

USER MANUAL

MH-0616

6" Android 10 Rugged
Handy Terminal with
Qualcomm[®] S660 Octa
Core CPU

MH-0616 M1

MH-0616

6" Android 10 Rugged Handy Terminal with Qualcomm[®] S660 Octa-core CPU (up to 2.2 GHz)

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DISCLAIMER

This user's manual is meant to assist users in installing and setting up the system. The information contained in this document is subject to change without any notice.

CE NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.


FCC NOTICE


This equipment has been tested and found to comply with the limits for a Class A 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.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

	<p>CAUTION: Danger of explosion may occur when the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.</p>
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	<p>WARNING: Some internal parts of the system may have high electrical voltage. We strongly recommend that only qualified engineers are allowed to service and disassemble the system. If any damages should occur on the system and are caused by unauthorized servicing, it will not be covered by the product warranty.</p>
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Revision History

The revision history of MH-0616 User Manual is described below:

Version No.	Revision History	Date
1.0	Initial Release	2023/10/05

1 Introduction

This chapter provides the introduction for the MH-0616 system as well as the framework of the user manual.

The following topic is included:

- About This Manual

1.1 About This Manual

Thank you for purchasing our MH-0616 system. The MH-0616 provides faster processing speed, greater expandability and can handle more tasks than before. This manual is designed to assist you how to install and set up the whole system. It contains 3 chapters and 1 appendix. Users can configure the system according to their own needs. This user manual is intended for service personnel with strong hardware background. It is not intended for general users.

The following section outlines the structure of this user manual.

Chapter 1 Introduction

This chapter provides the introduction for the MH-0616 system as well as the framework of the user manual.

Chapter 2 Getting Started

This chapter describes the package contents and outlines the system specifications. It also includes the physical illustrations and quick setup for the MH-0616 system. Read the safety reminders carefully on how to take care of your system properly.

Chapter 3 Hardware Configuration

This chapter outlines the locations of the motherboard and daughter board components and their respective functions. You will learn how to set the jumpers and configure the system to meet your own needs.

Chapter 4 Software Utilities

This chapter contains detailed information for installations of the 3D Camera Device, Barcode Scanner Device, RFID Reader Device and Smart Card Reader Device Software Installer driver utilities.

Appendix A System Assembly Diagrams

This appendix provides the exploded diagrams and part numbers of the MH-0616.

Appendix B Troubleshooting

This appendix describes the common problems that you may encounter when you use MH-0616 system for general operations as well as scanning barcodes and provide the corresponding solutions.

2 Getting Started

This chapter provides the information for the MH-0616 system. This chapter describes the package contents, system overview and outlines the system specifications.

The following topics are included:

- Package List
- System Overview
- Quick Setup
- System Specifications
- Safety Precautions

Experienced users can go to Chapter 3 Hardware Configuration on page 3-1 for a quick start.

2.1 Package List

If you discover any of the items listed below are damaged or lost, please contact your local distributor immediately.

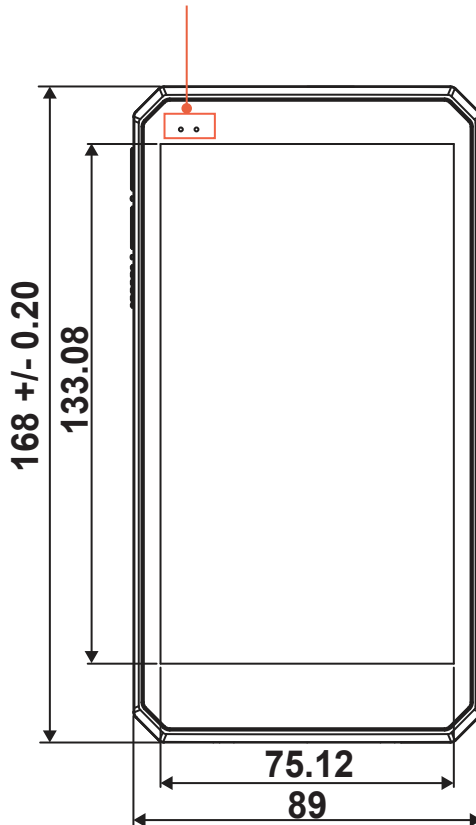
Item	Q'ty
MH-0616 Handy Tablet	1
Quick Reference Guide	1
AC Power Adaptor	1
Hand Strap (optional)	1

2.2 System Overview

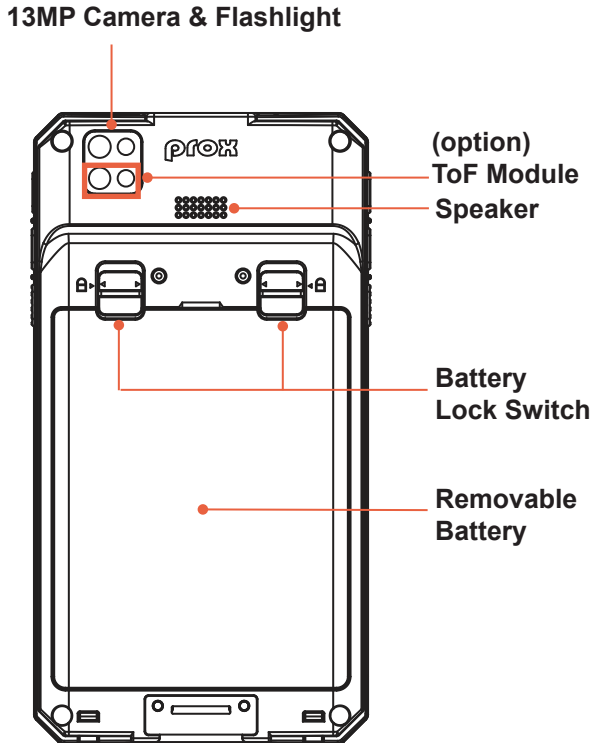
Unit: mm

2.2.1 Front View

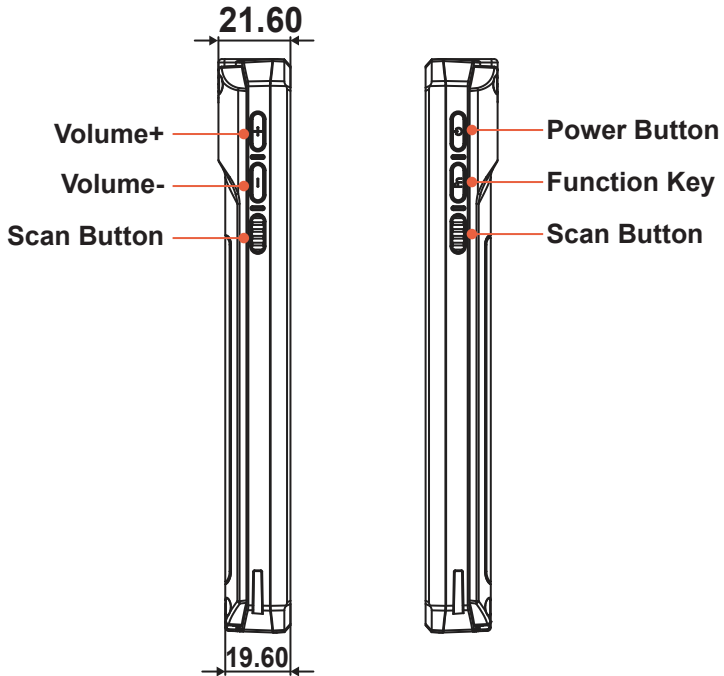
Power LED/ Alarm/ Error LED & Ambient Light Sensor



2.2.2 Rear View



2.2.3 Side View

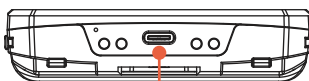


2.2.4 Top View



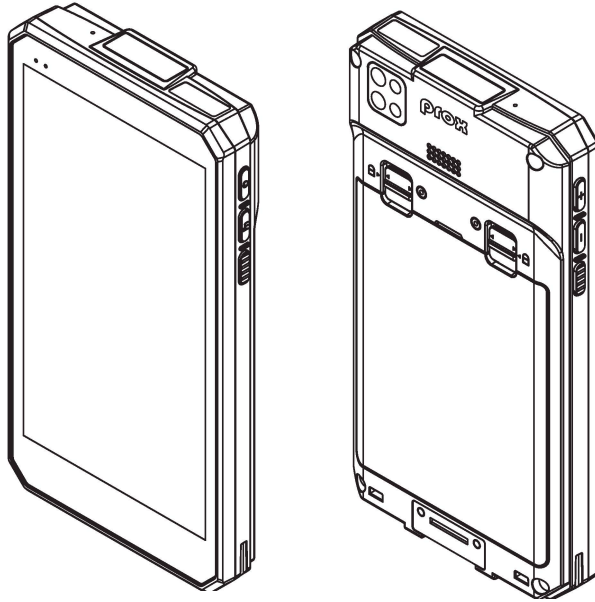
2D Barcode Scanner

2.2.5 Bottom View



USB Type-C

2.2.6 Quarter View



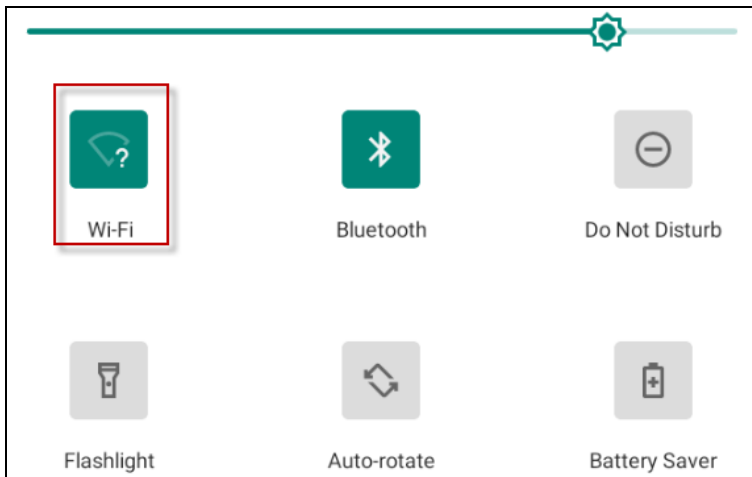
2.3 Quick Setup

2.3.1 Power ON MH-0616 Tablet and Connect to Wi-Fi

Long press the **Power Button** on the right side of the Tablet to turn on the system. Connect the Tablet to a wireless network via Wi-Fi connection. (Refer to the **Side View** section of Tablet for the location of **Power Button**.)

How to Set Up Wi-Fi Connection

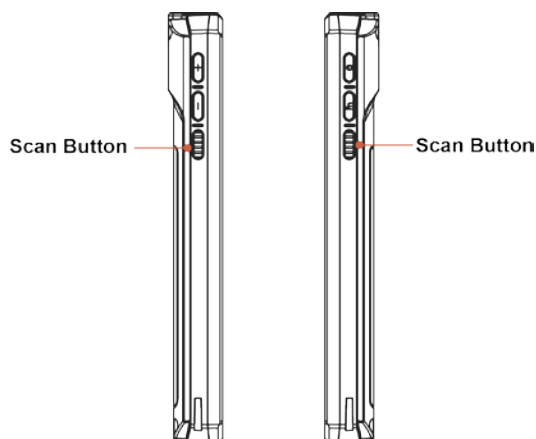
- Step 1.** Use your finger to swipe downwards from the top side of the Tablet screen. The function shortcuts will appear.
- Step 2.** Simply tap the **Wi-Fi** icon shortcut icon (located on the upper left corner of the function shortcuts picture) to activate Wi-Fi.



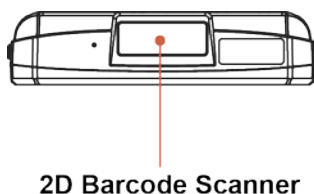
- Step 3.** Select a Wi-Fi network from the list and tap on it.
- Step 4.** Tap the **Connect** button.
- Step 5.** Enter the correct security key for the selected Wi-Fi network and wait for the Wi-Fi connection to establish.

2.3.2 Scanning Barcodes and QR Codes

Step 1. Press to turn on the **Scan Button** located on the left / right side of the Tablet. (Refer to the **Side View** section of the Tablet for the location of the **Scan Button**.)



Step 2. Point the **Barcode Scanner** at the barcode or QR code that you want to scan and position the light beam on the barcode/QR code. (See the following picture **Top View** section of Tablet for the location of the **2D Barcode Scanner**.)

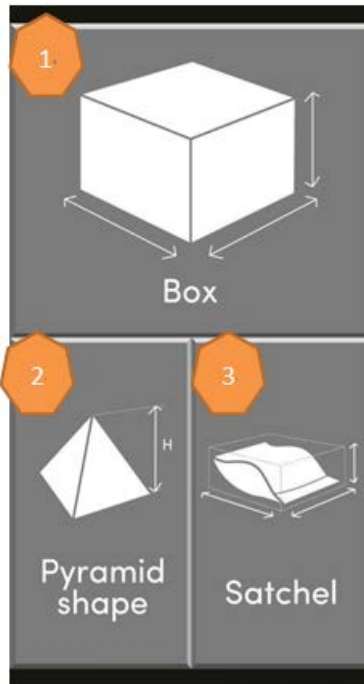


After the barcode/QR code has been scanned successfully, you will hear one beep sound.

2.4 Using Embedded Time of Flight (ToF) Sensor

2.4.1 Selecting Measurement Mode

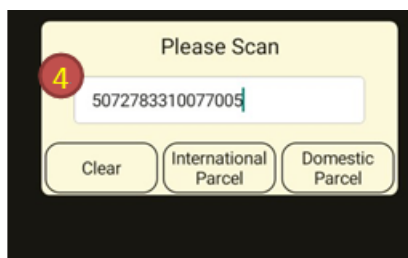
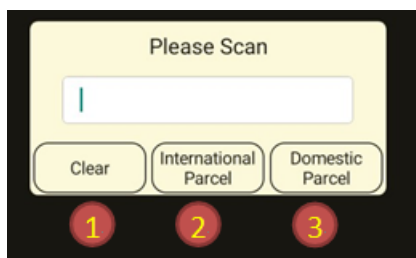
1. Box Measurement
2. Object Height measurement
3. Satchel Object Measurement



2.4.2 Box Measurement Instructions

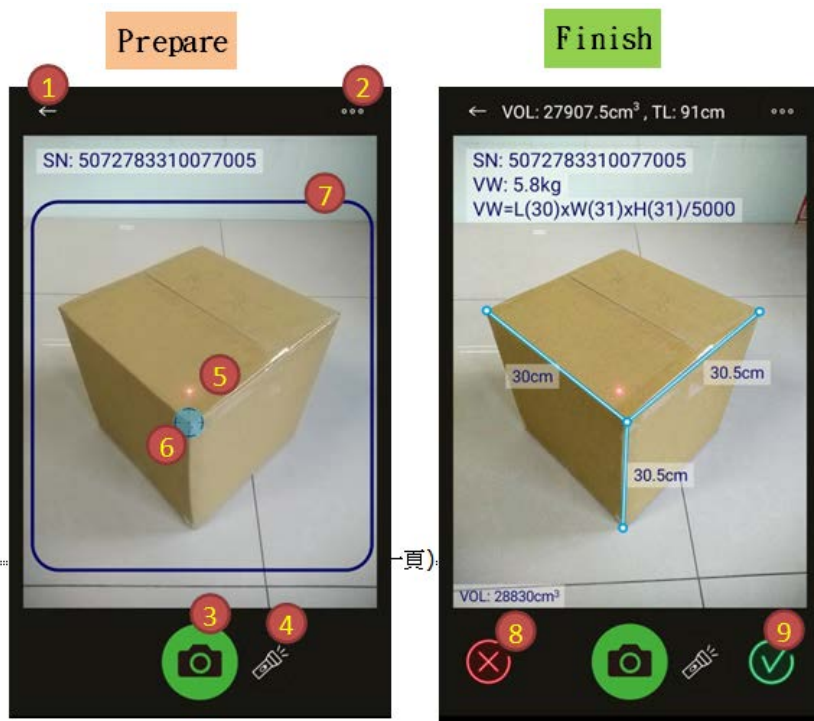
Barcode Scan

1. Clear
2. International Parcel valuation
3. Domestic Parcel valuation
4. Barcode number



2.4.3 Box Measurement Screen Keys

1. Return Arrow
2. Click to enter the **Settings** menu.
3. Taking photos
4. Lighting on the phone
5. Laser dot
6. Aiming Target
7. Auto AI detecting
8. Try again
9. Confirm



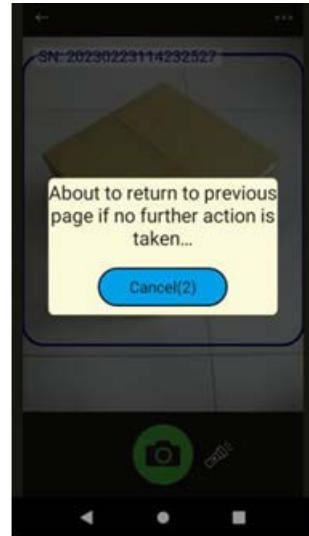
Other Instructions

➤ Setting

Please see the next page for the brief descriptions of the numbered Setting functions.



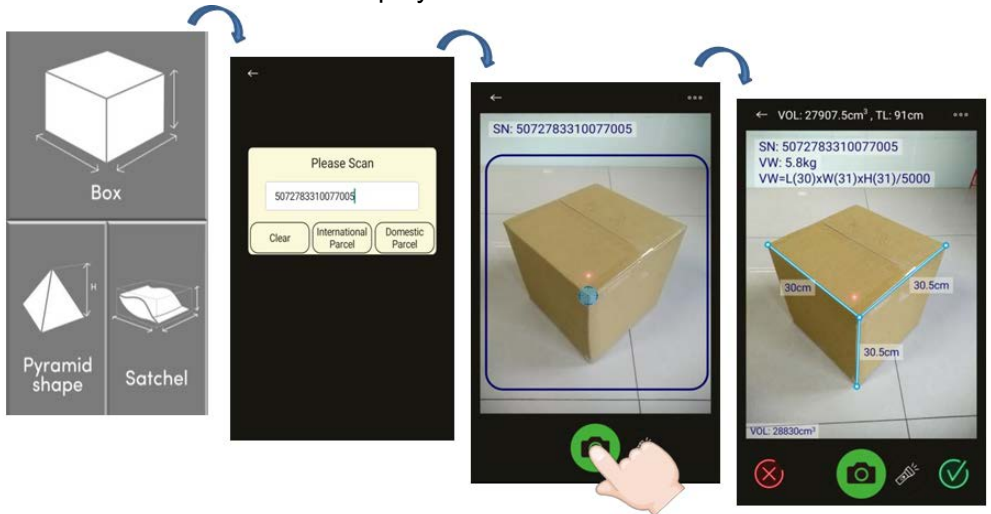
1. Return Arrow
2. Timestamp
3. Auto save photo (in the photo album)
4. Set the laser idle time (The laser will automatically turn off after the time you set. See photo on the right.)
5. Package Dimension Calculation Formula
6. Photo Exposure value setting
7. Barcode scan function on/off
8. AI detecting on/off
9. Photo shooting angle setting
10. Customer service mailbox
11. APP version info.



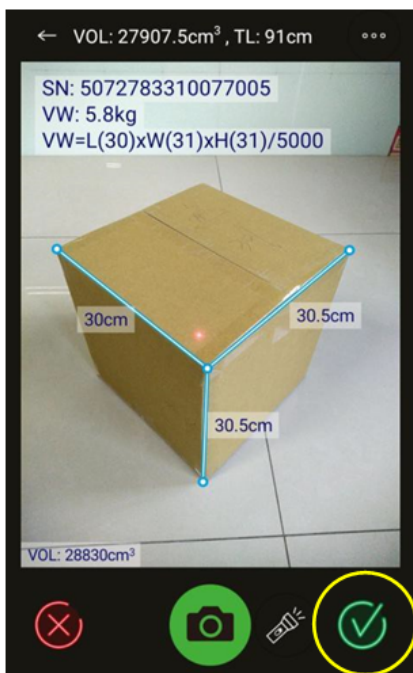
Please see the **Setting** menu picture on the last page.

2.4.4 Start Measuring Box

1. Press the BOX icon.
2. Scan the barcode of the box and then select **International Parcel** or **Domestic Parcel**.
3. Hold the device firmly, press the Photo button, and wait for measurement results to display.



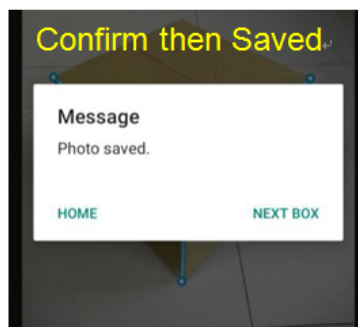
2.4.5 Reading Box Measurement Results



← Box Volume and total Length (L+W+H)

← Barcode and valuation information

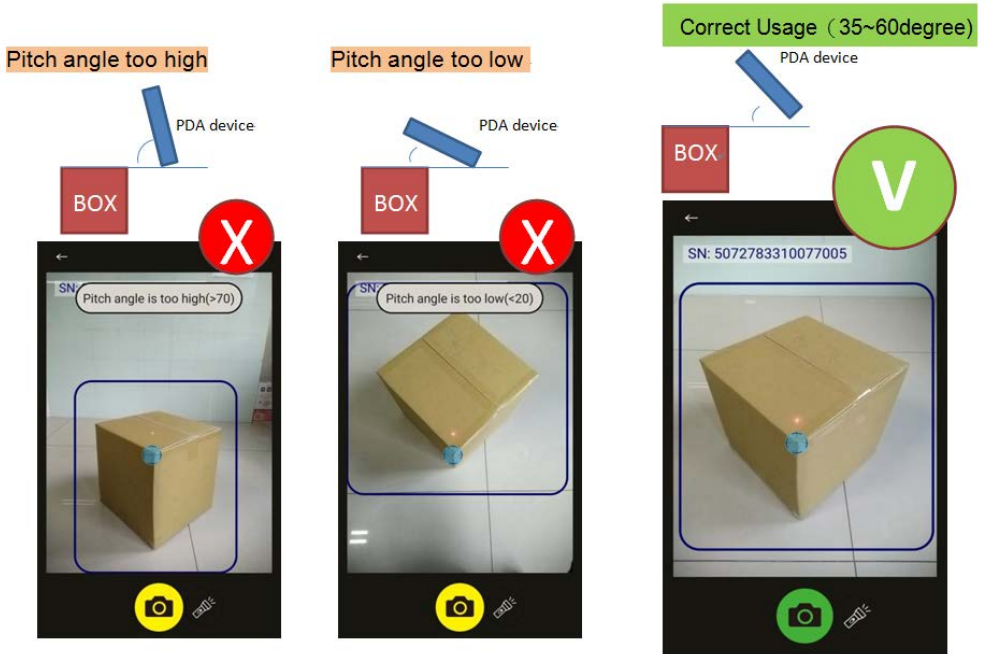
← Box length L, W, H



←

2.4.6 Errors in Operation

The photo shooting angle exceeds the setting limits.



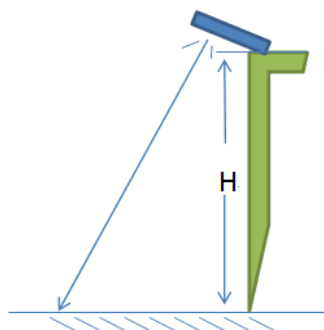
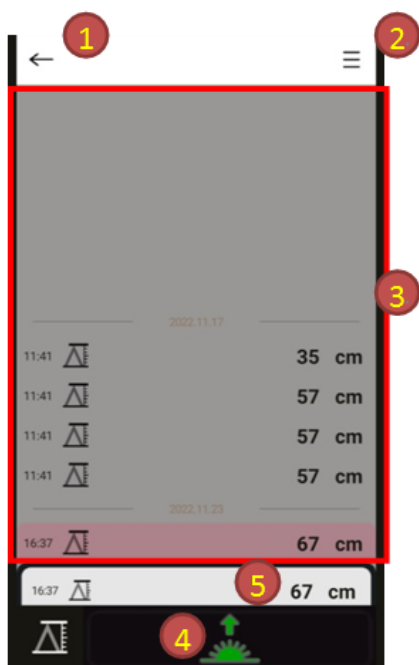
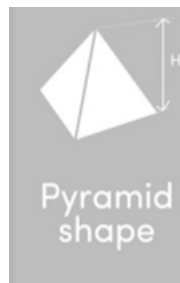
➤ **Red** Photo button

The laser module disconnected from the device or the angle sensor has failed. (Contact product support in the later case.)



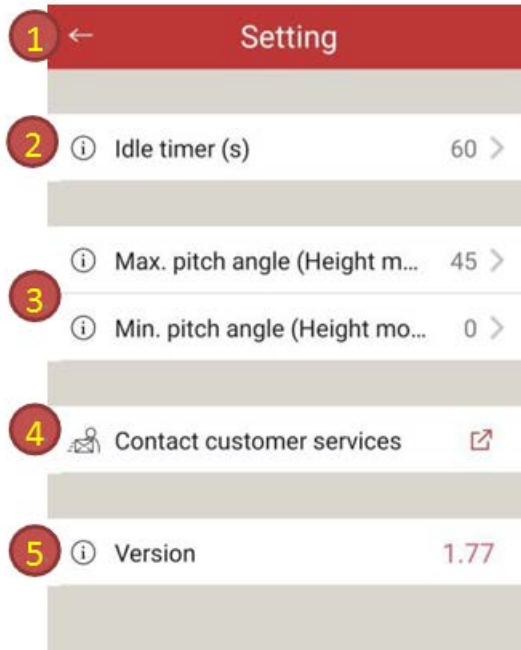
2.4.7 Height Measurement (for Pyramid Shape)

1. Return Arrow.
2. Setting
3. Result data
4. Laser turned on and ready to measure
5. The latest measurement result



Other Instructions (for Pyramid Shape)

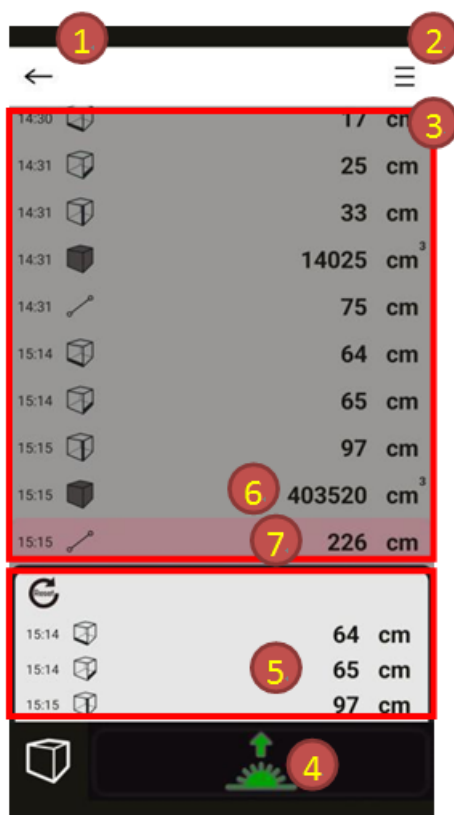
➤ Setting



1. Return Arrow.
2. Setting the laser idle time (The laser will be automatically turned off after the time you set has elapsed.)
3. Package dimension calculation
4. Setting Photo shooting angle
5. Customer service mailbox
6. APP version info.

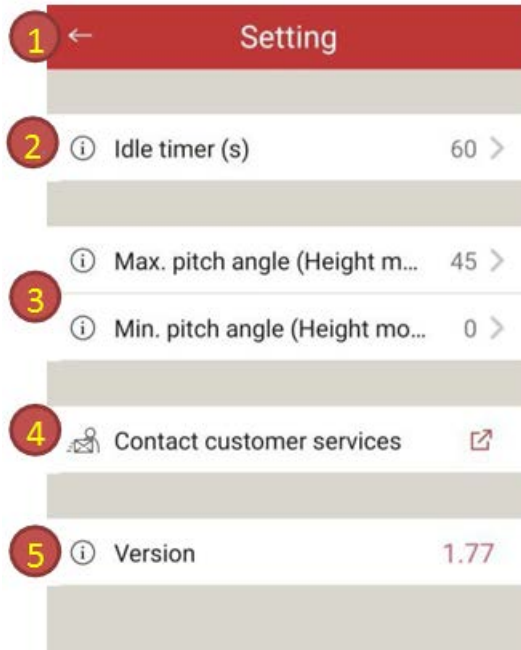
2.4.8 Satchel Object Measurement

1. Return Arrow.
2. Setting
3. Result data
4. Laser turns on and read to measure
5. The latest measurement records
6. Object volume data
7. Object TL (L+W+H) data



Other Instructions (for Satchel Object)

➤ Setting



1. Return Arrow.
2. Setting the laser idle time (The laser will be automatically turned off after the time you set has elapsed.)
3. Photo shooting angle setting
4. Customer service mailbox
5. APP version info.

2.5 System Specifications

System	
CPU Support	➤ Qualcomm® S660 Octa-Cores 2.2GHz
Operating System	➤ Android 10
Memory + Storage	➤ 4+ 64GB eMCP
Audio	➤ 1 x 0.8W Speaker & 2 x Digital Mic
Sensor	➤ G-Sensor, Ambient Light Sensor
LED Indicators	➤ 1 x tri-color LED (Green/ Yellow/ Red) for Power/ Battery status indication
Buttons	➤ 1 x Power button, 1 x Function key, 2 x Scan buttons, 1 x Volume+, 1 x Volume-
Battery	➤ 1S1P 3.85V/ 4380mAh/ 16.8Wh, Removable Battery, up to 10 hours operating (per JEITA test v2.0)
AC Adapter	➤ Quick Charge™ 3.0 30W for tablet & Charging Stand
USB Cable	➤ 1 x USB Type-C cable for Charging with AC Adapter & Data Transmission
Dimensions (W x H x D)	➤ 89 x 168 x (18.6-19.6) mm (Tablet only)
Weight	➤ 330 g (Tablet only)
Display	
Size	➤ 6"
Resolution	➤ 720 x 1280 pixels (High Definition)
Brightness	➤ 500 nits for Sunlight readable
Backlight lifetime	➤ 30,000 hours
Touch	➤ P-CAP Multi-Touch with Anti-Fingerprint & Corning Gorilla Glass (Support Finger/ Stylus/ Glove/ Raindrop)
Bonding Technology	➤ LCD Optical Clear Adhesive direct bonding with Touch
I/O Ports	
USB	➤ 1 x USB 3.0 Type-C for Charging with Quick Charge™ 3.0 & Data Transmission
	➤ 1 x USB 2.0 with 5 pins internal connector for Expansion Device with customized back cover (such as 3-in-1 Card

	Reader)
MicroSD Slot	➤ 1 x internal slot for MicroSD up to 128GB
Nano-SIM Slot	➤ 1 x internal slot for 4G LTE
POGO Pin	➤ 4 x Pin (For Cradle Charger)
Communications	
WLAN	➤ Wi-Fi 802.11 a/b/g/n/ac (WiFi 5)
Bluetooth	➤ Bluetooth 5.0
GNSS	➤ GPS, GLONASS (optional)
WWAN	➤ 4G LTE for North America/ Europe/ Taiwan/ Japan (Optional)
Optional Peripherals & Accessories	
1D/2D Barcode	➤ Honeywell N6703
Camera	➤ 13MP Rear Camera with Auto-Focus, Flashlight
3D Camera	➤ Embedded Time of Flight (ToF) Sensor for dimension measurement
RFID	➤ Support ISO14443A/ MifaireS50(R/W)/ ISO14443B Des Fires (Read UID Only) ISO15693 I-Code SLI (R/W)/ ISO18092 SONY Felica/ Mifare Classic1K/ 4K type1)/ Mifare Ultralight (Type 2) & Mifare DesFire EV1/EV2/EV3 (Type4)
Charging Stand	➤ For tablet & Battery charging
Protective Case	➤ Support 1.8m Drop test
Hand Strap	➤ Hand strap attaches to tablet sliding handle Easily detachable with clips underneath Snaps securely in place
Shoulder Strap	➤ Must be used with Protective Case
Stylus	➤ Capacitive Stylus
TP Protector	➤ 9H glass Touch Panel Protector
Reliability & Environment	
ESD	➤ Contact +/-8kV & Air +/- 15kV
EMI	➤ Class B
IP Rating	➤ IP65 per IEC 60529
Drop Test	➤ 1.2m per MIL-STD-810H
Tumble Test	➤ 1000 tumbles, 0.5m per IEC 60068-2-32
Shock	➤ Per MIL-STD-810H
Vibration	➤ Per MIL-STD-810H

Operating Temp.	➤ -10°C~50°C (Discharging) & 0°C~40°C (Charging)
Storage Temp.	➤ -20°C~60°C
Humidity	➤ 10%~90% non-condensing
Environment	
Certificate	➤ CE, FCC, BSMI, PSE, Battery with UN 38.3 & IEC 62133

2.6 Safety Precautions

Before operating this system, read the following information carefully to protect your system from damages, and extend the life cycle of the system.

1. Check the Line Voltage
 - The operating voltage for the power supply should be within the range of 100V to 240V AC; otherwise, the system may be damaged.
2. Environmental Conditions
 - Place your MH-0616 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
 - Avoid installing your MH-0616 system in extremely hot or cold places.
 - Avoid direct sunlight exposure for a long period of time (for example, in a closed car in summer time. Also avoid the system from any heating device.). Or do not use MH-0616 when it has been left outdoors in a cold winter day.
 - Avoid moving the system rapidly from a hot place to a cold place, and vice versa, because condensation may occur inside the system.
 - Do not place the system too close to any radio-active device. Radio-active device may cause signal interference.
 - Always shut down the operating system before turning off the power.
3. Handling
 - Avoid placing heavy objects on the top of the system.
 - Do not allow any objects to fall into this device.
 - If water or other liquid spills into the device, unplug the power cord immediately.
4. Good Care
 - When the outside case gets stained, remove the stains using neutral washing agent with a dry cloth.
 - Never use strong agents such as benzene and thinner to clean the surface of the case.
 - If heavy stains are present, moisten a cloth with diluted neutral washing agent or alcohol and then wipe thoroughly with a dry cloth.
 - If dust is accumulated on the case surface, remove it by using a special vacuum cleaner for computers.

3 **Hardware Configuration**

This chapter contains helpful information about the jumper & connector settings, and component locations.

The following sections are included:

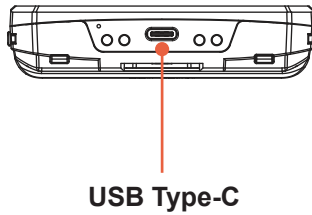
- External I/O Ports Diagram
- Main Board Component Locations
- Main Board Connectors Quick Reference Table
- Setting Main Board Connectors
- Daughter Board MR-0616GxA-1 Component Locations

3.1 External I/O Ports Diagram

3.1.1 I/O Ports Diagram

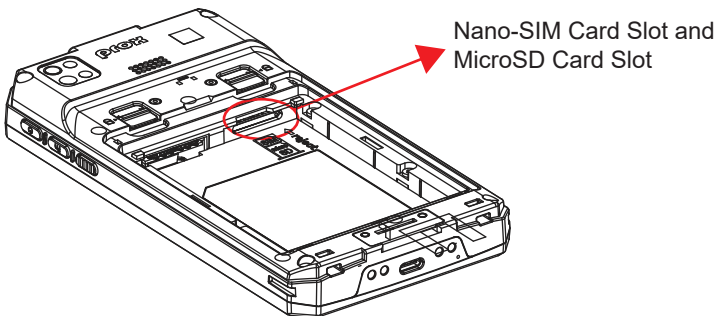
➤ **USB Type-C Port**

The USB Type-C port is located on the bottom side of the Handy Tablet as illustrated below:



➤ **Nano-SIM Card Slot and MicroSD (Secure Digital) Card Slot**

The **Nano-SIM Card Slot and MicroSD Card Slot** is located on the upper right side of the Battery Pack compartment. You can use your finger or a pin to pull out the SIM Card holder. See the picture below:



3.2 Main Board Component Locations

3.2.1 Top View of Main Board Component Locations

M/B: MB-0616

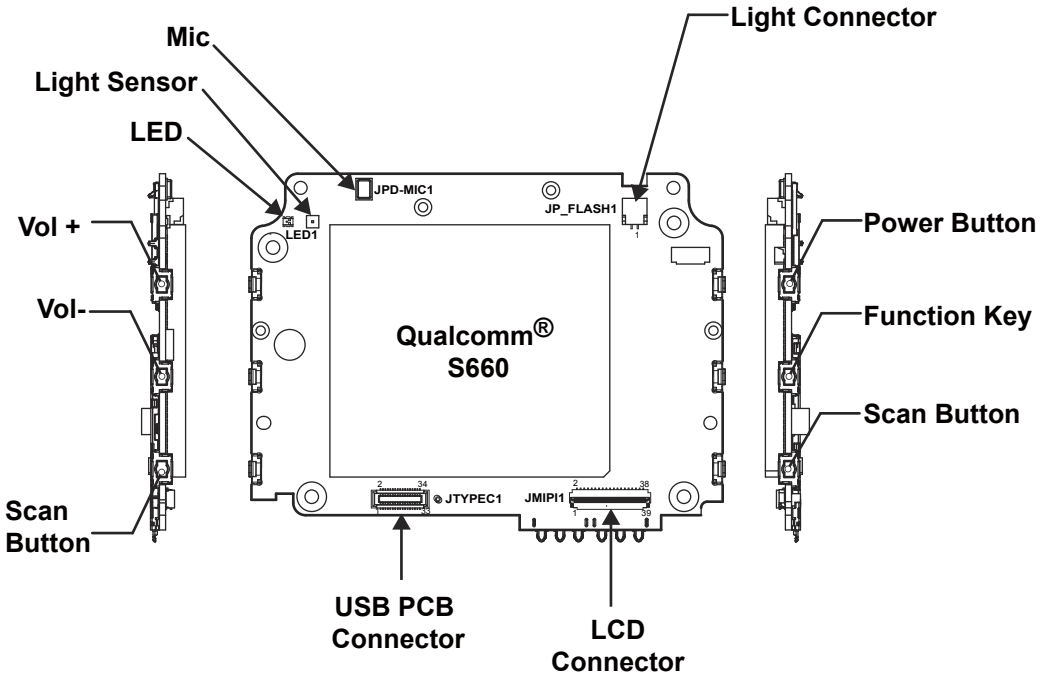




Figure 3-1. MB-0616 Main Board Component Locations (Top View)

	<p>WARNING: Always disconnect the power cord when you are working with the connectors on the main board. Make sure both the system and the external devices are turned OFF as sudden surge of power could ruin sensitive components. Make sure MB-0616 is properly grounded.</p>
	<p>CAUTION: Observe precautions while handling electrostatic sensitive components. Make sure to ground yourself to prevent static charge while configuring the connectors. Use a grounding wrist strap and place all electronic components in any static-shielded devices.</p>

3.2.2 Bottom View of Pad Main Board Component Locations

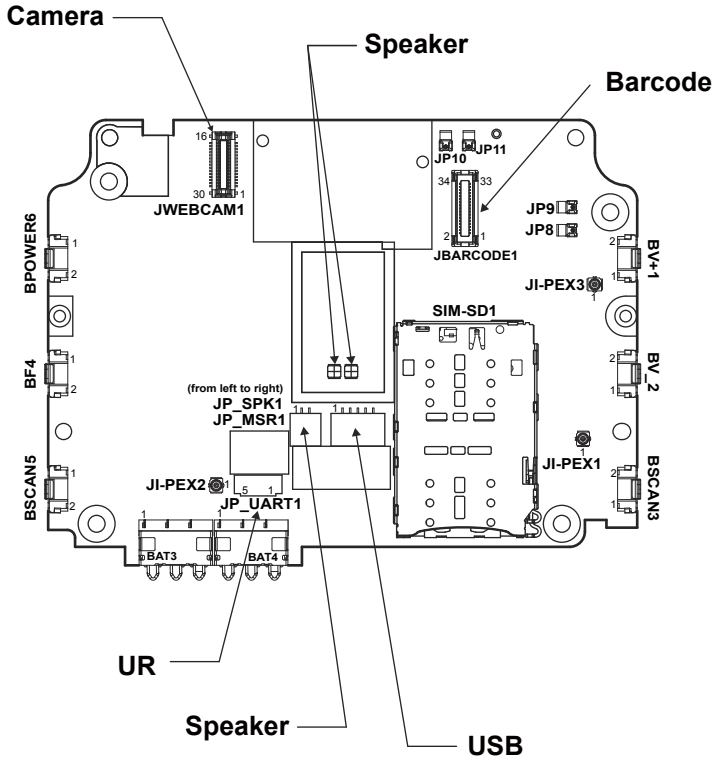


Figure 3-2. MB-0616 Main Board Component Locations (Bottom View)

3.3 Main Board Connectors Quick Reference Table

Main Board Top Side Connectors:

CONNECTOR Description	NAME
USB Type-C Connector	JTYPEC1
JMIPI1 Connector	JMIPI1
Flash Connector	JP_FLASH1

Main Board Bottom Side Connectors:

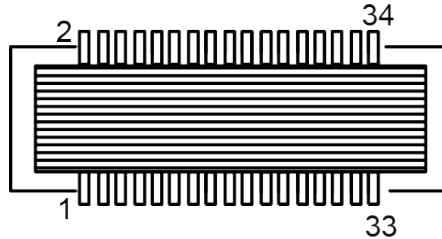
CONNECTOR Description	NAME
Power Button	BPOWER6
Function Key Button	BF4
Volume Key + Button	BV+1
Volume Key - Button	BV_2
Scan Button 2	BSCAN3
Scan Button_1	BSCAN5
Barcode Connector	JBARCODE1
MSR Connector	JP_MSR1
UART Connector	JP_UART1
Speaker Connector	JP_SPKR1
Battery Connector	BAT3, BAT4
RF_MAIN Connector	J1-PEX1
RF_DIV Connector	J1-PEX2
GPS_ANT Connector	J1-PEX3
Wifi_2.4G Connector	JP9 and JP8
Wifi_5G Connector	JP10 and JP11
Speaker Connector	JP12 and JP13
Web Camera Connector	JWEBCAM1
Nano-SIM Card Slot and MicroSD (Secure Digital) Card Connector Slot	SIM-SD1

3.4 Setting Main Board Connectors (Top Side)

3.4.1 USB Type-C Connector (JTYPEC1)

Connector Location: JTYPEC1

Description: USB Type C Connector



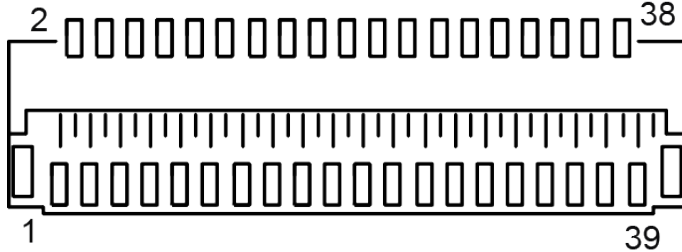
JTYPEC1

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	V3P3A	2	NC
3	GPIO47_VIBRATOR	4	NC
5	MIC_BIAS1	6	NC
7	LPI_GPIO28/DMIC2_CLK	8	NC
9	LPI_GPIO29/DMIC2_DATA	10	GND
11	VBUS	12	VBUS
13	VBUS	14	VBUS
15	GND	16	GND
17	USB_CC2	18	USB0_SS_RX_M
19	USB_CC1	20	USB0_SS_RX_P
21	GND	22	GND
23	USB1_SS_TX_M	24	USB0_SS_TX_M
25	USB1_SS_TX_P	26	USB0_SS_TX_P
27	GND	28	GND
29	USB1_SS_RX_M	30	USB_DP
31	USB1_SS_RX_P	32	USB_DM
33	GND	34	GND

3.4.2 MIPI Connector (JMIP11)

Connector Location: JMIP11

Description: MIPI (Mobile Industry Processor Interface) Connector



JMIP11

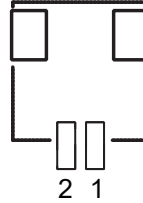
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	MIPI_DSIO_LANE3_P
3	NC	4	MIPI_DSIO_LANE3_N
5	GND	6	MIPI_DSIO_LANE2_P
7	NC	8	MIPI_DSIO_LANE2_N
9	GND	10	MIPI_DSIO_LANE1_P
11	NC	12	MIPI_DSIO_LANE1_N
13	GND	14	MIPI_DSIO_CLK_P
15	NC	16	MIPI_DSIO_CLK_N
17	GND	18	MIPI_DSIO_LANE0_N
19	NC	20	MIPI_DSIO_LANE0_P
21	GND	22	LCS_RST_N
23	LCD_TE0	24	LCD_BL_LED_A
25	NC	26	LCD_BL_LED_K1
27	LCD_BL_LED_K2	28	NC
29	V3P3A	30	GND
31	AVDD	32	GND
33	AVEE	34	GND
35	V1P8A	36	TP_I2C4_SCL
37	TP_I2C4_SDA	38	TP_INT_N
39	TP_RST_N	-	-

3.4.3 Flash Connector (JP_FLASH1)

Connector Location: JP_FLASH1

Description: Flash Connector

PIN	ASSIGNMENT
1	FLASH_LED1
2	GND



JP_FLASH1

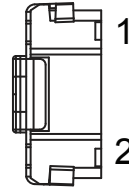
3.5 Setting Main Board Connectors (Bottom Side)

3.5.1 Power Button (BPOWER6)

Button Location: BPOWER6

Description: Power Button

PIN	ASSIGNMENT
1	GND
2	KYPD_PWR_N1



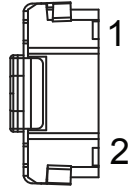
BPOWER6

3.5.2 Function Key Button (BF4)

Connector Location: BF4

Description: Function Key Button

PIN	ASSIGNMENT
1	GND
2	Function Key



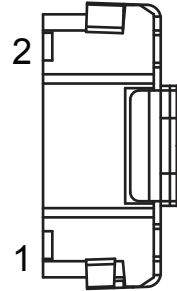
BF4

3.5.3 Volume Key + Button (BV+1)

Button Location: BV+1

Description: Volume Key + Button

PIN	ASSIGNMENT
1	GND
2	KEY1_VOL+ / VOL_UP_RS



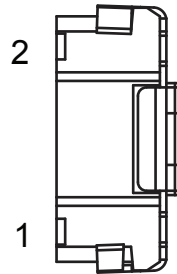
BV+1

3.5.4 Volume Key - Button (BV_2)

Button Location: BV_2

Description: Volume Key - Button

PIN	ASSIGNMENT
1	GND
2	KEY2_VOL-



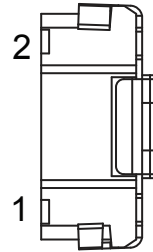
BV_2

3.5.5 Scan Button 2 (BSCAN3)

Button Location: BSCAN3

Description: Scan Button 2

PIN	ASSIGNMENT
1	GND
2	HOME_KEY



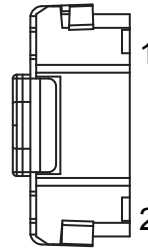
BSCAN3

3.5.6 Scan Button_1 (BSCAN5)

Button Location: BSCAN5

Description: Scan Button_1

PIN	ASSIGNMENT
1	GND
2	SCAN_BUTTON_1



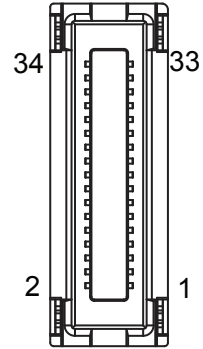
BSCAN5

3.5.7 Barcode Connector (JBARCODE1)

Connector Location: JBARCODE1

Description: Barcode Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	GND
3	SCAN_3V3	4	MIPI_CSI1_LANE0_N
5	SCAN_3V3	6	MIPI_CSI1_LANE0_P
7	NC	8	GND
9	SCAN_I2C_SCL_3V3	10	MIPI_CSI1_LANE1_N
11	GND	12	MIPI_CSI1_LANE1_P
13	SCAN_I2C_SDA_3V3	14	GND
15	NC	16	MIPI_CSI1_CLK_N
17	SCAN_RESET_3V3	18	NC
19	SCAN_PWR_ENA_3V3	20	MIPI_CSI1_CLK_P
21	TP	22	GND
23	GND	24	TP
25	GND	26	TP
27	NC	28	GND
29	SCAN_3V3	30	TP
31	SCAN_3V3	32	TP
33	GND	34	GND



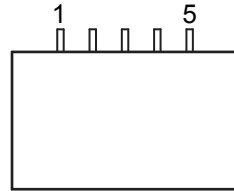
JBARCODE1

3.5.8 MSR Connector (JP_MSR1)

Connector Location: JP_MSR1

Description: MSR Connector

PIN	ASSIGNMENT
1	V5P0A
2	MSR_USB_DM
3	MSR_USB_DP
4	GND
5	GND



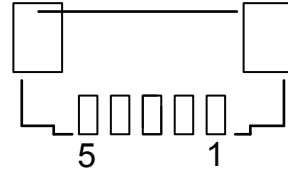
JP_MSR1

3.5.9 UART Connector (JP_UART1)

Connector Location: JP_UART1

Description: UART Connector

PIN	ASSIGNMENT
1	UART1_TX
2	UART1_RX
3	GND
4	V5P0A
5	UART1_GPIO31



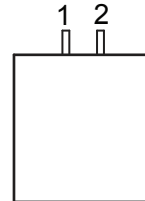
JP_UART1

3.5.10 Speaker Connector (JP_SPKR1)

Connector Location: JP_SPKR1

Description: Speaker Connector

PIN	ASSIGNMENT
1	SPKR_DRV_P_C
2	SPKR_DRV_M_C



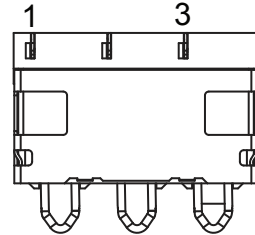
JP_SPKR1

3.5.11 Battery Connector (BAT3)

Connector Location: **BAT3**

Description: Battery Connector

PIN	ASSIGNMENT
1	VBAT
2	VBAT
3	BAT_THERM



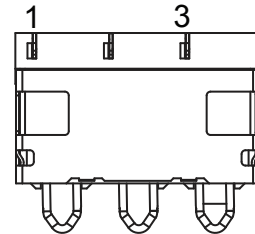
BAT3

3.5.12 Battery Connector (BAT4)

Connector Location: **BAT4**

Description: Battery Connector

PIN	ASSIGNMENT
1	BAT_CON_ID
2	GND
3	GND



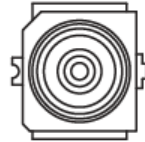
BAT4

3.5.13 RF_MAIN Connector (JI-PEX1)

Connector Location: JI-PEX1

Description: RF_MAIN Connector

PIN	ASSIGNMENT
1	RF_MAIN
G1	GND
G2	GND
G3	GND



1

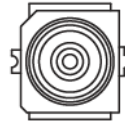
JI-PEX1

3.5.14 RF_DIV Connector (JI-PEX2)

Connector Location: JI-PEX2

Description: RF_DIV Connector

PIN	ASSIGNMENT
1	RF_DIV
G1	GND
G2	GND
G3	GND



1

JI-PEX2

3.5.15 GPS_ANT Connector (JI-PEX3)

Connector Location: JI-PEX3

Description: GPS_ANT Connector

PIN	ASSIGNMENT
1	GPS_ANT
G1	GND
G2	GND
G3	GND



1

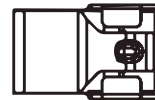
JI-PEX3

3.5.16 Wifi_2.4G Connector (JP9 and JP8)

Connector Location: JP9 and JP8

Description: Wifi_2.4G Connector

Connector	ASSIGNMENT
JP9	2.4G_ANT
JP8	GND



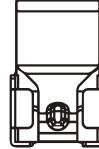
JP9 / JP8

3.5.17 Wifi_5G Connector (JP10 and JP11)

Connector Location: JP10 and JP11

Description: Wifi_5G Connector

Connector	ASSIGNMENT
JP10	5G_ANT
JP11	GND



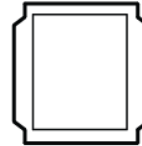
JP10 / JP11

3.5.18 Speaker Connector (JP12 and JP13)

Connector Location: JP12 and JP13

Description: Speaker Connector

Connector	ASSIGNMENT
JP12	SPKR_DRV_P_C
JP13	SPKR_DRV_M_C



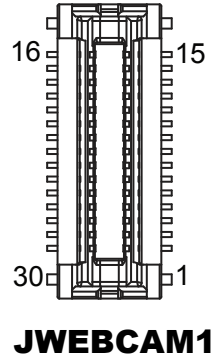
JP12 / JP13

3.5.19 Web Camera Connector (JWEBCAM1)

Connector Location: JWEBCAM1

Description: Web Camera Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	MCSI_2CCD_D1_DN	30	NC
2	MCSI_2CCD_D1_DP	29	FLASH_LED_N
3	GND	28	FLASH_LED_N
4	MCSI_2CCD_D3_DN	27	FLASH_LED_P
5	MCSI_2CCD_D3_DP	26	FLASH_LED_P
6	GND	25	NC
7	MCSI_2CCD_D0_DN	24	GPIO44_MCAM_PWD_N
8	MCSI_2CCD_D0_DP	23	GPIO46_MCAM_RST_N
9	GND	22	CAM_I2C_SDA0
10	MCSI_2CCD_D2_DN	21	CAM_I2C_SCL0
11	MCSI_2CCD_D2_DP	20	GPIO32_CAM_MCLK0
12	GND	19	VREG_L11A_1P8
13	MCSI_2CCD_CLK_DN	18	VREG_DVDD_1P2
14	MCSI_2CCD_CLK_DP	17	VREG_AVDD_2P8
15	GND	16	VREG_AF_VDD_2P8

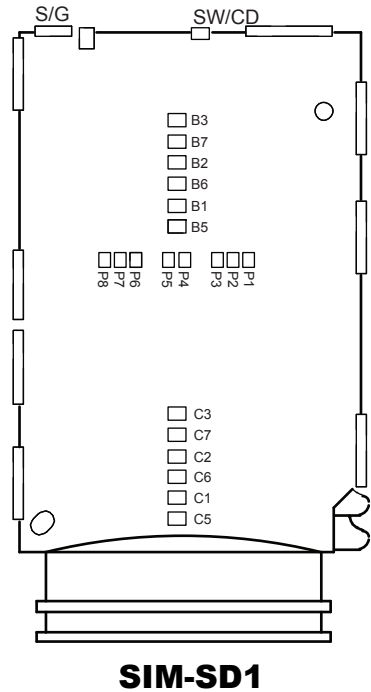


3.5.20 Nano-SIM Slot and MicroSD (Secure Digital) Card Connector Slot (SIM-SD1)

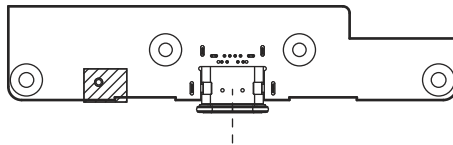
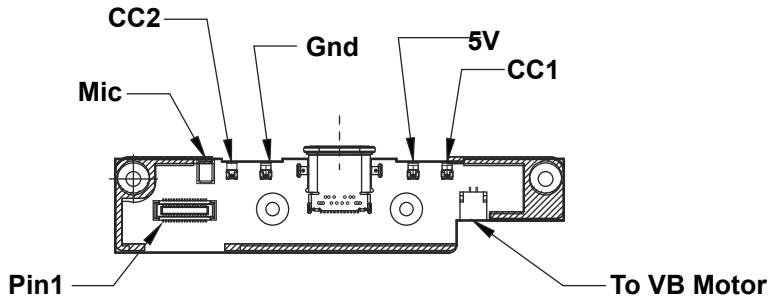
Connector Location: SIM-SD1

Description: Nano-SIM Slot and MicroSD (Secure Digital) Card Connector Slot

PIN	ASSIGNMENT
SW/CD	SW_DET
S/GND	GND
B3	USIM1_CLK_R
B7	USIM1_DATA_R
B2	USIM1_RST_R
B6	SWIO_UICC
B1	V_SIM_VCC
B5	GND
P1	SD_DATA2
P2	SD_DATA3
P3	SD_CMD
P4	VREG_L5B_2P95
P5	SD_SCLK
P6	GND
P7	SD_DATA0
P8	SD_DATA1
C3	NC
C7	NC
C2	NC
C6	NC
C1	NC
C5	NC
G1 ~G9	GND



3.6 Daughter Board MR-0616-GxA-1 Component Locations



4 Software Utilities

This chapter provides the detailed information that guides users to install driver utilities for the system. The following topics are included:

- Installing 3D Camera Device Software Driver Utilities
- Installing Barcode Scanner Device Software Driver Utilities
- Installing RFID Reader Software Device Software Driver Utilities
- Installing Smart Card Reader Device Software Driver Utilities

4.1 Introduction

MH-0616 Driver Utilities have been stored in the Tablet system:

File Path: C:\MH-0616_v1.0

Filename (Assume that DVD- ROM drive is C:)	Purpose
C:\Driver\Device\3D Camera SizensorPlus_1.107_107-release.apk	3D Camera Device Software installer
C:\Driver\Device\Barcode Scanner OemScanApiDemo-debug.apk	Barcode Scanner Device Software installer
C:\Driver\Device\RFID Reader proxcomm_demo_RFID-1.3.apk	RFID Reader Device Software installer
C:\Driver\Device\Smart Card Reader VP3300_Demo.apk	Smart Card Reader Device Software installer

Note: After the OS installation is completed, the driver utilities will also be installed at the same time.

For more details on the installation procedure, refer to the **MH-0616 README V1.0**

4.2 Installing 3D Camera Device Driver Utilities

Please follow the steps below to install 3D Camera Device driver utilities:

- 1** Enter the **C:\Driver\Device\3D Camera** folder.
- 2** Click the **SizensorPlus_1.107_107-release.apk** file for driver installation.
- 3** Follow the on-screen instructions to install the 3D Camera driver.
- 4** Once the installation is completed, restart the system for the changes to take effect.

4.3 Installing Barcode Scanner Device Driver Utility

Please follow the steps below to install Barcode Scanner Device driver utilities:

- 1** Enter the **C:\Driver\Device\Barcode Scanner** folder.
- 2** Click the **OemScanApiDemo-debug.apk** file for driver installation.
- 3** Follow the on-screen instructions to install the Barcode Scanner driver.
- 4** Once the installation is completed, restart the system for the changes to take effect.

4.4 Installing RFID Reader Device Driver Utility

Please follow the steps below to install RFID Reader driver utilities:

- 1** Enter the **C:\Driver\Device\RFID Reader** folder.
- 2** Click the **proxcomm_demo_RFID-1.3.apk** file for driver installation.
- 3** Follow the on-screen instructions to install the RFID Reader driver.
- 4** Once the installation is completed, restart the system for the changes to take effect.

4.5 Installing Smart Card Reader Device Driver Utility

Please follow the steps below to install Smart Card Reader driver utilities:

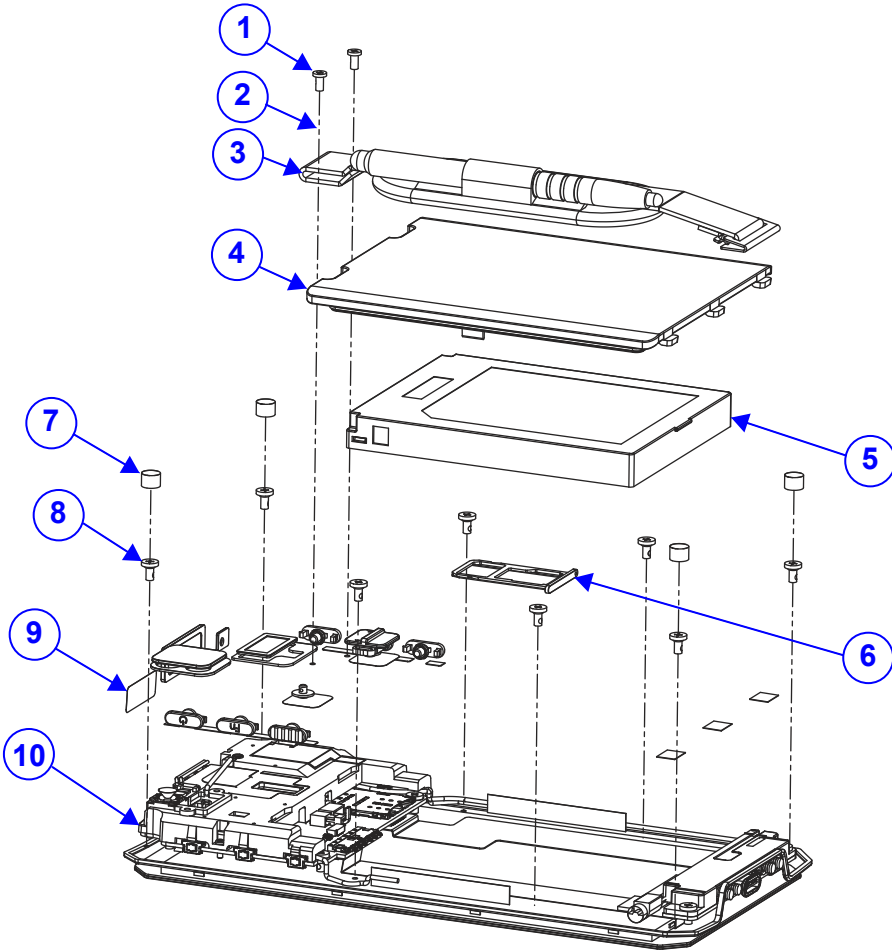
- 1** Enter the **C:\Driver\Device\Smart Card Reader** folder.
- 2** Click the **VP3300_Demo.apk** file for driver installation.
- 3** Follow the on-screen instructions to install the Smart Card Reader driver.
- 4** Once the installation is completed, restart the system for the changes to take effect.

Appendix A System Diagrams

This appendix includes the exploded diagrams of the system and the parts list as well as the part numbers of the MH-0616 system.

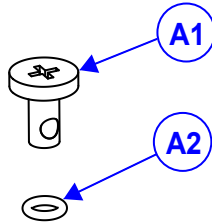
- Exploded Diagram For Battery and Hand Strap and Rear and Bottom Cover Assembly
- Exploded Diagram For Handy Tablet PCBA and Inside Cover Assembly
- Exploded Diagram for Inside Cover and Camera and ToF Module Assembly (Laser Distance Type)
- Exploded Diagram for Inside Cover and Camera and ToF Module Assembly (RFID Type)
- Exploded Diagram For Top Cover & Touch Panel & Panel Assembly
- Exploded Diagram For Bottom Cover Assembly

Exploded Diagram For Battery and Hand Strap and Rear and Bottom Cover Assembly



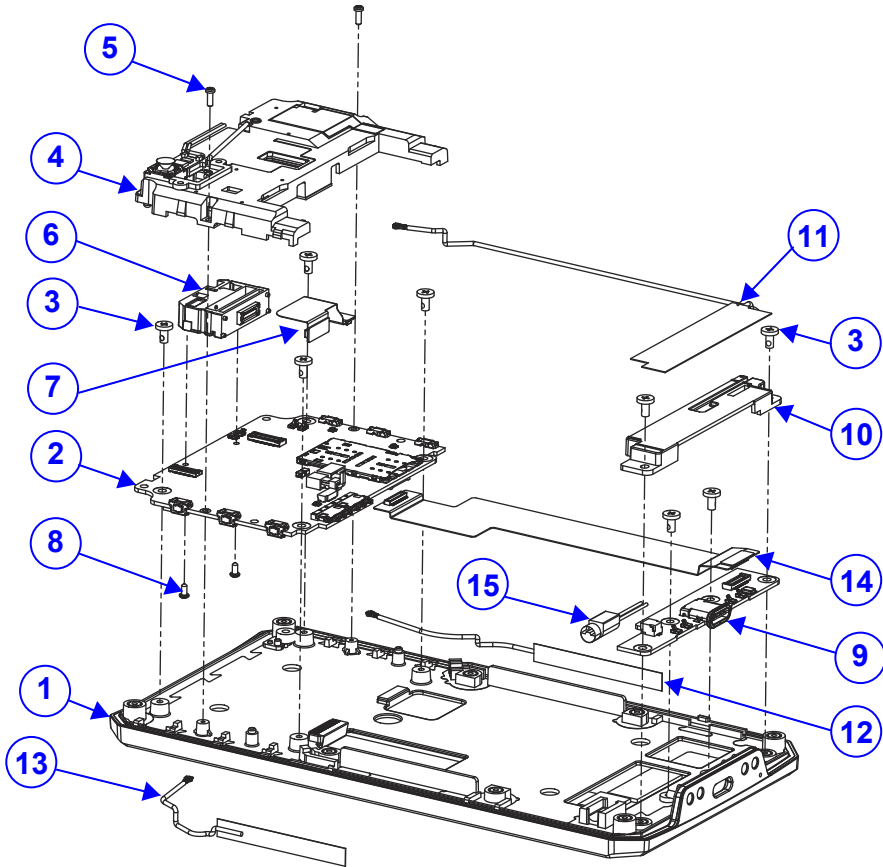
No.	Component Name	P/N No.	Q'ty
1	Fillister Head Screw ϕ 3.6 / #1 / M2x0.4Px4L	22-275-20004911	2
2	MH-0616 Belt Part-T (Black)	30-002-02410530	1
3	MH-016 Belt	N/A	1
4	MH-0616 Battery Cover (Black)	30-002-02310530	1
5	MH-0616 Battery Pack (1S1P) (3.85V/4380mAh,without Gas gauge)	52-990-54130068	1

No.	Component Name	P/N No.	Q'ty
6	MicroSD Slot	N/A	1
7	Rubber Foot (Φ 5x3.5mm) (Black)	90-004-06103000	4
8	MH-0616 Screw ASM	N/A	8
9	MH-0616 Back ASM	N/A	1
10	MH-0616 Front ASM	N/A	1



No.	Component Name	P/N No.	Q'ty
A1	Fillister Head Screw #1 / M2x0.4Px4mm	22-272-20004211	1
A2	O-RING (ID= φ 1.7, OD= φ 2.9, H=0.6mm) (Black)	90-013-01600000	1

Exploded Diagram For Handy Tablet PCBA and Inside Cover Assembly

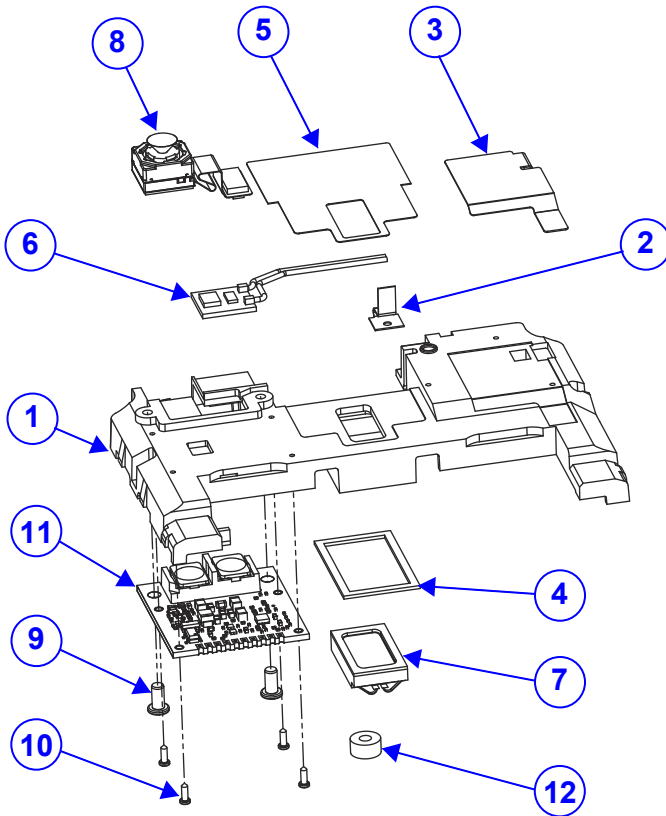


No.	Component Name	P/N No.	Q'ty
1	MH-0616 F Cover ASM	N/A	1
2	MB-0616	MB-0616	1
3	Fillister Head Screw #1 / M2x0.4Px4mm	22-272-20004211	8
4	MH-0616 Cam unit	N/A	1
5	Pan Head Screw #0 / M1.4x0.35Px4mm	22-222-14004911	2
6	2D Scan Engines, MIPI Interface(Honeywell N6703SR-W5-103)	52-820-67030111	1
7	PCB FOR MR-0616-G0B-5, 27.5x16.4mm (255um) (4L)	18-455-06160234	1
8	Round Head Screw #1 / T1.4x4mm	22-132-14004011	2

Appendix A System Diagrams

No.	Component Name	P/N No.	Q'ty
9	MR-0616GxA-1	N/A	1
10	MH-0616 Main Ant Cover(Black)	30-002-02510530	1
11	FPC Antenna (+IPX4-LTE_Main) L=129mm	27-029-53003071	1
12	FPC Antenna(+IPX4-GPS) L=54mm	27-029-53001071	1
13	FPC Antenna(+IPX4-LTE_Aux)L=41mm	27-029-53001072	1
14	PCB FOR MR-0616-G0B-4,108x25mm (243um)(4L)	18-454-06160234	1
15	Vibrator Motor Cable L=12mm	27-055-00001071	1
16	MH-0616 Case Rubber-2 (Black)	30-013-06100530	1
17	MH-0616 Case Rubber-2 (Black)	30-013-06100530	1

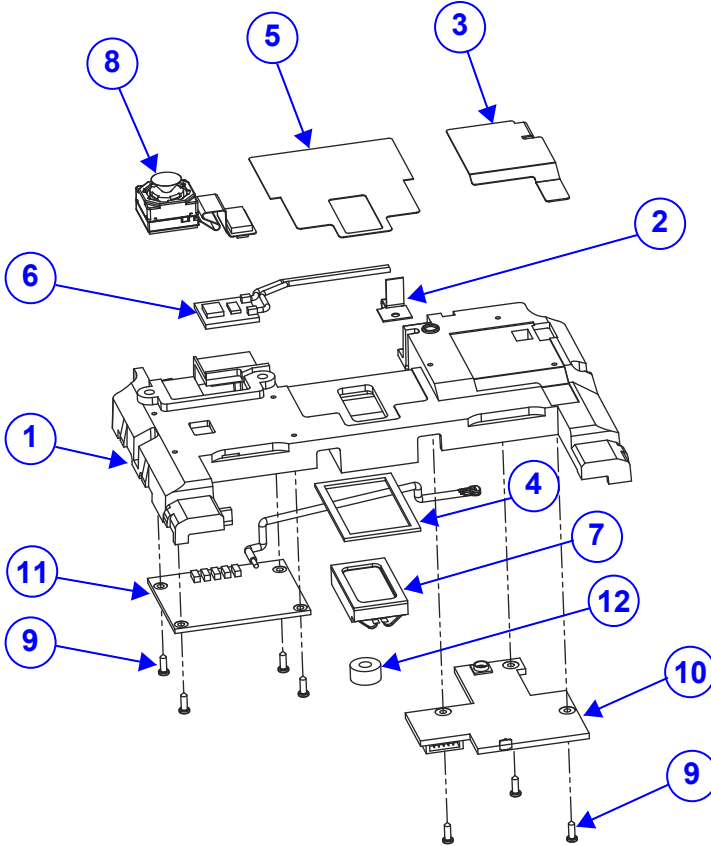
Exploded Diagram for Inside Cover and Camera and ToF Module Assembly (Laser Distance Type)



Laser Distance Type			
No.	Component Name	P/N No.	Q'ty
1	MH-0616 Inside Cover (Black)	30-002-28110530	1
2	FPC Antenna (5G WiFi)	27-029-53000002	1
3	FPC Antenna (2G WiFi)	27-029-53000001	1
4	MH-0616 SP Poron	30-013-24400530	1
5	MH-0616 SP ESD Mylar (Black)	90-056-02100530	1
6	LED Cable (5V60mA,E001H-2P) (LED to 2F/P1.00/TIN) L=25.5~27.5mm	27-018-53001071	1
7	MH-0616 Speaker 8Ω/1W,16x9x3mm	13-500-06090033	1
8	13M CLJ Camera Module	52-151-08937349	1
9	Fillister Head Screw T2x4mm	22-272-20006011	2
10	Pan Head Screw #000/T1.0x3mm	22-122-10003011	4

Laser Distance Type			
No.	Component Name	P/N No.	Q'ty
11	MiniLidar, iTOF Laser Distance Measurement Module	52-151-08022248	1
12	MH-0616 Sensor Poron (OD= φ 5mm, ID= φ 2mmx2.5T)	30-013-24300530	1

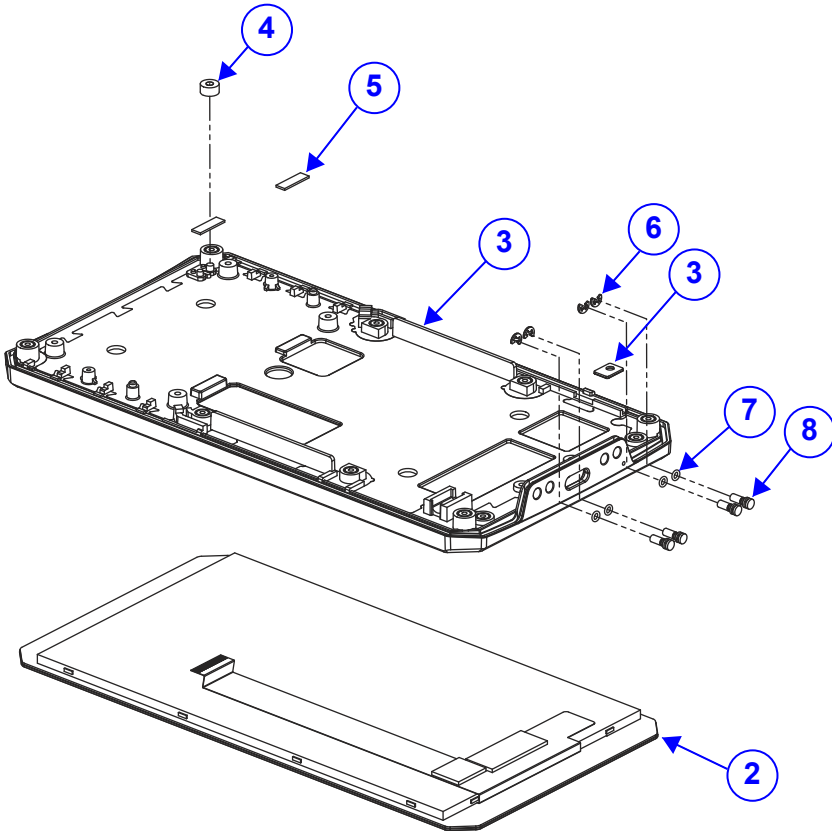
Exploded Diagram for Inside Cover and Camera and ToF Module Assembly (RFID Type)



RFID Type			
No.	Component Name	P/N No.	Q'ty
1	MH-0616 Inside Cover (Black)	30-002-28110530	1
2	FPC Antenna (5G_WiFi)	27-029-53000002	1
3	FPC Antenna (2G_WiFi)	27-029-53000001	1
4	MH-0616 SP Poron	30-013-24400530	1
5	MH-0616 SP ESD Mylar (Black)	90-056-02100530	1
6	LED Cable (5V60mA, E001H-2P) (LED to 2F/P1.00/TIN) L=25.5~27.5mm	27-018-53001071	1
7	MH-0616 Speaker 8Ω/1W, 16x9x3mm	13-500-06090033	1

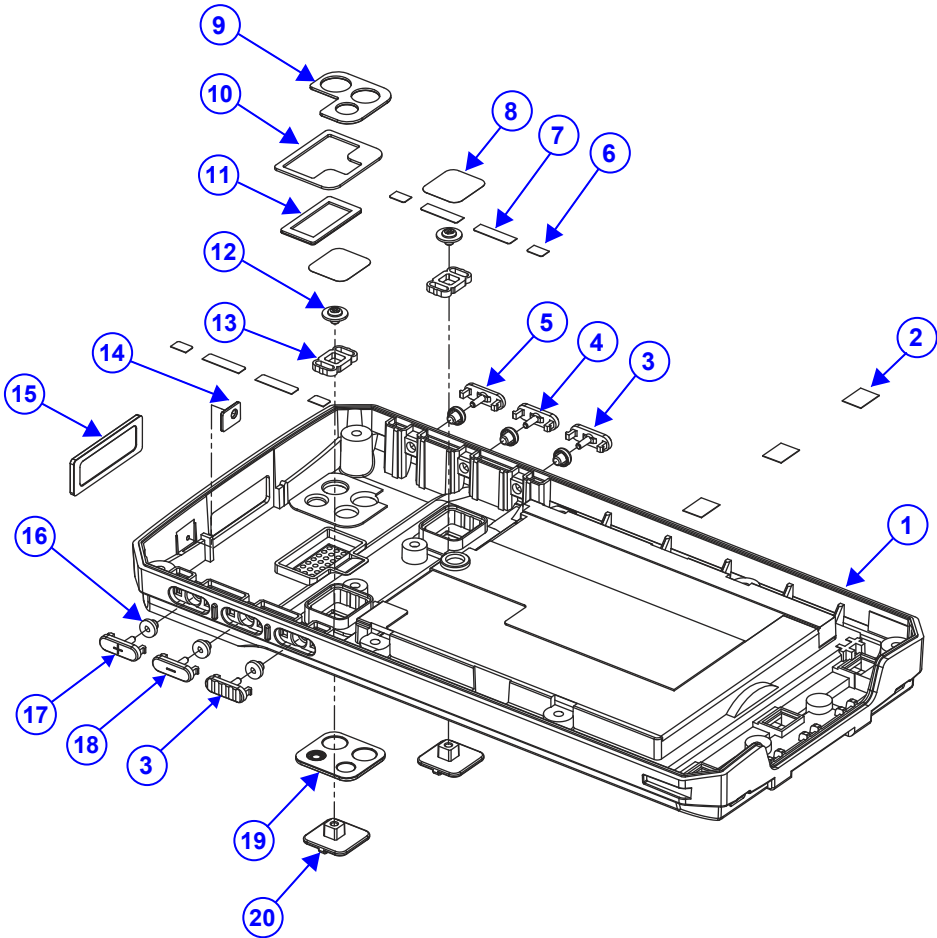
RFID Type			
No.	Component Name	P/N No.	Q'ty
8	13M CLJ Camera Module	52-151-08937349	1
9	Pan Head Screw #000/T1.0x3mm	22-122-10003011	7
10	RFID Moudle, 13.56MHz	52-151-08052150	1
11	RFID Antenna, 13.56MHz	52-151-08221950	1
12	MH-0616 Sensor Poron (OD= φ 5mm, ID= φ 2mmx2.5T)	30-013-24300530	1

Exploded Diagram For Top Cover & Touch Panel & Panel Assembly



No.	Component Name	P/N No.	Q'ty
1	MH-0616 Front Cover ASM (Black)	30-002-02210530	1
2	5.94" Touch Panel, LCD + Capacitive TP(720x1280) (without Prox logo)	52-380-18128134	1
3	MH-0616 MIC Film	30-056-15100530	1
4	MH-0616 Sensor Poron (OD= φ 5mm, ID= φ 2mmx2.5T)	30-013-24300530	1
5	MH-0616 LCD FPC Poron (9.8x3x0.55mm)	30-013-24200530	2
6	E Type Washer (OD= φ 4mm, ID= φ 1.5mmx0.4T)	23-742-15000041	4
7	O-Ring (ID= φ 1.7, OD= φ 2.9, H=0.6mm) (Black)	90-013-01600000	4
8	MH-0616 EXT Pin	22-000-28066007	4

Exploded Diagram For Bottom Cover Assembly



No.	Component Name	P/N No.	Q'ty
1	MH-0616 Back ASM (Black)	30-002-02110530	1
2	MH-0616 PET Sheet	30-056-24100530	3
3	MH-0616 Barcode Bottom (Yellow)	30-046-28110530	2
4	MH-0616 FH Button (Gray)	30-046-28210530	1
5	MH-0616 P Button (Gray)	30-046-28310530	1
6	MH-0616 PET Sheet	30-056-24100530	4
7	MH-0616 PET Sheet	30-056-24100530	4

Appendix A System Diagrams

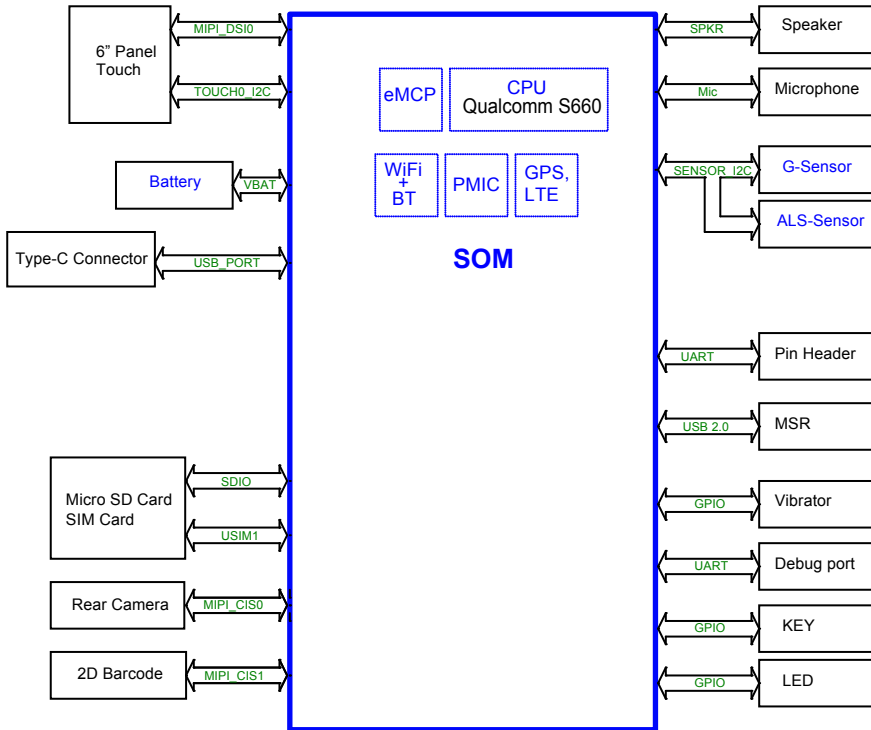
No.	Component Name	P/N No.	Q'ty
8	MH-0616 PET Sheet	30-056-24100530	2
9	MH-0616 CAM Poron	30-013-24100530	1
10	MH-0616 SP Poron-2	30-013-24500530	1
11	MH-0616 SP Film	30-056-39100530	1
12	Round Washer Head Screw #1 / M2x0.4Px2mm	22-232-20002911	2
13	MH-0616 Lock Part-B	30-019-28110530	2
14	MH-0616 MIC Film	30-056-15100530	1
15	MH-0616 Barcode Lens	30-021-10130530	1
16	MH-0616 SW Rubber-4 (Black)	30-013-06200530	6
17	MH-0616 V UP Button (Gray)	30-046-28410530	1
18	MH-0616 V Down Button (Gray)	30-046-28510530	1
19	MH-0616 Lens	30-021-10230530	1
20	MH-0616 BT Lock Type-5 (Black)	20-025-34001530	2
21	MH-0616 Caution Label	N/A	1

Appendix B Troubleshooting

This appendix describes the common problems that you may encounter when you use MH-0616 system for general operations as well as scanning barcodes and provide the corresponding solutions.

- Block Diagram
- Common Troubleshooting Solutions
- Barcode Troubleshooting Solutions

Block Diagram



Troubleshooting Solutions

Common Troubleshooting Solutions

Item	Solution
No display	<ol style="list-style-type: none"><li data-bbox="632 331 1069 447">1. Please check whether the batter is out of power. If Yes, please try to charge the system with the power adaptor.<li data-bbox="632 453 1069 539">2. When the Power LED shows green, please triple-click Display to awake Display.<li data-bbox="632 545 1069 626">3. Please make sure the Brightness of Display does not adjust to zero.
Cannot charge	Please make sure the DC plug of the power adaptor has been already plugged into the DC jack correctly.
Speaker no sound	Click setting -> sound -> adjust to volume up.

Barcode Troubleshooting Solutions

Item	Solution
Aiming line does not appear	<ol style="list-style-type: none">1. Make sure the system is in Power On status.2. Check trigger button is pressed.
Barcode is unreadable	<ol style="list-style-type: none">1. Make sure the barcode is not defaced. Test a bar code of the same bar code type.2. Adjust the scan angle, moving closer or farther away as required.
Barcode is out aiming line area	Move the cross aiming line over the bar code.