USER MANUAL

MH-5106

10.1” Integrated Pad
Powered By ARM
Cortex-A9

MH-5106 M1

MH-5106

10.1” Integrated Pad Powered By ARM Cortex-A9

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.

	**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.

	**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.

Contents

Revision History

The revision history of MH-5106 User Manual is described below:

Version No.	Revision History	Date
1.0	Initial Release	11/30/2017

1 Introduction

This chapter provides the introduction for the MH-5106 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-5106 system. The MH-5106 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-5106 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-5106 system. Read the safety reminders carefully on how to take care of your system properly.

Chapter 3 System 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.

Appendix A System Assembly Diagrams
This appendix provides the exploded diagrams and part numbers of the MH-5106.

2 Getting Started

This chapter provides the information for the MH-5106 system. In addition to the MH-5106 Pad, users are also welcome to purchase the optional "Lite Cradle" so you can combine MH-5106 Integrated Pad and Lite Cradle together and place the system set on the desktop for user application needs. This chapter describes the package contents, system overview and outlines the system specifications.

The following topics are included:

- Package List
- Pad System Overview
- Lite Cradle System Overview
- Quick Setup
- Pad Specifications
- Lite Cradle Specifications
- Safety Precautions

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

2.1 Package List

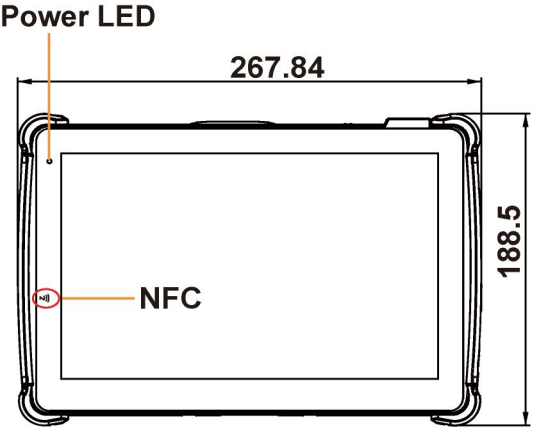
If you discover any of the items listed below are damaged or lost, please contact your local distributor immediately.

Item	Q'ty
MH-5106 Integrated Pad	1
Quick Reference Guide	1
AC Power Adapter for Pad	1
Hand Strap (optional)	1
Neck Strap (optional)	1
Lite Cradle (optional)	1
Power Adapter for Lite Cradle (optional)	1
Power Cord for Lite Cradle (optional)	1

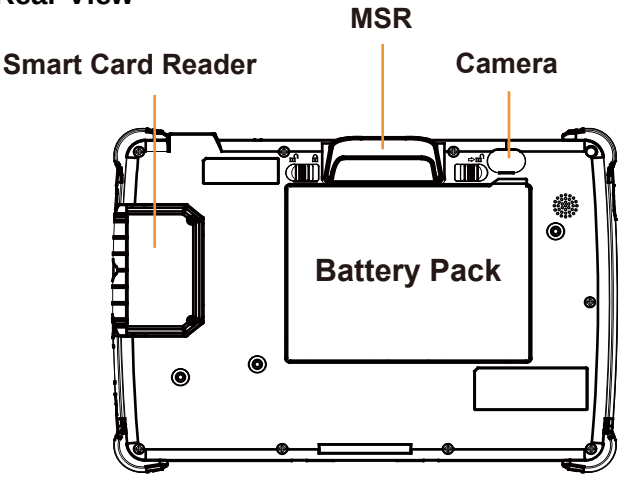
2.2 Pad System Overview

Unit: mm

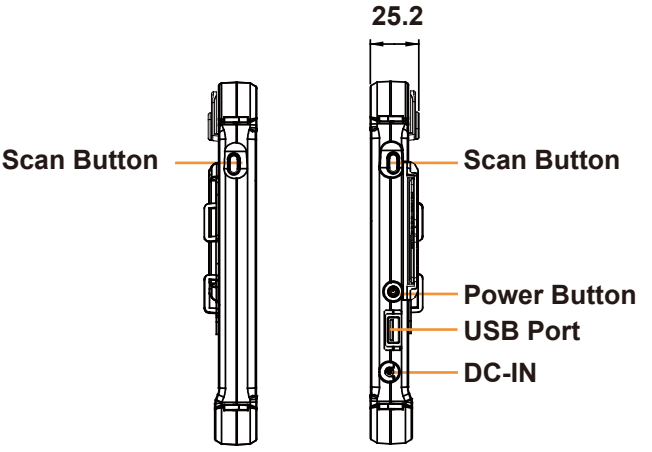
2.2.1 Front View



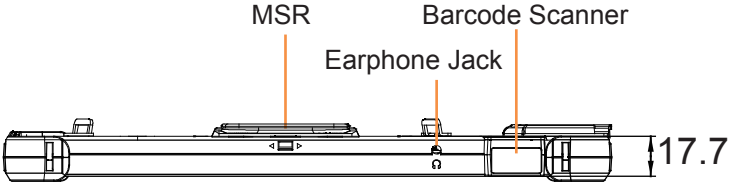
2.2.2 Rear View



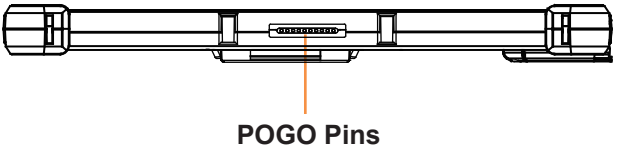
2.2.3 Side View



2.2.4 Top View



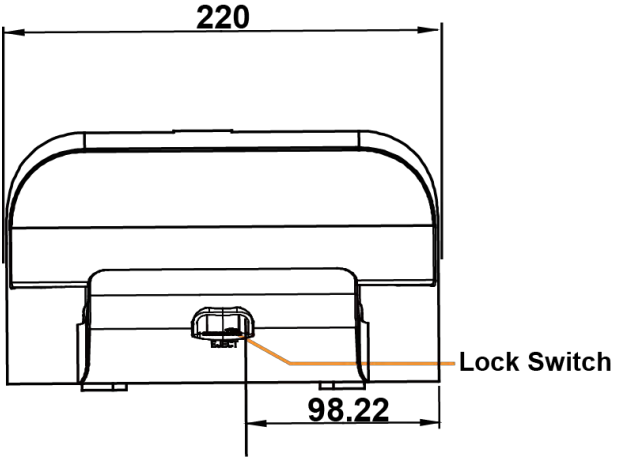
2.2.5 Bottom View



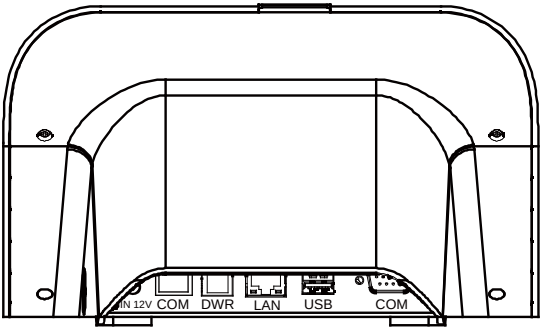
2.3 Lite Cradle System Overview

Unit: mm

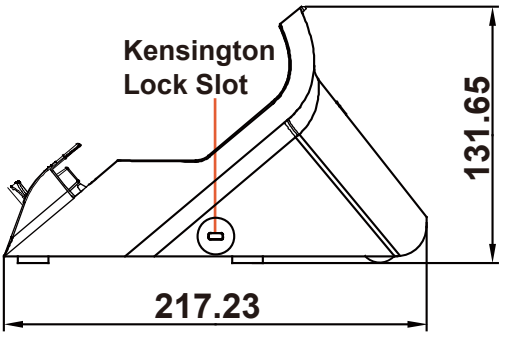
2.3.1 Front View



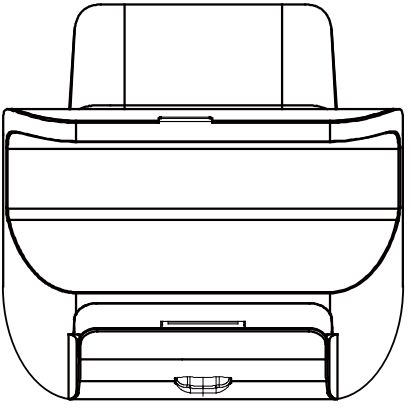
2.3.2 Rear View



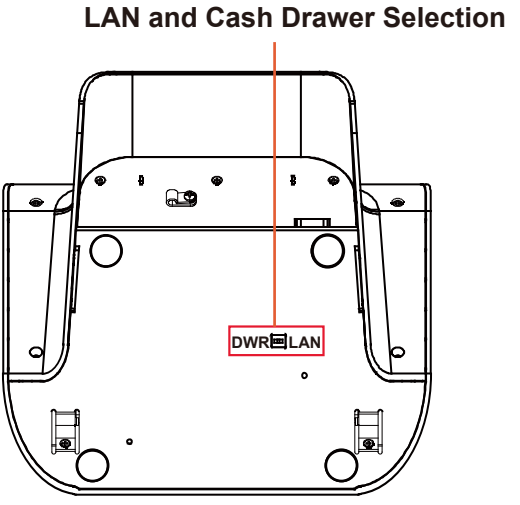
2.3.3 Side View



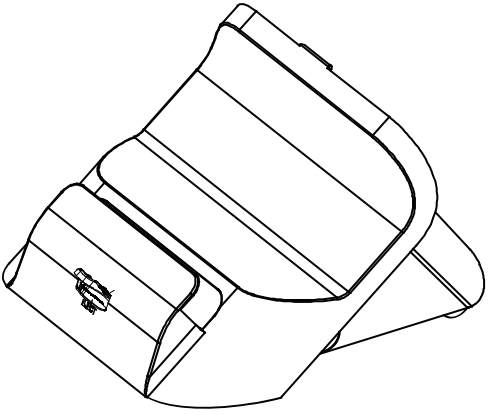
2.3.4 Top View

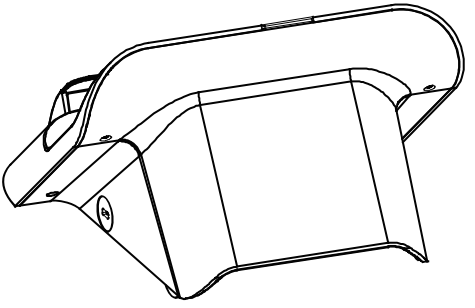


2.3.5 Bottom View



2.3.6 Quarter View





2.4 Quick Setup

2.4.1 Turning the Power On from Pad and Connect to Wi-Fi

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

How to Set Up Wi-Fi Connection

Step 1. From the bottom right corner of the screen, tap the ^ icon from the tool tray.

Step 2. From the small pop-up window, tap on the Wi-Fi icon  if it shows grey to activate Wi-Fi.

Step 3. Select a Wi-Fi network from the list and tap on it.

Step 4. Tap the **Connect** button.

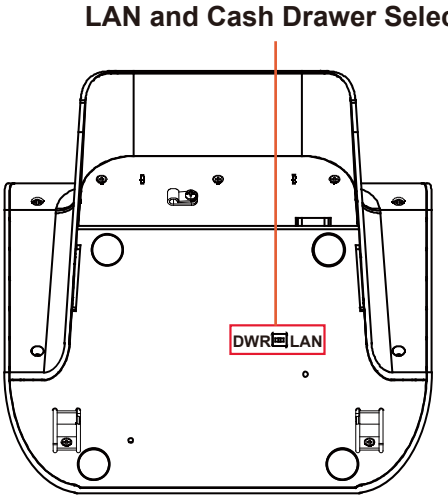
Step 5. Enter the correct security key for the selected Wi-Fi network and wait for the Wi-Fi connection to establish.

You can also swipe the screen from the right side of the Pad to bring up the **ACTION CENTER** window and select **Network** menu item to enter the Wi-Fi network selection list.

For stability issue, always power off the Pad from Windows 10 OS. Make sure you have closed all the application programs before you close Windows. Tap on  Start icon from the bottom left corner of the Pad and select the displayed  menu icon and select **Shut down** from the selection list to turn off the Pad power.

2.4.2 Turning the Power On and Connect to Local Network from Lite Cradle

Prerequisite: Insert a ball point pen or a pin into the hole of **DWR/LAN** selection switch slot located on the bottom base of the Lite Cradle, and switch it to the **LAN** port location. See the picture below:



Press the **Power Button** on the right side of the Pad to turn on the system. Connect the Ethernet cable to the **LAN** port on the rear side of the Lite Cradle and the other end of the network cable to a port on your hub, switch or router. (Refer to the **Side View** section of Pad for the location of **Power Button**.) Refer to the **I/O Ports Diagram** section of Lite Cradle for the location of LAN port.

2.4.3 Installing Battery for Pad

Make sure to power off the device first before you start installing the battery.

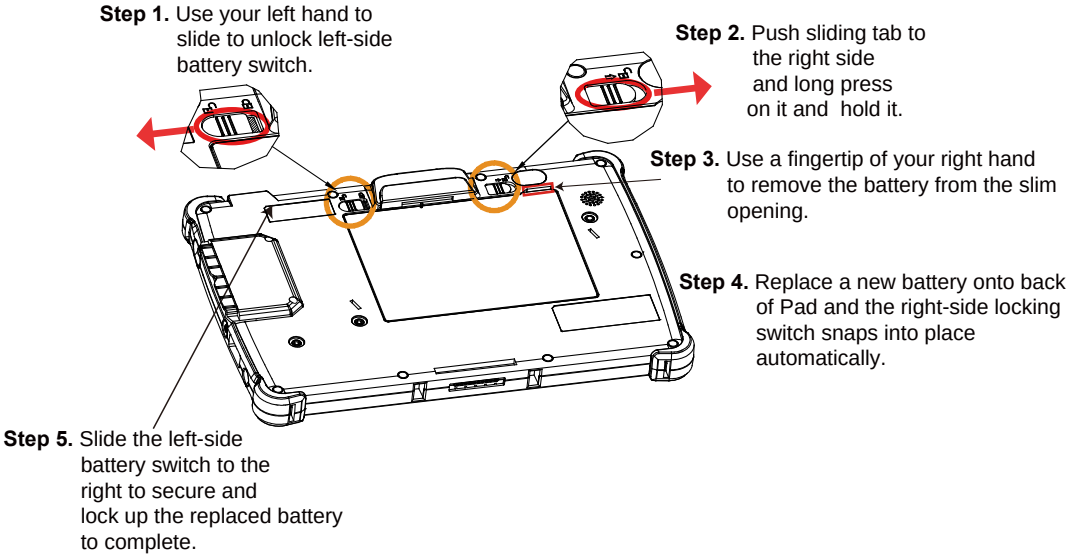
Step 1. Slide to unlock the left-side battery switch with your left hand. See the Figure below.

Step 2. Use your left hand to push the right-side sliding tab to the right and long press on it and hold it.

Step 3. Use a fingertip of your right hand to remove the battery from the slim opening located under the Camera.

Step 4. Replace a new battery onto the back of Pad and the right-side locking switch snaps into place automatically.

Step 5. Slide the left-side battery switch to the right to secure and lock up the replaced battery.



Note 1: The factory default battery cycle life guarantees to retain 80 percent of its original capacity after the battery has been charged and discharged for 300 times.

Note 2: Batteries are consumerables and the limited warranty for MH-5106 battery is **1** year only.

Low Battery Indicator

The low battery indicator will show on the LCD screen when the battery is nearly exhausted. When the low battery indicator appears on the tool tray, you should recharge the battery by connecting the power adapter of Pad/Lite Cradle or replace a fully charged battery immediately.

2.4.4 Recharging Battery from Pad

Before you use MH-5106 Pad, follow the instructions below to charge the battery:

Step 1. Connect the Pad's AC power adapter to the DC-IN jack located on the right side of the Pad. (Refer to the **Side View** section of Pad for the location of the DC-IN Jack.)

Step 2. Plug the other end to an AC power outlet.

MH-5106 Pad battery will then start charging, and the Power LED indicator on the top left corner of the touch screen will then flash GREEN. After the battery is fully charged, the Power LED indicator will turn to a solid green.

2.4.5 Recharging Battery from Lite Cradle

Step 1. Connect the Lite Cradle's AC power adapter to the DC-IN power jack located on the bottom of the Lite Cradle.

Step 2. Plug the other end to an AC power outlet.

The Power LED indicator on the top left corner of the touch screen will then flash GREEN. After the battery is fully charged, the Power LED indicator will turn to a solid green.

2.4.6 Installing Integrated Pad Onto Lite Cradle

Step 1. From the bottom side of Pad, align the ***two locking tabs*** located on both side of the **POGO** pins to their ***mating slots*** located inside of Lite Cradle base respectively.

Step 2. Lock the ***two locking tabs*** of Pad into their ***mating slots*** inside the Lite Cradle base and the Pad snaps into place.

Step 3. The installation is completed.

2.4.7 Separating Integrated Pad From Lite Cradle

Step 1. Push down the Lock Switch on the front of Lite Cradle.

Step 2. Separate the integrated pad from the lite cradle. See the picture below:

Push down the Lock Switch to eject.

2.4.8 Scanning Barcodes and QR Codes

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

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

2.4.9 Installing Hand Strap

Step 1. Tighten the two screws of the strap bracket set onto the strap bracket holes on the back cover.

Step 2. Ready to hold the hand strap attached on the strap brackets to lift up the Pad with your hand.

Note: The strap bracket set is pre-installed for easy user installation before the shipment. The strap bracket set includes 2 x strap brackets, 2 x pan head screws (M3 x 6 mm) and 1 x Velcro badge.

2.4.10 Installing Neck Strap

Step 1. Insert one end of the provided neck strap through the upper opening of the right-side bumper rubber and adjust to tighten the neck strap.

Step 2. Insert another end of the neck strap through the upper opening of the left-side bumper rubber and adjust to tighten the neck strap.

Step 3. Put the installed neck strap around your neck to carry the Pad around.

Note: You can also select to put the neck strap through the lower openings of the right-side and left-side bumper rubbers.

2.5 Pad Specifications

Fundamental Spec. (Conform to RoHS Directive)		
Operator Display (LCD)	Type	10.1” LCD
	Resolution	WXGA 1280 x 800 dots
	Brightness	Typical 400 cd/m^2
	Life time of Backlight Lamp	30,000 hours
	Interface	LVDS
Backlight	Type	LED Backlight
Touch Panel	Type	10.1” PCT
	Interface	I2C
CPU	BGA on board CPU	Actions S500 (ARM Cortex A9 R4 CPU)
Chipset	Type	Built-in CPU
Memory	DDR3L on Board	DDR3L 1GB / 2GB
PMIC or EC	Type	Actions ATC2603C
	Interface	I2C
Charger	Type	TI BQ24192
	Interface	I2C
Storage (eMMC)	Type	16GB / 32GB / 64GB
	Interface	SDIO
Storage (SD)	Type	MicroSD Slot
	Interface	SDIO
Hardware Monitor	Type	(1) Voltage detection (Battery) (2) CPU & System Temperature detection (3) CPU Temperature over heat warning (4) CPU Temperature over heat shut down
Speaker	Type	1W Speaker x1
Wi-Fi + Bluetooth Module IC	Type	802.11 a/b/g/n wireless LAN and Bluetooth 4.0 module
	Interface	Wi-Fi: SDIO / Bluetooth: UART

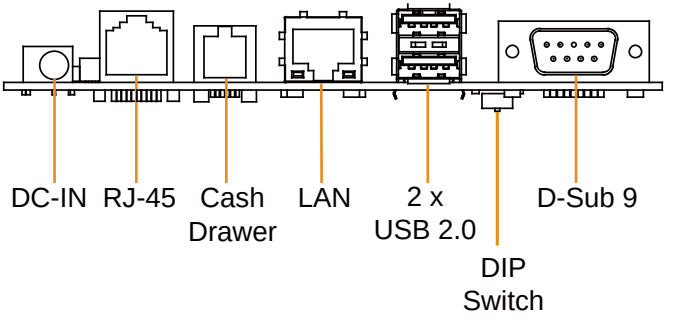
G-Sensor (Accelerator sensor)	Type	ST
	Interface	I2C
LED Indicator	Tri-color Light LED Green / Yellow / Red LED	**1. Power LED (Green):** a. Start OS→constant Green light b. Charging→ flashing Green light c. Full charge→constant Green light **2. Alarm LED (Yellow):** a. 4%< Battery Capacity ≤ 8%→flashing Yellow light b. Battery Capacity < 4% →system turns to Sleep→Yellow Alarm LED turns off. **3. Error LED (Red):** a. S0 unlock battery switch→flashing Red light b. Battery error→flashing Red light
Power Supply	Type	DC 12V/2A/24W for USB / Cradle
Operating System	OS	Android 5.1.1 (Linux Kernel 3.10)
Dimension	L x W x T	259.9 x 175.9 x 17.7mm
Weight	Pad only	838g (without any optional devices attached)
Certificate	-	FCC/CE
Battery Pack Operation time	Main battery(1S2P)	8 hours @ 7900mAh
Coin Battery	RTC Battery	160mAh
Battery Pack Charging time	Main battery (1S2P)	Power ON: 5 hours Power OFF: 3.3 hours
IP Rating	Body unit	IP54 (front panel only)
Drop Impact Resistance	-	1.2m
Temperature	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)
	Storage Temperature	-20°C ~ 60°C (-4°F ~ 140°F)
Humidity	Operating Humidity	0~90%RH (no condensation)
	Storage Humidity	0~95%RH (no condensation)

Integrated Devices (Optional)		
Barcode Scanner (Optional)	Type	Honeywell 2D Barcode scanner
	Interface	UART
3G Module (Reserved)	Type	3.75G module IC supports SIM card interface (on board)
	Interface	USB
NFC Module (Reserved)	Type	NXP N-P300
	Interface	I2C
Rear Camera	Type	5M pixels camera module with autofocus function on the back cover
	Interface	USB
MSR Module	Type	Meet ISO 7811, support AAMVA / JIS II format, support single / dual / triple tracks
	Interface	USB
Smart Card Reader Module	Type	USB port (meet ISO 7816 & EMV Level 1 & 2 Certification)
	Interface	USB
External I/O Ports		
DC-IN Jack	Type	DC-IN Jack x 1
Cradle Connector	Type	POGO pins (1x10 pins) x 1
USB	Type	Standard USB (Type A) x1 for external expansion
SD (Secure Digital)	Type	MicroSD Slot for internal memory expansion
SIM	Type	SIM Card Slot for cellular network services
Audio Jack	Type	Audio Jack (3.5mm) x1
External Buttons (for side I/O & front panel)		
Power Button	Type	Power Button x1
Scan Button	Type	2 x Scan buttons (left & right)

2.6 Lite Cradle Specifications

Lite Cradle		
Cradle Connector	Type	POGO pins (1 x 10 pins) x 1
	Interface	USB 2.0/Power/GND
DC-IN Jack	Type	DC 12V IN x 1
USB	Type	Standard USB 2.0 port (Type A) x 2
COM	Type	R-J45 with 12V/5V/RI x 1
COM	Type	D-Sub 9 with 12V/5V/RI x 1
LAN (10/100 Mbps) **or DWR** (Cash Drawer)	Type	RJ-45 x 1
	Type	RJ-11 with 12V/1A x 1
DIP Switch	-	LAN Port and Cash Drawer selection
Kensington Security Lock Slot	Type	1
Lock Switch	-	Fixing between Integrated Pad and Cradle
AC Power Adapter	Type	12V/5A/60W AC Power Adapter x 1
Dimension	L x W x T	220 x 217.23 x 131.65mm
Weight	Lite Cradle only	About 858g

Note: The functions of Ethernet LAN & Cash Drawer are co-layout and can be selected by DIP Switch.



2.7 OS Specifications

OS	Description
Android 5.1.1	Android 5.1.1 (Linux Kernel 3.10)

2.8 API Specification

- Cash Drawer API

2.9 Safety Precautions

Before operating this system, read the following information carefully to protect your systems 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-5106 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
   - Avoid installing your MH-5106 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-5106 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.
   - Protect your MH-5106 from strong vibrations which may cause hard disk failure.
   - 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 you turn 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:

- Pad Function Buttons and I/O Ports
- Lite Cradle I/O Ports Diagram
- Pad Main Board Component Locations
- Pad Mainboard Connectors Quick Reference Table
- Setting Pad Main Board Connectors
- Daughter Board MR-5100RA-5 and MR-5100RA-2 Connectors Quick Reference Table
- Setting Daughter Board MR-5100RA-5 Connectors and Jumpers
- Setting Daughter Board MR-5100RA-2 Connectors

3.1 Pad Function Buttons and I/O Ports

3.1.1 Power Button

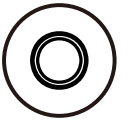
To turn on the system, press the Power Button on the right side of the Pad briefly.

Power Button

ACTION	ASSIGNMENT
Press	0V
Release	+3.3V

3.1.2 DC-IN Port

Port Name: DC-IN
Description: DC Power-In Port. The DC-IN Port is located on the right side of the Pad.



DC-IN

PIN	ASSIGNMENT	PIN	ASSIGNMENT
0	+12V	2	GND
1	+12V	3	GND

3.1.3 USB Port

Port Name: USB1
Description: USB Type A Port (Side I/O)

USB1

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+5V (Max. current: 0.5A)	3	D+
2	D-	4	GND

Note: The USB1 port is provided with Standby power 5V.

3.1.4 Audio Port

AUDIO1

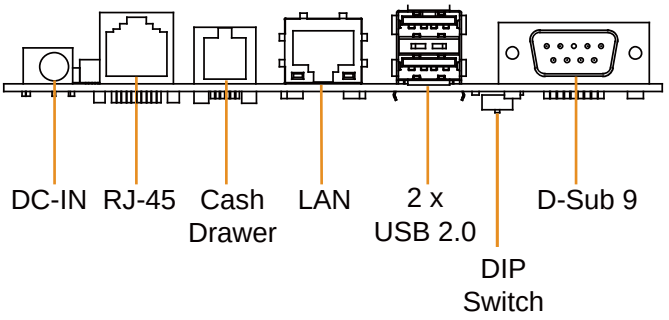
Port Name: AUDIO1
Description: Audio Port located on the top right side of the Pad.

PIN	ASSIGNMENT
1	LEFT
2	RIGHT
3	GND
4	GND
5	HP_DET

3.2 Lite Cradle I/O Ports Diagram

3.2.1 I/O Ports Diagram

The I/O ports are located on the bottom side of the Lite Cradle.



3.3 Pad Main Board Component Locations

3.3.1 Top View of Pad Main Board Component Locations

M/B: MB-5106

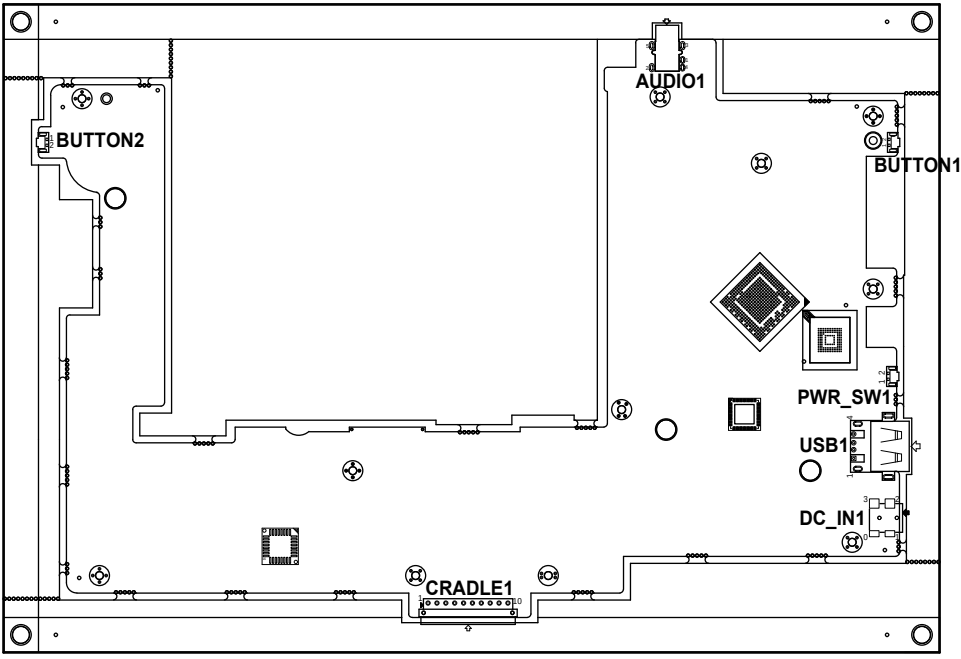


Figure 3-1. MB-5106 Main Board Component Locations (Top View)

	**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 MH-5106 is properly grounded.
	**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.

3.3.2 Bottom View of Pad Main Board Component Locations

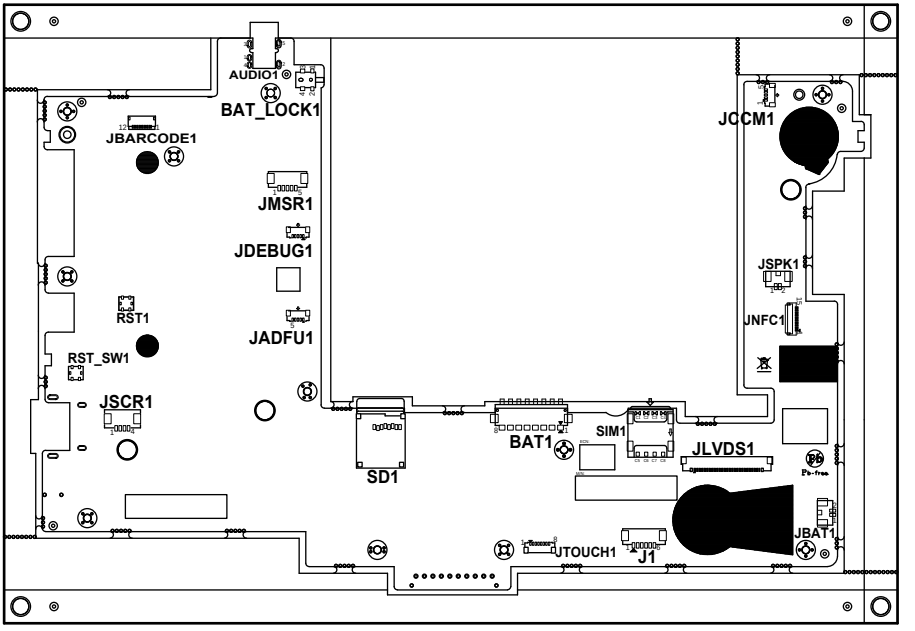


Figure 3-2. MB-5106 Main Board Component Locations (Bottom View)

3.4 Pad Mainboard Connectors Quick Reference Table

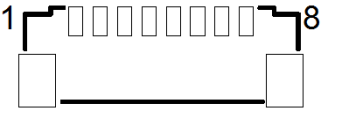
CONNECTOR Description	NAME
Touch Screen Connector	JTOUCH1
NFC Connector	JNFC1
LVDS Connector	JLVDS1
RTC Battery Connector	JBAT1
Earphone Jack Connector	AUDIO1
Speaker Connector	JSPK1
Barcode Scanner Connector	JBARCODE1
Left Scan Button	BUTTON1
Right Scan Button	BUTTON2
Power Button	PWR_SW1
Battery Connector	BAT1
DC IN Jack Connector	DC_IN1
Cradle Connector	CRADLE1
MCU F/W Update Connector	J1
Battery Lock Switch Button	BAT_LOCK1
MicroSD Card Connector	SD1
CMOS Front Camera Connector	JCCM1
Universal Serial Bus 2.0 Connector	USB1
MSR Connector	JMSR1
SCR Connector	JSCR1
SIM Card Connector	SIM1
Reset Button	RST_SW1
ADFU Button	RST1
Debug Connector	JDEBUG1
ADFU Connector	JADFU1

3.5 Setting Pad Main Board Connectors

3.5.1 Touch Panel Connector (JTOUCH1)

Connector Location: JTOUCH1 (rear side of mainboard)
Description: Touch Panel Connector

PIN	ASSIGNMENT
1	V3P3S_TCH
2	GND
3	GND
4	I2C2_Touch_SCL
5	I2C2_Touch_SDA
6	GND
7	TOUCH_INT_R
8	TOUCH_RST_R

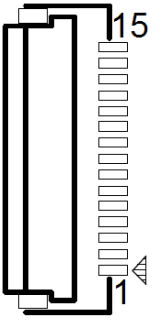


JTOUCH1

3.5.2 NFC Connector (JNFC1)

Connector Location: JNFC1 (rear side of mainboard)
Description: NFC (Near Field Communication) Connector

PIN	ASSIGNMENT
15	GND
14	VDD_IO
13	VBAT
12	SWP_PWR
11	DWL_REQ
10	WakeUp
9	GND
8	I2C_SCL
7	I2C_SDA
6	VDD_SIM
5	IRQ
4	VCC_BOOST
3	NC
2	GND
1	VBAT



JNFC1

3.5.3 LVDS Connector (JLVDS1)

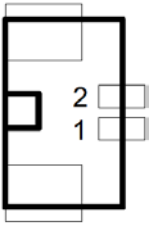
Connector Location: JLVDS1 (rear side of mainboard)
Description: LVDS (Low-Voltage Differential Signaling) Connector

JLVDS1

PIN	ASSIGNMENT
1	NC
2	VDD
3	VDD
4	NC
5	NC
6	NC
7	NC
8	LVDS_A_N0
9	LVDS_A_P0
10	GND
11	LVDS_A_N1
12	LVDS_A_P1
13	GND
14	LVDS_A_N2
15	LVDS_A_P2
16	GND
17	LVDS_A_CLK_N
18	LVDS_A_CLK_P
19	GND
20	LVDS_A_N3
21	LVDS_A_P3
22	GND
23	NC
24	NC
25	GND
26	NC
27	SEL
28	GND
29	NC

PIN	ASSIGNMENT
30	NC
31	GND
32	GND
33	GND
34	NC
35	LVDS_BKLT_CTRL
36	NC
37	NC
38	VLED
39	VLED
40	VLED

3.5.4 RTC Battery Connector (JBAT1)



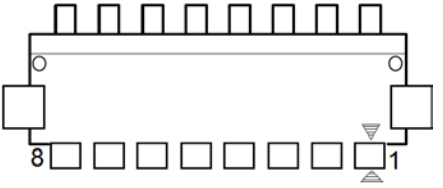
JBAT1

Connector Location: JBAT1 (rear side of mainboard)
Description: RTC (Real-Time Clock) Battery Connector
The RTC battery provides power supply for the internal real-time clock and calendar.

PIN	ASSIGNMENT
2	GND
1	VCC

3.5.5 Battery Connector (BAT1)

Connector Location: BAT1 (rear side of mainboard)
Description: Battery Connector



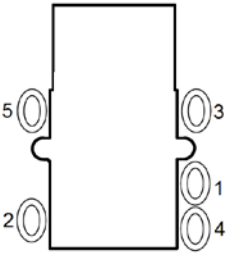
BAT1

PIN	ASSIGNMENT
1	BT+
2	BT+
3	BAT1_SENSE
4	BAT_DET
5	GND
6	BAT_SCL
7	BAT_SDA
8	GND

3.5.6 Earphone Jack Connector (AUDIO1)

Connector Location: AUDIO1 (top side of mainboard)
Description: Earphone Jack Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
5	HP_DET	3	GND
2	RIGHT	1	LEFT
-	-	4	GND

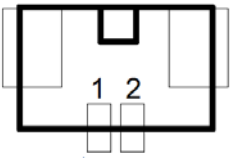


AUDIO1

3.5.7 Speaker Connector (JSPK1)

Connector Location: JSPK1 (rear side of mainboard)
Description: Speaker Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	SPK-	2	SPK+

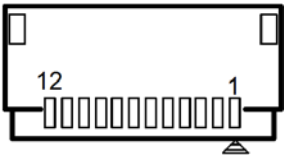


JSPK1

3.5.8 Barcode Scanner Connector (JBARCODE1)

Connector Location: JBARCODE1 (rear side of mainboard)
Description: Barcode Scanner Connector

PIN	ASSIGNMENT
1	NC
2	VCC3_3
3	GND
4	RXD
5	TXD
6	NC
7	NC
8	NC
9	Buzzer
10	NC
11	Wake up
12	Trigger

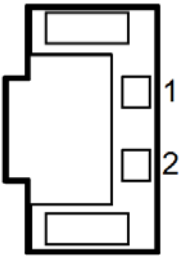


JBARCODE1

3.5.9 Left Scan Button (BUTTON1)

Connector Location: BUTTON1 (top side of mainboard)
Description: Left Scan Button

PIN	ASSIGNMENT
1	GND
2	SCAN_EN_SW

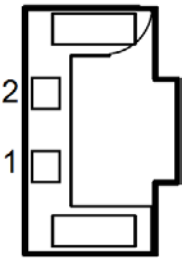


BUTTON1

3.5.10 Right Scan Button (BUTTON2)

Connector Location: BUTTON2 (top side of mainboard)
Description: Right Scan Button

PIN	ASSIGNMENT
1	GND
2	SCAN_EN_SW

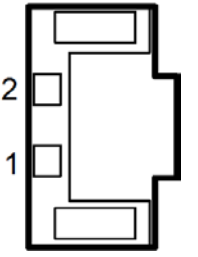


BUTTON2

3.5.11 Power Button (PWR_SW1)

Connector Location: PWR_SW1 (top side of mainboard)
Description: Power Button

ACTION	ASSIGNMENT
Press	0V
Release	3.3V

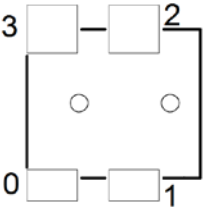


PWR_SW1

3.5.12 DC IN Jack Connector (DC_IN1)

Connector Location: DC_IN1 (top side of mainboard)
Description: DC IN Jack Connector

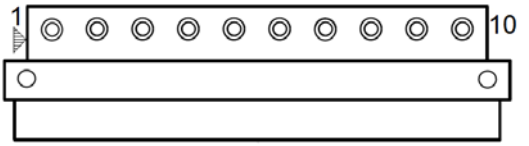
PIN	ASSIGNMENT	PIN	ASSIGNMENT
3	GND	2	GND
0	+12V	1	+12V



DC_IN1

3.5.13 Cradle Connector (CRADLE1)

Connector Location: CRADLE1 (rear side of mainboard)
Description: Cradle Connector

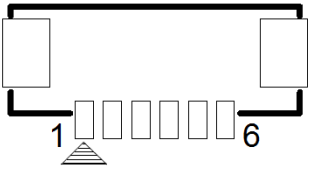


CRADLE1

PIN	ASSIGNMENT
1	GND
2	+12V
3	+12V
4	GND
5	USB_DP
6	USB_DP
7	USB_DN
8	USB_DN
9	+5V
10	GND

3.5.14 MCU F/W Update Connector (J1)

Connector Location: J1 (rear side of mainboard)
Description: MCU Firmware Update Connector



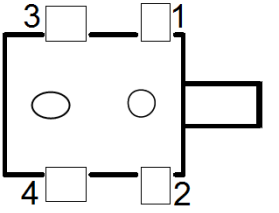
J1

PIN	ASSIGNMENT
1	MCU_MISO
2	3.3V
3	MCU_SCK
4	MCU_MOSI
5	MCU_RST
6	GND

3.5.15 Battery Lock Switch Button (BAT_LOCK1)

Connector Location: BAT_LOCK1 (rear side of mainboard)
Description: Battery Lock Switch Button

PIN	ASSIGNMENT	PIN	ASSIGNMENT
3	NC	1	GND
4	NC	2	BAT_LOCK

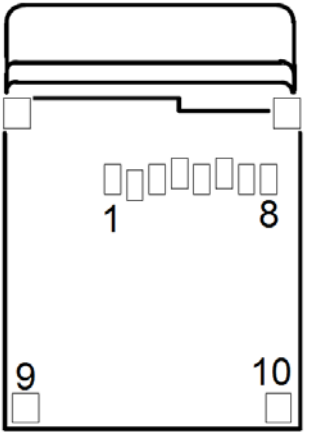


BAT_LOCK1

3.5.16 MicroSD Card Connector (SD1)

Connector Location: SD1 (rear side of mainboard)
Description: MicroSD (Secure Digital) Card Connector

PIN	ASSIGNMENT
1	DAT2
2	CD/DAT3
3	CMD
4	VDD
5	CLK
6	GND
7	DATA0
8	DAT1
9	CARD DETECT
10	GND

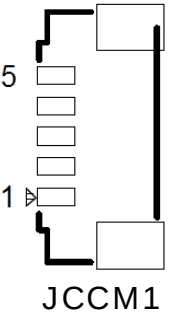


SD1

3.5.17 CMOS Front Camera Connector (JCCM1)

Connector Location: JCCM1 (rear side of mainboard)
Description: CMOS Front Camera Connector

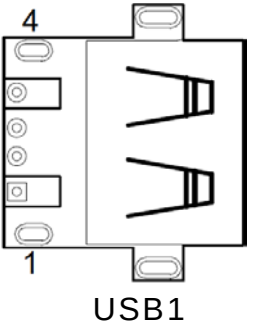
PIN	ASSIGNMENT
5	GND
4	GND
3	D+
2	D-
1	5V



3.5.18 USB 2.0 Connector (USB1)

Connector Location: USB1 (right side of mainboard)
Description: USB 2.0 Connector

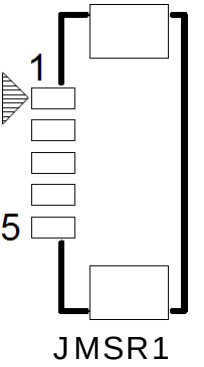
PIN	ASSIGNMENT
4	GND
3	D+
2	D-
1	+5V



3.5.19 MSR Connector (JMSR1)

Connector Location: JMSR1 (rear side of mainboard)
Description: MSR (Magnetic-Stripe Card Reader) Connector

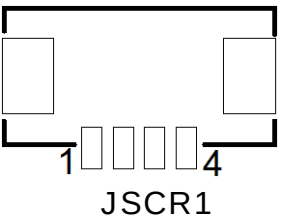
PIN	ASSIGNMENT
1	5V
2	D-
3	D+
4	GND
5	GND



3.5.20 SCR Connector (JSCR1)

Connector Location: JSCR1 (rear side of mainboard)
Description: SCR Connector

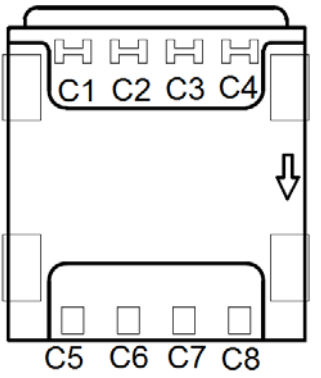
PIN	ASSIGNMENT
1	5V
2	D-
3	D+
4	GND



3.5.21 SIM Card Connector (SIM1)

Connector Location: SIM1 (rear side of mainboard)
Description: SIM (Subscriber Identity Module) Card Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
C5	GND	C1	VSIM
C6	VPP	C2	RST
C7	DATA	C3	CLK
C8	RSV	C4	RSV



SIM1

3.5.22 Reset Button (RST_SW1)

Connector Location: RST_SW1 (rear side of mainboard)
Description: Reset Button

ACTION	ASSIGNMENT
Press	1.8V
Release	Floating


RST_SW1

3.5.23 ADFU Button (RST1)

Connector Location: RST1 (rear side of mainboard)
Description: ADFU Button

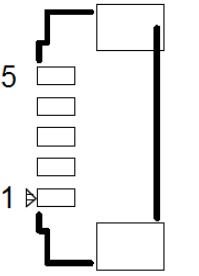
ACTION	ASSIGNMENT
Press	0V
Release	3.1V

RST1

3.5.24 Debug Connector (JDEBUG1)

Connector Location: JDEBUG1 (rear side of mainboard)
Description: Debug Connector

PIN	ASSIGNMENT
5	GND
4	GND
3	RXD
2	TXD
1	3.3V

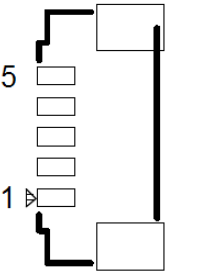


JDEBUG1

3.5.25 ADFU Connector (JADFU1)

Connector Location: JADFU1 (rear side of mainboard)
Description: ADFU Connector

PIN	ASSIGNMENT
5	GND
4	GND
3	D+
2	D-
1	5V



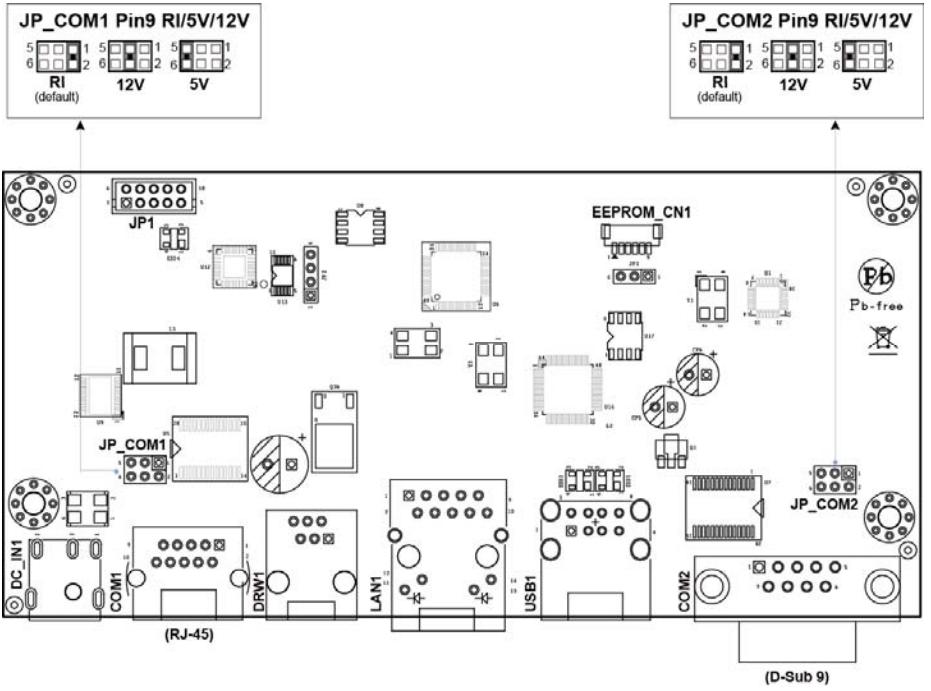
JADFU1

3.6 Daughter Board MR-5100RA-5 and MR-5100RA-2 Connectors Quick Reference Table

JUMPER Description	NAME
RJ-45 COM Port Pin9 Definition Selection Guide (MR-5100RA-5)	JP_COM1
D-SUB 9 COM Port Pin9 Definition Selection Guide (MR-5100RA-5)	JP_COM2

CONNECTOR Description	NAME
COM Port For Barcode Scanner	COM Port for Barcode Scanner
RJ-45 COM Port	RJ-45
Universal Serial Bus 2.0 Connector (Dual Layers)	USB1
Cash Drawer Connector	DRW1
Local Area Network Connector	LAN1
DC IN Jack Connector	DC_IN1
LAN & Cash Drawer Function Switch (MR-5100RA-5 Bottom Side)	SW1
Lite Cradle Connector (MR-5100RA-2)	CRADLE1

3.6.1 Jumper Settings of Daughter Board MR-5100RA-5



Note 1: For Pad built in with Android system: When the Lite Cradle is joined with Integrated Pad, the RJ-45 and D-Sub 9 COM ports shown on Pad system are actually the COM port for Barcode Scanner of Pad and RJ-45 port of daughter board respectively, because the Lite Cradle's COM ports are deployed according to OS Image built by Protech and the placement of COM Port for Barcode Scanner has been used by Pad system. Please refer to SDK (Software Development Kit) for the definitions of COM Ports.

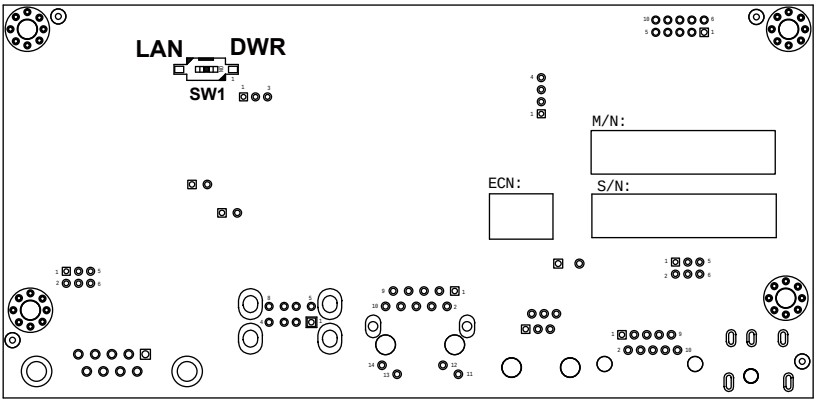


Figure 3-3. MR-5100RA-5 Daughter Board Component Locations (Bottom View)

3.6.2 Daughter Board MR-5100RA-2 Connectors Location

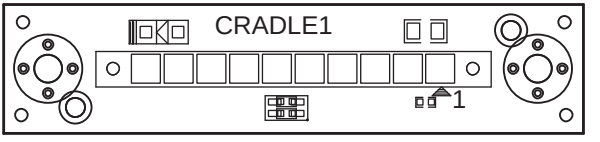


Figure 3-4. MR-5100RA-2 Daughter Board Component Locations (Top View)

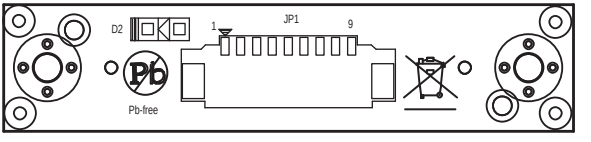


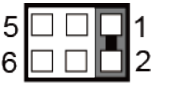
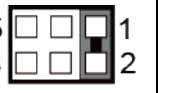
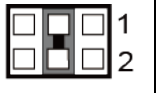
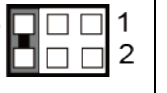
Figure 3-5. MR-5100RA-2 Daughter Board Component Locations (Bottom View)

3.7 Setting Daughter Board MR-5100RA-5 Connectors and Jumpers

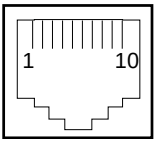
3.7.1 COM Ports Pin9 Definition Selection Guide (JP_COM1 and JP_COM2)

Jumper Location: JP_COM1 and JP_COM2

Description: COM Ports Pin9 RI/+5V/+12V Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
RI	***1-2 (Default Setting)***	 JP_COM1	 JP_COM2
12V	3-4	 JP_COM1	 JP_COM2
5V	5-6	 JP_COM1	 JP_COM2

3.7.2 COM Port For Barcode Scanner



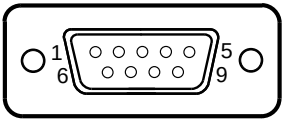
COM Port for Barcode Scanner

COM Port for Barcode Scanner Connector (RS-232) Pin Assignment:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI/5V/12V
5	GND	-	

Note: COM Port For Barcode Scanner Pin 9 is selectable for RI, +5V or +12V by jumper setting. Default setting is RI. Please see "**COM Ports Pin9 Definition Selection Guide**" section for selection details.

3.7.3 RJ-45 COM Port (RJ-45)



RJ-45

RJ-45 COM Connector (RS-232) Pin Assignment:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI/5V/12V
5	GND	-	

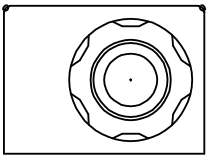
Note: RJ-45 COM Port Pin 9 is selectable for RI, +5V or +12V by jumper setting. Default setting is RI. Please see "**COM Ports Pin9 Definition Selection Guide**" section for selection details.

3.7.4 DC-IN Port (DC_IN1)

Port Name: DC_IN1

Description: DC Power-In Port. The DC-IN Port is located on the bottom side of Lite Cradle.

PIN	ASSIGNMENT
1	VCC12V
2	GND
3	GND



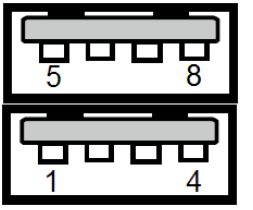
DC_IN1

3.7.5 Dual USB Ports (USB1)

Port Name: USB1

Description: Dual USB 2.0 Type A Connectors

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5V	5	VCC5V
2	USB_DN	6	USB_DN
3	USB_DP	7	USB_DP
4	GND	8	GND



USB1

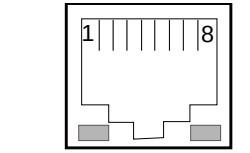
Note: The top USB 2.0 connector pin assignments are the same as the one below.

3.7.6 Local Area Network (LAN) Port (LAN1)

Port Name: LAN1

Description: a Giga LAN RJ-45 Port

PIN	ASSIGNMENT
1	MX0+
2	MX0-
3	MX1+
4	MX1-
5	CT1
6	CT2
7	NC
8	NC
9	NC
10	NC
11	SPEED_LED
12	VCC3.3V
13	LINK_ACT_LED
14	VCC3.3V



LAN1

LAN LED Status

There are 2 LAN LED indicators for LAN on the bottom side of the Lite Cradle. By observing their status, you can know the status of the Ethernet connection.

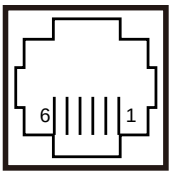
LAN LED Indicator	Color	Status	Description
Left Side LED	Orange	Blink	Giga LAN connection is activated.
	Green	Blink	10/100Mbps LAN connection is activated.
Right Side LED	Green	On	LAN switch/hub connected.

3.7.7 Cash Drawer Port (DRW1)

Port Name: DRW1

Description: RJ-11 Cash Drawer Port

PIN	ASSIGNMENT
1	GND
2	DRAWER_OPEN
3	DRAWER_SENSE
4	VCC12V
5	NC
6	GND

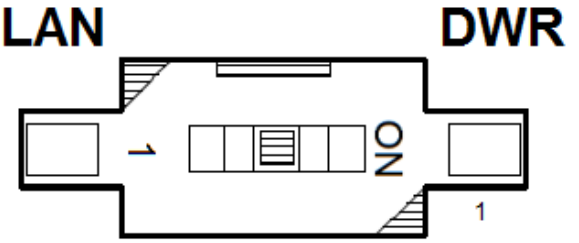


DRW1

3.7.8 LAN & Cash Drawer Function Switch (SW1)

Connector Name: SW1

Description: LAN Port and Cash Drawer function selection



SW1

PIN	ASSIGNMENT
1	CASH DRAWER
2	LAN

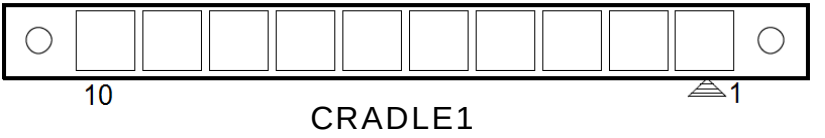
Note: Users need to use a ball point pen or a pin to toggle the DIP switch.
Default: LAN

3.8 Setting Daughter Board MR-5100RA-2 Connectors

3.8.1 Lite Cradle Connector (CRADLE1)

Connector Name: CRADLE1

Description: Lite Cradle Connector



PIN	ASSIGNMENT
1	GND
2	CRA_DCIN
3	CRA_DCIN
4	GND
5	USB_DP
6	USB_DP
7	USB_DN
8	USB_DN
9	V5P0S
10	GND

Appendix A System Diagrams

This appendix contains exploded diagrams and part numbers of the Pad and Lite Cradle for MH-5106 system.

The following topics are included:

Exploded Diagrams for Integrated Pad

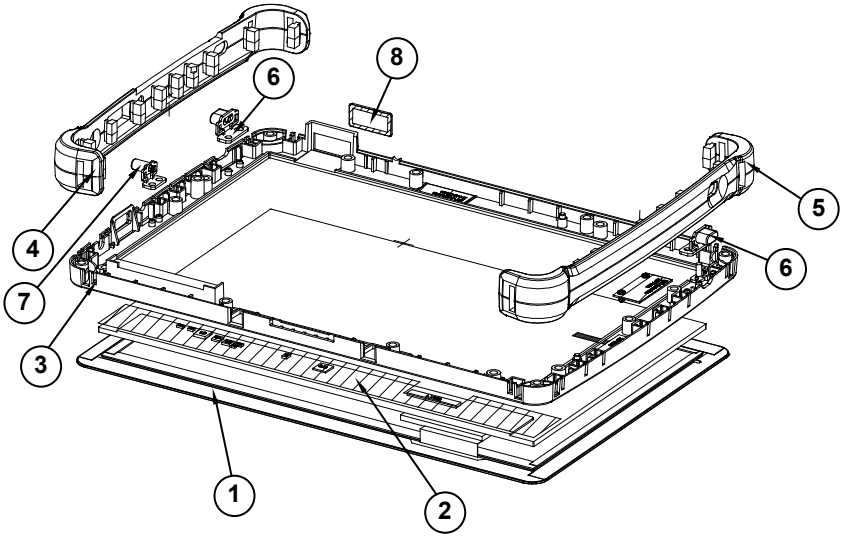
- Exploded Diagram for Top Cover, Touch Panel and Panel Assembly
- Exploded Diagram for Pad PCBA Assembly
- Exploded Diagram for Bottom Cover Assembly
- Exploded Diagram for Camera Module, Barcode Scanner Module and NFC Module Assembly
- Exploded Diagram for Back Cover Assembly
- Exploded Diagram for Smart Card Reader Assembly

Exploded Diagrams for Lite Cradle

- Exploded Diagram for Cradle Top Cover Assembly
- Exploded Diagram for Cradle PCBA & Bottom Cover Assembly

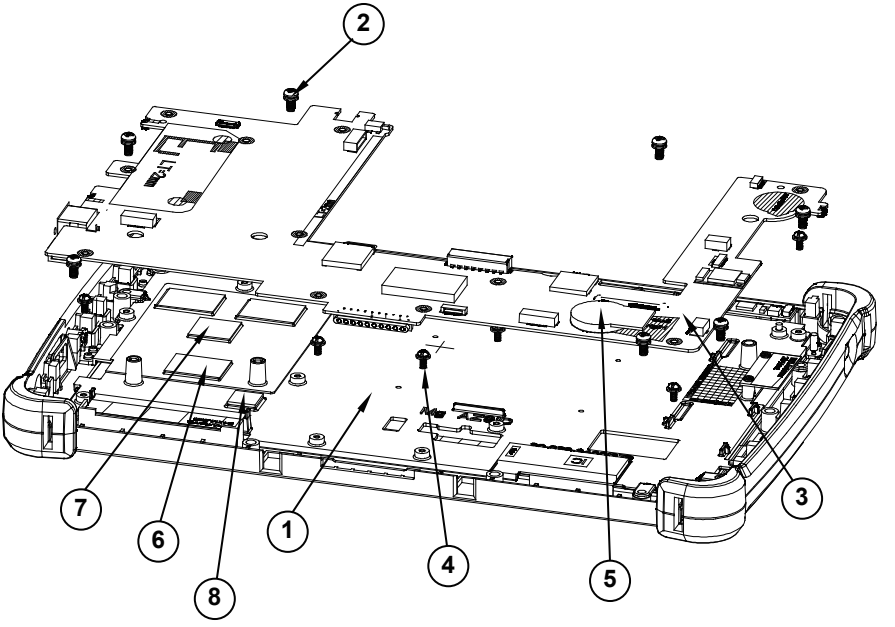
Integrated Pad Exploded Diagrams

Exploded Diagram For Top Cover & Touch Panel & Panel Assembly



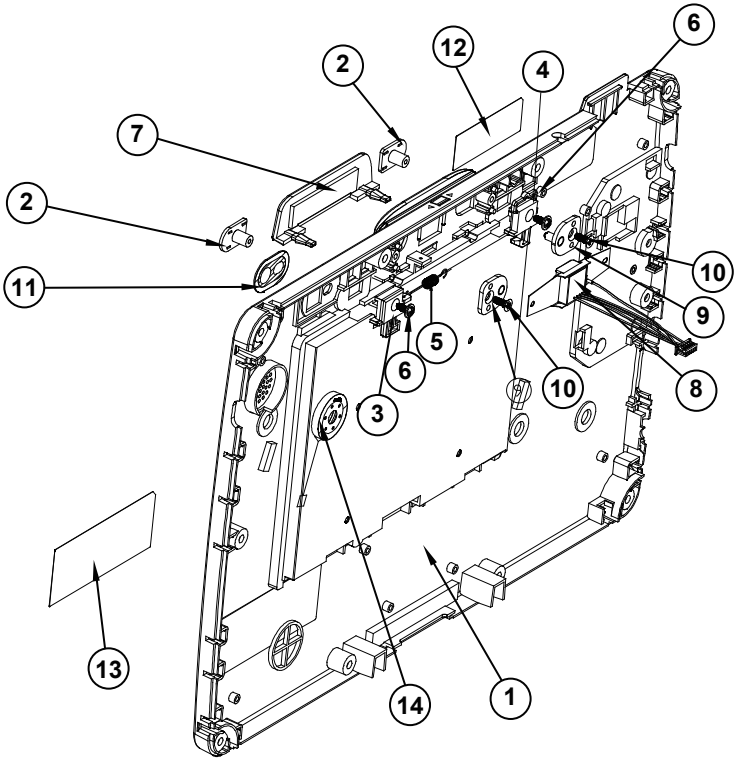
ITEM	Description	Part No.	Q'ty
1	Touch Panel	52-380-14164123	1
2	Panel	52-351-12101028	1
3	MH-5100 Top Cover	30-002-12210378	1
4	MH-5100 Bumper Right	30-013-48300378	1
5	MH-5100 Bumper Left	30-013-48200378	1
6	MH-5100 Barcode Button	30-046-28110378	2
7	MH-5100 Power Button	30-046-28210378	1
8	MH-5100 Barcode Lens	30-021-10130378	1

Exploded Diagram For Pad PCBA Assembly



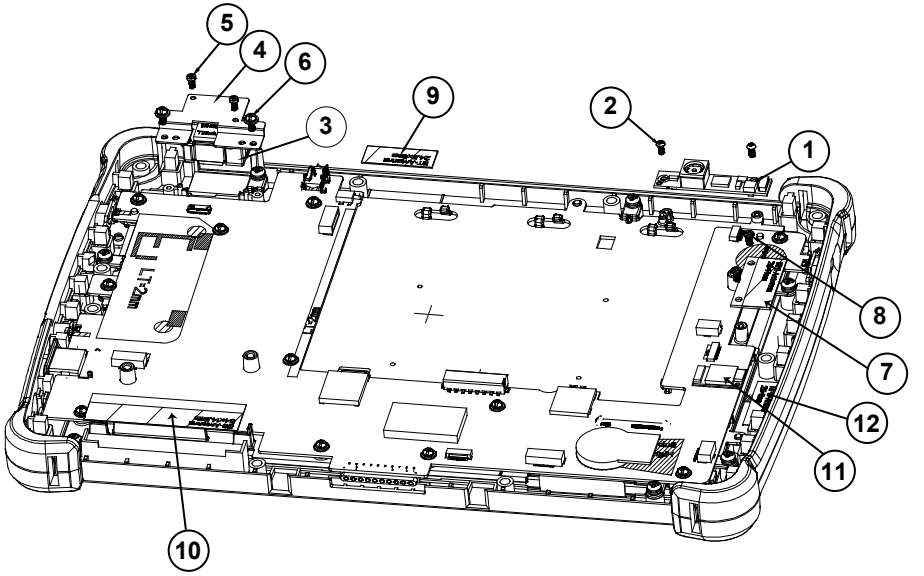
ITEM	Description	Part No.	Q'ty
1	MH-5100 Panel Holder	80-029-34001423	1
2	Round Head With Spring Washer Screw (M2.5x0.45Px6mm)	22-235-25006011	7
3	MH-5106 PCBA	MB-5106RA-x1N	1
4	Round Head With Spring Washer Screw (M2x0.4Px5mm)	22-232-20005311	11
5	Sub-Battery	27-061-37801071	1
6	Thermal Pad 20x15mm	81-006-82015001	3
7	Thermal Pad 15x15mm	81-006-81515005	1
8	Thermal Pad 10x10mm	81-006-81010003	1

Exploded Diagram For Bottom Cover Assembly



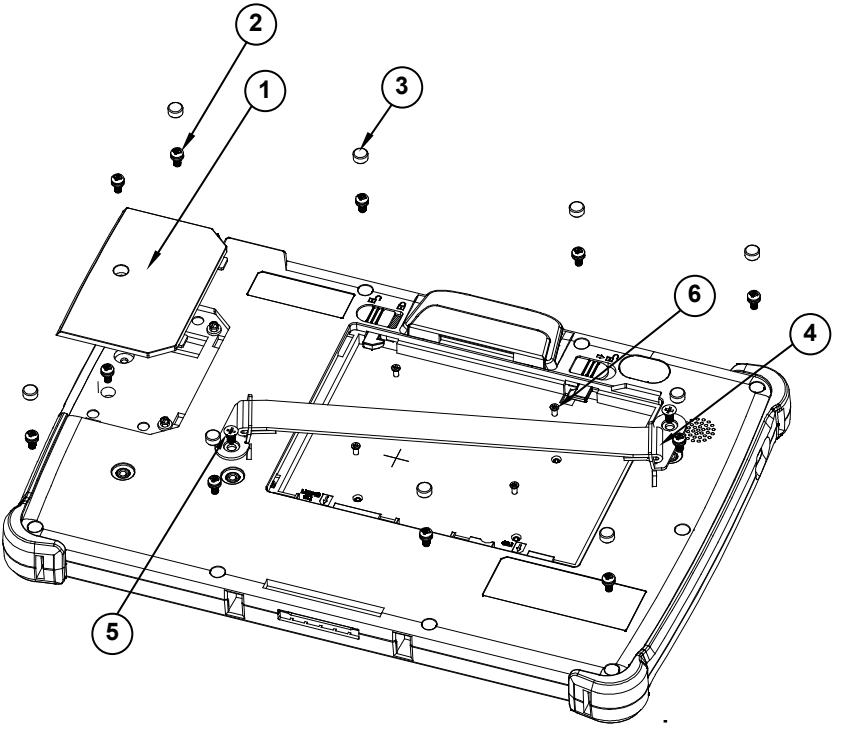
ITEM	Description	Part No.	Q'ty
1	MH-5100 Bottom Cover	30-002-12110378	1
2	MH-5100 Slide Key	30-002-28410378	2
3	MH-5100 Battery Hook	90-019-04110378	1
4	MH-5100 Battery Hook (Lock)	90-019-04210378	1
5	MH-5100 Battery Lock Spring	23-002-00000332	1
6	Round Washer Head Screw #1/T2.0x5mm	22-132-20005011	2
7	MH-5100 MSR-Bumper-Rubber	30-013-48100378	1
8	MSR Module	N/A	1
9	PA-8225 MSR Plate Pin (IDTECH)	20-005-07001342	2
10	Flat Head Screw #1 (T2.6x6mm)	22-112-26006011	2
11	Camera Lens	30-021-10330378	1
12	Warning Label	94-017-01601378	1
13	Rating Label	94-017-01602378	1
14	Speaker	27-021-37802071	1

Exploded Diagram For Camera Module, Barcode Scanner Module and NFC Module Assembly



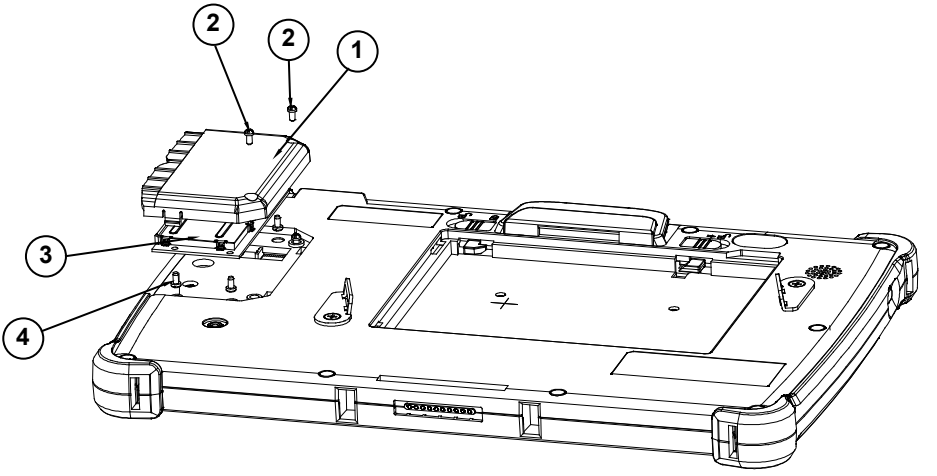
ITEM	Description	Part No.	Q'ty
1	Camera PCBA	52-151-08040533	1
2	Round Head Screw φ3.3/#1/M2x0.4Px4mm	22-232-20004811	2
3	Barcode Module	52-820-36800111	1
4	MH-5100 Barcode Fix Plate	80-005-03001378	1
5	Fillister Head Screw T1.7xL4mm	22-175-17004011	2
6	Round Head With Spring Washer Screw (M2x0.4px5mm)	22-232-20005311	2
7	WIFI Antenna	27-029-37805071	1
8	Fillister Head Screw M2x0.4Px2.5mm	22-272-20004011	2
9	Bluetooth Antenna	27-029-37802071	1
10	3G Antenna	27-029-37803071	1
11	NFC Module	52-151-08030035	1
12	MH-5100 NFC Antenna	52-810-00140011	1

Exploded Diagram For Back Cover Assembly



ITEM	Description	Part No.	Q'ty
1	MH-5100 Decoration Cover	30-002-28110378	1
2	Round Head With Spring Washer Screw (M2.5x0.45Px6mm)	22-235-25006011	11
3	MH-5100 –Screw-Hole-Plug	30-013-06100378	9
4	MH-5100 Strap Bracket	80-006-06001378	2
5	Pan Head Screw M3x0.5Px6mm	22-220-30006011	2
6	M2xL3mm Flat-Head-Screw	22-215-20003011	4

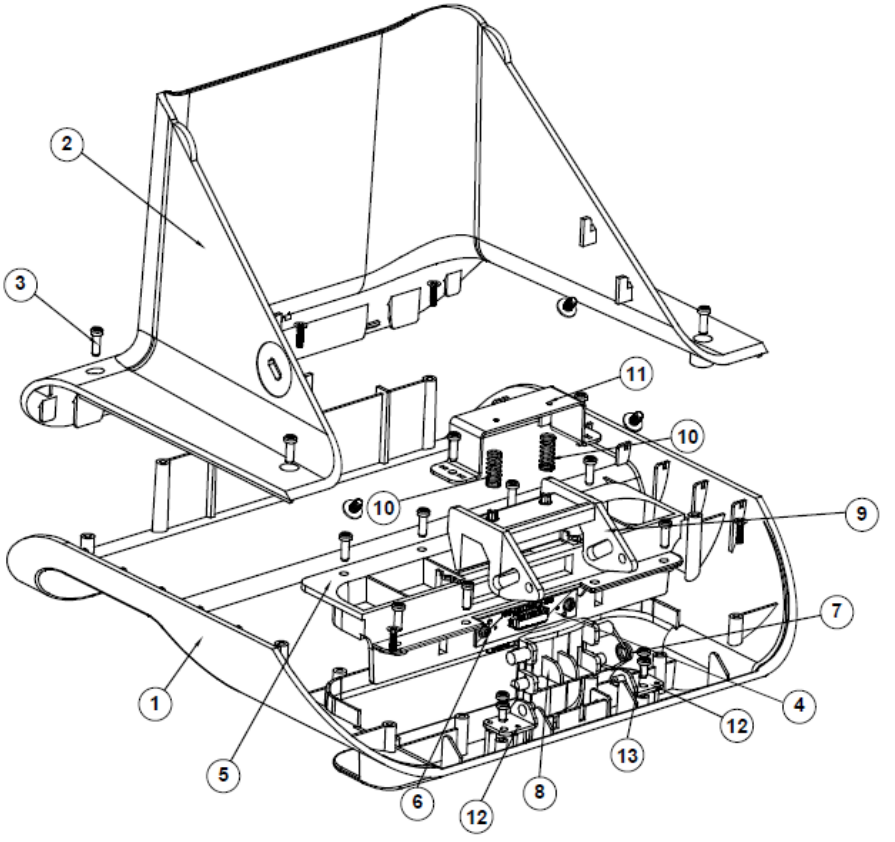
Exploded Diagram For Smart Card Reader Assembly



ITEM	Description	Part No.	Q'ty
1	MH-5100 Smart Card Cover	30-002-28610378	1
2	Round Head Screw φ3.3 / #1 / M2x0.4Px4mm	22-232-20004811	2
3	Smart Card Module	52-551-16000010	1
4	Pan Head Screw (T2.0x4mm)	22-125-20004011	4

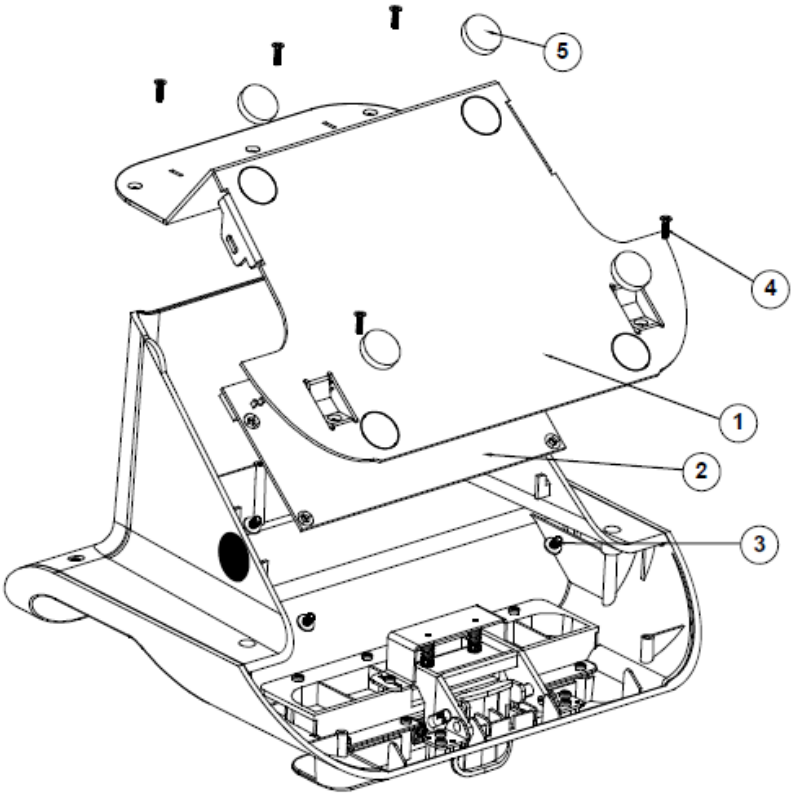
Lite Cradle Exploded Diagrams

Exploded Diagram For Cradle Top Cover Assembly



ITEM	Description	Part No.	Q'ty
1	MH-5100-Lite-Cradle-Top-Cover	30-002-28310378	1
2	MH-5100-Lite-Cradle-Rear-Cover	30-002-28210378	1
3	T2.6xL8mm Pan-Head-Screw	22-135-26008011	14
4	POGO Pin PCBA	10-625-01010025	1
5	MH-5100-Lite-Cradle-Hole-Cover	30-002-28510378	1
6	Pan Head screw (T2.0x4mm)	22-125-20004011	2
7	MH-5100-Lite-Cradle-Ejection-Spring	23-000-00010622	1
8	MH-5100-Lite-Cradle-Lock-Button	30-046-09230378	1
9	MH-5100-Lite-Cradle-Button-Hook	30-046-09130378	1
10	MT-590X Battery Lock Spring	23-000-01000132	2
11	MH-5100-Lite-Cradle-Lock-Spring-Cover	80-004-03001378	1
12	MH-5100-Lite-Cradle-Rotate-Plate	80-005-03002378	2
13	T2.3xL5mm Pan-Head-Screw	22-135-23005011	4

Exploded Diagram For Cradle PCBA & Bottom Cover Assembly



ITEM	Description	Part No.	Q'ty
1	MH-5100-Lite-Cradle-Metal-Plate	80-005-03003378	1
2	Lite Cradle PCBA	N/A	1
3	Round Washer Head Screw (M3x0.5Px6mm)	22-232-30006311	4
4	T2.6xL8mm Flat-Head-Screw	22-115-26008011	5
5	Rubber Foot φ=16x3.5mm (Black)	30-004-06800000	4