

# Industrial/Open-Frame Monitor User's Manual



Manual Rev.:1.1Revision Date:March 28, 2023Mother Board Part No:AT1100-V2.0



# **Revision History**

Revision	Description	Date
1.0	Initial release	2023-07-06
1.1	Add information for larger models & mechanical details	2023-09-14



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### Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.



Additional information, aids, and tips that help users perform tasks.



Information to prevent minor physical injury, component damage, data loss, and/or program corruption when trying to complete a task.



Information to prevent serious physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.



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# 1. Introduction

EM/ OM is AOK's new industrial framed( enclosed ) and open-frame touch monitor designed for quick and easy integration with a variety of industrial applications, such as public signage, self-service kiosks, medical displays, and point-of- sale terminals, HMI panel & automation controllers.

## 1.1. Features

#### **EM Line**

- 10.1"/ 13.3"/ 15.6"/ 18.5"/ 21.5"/23.8"/31.5" 16:9 LCD panel with LED backlight up to 40,000 service life hours
- 10-point PCAP touchscreen
- Anti-fingerprint surface treatment for ease of cleaning and enhanced readability
- Wide viewing angle support for both portrait and landscape modes
- IP rating for water and dust protection
- Up to 0°C to 60°C operating temperature
- All new true-flat design
- VESA Mount Holes: MIS-D 75mm x 75mm, 100mm x 100mm (Standard),200mm x 200mm (For EM3150)

#### **OM Line**

- 10.1"/13.3"/15.6"/21.5"/23.8"/27"/32"/43" LCD panel with LED backlight up to 50,000 service life hours
- 10-point PCAP touchscreen
- Anti-fingerprint surface treatment for ease of cleaning and enhanced readability
- Wide viewing angle support for both portrait and landscape modes
- IP rating for water and dust protection
- Up to -20°C to 70°C operating temperature
- VESA Mount Holes: MIS-D 75mm x 75mm, 100mm x 100mm, 200mm x 200mm (For OM3150, OM4300)
- Easy panel mount installation

### 1.2. Applications

- KIOSK / POI / Ticketing / ATM
- Transportation
- Public communication
- Entertainment / Gaming / Slot machine
- Human-Machine Interface equipment controller monitor



## 1.3. I/O of Driver Board



## For full technical specification of the driver board, please click the following link:

## AT1100-V2.0 Monitor Driver Board Technical Specification



# 1.4. Package Contents

Please check that your package contains the items below. If you discover damaged or missing items, please contact our support team.

Non-touch versions:

- 1x DC power adapter
- 4x Screw M3/M4 (to secure VESA mounts)

Besides the above, for touch version, the following is included:

1x USB cable

## 1.5. Optional Accessories

- UL approved AC power extension cable
- Panel mounting kit (custom project only)



# 2. Specifications

# 2.1. EM Line

Model	EM1010	EM1330	EM1560	
Display				
Size	10.1"	13.3"	15.6"	
Resolution	1280x800	1920x	1080	
Aspect Ratio	16:10	16:10 16:9		
Color		16.7M		
Brightness (Nits w/touch)	400	250	250	
Backlight Life (Hours)	30,	000	40,000	
View Angle (U/D/R/L)	89/89/89/89	85/85/	/85/85	
Contrast Ratio	1000:1	300	0:1	
Touchscreen	10-poir	nt, PCAP, Anti-fingerprint c	oating	
Bonding		Optical bonding		
I/O				
USB Port	l	JSB 2.0 Type-B (for touch	)	
Video		HDMI x1, VGA x 1, DF	Px1	
Audio		w/o Audio		
Environmental				
Operating Temperature	0°C to 60°C	0°C to	50°C	
Storage Temperature	-20°C to 60°C			
Humidity	10% to 80% @ 40°C (non-condensing)		ensing)	
Surface Hardness	7H			
Vibration	Оре	rating: 1G random 5 to 50	0Hz	
Shock	Operating:	20G acceleration part to	part, 11ms	
IP Rating		Front IP65		
Certifications & Compliance		CE/FCC		
Power Input		12V DC, 3A Max.		
Power Consumption	12W 18W 18W		18W	
Power Adapter (Optional)	This unit is intended to be supplied by listed equipment whose output meets ES1 and is rated at 12 V DC, 5A minimum, TMA rated 60°C minimum, altitude 5000m minimum and evaluated in accordance with UL/EN/IEC 60950-1 and/or UL/EN/IEC 62368-1, and CNS 14336-1 or CNS 15998-1.			
Mechanical				
Net Weight / Gross Weight	3.0kg / 4.2kg	3.7kg / 4.9kg	4.6kg / 5.9kg	
Packing Dimensions (H x W x D)	330 x 210 x 63 mm 421 x 259 x 75 mm 457 x 267 x 80 m		457 x 267 x 80 mm	
Mounting	VESA Mount: MIS-D 75mm x 75mm, 100mm x 100mm (Standard)			

#### Table 1: EM Line Enclosed Frame Monitor Specifications



# 2. Specifications

# 2.1. EM Line

#### Table 2: EM Line Enclosed Frame Monitor Specification EM2150

Model	EM2150
Display	
Size	21.5"
Resolution	1920x1080
Aspect Ratio	16:9
Color	16.7M
Brightness (Nits w/touch)	250
Backlight Life (Hours)	30,000
View Angle (U/D/R/L)	89/89/89
Contrast Ratio	1000:1
Touchscreen	10-point, PCAP, Anti-fingerprint coating
Bonding	Air bonding
I/O	
USB Port	USB 2.0 Type-B (for touch)
Video	HDMI x1, VGA x 1, DPx1
Audio	w/o Audio
Environmental	
Operating Temperature	0°C to 60°C
Storage Temperature	-20°C to 60°C
Humidity	10% to 80% @ 40°C (non-condensing)
Surface Hardness	7H
Vibration	Operating: 1G random 5 to 500Hz
Shock	Operating: 20G acceleration part to part, 11ms
IP Rating	Front IP65
Certifications & Compliance	CE/FCC
Power Input	12V DC, 3.5A Max.
Power Consumption	25.4W
Power Adapter (Optional)	This unit is intended to be supplied by listed equipment whose output meets ES1 and is rated at 12 V DC, 5A minimum, TMA rated 60°C minimum, altitude 5000m minimum and evaluated in accordance with UL/EN/IEC 60950-1 and/or UL/EN/IEC 62368-1, and CNS 14336-1 or CNS 15998-1.
Mechanical	
Net Weight / Gross Weight	5.0kg / 6.2kg
Packing Dimensions (H x W x D)	640 x 480 x 160 mm
Mounting	VESA Mount: MIS-D 75mm x 75mm, 100mm x 100mm (Standard)



# 2.2. OM Series

**Table 3: Open Framed Series Specifications** 

Model	OM1010	OM1560	OM2150	OM2380	OM2700
Display					
Size	10.1"	15.6"	21.5"	23.8"	27.0"
Resolution	1280x800		1920>	(1080	
Aspect Ratio	16:10		16:9		
Color			16.7M		
Brightness (w/touch)		300 nits		250 nits	250 nits
Backlight Life (Hours)	50,	000	30,	000	40,000
View Angle (U/D/R/L)		89/89/89/89		85/85/	/85/85
Contrast Ratio	800:1	100	0:1	300	0:1
Touchscreen		10-point, P	CAP, Anti-fingerpri	int coating	
Bonding			Air bonding		
I/O					
USB Port		US	B Type-B (for touc	ch)	
Video			HDMI x1, VGA x 1		
Audio			w/o Audio		
Environmental					
Operating Temperature	-20°C 1	to 70°C	0°C to 60°C	0°C to	o 50°C
Storage Temperature	-20°C 1	to 70°C		-20°C to 60°C	
Humidity		10% to 80% @ 40°C (non-condensing)			
Surface Hardness			7H		
Vibration		Operatir	ng: 1G random 5 to	o 500Hz	
Shock		Operating: 200	G acceleration part	t to part, 11ms	
IP Rating			Front IP65		
Power Input			12V DC, 5A Max.		
Power Consumption	12W	18W	25.4W	25.4W	25.4W
Power Adapter (Optional)	This unit is intended to be supplied by listed equipment whose output meets ES1 and rated at 12 V DC, 5A minimum, TMA rated 60°C minimum, altitude 5000m minimum and evaluated in accordance with UL/EN/IEC 60950-1 and/or UL/EN/IEC 62368-1, at CNS 14336-1 or CNS 15998-1.			eets ES1 and is om minimum C 62368-1, and	
Mechanical					
Net Weight / Gross Weight	3.0kg / 4.2kg	4.6kg / 5.9kg	4.8kg / 6.0kg	6.2kg / 7.5kg	7.5kg / 8.0kg
Packing Dimensions (H x W x D) (mm)	350 x 210 x 63	457 x 267 x 80	620 X 440 X 176	700 X 493 X 172	780 X 543 X 175
Mounting (mm)		VESA Mount: MI	S-D 75 x 75, 100 >	(100 (Standard)	
	1		and Panel Mount		



### Table 4: OM Line - OM3150, OM4300 Specifications

Model	OM3150	OM4300			
Display					
Size	31.5" 43"				
Resolution	1920 >	x 1080			
Aspect Ratio	16	6:9			
Color	16.	7M			
Brightness (w/ touch)	400	nits			
Backlight Life (Hrs)	50,	000			
Viewing Angle (U/D/R/L)	89/89/	/89/89			
Contrast Ratio	400	00:1			
Touchscreen	10-point, PCAP, Ant	i-fingerprint coating			
Bonding	Air bo	onding			
I/O					
USB Port	USB type B	3 (for touch)			
Video	HDMI x1, VGA x1,	DVI x1, DP 1.2 x1			
Audio	w/o Audio				
Environmental					
Operating Temperature	0°C to 40°C				
Storage Temperature	-20°C to 60°C				
Humidity	10% to 90% (non-condensing)				
Surface Hardness	≥€	6H			
Vibration	Operating: 1.5G ra	ndom 10 to 200Hz			
Shock	N	A			
IP Rating	Front	: IP65			
Power Input	DC-24V	5A Max.			
Power Consumption	38.4W 50.4W				
Mechanical					
Net Weight/ Gross Weight	14.2kg	23.5kg			
Packing Dimensions	630 x 920 x 160 mm	800 x 1200 x 220 mm			
(H x W x D)					
Mounting	VESA Mount 200 x 200 mm	200 x 200 mm (M6) M4 Rear			
	(M6), M4 Rear mount x 12	mount x 8			

# 3. Mechanical Layout

### 3.1. I/O Connectors



Figure 1: Enclosed Frame Line I/O Connectors

In most cases, only the specific needed I/O is mounted on board



Figure 2: Open Frame Line I/O Connectors

This View Shows All the display I/O are mounted on board,

In most cases, only the specific needed I/O is mounted on board.

### **VGA** Connector

A 15-pin VGA connector is provided to connect the monitor to a computer.

Pin No.	Pin Name	Signal Type	Pin Assignment
1	RED	Analog In	
2	GREEN	Analog In	
3	BLUE	Analog In	
4	N/C		
5	GND	GND *for cable detection	
6	GND	GND	
7	GND	GND	
8	GND	GND	
9	+5V Power	Power In	00000
10	GND	GND	
11	N/C		
12	SDA	I/O	
13	Horizontal Sync	In	
14	Vertical Sync	In	]
15	SCL	In	



## DVI (when it is specified by project)

A DVI connector is provided to connect the monitor to a computer.

Pin No.	Signal	Pin No.	Signal	
1	TMDS Data2-	16	Hot Plug Detect	
2	TMDS Data2+	17	TMDS Data0-	
3	GND	18	TMDSData0+	
4	NC	19	GND	
5	NC	20	NC	
6	DDC Clock [SCL]	21	NC	
7	DDC Data [SDA]	22	GND	
8	Analog vertical sync	23	TMDS Clock +	
9	TMDS Data1-	24	TMDS Clock -	
10	TMDS Data1+	C1	Analog Red	
11	GND	C2	Analog Green	
12	NC	C3	Analog Blue	
13	NC	C4	Analog Horizontal Sync	
14	+5 V Power	C5	Analog GND Return	
15	GND			



An HDMI Type-A socket is provided to connect the monitor to a computer.

Pin No.	Pin Name	Signal Type	Pin Assignment
1	TMDS Data2+	In	
2	TMDS Data2 Shield	GND	]
3	TMDS Data2-	In	
4	TMDS Data1+	In	]
5	TMDS Data1 Shield	GND	]
6	TMDS Data1-	In	
7	TMDS Data0+	In	]
8	TMDS Data0 Shield	GND	
9	TMDS Data0-	In	10 17 15 12 11 0 7 5 2 1
10	TMDS Clock +	IN	
11	TMDS Clock Shield	GND * Cable detection	18 16 14 12 10 8 6 4 2
12	TMDS Clock -	In	
13	CEC	* project only	]
14	NC		]
15	DDC Clock	In	
16	DDC Data	I/O	]
17	GND	GND	
18	HDMI-HOT	+5V Power (in)	]
19	HDMI-PLUG	Out (Hot Plug Detection)	

## **DisplayPort Connector**

A DisplayPort Connector is provided to connect the monitor to a computer.

Pin	Signal	Pin	Signal	Pin Assignment
1	CON_DDI1_TX0_P	11	GND	
2	GND	12	CON_DDI1_TX3_N	
3	CON_DDI1_TX0_ N	13	CON_DDI1_DDC_AUX_SEL	
4	CON_DDI1_TX1_P	14	CON_DDI1_CONFIG_2	
5	GND	15	CON_DDI1_I2CCLK_AUX_ P	
6	CON_DDI1_TX1_ N	16	GND	
7	CON_DDI1_TX2_P	17	CON_DDI1_I2CCLK_AUX_ N	
8	GND	18	CON_DDI1_HPD	
9	CON_DDI1_TX2_ N	19	GND	
10	CON_DDI1_TX3_P	20	P_+3V3_DP1	



#### **USB** Connector

A USB 2.0 Type-B connector is provided for touch support.

Pin No.	Pin Name	Signal Type	Pin Assignment	
1	+5V	In		
2	USB-Data-	I/O	USB2.0 for touch	
3	UDB-Data+	I/O	USB2.0 for touch	
4	GND	GND		

#### **DC Power Connector**

A 2.1mm center pin DC barrel jack connector is provided for power UL 94V-0 Rated

Pin No.	Pin Name	Signal Type
1	Center Pin +12V @5A	Power
2	GND	GND
3	GND	GND



#### Options:

To effective secure the DC jack connection, use the cable clamp provided to secure the DC power connector

to the rear panel as shown below (project only, the screw location depends on the installation profile).



#### DC Power Connector (for 43 inch only)

A 2.1mm center pin DC barrel jack connector is provided for power input.

Pin No.	Pin Name	Signal Type
1	Center Pin +24V @5A	Power
2	GND	GND





# 3.2. Mechanical Dimensions

All dimensions are in mm.

### **EM** Line

3.2.1.1. EM1010



Figure 3: EM1010 Mechanical Dimensions

3.2.1.2. EM1330







3.2.1.3. EM1560



Figure 5: EM1560 Mechanical Dimensions

3.2.1.4. EM2150







## 3.2.1.5. OM1330



Figure 7: OM1330 Mechanical Dimensions

## 3.2.1.1. OM1560



Figure 8: OM1560 Mechanical Dimensions



3.2.1.1. OM1730



Figure 9: OM1730 Mechanical Dimensions





### 3.2.1.1. OM2150



Figure 11: OM2150 Mechanical Dimensions

### 3.2.1.1. OM3150



### Figure 12: OM3150 Mechanical Dimensions



### 3.2.1.1. OM4300



Figure 13: OM4300 Mechanical Dimensions



# 3.3. Mounting

This section includes details for VESA and panel mounting options.



Risk of physical injuries and / or property damage:

When mounting the device, use four M4 x 4mm screws (max 6mm) or four M6 x 7mm (OM3150 and OM4300) to mount the VESA bracket to the rear of the device. Tighten all four screws firmly to support the weight of the device. Make sure that the suspension system is capable of supporting the device!



Risk of burns to the user caused by hot surfaces:

Turn off power and allow the device to cool down prior to performing any mounting or unmounting operations. Avoid prolonged contact with the enclosure (over 10 seconds) when the device is in operation or is still hot from previous use.

### **VESA Mounting**

**Note:** The VESA mounting hole pattern is shown in the figure below. The I/O ports can face down or left/ right for different models.



Figure 14: Attaching a VESA Mounting Bracket



### Panel Mounting (OM Line only)

The OM line units can be panel-mounted with 14 mounting clips (not included). Make sure there is adequate space behind the panel for ventilation, and that the panel material and thickness can support the weight of the device.

**Step 1**: Cut the panel opening using the appropriate cutout dimensions. All dimensions are in mm unless otherwise specified.



#### Figure 15: OM1330 Cut Out Dimensions



Figure 17: OM1730 Cut Out Dimensions



#### Figure 16: OM1560 Cut Out Dimensions



#### Figure 18: OM1850 Cut Out Dimensions



#### Figure 19: OM2150 Cut Out Dimensions





Figure 21: OM4300 Cut Out Dimensions

- Step 2: If rear access will be limited after installation, attach I/O cables to the device before installing into the panel (see I/O Connectors on page 8).
- Step 3: Place the device into the panel cutout.



Figure 22: Insert Monitor into Cut Out



**Step 4**: Insert the mounting clips into the slots on the sides of the device as shown. Hand-tighten the mounting clips with a Phillips-head screwdriver to secure it to the panel.

Do not overtighten the clips to avoid damaging the device enclosure.





Figure 23: Secure Monitor with Mounting Clips

### Panel Mounting (project only)

The OM3200, OM4300 can be panel-mounted using the screw holes on the back of the device. For OM3200, 12 screw holes with a max depth of 7mm require a minimum of 8 screws (4 on each side) to support the weigh of the device. For OM4300, 8 screw holes with a max depth of 7mm may be used. Make sure there is adequate space behind the panel for ventilation, and that the panel material and thickness can support the weight of the device.



# 4. On-screen Display (OSD)

This chapter describes the OSD features of our industrial monitors

## 4.1. OSD Buttons

OSD buttons are located on the rear panel of the monitor.



#### Figure 24: Rear Panel OSD Buttons

Table 5: Monitor OSD E	<b>Button Functions</b>
------------------------	-------------------------

Button	Function	Remark	
On/Off	Power On/Off	Press to power the monitor on/off. Press at least 1 second for power off.	
Menu	OSD menu On/Off	Press to turn the OSD menu on/off.	
	Leave OSD Submenu	Press to step out of a submenu.	
Source	Step through menu	Press to step into a submenu.	
	Execute Autotune (VGA only)	Press to execute autotune after clicking the "Auto" key.	
$^{\sim}$	Move up to next item	Press to move the cursor up to the next menu item.	
	Increase value	Press to increase the value of an item.	
V	Move down to next item	Press to move the cursor down to the next menu item.	
	Decrease value	Press to decrease the value of an item.	



## 4.2. OSD Menus

The table below lists the OSD menu structure and items.

Table 6: OSD Menu Overview

Main Menu	Submenu	ltem	Value/Range	Default Value	Comment
Picture	Backlight	Slider	0-100	100	Adjust luminance
	Brightness	Slider	0-100	50	Adjust brightness
	Contrast	Slider	0-100	50	Adjust contrast
	Sharpness	Slider	0-4	2	Adjust sharpness
	Auto Adjust	Text			Auto adjust VGA screen (VGA only)
	HPosition	Slider	0-100	VGA adjustable	Adjust VGA screen horizontal position (VGA only
Display	VPostion	Slider	0-100	VGA adjustable	Adjust VGA screen vertical position (VGA only)
	Clock	Slider	0-100	VGA adjustable	Adjust VGA signal clock latency (VGA only)
	Phase	Slider	0-100	VGA adjustable	Adjust VGA signal clock phase (VGA only)
	Temperature	Text	9300K 6500K 5800K User	6500k	Select color temperature
000	Hue	Slider	0-100	50	Adjust color hue
	Saturation	Slider	0-100	50	Adjust color saturation
	Auto Color	Text			Auto adjust color parameter on VGA
Advance	Aspect Ratio	Text	Full 16:9 4:3 5:4	Full	Select the aspect ratio of the screen
	Over Scan	Text	On/Off	On	Turn on/off over scan on screen
	DDCCI	Text	On/Off	On	Turn on/off DDCCI communication function
	Auto Select				Auto select input source
Input	VGA				Set input source as VGA
	HDMI				Set input source as HDMI
	Reset				Reset OSD user setting
	Menu Time	Slider	0-100	50	Set OSD menu timeout
	OSD H Pos	Slider	0-100	50	Set OSD menu horizontal position
	OSD V Pos	Slider	0-100	50	Set OSD menu vertical position
Other	Language	Text	English French German Italiano Spanish 中文 簡中 日文	English	Set OSD language
	Transparency	Slider	0-100	0	Set OSD menu transparency
Information		Text			Display input source information



# 5. Troubleshooting

In the event that you experience trouble with your monitor, check the following items before contacting the dealer from whom the monitor was purchased. The most common problems usually involve an incorrect connection from the graphics card to the monitor. We recommend that you also consult your graphics card user's manual during the troubleshooting procedure.

Do not exceed the maximum refresh rate recommended for the monitor.

Problem	Solution	
Blank screen	1. Check that power cord of the computer or AV device has been plugged securely into a wall outlet.	
	2. Check that the monitor has been turned on.	
	<ol><li>Check that the video signal cable from the monitor has been securely and correctly connected.</li></ol>	
	<ol> <li>Check that the graphics card is firmly seated in the card slot of the computer motherboard.</li> </ol>	
	5. Check that the video input from the graphics card falls within the timing range of the monitor.	
Abnormal image	1. Check that the video input from the graphics card falls within the timing range of the monitor.	
	<ol> <li>Check that the video signal cable from the monitor has been securely and correctly connected to the video connector of the computer.</li> </ol>	
Abnormal color	Check that the video cable from the display has been securely and correctly connected to the video connector of the computer.	
Garbled image	1. OSD adjustment is incorrect. Refer to OSD screen adjustment procedures.	
	2. Run autotuning from the OSD adjustment menu (VGA only).	
Unresponsive touch	Verify the USB cable is correctly attached and functional.	



# Safety Instructions

Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use.

- Please read these safety instructions carefully.
- Please keep this User's Manual for later reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- Prior to installing/mounting or uninstalling/removing equipment, turn off the power and unplug any power cords/cables. Please observe the mounting instructions provided in this manual.
- If the device is still hot from previous use, allow the device to cool down prior to performing any mounting/unmounting operations.
- To avoid electrical shock and/or damage to equipment:
  - T Keep equipment away from water or liquid sources.
  - T Keep equipment away from high heat or high humidity.
  - T Keep equipment properly ventilated (do not block or cover ventilation openings).
  - T Make sure to use recommended voltage and power source settings.
  - T Always install and operate equipment near an easily accessible electrical socket-outlet.
  - T Ensure to connect the power adapter to an electrical outlet with a grounded connection.
  - T Secure the power cord (do not place any object on/over the power cord).
  - T Only install/attach and operate equipment on stable surfaces and/or recommended mountings.
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.
- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.
- Failure to comply with the instructions above could result in physical injuries and/or property damage.