# OPS100-SH Installation Guide


## Package Contents

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|---|
| • One OPS100-SH System Unit |
| • One OPS-DB Docking Board |
| • One Quick Installation Guide |
| • One DVD disk includes: |
| - Manual |

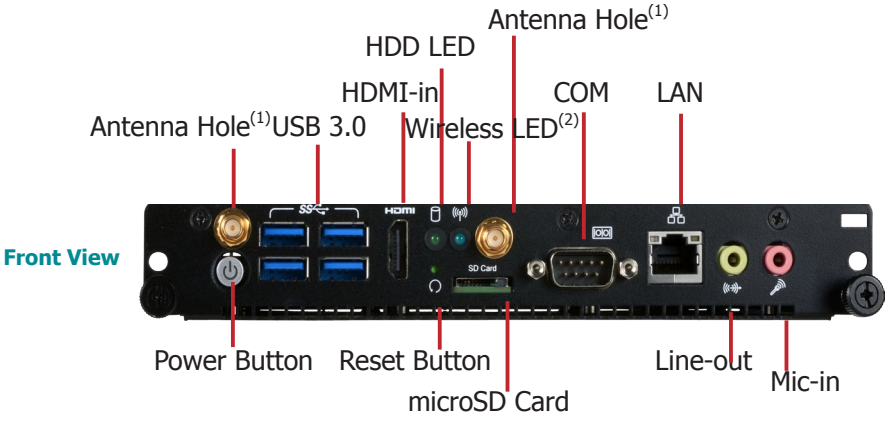
**Notes:**

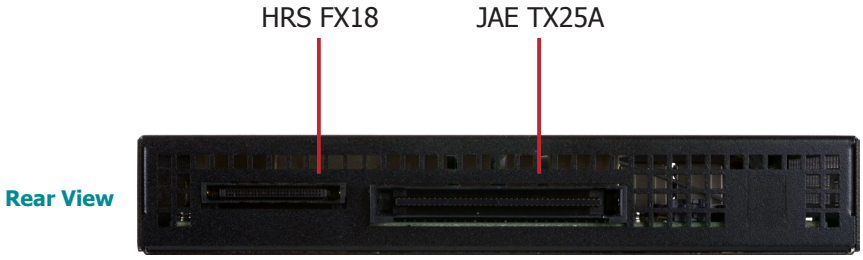
1. Throughout this guide the OPS100-SH may be referred to as the OPS+ Module.
2. The OPS-DB (referred to as the Docking Board) is an expansion dock, which provides additional I/O connectivity.

DFI reserves the right to change the specifications at any time prior to the product's release. For the latest revision and more details of the installation procedure, please refer to the user's manual on the website.

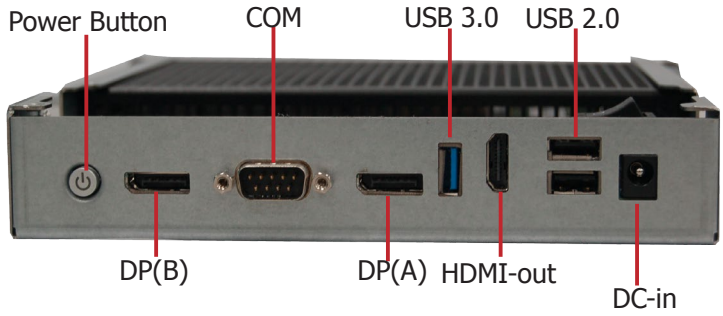
www.dfi.com

## Panel: OPS100-SH




## Panel: OPS-DB




**Notes:**

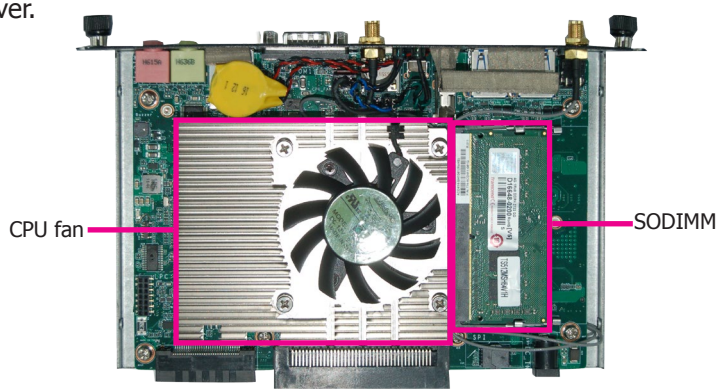
1. The OPS+ Module is equipped with a Wi-Fi module to provide Wi-Fi connectivity. Please install antennas to these SMA connectors.
2. There may not be indicator light depending on the installed Wi-Fi module; for example, the LED will not be lit for Intel® Dual Band Wireless-AC 8260.

## Removing the Chassis Cover

The OPS+ Module consists of a computing board in a wrapper chassis. Pease observe the following guidelines and follow the procedure to open the system.

1. Make sure the system and all other peripheral devices connected to it have been powered-off.
2. Disconnect all power cords and cables.
3. The 6 mounting screws on the sides and top cover of the system chassis, and the 3 screws that affix the front panel to the chassis should all be removed to open the system. Put these screws in a safe place for later use.

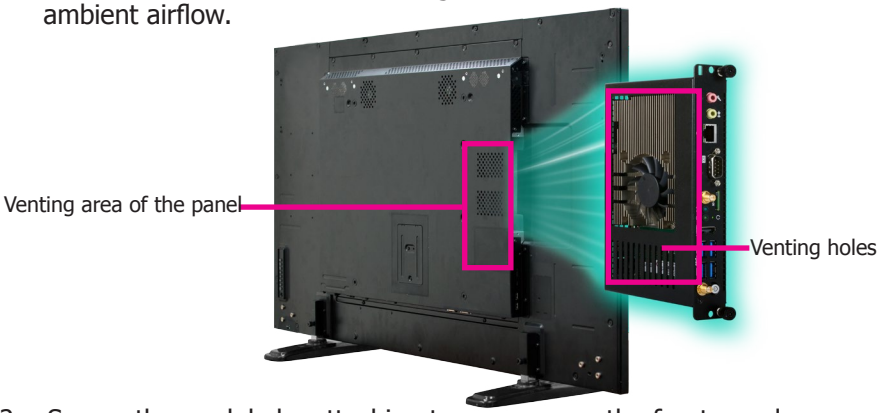

4. Lift the cover up to open the system.
5. The SODIMM sockets are readily accessible after removing the chassis cover.



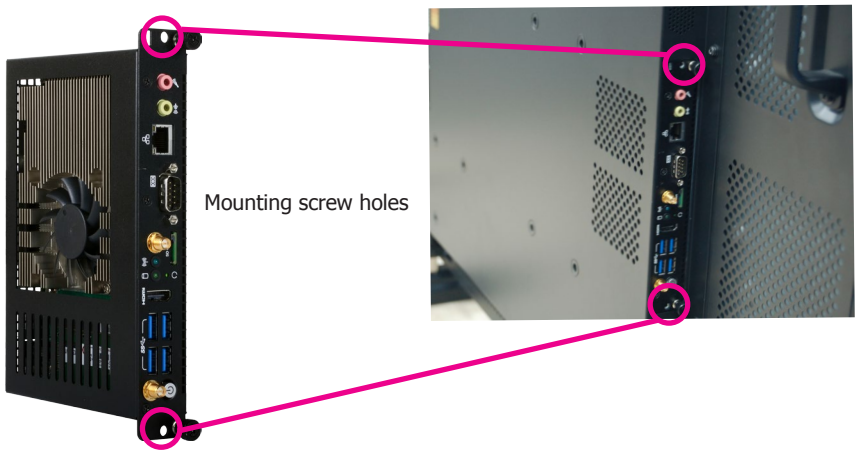
## Installing the OPS100-SH into a Display

Integrating a computing system into a digital signage display is made easy by standardizing the connectors and signals between an OPS+ Module and an OPS-compliant display. Note that the OPS+ Module does not support hot swapping; do not power on the display before the installation is complete. Please use the following steps to install the OPS+ Module into the display panel:

1. Align the OPS+ Module with the slot of the display and slide the module into the slot. Note that the venting holes should face outward to allow ambient airflow.




2. Secure the module by attaching two screws on the front panel.




3. Power on the display panel. The OPS+ Module should be automatically powered on.

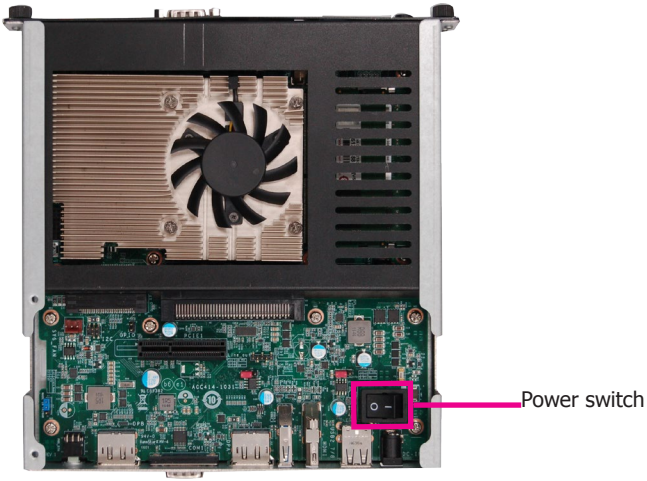
**Note:**
The location of the OPS slot may be at the side or at the bottom of the display panel depending on the design.

## Installing the OPS100-SH into the OPS-DB

The OPS+ Module has an accompanying Docking Board and allows it to serve as a standalone computing system. The plug and unplug mechanism between the OPS+ Module and the Docking Board utilizes the combo connector at the back of the module. Please use the following steps to install the OPS+ Module into the Docking Board:

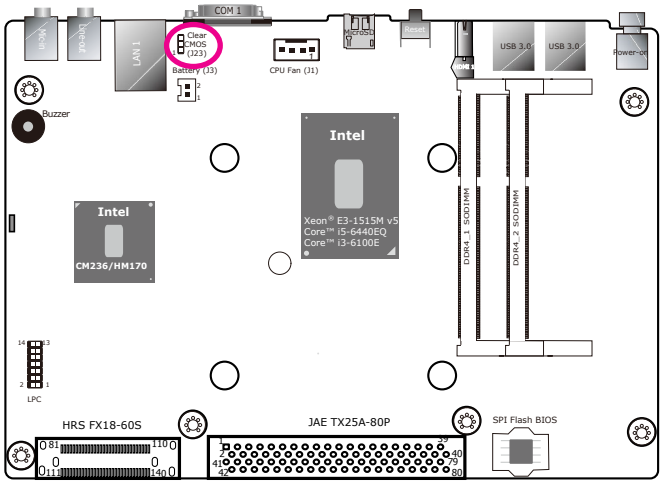
1. Align the OPS+ Module with the slot of the Docking Board and slide the module into the slot. Note that the venting holes should face upward to allow ambient airflow.
2. Secure the module by tightening the thumbscrews on the front panel.


3. Connect the included AC power adapter. Turn on the system by pressing the power switch.

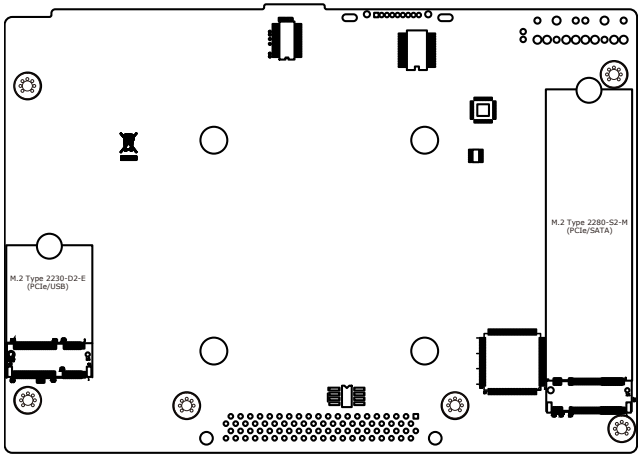


# Board Layout and Jumper Settings: OPS100-SH

## Top View

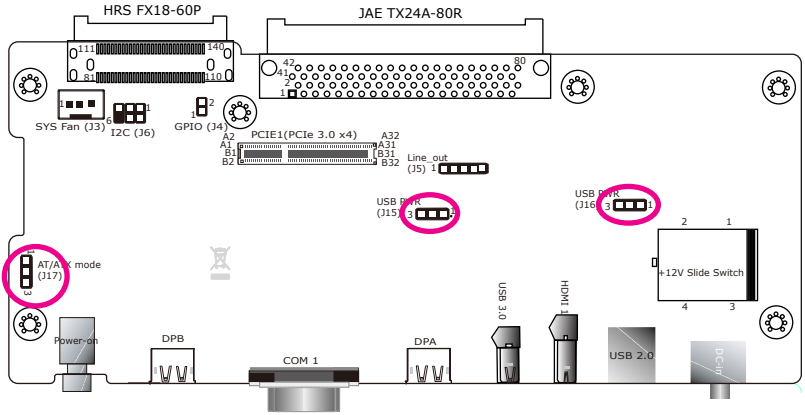



## Bottom View




| Clear CMOS | J23 |
|---|---|
| Normal (default) | 1-2 On |
| Clear CMOS | 2-3 On |

# Board Layout and Jumper Settings: OPS-DB




| USB Power Select | J15 (for the USB 3.0 port)<br>J16 (for the USB 2.0 ports) |
|---|---|
| 5V | 1-2 On |
| 5V Standby (default) | 2-3 On |

| AT/ATX Mode Select | J17 |
|---|---|
| ATX mode (default) | 1-2 On |
| AT mode | 2-3 On |

## Connector Pin Assignment

The OPS+ Module enables the integration of a pluggable module and a display panel by employing the defined interconnect based on the JAE and HRS combo plug and their receptacle connectors. The right angle blind mate plug connector (p/n: JAE TX25A-80P-LT-H1E) should be mated with the receptacle connector (p/n: JAE TX24A-80R-LT-H1E); together, they provide interfacing for the following functions:

Power: DC-IN +12V~+19V@12A max

Display Interface: 2*HDMI 2.0 (or DVI or DP, 4K at 60Hz)

Audio: left and right Channel

USB: 1*USB 3.0 and 3*USB 2.0

Control and Sensors: 1*UART and Consumer Electronics Control (CEC, note that the OPS100-SH does not support this function)

Control and Management Signals: the OPS+ Module power status, power-on via display panel, OPS+ Module detect, Consumer Electronics Control (CEC), system fan control, and device reset.

The following table lists the pin assignments of the 80-pin JAE connector:

| Pins | Pin Assignment | Description | I/O[1] | Pins | Pin Assignment | Description | I/O |
|---|---|---|---|---|---|---|---|
| 40 | +12V~+19V | Power | - | 80 | GND | Ground | - |
| 39 | +12V~+19V | Power | - | 79 | GND | Ground | - |
| 38 | +12V~+19V | Power | - | 78 | GND | Ground | - |
| 37 | +12V~+19V | Power | - | 77 | GND | Ground | - |
| 36 | +12V~+19V | Power | - | 76 | GND | Ground | - |
| 35 | +12V~+19V | Power | - | 75 | GND | Ground | - |
| 34 | +12V~+19V | Power | - | 74 | PWR_STATUS | PowerGood | OUT(OC)[2] |
| 33 | +12V~+19V/NC | Power/NC | - | 73 | PS_ON# | Pluggable Signal ON | IN |
| 32 | GND | Ground | - | 72 | PB_DET | Pluggable Board Detect | OUT |
| 31 | DVI0_HPD | DVI-D | IN | 71 | Not Available | Not Available | I/O |
| 30 | DVI0_DDC_CLK | DVI-D | I/O | 70 | AZ_LINEOUT_R | Audio-R ch | OUT |
| 29 | DVI0_DDC_DATA | DVI-D | I/O | 69 | AZ_LINEOUT_L | Audio-L ch | OUT |
| 28 | GND | Ground | - | 68 | GND | Ground | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 27 | TMDS0_2+ | DVI-D | OUT | 67 | USB_PP0 | USB | I/O |
| 26 | TMDS0_2- | DVI-D | OUT | 66 | USB_PN0 | USB | I/O |
| 25 | GND | Ground | - | 65 | GND | Ground | - |
| 24 | TMDS0_1+ | DVI-D | OUT | 64 | USB_PP1 | USB | I/O |
| 23 | TMDS0_1- | DVI-D | OUT | 63 | USB_PN1 | USB | I/O |
| 22 | GND | Ground | - | 62 | GND | Ground | - |
| 21 | TMDS0_0+ | DVI-D | OUT | 61 | USB_PP2 | USB | I/O |
| 20 | TMDS0_0- | DVI-D | OUT | 60 | USB_PN2 | USB | I/O |
| 19 | GND | Ground | - | 59 | GND | Ground | - |
| 18 | TMDS0_CLK+ | DVI-D | OUT | 58 | StdA_SSTX+ | USB3.0 | OUT |
| 17 | TMDS0_CLK- | DVI-D | OUT | 57 | StdA_SSTX- | USB3.0 | OUT |
| 16 | GND | Ground | - | 56 | GND | GND | - |
| 15 | DDP_HPD | DisplayPort | IN | 55 | StdA_SSRX+ | USB3.0 | IN |
| 14 | DDP_AUXP | DisplayPort | I/O | 54 | StdA_SSRX- | USB3.0 | IN |
| 13 | DDP_AUXN | DisplayPort | I/O | 53 | GND | Ground | - |
| 12 | GND | Ground | - | 52 | UART_TXD | UART 3.3V | OUT |
| 11 | DDP_0P | DisplayPort | OUT | 51 | UART_RXD | UART 3.3V | IN |
| 10 | DDP_0N | DisplayPort | OUT | 50 | SYS_FAN | System Fan Control | OUT |
| 9 | GND | Ground | - | 49 | RSVD | Reserved | - |
| 8 | DDP_1P | DisplayPort | OUT | 48 | RSVD | Reserved | - |
| 7 | DDP_1N | DisplayPort | OUT | 47 | RSVD | Reserved | - |
| 6 | GND | Ground | - | 46 | RSVD | Reserved | - |
| 5 | DDP_2P | DisplayPort | OUT | 45 | RSVD | Reserved | - |
| 4 | DDP_2N | DisplayPort | OUT | 44 | RSVD | Reserved | - |
| 3 | GND | Ground | - | 43 | RSVD | Reserved | - |
| 2 | DDP_3P | DisplayPort | OUT | 42 | RSVD | Reserved | - |
| 1 | DDP_3N | DisplayPort | OUT | 41 | RSVD | Reserved | - |

**Notes:**

(1) The I/O column definition is in reference to the OPS+ pluggable board.
(2) OC= Open Collector.

The right angle mate plug connector (p/n: FX18-60S-0.8SH) should be mated with the receptacle connector (p/n: FX18-60P-0.8SH); together, they provide interfacing for the following functions:

Power Contacts: 5V, 3V3@0.5A max

Display Interface: 1*DisplayPort 1.2 (4K at 60Hz)

PCI Express Expansion: 1*PCI-Express 3.0 x4

Control and Management Signals: 1*GPIO, 1*I2C, PHY device management signals

The following table lists the pin assignments of the 60-pin HRS connector:

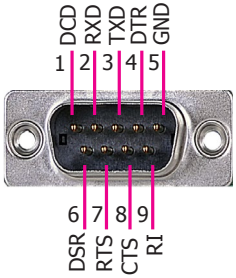
| Pins | Pin Assignment | Description | I/O(1) | Pins | Pin Assignment | Description | I/O |
|---|---|---|---|---|---|---|---|
| 110 | DDI1_TXP0 | | | 140 | Hot Plug - Hot Plug Detect | | |
| 109 | DDI1_TXN0 | | | 139 | DDI1_TXP2 | | |
| 108 | GND | Ground | | 138 | DDI1_TXN2 | | |
| 107 | DDI1_TXP1 | | | 137 | GND | Ground | |
| 106 | DDI1_TXN1 | | | 136 | DDI1_TXP3 | | |
| 105 | GND | Ground | | 135 | DDI1_TXN3 | | |
| 104 | DDI_AUXP | | | 134 | GND | Ground | - |
| 103 | DDI_AUXN | | | 133 | GPIO | GPIO | |
| 102 | GND | | | 132 | PCIe_RST | | |
| 101 | I2C1_DATA1 | I2C Data | I/O | 131 | SLEEP_S3 | PHY Status | OUT |
| 100 | I2C1_CLK | I2C Clock | OUT | 130 | LAN_DISABLE | PHY Status | OUT |
| 99 | GND | Ground | | 129 | I2C_DATA_LAN | I2C/SMBus Data | I/O |
| 98 | PCIE_CLK_P | PCIe CLK | OUT | 128 | I2C_CLK_LAN | I2C/SMBus CLK | OUT |
| 97 | PCIE_CLK_N | PCIe CLK | OUT | 127 | GND | Ground | - |
| 96 | GND | Ground | | 126 | PCIE-TXP3 | PCIe | OUT |
| 95 | GND | Ground | - | 125 | PCIE-TXN3 | PCIe | OUT |
| 94 | PCIE-RXP3 | PCIe | IN | 124 | GND | Ground | - |
| 93 | PCIE-RXN3 | PCIe | IN | 123 | GND | Ground | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 92 | GND | Ground | - | 122 | PCIE-TXP2 | PCIe | OUT |
| 91 | GND | Ground | - | 121 | PCIE-TXN2 | PCIe | OUT |
| 90 | PCIE-RXP2 | PCIe | IN | 120 | GND | Ground | - |
| 89 | PCIE-RXN2 | PCIe | IN | 119 | GND | Ground | - |
| 88 | GND | Ground | - | 118 | PCIE-TXP1 | PCIe | OUT |
| 87 | GND | Ground | - | 117 | PCIE-TXN1 | PCIe | OUT |
| 86 | PCIE-RXP1 | PCIe | IN | 116 | GND | Ground | - |
| 85 | PCIE-RXN1 | PCIe | IN | 115 | GND | Ground | - |
| 84 | GND | Ground | - | 114 | PCIE-TXP0 | PCIe | OUT |
| 83 | GND | Ground | - | 113 | PCIE-TXN0 | PCIe | OUT |
| 82 | PCIE-RXP0 | PCIe | IN | 112 | GND | Ground | - |
| 81 | PCIE-RXN0 | PCIe | IN | 111 | PCI_E_WAKE | PHY Status | IN |

**Notes:**
(1) The I/O column definition is in reference to the OPS+ pluggable board.
(2) OC= Open Collector.

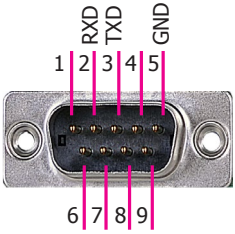
The COM ports on the front panel of the OPS+ Module and the Docking Board provide serial communication. The following illustrations show the pin assignments of the COM port:

**COM 1 on OPS100-SH**




RS232

**COM 1 on OPS-DB**




RS232

Both the OPS+ Module and the Docking Board provide pin headers for miscellaneous connectors. The following tables list the pin assignments of these connectors:

### CPU Fan (OPS100-SH: J1)

| Pins | Pin Assignment |
|---|---|
| 4 | Speed Control |
| 3 | Sense |
| 2 | Power |
| 1 | Ground |

### LPC (OPS100-SH: J7)

| Pins | Pin Assignment | Pins | Pin Assignment |
|---|---|---|---|
| 7 | L_AD3 | 14 | 5V |
| 6 | 3V3 | 13 | 5VSB |
| 5 | L_FRAME# | 12 | GND |
| 4 | L_AD0 | 11 | INT_SERIRQ |
| 3 | L_RST# | 10 | Key |
| 2 | L_AD1 | 9 | L_AD2 |
| 1 | L_CLK | 8 | GND |

### SYS Fan (OPS-DB: J3)

| Pins | Pin Assignment |
|---|---|
| 3 | No Connect |
| 2 | PWM Control |
| 1 | Ground |

### GPIO (OPS-DB: J4)

| Pins | Pin Assignment |
|---|---|
| 2 | GPIO |
| 1 | Ground |

### Line out (OPS-DB: J5)

| Pins | Pin Assignment |
|---|---|
| 5 | AZ_LINEOUT_L |
| 4 | Audio Ground |
| 3 | AZ_LineOut_R |
| 2 | No Connect |
| 1 | No Connect |

### I2C (OPS-DB: J6)

| Pins | Pin Assignment |
|---|---|
| 5 | No Connect |
| 4 | I2C_Data |
| 3 | I2C_CLK |
| 2 | Ground |
| 1 | 3V3SB |

## Physical Dimension

The overall dimensions of the OPS+ Module exclusive of the front panel frame is 180 x 30 x 119 mm (W x H x D). The following illustrations show the dimensions of the OPS+ Module as well as the dimension and location of the front panel screw holes: