



PM-31 1B

User's Manual



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About This Manual

The PM-311B User's Manual provides instruction for qualified personnel to follow when setting up a new PM-311B device.

This document is intended for use by qualified personnel to compliment the training and expertise, not to replace it.

Related Information

Current information and manuals are available for download at the following website:

<http://www.ruggon.com>

Conventions

Bolded or underlined text is used to emphasize the designated information.



A Note is used to provide additional information for the device or settings.



A Caution is used to warn against potential hazards or to caution against unsafe practices.



A Warning is used to identify immediate hazards for property damage, injury or death.

Basic Safety Guidelines

The following safety guidelines are intended to help protect the user from injury and prevent damage to the hardware.

- Do not place anything on the AC adapters power cable and make sure the cable is not located where it can be tripped over or stepped on.
- Do not cover the AC adaptor as it reduces the cooling
- Do not use the AC adapter while it is inside the carrying case.
- Use only the AC adapter, power cord, and batteries that are approved for use with the device. Use of another type of battery or AC adapter may cause risk of fire or explosion.
- If you use an extension cable with the AC adapter, ensure that the total ampere rating of all products plugged in to the extension cable does not exceed the ampere rating of the extension cable.
- If the device is moved between environments with very different temperature and/ or humidity ranges, condensation may form on or within the device. Avoid damaging the device by allowing sufficient time for the moisture to evaporate before using the device.
- When disconnecting cables, pull on the connector or on its strain relief loop, not on the cable itself. When pulling out or plugging in the connector, keep it evenly aligned to prevent bending the connector pins.

Intended Use

The PM-311B rugged tablet is equipped with multi-functional terminals for stationary and mobile applications in industrial environments such as logistics, warehousing, fleet management, manufacturing and the automotive industry.

Read the safety guidelines thoroughly before starting any servicing on the device. Read the guidelines before powering up the device, and keep this document for later use.

The operator is solely responsible for any damage resulting from unauthorized modifications to the device.

Unintended Application Use

The device is not designed for use in life-support systems or critical safety/security systems where system malfunction can lead to the direct or indirect endangerment of human life. The operator is fully responsible for using the device in these situations.

Maintenance and Operation Overview

The PM-311B is designed and manufactured according to strict controls and following the stated safety regulations. The following list identifies incorrect operating uses of the PM-311B. Incorrect use of the PM-311B can lead to hardware damage, safety issues and possible risk to personnel health:

- The PM-311B is under operation by untrained personnel;
- The PM-311B is not maintained as recommended;
- The PM-311B is not used as intended.

Safety

To prevent injury and damage, read the following safety guidelines prior to operating the device. The manufacturer assumes no liability for any and all damages arising from misuse or noncompliance with these guidelines.

Electrical Hazards

Cleaning/Servicing: Power Off the PM-311B

- Disconnect the PM-311B from power before cleaning or servicing it.

Power Adapter

Contact an authorized service personnel for repairs to the power pack. In the event of a blown fuse after replacing the fuse, contact an authorized service personnel to avoid electrical shock.

Use only Supplied Power Cables

RuggON power cables meet industrial requirements for low-temperature flexibility, UV resistance, and oil resistance. Use only supplied power cables from RuggON.

If other power cables are used, the following may apply:

- The operator is solely responsible for the resulting damage;
- All RuggON warranties are void.

Environmental Hazards

Do not use the PM-311B in locations near/with flammable gases or vapor.

The use of electrical equipment in explosive environments can be dangerous.

- Turn off the device when near a gas station, fuel depot, chemical plant or a place where blasting operations take place.

Safety Guidelines for Mounting

- If the PM-311B is installed on a mounting bracket, make sure all mounting equipment meets with safety and regulatory standards to prevent damage to the hardware or injury.
- If installing in a fixed location, it is advised to properly secure the device to prevent loss of the device.

Environmental

Ambient Temperature

The PM-311B operates on the basis of a passive cooling concept which internal waste heat is released via the housing surface and requires fresh airflow in the environment.

- Operating the PM-311B with no fresh cooling air may cause overheating and damage to the device.
- The operating environment should not be enclosed to prevent the cool air being heated by the heat waste from the device.

Connecting and Disconnecting External Devices

To prevent the considerable damage, the PM-311B and the external device should be disconnected from power when connecting/disconnecting excluding USB devices.

Only Use Authorized Accessories

Only use the supplied cables, power packs and other accessories that have been tested and approved by RuggON. Contact your local distributor for further information.

Radio Transmissions

Permitted Transmission Power

Follow the national regulations for the maximum permitted transmission power.

The operator is solely responsible for this type of operation.

Radio Frequency Limited Locations

Considering the radio frequency limitation in hospitals and aircraft, the PM-311B can only be installed with permission.

Industrial computers may affect the function of implanted medical devices such as pacemakers and may cause malfunction.

Cleaning and Servicing

- Disconnect the PM-311B from power before cleaning or servicing.
- Never clean the PM-311B with compressed air, a pressure washer or a vacuum cleaner.
- If necessary, clean the housing of the PM-311B with a damp cloth.
- Clean the touch-screen with a nonabrasive cloth.

Regulatory and Certification

FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio / TV technician for help.



Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

This device is operation in 5.15 ; 5.25GHz frequency range, then restricted in indoor use only, Outdoor operations in the 5.15 ; 5.25GHz is prohibit.

This device is slave equipment; the device is not radar detection and not ad-hoc operation in the DFS band.

Labeling Requirements

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Exposure Information (SAR)

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg. Tests for SAR are conducted using standard operating positions accepted by the FCC with the EUT transmitting at the specified power level in different channels.

The highest SAR value for the device as reported to the FCC is **1.487** W/kg when placed next to the body.

CE Marking

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. Please contact your local representative for ordering information.

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

R&TTE

This device complies with the essential requirements of the R&TTE Directive 2014/53/EU.

CB

This device complies with the IEC 60950-1:2005 (second edition)+Am1:2009+Am2:2013.

Lithium Battery Safety Statement



Lithium battery inside. Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by battery manufacturer.

Chapter 1 . Introduction

The PM-311B is a rugged device equipped with 802.11, Bluetooth and GNSS for wireless data communications.

The PM-311B is a rugged 7" tablet computer capable of 1024 x 600 resolution.

The PM-311B supports the following operating systems:

- Windows® 10 IoT Enterprise for Small Tablets 64bits
- Windows® Embedded 8.1 Industry Pro Tablet 64bits
- Windows® Embedded Standard 8 64bits

About This Guide

The PM-311B User Manual provides instruction for qualified personnel to use as a guide for setup of the device. This document is not intended to replace the training and expertise of the end-user.

Unpacking the Device

Before you begin the installation or configuration process make sure to inspect all components and accessories. Contact your representative if there are any missing or damaged items. See “*Contacting RuggON*” on page 67.

Technical Specifications

Table 1. Technical Specifications

Item	Description
Display	7" LED Backlight, 1024 (W) x 600 (H)
Touch screen	5-point capacitive touch screen
Brightness	800 nits
CPU	Intel® Celeron® Processor N2930
Operating System (Optional)	■ Windows® 10 IoT Enterprise for Small Tablets 64bits ■ Windows® Embedded 8.1 Industry Pro Tablet 64bits ■ Windows® Embedded Standard 8 64bits
RAM	DDR3L@1600 MHz 4 GB RAM (optional: 8 GB)
Storage	M.2 SSD 128 GB (optional: 256 GB)
Battery	■ Standard battery: 7.5V, 2900mAh, Li-ion ■ Extended hot swappable battery: 7.4V, 4200 mAh, Li-ion (optional)
Power Supply	AC 100V ~ 240V, 50~60Hz input; 19VDC@3.42A, 65W
Dimensions (W x H x L)	225 mm (8.86") x 27 mm (1.06") x 168 mm (6.61")
Weight	950 g (2.09 lbs)

Item		Description
Wireless		
WLAN		Wi-Fi IEEE 802.11 a/b/g/n/ac
Bluetooth		Bluetooth V4.0
Sensor		
Sensor		Gyroscope, G Sensor, E-compass, Light Sensor
I/O		
Docking Connector		32-pin
DC-IN Jack		x1
MicroSD Slot		x1
Audio Jack		x1; headphone / microphone combo
USB 3.0		x2; type A
RS-232		x1
Ethernet		x1
Security		
TPM		TPM 2.0
Data Collection		
Camera		■ Front: 2.0 Mega-Pixels camera ■ Rear: 8.0 Mega-Pixels camera with LED auxiliary light and Auto-focus
GNSS		YES
NFC		YES
Fingerprint Reader		Optional
Magnetic Stripe Reader + 2D Barcode		Optional
Magnetic Stripe Reader + MRZ		Optional

Item	Description
Rugged Specifications	
Drop	153 cm (5 feet), 26 drops on plywood
MIL-STD 810G	■ Vibration (MIL-STD-810G Method 514.6 Category 4, Fig 514.6C-1, Fig 514.6C-2, Fig 514.6C-3) ■ Drop (MIL-STD-810G Method 516.6 Procedure IV) ■ Mechanical shock (MIL-STD-810G Method 516.6 Procedure I, Procedure V) ■ Operation and storage temperature (MIL-STD-810G Method 501.5 and 502.5) ■ Humidity MIL-STD-810G Method 507.5 Humidity Procedure II Aggravated Cycles (Fig 507.5-7)
IP rating	IP65
Operating Temperature Range	-20°C (-4°F) to 50°C (122°F)
Storage Temperature Range	-30°C (-22°F) to 70°C (158°F)
Humidity	5-95% without condensation

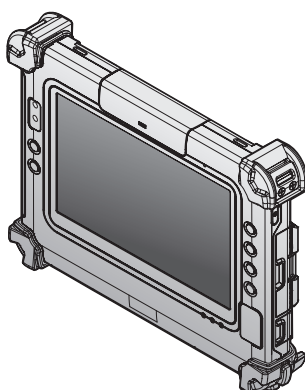
PM-311B Configuration Options

The following options are available for the PM-311B:

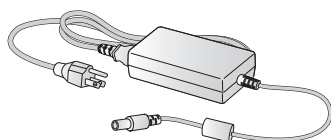
- MSR+Barcode reader
- MSR+MRZ reader
- High capacity battery

Parts List

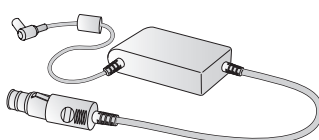
The PM-311B is shipped with the following items. All other accessories are sold and ordered separately. For help, contact your local RuggON sales representative. See “*Contacting RuggON*” on page 67.



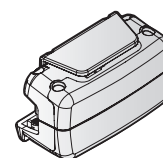
PM-311B



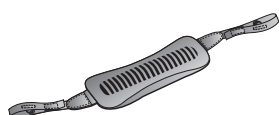
Power Adapter



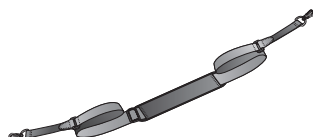
Car Adapter*



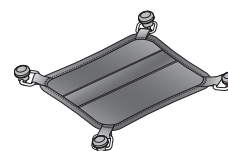
Magnetic Stripe Reader with
2D Barcode*



2-Point Carrying Handle



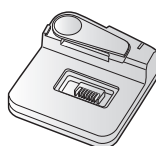
2-Point Shoulder Strap



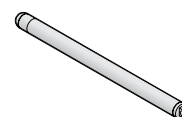
4-Point Handstrap with
Hitch D-rings
(Attaching straps)



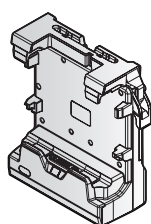
External Battery*



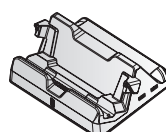
Battery Charger*



Stylus



Vehicle Dock*



Desktop Dock*

*Optional, not included in the standard package.

Identifying the Device

Overview

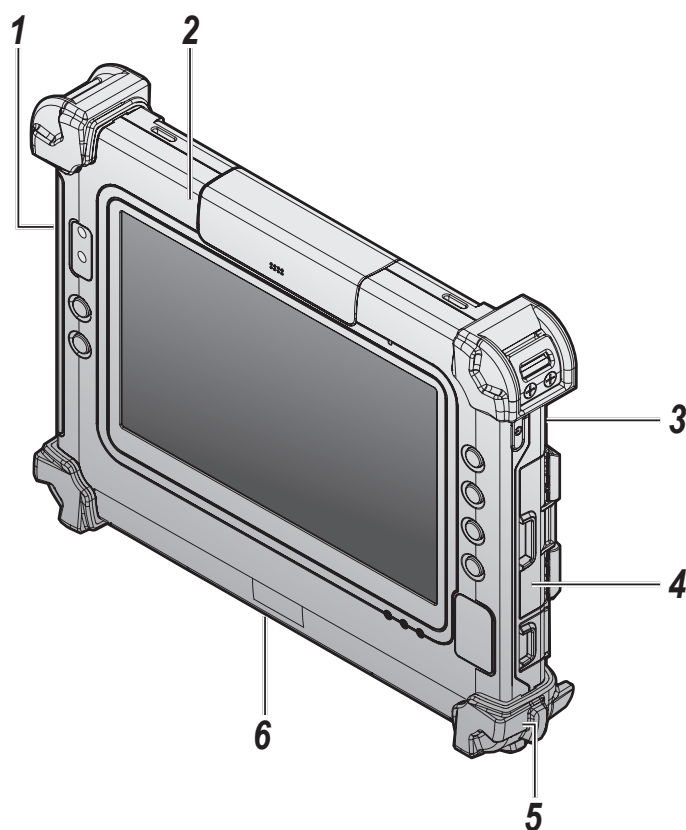


Figure 1. Overview

Table 2. Overview

No	Item	Description
1	Left view	See “Side View” on page 13 for further information.
2	Front view	See “Front View” on page 11 for further information.
3	Rear view	See “Rear View” on page 14 for further information.
4	Right view	See “Side View” on page 13 for further information.
5	Rubber bumpers	Easy to grip rubber bumpers enable the rugged tablet to withstand shocks and drop for use in demanding environments.
6	Bottom view	See “Bottom View” on page 12 for further information.

Front View

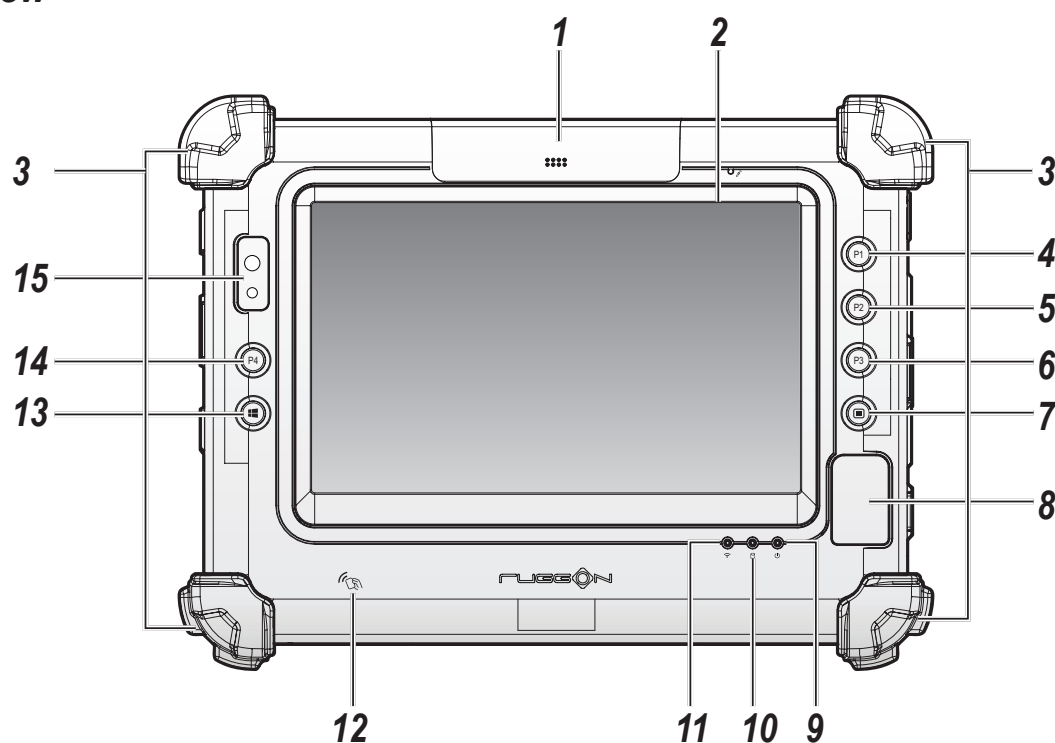


Figure 2. Front View

Table 3. Front View

No	Item	Description
1	Snap-on module connector cover	Open to access snap-on module connector.
2	Touch screen	Capacitive touch panel.
3	Rubber bumpers	Easy to grip rubber bumpers enable the rugged tablet to withstand shocks and drop for use in demanding environments.
4	P1 key	Programmable function key.
5	P2 key	Programmable function key.
6	P3 key	Programmable function key.
7	Menu key	Enter DashON function.
8	Fingerprint sensor	Read fingerprint for biometric authentication.
9	Power LED	The LED lights when the device is on or when the battery is being charged.
10	Storage Access LED	The LED (blue) lights during access of system storage drive.
11	Wi-Fi LED	The LED lights to indicate Wi-Fi is enabled.
12	NFC sensor	Pairing with NFC devices or reading RFID cards.
13	Start key	Windows® Start key (also can trigger BIOS setup and work as enter button in BIOS mode).
14	P4 key	Programmable function key.
15	Front camera	2 Mega-Pixels camera.

LED Status

Table 4. LED Status

Item	Status	Description
Power	Green: On	Power on / not charging
	Green: Blinking	Battery charging
	Amber: On	Low battery
Storage Access	Green: On	The system is accessing storage drive
	Green: Off	The system is not accessing storage
Wi-Fi	Green: On	Wi-Fi is enabled
	Off	Wi-Fi is disabled

Bottom View

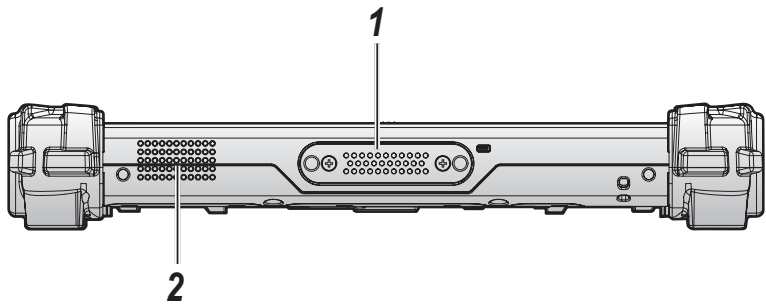


Figure 3. Bottom View

Table 5. Bottom View

No	Item	Description
1	Docking connector	32 pin connector for docking onto a station.
2	Speaker	1 x 1W waterproof, front mounted speaker.

Side View

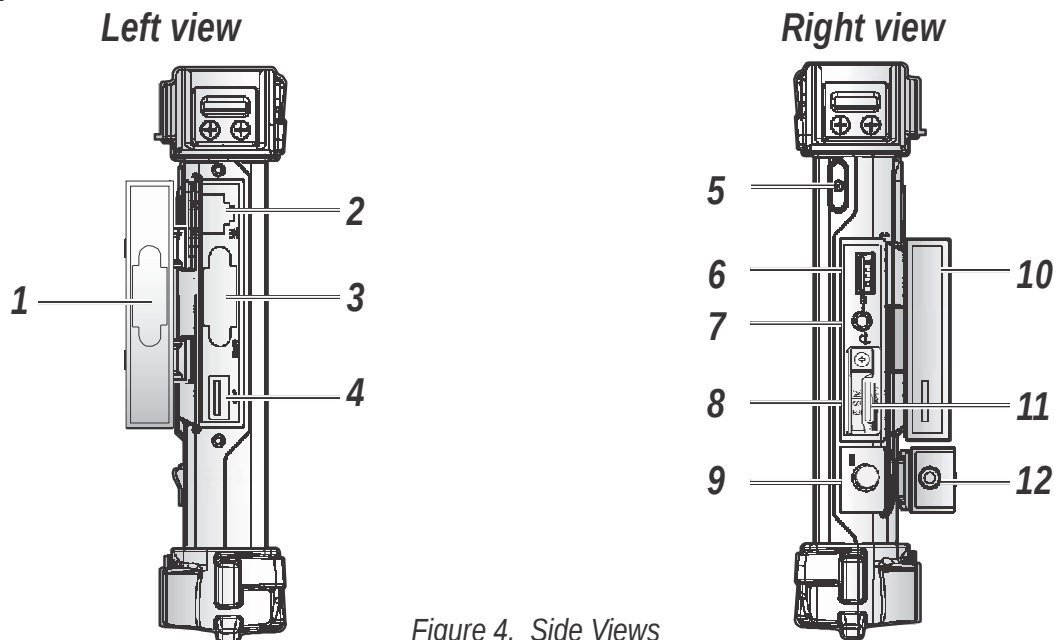
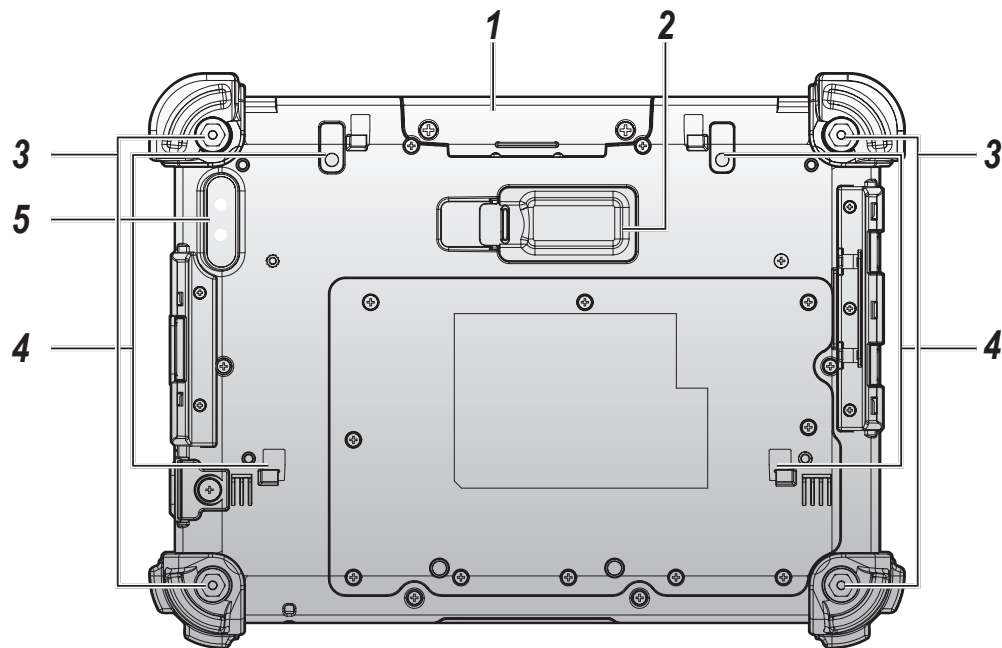


Figure 4. Side Views

Table 6. Side View

No	Item	Description
1	Left I/O compartment cover	Open to access the left I/O ports.
2	LAN	Connect the PM-311B to an Ethernet interface.
3	RS-232	Connect the PM-311B to a serial device.
4	USB 3.0	Connect USB devices to the PM-311B.
5	Power key	Turns the PM-311B on or off.
6	USB 2.0	Connect USB devices to the PM-311B.
7	Audio jack	Connect a headphones or external microphone.
9	DC-IN jack	Insert power connector to charge battery.
10	Right I/O compartment cover	Open to access the right I/O ports.
11	MicroSD slot	Insert microSD card in to slot.
12	DC-IN cover	Open to access the DC-IN jack.

Rear View*Figure 5. Rear View**Table 7. Rear View*

No	Item	Description
1	Snap-on module connector cover	Open to access snap-on module connector.
2	External battery connector cover	Open to access external battery connector. The external battery is optional.
3	Securing holes	Location of holes to secure the handstrap.
4	External battery bracket slots	Align with the external battery bracket when installing.
5	Rear camera	8.0 Mega-Pixels camera with LED auxiliary light.

Dimensions

The following image lists the device dimensions without add-ons (mm/inches).

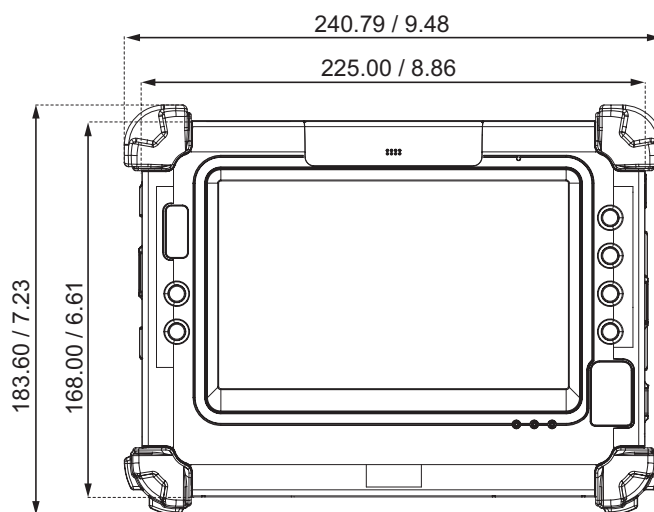


Figure 6. Front View Dimensions

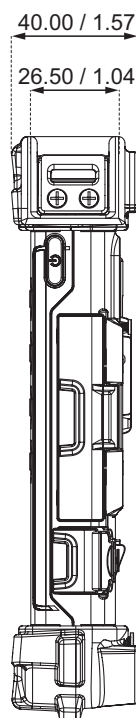


Figure 7. Side View Dimensions

Touch Screen Features



Always use the point of the stylus for clicking or making strokes on the touch screen.
Never use an actual pen, pencil, or sharp/abrasive object on the touch screen.

The stylus is used as if it were a pen or pencil. Touch the screen with the tip of the stylus then remove the stylus from the screen.

After each use, replace the stylus in the stylus holder for proper care and to preserve the life of the stylus.

Using a stylus is similar to moving the mouse pointer then left-clicking icons on a desktop computer screen.

The following actions are available through the use of the stylus:

- Open applications
- Choose commands in menu
- Select options in dialog box or drop-down menu
- Drag the scroll bar
- Drag across the text to select content
- Place the cursor in a text box before typing

A right click is generated by tapping the mouse icon in the system tray. After tapping, the mouse icon highlights the right button of the icon in red. The next touch screen tap is treated as a right click. The mouse icon returns to the left button highlighted in red so subsequent taps are treated as left clicks.

A stylus replacement kit is available.



To prevent damage or malfunction, always dry the touch screen when wet.

Chapter 2. Getting Started

This section provides an outline of the steps necessary to setup a new PM-311B. A detailed guide follows the listed items, see as follows.

For additional technical assistance, contact your RuggON representative. See “*Contacting RuggON*” on page 67.



It is recommended to installing or remove accessories on a clean, well-lit work surface. To protect yourself and the device from electrostatic discharge, wear anti-static wrist straps or place the device on an anti-static mat.

Charging the Battery

When you use the AC adapter to connect your PM-311B to a power outlet, the standard and external (optional) battery will automatically begin to recharge.

While the battery is charging, the power LED will be active. When the battery is fully charged, the power LED is lit a solid green.

1. Locate the DC-IN cover.

Right view

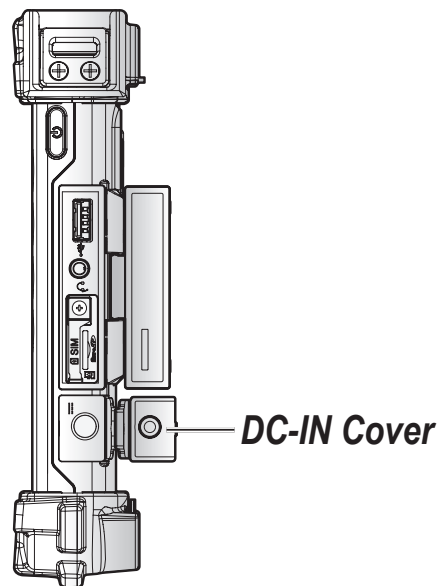


Figure 8. Right View: Locating the DC-IN Cover

2. Flip open the DC-IN cover to expose the DC-IN jack.

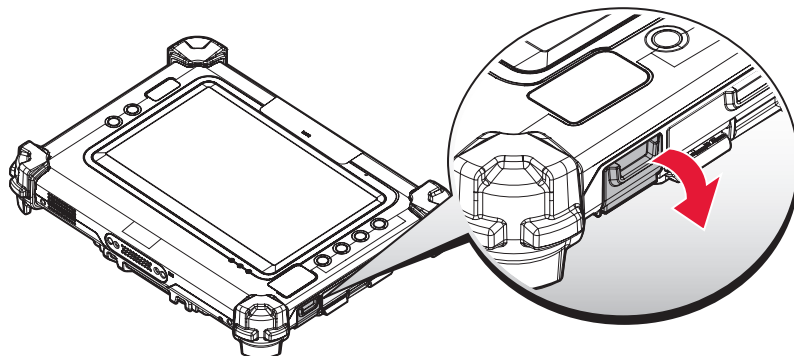


Figure 9. Opening the DC-IN Cover

3. Connect the AC adapter to the DC-IN port.

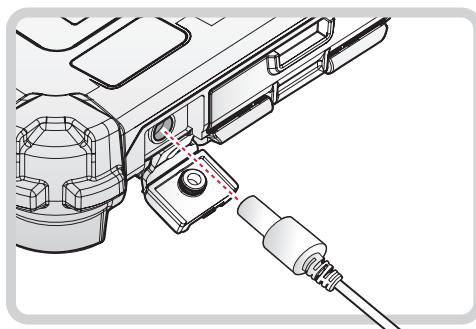


Figure 10. Connecting the AC Adapter

After charging the battery, disconnect the AC adapter and close the DC-IN cover.

1. Locate the DC-IN cover.

Right view

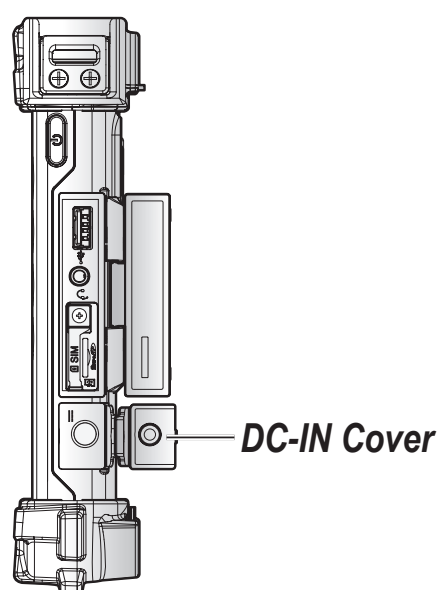


Figure 11. Right View: Locating the DC-IN Cover

2. Flip the DC-IN cover and install.

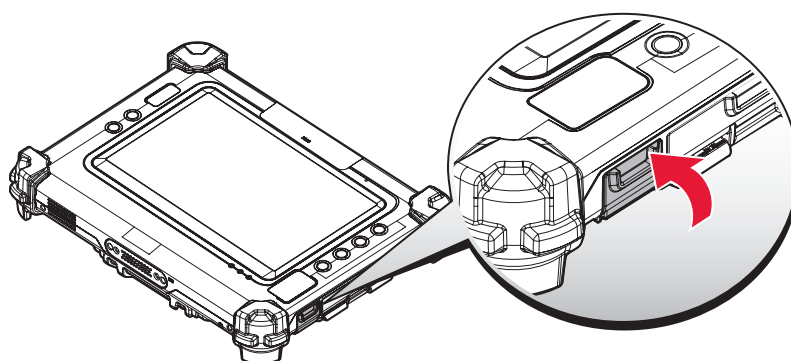


Figure 12. Closing the DC-IN Cover



The DC-IN cover must be inserted correctly to prevent internal damage to the device.

Powering the Device On and Off

Powering On the Device

Only power on the PM-311B after connecting all of the peripherals and cabling.

1. Press and hold the power button until the screen lights. The device runs through the start up sequence and powers up.

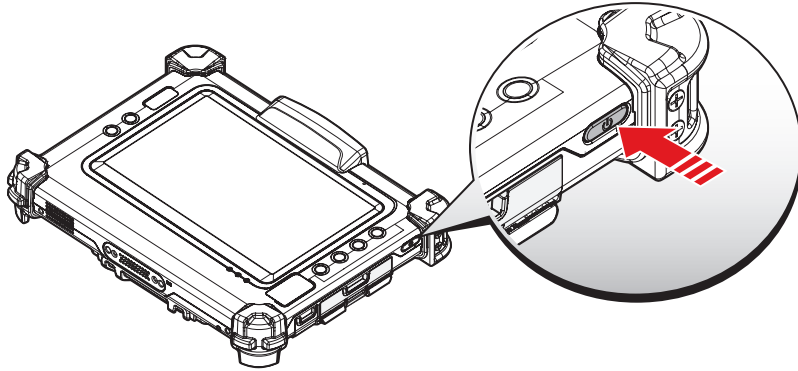


Figure 13. Power On the PM-311B

Powering Off the Device

- Start screen:
Tap  > **Shut down**.
- Desktop screen:
 1. Tap and hold  at the bottom left corner of the Desktop screen.
 2. Tap **Shut down or sign out** > **Shut down**.
- Both Start screen and Desktop screen:
 1. Display charm bar and tap **Settings**.
 2. Tap **Power** > **Shut down**.

Installing the microSD Card

The device supports microSD card for easier data storage.

1. Open the right I/O compartment cover. See “Opening the I/O Compartment Cover” on page 34.
2. Locate the microSD slot in the right I/O parts.

Right view

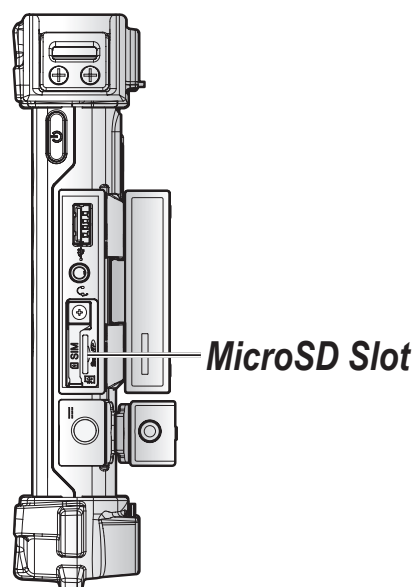


Figure 22. Right View: Locating the microSD Slot

3. The microSD card has a beveled edge. Align the microSD card with the slot making sure that the corners match.
4. Insert the microSD card and press it in until an audible click sounds.

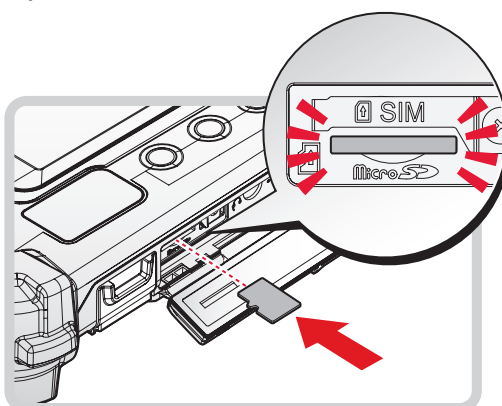


Figure 23. Installing the microSD Card

5. Close the right I/O compartment cover. See “Closing the I/O Compartment Cover” on page 35.

Removing the MicroSD Card

1. Open the right I/O compartment cover. See “Opening the I/O Compartment Cover” on page 34.
2. Locate the microSD slot in the right I/O parts.

Right view

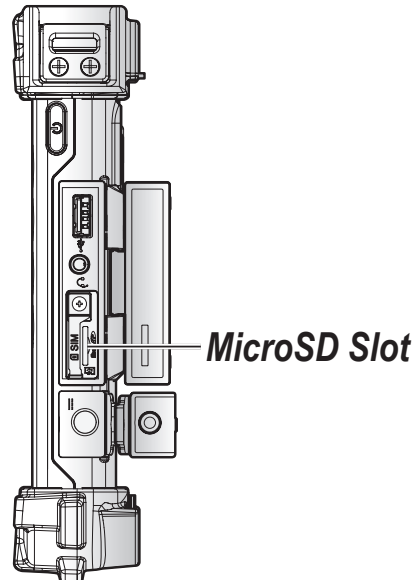


Figure 24. Right View: Locating the MicroSD Slot

3. Press the microSD card in and release it. The card springs out.
4. Grasp the microSD card and remove it from the slot.

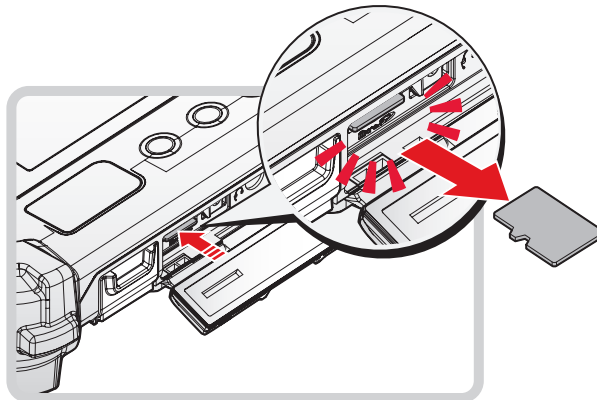


Figure 25. Removing the MicroSD Card

5. Close the right I/O compartment cover. See “Closing the I/O Compartment Cover” on page 35.

Installing on the Vehicle Dock

1. Power off the PM-311B. See “Powering Off the Device” on page 20.
2. Flip the levers upward on the both sides.

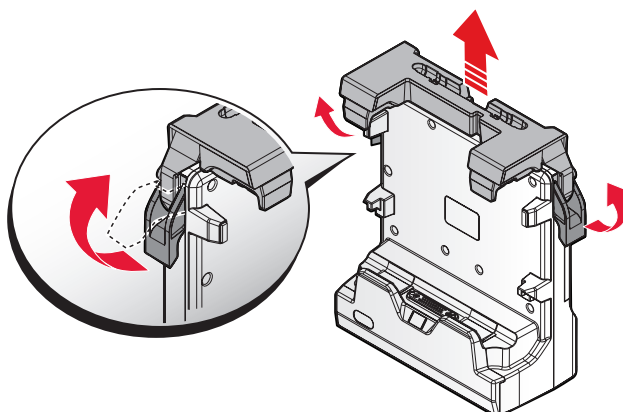


Figure 26. Releasing the Levers

3. Align the docking connector on the PM-311B with the connector on the vehicle dock and push downward.
4. Push the PM-311B forward and make sure it is fixed with latches.

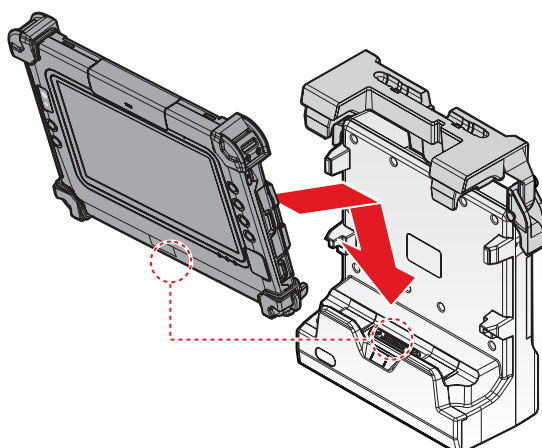


Figure 27. Installing the PM-311B

5. Press down the levers at the same time to lock.

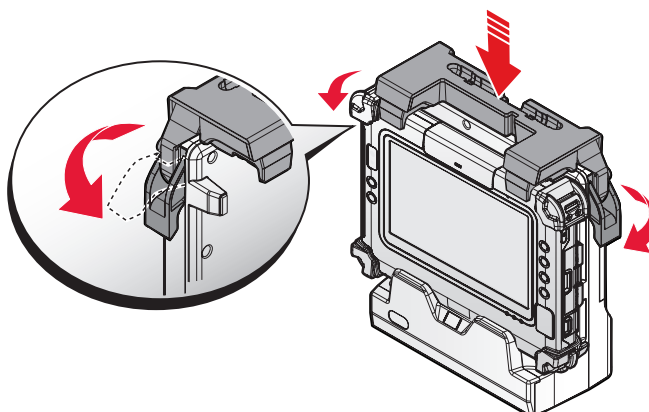


Figure 28. Installing the PM-311B

6. Connecting the cabling to the vehicle dock.

Removing from the Vehicle Dock

1. Power off the PM-311B. See “*Powering Off the Device*” on page 20.
2. Disconnect the cabling from the vehicle dock.
3. Flip the levers upward on the both sides.

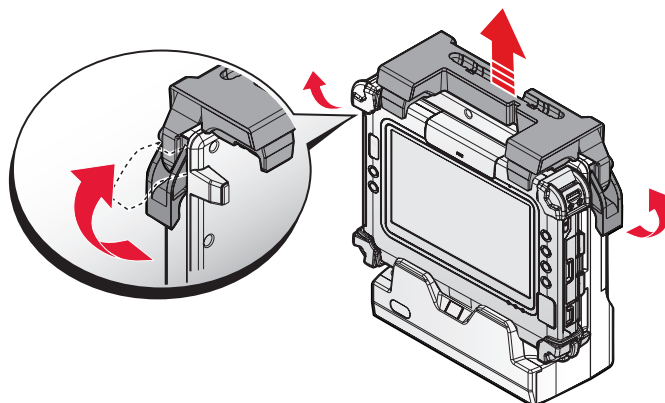


Figure 29. Releasing the Levers

4. Remove the PM-311B from the vehicle dock with an angle.

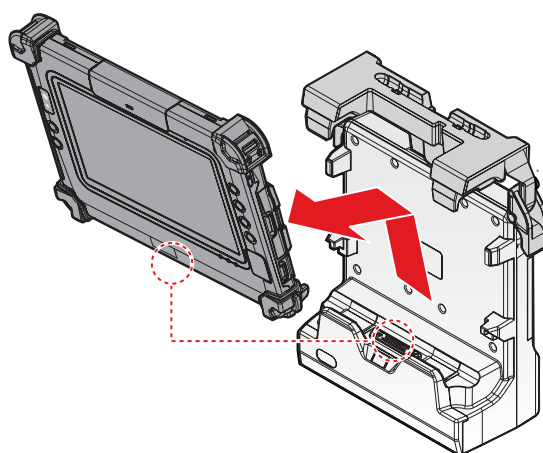


Figure 30. Removing the PM-311B

Installing on the Desktop Dock

1. Power off the PM-311B. See *“Powering Off the Device”* on page 20.
2. Align the docking connector on the PM-311B with the connector on the desktop dock and push downward.
3. Push the PM-311B downward.

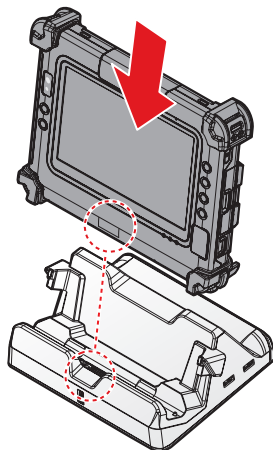


Figure 31. Installing the PM-311B

4. Connecting the cabling to the desktop dock.

Removing from the Desktop Dock

1. Power off the PM-311B. See *“Powering Off the Device”* on page 20.
2. Disconnect the cabling from the desktop dock.
3. Remove the PM-311B from the desktop dock.

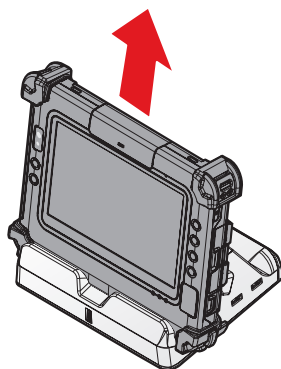


Figure 32. Removing the PM-311B

Using the Stylus

Following the information below when using a stylus:

- Use only the included stylus to touch the screen. Do not place any objects on its surface and do not press down strongly with sharp-pointed or hard objects that may leave marks (e.g., nails, pencils and ball point pens).
- Use the stylus only for touching the screen. Using it for any other purpose may damage the stylus and result in scratches on the screen.
- The pointer cannot follow the stylus movement if you move the stylus too quickly.

To make a selection, tap the screen once with the stylus. To double-click, tap twice without pausing. To do a long click, tap the screen and hold it for a few seconds.

Removing the Protective Film from the Display

The front display of the PM-311B is protected during transport by a transparent film. This film should remain on the front display during assembly to avoid damage to the front display surface.

Only remove the film once all of the assembly work has been completed.

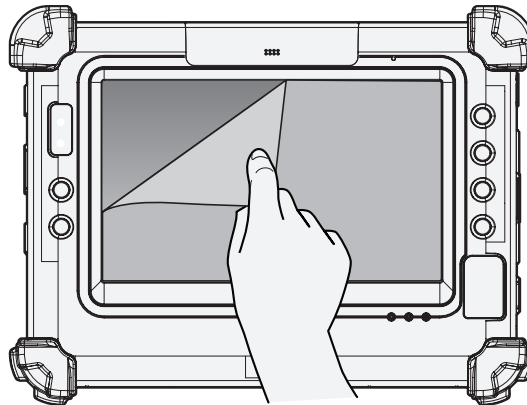


Figure 33. Removing the Protective Film

Chapter 3. Operation

Removing the Snap-on Module Connector Cover

The snap-on module connector is located on the top side of the device. For further information see “Overview” on page 10

1. Locate the snap-on module connector cover.

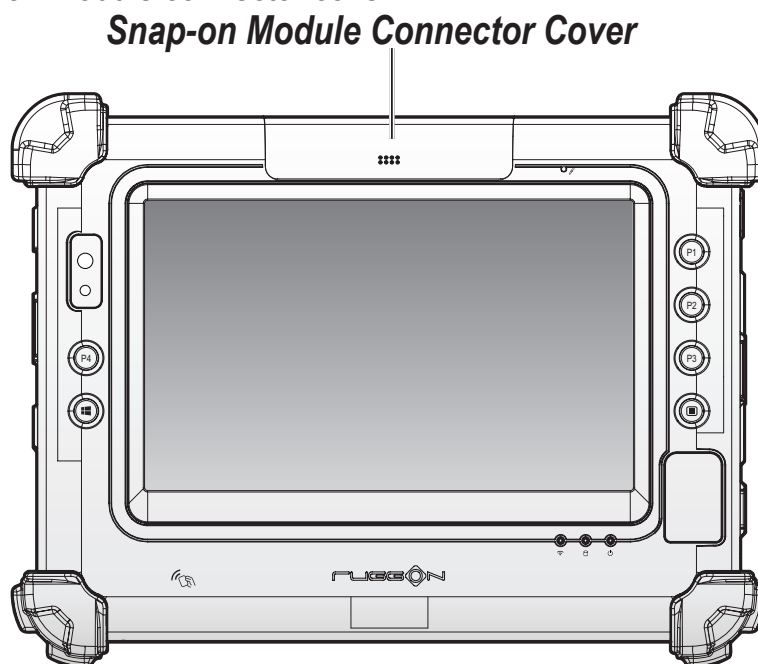


Figure 34. Front View: Locating the Snap-on Module Connector Cover

2. Place the device display side down on a clean work surface.
3. Remove the screws securing the cover.

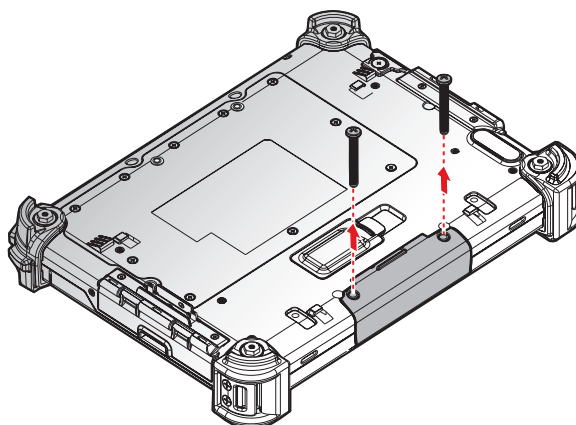


Figure 35. Removing the Screws

4. Remove the cover.

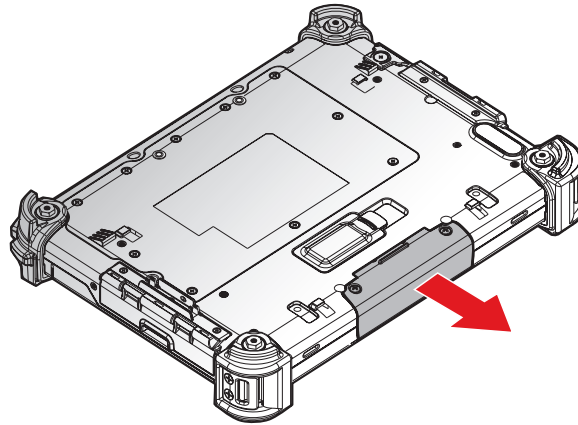


Figure 36. Removing the Snap-on Module Connector Cover

Replacing the Snap-on Module Connector Cover

The snap-on module connector is located on the top side of the device. For further information see “Overview” on page 10.

1. Locate the snap-on module connector cover.

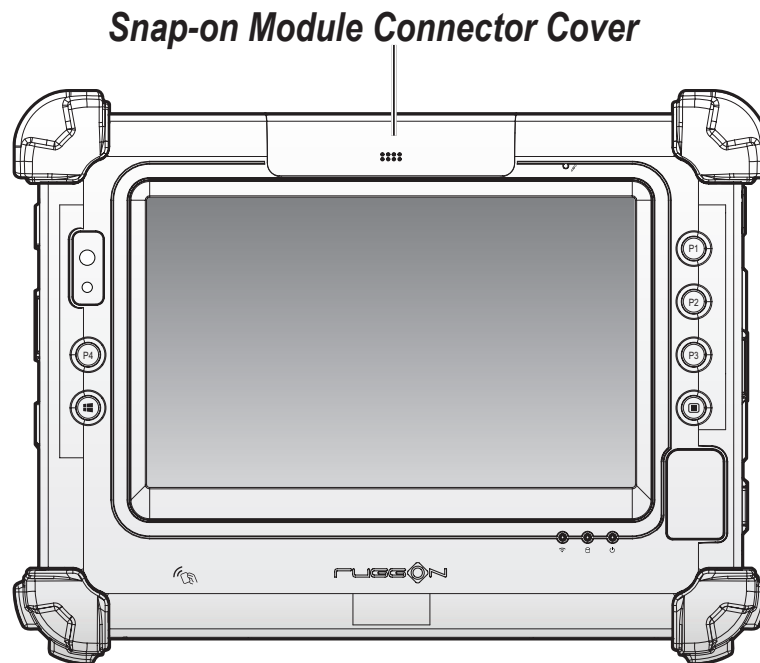


Figure 37. Front View: Locating the Snap-on Module Connector Cover