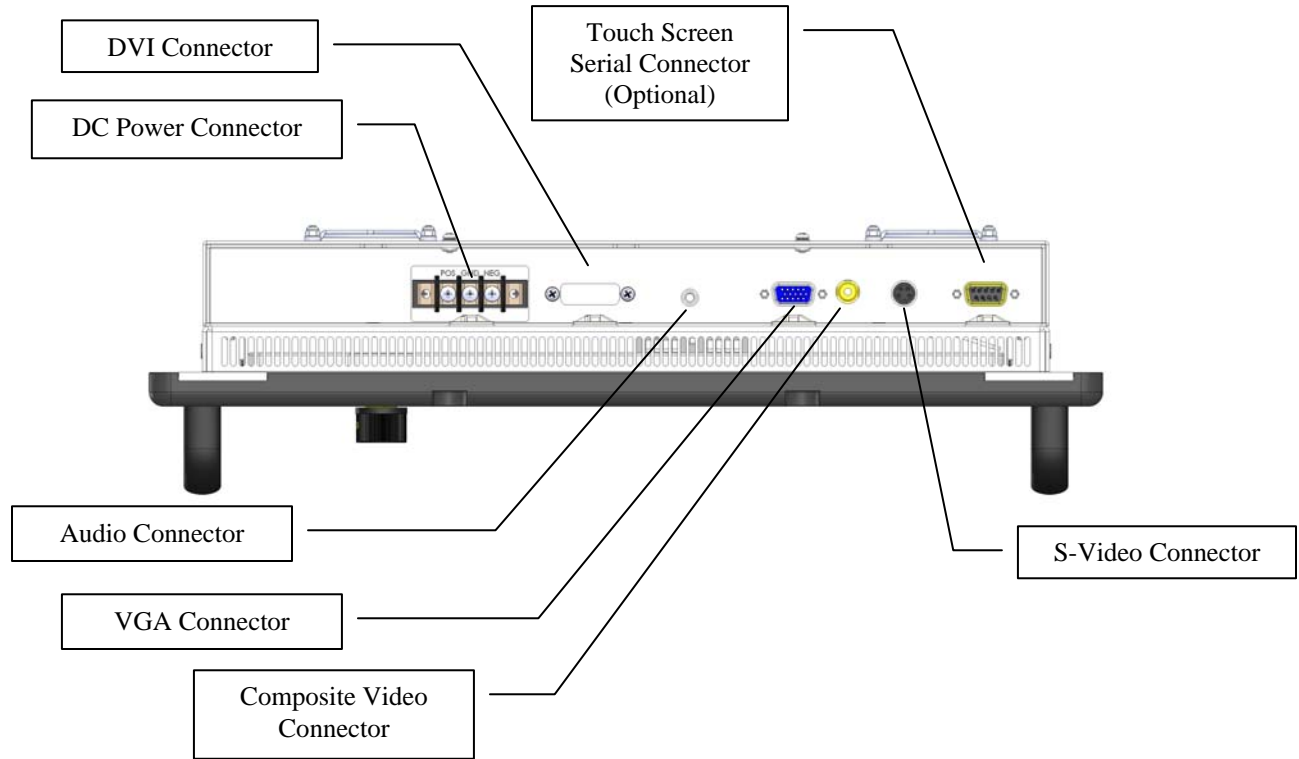
## MDU12 DC Power



## MDU15/MDU19 AC Power

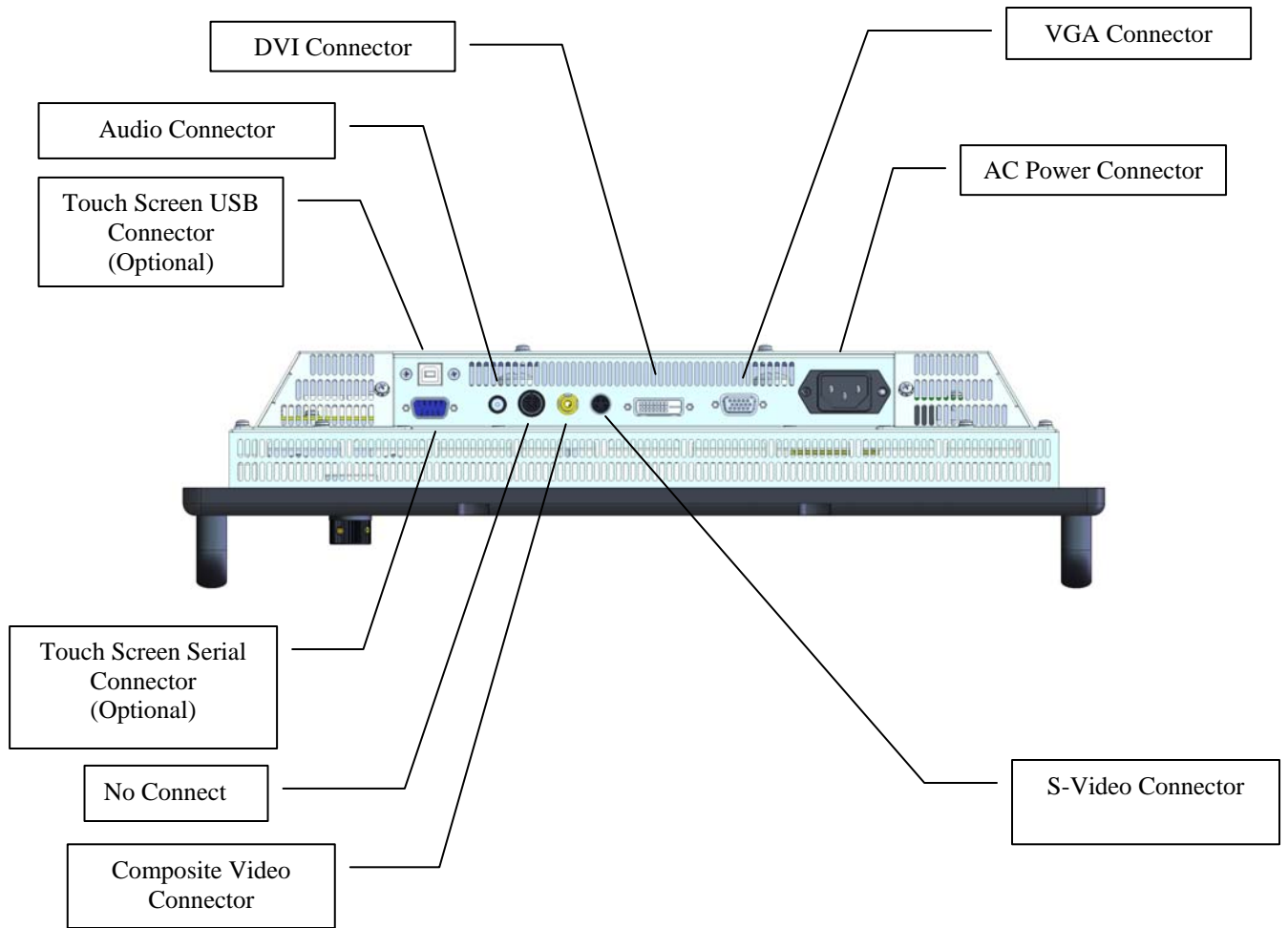


## MDU15/MDU19 DC Power

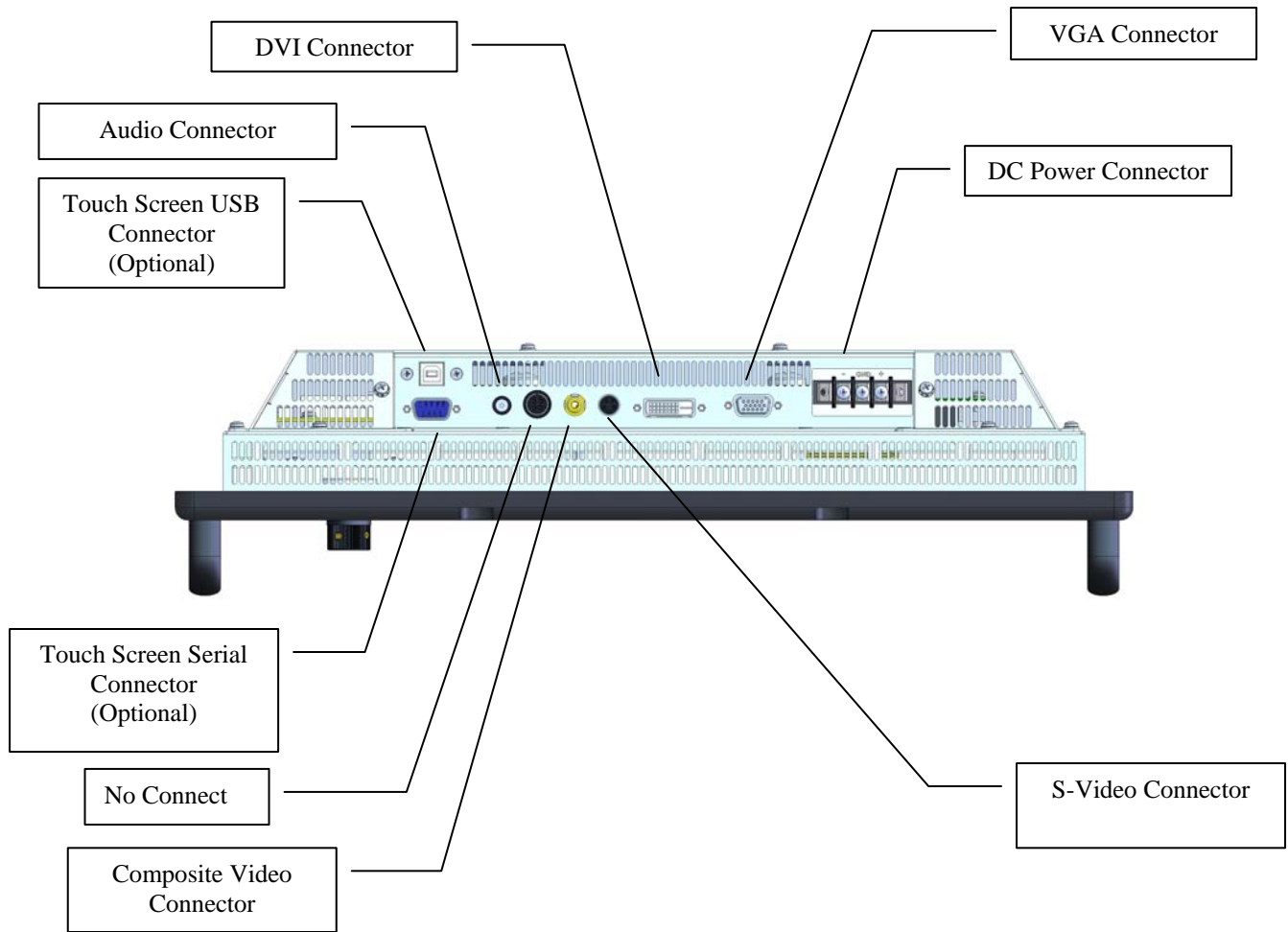




## MDU20 AC Power



## MDU20 DC Power



**Serial 1 (Touchscreen if equipped)**

<b>Pin Number</b>	<b>Signal</b>
1	NC
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	NC

## Installation

### Unpacking Unit:

Carefully remove MDU and accessories from shipping container.

Verify contents.

Inspect unit for any damage. Leave protective film over LCD until ready to apply power to the unit. This will prevent any accidental damage to the display.

Dimming Knob Caution: DO NOT lay the unit flat on a surface as this could damage the Dimming Knob.

### Panel Mounting Mounting Console

Refer to MDU Drawings and Cutouts section.

Ensure to leave room behind the unit for airflow.

### VESA Mount instructions:

Install VESA mount bracket to rear of MDU with Four (4) Mounting screws and bolts.

Secure MDU with VESA mount as required.

## Setup

1. Connect the Video cable to the display and video source.
2. If equipped with the optional touch screen, connect the touch screen cable between the display and the host computer (if required).
3. Connect the input power to the display. Red power light should illuminate. (LED may change to green if unit syncs to video source).
4. Set display settings as required (Optional):
  - a. Press "SOURCE" on right OSD to select input source.
  - b. Wait 3 seconds per selection
  - c. Source shows in upper right corner of display
  - d. DEFAULT = RGB (VGA)
  - e. DVI
  - f. S-VIDEO
  - g. COMPOSITE
5. Press "SELECT" to auto sync the display to your computer.

## Operation

### OSD MDU12/15/19/20

#### Start-Up

The MDU features “Instant On” functionality. The lower right control section of the display contains the following OSD controls:

- Power On/Off
- Power Indication: Red (OFF), Green (ON)
- Source (Video)
- Dimming Knob (Brightness)

The lower left control section of the display contains the following OSD controls:

#### MDU12/15/19:

- Menu
- Select
- Left
- Down

#### MDU20:

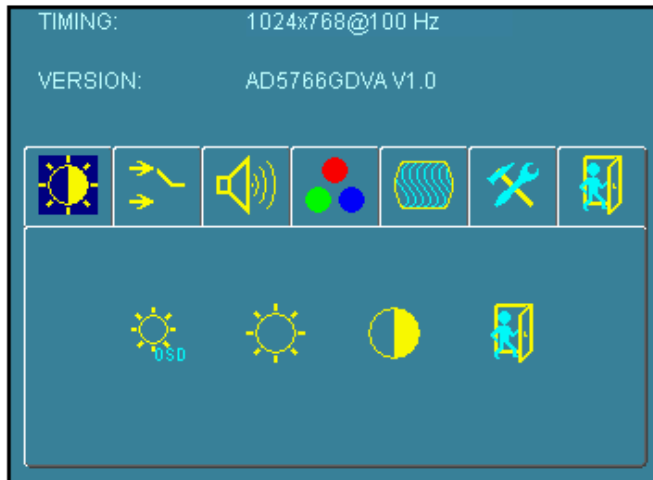
- Menu
- Select
- Left
- Right
- Up
- Down

## OSD Controls (MDU12/MDU15/MDU19)

### OSD menu

---

By pressing the "menu" button, you will see the below picture. Across from timing you will see resolution, frequency, and V-frequency of the panel. Version shows the firmware control version. These cannot be altered by the user.



There are 7 sub menus within the OSD user interface: Brightness, Signal Select, Sound, Color, Image, Tools, and Exit.

When you press the "menu" button, you enter the "Brightness" sub directory. In this directory, you will see 4 selections:

 press "menu"    press "menu"    press "menu"    press "menu"



#### OSD Brightness:



press "right" key



Press the "menu" once, to adjust the brightness. Press "left" to dim down the brightness to "0", press "right" to increase the brightness to "100"



**Ambient light sensor:** Press this Icon for auto dimming. (OPTION) To use this option, the Litemax ambient light sensor needs to have been installed



**Potentiometer:** Navigate to this icon to adjust the VR function. (OPTION)



**Ambient light sensor with OSD offset:** To set minimum brightness level based on ambient light.



Press "right" key



Press "menu" once, to adjust minimum luminance to fit your application (OPTION)



**Contrast:** Press “menu” and “right” buttons to adjust the contrast from “0” to “100”. To adjust from “100” to “0”, press “menu” and the “left” buttons.



**Exit:** You can exit this sub menu back to normal screen.



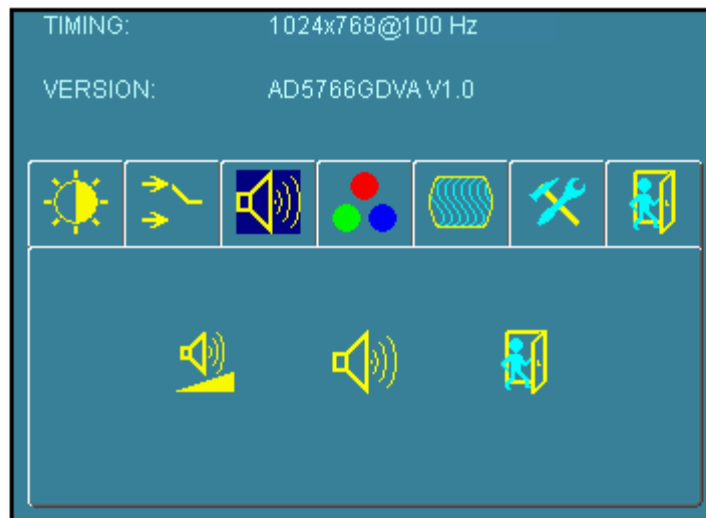
VGA **Analog:** RGB/VGA input

DVI **Digital:** DVI input

AV1 **AV1:** Composite input

S-Video **S-Video:** S-Video input

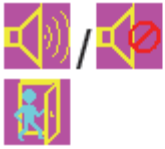
Exit **Exit:** You can exit this sub menu back to the beginning



There are 3 options for “Sound” sub page.



**Audio Volume:** Audio volume adjustment.



**UnMute/Mute:** You can mute the speaker by pressing this option.

**Exit:** back to the beginning menu.



**Auto Color:** By navigating over to the “Auto Color” option, optimal color performance is invoked.



**sRGB:** Windows standard color setting





**Color Temperature:** You have 3 options in this selection



**Color Temperature User Define:** Default is 100 for "R", "G", and "B".



**Color Tempure\_6500K:** Warm color scheme

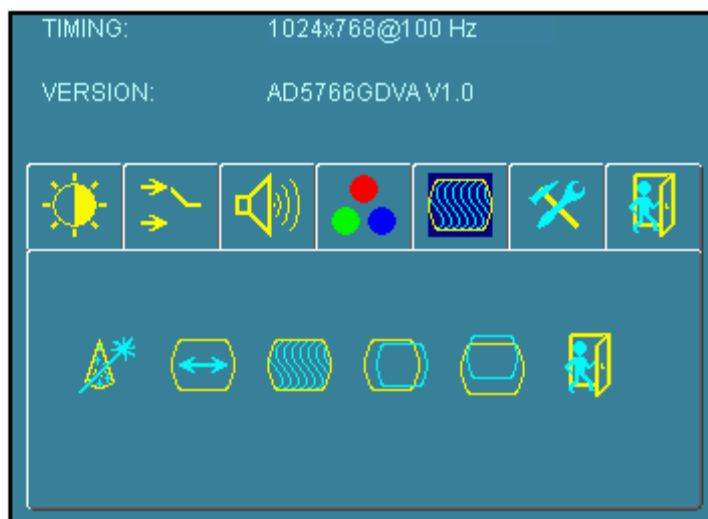


**Color Tempure\_9300K:** Cold color scheme



**Exit:** back to the normal screen.

Go to the "Image" page, and you will see the below picture





**Auto Adjust:** Choose this option and the AD5766 will adjust to the optimal horizontal and vertical frequency. You will see "Auto tune...." on the screen for around 3 seconds.



**Clock:** If you are not satisfied with the Auto tune result, you can adjust manually by pressing "Clock". Using this will make the image wider.



**Phase:** If "double images" appear around the characters, choose "Phase" to remove them..



**HPos:** You can shift the screen horizontally using this function.



**Vpos:** You can shift the screen vertically using this function.



**Exit:** Back to normal screen.

On the "Tools" sub menu, you will see 5 icons.



**OSD Control:** Selecting this option, brings you to 4 more options:



**Osd\_time:** Select time for the OSD user interface to stay on screen, for 2 sec. to 16 sec. Default is 6 sec.



**Osd\_HPos:** Moves the OSD user interface horizontally on screen.



**Osd\_VPos:** Moves the OSD user interface vertically on screen.



**Exit:** back to main menu.



**Factory\_Reset:** By pressing this, the screen will revert to factory settings, and the previous settings will be deleted.



**Sharpness:** Sharpen characters.

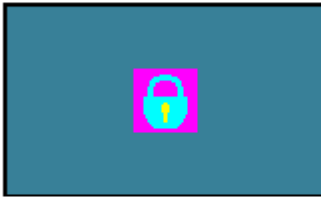


**Dos\_mode/Gxf\_mode:** For some old programs which use 640x400 and 720x400 (DOS Mode and graphics mode), This option needs to be selected manually.



**Exit**

OSD Lock Function: It is possible to lock all the OSD buttons to prevent unauthorized changes to occur by pressing "Menu" and "right >" buttons simultaneously. You will see the "lock" icon below on the center of the screen for 3 seconds. If any button is pushed after the lock function is initiated, the below icon will appear on the screen.'



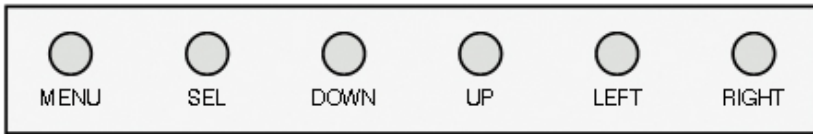
To release the OSD lock, press "Menu" and "Right >". The below icon will appear on the center of the screen for 3 seconds. Now all OSD keys are active again.



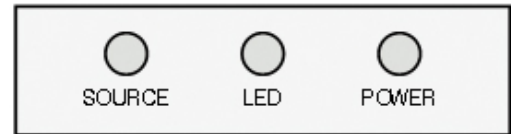
## OSD Controls MDU20

### OSD Controls

#### Left OSD Control



#### Right OSD Control



MAIN MENU	SUB MENU	CONTROL		MODE
PICTURE	PSM	Dynamic/Standard/Mild/Game/User		VIDEO
		USER	Brightness, Contrast, Color, Sharpness	
	CSM	CSM/Brightness/Contrast		PC
		CSM	Normal/Warm/User	
User	Red/Green/Blue			
PIP/POP/PBP	ON/OFF	ON	PIP	Source, Swap, PIP Size, PIP Position
			POP, PBP	Source, Swap
SETUP	Language	English/ Deutsch /François /Italiano /Espanol		
	Transparency	50 (1 ~ 100)		
	ARC	Auto/16:9/14:9/4:3		AV/TV: PAL
		16:9/14:9/4:3		AV/TV: NTSC
		4:3/16:9		PC
	ISM Method	Normal, Orbit, White		
Factory Reset	On/Off			
SCREEN	Auto Configure	On/Off		RGB PC
	H Position	50 (0 ~ 100)		
	V Position	50 (0 ~ 100)		
	Clock	50 (0 ~ 100)		
	Phase	50 (0 ~ 100)		

### MDU20 Picture on Picture Setup

Press the "MENU" button

Press the "RIGHT" button

Press the "DOWN" button to select the Picture-In-Picture menu

Press the "LEFT" or "RIGHT" buttons to select different Picture-In-Picture options

## MDU20 Serial Communication Commands (Optional)

Certain MDU20 models have optional Serial Control of the OSD. This section defines the common commands for use with Serial Control of the OSD.

### MDU20 Controller Setup using OSD

MENU → SET UP → Set ID On/Off → 'ON' setting

Set ID: 0, 1 ~ 99

You can adjust the set Id to choose desired monitor Id number in special menu.

Adjustment range is 1~99. When selecting Set ID '0', every connected NCB410 set is controlled. Set ID is indicated as decimal '1~99' on menu and transmission/receiving protocol.

RS232 Protocol = 9600 8N1 Flow control = None

## MDU20 COMMUNICATION COMMANDS

### Command Protocol

<k><x><sp><id><yy><cr><lf> All characters in ASCII.

x = Command type

sp = space

id = Set ID

yy = Data range

Example:

**kh = The command type**

0 = Set ID 1-99 for individual displays 0 for all connected displays.

64 = The data for the command to perform.

### OSD Control (K Command)

ka SET\_ID Data : Power On/Off (0 ~ 1)

Data - 0 : Power OFF / 1 : Power ON

kb SET\_ID Data : Input Select ( 0 ~ 3)

Data - 0 : RGB / 1 : DVI / 2 : Video / 3 : S-Video

kf SET\_ID Data : PSM Control(0 ~ 4)

Data - 0 : Dynamic / 1 : Standard / 2 : Mild / 3 : Game / 4 : User

### AV Only

**kg SET\_ID Data : Contrast(0 ~ 64H)**

Data - Min : 0 ~ Max : 64H

When PSM is User , This Function is working

**kh SET\_ID Data : Brightness (0 ~ 64H)**

Data - Min : 0 ~ Max : 64H

When PSM is User , This Function is working (PSM : Picture system Management)

**ki SET\_ID Data : Colors (0 ~ 64H)**

Data - Min : 0 ~ Max : 64H

When PSM is User , This Function is working

**kj SET\_ID Data : Tint (0 ~ 64H)**

Data - Min : 0 ~ Max : 64H

- 0 → -50 (-45)
- 1 → -49
- A → -40
- C → -38
- 10 → -34
- 32 → 0
- 64 → 50 (45)

When PSM is User , This Function is working

**kk SET\_ID Data : Sharpness (0 ~ 64H)**

Data - Min : 0 ~ Max : 64H

When PSM is User , This Function is working

**kl SET\_ID Data: Backlight (0~64)**

Data - Min : 0 ~ Max : 64

**km SET\_ID Data : FLIP ( 0 ~ 3)**

Data - Min : 0 ~ Max : 3

- 0: Normal
- 1: Horizontal Reverse
- 2: Vertical Reverse
- 3: Vertical & Horizontal Reverse (180' Rotate)



0 : Normal

1 : Horiz Reverse

2 : Vert Reverse

3 : Vert & HorizReverse

**kn SET\_ID Data : PIP/POP/PBP**

Data - 0 : PIP OFF / 1 : PIP / 2 : POP / 3 : PBP1 / 4 : PBP2

**ko SET\_ID Data : PIP Position**

Data - 0 : RIGHT BOTTOM / 1 : LEFT BOTTOM / 2 : LEFT TOP / 3 : RIGHT BOTTOM

**kp SET\_ID Data : Sub Display Input Select**

Data - 0 : RGB / 1 : DVI / 2 : Video / 3 : S-Video

**kq SET\_ID Data : PIP Size**

Data - 0 : Small 1 : Large

**kr SET\_ID Data : PIP SWAP**

Data : N/A , Any data

**ku SET\_ID Data : CSM**

Data - 0 : NORMAL / 1 : COOL / 2 : WARM1 / 3 : WARM2 / 4 : User

User Mode can be changed in Only RGB

**kv SET\_ID Data : Red Adj**

Data - Min : 0 ~ Max : FF

Only RGB , Only CSM is User

**kw SET\_ID Data : Green Ad**

Data - Min : 0 ~ Max : FF

Only RGB , Only CSM is User

**kx SET\_ID Data : Blue Adj**  
Data – Min : 0 ~ Max : FF  
Only RGB , Only CSM is User

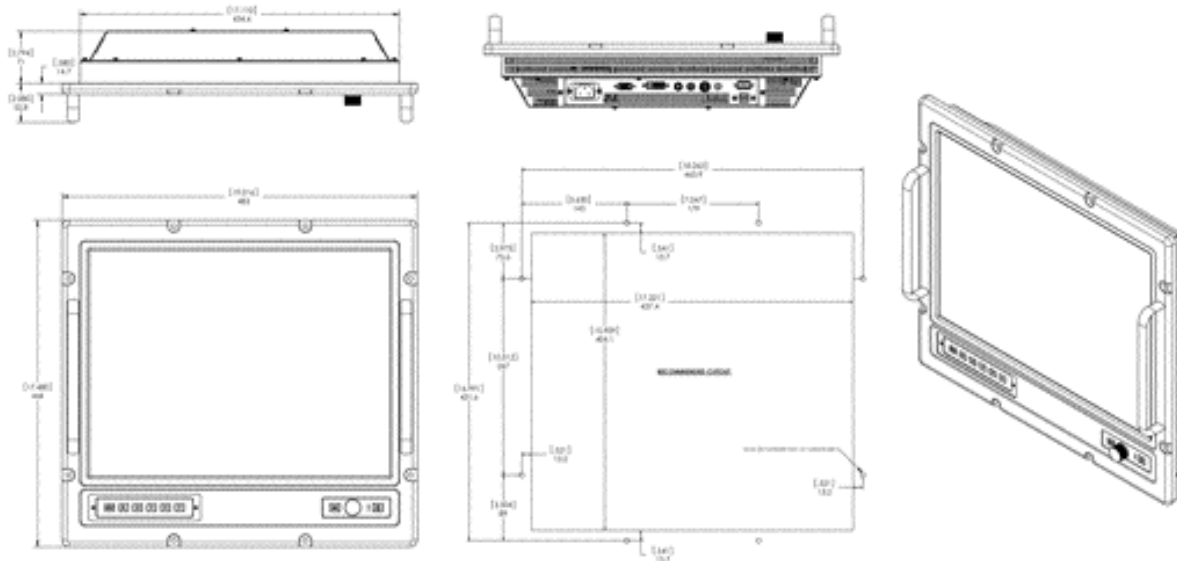
**Adjust range 0 ~ 64(Hex) :**

Hex.	Dec.
0	0
1	1
9	9
A	10
F	15
10	16
32	50
64	100

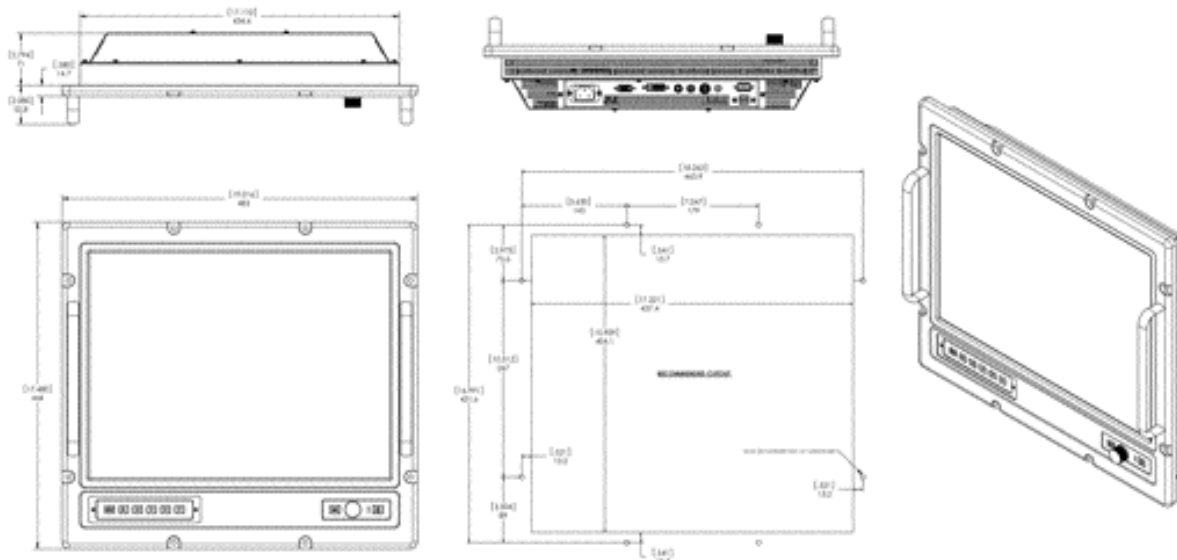


# MDU Drawings and Cut Outs

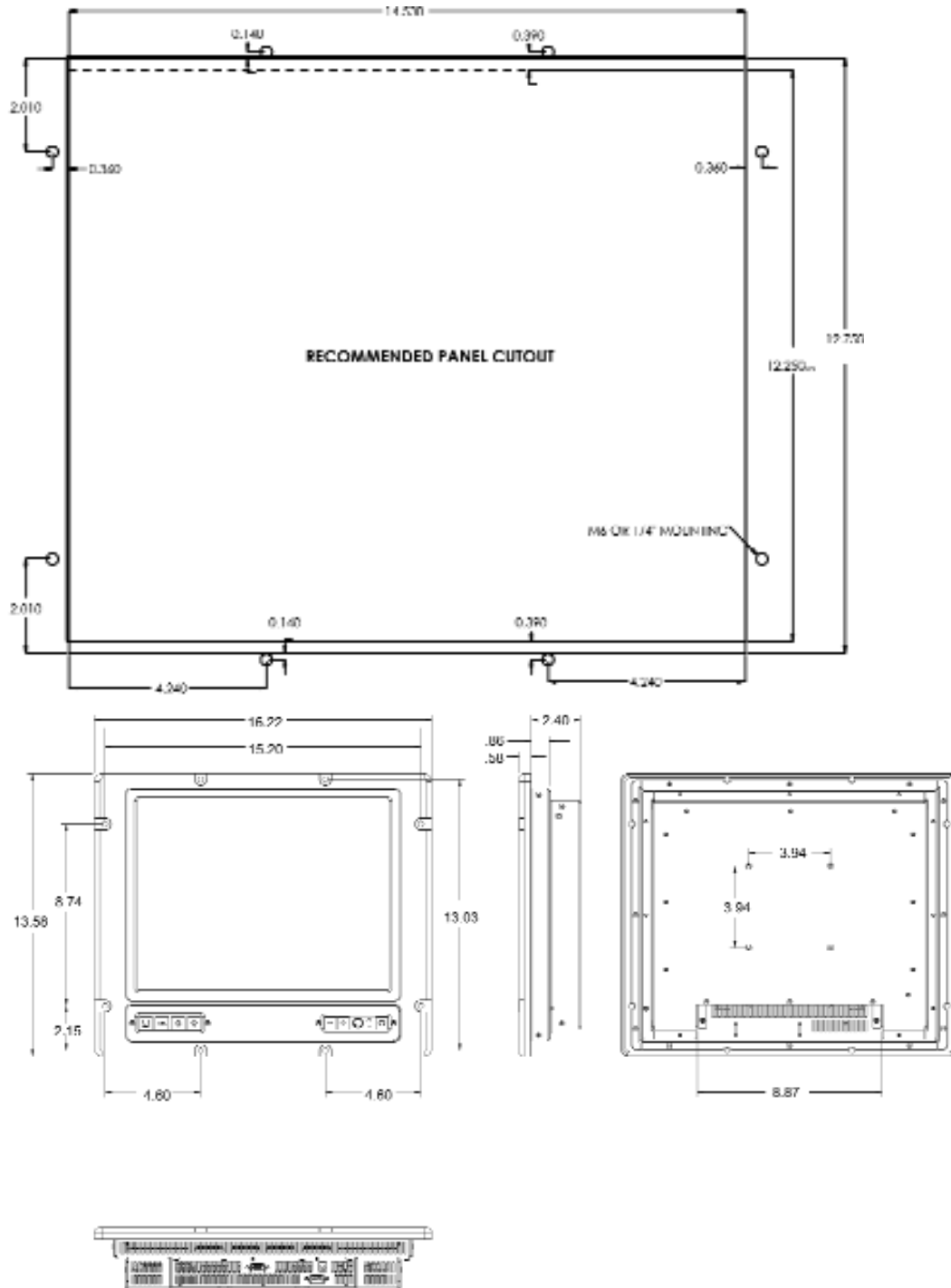
## MDU20 Technical Drawings



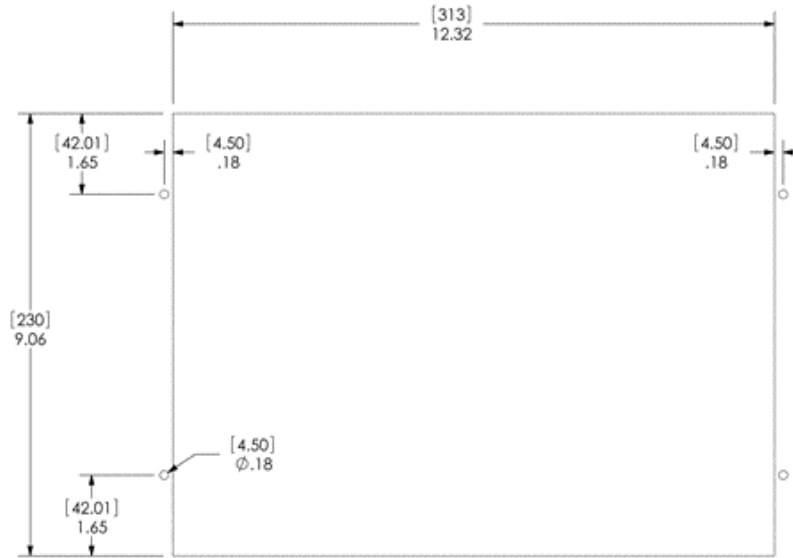
## MDU19 Technical Drawings



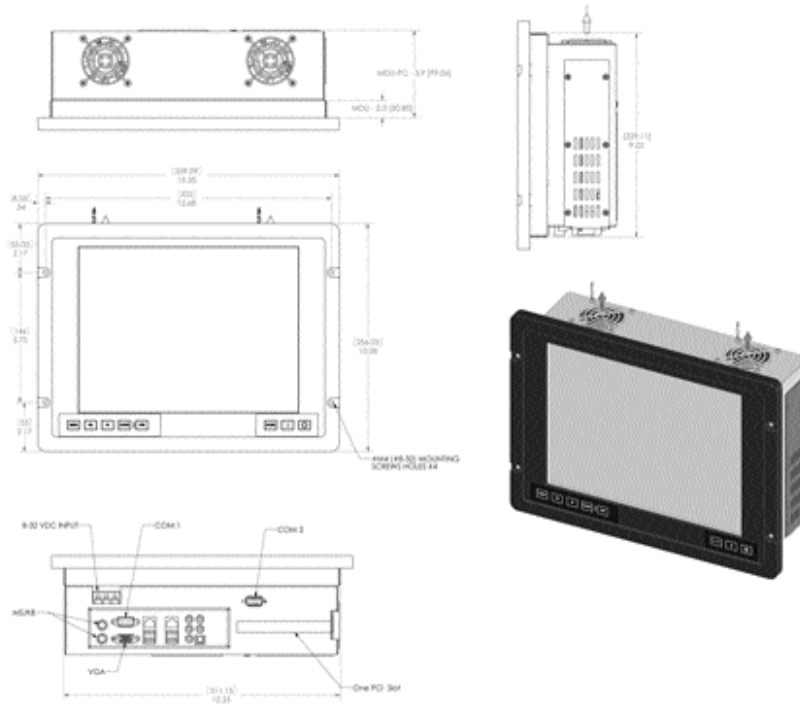
# MDU15 Technical Drawings



# MDU12 Technical Drawings



## PANEL CUT OUT



## Warranty & Technical Support

### Warranty and Returns

Comark Corporation warrants products to be in good working order for a period of one year from the date of shipment as a new product (90 days for out-of warranty repairs). Should products fail to perform properly anytime within that period, Comark Corporation will, at its option, repair or replace the products at no cost except as set forth in this warranty. Replacement parts or products will be furnished on an exchange basis only. Replacement parts and/or products become the property of Comark Corporation. No warranty is expressed or implied for products damaged by accident, abuse, misuse, natural or personal disaster, or unauthorized modification. All warranties for product, expressed or implied, including merchantability and fitness for a purpose, are limited to a one year duration from date of purchase; no warranties, expressed or implied, will apply after that period. If product does not perform as warranted herein, the owner's sole remedy shall be repair or replacement as provided above. In no event will Comark Corporation be liable to any purchaser for damages, lost revenue, lost wages, lost savings, or any other incidental or consequential damages arising from purchase, use, or inability to use this product, even if Comark has been advised of the possibility of such damages.

### Return Material Authorization (RMA)

All return items must be accompanied by an RMA number (obtained from Technical Support), and a purchase order to process repairs. (This covers cost of misuse, improper packing and incorrect setup for in-warranty work.) For out-of-warranty repairs, a flat fee of \$100 for evaluation, inspection, and minor repairs is charged. If major subassemblies are found to be defective, a flat fee for major repairs has been established (consult factory for fee structure). Method of Comark shipment corresponds to method used by customer.

### NOTE:

**ALL MATERIAL RETURNED SHALL BE SHIPPED PREPAID, TAGGED WITH PART NUMBER, FAILURE MODE, TECHNICAL CONTACT, TELEPHONE, AND FAX NUMBER TO EXPEDITE RESOLUTION OF TECHNICAL PROBLEMS.**

For Pricing, Applications and Delivery, contact Sales: 1-800-280-8522

For Technical Questions, System Use or Problems contact Technical Support: 1-800-280-8522 (ext 130)