Additel 710

Automated Gauge Reader

Additel 710 Automated Gauge Reader

-------User Manual

[Version：2604V01]

Additel Corporation

STATEMENT

This user manual provides operating and safety instructions for the Additel 710 Automated Gauge Reader. To ensure correct operation and safety, please follow the instructions in this manual. Additel Corporation reserves the right to change the contents and other information contained in this manual without notice.

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Safety Instructions

- Do not place your hands or objects under the lifting mechanism after it has been raised.
- When moving this device, lower the lifting mechanism to its lowest position.
- Use only the designated power adapter for power supply.
- Do not apply pressure beyond the rated range to this device; Any resulting accidents will not be covered by the warranty.
- Do not use in environments with explosive gases, vapors, or dust.

Warning：

To prevent injury to the user, be sure to use this product in accordance with the user manual.

To prevent fire, electric shock, or personal injury:

1. General:

- Before using the device, please read the user manual, especially the "Safety Instructions" section.
- This device must be operated only by trained professionals to prevent injury to the operator or damage to the equipment.
- Before using the product, please check the appearance of the product for any damage.
- Do not operate the device in any orientation other than the upright position.
- If the product is damaged or malfunctioning, do not use it and contact Additel.

2.Electrical：

- Due to the high voltage inside the device during use, please do not disassemble it without permission.

Note：

- The device should not be used in environments with strong mechanical vibrations.
- When using this device, ensure it is powered by the dedicated power adapter to function properly.
- In case of serious malfunction, disconnect the power adapter immediately and promptly contact after-sales service personnel.
- Do not insert or remove the automated gauge reader module while the device is in operation.
- The tilt angle of the meter under test should be ≤10 degrees to avoid affecting the reading.
- The distance between the tapping hammer and the unit under test should be ≤7 mm.

1. Device Introduction

1. 1 General Introduction

The ADT 710 Automated Gauge Reader is the latest automatic reading solution launched by Additel for general pressure gauges (single-dial, single-scale specifications). It highly integrates a pressure manifold, image processing and machine learning technologies. When used in conjunction with Additel pressure controller and ACal pressure calibration software, it enables fully automatic calibration of general dial pressure gauges requiring no human intervention throughout the entire process, significantly improving users' calibration efficiency. It is especially suitable for periodic, repetitive, and large-scale calibration work in measurement institutions, calibration companies, and instrument workshops across various industries.

1.2 Features

1. Quickly forms a fully automatic calibration system with pressure controllers, pressure calibrators, and ACal pressure calibration software, and supporting all Additel pressure controllers.

2. No additional light source required; automatically captures images. Quickly and accurately reads the indications of general dial pressure gauges.

3. Equipped with the self-developed recognition module AMetis. Creating a dataset of nearly 10,000 dial pressure gauge test data and offering high recognition accuracy, excellent reading precision, and an upgradable algorithm library.

4. Built-in lifting motor for intelligent identification, tracking, and capture of the dial.

5. Comes with an integrated tapping hammer to automatically perform tapping actions during the calibration process.

6. Supports code scanning function. When used with ACal software, automatically retrieves the DUT information from the database.

7. Additel 108/109

- ADT108 Contamination Prevention System (Pneumatic pressure version): The residual liquid in the DUT is effectively drained during each calibration to prevent it from entering the gas controller pipeline.
- ADT109 Contamination Prevention System (Hydraulic pressure version): Effectively enhance the liquid zeroing capability. The zero-point control requires no manual intervention, achieving truly fully automatic verification.

8. Pressure Connnection

- Order the quick connector type (M20X1.5,1/4NPT,1/2NPT,1/4BSP, 1/2BSP) according to requirements.
- The quick connector can be flipped 90 degrees for rapid switching between radial and axial gauge calibration.
- The quick connector uses a push-to-lock structure, enabling rapid replacement of connectors with different thread requirements.

1.3 Technical Specifications

Table 1 General specifications

Item	Additel 710 Automated Gauge Reader (Pneumatic)	Additel 710 Automated Gauge Reader (Hydraulic)
Pressure Range	(-15~6000) psi/ (-1~420) bar	(0~15000) psi/ (0~1000) bar
Working Medium	Nitrogen or compressed air	Liquid
Pressure Inlet	1/4 BSP M thread. ADT108 Contamination Prevention System needs to be ordered separately.	1/4 BSP quick-connect M thread. ADT109 Contamination Prevention System needs to be ordered separately.

Cavity volume	Additel 710：4.3mL, Additel 108(42MPa)：9mL	Additel 710：4.3mL, Additel 109：6mL
Pressure Connection	Order the quick connector type (M20X1.5,1/4NPT,1/2NPT,1/4BSP, 1/2BSP) according to requirements.	
Pressure Vent	Supports automatic pressure venting.	
Display Screen	5-inch TFT touch screen.	
Camera	High-definition mobile phone camera (50 million pixels), supporting auto zoom and autofocus.	
Working environment	Working temperature:(0~40)℃; Storage temperature:(-20~70)℃; Environment humidity:<90% RHD (no condensation).	
Power Supply Requirement	(100～240)VAC,(50/60)Hz,65W Max.	
Communication	WLAN, Ethernet.	
Size & Weight	Width 190mm X High 275mm X Deep 392mm, 7.3kg	

Table 2 Recognition technical specification

Item	Description
Recognition Engine	Self-developed AMetis recognition engine, with a self-built test dataset of nearly ten thousand general dial gauge tables.
Recognition	A general dial pressure gauge with a single dial and single scale ruler. Dial size: Φ40 to Φ250 mm, Axial gauge Φ 40～ Φ 150 mm Accuracy: ≥1.0.
Reading Accuracy	Better than 1/10 grid.
Identification Speed	Recognition speed: 2 to 3 frames per second.
Working Mode	Edge computing, offline working.
Upgrade Method	Quick firmware upgrade along with the product.
Scan the QR code to read gauge.	It supports automatic recognition of over 10 common types of barcodes and QR codes. After scanning, it automatically retrieves the tested pressure gauge information from the ACal software database, improving the efficiency of data entry.

1.4 Basic Structure

1.4.1 Additel 710 Automated Gauge Reader

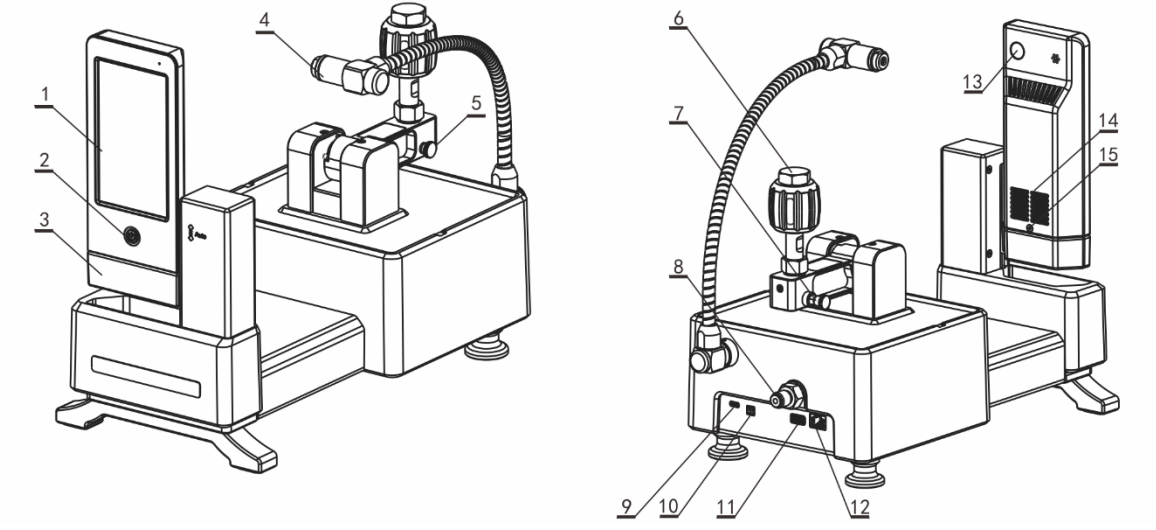


Figure 1 Additel 710 Automated Gauge Reader

Table 3 Basic Structure Description of Additel 710 Automated Gauge Reader

No	Name	Description
1	Display touch screen	Automated Gauge Reader main display touch screen.
2	Power button	Power button of intelligent identification module
3	Lifting device	The camera automatically adjusts its height to align with the center of the DUT.
4	Light tapping hammer	Strike the tested gauge, adjust the metal hose to bring the hammer head close to the back or side of the gauge, with a distance ≤7 mm.
5	Knurled thumb screw	A safety latch providing dual protection.
6	Quick connector	The pressure connection port of the DUT and order the quick connector type (M20X1.5,1/4NPT,1/2NPT,1/4BSP, 1/2BSP) according to requirements.
7	Lock pin	Quick connector assembly automatic locking pin.
8	Pressure inlet port	1/4 BSP M standard thread
9	DC5V PD	Power supply interface. Please use the Additel power adapter and cable.
10	Vent valve control port	Connect with Additel 108 or 109 contamination Prevention System

11	USB-A port	For software upgrades via USB driver or another USB device
12	LAN port	Ethernet interface
13	Camera	Image and QR code recognition camera
14	Electric fan	For the active cooling for Intelligent recognition module.
15	Locking screw	M3×8 countersunk head screw, used for locking intelligent identification module.

1.4.2 Additel 108 Contamination Prevention System (Depending on the model and configuration)

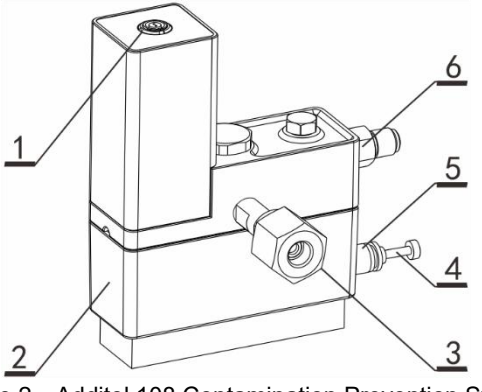


Figure 2 Additel 108 Contamination Prevention System.

Table 4 Basic structure description of Additel 108 Contamination Prevention System

Serial Number	Item Name	Description
1	Lemo plug port	The vent valve control Lemo plug connects to the pressure controller (recommended) or Additel 710.
2	Oil reservoir	Capacity: 150 ml
3	Pressure output port	1/4 BSP M standard thread.
4	Plug	Plug for quick connector
5	Oil drain port	It can be connected to a φ8 hose, with an external oil storage tank.
6	Pressure inlet port	1/4 BSP M standard thread.

1.4.3 Additel 109 Contamination Prevention System (Depending on the model and configuration)

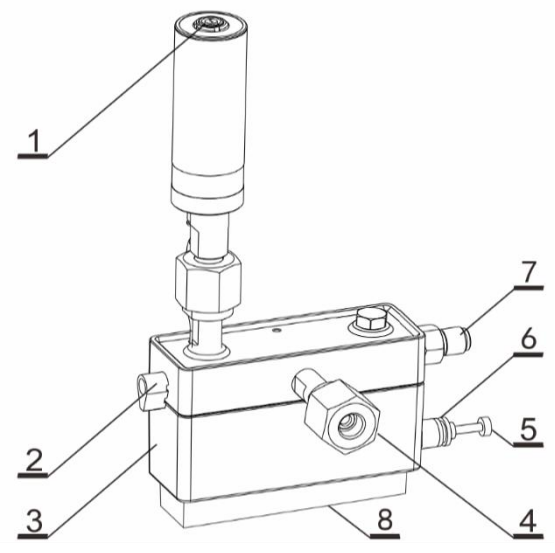


Figure 3 Additel 109 Contamination Prevention System.

Table 5 Basic structure description of Additel 109 Contamination Prevention System

Serial Number	Item Name	Description
1	Lemo plug port	The vent valve control Lemo plug is connected to the pressure controller (recommended) or Additel 710.
2	Oil reservoir press buckle	Oil reservoir limit latch
3	Oil reservoir	Capacity: 150 ml
4	Pressure output port	1/4 BSP F standard thread
5	Plug	Plug for quick connector
6	Oil drain port	It can be connected to a φ8 hose, with an external oil storage tank.
7	Pressure inlet port	1/4 BSP M standard thread.
8	Support pad	Supporting pad of Additel 109

1.5 Calibration Software

The ACal Pressure Calibration System software is a professionally designed calibration and verification platform sold globally. It supports the calibration and verification of over 10 types of pressure instruments. The software can operate in a networked environment, enabling multi-user collaborative work. Its calibration procedures, data calculation processes, and issued certificates all comply with national verification regulations. Featuring a simple and user-friendly interface with a consistent operation style, the software also supports touch operation, ensuring low learning curve and allowing calibration personnel to quickly start their metrology tasks.

The Additel 710 Automated Gauge Reader cannot be used alone and requires purchasing ACal software to use together. The software selection table is as follows:

Table 6 Software options

Item	Model	Specification
Basic Software [1]	ACal Network	ACal software - Network version
	ACal Professional	ACal software - Professional version

Note:

[1] Only need to choose one of the two software options: ACal Network or ACal Professional.

2. Typical connection

2.1 Connection with Additel 773 or Additel 783 pressure controller

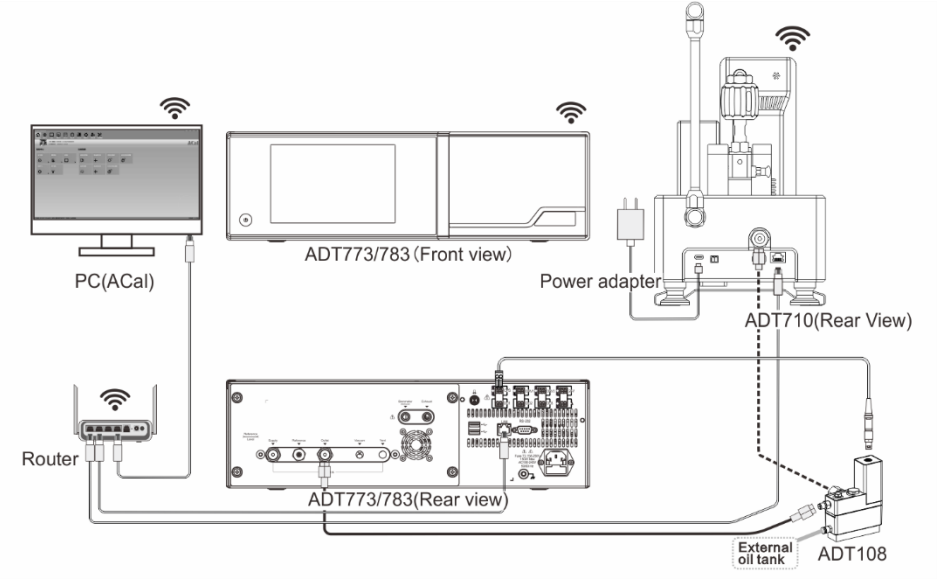


Figure 4 Schematic diagram of connection with Additel 773 or Additel 783 pressure controllers

Note: Optional network connections: WLAN, Ethernet, or a hybrid combination of both.

2.2 Connection with Additel 793 pressure controller

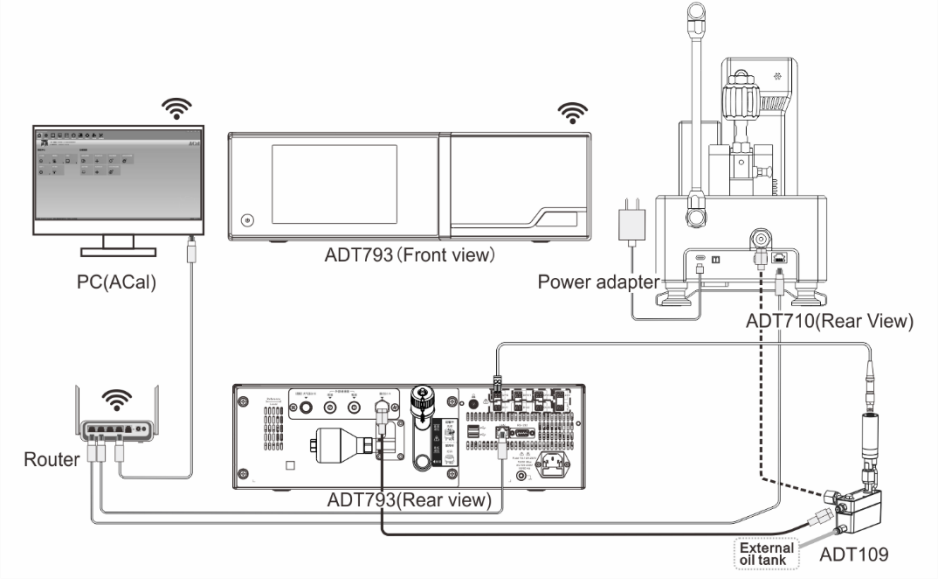


Figure 5 Schematic diagram of connection with Additel 793 pressure controllers

Note: ①Optional network connections: WLAN, Ethernet, or a hybrid combination of both.

2.3 Connect two or more Additel 710 (Pneumatic)

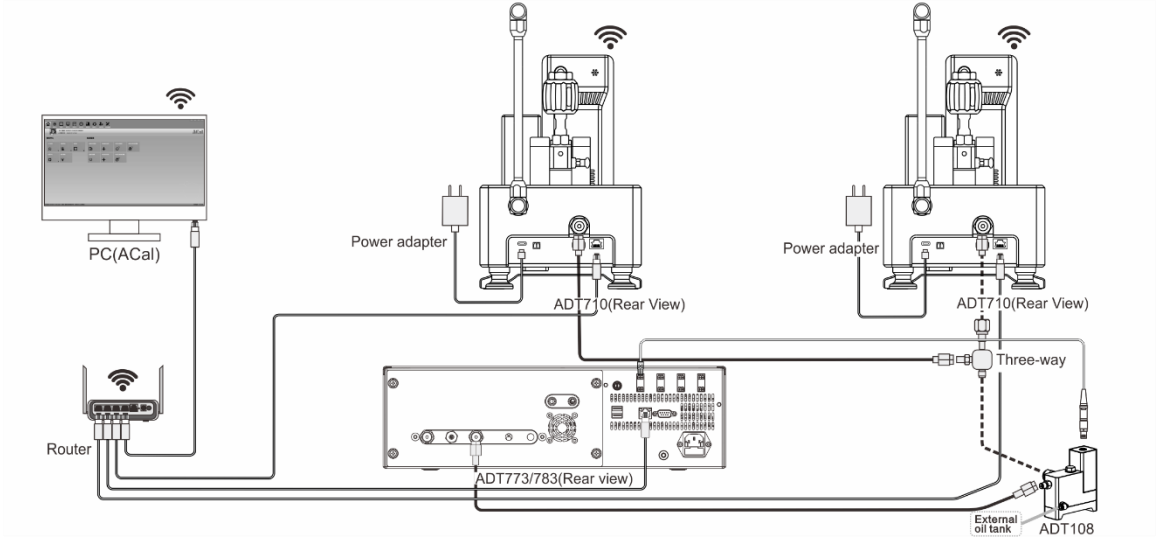


Figure 6 Schematic diagram of electrical and pipeline/ pneumatic connections for two or more Additel 710.

Note: ①Optional network connections: WLAN, Ethernet, or a hybrid combination of both.

②Only need one pressure controller and one Additel 108. By connecting two or more Additel 710 through a three-way extension pressure port, batch calibration can be achieved.

③This Connection kit which is a tubing kit to connect multiple ADT710 gauge readers is optional.

2.4 Connect two or more Additel 710 (Hydraulic)

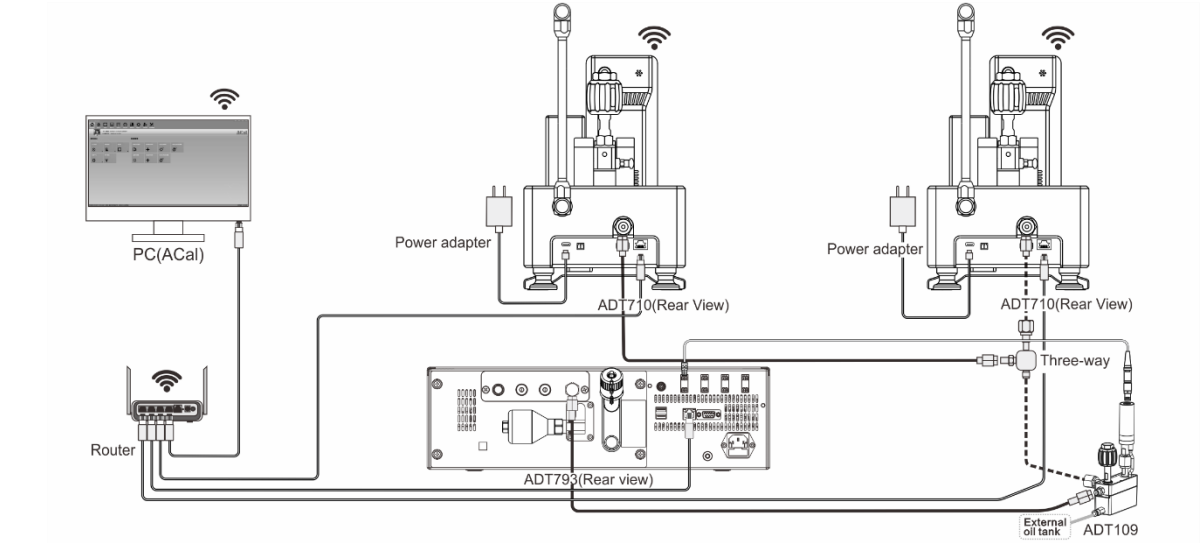


Figure 7 Schematic diagram of electrical and pipeline/ hydraulic connections for two or more Additel 710 systems.

Note: ①Optional network connections: WLAN, Ethernet, or a hybrid combination of both.

②Only need one pressure controller and one Additel 109. By connecting two or more Additel 710 through a three-way extension pressure port, batch calibration can be achieved.

③This Connection kit which is a tubing kit to connect multiple ADT710 gauge readers is optional.

3. Additel 710 display and system settings

3.1 Main interface

Plug in the power adapter. If the display shows nothing, please press and hold the power button to enter main interface.

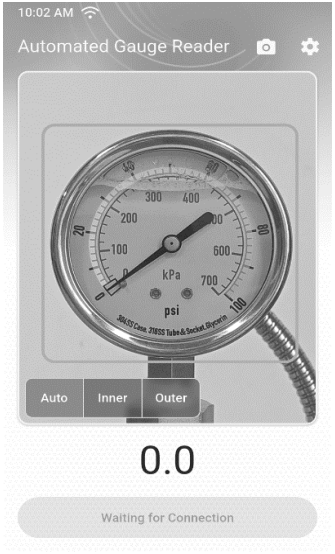


Figure 8 Main interface

3.1.1 Status Bar

The status bar consists of four parts, from left to right: system time, Automated Gauge Reader status, external device status, and charging status.

- ◆System Time: Displays the current system time. The system time can be modified in "Settings > Date and Time."
- ◆Automated Gauge Reader Module Status:  Flashing red indicates a device malfunction. Troubleshoot the issue before using the device. This status does not appear when there are no abnormalities.
- ◆External Device Status:  -None,  - CPS Contamination Prevention System,  - Pressure Switch Control Valve.
- ◆Charging Status: Displays battery level and charging status.

3.1.2 Display and Setting of Device Name

- ◆Device Name: The "Automated Gauge Reader" allows you to modify the equipment name in the settings column as needed.
- ◆Settings: click  to enter the settings menu. For details, see Section 3.2 Settings.

3.1.3 Snapshot

Click the  on the upper right corner of the display to have a snapshot. It can view, delete, and export screenshots in Settings > Screenshot Management.

3.1.4 Power Button

The buttons on the right side of the display are the power switch and unlock keys for the intelligent identification module. Press and hold to turn the device on or off and press briefly to lock or unlock the screen.

3.1.5 Image Preview Area

The real-time preview image is displayed, allowing users to adjust their working environment based on the image effect. This helps avoid working in overly cluttered environments or under conditions with excessive backlighting, overexposure, or dial glare. When scanning a QR code, ensure that the code is within the preview frame and the image is clear.

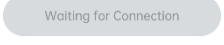
3.1.6 Dual-scale recognition settings

- ◆Auto: Automatic scale recognition.
- ◆Inner:Inner ring scale recognition.
- ◆Outer:Outer ring scale recognition.

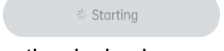
3.1.7 Display Area for Indicated Values

The real-time display of the instrument readings automatically adjusts the number of digits and precision based on the instrument or is calculated and adjusted according to the instrument information.

3.1.8 Task Start/End Button

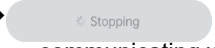
- ◆ 

Gray: When not connected to ACal, the button is disabled.
- ◆ 

Blue: This button means connected to ACal and can be clicked to start calibration.
- ◆ 

Gray: This button is in the "Quick Start" state means after clicking "Quick Start." In this state, the device is communicating with ACal and waiting for calibration to start.
- ◆ 

Red: This button means in the calibration process-clicking it stops calibration.

◆ 

Gray: This button is in the "Stop" state after clicking "Stop." In this state, the device is communicating with ACal and waiting for calibration to stop.

3.2 Settings

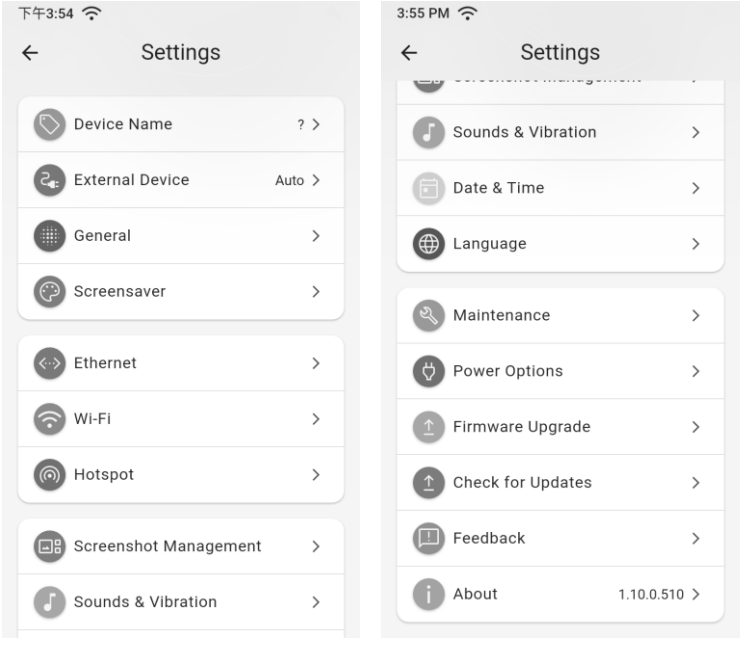


Figure 9 Settings

3.2.1 Device Name

Click to enter "Device Name" to modify the main interface name, default name is "Automated Gauge Reader".

3.2.2 External Device

 -None,  -CPS Contamination Prevention System,  -Pressure switch control valve.

3.2.3 General

Click the "General" option to enter the general settings interface, where you can modify the relevant settings for quickly entering dial gauge readings: whether to enable automatic dial recognition, whether historical data is involved in recognition, and whether to automatically fill in the specifications and model.

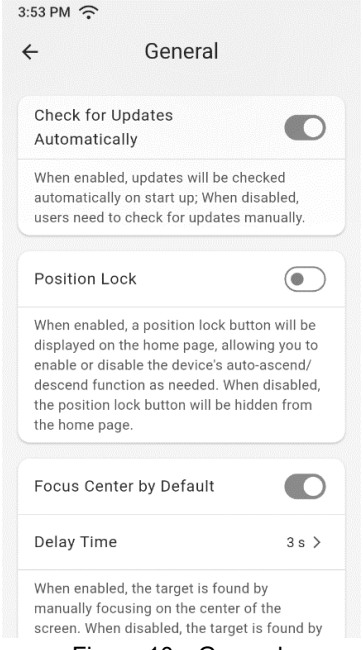


Figure 10 General

3.2.4 Screensaver

Click “Screen protect” to enter the screen protect parameter settings

3.2.5 Snapshot Management

Click “Snapshot Management” to enter the snapshot management interface where you can view or delete saved snapshots.

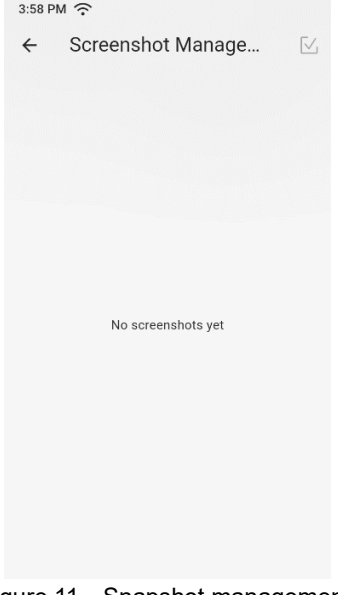


Figure 11 Snapshot management

3.2.5 Date and Time

Click "Date and Time" to enter the system settings "Date and Time" interface, where you can select 24-hour format, automatically set the time (connected internet users can turn on automatic time synchronization, while unconnected users need to turn it off and set the time manually), and automatically set the time zone (same as above).

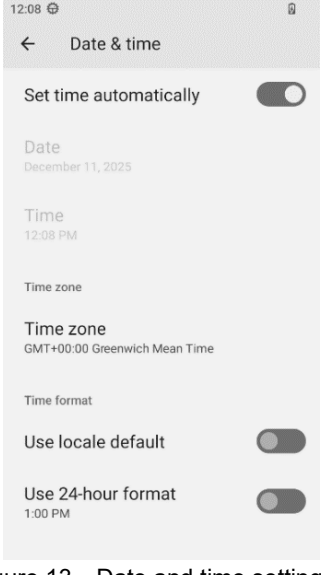


Figure 13 Date and time settings

3.2.6 Wi-Fi

Click "Wi-Fi" and follow the prompts to turn on Wi-Fi and connect to the target Wi-Fi. After connecting to Wi-Fi, the current network's IP address, port, gateway, and subnet mask information will be listed for easy manual connection using ACal.

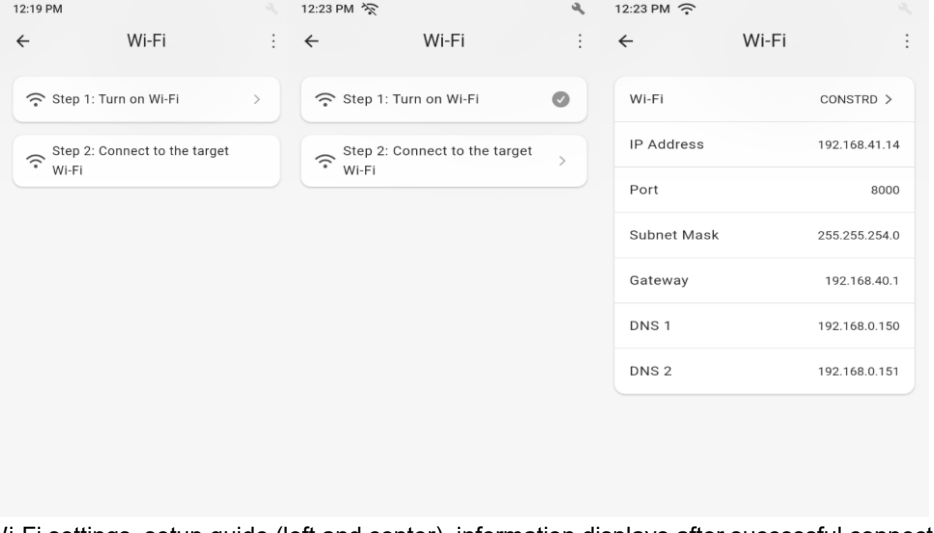


Figure 14 Wi-Fi settings, setup guide (left and center), information displays after successful connection (right)

3.2.7 Ethernet

Click "Ethernet" and follow the prompts to turn off Wi-Fi. Plug a network cable with the correct DHCP configuration into the Ethernet port on the back of the device. Once properly connected to a wired network, the current network's IP address, port, gateway, and subnet mask will be listed for easy manual connect with ACal.

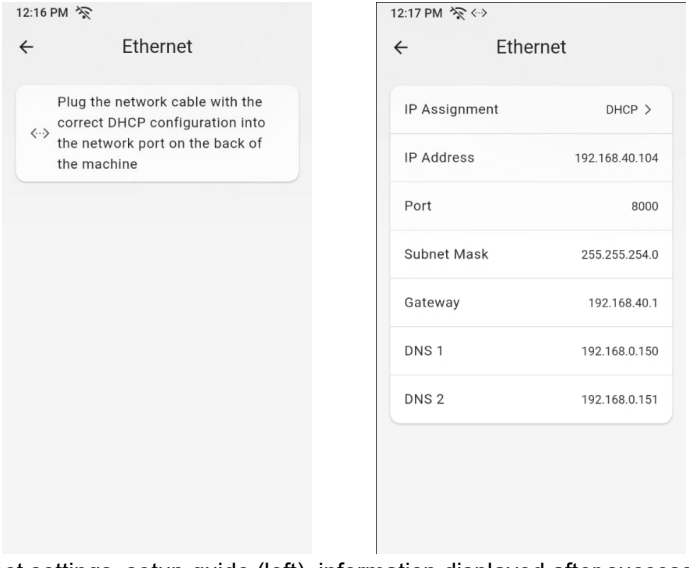


Figure 15 Ethernet settings, setup guide (left), information displayed after successful connection (right)

3.2.8 Hotspot

Click "Hotspot" to enter the system settings "Network Sharing" interface, click and turn on "Personal Hotspot", and "Hotspot Management" to set the hotspot name, password and other information.

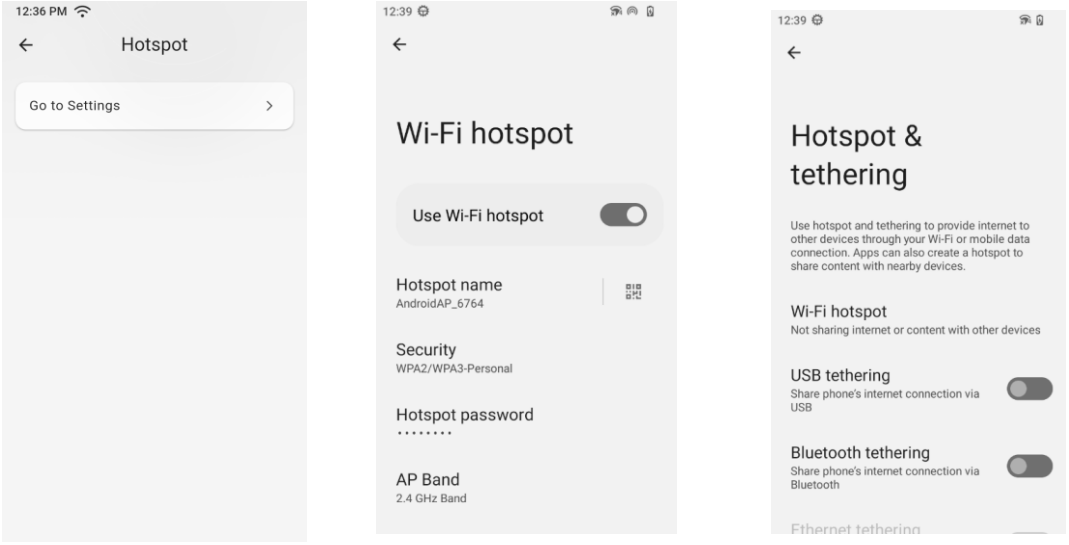


Figure16 Hotspot settings, including network sharing configuration (left), personal hotspot setup (center), and information display after successful configuration (right)

3.2.9 Maintenance

Click "Maintenance" and enter the password "123456" to enter the maintenance interface, where you can view system logs, maintenance records and add or manage them.

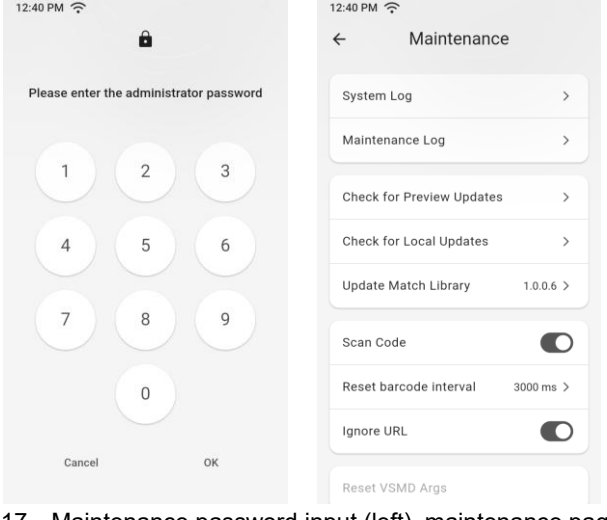


Figure 17 Maintenance password input (left), maintenance page (right)

3.2.10 Power Options

Click “Power Options” to open the power settings menu. From this interface, you can configure the system behavior after a power failure, including:

- Prompt for shutdown
- Automatic shutdown
- No shutdown

You can also adjust the related parameters for each shutdown mode.

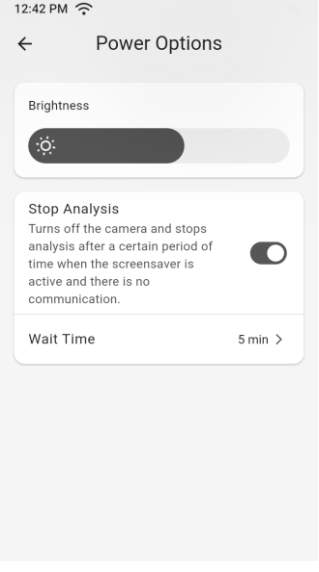


Figure 18 Power options

3.2.11 Firmware Upgrade

Click "Firmware Upgrade" to enter the firmware upgrade interface. Insert the USB storage device containing the installation package according to the prompts in the picture. The system will automatically identify the installable update package. Manually select the update package and then upgrade. Do not turn off the power during the upgrade process.

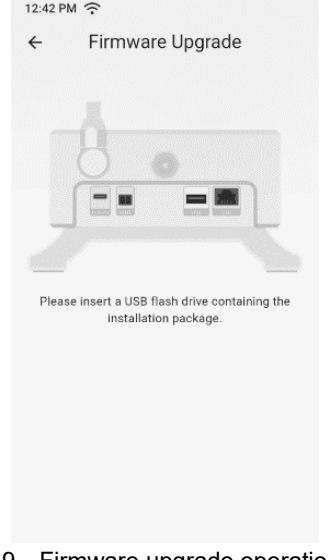


Figure 19 Firmware upgrade operation guide

3.2.12 Feedback

Click the "Feedback" option to enter the feedback interface, fill in the problem description, contact person, email address, and contact number, select the image that needs feedback, and click Submit to provide online feedback on problems encountered during identification.

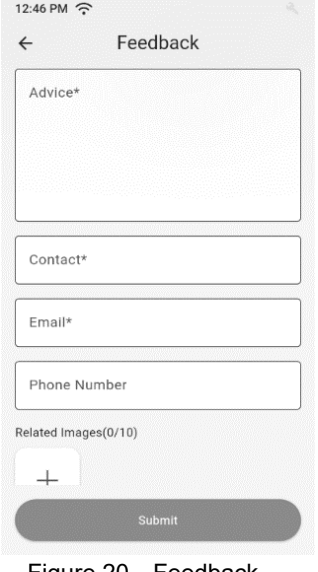


Figure 20 Feedback

3.2.13 About

Click "About" to enter the about interface, which displays software information, including icon, software name, device model, product serial number, software version and algorithm version information.

3.3 Others

3.3.1 Power On/Off Instructions

There is a "Power On/Off Instructions" label on the host. Please follow the instructions to power on and off.

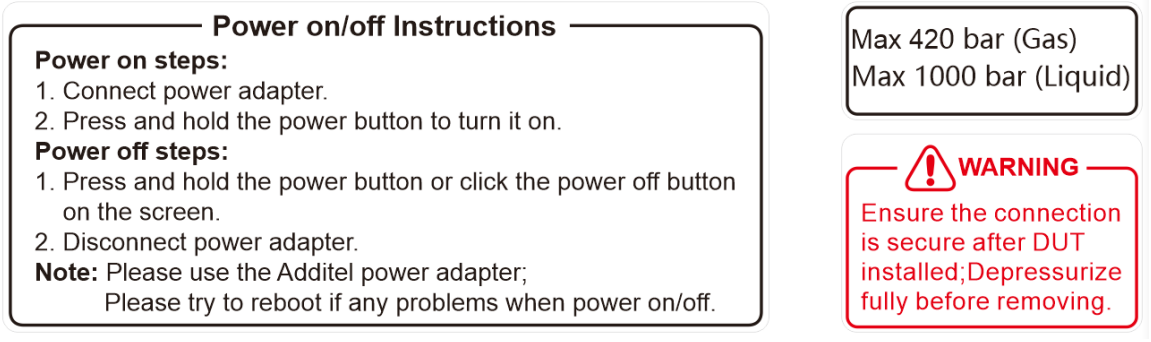


Figure 23 Power on/off instructions

4. ACal Display and System Setting

This document only introduces the automated gauge reader module. For more information on ACal operation instructions, please refer to the ACal user manual.

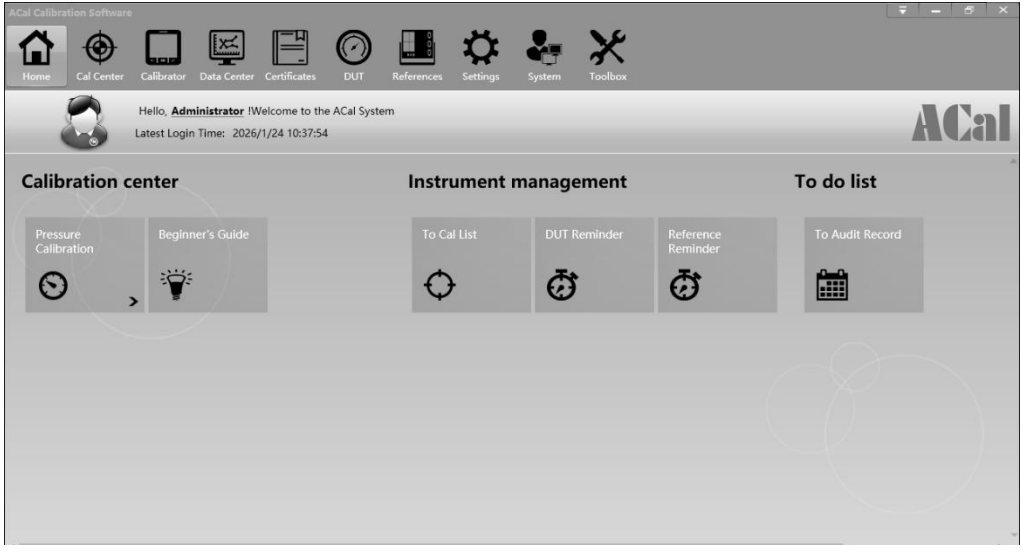


Figure 24 ACal main interface

4.1 Calibration Plan and Configuration

Open the ACal software, enter the Calibration Center. Click the "Calibration Solution Library" button to create or find a calibration solution.

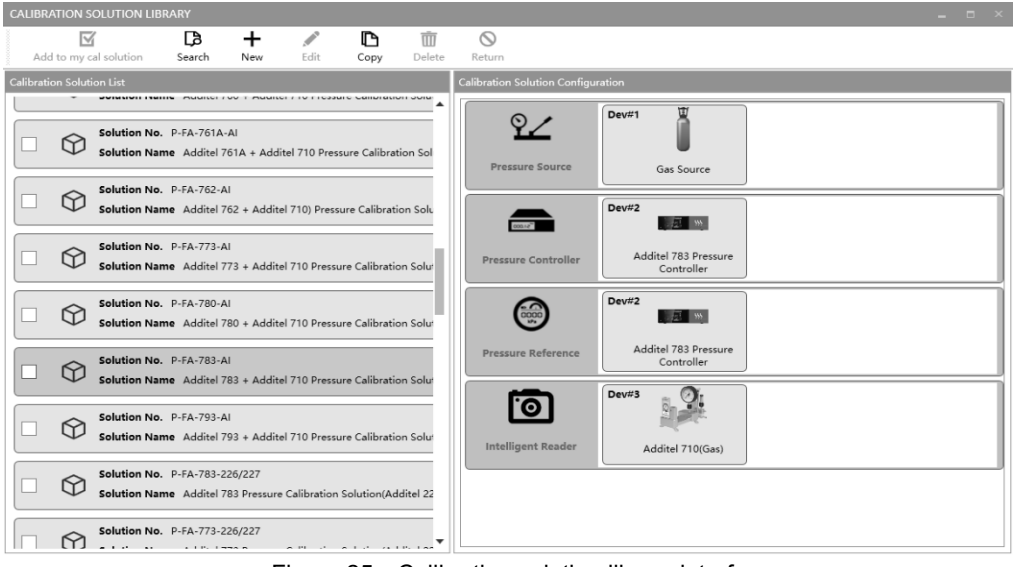


Figure 25 Calibration solution library interface

4.1.1 Creating new calibration Solution

Click the "New" button to create a new calibration solution, fill in the plan number and plan name, select the pressure source and standard pressure gauge/module required for pressure calibration, add the Additel 710 Automated Gauge Reader in the intelligent reading device, click Save, the calibration plan designer interface will automatically close and

return to the calibration solution library interface. The newly created calibration plan is checked by default. Click the "Add to My Cal Solution" button to add the checked plan to my calibration solution library.

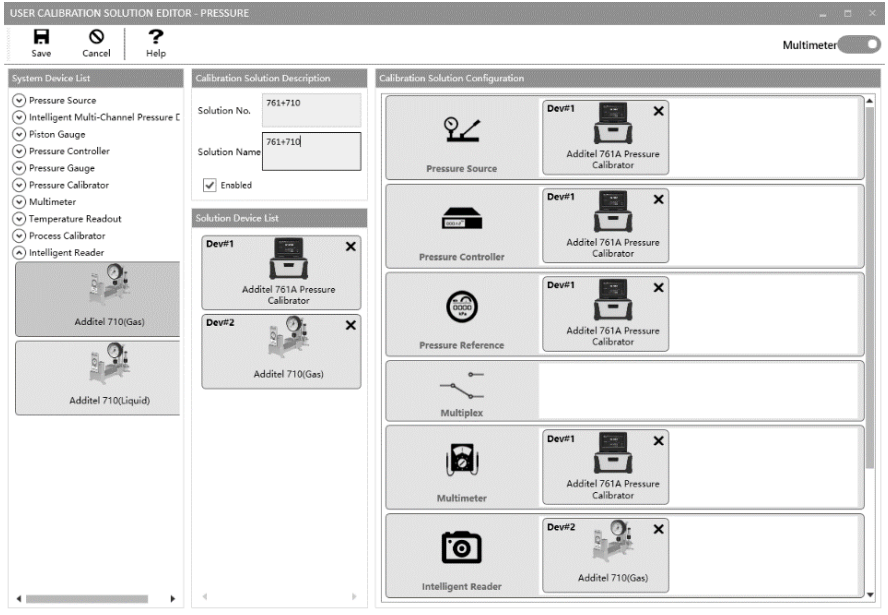


Figure 26 User calibration solution editor

4.1.2 Add Built-in calibration plan

Open the calibration plan library, find the calibration plan with the Additel 710 Automated Gauge Reader in the calibration plan list, check the plan to be added, and click the "Add to My Cal Solution" button.

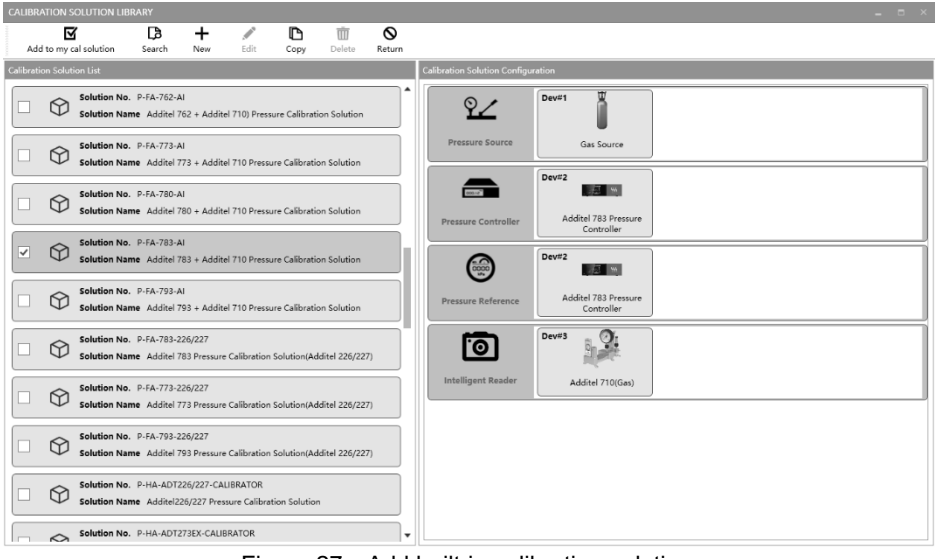


Figure 27 Add built-in calibration solution

4.1.3 Search

Click the "Search" button in the menu bar of the calibration solution library. A query condition setting box will pop up. You can set a single condition or a combination of conditions to search for calibration plans that meet the conditions. For example, to search for calibration plans that include the Additel 710, enter 710 in the solution number and click the "Search" button. The system will search for all calibration plans that include the Additel 71

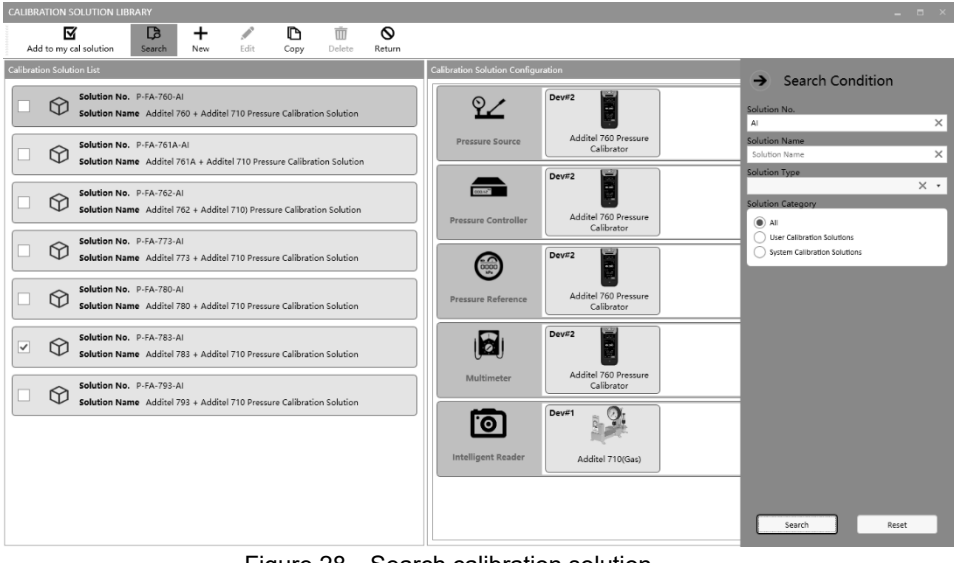


Figure 28 Search calibration solution

4.1.4 Calibration solution configuration

In the Calibration Center, select a calibration plan and click "Configuration" to open the calibration plan configuration interface. Configuration items in the calibration plan are only valid for the current calibration plan.

① Communication Configuration

Calibration plans that include the Additel 710 device require device communication configuration. Click the Settings button  in the lower right corner of the device column to configure communication. Click Save when configuration is complete.

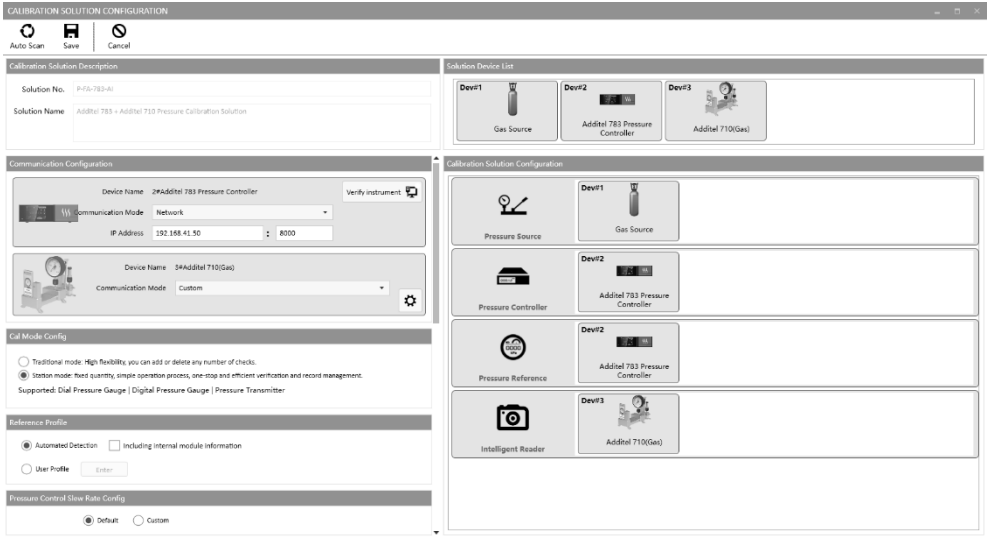


Figure 29　Calibration solution configuration

② Automated Gauge Reader configuration

（1）Light Tapping Configuration

Tapping Times: The number of taps performed when the tapping hammer executes a tap.

Tapping Interval: If the tap count is greater than 1, this refers to the time interval between each tap.

Reading Delay After Tapping: The time interval from the completion of tapping to the execution of automatic reading.

Tapping Force: The force applied by the tapping hammer when striking the instrument under test.

(2) Reading

Sampling quantity: The number of readings collected at the same calibration point, and the most reasonable value in the set is calculated by the algorithm. The purpose is to avoid single sampling failure caused by network fluctuations. The larger the sampling quantity, the more accurate the value, but the longer the time consumption.

(3) Venting

Enable vent: Check whether the calibration enables vent.

③ Calibration operation mode

Enable Silent Mode: Whether to enable silent mode. In silent mode, no unnecessary prompts will pop up during the calibration process.

4.2 Communication Configuration

The communication configuration interface is used for communication configuration of Additel 710 Automated Gauge Reader.

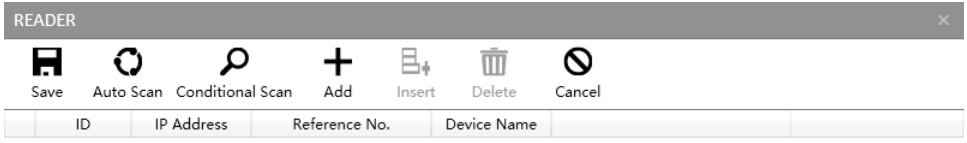


Figure 30 Communication configuration interface

① Menu

◆The menu includes below buttons:

◆Save: Save the configuration and exit.

◆Auto Scan: Scan for Additel 710 Automated Gauge Reader on the same network.

◆Add: Add a Additel 710 Automated Gauge Reader.

◆Insert: Insert a new device after the selected device.

◆Delete: Delete the selected device.

◆Cancel: Cancel changes and exit.

② Device List

◆The device list display below information:

◆Enable: Whether the device is enabled.

◆Serial Number: Device serial number.

◆IP Address: Device IP address.

◆Device ID: Device ID.

◆Device Name: Device name.

◆Communication Test Button: Tests on whether the device can communicate successfully.

◆Move up: Move up one position.

◆Move down: Move down one position.

◆QR Code: Display the workstation QR code.

③ Manually Add

Click the "Add" button to add a new device, configure the IP address, click the "Communication Test" button to test

the device connectivity, and click the "Save" button if the test passes.

④ Automatic Scan

The auto-scan function can detect Additel 710 devices within the same network. Click "Auto Scan," wait for the scan to complete, select the device(s) you want to enable, and then click the "Save" button. This feature is subject to network stability and does not guarantee that all devices on the network will be detected every time. If scanning fails, please add the device manually.

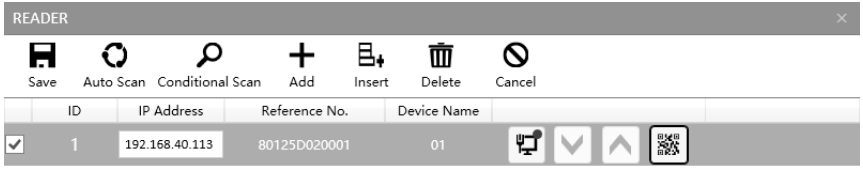


Figure 31 Automatic scanning device

⑤ Adjustment of device orderSelect the device to adjust the order, hold down the left mouse button, move the mouse to the target position, release the left mouse button to complete the adjustment

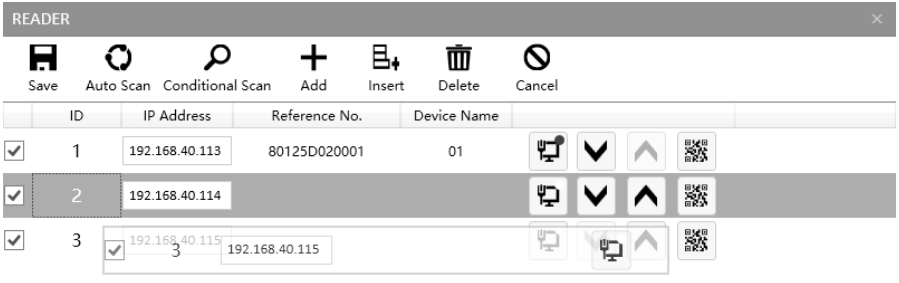


Figure 32 Multiple device order adjustment

⑥ Save

Click the "Save" button to save the configuration. Before saving, you can select whether to enable each device. Uncheck the devices you do not want to enable.

4.3 Start calibration

Open the Cal Center, select the calibration solution, then double-click it or click the "Start Test" button in the menu bar to execute the calibration.

4. 3. 1 Page Layout

1. The Additel 710 Automated Gauge Reader is not configured or enabled.

Figure 33 Un-configured recognition device calibration interface

2. Start up an Additel 710 Automated Gauge Reader.

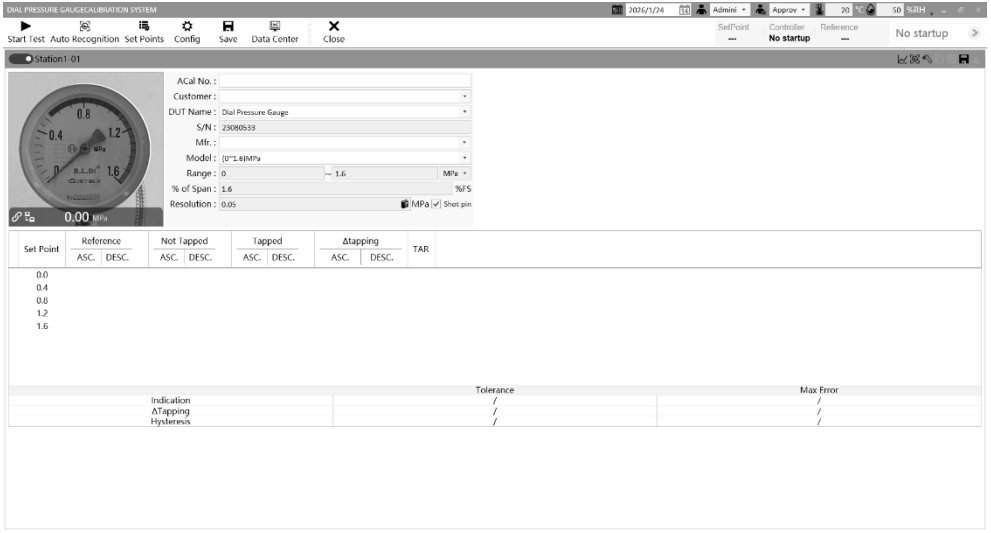


Figure 34 Calibration interface of a single reader

3.Start using multiple Additel 710 Automated Gauge Readers.

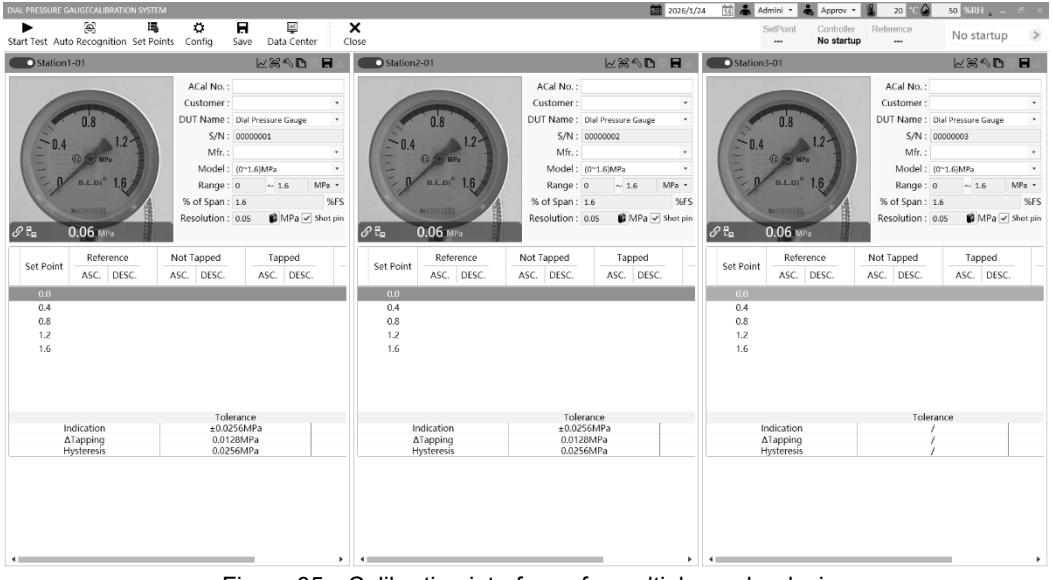


Figure 35 Calibration interface of a multiple reader devices

4.3.2 Function Introduction

This introduces the display content and functions of the calibration panel for the Additel 710 Automated Gauge Reader.

1. Display Content

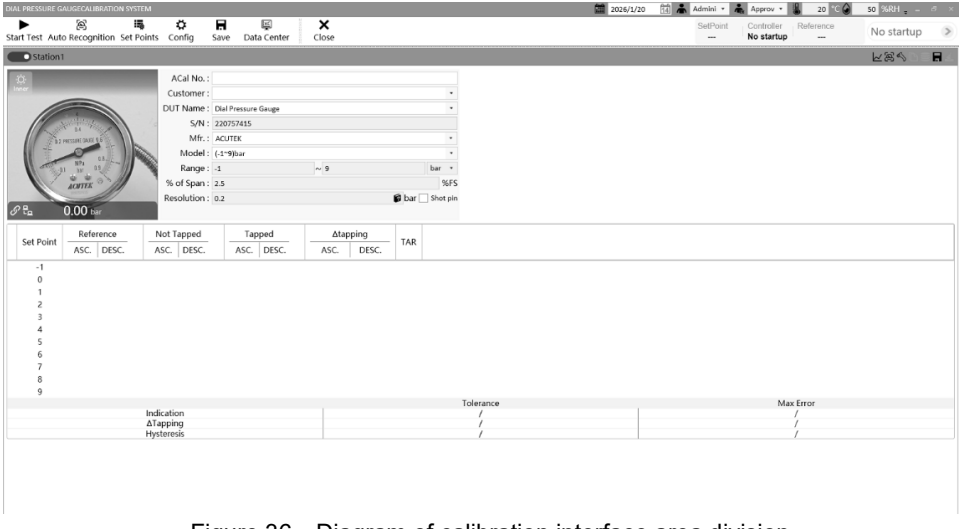


Figure 36 Diagram of calibration interface area division

4.3.3 Calibration Data

① Save reading screenshots

If the "Save reading screenshots" feature is enabled, real-time images will be automatically captured during readings for easy viewing and exporting in calibration data.

② View reading screenshots

During calibration: Hover your mouse over the displayed value in the calibration data to show the corresponding screenshot of the current reading.

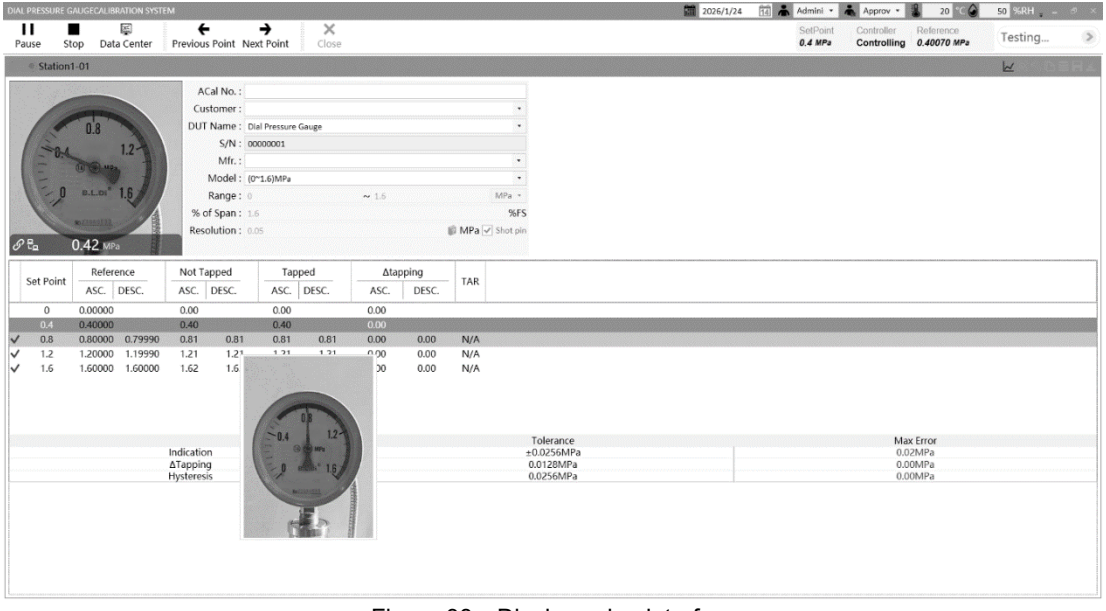


Figure 38 Display value interface

Check the in calibration results:

Select a row of data, then click the “View Reading Pictures” button to view the indication image for the selected row. In the indication image interface, click the "Zoom In" or "Zoom Out" buttons to enlarge or reduce the image

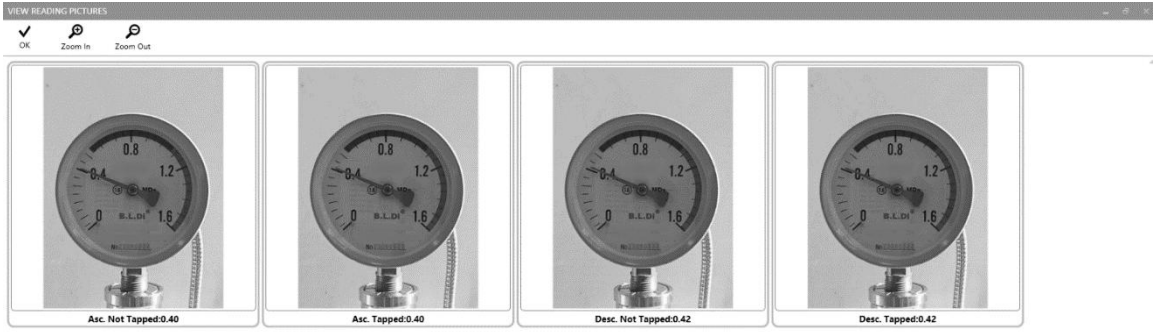


Figure 39 View reading diagram

1. Export reading data screenshot

Clicking the "Export Image Recognition Results" button in the calibration data table allows you to export all indication images of that specific calibration data entry to a designated folder.

4.4 Other Parameter Settings

The settings related to the Automated Gauge Reader exist in both the "Settings" and "My Settings." The configurations in the "Settings" apply to all users, while those in "My Settings" are only effective for the current user.

4.4.1 Settings

Open the configuration center, click " Settings" >"Calibration Settings"> "Pressure Instruments" > " Reader" to open the Automated Gauge Reader settings page. Open the Station page, click "Config"> "Station Setting">"Parameter Settings"

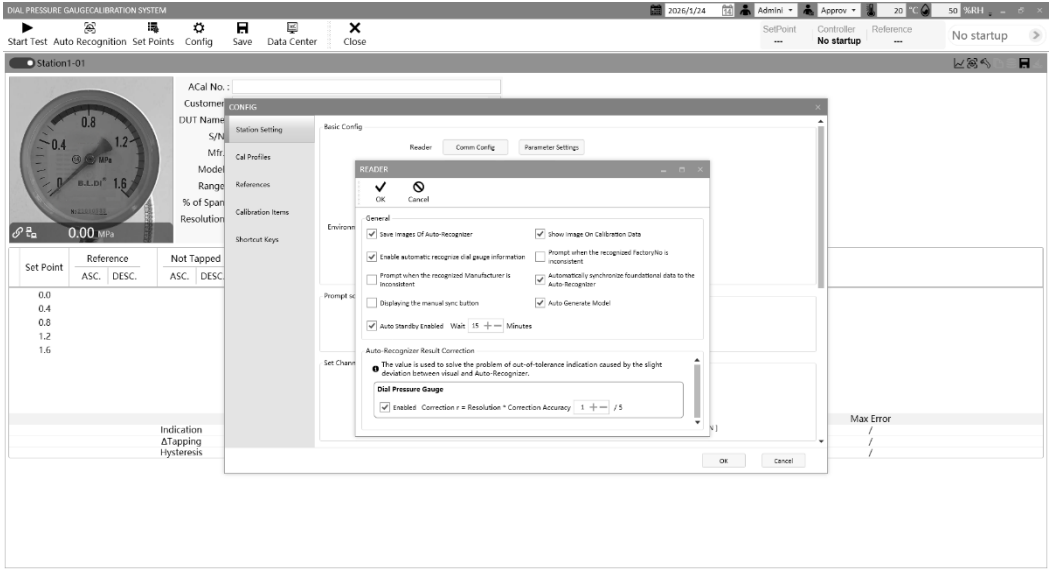


Figure 40 Settings - Automated Gauge Reader setting

① General Settings

Save Identification Diagram: Whether to save the identification diagram during readings.

Display Identification Diagram in Calibration Data: Displaying the identification diagram in calibration data is only available when saving the identification diagram. When this option is checked, you can view the indication image during calibration and view and export the identification diagram when viewing calibration data in the data center. Unchecking this option disables these operations.

② Identification error correction

This function corrects indication errors caused by slight discrepancies between visual estimation and machine recognition. Set the estimation accuracy for the type of instrument supported by the Automated Gauge Reader to correct the value recognized by the Automated Gauge Reader.

5. System maintenance

This section describes the troubleshooting of the identification device, as well as its routine cleaning, maintenance, and disassembly/assembly.

5.1 Troubleshooting

If the issue cannot be resolved, please immediately stop operating the system and contact Additel.

Table 7 Troubleshooting Reference Table

Number	Fault phenomenon	Reason and solution
1	display the interface status bar with a red blinking indicator.	Make sure the power adapter is plugged in. Press and hold the power button to restart.
2	Abnormal lifting, no movement or unable to return to the original position	Verify that the dedicated power adapter is used. Check for any additional objects under the lifting mechanism.
3	Unable to reach the set pressure value, or the pressure fluctuates greatly	Check the pneumatic and hydraulic sources. Check the pipeline and hydraulic circuit to identify and eliminate leaks. Check the quick-connect sealing rings. Check the Additel 108 solenoid valve or Additel 109 CPS vent channel for closure.
4	DUT with no pressure	Check if the filter is blocked.

5.2 Maintenance and disassembly

5.2.1 Disassembly and assembly of the automated gauge reader module and quick connector

The automated gauge reader module and the main unit need to be installed when the device is unpacked. Please follow the steps below to complete the installation.

(1) Insert the "Auto gauge reader module" into the base along the guide groove (as shown by arrow ① in the figure);

(2) Use a screwdriver to tighten the "M3X8 screw" (as shown by arrow ② in the figure).

Disassembly and assembly of the quick connector

DIsassembly： Pull the locking pin to the left while lifting the quick connector upward.

Assembly： Insert vertically until hear a click.

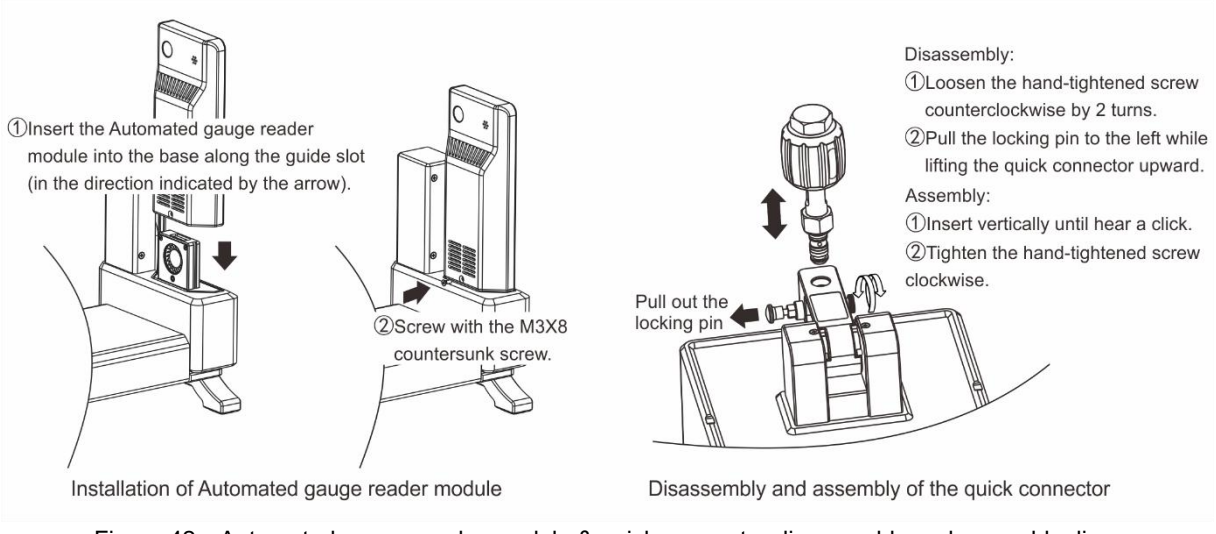


Figure 42 Automated gauge reader module & quick connector disassembly and assembly diagram

5.2.2 Disassemble and assemble of Additel 108 and Additel 109

◆Connect the Additel 108/109 and Additel 710 pressure port by inserting them together, then tighten with a wrench.

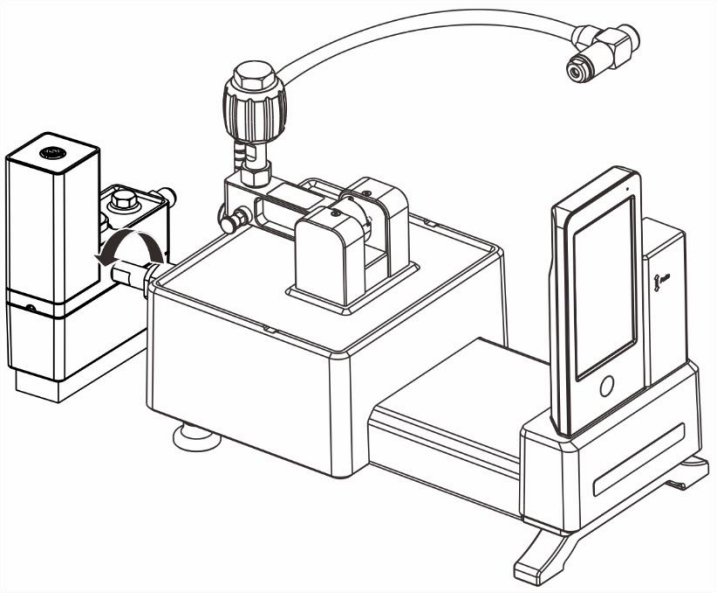


Figure 43 Additel 108/109 and Additel 710 pressure port connection diagram

◆Additel 108 Contamination Prevention System:

Cut the hose to the appropriate length and plug it into the quick connector and the oil drum to drain the oil.

◆Additel 109 Contamination Prevention System：

Oil Reservoir Installation:

Insert the reservoir into the base guide slot in the direction shown in the diagram until the reservoir and base are flush (you will hear a click when it is properly seated). Rotate the locking clip 90 degrees to secure the reservoir.

Oil Reservoir Disassemble:

To empty the oil, rotate the locking clip and pull out the reservoir in the direction indicated in the diagram.

External Oil Drainage Setup: When connect an external oil tank, Remove the plug from the quick-connect fitting. Cut a suitable length of φ8 (8mm diameter) hose and insert it into the quick-connect fitting, then attach it to the oil tank. Ensure the hose hangs downward without upward bends to maintain smooth drainage. Press the blue unlocking ring on the oil draining port to remove the oil hose when needed.

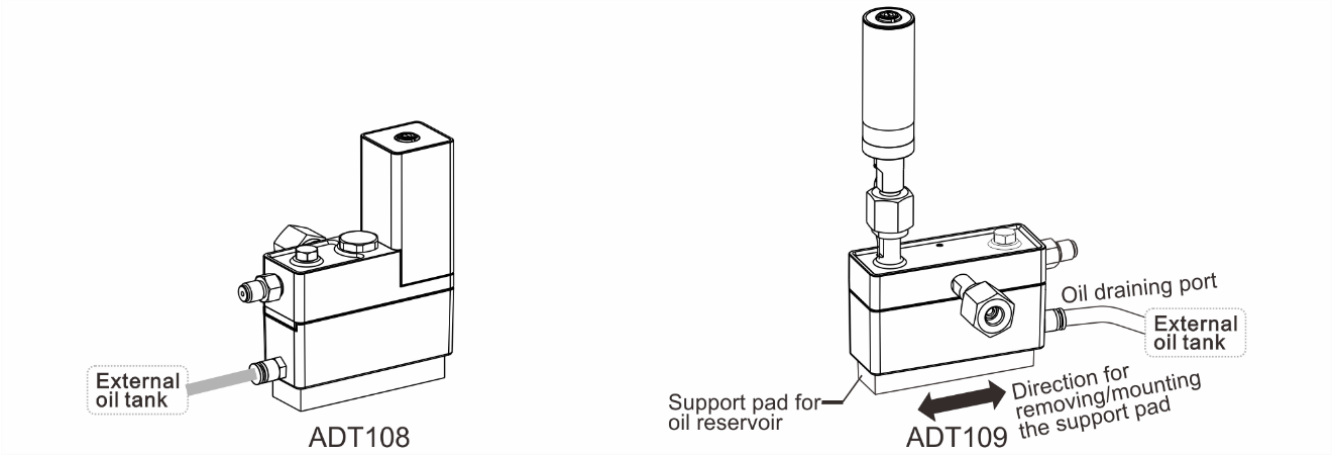


Figure 44 Diagram of removing/mounting the oil reservoir or connecting the external oil drain hose

5.2.3 Removing and mounting of the light tapping hammer

If the tap hammer is damaged, it can be removed and replaced as a whole. The disassembly and assembly steps are shown in the figure below.

(1) Use a 2mm hex wrench to loosen the "M4 setscrew" (screw indicated by arrow ①).

(2) Pull out the tapping hammer in the direction of arrow ②.

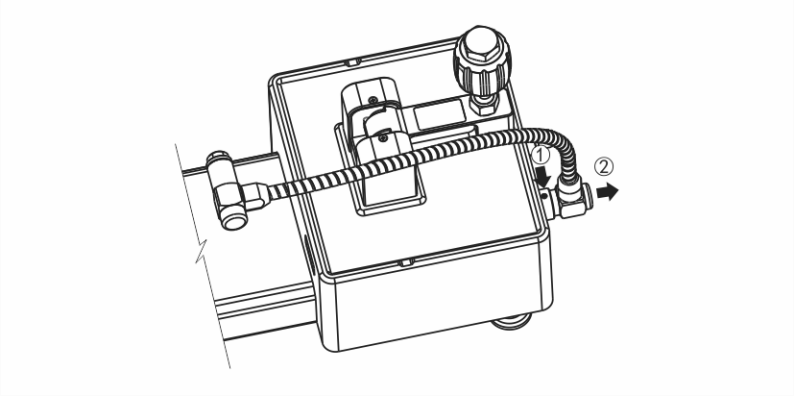


Figure 45 Light tapping hammer removing/mounting diagram

5.2.4 Fan and lift maintenance

When fans operate for extended periods, they absorb dust, which can become lodged in the blades or inlets, affecting cooling efficiency and requiring regular dust cleaning. The lifting mechanism, which includes moving parts such as the motor, gears, screws, and slider rails, also requires regular maintenance.

Maintenance procedures are as follows:

(1) Disconnect the power adapter.
(2) Remove the screws behind the identification module (as shown in Figure ①).
(3) Pull the identification module upward as indicated in Figure ②.
(4) Clean dust from the fan blades and air vents (intake and exhaust).
(5) Remove the three screws on the side of the screw rod protective cover (as shown in Figure ③), then slide and lift it out as directed in Figure ④.
(6) Remove the four screws at the bottom (as shown in Figure ⑤), then disassemble the lifting mechanism protective cover by moving it in the direction shown in Figure ⑥.
(7) Clean dust from the screw rod and guide rail, apply grease to the screw rod, and lubricate the guide rail.
(8) Reassemble all the removed parts in their original positions.

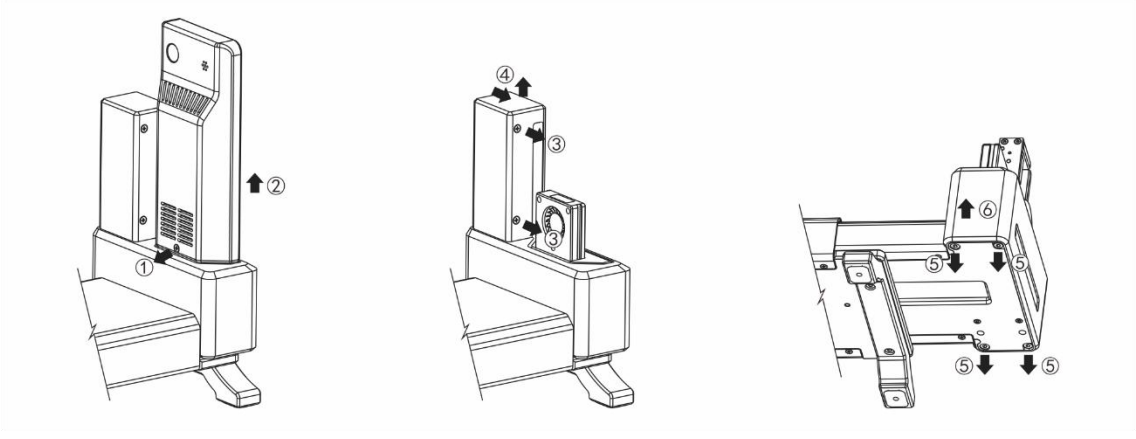


Figure 47　Fan and lift maintenance diagram

5.2.5 Pressure port cleaning

If you need to clean contamination inside the pressure fitting cavity, please unscrew the pressure fitting. Before disassembly, ensure that all pressure ports are connect to the atmosphere.

The disassembly steps are as follows:

（1) Release all internal pressure and disconnect the external gas supply;

(2) Disconnect the device power supply;

(3) Disconnect the external piping connections;

(4) Use specialized tools to remove the pressure port and clean impurities inside the cavity;

(5) Restore the pneumatic, hydraulic, and electrical connections.

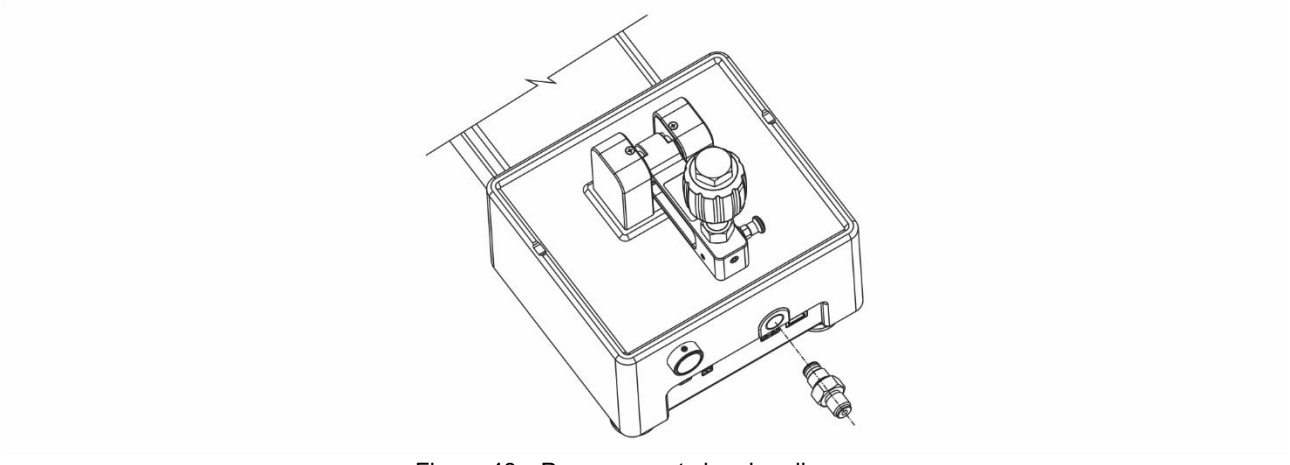


Figure 48 Pressure port cleaning diagram

5.2.6 Replace the quick Connector seal and filter

Quick connector sealing ring. Replace it promptly if any damage.

The quick connector is equipped with a filter that effectively prevents contamination from the DUT from entering the pressure channel. When replacement is needed, follow these steps:

(1) Remove the sealing ring inside the quick connect rod;

(2) Use tweezers to take out the filter element and replace it with a new one;

(3) Reinstall the sealing ring in place.

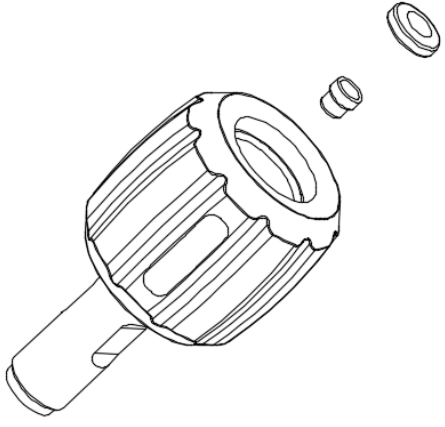


Figure 49 Replacing the quick connector seal ring and filter diagram

5.2.7 Replace the sealing ring of the high-pressure connecting hose

The high-pressure connecting hose is equipped with sealing rings (4*2-NBR70) at both ends. Please replace them promptly if damaged.

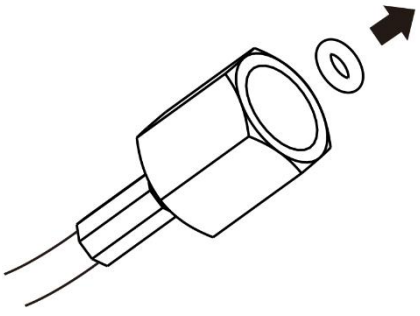


Figure 50 Replacing the sealing ring of a high-pressure connecting hose

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