

SRG-ADIO

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-ADIO	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. All cables and adapters supplied by AAEON are certified and in accordance with the material safety laws and regulations of the country of sale. Do not use any cables or adapters not supplied by AAEON to prevent system malfunction or fires.
3. Make sure the power source matches the power rating of the device.
4. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
5. Always completely disconnect the power before working on the system's hardware.
6. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
7. 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.
8. Always disconnect this device from any AC supply before cleaning.
9. While cleaning, use a damp cloth instead of liquid or spray detergents.
10. Make sure the device is installed near a power outlet and is easily accessible.
11. Keep this device away from humidity.
12. Place the device on a solid surface during installation to prevent falls
13. Do not cover the openings on the device to ensure optimal heat dissipation.
14. Watch out for high temperatures when the system is running.
15. Do not touch the heat sink or heat spreader when the system is running
16. Never pour any liquid into the openings. This could cause fire or electric shock.

17. 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.
18. 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
19. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

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。

China RoHS Requirement (EN)

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)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBBs)	Polybrominated 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.

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Chapter 1

Product Specifications

1.1 Specifications

General

CPU	ARM Cortex-A8 800 MHz RISC Processor
Memory	DDR3L 1GB
Storage	eMMC 8GB
OS Support	Debian 10 (Buster)
RTC Supported	Yes
Security	TPM 2.0

Interface

Ethernet Ports	2 x Auto-sensing 10/100/1000 Mbps ports (RJ45 connector)
USB Ports	2 x USB2.0 (Type A Connector)
Serial Ports	2 x RS485 Terminal Block (optional)
Expansion Ports	1 x Mini PCIe Slot
SIM Slot	1 x Micro SIM
SD Slot	1 x microSD
Debug Port	1 x Mini USB
Function Port	Analog Input: Type: 2 CH differential or 4 CH single-end Input Range: 0~15V, 0~20mA Resolution: 16-bit Isolated Digital Input: Channel: 4 Voltage Level: ON: 9~24V, OFF: 0~8V Isolation Voltage: 2500 Vrms

Interface

Function Port (Continued)	Isolated Digital Output:
	Channel: 4
	Load Voltage: DC 24V
	Max Load Current: 100 mA per channel
	Isolation Voltage: 2500 Vrms

Radio Frequency Interface

Wi-Fi	IEEE Std 802.11b/g/n
Bluetooth	Bluetooth 4.2 and Bluetooth low energy

Physical Characteristics

Dimensions	4.3" x 4.33" x 1.54" (109mm x 110mm x 39mm)
Weight	430 g
Mounting	DIN-rail mounting, Wall Mount

Environmental

Operating Temperature	32°F ~ 140°F (0°C ~ 60°C)
Operating Humidity	10% ~ 95% relative humidity, non-condensing
Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)
Vibration	2 Grms at IEC 60068-2-64, random wave, 5-500 Hz, 1 hour per axis (without USB devices attached)

Certification

EMC	EN 55032/24
EMI	FCC Part 15B Class A

Certification

EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
	IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
	IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
	IEC 61000-4-5 Surge: Power: 0.5 kV
	IEC 61000-4-6 CS: 0.15 to 80MHz; 3 Vrms
	IEC 61000-4-8 PFMF: 50Hz/60Hz, 1 A/m

CE Red	EMC: EN301489-1/-17
	RF: EN300328 (Wi-Fi, Bluetooth, 2.4GHz)
	Safety: EN 62368-1

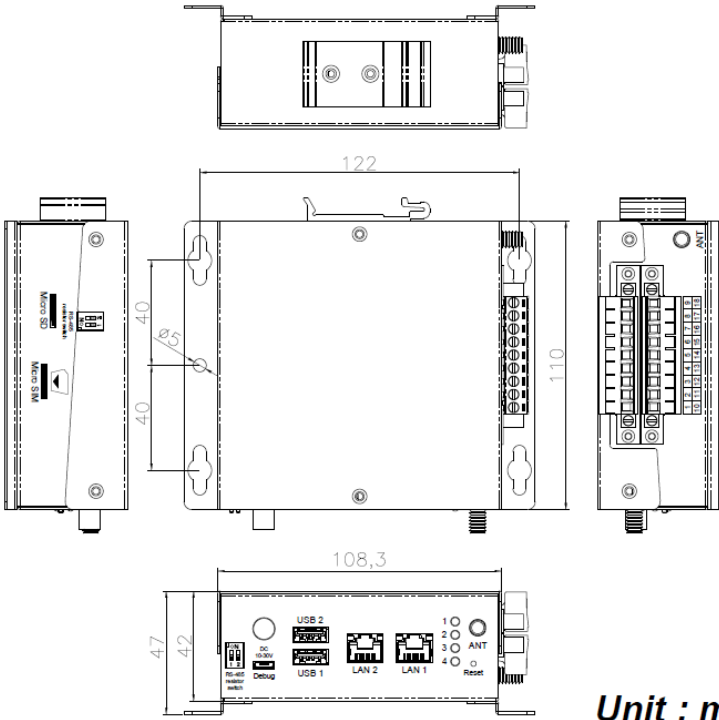
Green Product	RoHS
----------------------	------

MTBF	855,890 Hours
-------------	---------------

Chapter 2

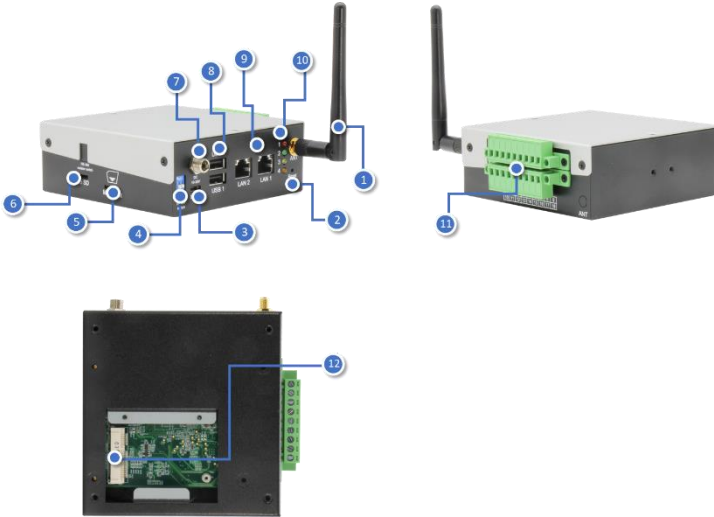
Hardware Information

2.1 Dimensions



Unit : mm

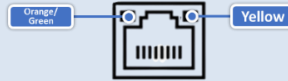
2.2 I/O Location



Position	Function
1	Antenna Connector Supports 2.4G or LTE antennas
2	Reset Button Reboots the system
3	Debug Port User can login into gateway's Linux OS via SSH by debug port (Micro-USB port)
4	RS-485 Terminal Resistor Used when there are long distances between the gateway and RS-485 device.
5	Micro SIM Slot Insert micro SIM card into the slot when using LTE module installed in Mini Card slot
6	microSD Slot Increase storage capacity by inserting a microSD card
7	DC Power Jack Gateway supports DC 9~30V input
8	USB2.0 Port USB2.0 type A connector, supports external USB storage devices

9 Gigabit LAN Port

Standard RJ-45 LAN jack to connect with Local Area Network (LAN).



LED	Function	Status
Yellow	Active Status	ON: LAN link is established. OFF: LAN link is not established. Blinking: Data received and transmitted.
Orange /Green	Link Speed Status	Green: 10/100Mbps. Orange: 1000Mbps.

10 LED

LED can be controlled or defined by GPIO settings.

The control command for LED 1:

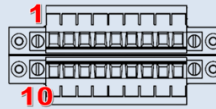


```
turn on: echo 1 > /sys/class/leds/srt3352:led1/brightness
turn off: echo 0 > /sys/class/leds/srt3352:led1/brightness
```

See Chapter 3 for more information.

11 Function Port

The function port supports ADC, Digital I/O functions



Pin	Definition	Pin	Definition
Upper Row		Lower Row	
1	DO_VCC+	10	AI_GND
2	DO_1	11	AI_4
3	DO_VCC-	12	DI_3
4	-	13	AI_3
5	DO_2	14	DI_2
6	-	15	AI_2
7	DO_3-	16	DI_1
8	DI_4	17	AI_1
9	DO_4	18	DI_Common

The Mini PCIe slot can support LTE modules (USB signal).

2.3 Wireless Hardware Setup

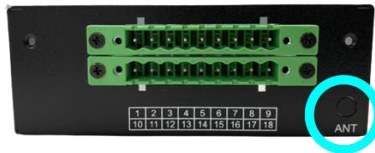
The SRG-AD10 features both a SIM Card and Mini Card slot for connecting to wireless networks such as 4G. This section details how to install a SIM Card and 4G/LTE module on the mini card slot.

2.3.1 Mini Card Installation

Step 1. Remove the top cover by removing the 6 screws.



Step 2. Open the antenna hole by removing the cover on the hole located on the left side.



Step 3. Install the RF coaxial cable in the antenna hole.



Step 4. Remove the bottom cover and install the 4G/LTE module in the Mini Card slot, and connect the coaxial cable to the 4G/LTE module.



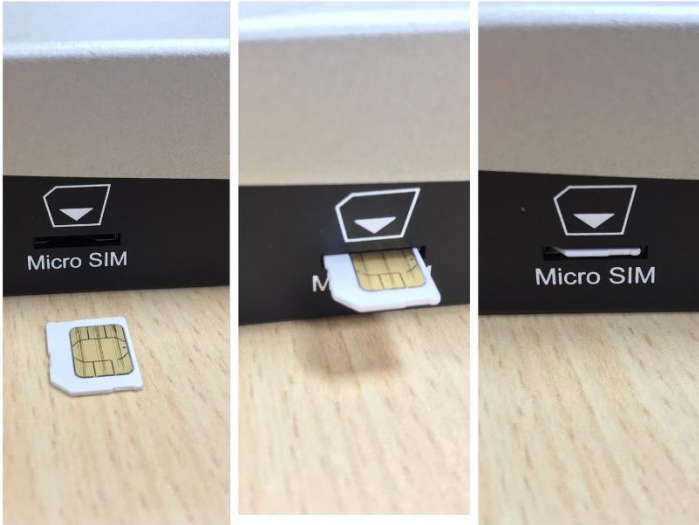
Step 5. Place the bottom cover and secure with screws.



Step 6. Place the top cover and secure with screws.

2.3.2 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

Gateway Setup and Configuration

3.1 Connecting to System

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

<https://www.putty.org/>

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-ADIO system by installing the CDC Serial Driver. The CDC Serial Driver can be downloaded from the SRG-ADIO product page on AAEON.com

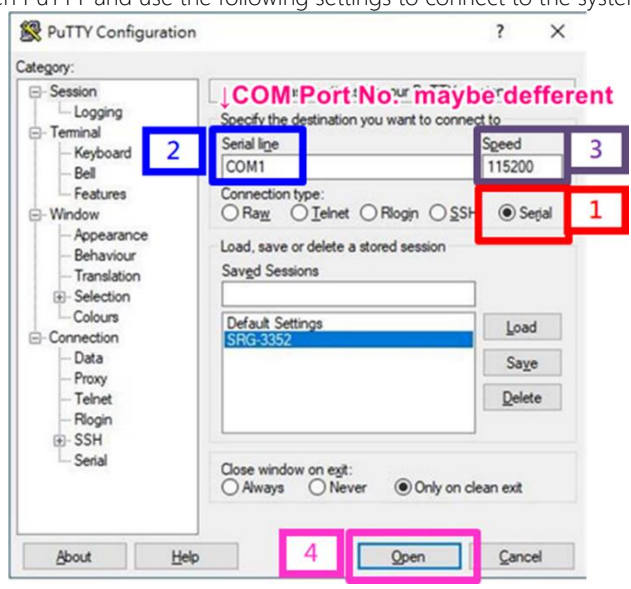
Step 1: Download the PuTTY software.

Step 2: Connect the host PC to the gateway with a USB cable to the Micro USB port.

Step 3: 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.



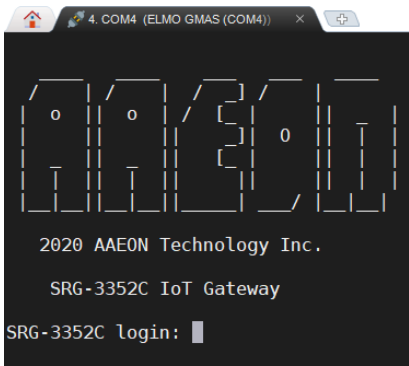
Step 4: Open PuTTY and use the following settings to connect to the system.



Serial Port Settings	
Baud Rate	115200 bps
Parity	None
Data bits	8
Stop bits	1
Flow Control	None

Click "Open" to connect with the gateway system.

Step 5: You will see the login prompt once the host PC successfully connects to the gateway.



Default login information is:

- Username: **aaeon**
- Password: **aaeon**

3.2 User Account Management

This section details how to manage user accounts on the system.

Add User Account

- ✓ Command Line:

```
$ sudo useradd -m -G sudo -s /bin/bash USERACCOUNT
```

USERACCOUNT -> Account name you want to add

- ✓ Return (test3 is the account name in this example):

```
aaeon@SRG-3352C:~$ sudo useradd -m -G sudo -s /bin/bash test3
aaeon@SRG-3352C:~$ █
```

Delete User Account

- ✓ Command Line:

```
$ sudo userdel USERACCOUNT
```

USERACCOUNT -> Account name you want to delete

- ✓ Result:

```
aaeon@SRG-3352C:~$ sudo userdel test1
```

3.3 Network Settings

This section details how to check and setup the network settings.

3.3.1 Check IP Settings:

Check the IP setting by entering the following command into Terminal/Command Line:

```
$ nmcli con show NETWORKPROFILE
```

NETWORKPROFILE refers to one of the system's network connections as follows:

NETWORKPROFILE	Port/Hardware
Ethernet0	LAN1
Ethernet1	LAN2
Modem	4G LTE module

For example, to pull up the IP settings for LAN1, us the following command:

```
$ nmcli con show Ethernet0
```

You should see the following results:

```
aaeon@SRG-3352C:~$ nmcli con show Ethernet0 | grep ipv4
ipv4.method:                auto
ipv4.dns:                   --
ipv4.dns-search:            --
ipv4.dns-options:           ""
ipv4.dns-priority:          0
ipv4.addresses:              192.168.3.127/24
ipv4.gateway:               --
ipv4.routes:                --
ipv4.route-metric:          -1
ipv4.route-table:           0 (unspec)
ipv4.ignore-auto-routes:    no
ipv4.ignore-auto-dns:      no
ipv4.dhcp-client-id:        --
ipv4.dhcp-timeout:          0 (default)
ipv4.dhcp-send-hostname:    yes
ipv4.dhcp-hostname:         --
ipv4.dhcp-fqdn:             --
ipv4.never-default:         no
ipv4.may-fail:              yes
ipv4.dad-timeout:           -1 (default)
```

3.3.2 Set Static IP

Step 1: Enter edit mode with the following command:

```
$ nmcli con edit NETWORKPROFILE
```

See table in 3.3.1 for NETWORKPROFILE values

Command should return the following (Ethernet0 used in this example):

```
aaeon@SRG-3352C:~$ nmcli con edit Ethernet0
===| nmcli interactive connection editor |===
Editing existing '802-3-ethernet' connection: 'Ethernet0'

Type 'help' or '?' for available commands.
Type 'print' to show all the connection properties.
Type 'describe [<setting>.<prop>]' for detailed property description.

You may edit the following settings: connection, 802-3-ethernet (ethernet), 802-1x, dc
b, sriov, ethtool, match, ipv4, ipv6, tc, proxy
nmcli>
```

Step 2: Edit the IP Address with the following commands:

```
$ nmcli> goto ipv4
$ nmcli> set address IPADDRESS/24
```

IPADDRESS is the address you wish to use. This example uses 192.168.3.127

```
$ nmcli> save
$ nmcli> quit
```

You have now exited the edit mode.

```
$ sudo ifconfig PORT down
$ sudo ifconfig PORT up
```

PORT variables are eth0 for Ethernet0 or eth1 for Ethernet1; this example uses eth0.

The following will be returned:

```
aaeon@SRG-3352C:~$ sudo nmcli con edit Ethernet0
===| nmcli interactive connection editor |===
Editing existing '802-3-ethernet' connection: 'Ethernet0'

Type 'help' or '?' for available commands.
Type 'print' to show all the connection properties.
Type 'describe [<setting>.<prop>]' for detailed property description.

You may edit the following settings: connection, 802-3-ethernet (ethernet), 802-1x, dc, sriov, ethtool, match, ipv4, ipv6, tc, proxy
nmcli> goto ipv4
You may edit the following properties: method, dns, dns-search, dns-options, dns-priority, addresses, gateway, routes, route-metric, route-table, ignore-auto-ru
tes, ignore-auto-dns, dhcp-client-id, dhcp-timeout, dhcp-send-hostname, dhcp-hostname, dhcp-fqdn, never-default, may-fail, dad-timestamp
nmcli ipv4s set address 192.168.3.127/24
Do you also want to set 'ipv4.method' to 'manual'? [yes]: yes
nmcli ipv4s save
Connection 'Ethernet0' (d2a83a52-315f-3ed3-b9f8-c7de6091feb5) successfully updated.
nmcli ipv4s quit
aaeon@SRG-3352C:~$ sudo ifconfig eth0 down
aaeon@SRG-3352C:~$ sudo ifconfig eth0 up
```

3.3.3 Set Dynamic IP

Step 1: Enter edit mode with the following command:

```
$ nmcli con edit NETWORKPROFILE
```

See table in 3.3.1 for NETWORKPROFILE values

Command should return the following (Ethernet0 used in this example):

```
aaeon@SRG-3352C:~$ nmcli con edit Ethernet0
===| nmcli interactive connection editor |===
Editing existing '802-3-ethernet' connection: 'Ethernet0'

Type 'help' or '?' for available commands.
Type 'print' to show all the connection properties.
Type 'describe [<setting>.<prop>]' for detailed property description.

You may edit the following settings: connection, 802-3-ethernet (ethernet), 802-1x, dc
b, sriov, ethtool, match, ipv4, ipv6, tc, proxy
nmcli> █
```

Step 2: Edit the IP address with the following commands:

```
$ nmcli> goto ipv4
$ nmcli> remove address
$ nmcli> save
$ nmcli> quit
```

You have now exited edit mode

The following should be returned:

```
aaeon@SRG-3352C:~$ sudo nmcli con edit Ethernet0
===| nmcli interactive connection editor |===
Editing existing '802-3-ethernet' connection: 'Ethernet0'

Type 'help' or '?' for available commands.
Type 'print' to show all the connection properties.
Type 'describe [<setting>.<prop>]' for detailed property description.

You may edit the following settings: connection, 802-3-ethernet (ethernet), 802-1x, dcb, sriov, ethtool, match, ipv4, ipv6, tc, proxy
nmcli: goto ipv4
You may edit the following properties: method, dns, dns-search, dns-options, dns-priority, addresses, gateway, routes, route-metric, route-table, ignore-auto-ro
utes, ignore-auto-dns, dhcp-client-id, dhcp-timeout, dhcp-send-hostname, dhcp-hostname, dhcp-fqdn, never-default, may-fail, dad-timeout
nmcli ipv4: remove address
nmcli ipv4: save
Connection 'Ethernet0' (d2a83a52-315f-3ed3-b9f8-c7de691feb5) successfully updated.
nmcli ipv4: quit
aaeon@SRG-3352C:~$ █
```


3.4 Cellular Network Settings

This section details how to check and manage the cellular network settings.

3.4.1 Check Cellular Module Status

Step 1: To check the status of the cellular module, enter the following command:

```
$ mmcli -m 0
```

The system should output the following:

```
aaeon@SRG-3352C:~$ mmcli -m 0
General |      dbus_path: /org/freedesktop/ModemManager1/Modem/0
        |      device_id: 97a2a2d2331bf970dd9c52a85cb7517b2619e6c4
-----|-----
Hardware | manufacturer: QUALCOMM INCORPORATED
        | model: QUECTEL Mobile Broadband Module
        | revision: EC25EFAR06A02M4G
        | h/w revision: 10000
        | supported: gsm-umts, lte
        | current: gsm-umts, lte
        | equipment_id: 866758041336559
-----|-----
System   |      device: /sys/devices/platform/ocp/47400000.usb/47401c00.usb/musb-hdrc.1/usb/l1-1/1-1.1
        |      drivers: option1, qmi_wwan
        |      plugin: Quectel
        |      primary port: cdc-wdm0
        |      ports: ttyUSB0 (qcdm), ttyUSB2 (at), cdc-wdm0 (qmi), wwan0 (net),
        |             ttyUSB3 (at)
-----|-----
Status   |      state: failed
        |      failed reason: sim-missing
        |      power state: on
        |      signal quality: 0% (cached)
-----|-----
Modes    |      supported: allowed: 2g; preferred: none
        |                  allowed: 3g; preferred: none
        |                  allowed: 4g; preferred: none
        |                  allowed: 2g, 3g; preferred: 3g
        |                  allowed: 2g, 3g; preferred: 2g
        |                  allowed: 2g, 4g; preferred: 4g
        |                  allowed: 2g, 4g; preferred: 2g
        |                  allowed: 3g, 4g; preferred: 3g
        |                  allowed: 3g, 4g; preferred: 4g
        |                  allowed: 2g, 3g, 4g; preferred: 4g
        |                  allowed: 2g, 3g, 4g; preferred: 3g
        |                  allowed: 2g, 3g, 4g; preferred: 2g
        |      current:  allowed: any; preferred: none
-----|-----
Bands    |      supported: egsm, dcs, utran-1, utran-5, utran-8, eutran-1, eutran-3,
        |                  eutran-5, eutran-7, eutran-8, eutran-20, eutran-38, eutran-40,
        |                  eutran-41
-----|-----
IP       |      supported: ipv4, ipv6, ipv4v6
aaeon@SRG-3352C:~$
```

3.4.2 Dial Up Cellular Module

Step 1: Follow the steps in the previous section to check the cellular module status. The system should return a state of “registered” under Status if the module is ready to use.

```
Status | lock: sim-pin2
        | unlock retries: sim-pin (1), sim-pin2 (3), sim-puk (10), sim-puk2 (10)
        | state: registered
        | power state: on
        | access tech: umts
        | signal quality: 34% (recent)
```

If there is an issue, the state will show “failed” along with a failed reason such as “sim missing”.

```
Status | state: failed
        | failed reason: sim-missing
        | power state: on
        | signal quality: 0% (cached)
```

Step 2: Enable the cellular module with the following command:

```
$ mmcli -m 0 -e
```

System will return the following if successful:

```
root@SRG-3352C:~# mmcli -m 0 -e
successfully enabled the modem
```

Step 3: Dial up the cellular module with the following command:

```
$ nmcli con up id Modem
```

System will return the following:

```
root@SRG-3352C:~# nmcli con up id Modem
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/2)
```

Step 4: You can check the cellular module connection with the command:

```
$ ifconfig
```

```
wlan0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
        ether f2:c7:26:ec:ab:85 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

wlan0: flags=4305<UP,POINTOPOINT,RUNNING,NOARP,MULTICAST> mtu 1500
        inet 10.96.28.171 netmask 255.255.255.248 destination 10.96.28.171
        unspec 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00 txqueuelen 1000 (UNSPEC)
        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
```

3.5 Wi-Fi and Bluetooth Network Settings

This section details how to check and setup Wi-Fi and Bluetooth wireless networks.

3.5.1 Scan for Wi-Fi Access Points

To scan for Wi-Fi access points, enter the following command:

```
$ nmcli dev wifi
```

The system will return a list of Wi-Fi networks with their name, signal strength and security type.

```
aaeon@SRG-3352C:~$ nmcli dev wifi
IN-USE SSID          MODE  CHAN  RATE  SIGNAL  BARS  SECUR
ITY
      Tomato24          Infra  1
195 Mbit/s 100
      TOTOLINK99        Infra  3
270 Mbit/s 100
      TOTOLINK N150RA S  Infra  11
135 Mbit/s 100
      ASUS              Infra  2
130 Mbit/s 90
      TP-LINK_FE7C      Infra  3
270 Mbit/s 90
      DIRECT-5WAA-LA11-2122msGN  Infra  1
130 Mbit/s 89
      An-WiFi           Infra  4
65 Mbit/s 89
      dlink-E37D        Infra  9
270 Mbit/s 87
      Newton flaming laser sword  Infra  11
130 Mbit/s 82
```

3.5.2 Connect to Wi-Fi Access Point

To connect to a Wi-Fi network, enter the following command

```
$ nmcli dev wifi connect 'SSID' password 'PASSWORD'
```

SSID is the name of the network you want to connect to

PASSWORD is the network password for the chosen SSID

The system will show the following if successful:

```
aaeon@SRG-3352C:~$ sudo nmcli dev wifi connect 'TOTOLINK99' password 'password'
[sudo] password for aaeon:
Device 'wlan0' successfully activated with '64da4185-ebf6-4b1f-acfd-eb36d214cbb5'.
aaeon@SRG-3352C:~$
```

3.5.3 Disconnect from Wi-Fi Access Point

To disconnect from a Wi-Fi network, enter the following command:

```
$ sudo nmcli con down id 'SSID'
```

SSID is the name of the network you want to disconnect from

The system will return the following if successful:

```
aaeon@SRG-3352C:~$ sudo nmcli con down id TOTOLINK99
[sudo] password for aaeon:
Connection 'TOTOLINK99' successfully deactivated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/2)
aaeon@SRG-3352C:~$ █
```

3.5.4 Check Wi-Fi Connection Status

To check the status of a Wi-Fi connection, enter the following command:

```
$ nmcli dev
```

If connected, the system will return a “connected” status for wlan0:

```
aaeon@SRG-3352C:~$ sudo nmcli dev
DEVICE      TYPE      STATE      CONNECTION
eth0        ethernet connected  Ethernet0
wlan0       wifi      connected  TOTOLINK99
eth1        ethernet unavailable --
cdc-wdm0    gsm       unavailable --
lo          loopback  unmanaged  --
aaeon@SRG-3352C:~$ █
```

If disconnected, the system will return “disconnected” status for wlan0

```
aaeon@SRG-3352C:~$ sudo nmcli dev
DEVICE      TYPE      STATE      CONNECTION
eth0        ethernet connected  Ethernet0
wlan0       wifi      disconnected --
eth1        ethernet unavailable --
cdc-wdm0    gsm       unavailable --
lo          loopback  unmanaged  --
aaeon@SRG-3352C:~$ █
```

3.5.5 Enter Bluetooth Control Panel

Before managing Bluetooth settings, you must first enter the Bluetooth Control Panel with the following command:

```
$ sudo bluetoothctl
```

The system will return the following:

```
aaeon@SRG-3352C:~$ sudo bluetoothctl
Agent registered
[bluetooth]# █
```

3.5.6 Scan for Bluetooth Device

To scan for a Bluetooth Device, enter the following commands:

```
$ power on
```

This command turns on the Bluetooth module

```
$ scan on
```

The system will return a list of devices and their MAC addresses:

```
aaeon@SRG-3352C:~$ sudo bluetoothctl
Agent registered
[bluetooth]# power on
Changing power on succeeded
[bluetooth]# scan on
Discovery started
[CHG] Controller 18:93:D7:01:BB:4E Discovering: yes
[NEW] Device 00:07:32:00:00:44 BLEVS_000044
[NEW] Device 6E:22:7D:C5:6A:87 6E-22-7D-C5-6A-87
[NEW] Device C0:EE:40:70:06:D8 GW6506D8
[NEW] Device 62:59:FE:7F:AC:03 62-59-FE-7F-AC-03
[NEW] Device 6E:09:A9:1F:38:43 6E-09-A9-1F-38-43
[NEW] Device 74:35:40:C9:C4:2C 74-35-40-C9-C4-2C
[NEW] Device 00:07:32:00:00:31 BLEVS_000031
[NEW] Device 00:07:32:71:13:92 SV87711392
[NEW] Device 00:07:32:71:14:40 SV87711440
[NEW] Device 75:C3:03:E2:1F:A4 75-C3-03-E2-1F-A4
[NEW] Device 18:04:ED:6E:5F:39 Uspace-CHTIOT-RD
[NEW] Device 6E:64:FF:00:47:F1 6E-64-FF-00-47-F1
[NEW] Device 00:07:32:71:14:41 SV87711441
[NEW] Device 41:AA:02:91:53:80 41-AA-02-91-53-80
[NEW] Device 71:B2:F4:3C:6F:9F 71-B2-F4-3C-6F-9F
[NEW] Device 7B:D4:9E:89:AB:C1 7B-D4-9E-89-AB-C1
[NEW] Device 00:07:32:A3:45:0D SV87A3450D
[NEW] Device 68:8F:5B:78:51:88 68-8F-5B-78-51-88
```

3.5.7 Pair Bluetooth Device

To pair a Bluetooth Device, enter the following command while in the control panel:

```
$ pair MAC_ID
```

MAC_ID is the MAC address of the device you wish to connect to.

This example is connecting to device E8:6F:38:83:CF:10

```
[bluetooth]# pair E8:6F:38:83:CF:10
Attempting to pair with E8:6F:38:83:CF:10
[CHG] Device E8:6F:38:83:CF:10 Connected: yes
Request confirmation
[agent] Confirm passkey 656573 (yes/no): yes
[CHG] Device E8:6F:38:83:CF:10 ServicesResolved: yes
[CHG] Device E8:6F:38:83:CF:10 Paired: yes
Pairing successful
```

3.5.8 Check Paired Bluetooth Devices

To check which Bluetooth devices are paired with the system, use the command:

```
$ paired-devices
```

The system will return a list of connected devices and their MAC addresses.

```
[DESKTOP-6E636SN]# paired-devices
Device E8:6F:38:83:CF:10 DESKTOP-6E636SN
[DESKTOP-6E636SN]#
```

3.6 System Management

This section details how to check the OS version, storage device status, shutdown the system and set the date and time.

3.6.1 Check OS Version

To check which OS version the system is running, enter the command:

```
$ cat /etc/os-release
```

The system will return the OS information:

```
aaeon@SRG-3352C:~$ cat /etc/os-release
PRETTY_NAME="Debian GNU/Linux 10 (buster)"
NAME="Debian GNU/Linux"
VERSION_ID="10"
VERSION="10 (buster)"
VERSION_CODENAME=buster
ID=debian
HOME_URL="https://www.debian.org/"
SUPPORT_URL="https://www.debian.org/support"
BUG_REPORT_URL="https://bugs.debian.org/"
IMAGE_UUID="412c9c76-8f21-4a11-9803-9b9df58ead58"
BUILD_ID="5f5e4a9"
BUILD_DATE="2020/11/25"
VARIANT="SRG-3352x Debian Buster image"
VARIANT_VERSION="1.0-beta"
aaeon@SRG-3352C:~$ █
```

3.6.2 Check Storage Status

To check the status of the system storage, enter the following command:

```
$ df -h
```

The system will return a list of storage devices, capacity and usage

```
aaeon@SRG-3352C:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            471M   0  471M   0% /dev
tmpfs           100M   6.9M  93M   7% /run
overlay         5.1G  199M  4.6G   5% /
tmpfs           498M   0  498M   0% /dev/shm
tmpfs           5.0M   0   5.0M   0% /run/lock
tmpfs           498M   0  498M   0% /sys/fs/cgroup
tmpfs           498M   0  498M   0% /var/volatile
/dev/mmcblk1p2  58M   21M   34M  39% /boot
tmpfs           100M   0  100M   0% /run/user/1000
aaeon@SRG-3352C:~$
```

3.6.3 Shut Down the System

To force the system to shut down, use following command. Note, you may need to enter the user password.

```
$ sudo shutdown now
```

On successful shutdown, terminal will return "Error reading from serial device".

```
aaeon@SRG-3352C:~$ shutdown now
Failed to set wall message, ignoring: Interactive authentication required.
Failed to power off system via logind: Interactive authentication required.
Failed to open initctl fifo: Permission denied
Failed to talk to init daemon.
aaeon@SRG-3352C:~$ sudo shutdown now
[sudo] password for aaeon:
aaeon@SRG-3352C:~$
Error reading from serial device
```


3.6.4 Set Date and Time

Step 1: Check current date and time by issuing the following command:

```
$ timedatectl
```

The system will return the current system clock settings

```
aaeon@SRG-3352C:~$ timedatectl
    Local time: Thu 2020-11-26 05:22:16 UTC
    Universal time: Thu 2020-11-26 05:22:16 UTC
    RTC time: Thu 2020-11-26 05:22:17
    Time zone: Etc/UTC (UTC, +0000)
System clock synchronized: yes
    NTP service: inactive
    RTC in local TZ: no
aaeon@SRG-3352C:~$ █
```

Step 2: Change the date and time by issuing the following command:

```
$ date MMDDhhmmYYYY
```

Command uses the following formatting:

MM – Month

DD – Day

hh – Hour (in 24-hour clock)

mm – Minute

YYYY – Year

The system will return the following:

```
aaeon@SRG-3352C:~$ sudo date 11261400
Thu 26 Nov 2020 02:00:00 PM UTC
aaeon@SRG-3352C:~$ timedatectl
    Local time: Thu 2020-11-26 14:00:10 UTC
    Universal time: Thu 2020-11-26 14:00:10 UTC
    RTC time: Thu 2020-11-26 06:00:51
    Time zone: Etc/UTC (UTC, +0000)
System clock synchronized: no
    NTP service: inactive
    RTC in local TZ: no
aaeon@SRG-3352C:~$ █
```

3.7 I/O Management

This section details how to operate the programmable I/O functions; GPIO and Serial Port connectors.

3.7.1 Control GPIO (LEDs)

To control the GPIO manually, issue the following commands, this example uses led1:

GPIO On:



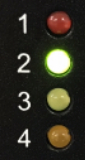

```
$ echo 1 > /sys/class/leds/srt3352:led1/brightness
```

GPIO Off:

```
$ echo 0 > /sys/class/leds/srt3352:led1/brightness
```

```
root@SRG-3352C:/home/aaeon# echo 1 > /sys/class/leds/srt3352:led1/brightness
root@SRG-3352C:/home/aaeon# echo 0 > /sys/class/leds/srt3352:led1/brightness
```

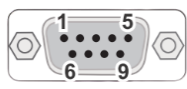
Use the following table to reference each LED label for the command:

Number	Label	Picture	Number	Label	Picture
1 Red	led1		3 Yellow	led3	
2 Green	led2		4 Orange	led4	

3.7.2 RS-485 2-wire Pin Definition (SRG-3352C)

Note: This feature is only on the SRG-3352C.

Label	System Reference
COM1	/dev/ttyS4
COM2	/dev/ttyS5



Pin	Signal
1	DATA+
2	DATA-
3	
4	
5	
6	
7	
8	
9	

3.7.3 RS-232/422/485, CAN Bus Pin Definitions (SRG-ACAN)

Note: This feature is only on the SRG-ACAN. There are two versions of SRG-ACAN, which you can verify by checking which interface ports your system has.

SRG-ACAN-A10-0001 has one COM port and one CAN Bus Port.

SRG-ACAN-A10-0002 has two COM ports only.

SRG-ACAN-A10-0001 (COM + CAN Bus)

Label	System Reference
COM1	/dev/ttyMU0
CAN Bus	N/A



Pin	COM1 Signal	CAN Signal
1	DCD	GND
2	RXD	AI_2
3	TXD	AI_4
4	DTR	CAN1_H
5	GND	CAN0_H
6	DSR	AI_1
7	RTS	AI_3
8	CTS	CAN1_L
9	RI	CAN0_L

SRG-ACAN-A10-0002 (2 x COM Ports)

Label	System Reference
COM1	/dev/ttyMU0
COM2	/dev/ttyMU1



Pin	COM1 Signal	COM2 Signal
1	DCD	DCD
2	RXD	RXD
3	TXD	TXD
4	DTR	DTR
5	GND	GND
6	DSR	DSR
7	RTS	RTS
8	CTS	CTS
9	RI	RI

3.7.3.1 Manage RS-232/422/485 Mode

Check **Current Mode** by entering the following command:

```
$ sudo uartmode -p PORTNO
```

PORTNO is the label of each port:

PORTNO	System Name	Port Label
0	/dev/ttyMU0	COM1
1	/dev/ttyMU1	COM2

Example: will return mode for COM1

```
$ sudo uartmode -p 0
```

The command will output a single number. Refer to the table below for each mode:

PORTMODE	COM Mode
0	RS-232
1	RS-485 2-wire
2	RS-422/RS-485 4-wire

Switch Mode: by entering the following command:

```
$ sudo uartmode -p PORTNO -m PORTMODE
```

Refer to the tables above for **PORTNO** and **PORTMODE**

The system will return the following:

```
aaeon@SRG-3352C:~$ sudo uartmode -p 0
We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

#1) Respect the privacy of others.
#2) Think before you type.
#3) With great power comes great responsibility.

[sudo] password for aaeon:
1
aaeon@SRG-3352C:~$ sudo uartmode -p 0 -m 2
aaeon@SRG-3352C:~$ sudo uartmode -p 0
2
aaeon@SRG-3352C:~$
```

3.7.3.2 CAN Bus Read/Write

To command the CAN Bus to Read or Write, use the following commands:

Initialize CAN Bus:

```
$ sudo srg52-initcan CANNO BAUDRATE
```

CAN Bus Read:

```
$ sudo can_read CANNO
```

CAN Bus Write:

```
$ sudo can_write CANNO
```

CANNO variable is either can0 or can1

CANNO	System Name
can0	can0
can1	can1

BAUDRATE should be the specific baud rate for the current CAN bus

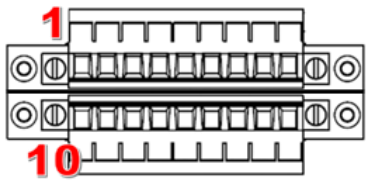
Example and results:

```
7:51:50.21/srg52-initcan 152 7510 writec
aaeon@SRG-3352C:~$ sudo srg52-initcan can1 250000
aaeon@SRG-3352C:~$ sudo srg52-initcan can0 250000

aaeon@SRG-3352C:~$ can_read can1 & can_write can0
[1] 1241
can1 at index 5
can0 at index 4
can1 123 [8] 11 22 33 44 55 aa bb cc
Wrote 16 bytes
[1]+ Done can_read can1
```

3.7.4 ADC, Digital I/O Pin Definitions (SRG-ADIO)

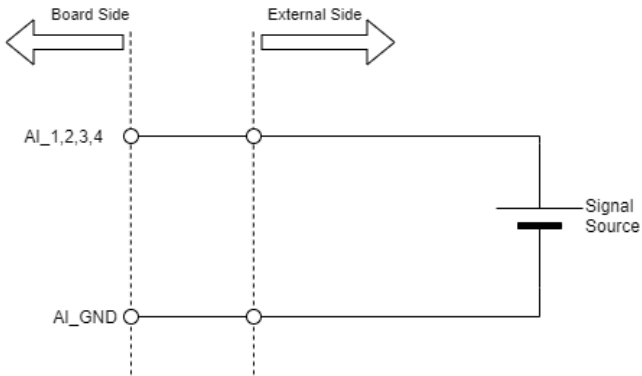
Note: This feature is only on the SRG-ADIO.



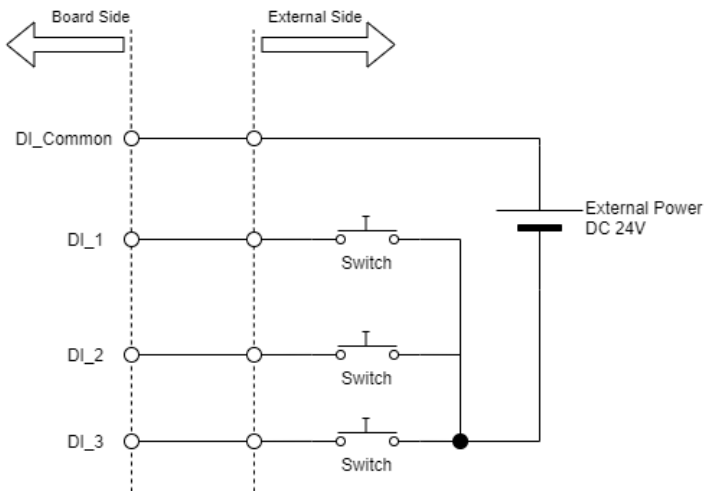
Pin	Definition	Pin	Definition
Upper Row		Lower Row	
1	DO_VCC+	10	AI_GND
2	DO_1	11	AI_4
3	DO_VCC-	12	DI_3
4	NC	13	AI_3
5	DO_2	14	DI_2
6	NC	15	AI_2
7	DO_3-	16	DI_1
8	DI_4	17	AI_1
9	DO_4	18	DI_Common

3.7.4.1 Wiring Diagram

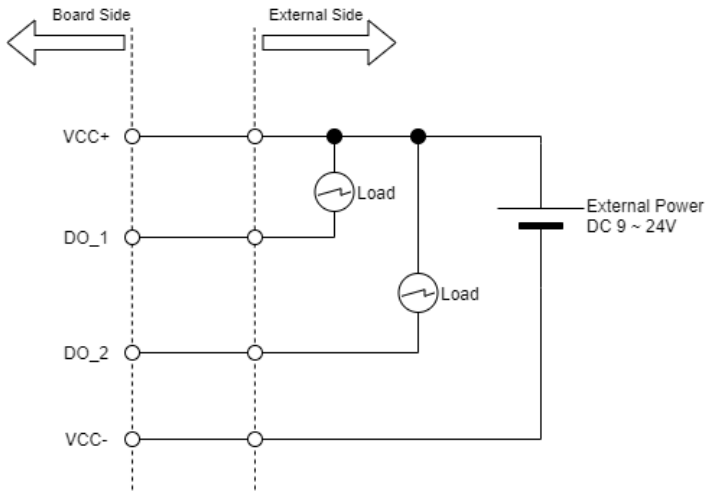
Analog Input:



Digital Input:



Digital Output



3.7.4.2 Manage Digital I/O

Set Digital Output State

Use the following command to set digital output state to ON or OFF

```
$ setdo CHANNEL STATE
```

CHANNEL 0, 1, 2, or 3

STATE set to 1 for ON or 0 for OFF

Example:

```
aaeon@SRG-3352C:~$ setdo
setdo -- set digital output state

Usage: setdo pin stats, pin in [0-3]
, state in [0,1], 0 for lower, 1 for high
```

```
aaeon@SRG-3352C:~$ setdo 0 0
aaeon@SRG-3352C:~$ setdo 0 1
aaeon@SRG-3352C:~$ setdo 1 0
aaeon@SRG-3352C:~$ setdo 1 1
```

Get Digital Input Status

Use the following command to check the status of digital input:

```
$ getdi CHANNEL
```

CHANNEL 0, 1, 2, or 3

The system will return a value of 1 for ON and 0 for OFF.

```
aaeon@SRG-3352C:~$ getdi
getdi -- read digital input state

Usage: getdi pins, pins in [0-3]

will return 0 or 1 for pin state lower/high
```

```
aaeon@SRG-3352C:~$ getdi 0
0
aaeon@SRG-3352C:~$ getdi 0
1
aaeon@SRG-3352C:~$ getdi 1
0
aaeon@SRG-3352C:~$ getdi 1
1
```

3.7.4.3 Manage Analog Input (4CH Signal End)

Enter the following command to view status for all channels:

```
$ rd_exadc -a Config-CH0 Config-CH1 Config-CH2 Config-CH3
```

Config-CH# for each channel use the following numerical inputs:

- 0 Voltage
- 1 Current
- 1 Disable (no value will be returned)

For example: The following command will return voltage values for all four channels:

```
$ rd_exadc -a 0 0 0 0
```

The system will output information based on the inputs you used, as follows:

```
aaeon@SRG-3352C:~$ rd_exadc -a 0 1 -1 0
chmode[]: 0 1 -1 0
Bus open
I2C_SLAVE set at address: 0x48
CH_0 = 0.02 V | CH_1 = 0.11 mA | CH_3 = 0.02 V |
aaeon@SRG-3352C:~$ rd_exadc -a 0 0 0 0
chmode[]: 0 0 0 0
Bus open
I2C_SLAVE set at address: 0x48
CH_0 = 0.02 V | CH_1 = 0.03 V | CH_2 = 0.02 V | CH_3 = 0.02 V |
^[[Aaaeon@SRG-3352C:~$ rd_exadc -a 1 1 1 1
chmode[]: 1 1 1 1
Bus open
I2C_SLAVE set at address: 0x48
CH_0 = 0.09 mA | CH_1 = 0.11 mA | CH_2 = 0.09 mA | CH_3 = 0.09 mA |
```

To view status for a specific channel, use the following command:

```
$ rd_exadc -c CHANNEL -M MODE
```

CHANNEL is the channel you wish to check, 0, 1, 2, or 3

MODE enter 0 for voltage, or 1 for current

```
aaeon@SRG-3352C:~$ rd_exadc -c 0 -m 0
chmode[]: 0 -1 -1 -1
Bus open
I2C_SLAVE set at address: 0x48
CH_0 = 0.02 V |
aaeon@SRG-3352C:~$
```

3.7.4.4 Manage Analog Input (2CH Differential)

To check Group status, use the following command:

```
$ rd_exadc -g GROUP -m 0
```

GROUP enter 0 for group 0 (ch0 and ch1); enter 1 for group 1 (ch2 and ch3)

The system will return the following:

```
aaeon@SRG-3352C:~$ rd_exadc -g 0 -m 0
groupmode[]: 0 -1
chmode[]: 0 0 -1 -1
Bus open
I2C_SLAVE set at address: 0x48
CH_0&1 = 12.10 V |
```