

AL-820 Manuals

High Performance UHF RFID Reader

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1 Overview



Thank you for choosing the Arizon AL-820 UHF RFID Reader, this document will explain how to use this reader $\,^\circ$

1. AL-820 Specification

System	
OS	Linux
CPU	ARM Cortex-A53 Quad-Core 1.8GHz + NPU
RAM	2GB
Interface	
Ethernet	10/100/1000 Base-Ethernet
Wi-Fi	802.11 b/g/n/ac
WWAN	-
USB 3.1 Host	2
USB HID	Yes
RF	
Air Interface Protocol	EPC Global UHF Class 1 Gen2 / ISO 18000-63
Frequency Range	920~928 MHz
Frequency Resolution	100KHz
TX Power	+1dBm~+31.5 dBm

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Power Resolution	0.25dB	
RX Sensitivity	-84 dBm	
Antenna	4	
GPIO		
GPI	3 Input, 1.5V ~ 5V with Optical coupling	
GPO	3 Output, Dry Connect with Optical coupling	
External Storage		
Micro-SD	1	
Power		
DC In	+24V / 1A	
Power on Ethernet	802.3at (25.5W)	
Operating Environment		
Operating Temperature	-20°C ~55°C	
Storage Temperature	-20°C ~85°C	
Operating Humidity	5% ~ 95%	
Mechanical		
Size (L*W*H)	232.2 * 135.1 * 41.3 mm	
Weight	980g	
Certification		
Certification	-	

2 System requirements

To use the AL-820's URC Utility tool smoothly, make sure the main computer meets the following specifications:

CPU: Intel Core i3 / AMD Ryzen 3

Memory : Up to 4GB

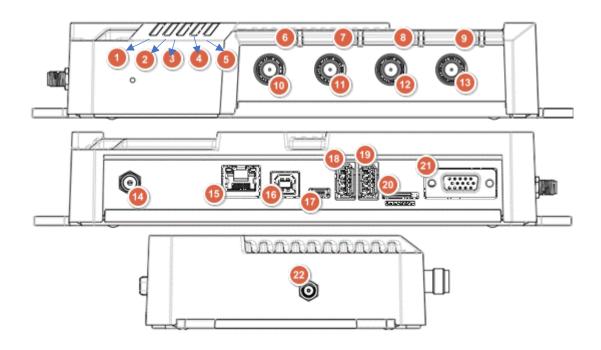
Hard disk free space: 30GB

Operating System: Windows 10/11

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1. Appearance description



- 1. **Power indicator** On indicates power and off indicates no power.
- 2. **System Status indicator** Flashing green light that the system is powering on, and constant green light that the power-on is complete. A quick flash red light a restore to a preset value in progress, and a slow flash red light an update in progress.
 - (*Warning: Do not turn off the power when this light is blinking!)
- 3. **RF Status indicator** Standby mode when blinking slowly and RF signals being emitted when blinking fast.
- 4. Wi-Fi indicator Illuminates to indicate that Wi-Fi is enabled, flashing indicates

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that communication is in progress, and off indicates that Wi-Fi is disabled.

- 5. Not use.
- 6. **Antenna 1 indicator** Green light is the port activity, Red light is the port error.
- 7. **Antenna 2 indicator** Green light is the port activity, Red light is the port error.
- 8. **Antenna 3 indicator** Green light is the port activity, Red light is the port error.
- 9. **Antenna 4 indicator** Green light is the port activity, Red light is the port error.
- 10. Antenna 1 TNC connector with impedance 50Ω .
- 11. Antenna 2 TNC connector with impedance 50Ω .
- 12. **Antenna 3** TNC connector with impedance 50Ω .
- 13. Antenna 4 TNC connector with impedance 50Ω .
- 14. **DC power JACK** Input voltage 24V / 1.2A power supply.
- 15. **RJ-45 Ethernet** Used to communicate with RFID function and supports 10/100Mbps twisted pair network cables above Cat.5E. Support Power on Ethernet(PoE) 802.3at
- 16. USB Device—For RFID function communication, using a HID interface.
- 17. **Console** The internal L inuxsystemcanbeoperated using TTY.
- 18. **USB Host** Can be connected to usb stickers, VCP, 4G LTE Dongle and more.
- 19. **USB Host** Can be connected to usb stickers, VCP, 4G LTE Dongle and more.

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- 20. Micro SD supports S DHC up to 64GB.
- 21. GPIO D-SUB- Connect to an external GPIO control box for use.
- 22. Wi-Fi Antenna Connects an SMA specification 2.4GHz antenna.

3 Connect to the AL-820

AL-820 default built-in DHCP server, the computer please keep the network adapter settings automatically get DHCP, the following figure is Windows 10 network interface settings.



The default IP address and web login information for the AL-820 are as follows:

URL: https://192.168.50.1/

IP 位址: 192.168.50.1

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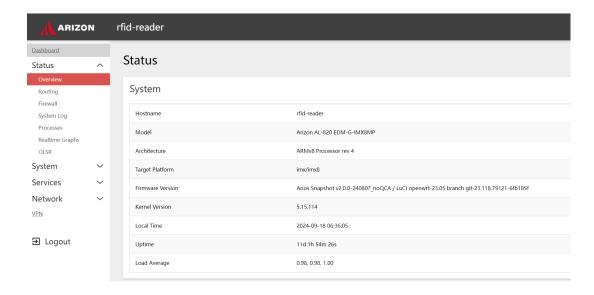


User account: root

Password: 123456

4 Web control panel

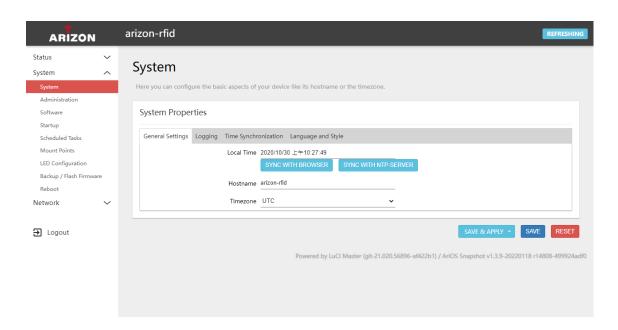
The AL-820 web control panel provides network settings, firmware updates, system settings, time and date settings, etc. (please use URC Utility for RFID operations).



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5. Time Setting



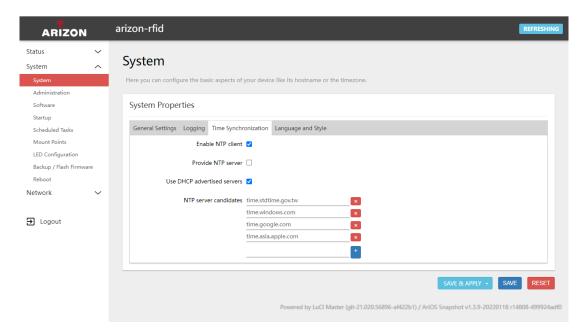
- 1. Log in to the web control panel.
- 2. Click the **System** tab in the left menu.
- 3. Select **System**.
- 4. For **the general date and** time setting in the **system properties**, you can choose the following two setting methods:
 - 1. Synchronize time with the browser (computer).
 - Synchronize time with NTP server (AL-820 requires a connection to the network).
- 5. Select the **time zone** you want.
- 6. Press Save and Apply Settings.

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6. NTP Setting

NTP (Network Time Protocol) can be used to automatically synchronize time with the server.



- 1. Log in to the web control panel.
- 2. Click the **System** tab in the left menu.
- 3. Select **System**.
- 4. Click the Time Synchronization tab.
- 5. Tick Enable NTP Client.

(*To use the local area network automatically, select a server that uses DHCP advertising)

6. In Alternate NTP Server, enter a list of destination servers that you want to

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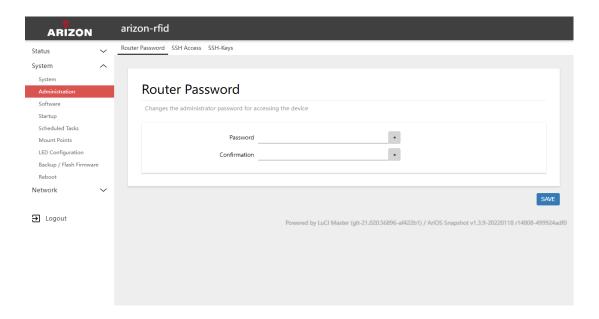


synchronize •

7. Press **Save** and **Apply** Settings.

7. Set the account password

Changing the default account password prevents unauthorized modification of device settings.



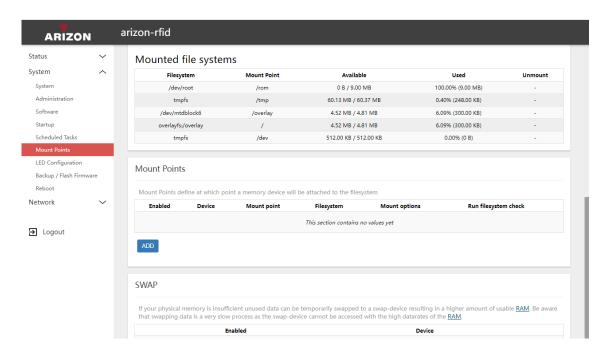
- 8. Log in to the web control panel.
- 9. Click the **System** tab in the left menu.
- 10. Select Administration.
- 11. In Router Password, enter the new password
- 12. Press **Save** and **Apply** Settings.

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8. Mount a USB storage deviceand Micro-SD card

The AL-820 supports connecting external storage space from a USB storage deviceor Micro-SD slot, and the following explains how to attach storage to an internal archive system.

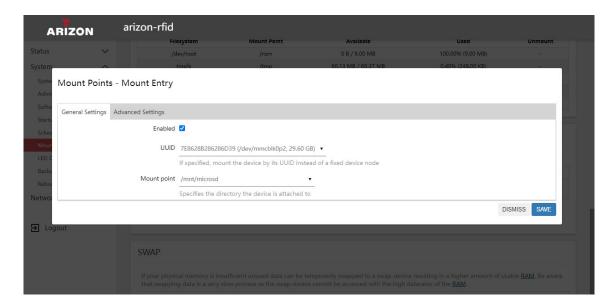


- 1. Plug in a USB storage device or Micro-SD memory
- 2. Log in to the web page background.
- 3. Click the **System** tab in the left menu.
- 4. Select **Mount points**.
- 5. In Mount Points, click Add New.
- 13. After the Enable check box is selected, select the corresponding disk area from the device universal unique identification code UUID.

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(MicroSD is usually /dev/mmcblk0p[N], where [N] is the disk number of the memory card, the example in the picture is mmcblk0p2.)



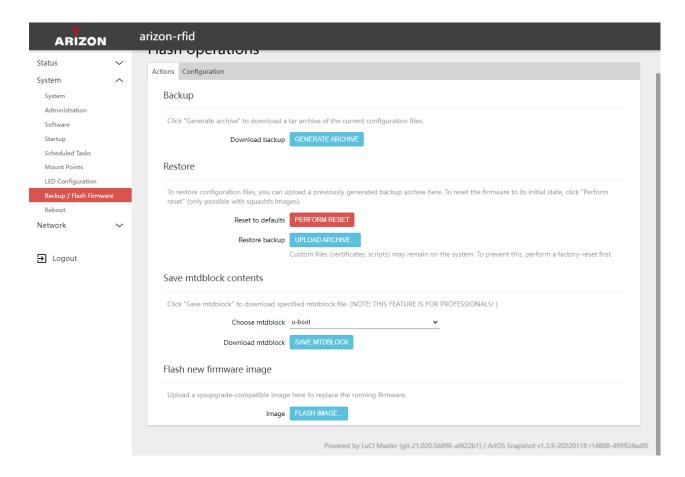
- 14. Select Custom at **the mount point**, enter /mnt/[Custom Name], and press **Save**.
- 15. After pressing **Save** and **Apply**, it takes effect immediately.

9. Upgrades the firmware

In order to ensure system stability and introduce new features, new versions of the firmware will be released from time to time.

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- 1. Log in to the web page background.
- 2. Click the **System** tab in the left menu.
- 3. Select Backup/Flash Firmware.
- 4. In Flash new firmware image, click Flash Image File.
- 5. Press **Browse** to select the image file and click Upload.



6. Follow the on-screen instructions to continue with the update, and do not interrupt the power supply during the update, otherwise it will cause

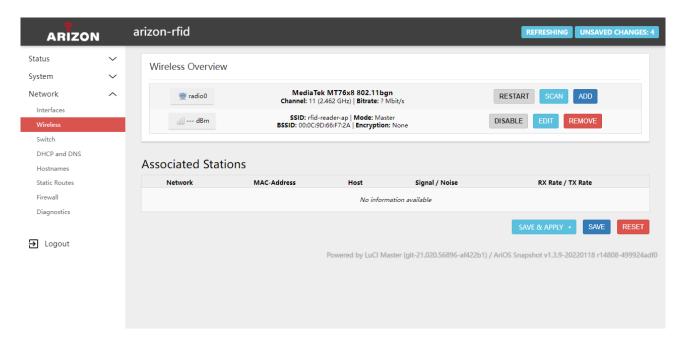
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damage to the firmware.

10. Set Wi-Fi to client mode

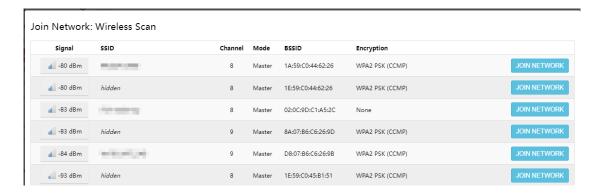
The AL-820 supports 802.11 b/g/n wireless networks, the default is access point mode to accept connections from other computers, you can switch the AL-820 to client mode and connect to other networks.



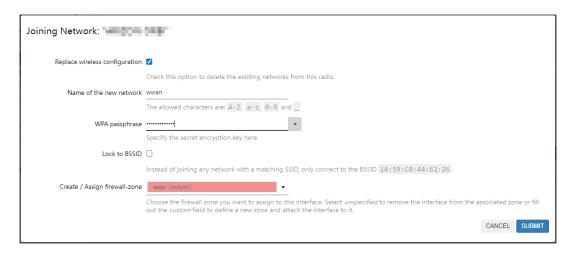
- 1. Log in to the web control panel.
- 2. Click on the **Network** tab in the left menu.
- Select Wireless.
- 4. In the Wireless Overview, click Scan.
- 5. Press Join Network in the network you want **to** connect to.

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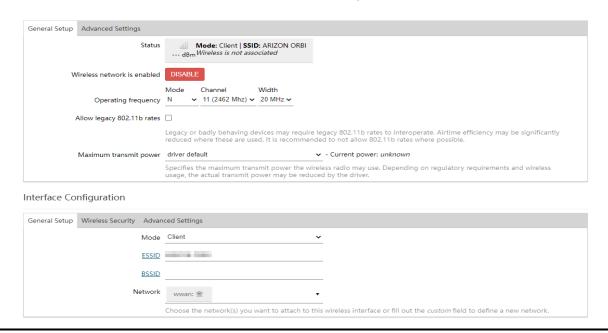




6. Enter your **network password** and click Submit.



7. The details window appears, if you do not need to change other options, please click **Save** directly.



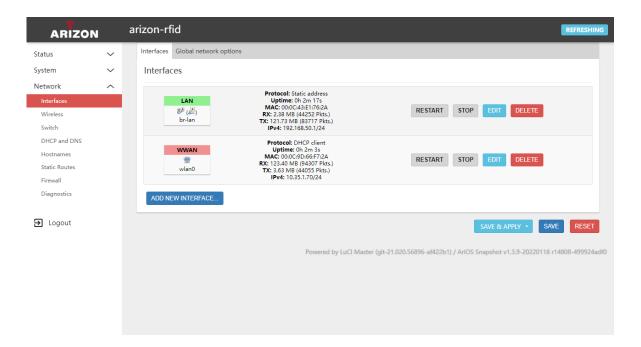
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8. After clicking Save and Apply, wait about 80 seconds for it to take effect.

11. Set up Ethernet

TheAL-820 has a full-duplex10/100Mbps Ethernet jack, the default IP address is 192.168.50.1 and the DHCP server is enabled, you can change the settings as needed.



Please follow the instructions below to reach this page first:

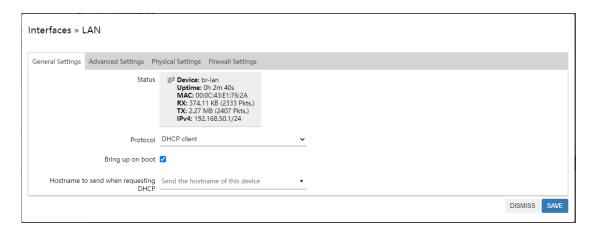
- 1. Log in to the web page background.
- 2. Click on the **Network** tab in the left menu.
- Select Interfaces.
- A. Change to automatically obtain the IP location (the DHCP server will be

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deactivated):

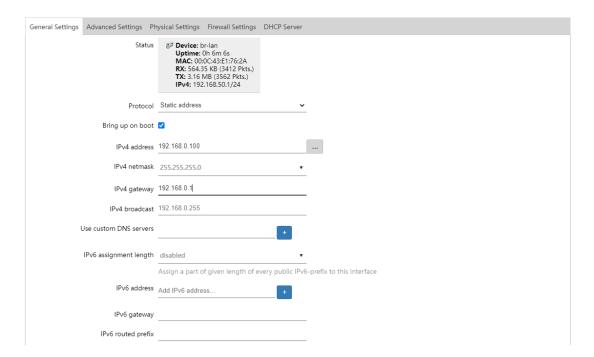
- 1. Click **Edit** at **LAN**.
- 2. In the General Settings tab, change the **protocol** to **DHCP Client**.
- 3. Click **Switch Protocol** to refresh the screen to the corresponding setting parameters.



- 1. Click Save.
- 2. Click **Save** and **Apply** to make the settings take effect.
- B. Change static IP and disable DHCP server
 - 1. Click Edit on LAN.
 - 2. In the general settings tab, change the **protocol** to **static address**.
 - Click Switch Protocol to refresh the screen to the corresponding setting parameters.
 - 4. Please enter the parameters you want to change, such as the IPv4/v6 address, IPv4 gateway, etc.

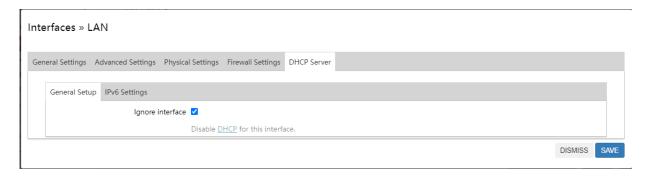
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- 5. Please click the **DHCP Server** tab.
- 6. On the **General Settings** tab, select **Ignore Interfaces** and check this interface.

(*This setting will disable the DHCP server, if you want the AL-820 to assign an IP address, please uncheck it)



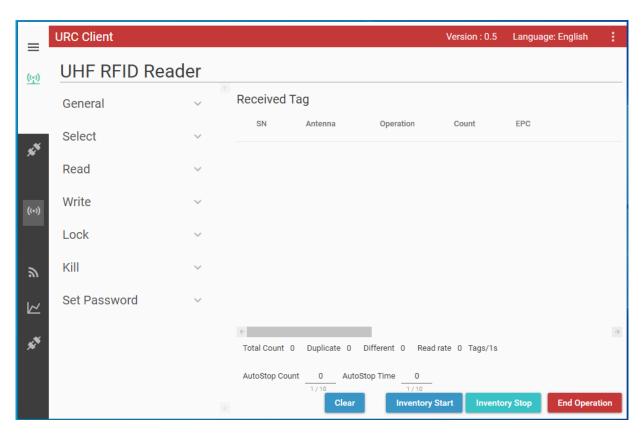
- 7. Click Save.
- 8. Click **Save and Apply** to make the settings take effect.

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12 URC UtilityBasic Instructions for Use

URC Utility is a utility released by Arizon for new readers, which can be used to configure and operate RFID functions

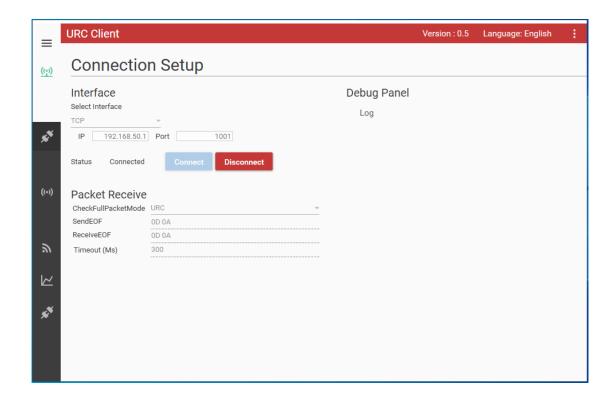


13. Connecting to the device

Connect to AL-820 or other Reader that supports URC function

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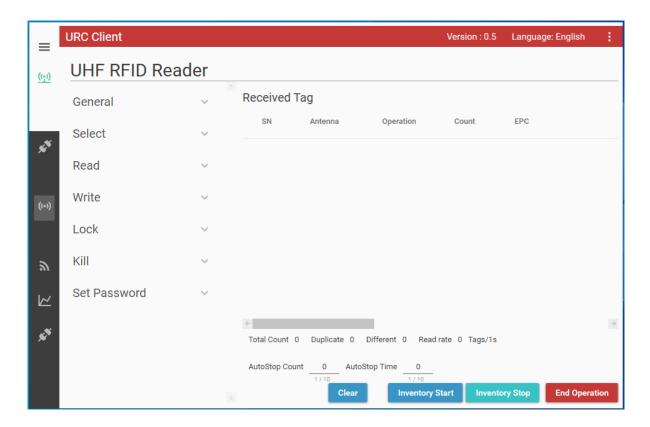


- 1. Please select Connection on the left menu
- 2. Enter the IP Address of the device and the port number (the default is 192.168.50.1, and the port is 1001).
- 3. Press Connect, when the status displays Connected, it means the connection is successful.

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14. UHF RFID Reader



The function of this area is the operation area of the ISO18000-63 (EPCglobal Class1

Gen2) standard function, which is mainly divided into the following functions:

- Inventory
- Select
- Read
- Write
- Lock
- Kill

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15. Inventory

序	天線	操作	數量	EPC
737) \ 105	JA 1 F	※	
1	1	None	86	E200-001C-1107-0095-0310-3F23
2	1	None	162	E200-001C-1107-0184-0240-9DF0
3	1	None	330	E200-001C-1107-0135-0200-69BF
4	1	None	144	E200-001C-1107-0086-0310-370F
5	1	None	108	E200-001C-1107-0144-0210-7240
6	1	None	144	E200-001C-1107-0186-0250-A681
7	1	None	305	E200-001C-1107-0195-0250-AF25
8	1	None	110	FFF-FFFF-FFFF-3132-3232-3435-363
9	1	None	174	E200-001C-1107-0167-0250-8CCB
10	1	None	174	E200-001C-1107-0166-0250-8C6F
11	1	None	53	E200-001C-1107-0098-0320-4715
12	1	None	238	E200-001C-1107-0188-0250-A682
13	1	None	48	E200-001C-1107-0184-0200-9E00
14	1	None	189	E200-001C-1107-0153-0250-7B4C
15	11	None	358	F200-001C-1107-0196-0250-AFF6
息數量 150	72 重複 134	未重複 136 讀取i	· 東率 89 標籤/秒	
動停止數量	0 自動係	亭止時間 0		

The values of the status bar represent the following meanings:

- Total Count: The total number of tags received.
- **Duplicate**: The number of duplicates received for labels.
- **Different**: The number of tags received that were not duplicated.
- Read rate: The read rate of tags per second, repetitions will also be included in the calculation.

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- AutoStop Count: the number of auto-stops after starting the inventory. When it is set to 0, this function will be disabled.
- AutoStop Time: The time for auto-stop after starting the inventory, in seconds, when
 it is set to 0, this function will be disabled.

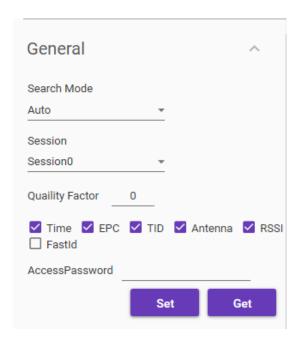
The operation button area has the following functions:

- Clear: Clears the currently received tag screen.
- **Inventory start**: start the inventory, and automatically stop according to the automatic stop condition (if it is 0, it will not stop).
- **Inventory Stop**: stop the inventory.
- **End Operation**: When performing write, read, and kill operations, use this button to terminate the operation, otherwise the last operation will be maintained when the inventory is started next time.

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16. General options



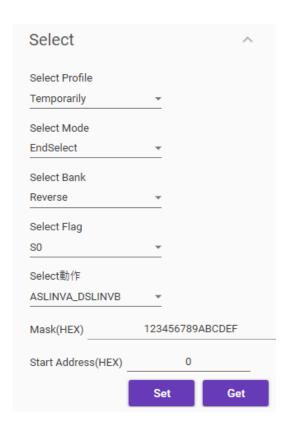
- Search Mode: Specify the received tag flag and tag mode. Currently, the modes supported by AL-820 are as follows:
 - 1. Auto: automatic mode.
 - 2. Dual Target: A and B flags are read.
 - 3. Single A to B: Read the A flag and flip the tag to the B flag.
 - 4. Single B to A: Read the B flag and flip the tag to the A flag.
- **Session**: Set the interval between tag flipping after data exchange between tag and reader. For details, please refer to EPCglobal Class1 Gen2 standard agreement.
- Quality factor: The reference value of tag anti-collision, it is recommended to input the actual possible reading quantity of the application.

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- Report content: You can choose the tag content reported by the reader, which will
 affect the packet size of data transmission •
- Access Password: Some tags may be locked, and Access Password is required for access. The content used in this area is a hexadecimal value. For details, please refer to the EPCglobal Class1 Gen2 standard agreement.

17. Select



Available options:

• Select profile: Divided into Temporarily and Permanent

• Select Mode: Determines the type of tags reported by the reader, divided into Not

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Select, Selectand End Select.

- **Select Bank**: Specify the selection block to be labeled, usually using EPC or TID as the selection criteria.
- Select Flag: Specifies the target tag flag to be selected. The default is to use SL.

Currently, the following flags are supported

- 1. Session 0
- 2. Session 1
- 3. Session 2
- 4. Session 3
- 5. SL
- **Select action**: Determines the behavior when the tag is selected or unselected.

Currently, the following functions are supported

Action	Tag Matching	Tag Not Matching
ASLINVA_ DSLINVB	assert SL or inventoried → A	deassert SL or inventoried → B
ASLINVA_NOTHING	assert SL or inventoried → A	do nothing
NOTHING_DSLINVB	do nothing	deassert SL or inventoried → B
NSLINVS_NOTHING	negate SL or (A \rightarrow B, B \rightarrow A)	do nothing
DSLINVB_ ASLINVA	deassert SL or inventoried → B	assert SL or inventoried → A

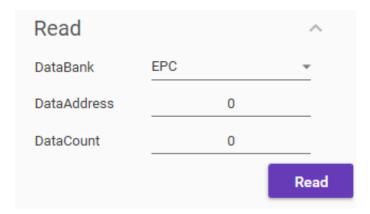
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DSLINVB_NOTHING	deassert SL or inventoried → B	do nothing
NOTHING_ ASLINVA	do nothing	assert SL or inventoried \rightarrow A
NOTHING_ NSLINVS	do nothing	negate SL or (A \rightarrow B, B \rightarrow A)

- Mask: Select mask for Select, the data format is hexadecimal.
- **Start Address(Hex)**: Set the relative start position of the mask effect and the block.

18. Read



Specify the Reader to enter the read operation state. After setting the following parameters, press **Read** to automatically start the inventory:

- Data Bank: specify the block to be read.
- Data Address: Specify the relative starting position of the read block
- Data Count: Specify the length of the data to be read.

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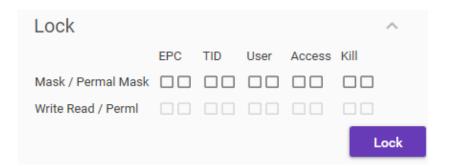
19. Write



Specify the Reader to enter the write operation state. After setting the following parameters, press **Write** to automatically start the inventory:

- Write Bank: specify the block to be written.
- **Start Address**: specify the relative start position of the block.
- Data: Enter the data you want to write in hexadecimal format.

20. Lock



Specify the Reader to enter the lock operation state. After setting the following parameters, pressing the **Lock** will automatically start the inventory:

• Mask / Permal Mask : Specify the item to be changed.

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Write Read / Permal: The function corresponds to the option parameter. When it is checked, it is locked (valid), and when it is not checked, it is unlocked (not valid).(*Note: After Perm Mask is checked, if Perm is not checked, the tag will be permanently unlocked)

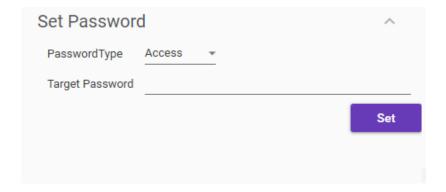
21. Kill



Specify the Reader to enter the kill operation state. After setting the following parameters, press **Kill** to automatically start the inventory:

• Kill Password: Enter the kill password in hexadecimal format.

22. Set Password



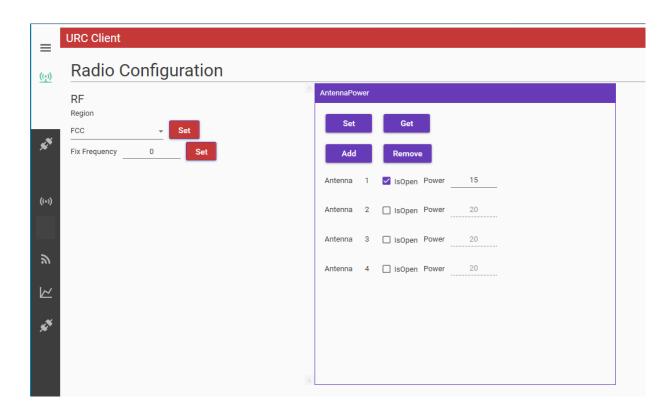
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Specify the Reader to enter the write operation state, and press **Set** after setting the following parameters to automatically start the inventory:

- Password Type: Select the set password type.
- Target Password: Enter a new password in hexadecimal format.

23. RFSettings



This area is to set the RF working frequency range and antenna transmit power. The available options are as follows:

Region: Select the applicable frequency range of the reader. Please set it according
to the country where you are located. After selecting, press Set to apply.

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- Fix frequency: It is used for error detection or special situations. The usable frequency may be limited by hardware designed according to the laws and regulations of different countries, and the unit is MHz.
- Antenna Power: Adjust the antenna transmit power, the unit is dBm.
 - (* Note: Please press Get first to get the current antenna settings, after adjusting the parameters, press Set to apply)

24 NCC Warnings

For the low-power radio frequency equipment that has obtained the verification certificate, without approval, the company, firm or user shall not change the frequency, increase the power or change the features and functions of the original design without authorization. The use of low-power radio frequency equipment shall not affect flight safety and interfere with legal communications; if any interference is found, it should be stopped immediately, and it should be improved until there is no interference before continuing to use it. The aforesaid legal communication refers to the radio communication operated in accordance with the provisions of the Telecommunications Management Law. Low power radio frequency equipment must endure interference from legal communication or radio wave radiated electrical equipment for industrial, scientific and medical use.

This product is for professional installation only. Non-professional personnel are not allowed to disassemble and replace related accessories at will.

25. FCC Warning

Any changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Note: 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

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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.

RF exposure statements

- 1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- 2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body or nearby persons.

This product is for professional installation only. Non-professional personnel are not allowed to disassemble and replace related accessories at will.

26 Contact us

ARIZON Corporation (US)

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