

# SKY15-P20

15" Rugged Smart Display with  
20 Programmable function keys



**USER MANUAL**

## Safety Information

### Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

### Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter any technical problems with the product, contact your local distributor

### Statement

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- All product specifications are subject to change without prior notice

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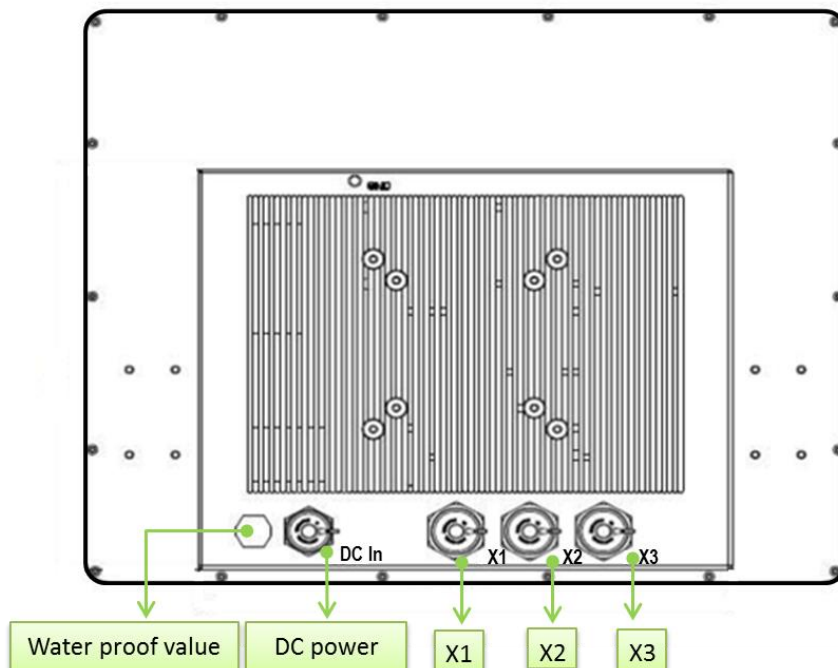
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## Chapter 1: Product Introduction

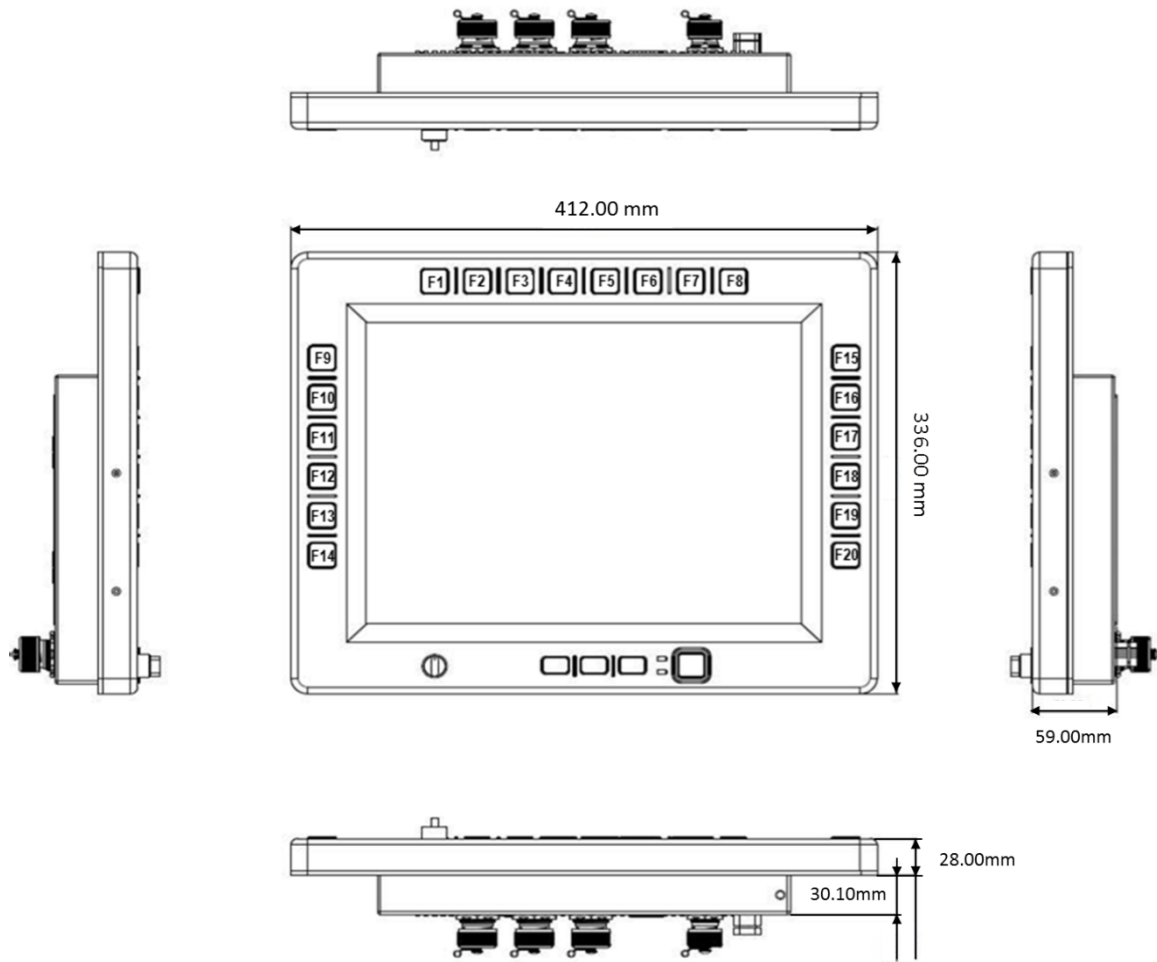
### 1.1 Front View



### 1.2 Rear View



### 1.3 Me dimension



## Chapter 2: Components

### 2.1 Location

A clean and moisture free environment is preferred. Make room for air circulation. Avoid areas with:

- Sudden or extreme changes in temperature.
- Extreme heat.
- Strong electromagnetic fields.
- Dust or high humidity.

If it is necessary to work in a hostile environment, please regularly maintain your display by cleaning dust, water, etc. to keep it in optimal condition.

### 2.2 Ruggedness

The display is designed with rugged features such as vibration, shock, dust and rain/water protection. However, it is still necessary to provide appropriate protection while operating in harsh environments. NEVER immerse the unit in water. Doing so may cause permanent damage. All connectors will corrode if exposed to water or moisture. Corrosion is accelerated if the system's power is ON. Please take proper water-resistant measures for cable connections.

The DC jack and cables are sealed and may be operated with water splashing while attached. All port covers should be in place when no cable is attached.

### 2.3 Power supply

The display can be powered via DC-IN (9~36V)

Optional:12~40V DC-IN (150W max) MIL-STD-461, MIL-STD-1275

### 2.4 Display Panel

The panel of the SKY15 series is a 4:3, 1024 x 768 panel with typical 1000 cd/m<sup>2</sup> brightness, a contrast of 900:1 at least and a LED backlight.

#### 2.4.1 Brightness

The brightness of the display can be changed by simple pressing the brightness up/down keys in normal operational mode.

## 2.5 Touch screen

SKY15 series is equipped with a 15" G.F.G touch screen.

## 2.6 Video signal inputs

The SKY15 series is equipped with the following video signal interfaces:

- DVI (single link DVI signal) (primary)

- VGA(RGB) (primary)

The video source is selected automatically. Simultaneous operation with two different signal sources connected is not provided.

## Chapter 3: Specification

### 3.1 System Specification

<b>Resolution</b>	1024x768	<b>Brightness</b>	1000 Nits
<b>Aspect Ratio</b>	4:3	<b>Contrast Ratio</b>	≥ 900
<b>Touch Panel</b>	Glass-Film-Glass 5-Wire resistor touch panel (Optional)		

#### System SPEC

<b>Triple Mode</b>	Day Mode: Ultra-Brightness 1000 nits Night Mode: NVIS (Dimmable under 1% Nits) Invisible Mode: Backlight off
<b>OSD</b>	Backlight+ Backlight- Function key backlight On/Off
<b>Function Keys</b>	Programmable Function Keys (F1~F20)
<b>DC-IN</b>	9V ~ 36 V, 28Vdc Optional:12V~40V DC-IN (150W max) MIL-STD-461, MIL-STD-1275,

#### Connectors

<b>DC-IN</b>	Amphenol TV07RW-11-54P
<b>IO Ports</b>	[X1] 1x VGA with MIL-38999 (Amphenol TV07RW-13-35S)
	[X2] 1x DVI with MIL-38999 (Amphenol TV07RW-13-35S)
	[X3] 1x USB2.0 with MIL-38999 (Amphenol TV07RW-13-35S) +Debug Port(optional)

#### Applications

<b>Applications</b>	Marine, Naval, Ground and Airborne environment.
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#### Physical

<b>Dimension</b>	412 x 59x336 mm (W x D x H)		
<b>Weight</b>	12.35kg (27.23 lbs)	<b>Finish</b>	Anodic aluminum oxide
<b>Chassis</b>	Aluminum Alloy, Corrosion Resistant.	<b>Ingress Protection</b>	IP65 Dust /water Proof

#### MIL Compliance

##### MIL-STD-810 (Operation Test)

<b>Low Temp.</b>	Method 502.5 Procedure 2	Exposure(24h x 3 cycle) at -10°C min.
<b>High Temp.</b>	Method 501.5 Procedure 2	60°C for 2 hrs after temperature stabilization.
<b>Humidity</b>	Method 507.5 Procedure 2	RH -95%. Test cycles: ten 24-hrs , functional test after 5th and 10th cycles
<b>Vibration</b>	Method 514.6 Category 20	10-500Hz 1.04Grms Test duration: 1 hr x 3 axis (total 3 hrs)
<b>Shock</b>	Method 516.6 Procedure 1	20G, 11mSec, 3 per axis

##### MIL-STD-810 (Non-Operating Tests)

<b>Low Temp.</b>	Method 502.5	Exposure(24h x 7 cycle) at -20°C min.
<b>High Temp.</b>	Method 501.5 Procedure 1	71°C for 2 hrs after temperature stabilization.
<b>Vibration</b>	Method 514.6 Category 24	200 to 2000Hz Test duration: 1hr per axis; rms = 2.24 gs
<b>Shock</b>	Method 516.6 Procedure 1	20G, 11mSec, 3 per axis



## MIL-STD-461

CE102 Basic curve, 10kHz - 30 MHz

RE102-4, (1.5 MHz) (1.5 MHz) -30 MHz - 5 GHz

RS103 1.5 MHz - 5 GHz, 50 V/m equal for all frequencies EN 61000-4-2: Air discharge: 8 kV,

## Environmental Qualifications

**Regulatory** CE ,FCC Compliance

**Operation** -20°C~60°C(without heater system)

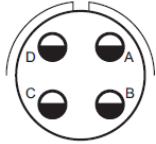
**Temp.** -40°C~60°C (with heater system inside (for optional)

**Storage Temp.** -40~+85 °C

**Green Product** RoHS, WEEE compliance

## 3.2 Interface

### 3.2.1 DC-In connector



Pin	Function
A	VDC(+)
B	VDC(+)
C	VDC(-) or Ground
D	VDC(-) or Ground

### 3.2.2 (X1)SW + Audio + VGA connector



Pin	Function	Pin	Function
P01	A1 (SW1)	P12	C8(VGA GND)
P02	A2 (SW2)	P13	C5(VGA GND)
P03	B1 (Audio L)	P14	C9(VGA GND)
P04	B2 (Audio R)	P15	C10(VGA GND)
P05	B3 (Audio G)	P16	C11(VGA RES)
P06	G4 (GND)	P17	C12 (VGA SDA)
P07	C1(VGA RED)	P18	C13(VGA H-SYNC)
P08	C6(VGA GND)	P19	C14(VGA V-SYNC)
P09	C2(VGA GREEN)	P20	C15(VGA SCL)
P10	C7(VGA GND)	P21	Customization
P11	C3(VGABLUE)	P22	Customization

### 3.2.3 (X2)DVI connector



Pin	Function	Pin	Function
P01	G	P12	P11
P02	G	P13	P14
P03	C5	P14	P15
P04	P1	P15	P16
P05	P2	P16	P17
P06	P3	P17	P18
P07	P6	P18	P19
P08	P7	P19	P22
P09	P8	P20	P23
P10	P9	P21	P24
P11	P10	P22	G

### 3.2.4 (X3)USB connector



Pin	Function	Pin	Function
P01	VCC	P12	USB D+
P02	N/A	P13	USB V-
P03	TX	P14	G
P04	DAT	P15	N/A
P05	RX	P16	N/A
P06	CLK	P17	N/A
P07	RST	P18	N/A
P08	G	P19	N/A
P09	G	P20	N/A
P10	USB V+	P21	N/A
P11	USB D-	P22	N/A

## Chapter 4: Operation Introduction



item	Description
1	F1 ~ F20 Function Keys
2	Power Button
3	LED Indicator
4	Brightness Adjust
5	Function Key Backlight Button
6	Night Vision Function key

## 4.1 F1~F20 Function Keys

Programming function keys could be customized depend on customer's requirement.

## 4.2 Power Button

Turn the display ON by pressing the power button. Turn the display Off by pressing the power button again.

PS: When ambient temperature is under -28 °C, heater will be enabled automatically to increase ambient temperature until over than -28°C, system power boot up automatically.

## 4.3 LED Indicators

Blue: When adapter is connected to DC connector.

Red: When heater is enabled.

## 4.4 Brightness Up or Down

+:LCD backlight increase

-:LCD backlight decrease

## 4.5 Fn-key backlight on off

Turn the Fn-key backlight on off by pressing the Fn-key backlight on off. Turn the Fn-key backlight on by pressing the Fn-key backlight on off again.

## 4.6 NVIS Mode

NVIS: LCD Backlight<1.7 nits, keypad backlight and Led indicator off.

On: LCD Backlight 0~1000 nits, keypad backlight and led indicator on and can be controlled formally.

Off: LCD Backlight off, keypad backlight and led indicator off.