SRG-3352

IOT Gateway System

User's Manual 1st Ed

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Packing List

Before setting up your product, please make sure the following items have been shipped:

Item	Quantity
● SRG-3352	1

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the product page at AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1.   All cautions and warnings on the device should be noted.
2.   Make sure the power source matches the power rating of the device.
3.   Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4.   Always completely disconnect the power before working on the system's hardware.
5.   No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6.   If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7.   Always disconnect this device from any AC supply before cleaning.
8.   While cleaning, use a damp cloth instead of liquid or spray detergents.
9.   Make sure the device is installed near a power outlet and is easily accessible.
10.   Keep this device away from humidity.
11.   Place the device on a solid surface during installation to prevent falls
12.   Do not cover the openings on the device to ensure optimal heat dissipation.
13.   Watch out for high temperatures when the system is running.
14.   Do not touch the heat sink or heat spreader when the system is running
15.   Never pour any liquid into the openings. This could cause fire or electric shock.
16.   As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:

     i. Damaged power cord or plug

     ii. Liquid intrusion to the device

     iii. Exposure to moisture

     iv. Device is not working as expected or in a manner as described in this manual

     v. The device is dropped or damaged

     vi. Any obvious signs of damage displayed on the device

18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

FCC Statement

Warning!

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

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte.
Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

产品中有毒有害物质或元素名称及含量

AAEON System   QO4-381

Rev.A0

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
外壳	○	○	○	○	○	○
中央处理器 与内存	×	○	○	○	○	○
硬盘	×	○	○	○	○	○
液晶模块	×	×	○	○	○	○
光驱	×	○	○	○	○	○
触控模块	×	○	○	○	○	○
电源	×	○	○	○	○	○
电池	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。

○：表示该有毒有害物质在该部件所有均质材料中的含量均在
　　GB/T 26572标准规定的限量要求以下。

×：表示该有毒有害物质的某一均质材料超出了GB/T 26572的限量要求，然而该部件
　　仍符合欧盟指令2011/65/EU 的规范。

备注：
一、此产品所标示之环保使用期限，系指在一般正常使用状况下。
二、上述部件物质中央处理器、内存、硬盘、光驱、电源为选购品。
三、上述部件物质液晶模块、触控模块仅一体机产品适用。

Hazardous and Toxic Materials List

AAEON System   QO4-381 Rev.A0

Component Name	Hazardous or Toxic Materials or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Chromium (Cr(VI)) Hexavalent	Polybrominated biphenyls (PBBs)	Polybrominated diphenyl ethers (PBDEs)
PCB and Components	X	O	O	O	O	O
Wires & Connectors for Ext. Connections	X	O	O	O	O	O
Chassis	O	O	O	O	O	O
CPU & RAM	X	O	O	O	O	O
HDD Drive	X	O	O	O	O	O
LCD Module	X	X	O	O	O	O
Optical Drive	X	O	O	O	O	O
Touch Control Module	X	O	O	O	O	O
PSU	X	O	O	O	O	O
Battery	X	O	O	O	O	O

This form is prepared in compliance with the provisions of SJ/T 11364.

O: The level of toxic or hazardous materials present in this component and its parts is below the limit specified by GB/T 26572.

X: The level of toxic of hazardous materials present in the component exceed the limits specified by GB/T 26572, but is still in compliance with EU Directive 2011/65/EU (RoHS 2).

Notes:

1.   The Environment Friendly Use Period indicated by labelling on this product is applicable only to use under normal conditions.

2.   Individual components including the CPU, RAM/memory, HDD, optical drive, and PSU are optional.

3.   LCD Module and Touch Control Module only applies to certain products which feature these components.

Table of Contents

Chapter 1

Product Specifications

1.1   Specifications

System	
CPU	ARM Cortex-A8 RISC Processor 800 MHz
System Memory	Onboard DDR3L-SDRAM 8GB 1600MHz
Storage	8GB eMMC onboard
Power Requirement	9~30 VDC
Power Supply Type	DC-in
Power Consumption (Typical)	--
Dimensions	143mm (W) x 100mm (D) x 44mm (H)
Operating Temperature	0°C ~ 60°C
Operating Humidity	5~95% at 40°C, non-condensing
Certification	CE/FCC

I/O	
USB	USB 2.0 Type A x 1
	Micro USB x 1
LAN Port	RJ45 Gigabit Ethernet x 2
COM Port	RS-485 x 2

Expansion

Internal Expansion	Mini PCIe x 1
	USB port x 2
	NB-IoT 10 pin
	4pin wafer box
External Expansion	SIM Card Socket x 1
	Micro SD Socket x 1

Chapter 2

Hardware Information

2.1 Dimensions

Mechanical dimension drawings of the SRG-3352 showing:
- Top view with mounting holes
- Left side view with Micro SD and Micro SIM slots
- Top plate view with dimensions 100 (height) and 144 (width)
- Right side view with ANT 1 and ANT 2
- Front panel view (height 44) with: COM 1/2 (SG D2- D2+, SG D1- D1+), USB, Debug, ANT 3, connectors 1 2 3 4, LAN 2, LAN 1, ANT 4, Reset, DC 24V (+ − ⏚)
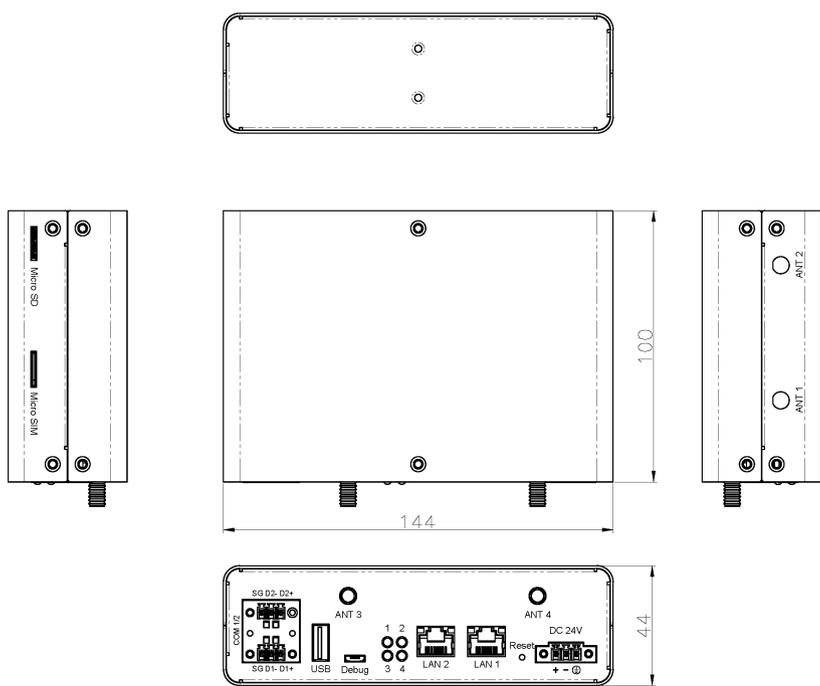
2.2 I/O Location
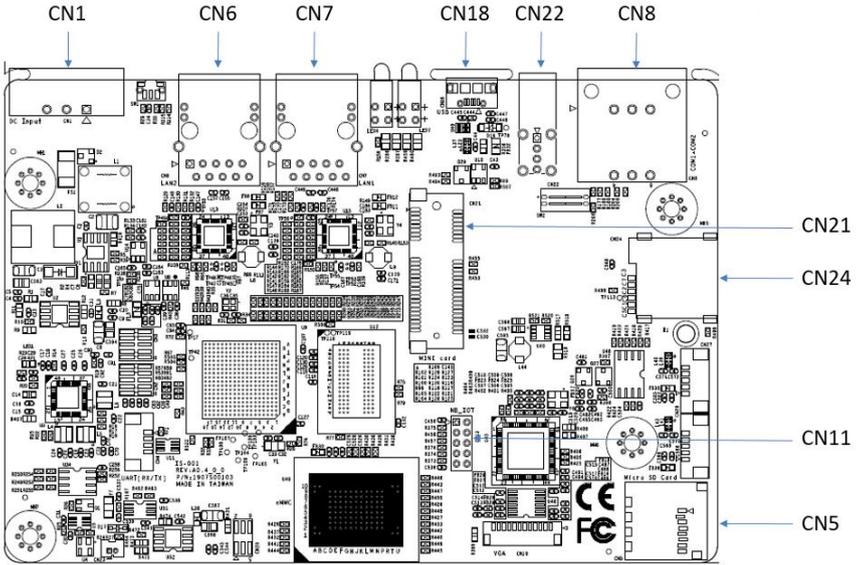
2.3   List of Connectors

The SRG-3352 features several connectors which can be configured for your application. This section details those connections and their specifications.
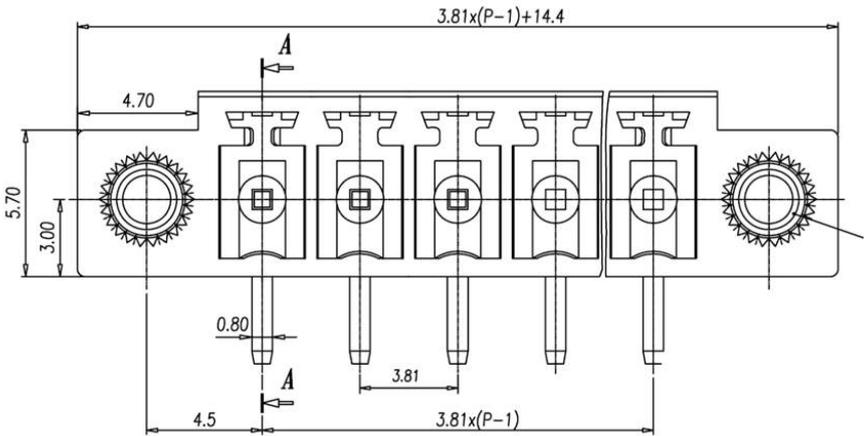
Label	Function
SW1	Reset Button
CN1	Power Input
CN6	RJ45 LAN Connector
CN7	RJ45 LAN Connector
CN8	RS-485 Connector x 2
CN11	NB-IoT 2x5P connector
CN18	Micro USB connector
CN21	Mini card slot
CN22	USB 2.0 Type A
CN24	Micro SIM card socket

2.3.1   Reset Button (SW1)
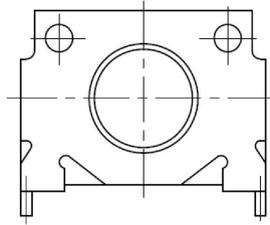
Position	Function
SW1 0	(default)
SW1 1	Reset

2.3.2   Power Input (CN1)

Pin	Signal Description
1	+12V DC
2	GND
3	GND

2.3.3 RJ45 LAN (CN6, CN7)
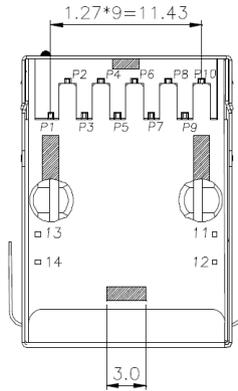
Pin	Signal Description	Pin	Signal Description
1	TD1 +	8	TD3 -
2	TD1 -	9	TD4 +
3	TD2 +	10	TD4 -
4	TD2 -	11	LED yellow+
5	CT	12	LED yellow-
6	CT	13	LED green+/ LED orange-
7	TD3 +	14	LED green-/ LED orange+

2.3.4 RS-485 Connector x2 (CN8)
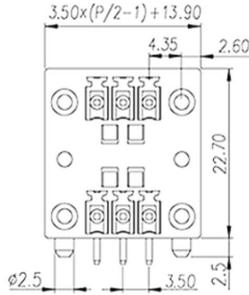
Pin	Signal Description
1	D+
2	D-
3	GND

2.3.5 Micro USB (CN18)
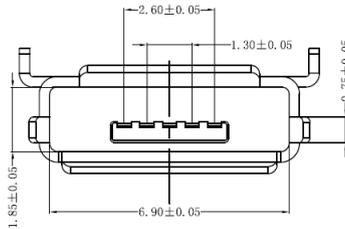
Pin	Signal Description	Pin	Signal Description
1	VCC	4	ID
2	D-	5	GND
3	D+		

2.3.6   Mini Card Slot (CN21)
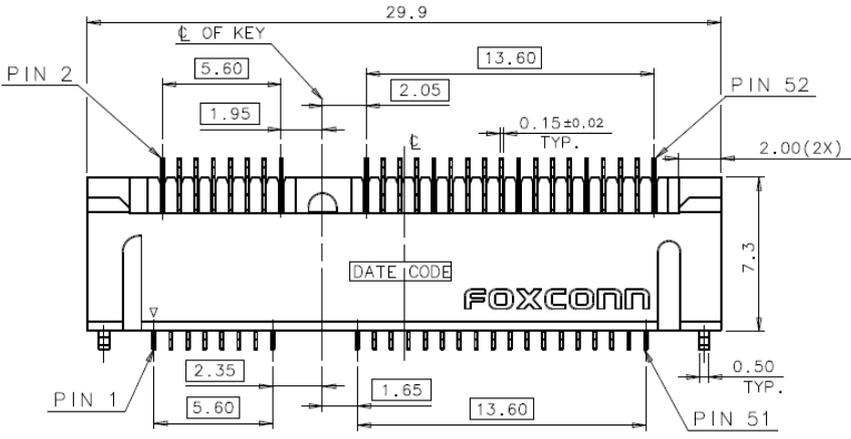
Pin	Signal Description	Pin	Signal Description
	Top Side		**Bottom Side**
1		2	3.3V
3	Reserved****	4	GND
5	Reserved****	6	1.5V
7	CLKREQ#	8	VCC**
9	GND	10	I/O**
11	REFCLK-	12	CLK**
13	REFCLK+	14	RST**
15	N/C or GND	16	VPP**
	Mechanical key		
17	Reserved	18	GND
19	Reserved	20	Reserved***
21	GND	22	PERST#
23	PERn0	24	+3.3Vaux
25	PERp0	26	GND
27	GND	28	+1.5V

Pin	Signal Description	Pin	Signal Description
Top Side		**Bottom Side**	
29	GND	**30**	SMB_CLK
31	PETn0	**32**	SMB_DATA
33	PETp0	**34**	GND
35	GND	**36**	USB_D-
37	Reserved*	**38**	USB_D+
39	Reserved*	**40**	GND
41	Reserved*	**42**	LED_WWAN#
43	Reserved*	**44**	LED_WLAN#
45	Reserved*	**46**	LED_WPAN#
47	Reserved*	**48**	+1.5V
49	Reserved*	**50**	GND
51	Reserved*	**52**	+3.3V

2.3.7 USB 2.0 Type A (CN22)
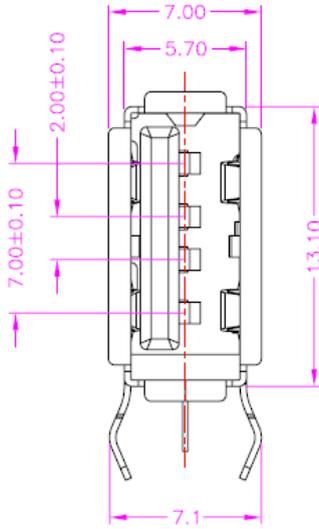
Pin	Signal Description
1	VCC
2	D-
3	D+
4	GND

2.3.8   Micro SIM Card Socket (CN24)
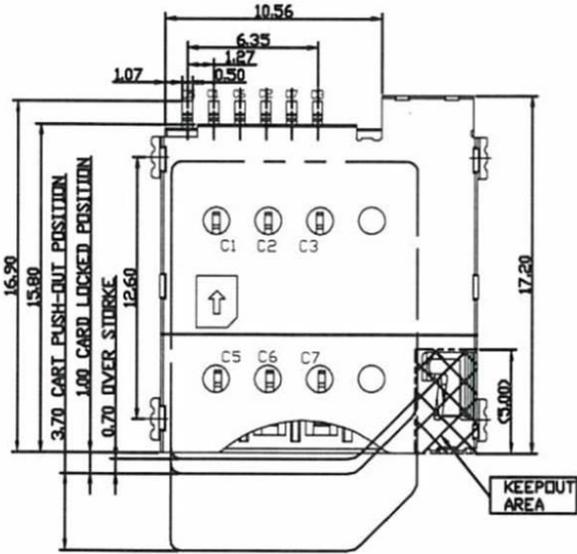
Pin	Signal Description	Pin	Signal Description
1	Vcc	5	GND
2	Reset	6	Vpp
3	Clock	7	I/O
4	Reserved	8	Reserved

2.4   Wireless Hardware Setup (SIM Card and Mini Card)

The SRG-3352 features both a SIM Card and Mini Card slot for connecting to wireless networks such as 4G. This section details how to install a SIM Card and/or Mini Card.

2.4.1   Mini Card Installation

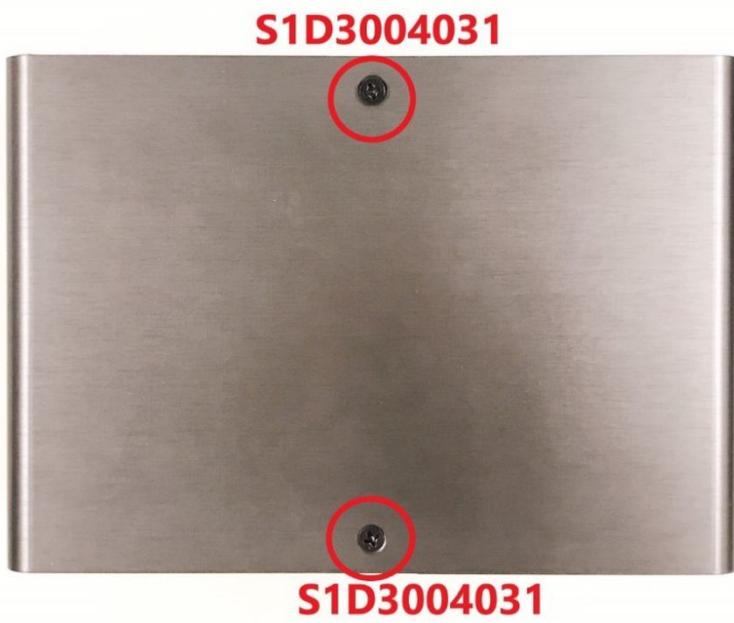**Step 1:** Remove top cover by first removing the screws securing the cover on the sides.

Left Side:

Right Side

Step 2: Next, remove the two screws securing the cover on the top:

Instructions continue on next page.

Step 3: Install Mini Card

Insert the Mini Card (Mini PCIe) into the slot at an angle about 30 degrees. Gently press down until it is horizontal. Use a screw to secure the corner shown below.

Step 4: Replace top cover and secure by fastening the top screws first, then the sides.

2.4.2   SIM Card Installation

To install a SIM Card (Micro SIM) simply insert the SIM Card into the slot on the side of the system as shown. Take care to make sure the card is oriented correctly.

Chapter 3

Connecting to PC and System Setup

3.1   Connecting to System

When connecting a PC or laptop to the SRG-3352 system, it is recommended to use PuTTY with Windows 10. Users can download the software from the PuTTY website.

For Windows 7 or older, users must first set up their PC to recognize the system. The following instructions detail how to set up your PC to connect to the SRG-3352 system by installing the CDC Serial Driver. The CDC Serial Driver can be downloaded from the SRG-3352 product page on AAEON.com.

Step 1
Connect your computer to the SRG-3352 using the micro USB port. Open **Device Manager** and locate **Multifunction Composite Gadget**. Double click on the device. A pop-up should appear, with a notice that the CDC Serial is unrecognized.
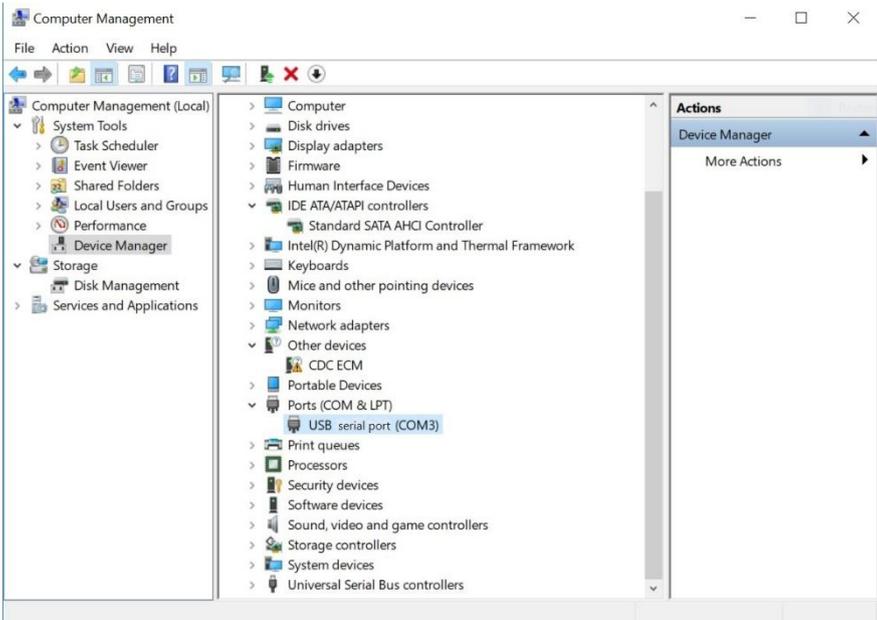
Step 2
Open the **Properties** menu for CDC Serial. Click "Update Driver" and use the file **linux-cdc-acm.inf** to update.
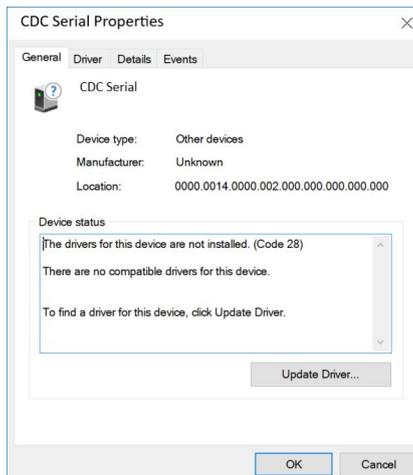
Step 3

After the driver has been successfully installed, the device **USB Serial Port (COM3)**

should appear in Device Manager.

You can now use PuTTY to access the SRG-3352 system.

3.2   Login and System Setup

This section details how to connect to the SRG-3352 system using PuTTY and performing initial system setup. Before you begin, make sure the system is plugged in and powered on, and connected to your PC via USB.
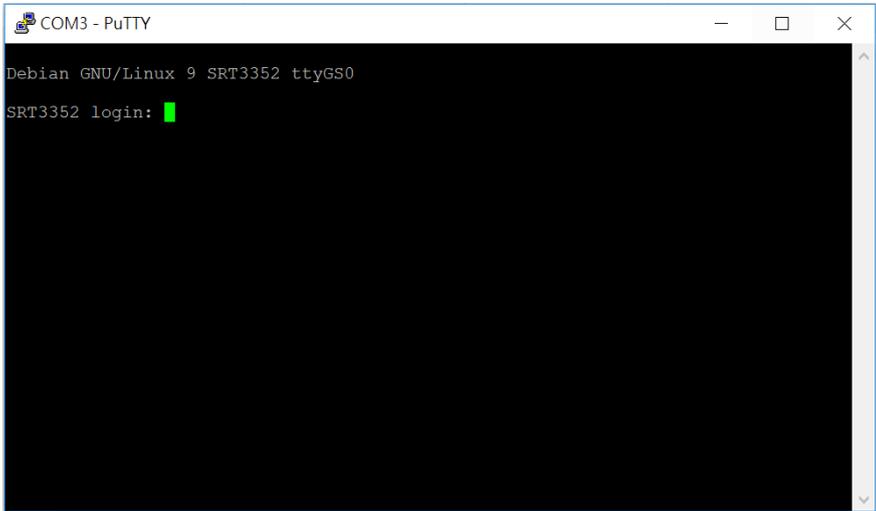
Step 1: PuTTY Configuration

Open the PuTTY application. In the configuration menu, type in the COM port and type **115200** in the Speed column. Select "Serial" under the Connection Type heading, then click the **Open** button to run PuTTY.
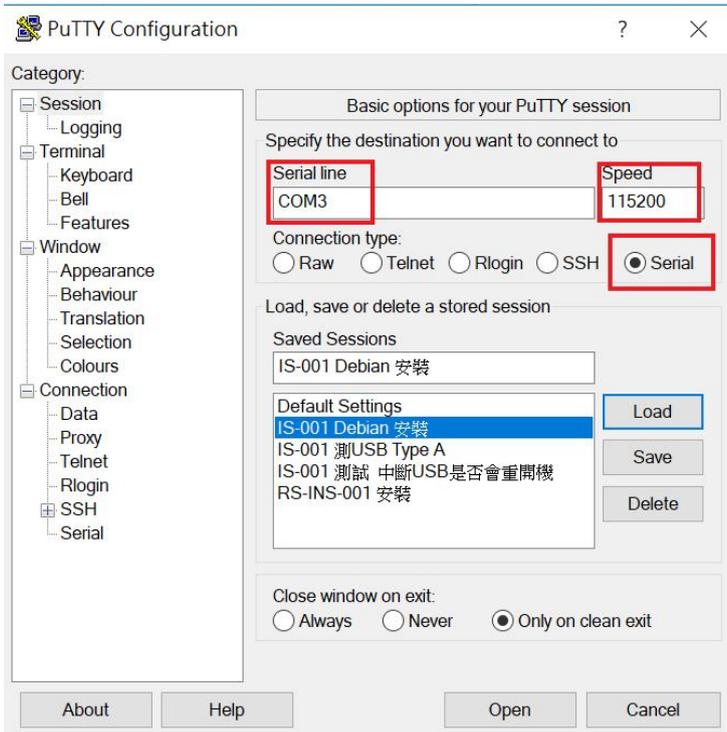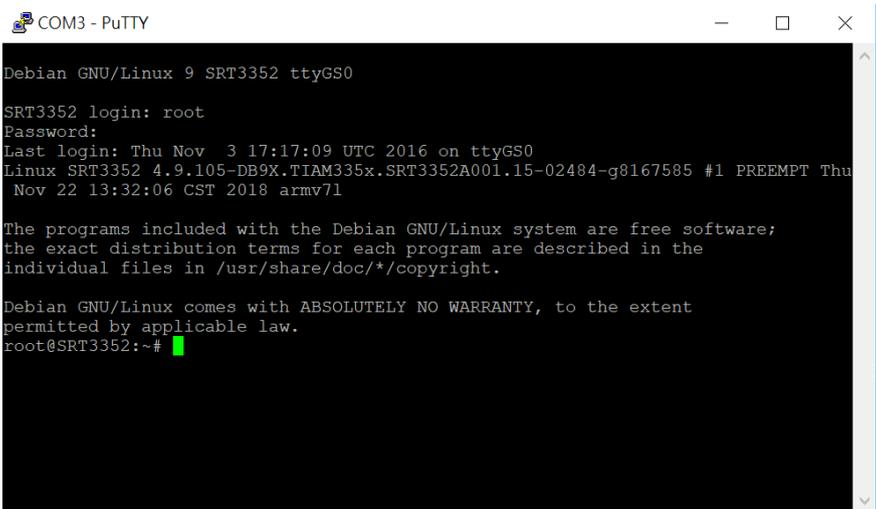
Step 2: System Login

Type the login name for "SRG3352 login" and press Enter. Type in the password and press Enter. If you are connecting to the system for the first time, the default initial login and password is **root**

Successful login will display the following with the cursor on the command line.

Step 3: System Logout

To logout of the system, type "`exit`" in the command line and press Enter. You will be

logged out of the system.
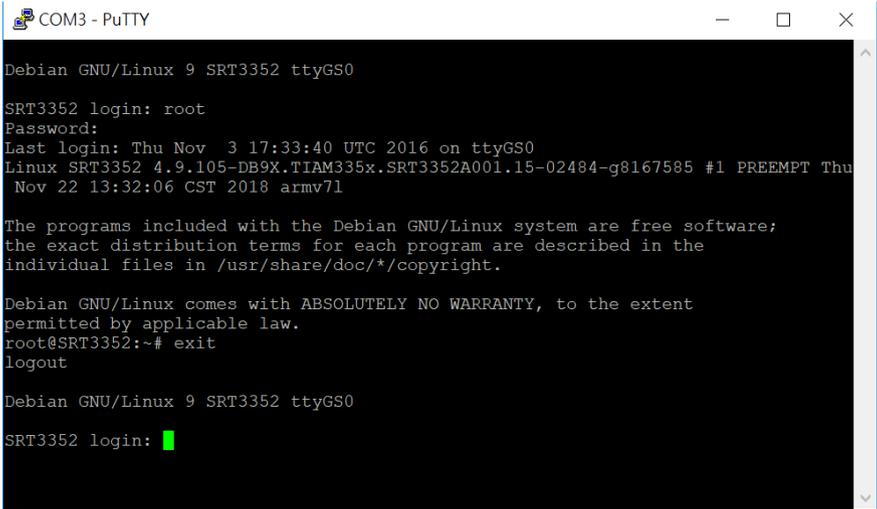
3.2.1   Check MAC Address

In the command line **root@SRT3352:~#** type "`ifconfig`" and press enter. The

MAC address of both LAN ports will be displayed.

3.2.2 LAN Settings (LAN1, LAN2)

This section details how to access and change LAN Settings, including setting a static IP address or DHCP for LAN1 and LAN2.

Step 1

Access the config file. This is done by typing the following in the command line:

For LAN1: `vim /var/lib/connman/ethernet0.config`

For LAN2: `vim /var/lib/connman/ethernet1.config`

You should see the following display (this is a sample display, IP and MAC addresses might be different for your system):

```
[service_ethernet0]
Type=ethernet
IPv4=192.168.1.142/255.255.255.0/192.168.1.1
MAC=40:bd:32:0c:82:d1
Nameservers=168.95.1.1
```

You should see `[service_ethernet1]` if you are configuring LAN2.

To set a static IP address, you can change the IPv4 field. The format must follow `network/netmask/gateway`.

If you want to use DHCP, fill in `dhcp` instead of the IP address, as such:

`IPv4=dhcp`

Use the "`Nameservers`" field to set up a DNS server. If you want to use multiple DNS servers, use a comma to separate each server address, for example:

`Nameservers=168.95.1.1,8.8.8.8,8.8.4.4`

The system must be reset after any changes are made. Type "`reboot`" to restart the system, or "`service connman restart`" to restart connman service. This will put the changes into effect for the system.

3.2.3 Check Micro SD Card

To check if the Micro SD Card is installed and recognized by the system, enter the following in the command line: `ls -al /media`
You will be able to check if the Micro SD Card has been mounted under `/media`

3.2.4 Test Status LED

The SRG-3352 features four Status LEDs. These LEDs can be tested by entering the following commands:

turn on: `echo 1 > /sys/class/leds/srt3352:green1/brightness`

turn off: `echo 0 > /sys/class/leds/srt3352:green1/brightness`

To test each LED, replace "green1" with the label as show in the diagram below:

Number	Label	Picture	Number	Label	Picture
1 Orange/ Yellow	green2		3 Blue	red2	
2 Red	red1		4 Green	green1	

3.2.5   Set RTC

The SRG-3352 features a hardware clock which can be set. Use the following commands to set the hardware clock. The date and time must be entered in the format YYYYMMDD HH:MM:SS using the 24-hour clock. (The date below is an example):

```
timedatectl
date -s "20181031 09:00:00"; hwclock -w
timedatectl
```

You should see the following message:

`RTC time has changed to "2018-10-31 09:00:00"`

3.2.6   Check USB Device

You can check if a USB Device is mounted and recognized by the system. Make sure the device is attached correctly. Use the following commands to check the USB Device:

```
ls -al /dev/sd*
ls -al /media/
```

3.2.7   Test Watchdog

The SRG-3352 includes the Watchdog timer feature. To activate or test Watchdog, use the following command:

```
$ echo 0 > /dev/watchdog
```

The system will automatically reboot if the command is not executed within 60 seconds.
To cancel Watchdog, use the following command:

```
echo 'V' > /dev/watchdog
```

3.2.8   Assign Access Point Name (APN)

Use the following command to assign APN the name highlighted as follows

$ vim /etc/ppp/peers/wcdma-chat-connect

```
ABORT 'NO CARRIER'
ABORT 'ERROR'
ABORT 'NO DIALTONE'
ABORT 'BUSY'
ABORT 'NO ANSWER'
'' AT
OK ATE0
OK ATI;+CSUB;+CSQ;+COPS?;+CGREG?;&D2
OK AT+CGDCONT=1,"IP","internet.globe.com.ph",,0,0
OK ATD*99#
CONNECT ''
```

3.2.9   PPP Dialing Procedure

To command PPP dial up, use the following command:

$ pppd call wcdma &

To check ppp0, use the command $ ifconfig

```
root@SRT3352:~# ifconfig
eth0: flags=-28605<UP,BROADCAST,RUNNING,MULTICAST,DYNAMIC>  mtu 1500
        inet 172.16.54.158  netmask 255.255.255.0  broadcast 172.16.54.255
        inet6 fe80::f6e1:1eff:fedd:22d  prefixlen 64  scopeid 0x20<link>
        ether f4:e1:1e:dd:02:2d  txqueuelen 1000  (Ethernet)
        RX packets 221562  bytes 15276175 (14.5 MiB)
        RX errors 0  dropped 54  overruns 0  frame 0
        TX packets 1142  bytes 121101 (118.2 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
        device interrupt 174

eth1: flags=-28669<UP,BROADCAST,MULTICAST,DYNAMIC>  mtu 1500
        ether f4:e1:1e:dd:02:2f  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1  (Local Loopback)
        RX packets 55307  bytes 8534052 (8.1 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 55307  bytes 8534052 (8.1 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

ppp0: flags=4305<UP,POINTOPOINT,RUNNING,NOARP,MULTICAST>  mtu 1500
        inet 10.131.235.127  netmask 255.255.255.255  destination 10.64.64.64
        ppp  txqueuelen 3  (Point-to-Point Protocol)
        RX packets 295071  bytes 70168256 (66.9 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 277235  bytes 24254037 (23.1 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

Alternatively, to check if PPPd is running, enter the command:

```
$ ps axu|grep -i ppp
```

```
root@SRT3352:~# ps aux|grep -i ppp
root       637  0.0  0.1   3364  1708 ?         S    May15   0:19 pppd call wcdma
root     23406  0.0  0.1   2068  1136 pts/0     S+   15:17   0:00 grep -i ppp
root@SRT3352:~#
```