MISSION CRITICAL

TOGETHER
BEYOND
THE
SUMMIT

SUSTAINABLE DEVELOPMENTAL PLAN

ACT POWER is committed to being one of the leading technology service providers around the world. We are constantly looking for opportunities to create value for customers and create mutual prosperity and mutual benefits.

SOCIAL RESPONSIBILITY & ENVIRONMENTAL POLICY

We are committed to maintaining ecological balance, promoting corporate social responsibility, promoting green production, actively participating in charity activities, paying attention to vulnerable groups, promoting the physical and mental health and safety of employees, and creating an open business stage for talents to fully develop.

MISSION CRITICAL

ACT MILITARY PRODUCT DEVELOPMENT HISTORY

2016
In-house Rugged Design Product

2018
Military Standard Display

Distribution: India, Middle-east

2019
Military Standard Panel PC, BOX PC

2021
Other Military Products

Distribution: Worldwide

2022
New development for Military Product – Military Embedded System and System integration

Programmable Temperature and Humidity Chamber

CAPABILITIES FOR PRODUCTS
DEVELOPMENT, MANUFACTURE AND SOURCE

ACT has our own in-house design team, including members from both electronics engineering and mechanical engineering backgrounds. Our team has been experienced in researching and developing products for military application.

We love to keep close relationship with our customer. Based on the deep knowledge from the IPC industry towards military application. We are not only aware of standards of military compliance, but also think from the perspective of the end-user about putting ourselves into their application scenario. Through our Design to Order Service (DTOS), we can provide a suitable solution for our customer in an efficient and accurate way.

ACT has our own manufacturing house for the NCT, die casting for sample & mass production. With respect to military standard products, our team are professional in EMI Mesh and Optical Bonding, Rugged Design, EMI/EMC design and solution.

Since we are familiar with the military display industry, ACT has a very stable source of display panels, panel glass, EMI shielding material supply.

QUALITY ASSURANCE
VALIDATION CENTER

ACT always cares about the quality of products. ACT has set up an in-house validation center. It helps us to validate the performance of the design, and ensure the quality of products delivered. For the EMI/EMC testing, it will be performed in an ISO-certified laboratory. For environmental compliance, for example, temperature, humidity, shock, vibration, etc., we do our design validation, incoming/ outgoing quality check at our facility.

WE MAKE PRODUCTS
THAT MEET YOUR NEEDS

WHY ACT TAIWAN

FOUR REASONS
TO CHOOSE ACT

1

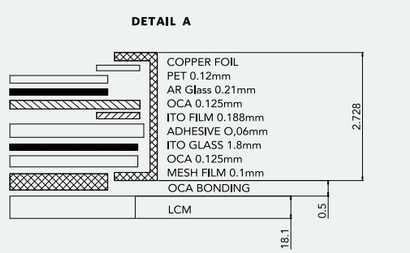
DESIGN FOR MILITARY STANDARD FROM THE PROSPECTIVE OF CUSTOMER

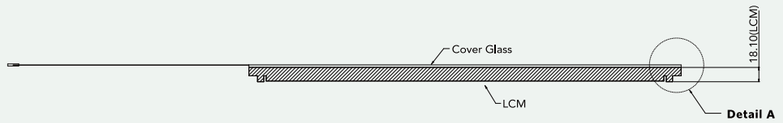
MIL-STD-461 and MIL-STD-810 are the basic standards for military products. The products should have high durability and reliability as well. ACT military products are designed to meet different military standards. With our experience in the military industry, we are capable of using different types of materials, e.g., EMI copper table, gasket, stirp, texture and processing method to achieve the requirements cost-effectively.

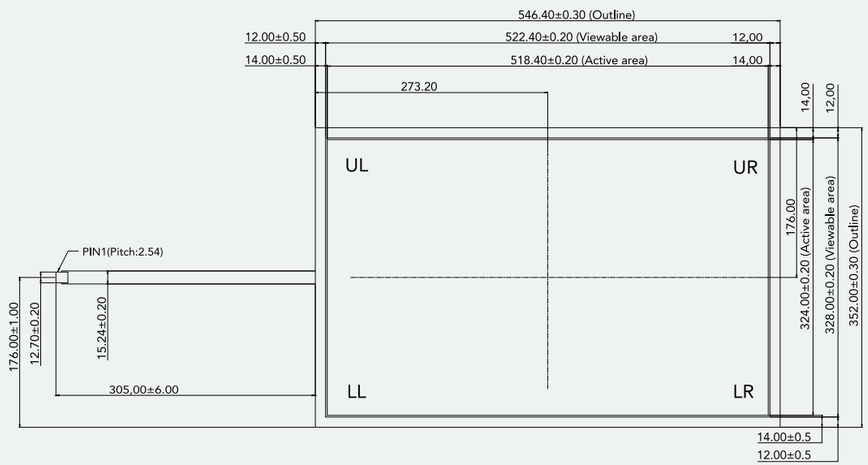
We understand that rugged design starts from every component in the device. For example, screw selection, material processing, heat conduction setup, component integration, etc. Our know-how can always provide a suitable solution to the customer's application. The product should be able to withstand impact, vibration, temperature extremes, and exposure to moisture and other environmental factors.

For instance, when we design the product to meet MIL-STD-461 and MIL-STD-810, ACT can strike a balance between cost and performance. From the material section, towards the assembling difficulties and application scenario, we can always give key components or suggestions for the integration.

CONNECTOR PINOUT	
Pin NO.	Designation
1	UR
2	LR
3	SG
4	UL
5	LL







CASE STUDY

TOUGHENED GLASS OPTICAL BONDING

SLM-MR240K-E

CUSTOMER REQUIREMENT

Extra glass on the 24" resistive touch display to enhance the hardness of the glass and protect the resistive touch damaged from outer force.

DIFFICULTY

a Adding an extra glass on the resistive touch could affect the touch response and AR/AG performance.

b The greater the size of the glass, the harder it is to be handled in terms of manufacturing and bonding process, considering the glass has to be thin enough that touch performance cannot be affected.

SOLUTION

ACT designs a thin AG glass on top of the touch glass. ACT developed an in-house technique to bond the thin glass by OCA and optical bonding.

ACHIEVEMENT

01 Maintain the same resistive touch performance as without extra glass on the resistive touch glass.

02 Bring the AG feature into the glass on top, enhancing the AG performance.

03 Protect the resistive touch glass by 6H thin Glass

SLM-MR240K-E

2

SUNLIGHT READABLE - Ultra High Brightness

When we consider the outdoor or vehicle application, sunlight readable feature should be one of the basic requirements. Especially for military products, no customer would like to find the display unseeable under sunlight.

In some cases, the original panel was only able to support 350 nits brightness. After optical bonding, the brightness could take up to a 30% discount. ACT has been experiencing high brightness modification. We have the know-how to use the driver board to boost the panel brightness, adding extra LED backlight to the panel, or even customizing a new panel to meet the requirement.

In addition, the higher brightness of the panel will generate greater heat at the same time because of the power consumption. With our design team, we are able to provide a suitable solution to assist in handling the heat spread even in large-sized panels.

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	REMARK
Input Voltage	Vin	10.8	12	13.2	V	
Input Current	Iin	-	400	2000	MA	
On / Off	SW	2	5	5	V	
Fregrency	F	280	330	360	KHz	
H.V load	Vload	-	18	68	VDC	ADJ:0V
H.V open	Vopen	-	12	68	VDC	NO LOAD
Efficiency	9	-	95	-	%	

CASE STUDY

HIGH-BRIGHTNESS SLM-MR101M-E

CUSTOMER REQUIREMENT

As a key component for military tablet application, the customer requires a 10.1 inch LCD module with low power consumption. The minimum resolution requirement is Full HD.

DIFFICULTY

Most 10.1" panels in the market cannot achieve 4 requirements at the same time.

a to be a military display in terms of the structure and electronic standards
b With high brightness, after optical bonding, 700 nits
c Support Full HD resolution
d With low power consumption

SOLUTION

ACT has modified a panel on the driver board and LED modification to meet all the above requirements.

ACHIEVEMENT

01 Panel with reliable structure and electronic performance. Wide Working temperature from -20°C to 70°C
02 Before bonding, the panel can support 1000 nits brightness. The finishing product can support up to 700+nits after optical bonding
03 Support 1920x1200 resolution
04 Low power consumption: <6W in typical operation
05 Extra: black silk print on the top of the panel glass, considering the front mount assembled in the customer's tablet design

DRIVER BOARD SPECIFICATION

PARAMETER		SYMBOL	VALUES			UNIT	NOTES
			Min.	TYP	MAX		
Power Supply Voltage		VOD	3.0	3.3	3.6	V	
		VRP			300	mV	Ripple
Power Supply Current		IDO	-	300	360	mA	Note 1
Power Consumption		PLCD	-	1	1.2	W	Note 2
Rush Current		IRUSH	-	-	3.0	A	
CMOS Interface	Input Voltage	VIH	2.7		3.30.5	V	
		VIL	0		3.3	V	
	Output Voltage	VOH	2.7		0.5	V	
		VOL	0			V	

3

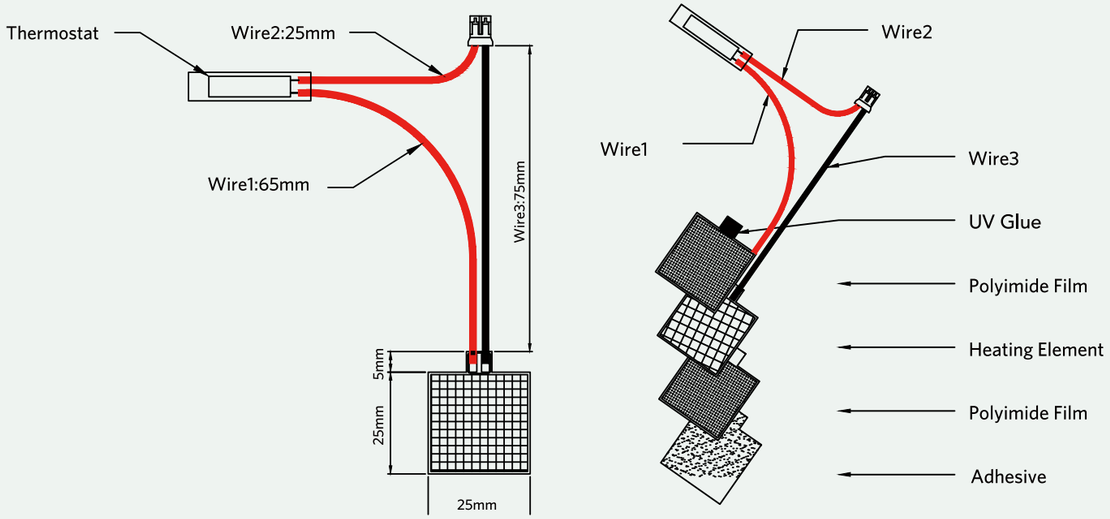
EXTREME ENVIRONMENT APPLICATION - Smart Heater

Military standard products should be reliable and able to perform consistently and predictably in all circumstances. Nowadays, many ICs and components provide a wide operating temperature. Like for some PCBAs, they are able to support -40 °C to 85 °C in operation. However, the LED Panel has another story.

Due to the nature of LED, most panels cannot be boosted up in low temperature. i.e., <-30 °C. At the same time, especially in military applications, it is common that a military product has to start working in an extremely low temperature environment.

In ACT products, especially in panel design, we always use a smart heater for the requirement to work below -20 °C.

HEATER DESIGN



ADVANTAGES

A

FAST WARM UP ON SPECIFIC COMPONENTS

For a common heater, it aims to boost the overall temperature in the structure. It delays the operation as we have to wait until the whole environmental temperature is raised. For our design, the heater is assembled as part of the component. For example, at the back of the panel. The heat conduction is through direct contact. Therefore, the device can be warmed up within a very short period of time.

B

STRUCTURAL DESIGN

ACT Heater size can be customized according to the components and it is flexible to integrate into the system. Also, when we need to consider the shock & vibration requirements, the heater pad is a paste form heater. It could be installed easily and firmly. After the electronics components analysis, we could assemble the heater on to the core part of the component. It does not greatly affect the overall thickness and occupy too much space in the structure.

C

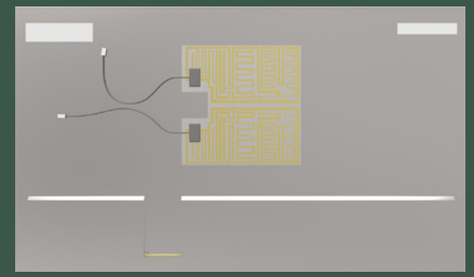
WIDE RANGE COMPATIBILITY OF POWER CONSUMPTION

Power supply voltage could be 1 to 240V AC/DC input. It could be compatible with different system integration.

D

EASY SETUP

The heater itself is controlled by a sensor. The operation runs automatically. For example, once the thermostat sensor detects the environmental temperature that is below 0°C, the heater will start operation to warm up the device.



4

CUSTOMIZATION DESIGN FOR APPLICATION

The ability to customize military standard products requires a flexible design that can accommodate modifications and additions without compromising the product's performance or reliability.

ACT has our own engineer team to develop the key components or final product into customers' application. Our engineering team includes both mechanical engineers and electronic engineers to co-work on the product.

STRENGTH OF ACT CUSTOMIZATION (DTOS)

A

FAST DEVELOPMENT TIME

ACT understands that customers require a high level of validation in military products. While having an in-house team for the product design, we are able to provide the solution efficiently. We would also like to provide a one-stop solution through our research and development team ability. It reduces the time for debugging and enhancement.

B

STRONG LINKAGE IN MECHANICAL AND ELECTRONICAL INTEGRATIONS.

Mechanical design is not the barrier of the product. It is assistance for the product. For example, today, we need to design a fan-less box PC using the Intel i7 Generation 10 CPU as required. Starting from the motherboard layout, we tried to put all the heat-generating components to be separated. However, it is unavoidable that the heat generation from the CPU will be too high. After heat simulation, our mechanical team will bring a head conduction solution to the product.

C

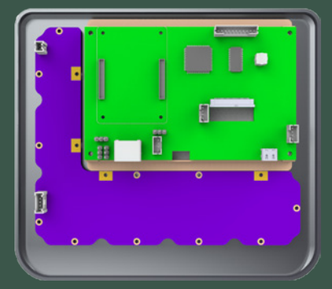
WIDE CUSTOMIZED OPTIONS

Military products include various features in different applications. For example, extreme high reliability in military servers, which may require redundancy design in both power supply and storage backup, or water-proof and EMI protection at the same time in outdoor usage. According to our team's know-how and experience in this industry for many years, we can always provide a suitable solution.

D

SYSTEM INTEGRATION FOR MORE POSSIBILITIES

Mission critical is one of the main series of ACT products, but ACT has more than that. With our development in other series, we can assist our customers to explore more possibilities in customers' applications. For example, we can integrate our PRO AV products to build up the situation room or monitoring center in the military station.



MILITARY LCD
MODULE

MODEL	SLM-MR2400-E	SLM-MN064M-E	SLM-MN064M1-E	SLM-MN084M-E	SLM-MN084M1-E	SLM-MR084M-E	SLM-MR084M2-E	SLM-MR101M-E	SLM-MC104M-E
Display Size	5"	6"	6"	8.4"	8.4"	8.4"	8.4"	10.1"	10.4"
Resolution	720 x 1280	1024 x 768	1024 x 768	1024 x 768	1024 x 768	1024 x 768	1024 x 768	1920 x 1200	1024 x 768
Luminance	700 cd/m2	800 cd/m2	800 cd/m2	800 cd/m2	800 cd/m2	700 cd/m2	700 cd/m2	700 cd/m2	700 cd/m2
Contrast Ratio	800:1	800:1	800:1	800:1	800:1	800:1	800:1	900:1	1000:1
No. of Color	16.7M	16.7M	16.7M	16.7M	16.7M	16.2M	16.2M	16.7M	16.1M
Touch	Capacitive Touch	No Touch	No Touch	No Touch	No Touch	Resistive Touch	Resistive Touch	Resistive Touch	Capacitive Multi Touch
Touch Interface	I2C	-	-	-	-	USB	USB	USB	USB
AG/AR Strengthern Glass	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EMI Mesh + Optical Bonding	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Operating Temperature	-20°C to 70°C	-40°C to 80°C	-40°C to 80°C	-40°C to 85°C	-40°C to 80°C	-40°C to 85°C	-40°C to 85°C	-20°C to 70°C	-30°C - 80°C
Storage Temperature	-30°C to 80°C	-40°C to 80°C	-40°C to 80°C	-40°C to 90°C	-40°C to 90°C	-40°C to 90°C	-40°C to 90°C	-30°C to 80°C	-30°C - 80°C
MIL-STD-461E/F shock compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MIL-STD-810D shock compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MIL-STD-810E vibration compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional information	With bezel option		Panel Mount		Panel Mount	Customized Glass		Panel Mount	

MODEL	SLM-MR104M-E	SLM-MR150M-E	SLM-MR185M-E	SLM-MR213M1-E	SLM-MR215M-E	SLM-MR230M-E	SLM-MR240M-E	SLM-MN270M-E	SLM-MC270M1-E
Display Size	10.4"	15"	18.5"	21.3"	21.5"	23"	24"	27"	27"
Resolution	1024 x 768	1024 x 768	1920 x 1080	1600 x 1200	1920 x 1080	1920 x 1080	1920 x 1200	1920 x 1080	1920 x 1080
Luminance	700 cd/m2	700 cd/m2	700 cd/m2	900 cd/m2	700 cd/m2	700 cd/m2	900 cd/m2	1000 cd/m2	700 cd/m2
Contrast Ratio	1000:1	2500:1	1000:1	1800:1	3000:1	1000:1	1000:1	3000:1	1000:1
No. of Color	16.1M	16.7M	16.7M	16.8M	16.7M	16.7M	1.07B	16.7M	16.7M
Touch	Resistive Touch	Resistive Touch	No Touch	Resistive Touch	Resistive Touch	Resistive Touch	Resistive Touch	No Touch	Capacitive Multi Touch
Touch Interface	USB	USB	USB	USB	USB	USB	USB	-	USB
AG/AR Strengthern Glass	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EMI Mesh + Optical Bonding	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Operating Temperature	-30°C to 80°C	-20°C to 55°C	-20°C to 70°C	-20°C to 60°C	-20°C to 50°C	-20°C to 55°C	-20°C to 60°C	-20°C to 55°C	-20°C to 55°C
Storage Temperature	-30°C to 80°C	-30°C to 70°C	-20°C to 70°C	-20°C to 60°C	-30°C to 70°C	-20°C to 60°C	-30°C to 70°C	-30°C to 70°C	-30°C to 70°C
MIL-STD-461E/F shock compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MIL-STD-810D shock compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MIL-STD-810E vibration compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional information									

REMARK

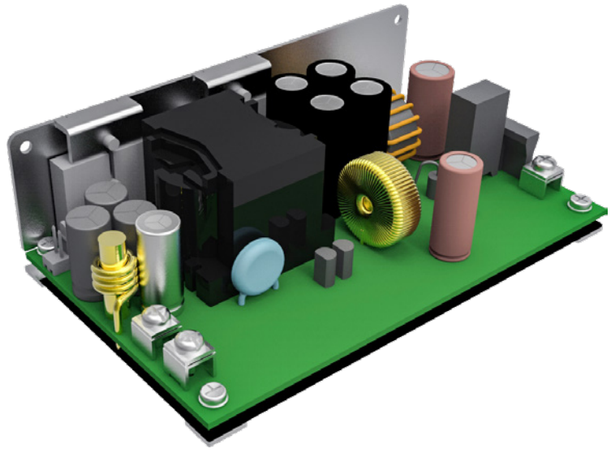
1.Above military LCD module is as a key components for the final products. To work with mentioned compliance, LCD kit has to be properly packed with bezel and back cover with required EMI-EMC and IP Gaskets to meet EMI/EMC and Environmental specifications

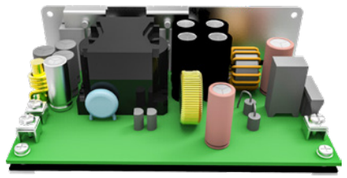
2.All the above LCD Module can be customized into LCD Kit, open frame or further design.

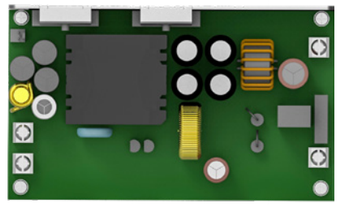
MILITARY LCD MODULE WITH OPEN FRAME DESIGN

MODEL	SLM-MR2400-E
Display Size	24 inch TFT LCD
Resolution	1920 x 1200
Luminance	300 nits (Upgradable)
Touch	Resistive Touch
Touch Interface	USB Touch
Touch Glass	AG/AR Strengthen Glass
Viewable Area	522.4 x 328 mm
Active Area	518.4 x 324 mm
Optical Bonding	Yes
EMI Mesh	Yes
Operating Temperature	-10°C to +60°C
Storage Temperature	-20°C to +70°C
EMI/EMC	Designed to meet MIL-STD-461E/F
Shock	Designed to meet MIL-STD-810D
Vibration	Designed to meet MIL-STD-810E
Weight	Approx. 13 kg

HIGH LEVEL POWER SUPPLY
DC/DC CONVERTER





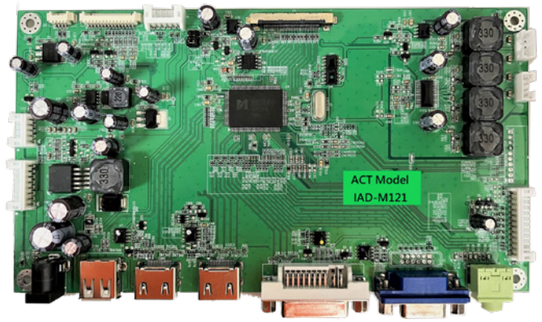


MODEL	DC-0150800-M
Input Range	9 to 36VDC
Input Current	Max load 16 Amp
Output Voltage	15 VDC
Output Current	8 Amp
Operating Temperature	-30°C to +70°C
Storage Temperature	-35°C to +75°C
Dimension	127 x 76.2 x 38 mm
Safety	EN 62368
EMC	EN 55022 / EN 55032, CISPR 32 & FCC Part 15 ClassA/ Class B
Further compliance	EMI shielding bracket design possible. Design to meet MIL-STD-461F and MIL-STD-1275D
Input Reverse Polarity Protection	When incorrect input polarity installation, the PSU will be not damaged and no output voltage.
Overvoltage Protection	For some reason the power supply fails to control itself, the build-in over voltage protection circuit will shut down the outputs to prevent damaging external circuits.
Short Circuit or Over Load Protection	The power supply will go into hiccup mode against short circuit or over load conditions, and will auto-recovery while fault conditions moved.

19" 3U RUGGED RACK MOUNT SERVER

MODEL	MIC-S0301
Size	3U, 19" Rack Mount
Processor	Intel® Xeon® Gold 6230 Processor, 20-cores, 40-threads 2.1 to 3.7GHz Frequency 42MB Cache Memory
Memory	Total 128 GB ECC DDR4 2933MHz pre-mounted Up to 256 GB capacitive each slots, 12 DIMM slots
Graphics	GEFORCE GT 710 2GB DDR3 64-bit graphics RAM
Storage	M.2 Interface: 4 PCIe 3.0 x4, RAID 0 & 1 Form Factor: 2242/2260/2280/22110 Key: M-Key M.2 support RAID 0,1(up to RAID 5, 10), VROC key is required for Raid 2 TB M.2 SSD pre-mounted
PCI-E	4 PCIe 3.0 x16, 3 PCIe 3.0 x8 (in x16 slot)
I/O ports rear (MIL Circular) With dust caps with cable secured	4 x LAN with D38999 military connector 3 x USB2.0 with D38999 military connector 3 x RS232 with D38999 military connector 1 x HDMI with D38999 military connector 1 x DVI-D with D38999 military connector 1 x AC with D38999 military connector
I/O ports front Buttons	1 x On/ OFF button 1 x Reset button 2 x LED indicators
Dimensions	3U – 17.5" x 24" x 3.5 (W x L x H)
Power	Power consumption: Approx. 200 Watts Power supply: Dual 550W Redundant power supplies Supports Automatic Power on State in BIOS Power input: AC 90-264V input
Operating Temperature	0°C to +55°C (Standard) -30°C to +55°C (With Heater)
Storage Temperature	-40°C to +70°C (Note)
Compliance	Designed to meet MIL-STD-810G, MIL-STD-461E

AD BOARD, CABLES AND OTHER ACCESSORIES



▲ AD Board

▲ Cables and Other Accessories

MODEL	**IAD-M121**
Features	3D COMB FILTER and ACE-3 Color Engine Support 8bits/ 10bits LVDS interface VGA, DVI, HDMI x 2, USB Media, RS232, Light Sensor Supported Audio 5W x 2 Supported USB Port for Firmware Upgrade
DC Input	12 VDC
Panel Power Output Selection	3.3V/ 5V/ 12V DC
Operating Temperature	-20°C to +55°C
Compliance	Designed to meet MIL-STD-810G, MIL-STD-461E

ACT is also capable of designing and manufacturing different water-proof, or D38999 military cables. Based on our client's original design, we can provide a cost-effective proposal.

Besides, other accessories, for instance, EMI shielding bracket design, mounting solution, AD Board, internal cables and heater. These are common projects we have been handling.

Last but not least, we always stay with our clients. Our Design to order service has been customizing plenty of solutions over the years. We understand that our customers have different applications, environmental and structural requirements. Our customization service would definitely provide solutions for you and your customers.

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