



AMSAT
Technologies

Imagine. Innovate. Inspire.

~fluiDroid® | NEO 2 + ~fluiDroid® | NEO 2 PRO

HPS CONTROLLERS

Evolving **Excellence** : Redefining Reliability



Intelligent
Performance



Reliable
Operation



Energy
Efficient



Insightful
Monitoring



Easy
Configuration

Installation and Operating Instructions

Ver 2.0



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1.1 Preface

This manual contains important information for reliable proper and efficient operation. Compliance with the operating instructions is of vital importance to ensure reliability and a long service life of the product and to avoid any risks.

The first chapters contain information about this manual and safety in general. The following chapters provide information about normal use, installation, maintenance and repairs of the product. The annexes contain the technical data, the parts drawings and the declaration(s) of conformity.

- Make yourself familiar with the content.
- Accurately follow the directions and instructions.
- Never change the sequence of the operations to be carried out.
- Keep this manual or a copy of it together with the logbook in a fixed place near the product which can be accessed by all personnel.



ATTENTION

Is used to introduce safety instructions whose non-observance may lead to damage to the product and its functions.



ENVIRONMENTAL INSTRUCTION

Remarks with respect to the environment.

1.2 Icons and symbols

In this manual and in all accompanying documentation the following icons and symbols are used.



WARNING

Danger of electric tension. Safety sign according to IEC 417 - 5036



WARNING

Operations or procedures, if carried out without caution, may cause personal injury or damage to the product. General hazard sign according to ISO 7000-0434

1 Manual Introduction

2 Identification, service and technical support:

2.1 Identification, service and technical support

The system is identified based on the text “~fluidroid | NEO 2™ Series Controllers” as given on the front of the system.

Indication	Meaning
~fluidroid NEO 2™ Series Controllers	Type of Control Unit

The following address data are available for service and technical support:

AMSAT Technologies Pvt. Ltd. B-11 Ground Floor, Anjali Building, Ameya Arcade, Mahatma Society, Kothrud, Pune 411 038, MH INDIA	support@amsattech.com sales@amsattech.com info@amsattech.com
AMSAT Electronics Design Centre 39-A Hanuman Nagar, Senapati Bapat Road, Pune 411 016, MH INDIA	support@amsatedc.com info@amsatedc.com

2.2 Supplementary Documentation

Apart from this manual supplementary documentation can be downloaded from www.amsattech.com

Additional documentation available:

- ~fluidroid | NEO 2™ VFD Interfacing – Quick Reference Handbook

3 Warranties

3.1 Terms of warranty:

This product's warranty, provided by our company, covers a period of 1 year from the date of purchase. All faulty parts and/or functions, resulting despite user's normal use, will be repaired and/or replaced at manufacturers discretion at no charge during the warranty period.

However, if any of the malfunctions are caused by user carelessness, in correct installation, inadequate maintenance, or natural disaster, we will the provide repair and/or replacement services for a fee regardless of warranty period.

Products covered by this warranty are limited to those that are registered at the AMSAT Technologies Pvt. Ltd. headquarter or branch offices and repairs, replacements will be issued according to manufacturer's discretion. When in need of warranty services, the purchaser may visit our headquarter or one of our sales offices with the product or send the product with a detailed description of services required via postal service to any of our sales offices (the purchaser will be responsible for packaging, postage, and any postal insurance). Once repair services are completed, the supplier will return the product to the purchaser (return postage will be paid by the supplier).

However, if we determined required services to be outside the boundaries of the warranty coverage, we will first contact the purchaser and provide an estimate of repair costs and obtain authorization to conduct services before any work is done. In such a case, return postage along with the repair costs will be billed to the purchaser when the repaired product is returned.

We will not be held legally for any malfunction resulting from user carelessness, abnormal use, and/or natural disaster. Even if we are in receipt of prior notification of such dangers, we will not be held legally liable.

Please read through the "Precautions for Safety" carefully to obtain a long and safe use of this product.

This product has been processed through careful quality control and testing procedures. Any malfunctions occurring during normal use are covered under the guidelines of the "Certificate of Product Warranty", which is included in this Manual.

If you experience product malfunction, please contact our headquarters or any of our sales offices

4 Safety and environment

4.1 General

This AMSAT Technologies product has been developed using state-of-the-art technology; it is manufactured with utmost care and subject to continuous quality control. AMSAT Technologies does not accept any liability for damage and injury caused by not observing the directions and instructions in this manual. This also applies in cases of carelessness during the installation procedure, use and maintenance of the product. Non-compliance with safety instructions can jeopardize the safety of personnel, the environment and the product itself. Non-compliance with these safety instructions will also lead to forfeiture of any and all rights to claims for damages.

For example, in particular non-compliance can result in:

- Failure of important pump/system functions,
- Failure of prescribed maintenance and servicing practices,
- Injury to persons by electrical, mechanical and chemical effects,
- Hazard of the environment due to leakage of hazardous substances,
- Explosions.

Depending on specific activities, extra safety measures may be required. Contact AMSAT Technologies if a potential danger arises during use.



ATTENTION

The owner of the product is responsible for compliance with the local safety regulations and internal company guidelines.



ATTENTION

Not only must the general safety instructions laid down in this chapter on "Safety" be complied with, but also the safety instructions outlined under specific headings

4.2 Users

All personnel involved in the operation, maintenance, inspection and installation of the product must be fully qualified to carry out the work involved. Personal responsibilities, competence and supervision must be clearly defined by the operator. If the personnel in question is not already in possession of the required know-how, appropriate training and instruction must be provided. If required, the operator may commission the manufacturer / supplier to take care of such training. In addition, the operator is responsible for ensuring that the contents of the operating instructions are fully understood by the responsible personnel.

4.3 Safety provisions

The product has been designed with the greatest possible care. Original parts and accessories meet the safety regulations. Modifications in the construction or the use of non-original parts may lead to a safety risk.

4.3.1 Labels on the product

The icons, warnings and instructions applied to the product are part of the safety provisions. The labels may not be removed or covered. Labels must remain legible during the entire life of the product. Replace damaged labels immediately



ATTENTION

Make sure that the product operates within its working range. Only then the product performance is guaranteed.

4.4 Safety precautions

4.4.1 During normal use

- Contact the local electricity company for questions about the power supply.
- Shield parts that can become hot in such a way, that direct contact is not possible.
- Always close the switch box.

4.4.2 During installation, maintenance and repair

Only authorised personnel may install, maintain and inspect the system and repair electrical components. Observe the local safety regulations.

4.5 Environmental aspects

4.5.1 General

This product of AMSAT Technologies is designed to function in an environmentally friendly way during their entire life.



ENVIRONMENTAL INSTRUCTION

Always act according to the laws, by-laws regulations and instructions with respect to health, safety and the environment.

4.5.2 Dismantling

Dismantle the product and dispose of it in an environmentally friendly way. The owner is responsible for this.



ENVIRONMENTAL INSTRUCTION

Ask at the local government about the re-use or the environmentally friendly processing of discarded materials.

5 Introduction



5.1 General

Control units of the type ~fluidroid™ are manufactured by AMSAT Technologies.

5.2 Intended Use

The control unit is suitable for controlling a Hydro-pneumatic system consisting of 1, 2, 3, or 4 pumps within the indicated working range (see “Working range”). Any other or further use of the control unit is not in conformity with its intended use. AMSAT Technologies does not accept any liability for any damage or injury resulting from this. The control unit has been produced in accordance with the current standards and guidelines. Use the control unit exclusively in a perfect technical state, in conformity with the intended use described below.

The *Intended use* as laid down in EN 12100-1 is the use for which the technical product is intended according to the specifications of the manufacturer.

The use of the product has been described in the available documentation / information. Always observe the instructions given in the installation and operating instructions. When in doubt the product must be used as becomes evident from its construction, version and function.

5.3 Working Range

The working range of the control unit can be summarized as follows:

TYPE	~fluidroid NEO 2™ Series Controllers
Maximum ambient temperature [°C]	50
Relative atmospheric humidity [%]	20 – 90 (Non-Condensing)
Voltage [V]	Single phase 85 -265VAC
Frequency [Hz]	50/60 ±5%

5.4 Functioning

5.4.1 Standard Operation

The ~fluidroid | NEO 2™ Series Controllers is an intelligent control unit for different components of pressurization systems consisting out of a maximum of 4 pumps. The required system pressure is sensed by a pressure sensor on the outlet side of the installation. When as a result of a decreasing water volume the pressure drops below the pressure set point, a pump will be switched on. When the required system pressure has been reached, the pumps are switched off one at a time. A more detailed working description will be provided in forth coming chapters of this document.

5.4.2 Custom Settings

The user can input custom parameters into the ~fluidroid | NEO 2™ Series Controllers, to meet specific requirements of a particular site by using the provided Human Machine Interface (HMI) via Wi-Fi using either a Laptop (Windows or Linux), Tablet/ Smartphone (Android or iOS).

5.4.3 Pump switching sequence

~fluidroid | NEO 2™ Series Controllers ensures equal running hours for each pump of the system, including the back-up pump. The ~fluidroid™ uses advanced running hour equalization algorithm to achieve the same. It takes into consideration, running hours of the pump and also the actual starts stops of the pump in the previous operating hour, before selecting a pump for operation. Thus, ensuring a smooth and long life for the pumps and the motors, and in turn a more reliable complete system.

6 Transport of Unit

Please follow all the instructions as may be marked on the packing during transportation.



ATTENTION

Store the control unit in a dry and dust-free place.

Always check for the stability of the control unit before installing.

During transportation take proper care of the display side, to avoid impacts and scratches on it.

If water/ moisture/ dust enters the unit, contact the manufacturer immediately. DO NOT power up the unit in such cases.

7 Installation

7.1 Mechanical Installation



ATTENTION

Contact the supplier if parts are missing or damaged.

Build in the control unit using suitable fastening material. Consult the annex “Build-in diagram” for the correct overall dimensions.

7.2 Electrical Installation



WARNING

Only authorized personnel is allowed to connect the control unit electrically in accordance with the local regulations.

Electrical connections

- Make sure that the electric control unit specifications correspond with the power supply to which is connected.
- Consult the annex "Electrical diagram" for a list of all electrical power points.
- Shielded cables must be used for connection to VFD and Pressure transducer.
- Snubbers (RC Filters) must always be used on all motor contactors.
- Ensure proper Earthing of the VFD and Motors to avoid damaging sensitive electronics and erratic operation of the unit.
- If any doubt contact the manufacturer immediately.

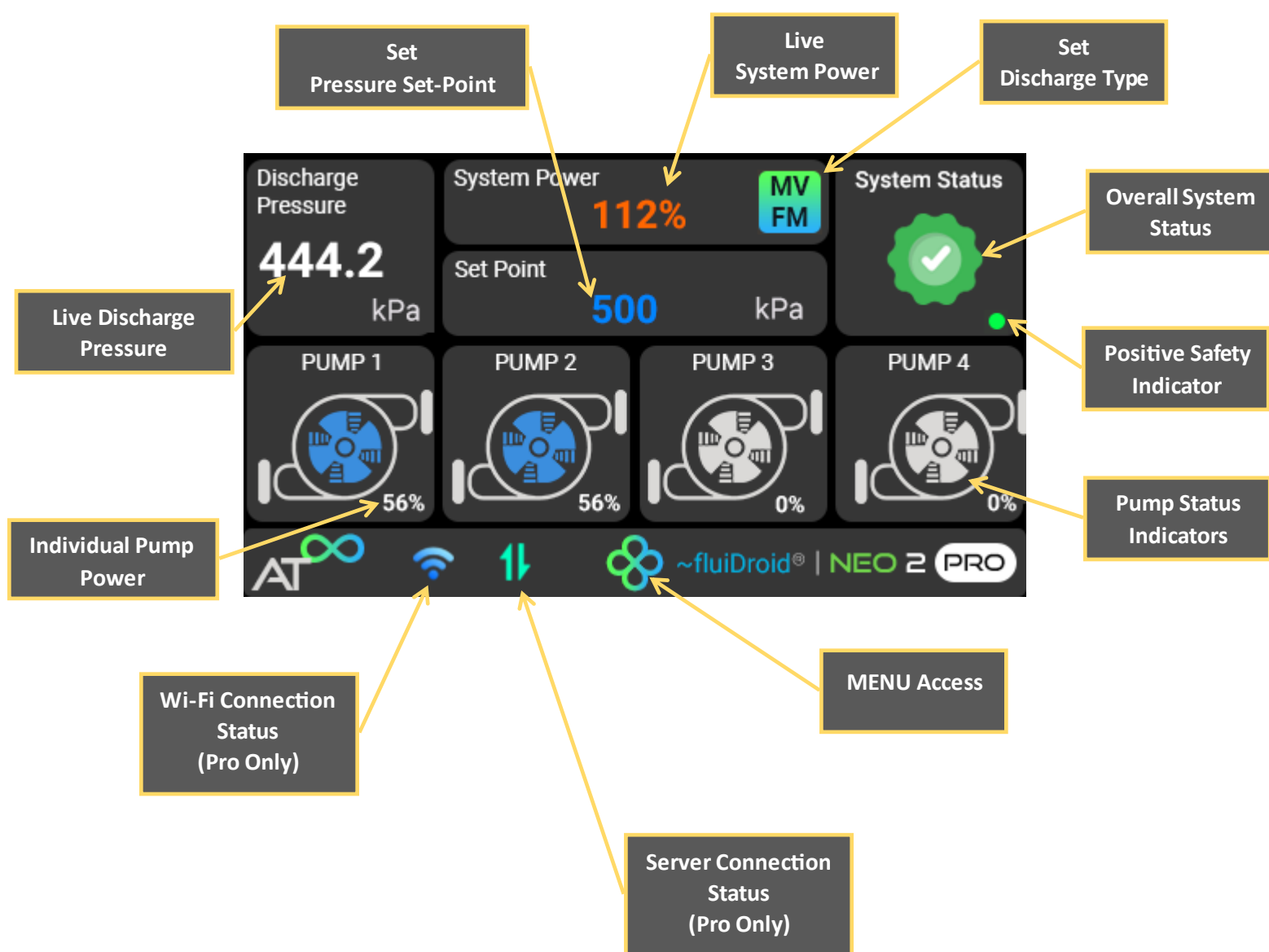
7.3 Commissioning

- The control unit is fully programmed and preset with factory default settings. Use the remote HMI, to access the parameters of the program which can be used to optimize the functionality of the installation, (see: “Parameter list”).
- In most of the cases, only the pressure set point of the system will have to be altered, along with the number of pumps and type of discharge. No other setting needs to be disturbed.
- Fine tuning of all other parameters must only be done by trained/ authorized personnel.

8 Operation

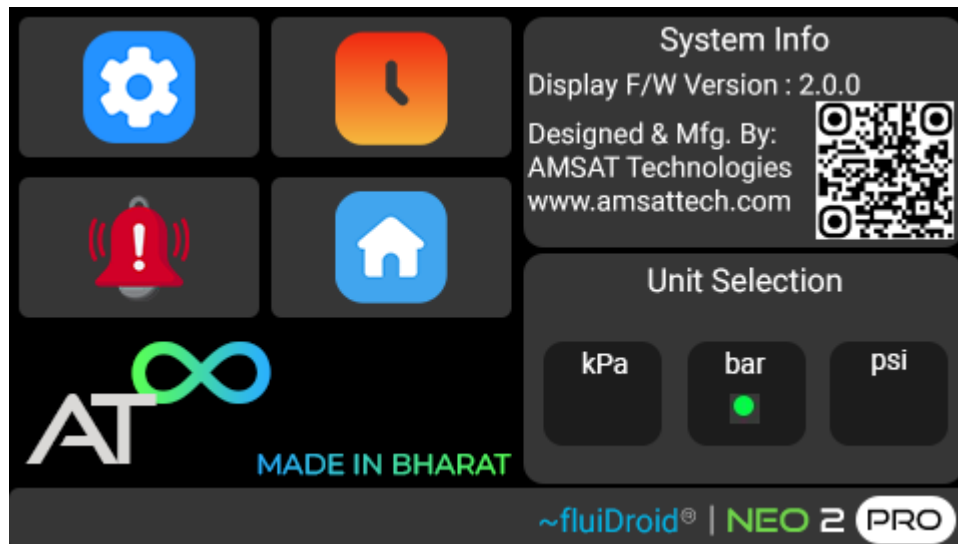
8.1 Control Panel HMI

8.1.1 MAIN DISPLAY SCREEN OF ~fluidDroid | NEO 2™ Series Controllers



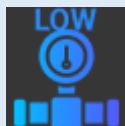
8.1.2 MENU Home SCREEN OF ~fluidDroid | NEO 2™ Series Controllers 2 + & PRO

To open the Menu Home screen, touch either the Infinity flower on the main screen. Also to go back to Main Screen touch either the Right or Left edge of the screen.



8.1.3 Screen Icons and their meaning:

Display Icon	Meaning
	Pump Disabled
	Pump Enabled – OFF
	Pump Fault – Tripped
	Pump Non-Urgent Fault – Optimum Start/Stop Exceeded
	Spinning Icon – Pump Running on VFD
	Spinning Icon – Pump Running on DOL
	System Status Icon – System Operations Normal, No Faults
	System Status Icon – Non Urgent Alarm, System Operations can continue in spite of fault.
	System Status Icon – Urgent Alarm. System Operations cannot continue. System Tripped.
	System Status Icon – High Pressure Aalarm. Discharge Pressure above set High Pressure Alarm Threshold. System Tripped



System Status Icon – Low Pressure Alarm. Discharge Pressure below set Low Pressure Alarm Threshold. System Tripped.



System Status Icon – Run Dry Protection Activated. System Tripped. Water not available at intake.



System Status Icon – System in Commissioning Mode



System Discharge Type Icon – Fixed Speed Discharge Type



System Discharge Type Icon – Single VFD Changeover Discharge Type



System Discharge Type Icon – Multi VFD Discharge Type



System Discharge Type Icon – Multi VFD Discharge Type With flowMatrix™ Enabled



Positive Safety Indicator – This icon blinks every second indicating proper operation of internal control software and also communication between Main Board and Display.



Station Mode Wi-Fi Connected/ Disconnected



Server Connected / Disconnected

8.2 Connecting to ~fluidroid | NEO 2™ Over Wi-Fi

This guide explains how to connect your device to ~fluidroid | NEO 2™ Series Controllers over Wi-Fi and access the Parameter Programming Menu.

Supported Devices

You can use the following devices to connect:

- Laptops: Windows or Linux
- Smartphones: Android or iOS
- Tablets: Android or iOS

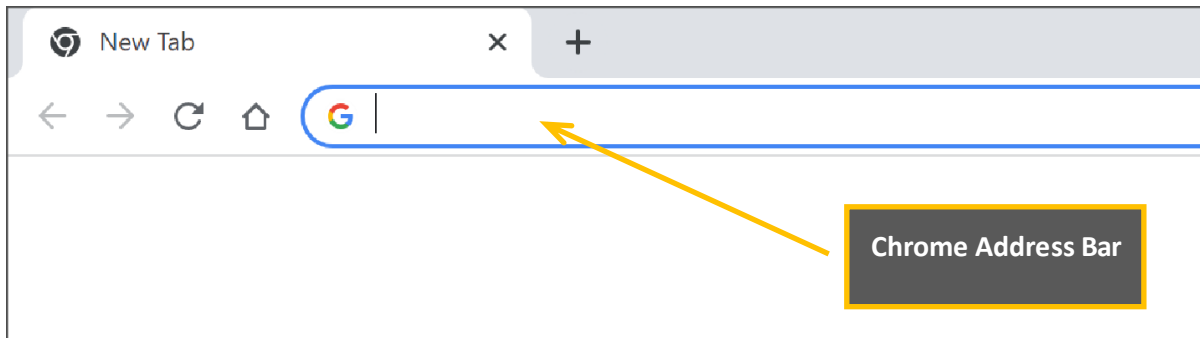
Step 1: Connecting to the ~fluidroid | NEO 2™ Series Controllers Network

1. **Power On ~fluidroid | NEO 2™ Series Controllers**
 - Ensure that the device is powered on and in operational mode.
 - Wait for the Wi-Fi module to initialize (this may take up to 10 seconds).
2. **Find and Connect to the Wi-Fi Network**
 - On a Laptop (Windows/Linux):
 - Open Wi-Fi Settings.
 - Look for a network named "fluidroid | NEO".
 - Click Connect and enter the Wi-Fi password (Default Factory Password: "12345678").
 - On a Smartphone/Tablet (Android/iOS):
 - Open Wi-Fi Settings from the device settings menu.
 - Select "fluidroid | NEO" from the available networks.
 - Enter the password when prompted.
3. **Verify Connection**
 - Once connected, your device will show an active Wi-Fi connection.
 - Ensure your device does not automatically switch to mobile data or another Wi-Fi network. It is advisable to turn off Mobile Data if active.

Step 2: Accessing the Parameter Programming Menu

1. **Automatic Launch of AMSAT EzConf™ System**
 - After a successful Wi-Fi connection, the AMSAT Technologies EzConf™ system will automatically start on your laptop, smartphone, or tablet.
 - No additional app or software download is required.
2. **If EzConf™ Does Not Start Automatically**

- Turn OFF Mobile Data
- Open a web browser (Chrome, Firefox, Edge, or Safari).
- In the address bar, type: <http://192.168.4.1/portal>



- The EzConf™ system interface should now load.

Step 3: Configuring Parameters

1. Navigate to the Programming Menu

- After logging in, locate and click on the desired tab in the main menu to program the necessary parameters.

2. Modify Parameters

- Adjust settings as needed, following the descriptions for each parameter.
 - **!! Always Click Save after making changes, before moving to the next tab.** After clicking save, the EzConf™ will revert back to main screen.
-

Troubleshooting

EzConf™ System Does Not Start Automatically

- Ensure that ~fluidroid | NEO 2™ Series Controllers is powered on and that you are connected to "fluidroid | NEO" Wi-Fi.
- Try manually opening the interface using <http://192.168.4.1/portal> in a browser.

Unable to Find the Wi-Fi Network

- Check if ~fluidroid | NEO 2™ Series Controllers is powered on and the Wi-Fi module is active.
- Restart your laptop, smartphone, or tablet and try again.

Unable to Access the EzConf™ System

- Ensure your device is connected to "fluidroid | NEO" and not another Wi-Fi network.
- Try a different web browser or clear your cache.

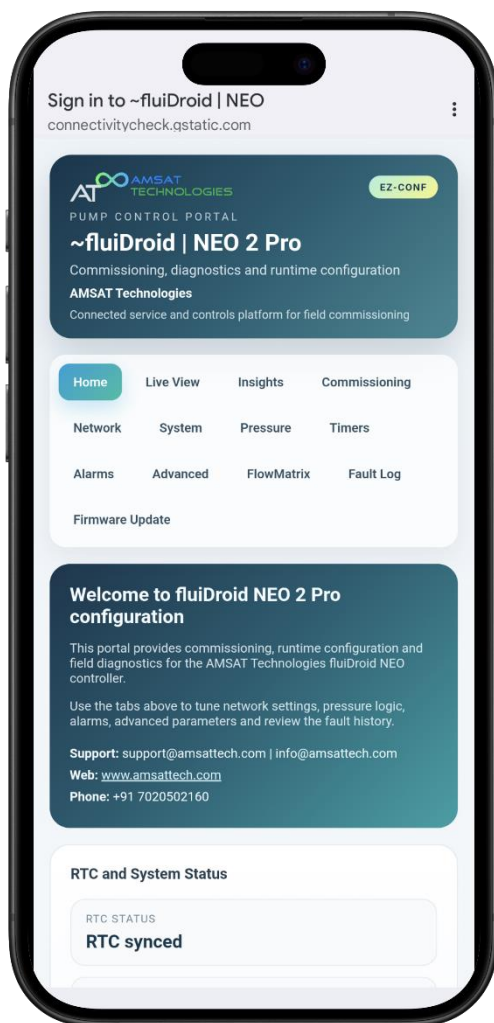
Forgot Login Credentials?

- If you changed the username/password and forgot them, reset ~fluiDroid | NEO 2™ Series Controllers to factory settings (Contact AMSAT Technologies for procedure to reset password).
-

Final Notes

- Ensure your device stays connected to "fluiDroid | NEO" during the entire configuration process.
- No additional apps or software downloads are required—the EzConf™ system launches automatically upon connection.
- For advanced settings, refer to the Administrator Guide.
- If issues persist, contact AMSAT Technologies Technical Support.

8.3 AMSAT Technologies EzConf™ Parameter Configuration System



EzConf™ Parameter Configuration does not need the user to download or load any special app and can be accessed directly using any browser (e.g. Chrome, Mozilla, Safari etc.) as mentioned in the previous section.

8.3.1 ~fluidDroid | NEO 2™ Series Controllers EzConf™ Configuration Portal

This screen is the **home page** of the ~fluidDroid | NEO 2™ Series Controllers EzConf™ system, which provides real-time system information and configuration options. Below is a breakdown of the key elements on the screen:

1. Navigation Menu (Tabs)

The menu bar contains multiple configuration options:

- **Home** – Displays system information and operational status (this is the current screen).
- **Live View** – Live view of System Pressure, System Power, Pump Status etc.
- **Insights** – Event Log, System Pressure and System power logs (Only in ~fluidDroid | NEO 2 Pro)
- **Commissioning** – Commissioning mode for testing each pump.
- **Network** – Configure Wi-Fi and communication settings.
- **System** – View and modify system-level configurations.
- **Pressure** – Adjust and monitor pressure settings
- **Timers** – Configure operational timing and scheduling.
- **Alarms** – Set alerts and warnings.
- **Advanced** – Access advanced configuration settings.
- **FlowMatrix** – Settings tab for the FlowMatrix Multi VFD Algorithm.
- **Fault Log** – Last 100 Fault logs (Only in ~fluidDroid | NEO 2 Pro)
- **Firmware Update** – Update the device firmware to the latest version.

2. Main Content Section (System Information & Status)

Welcome Message

- Displays a welcome message for users accessing the EzConf™ system.

- Provides support contact details:
 - **Email:** support@amsattech.com | info@amsatedc.com
 - **Website:** www.amsattech.com
 - **Phone:** +91 7020502160

RTC and System Status (Only for ~fluidroid | NEO 2 Pro)



- Shows the Real Time Clock (RTC) sync status
- Current Local Time
- Time Zone Set.
- And an option to Sync Browser Time to device.
!! The Unit should Always have accurate time for proper functioning of logging functions and remote connectivity.

Firmware & Hardware Details

- **Firmware Version:** 3.2.0 (Saraswati) – Shows the currently installed firmware version.
- **Release Date:** 14.04.2026 – Indicates when this firmware version was released.
- **Hardware Compatibility:** CRC Compatible – Confirms hardware compatibility with CRC-based devices.
- **Manufacturing Date:** 11.07.2026 – The manufacturing date of the device.

System Running Hours (Operational Status)

- Displays system runtime and individual pump operation times.
- **Total System Running Hours:** 0:00:02 – Indicates the entire system has been running for 2 seconds.
- **Pump Running Hours:**
 - **Pump 1:** 0:00:02 (Active for 2 seconds)
 - **Pump 2:** 0:00:00 (Not yet activated)
 - **Pump 3:** 0:00:00 (Not yet activated)
 - **Pump 4:** 0:00:00 (Not yet activated)



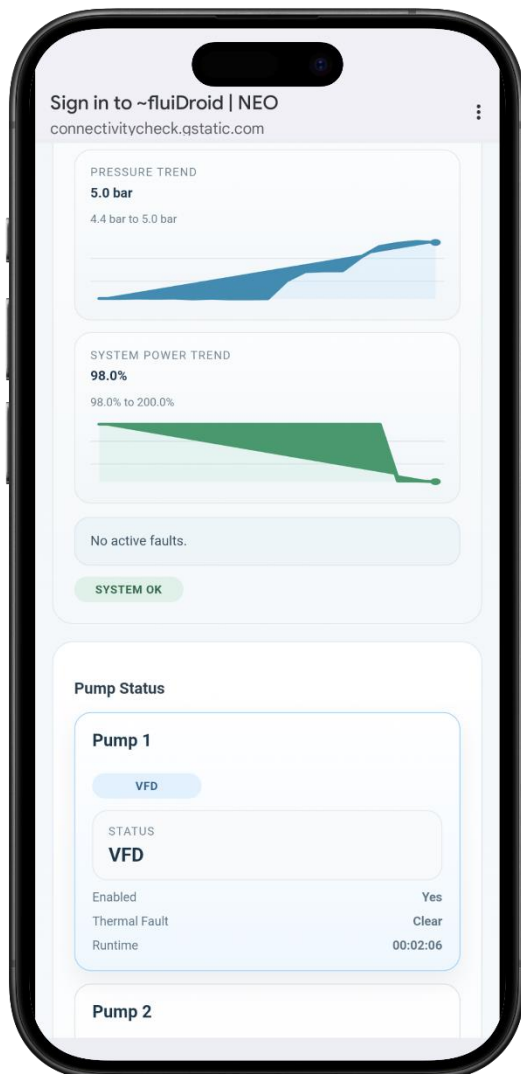
Settings Backup (New Feature)

All current unit settings can be backed up and downloaded as a JSON file using the Backup option. This file can be stored for future use and imported at any time to restore the unit's settings using the Import settings from JSON File option.

Usage Notes for the User Manual

- **This screen is the default landing page** when logging into the EzConf™ system.
- Users can navigate to different configuration sections using the **menu tabs**.
- **Firmware and hardware details** help users check if the system is up-to-date.
- The **running hours section** is useful for monitoring equipment operation and performance.

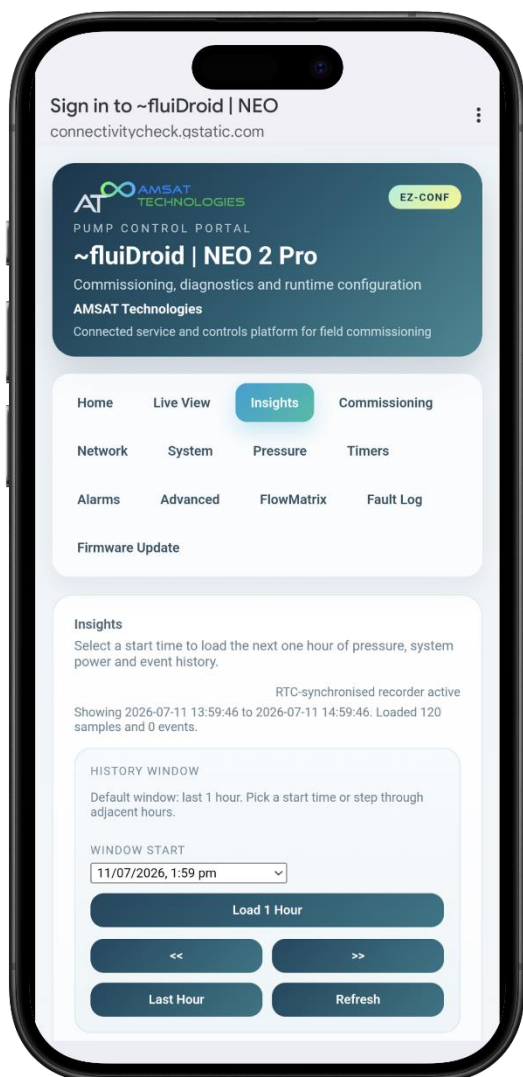
8.3.2 Live View



The **Live View** screen provides a real-time overview of the controller and the pumping system, allowing operators to continuously monitor system performance and operating conditions. It displays key parameters such as **System Discharge Pressure**, **Total System Power Consumption**, the **operating status of all four pumps**, active **faults and alarms**, along with other critical system information.

Live View enables users to quickly verify that the system is operating as expected, identify abnormal operating conditions, and diagnose potential issues such as low pressure, pump failures, overload conditions, sensor faults, or communication problems. By observing live data during commissioning, routine operation, or maintenance, users can make informed decisions, reduce troubleshooting time, and ensure reliable system performance.

8.3.3 Insights (~fluiDroid | NEO 2 Pro Only)



The **Insights** page provides a historical view of the controller's operation by displaying recorded pressure data, system power, and important system events over time. This feature allows operators to review system performance, analyse operating trends, troubleshoot intermittent issues, and download historical data for further analysis or reporting.

Unlike the **Live View**, which displays only the current operating condition, the **Insights** page enables users to examine what occurred during a selected period, making it an invaluable tool for diagnostics, preventive maintenance, and performance evaluation.

Note: The NEO 2 Pro records data using its built-in Real-Time Clock (RTC), ensuring that all measurements and events are accurately time-stamped even after power interruptions.

History Window

The **History Window** allows users to select the one-hour period to be viewed.

Users can:

- Select any desired start date and time.
- Click **Load 1 Hour** to retrieve the selected one-hour data window.
- Use the << and >> buttons to navigate to the previous or next one-hour window.
- Click **Last Hour** to instantly load the most recent hour of recorded data.
- Click **Refresh** to reload the currently selected time window.

Each window contains all recorded pressure samples, system power samples, and events that occurred during that hour.

Downloads

Historical data displayed on the screen can be exported for documentation, diagnostics, or further analysis.

Two export formats are available:

Download Visible CSV

Downloads the currently displayed one-hour history window as a **CSV (Comma Separated Values)** file.

The CSV file can be opened using Microsoft Excel, LibreOffice Calc, Google Sheets, or other spreadsheet applications for charting and analysis.

Typical applications include:

- Service reports
 - Customer documentation
 - Performance analysis
 - Long-term trend evaluation
-

Download Visible JSON

Downloads the currently displayed one-hour history window as a **JSON** file.

The JSON format preserves the complete data structure, making it suitable for:

- Software integration
 - Data processing
 - Custom analytics
 - Import into third-party applications
 - Technical support investigations
-

Recording Information

The Insights page also displays useful information about the internal data recorder.

Sample Interval

Indicates how frequently pressure and power samples are recorded.

For example: **30 Seconds**

means the controller stores one pressure and one system power sample every 30 seconds.

Samples Stored

Displays the number of recorded samples currently stored in memory.

Example:

1440 / 1440

indicates that the recorder has reached its maximum storage capacity.

When the recorder becomes full, the oldest samples are automatically overwritten by new ones, ensuring continuous recording without user intervention.

Events Stored

Displays the number of recorded system events currently stored.

Examples of recorded events include:

- Pump Starts
- Pump Stops
- Faults
- Alarm Clearance
- Commissioning Mode
- Configuration Changes
- System State Changes

Like historical samples, event storage operates on a circular buffer where the oldest events are automatically replaced by new events once capacity is reached.

Time Base

Indicates the source used for timestamping historical data.

For the NEO 2 Pro this is typically: **RTC (Real-Time Clock)**

which provides accurate time-stamped historical records.

Pressure Timeline

The **Pressure Timeline** graph displays the recorded **System Discharge Pressure** throughout the selected one-hour window.

The graph allows users to:

- Observe pressure stability.
- Identify pressure fluctuations.
- Detect sudden pressure drops or spikes.
- Verify correct pressure regulation.
- Evaluate controller performance.
- Confirm proper VFD operation.

By examining the pressure trend, users can quickly identify issues such as:

- Pressure oscillations
- Improper PID tuning

- Air leaks
- Pipeline leaks
- Insufficient pump capacity
- Blocked pipelines
- Pressure switch problems
- Incorrect sensor calibration

The latest pressure value is displayed above the graph together with the minimum and maximum pressure recorded during the selected period.

System Power Timeline

The **System Power Timeline** displays the total system power utilisation throughout the selected history window.

This graph provides valuable insight into:

- Pump loading
- Overall system demand
- Variable speed operation
- Energy consumption trends

Users can compare the power timeline with the pressure timeline to determine whether pressure variations correspond to changes in power consumption or pump operation.

Abnormal power patterns may indicate:

- Pump overload
 - Dry running
 - Excessive cycling
 - Incorrect pump sequencing
 - Hydraulic restrictions
 - Mechanical wear
-

Event Timeline

The **Event Timeline** provides a chronological log of all significant events that occurred during the selected one-hour period.

Each entry includes:

- **Time** – Exact time the event occurred.
- **Category** – Pump, Fault, Alarm, System, Configuration, etc.
- **Label** – Device or subsystem involved.
- **Source** – Origin of the event.
- **Change** – Previous state and new state.

- **Context** – Operating conditions such as pressure, system power, and fault status at the time of the event.

Examples of recorded events include:

- Pump Started
- Pump Stopped
- Pump Changed from DOL to VFD
- Pump Tripped
- Pump Recovered
- VFD Fault
- High Pressure Alarm
- Low Pressure Alarm
- External Stop
- Commissioning Mode Entered
- Commissioning Mode Exited
- Configuration Parameter Changed

The event log provides a complete audit trail of system activity, enabling maintenance personnel to reconstruct the sequence of events leading to a fault or abnormal operating condition.

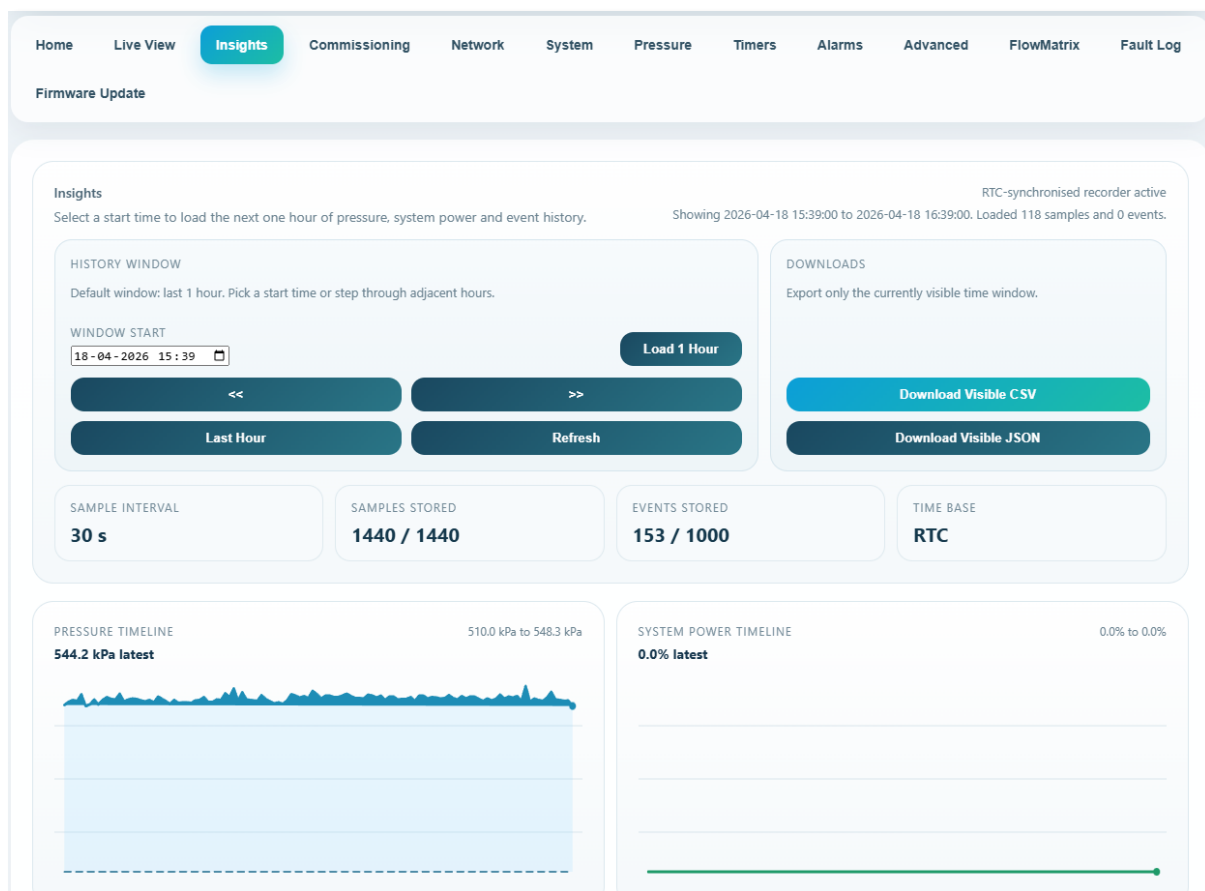
Using Insights for Diagnostics

The **Insights** page is one of the most powerful diagnostic tools available in the NEO 2 Pro. By reviewing historical pressure trends, power consumption, and recorded events together, operators can understand not only **what** happened but also **when** and **why** it occurred.

For example, if users receive a complaint of low water pressure at a particular time, they can load the corresponding one-hour history window and review the pressure graph, system power graph, and event log to determine whether the issue was caused by a pump trip, a VFD fault, an external stop command, or another operating condition. This historical record significantly reduces troubleshooting time, helps identify intermittent faults that may no longer be active, and provides valuable evidence for maintenance planning, performance optimisation, and customer support.



Tip: For the best viewing experience, the **Insights** page is recommended to be viewed on a **tablet or laptop**, where the graphs and event timeline are easier to read and analyse.

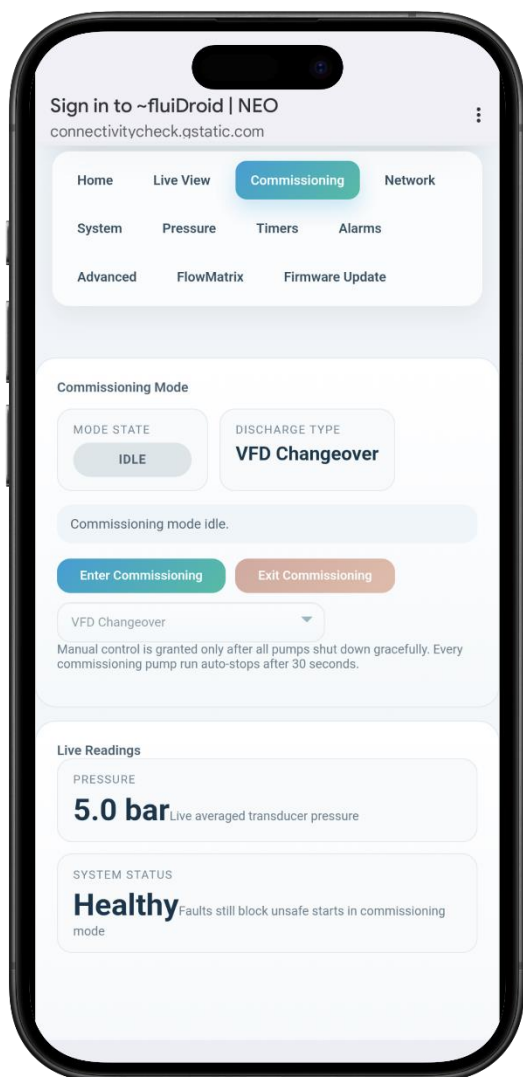


Event Timeline Page 1 • 11 events << >>

Fault edges, pump state changes, commissioning mode and audited setting changes within the selected one-hour window.

Time	Category	Label	Source	Change	Context
2026-04-18 13:17:15	Pump	Pump 1	Internal	Stopped -> DOL	486.5 kPa 101% Clear
2026-04-18 13:13:55	Pump	Pump 2	Internal	Stopped -> VFD	480.4 kPa 10% Clear
2026-04-18 13:13:16	Parameter	Setpoint	Touch Screen	510 -> 500	516.7 kPa 0% Clear
2026-04-18 13:10:26	Fault	Pump 1 Thermal	Internal	Active -> Clear	516.8 kPa 0% Clear
2026-04-18 13:10:26	Pump	Pump 1	Internal	Tripped -> Stopped	516.8 kPa 0% Clear
2026-04-18 13:10:14	Pump	Pump 2	Internal	VFD -> Stopped	516.9 kPa 0% P1 Thermal
2026-04-18 13:10:13	Fault	Pump 1 Thermal	Internal	Clear -> Active	517.0 kPa 51% P1 Thermal
2026-04-18 13:10:13	Pump	Pump 1	Internal	Stopped -> Tripped	517.0 kPa 51% P1 Thermal
2026-04-18 13:08:35	Pump	Pump 1	Internal	DOL -> Stopped	512.0 kPa 99% Clear
2026-04-18 13:08:20	Pump	Pump 1	Internal	Stopped -> DOL	463.4 kPa 102% Clear
2026-04-18 13:07:18	Pump	Pump 2	Internal	Stopped -> VFD	486.1 kPa 10% Clear

8.3.4 Commissioning



Commissioning Mode is a dedicated maintenance and testing feature that allows individual pumps to be operated manually without affecting the normal automatic operation of the system. It is primarily intended for system commissioning, installation verification, troubleshooting, and preventive maintenance.

Once Commissioning Mode is enabled, users can independently **start or stop any pump** in either **DOL (Direct-On-Line)** or **VFD (Variable Frequency Drive)** mode. This allows installers and maintenance personnel to verify motor operation, wiring, contactors, VFD functionality, sensors, and overall system health.

When a pump is started in **VFD mode**, an on-screen **speed slider** becomes available, allowing the VFD output to be adjusted from **0% to 100%** (corresponding to the configured **Minimum Frequency** and **Maximum Frequency**). This enables users to verify correct communication between the controller and the VFD, check speed control, and observe system response at different operating speeds.

Safety Features of Commissioning Mode

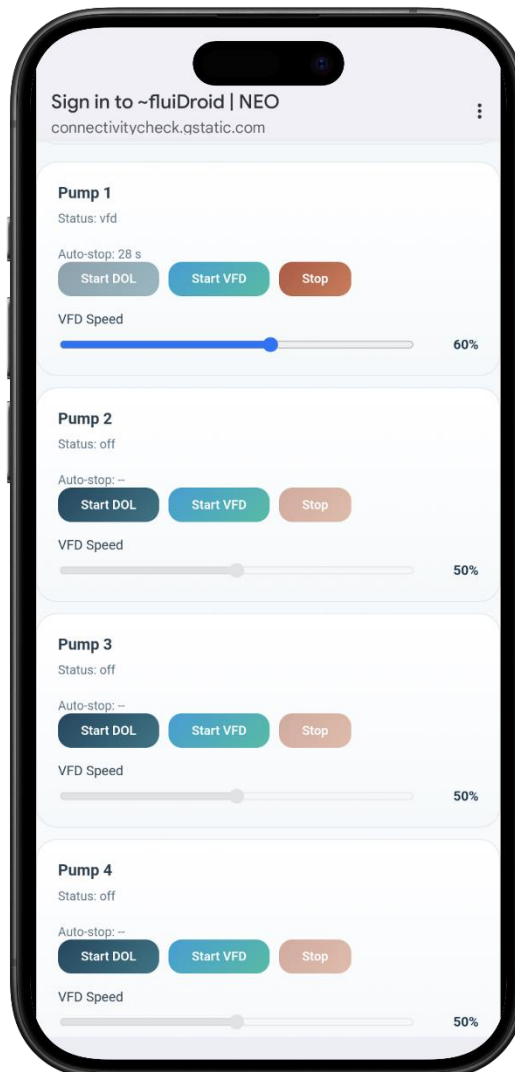
- Every manually started pump operates for a **maximum of 30 seconds**, after which it is automatically switched OFF. This prevents accidental continuous operation during testing.
- If any protection or alarm condition occurs while a pump is running in Commissioning Mode, the pump is **stopped immediately**. This includes conditions such as:
 - Pump Trip
 - VFD Trip
 - High Pressure
 - Low Pressure
 - Dry Run
 - Any other configured safety fault
- A pump that has been stopped due to a fault **cannot be restarted** in Commissioning Mode until the fault has been cleared and the system returns to a healthy state.

- Commissioning Mode can only be entered when the controller is in a **Healthy** state with **no active faults or alarms**.
- If the mobile phone, tablet, or laptop used for commissioning disconnects from the controller, the unit **automatically exits Commissioning Mode** and returns to **Auto Mode**, ensuring that the system cannot remain in manual test mode unintentionally.

While Commissioning Mode is active, the controller clearly indicates this by displaying the

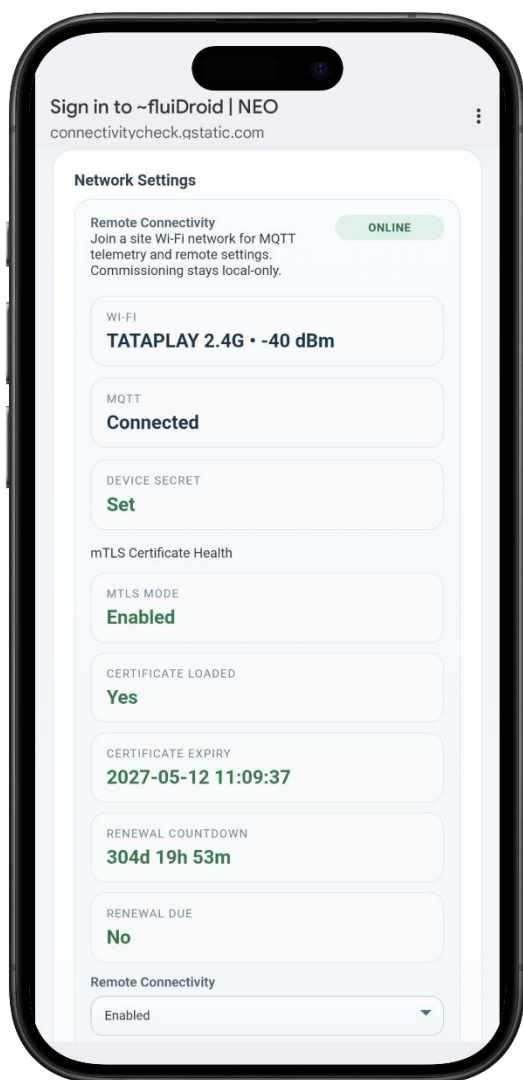


Commissioning Mode icon in the **System Status** area of the display, providing a clear visual indication that the system is operating in maintenance mode rather than normal automatic operation.



Commissioning Mode

8.3.5 Network



The **Network Settings** page is used to configure the controller's communication with the local Wi-Fi network, the GANIT Cloud platform, and Modbus RTU devices. It also allows users to configure the controller's Access Point (AP), communication parameters, and remote connectivity options.

Once configured, the controller can securely transmit telemetry data, receive configuration updates, enable remote monitoring through the GANIT Cloud, and communicate with external Modbus devices.

Remote Connectivity Status

The **Remote Connectivity** panel provides a quick overview of the controller's communication status.

It displays:

- **Wi-Fi Network** currently connected along with the received signal strength (RSSI).
- **MQTT Connection Status**, indicating whether the controller is successfully connected to the cloud server.

- **Overall Connectivity Status**, displayed as **ONLINE** or **OFFLINE**.

This section helps users quickly determine whether the controller is connected to both the local Wi-Fi network and the cloud platform.

Remote Connectivity

This option enables or disables cloud communication.

- **Enabled** – The controller connects to the configured cloud server and publishes telemetry while accepting remote configuration updates.
- **Disabled** – Cloud communication is disabled. The controller continues normal pump control locally but no telemetry or remote access is available.

Note: Disabling Remote Connectivity does **not** affect the controller's automatic pump operation. Only cloud communication is disabled.

Site Wi-Fi Scan

www.amsattech.com |
 support@amsattech.com |
 info@amsattech.com

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Selecting **Scan Nearby Wi-Fi** searches for all available wireless networks within range.

After the scan is complete:

- Select the desired SSID from the drop-down list, or
- Enter the network name manually if it is hidden.

Once a network is selected, enter the corresponding Wi-Fi password and save the settings.

Site Wi-Fi SSID

Displays the name (SSID) of the Wi-Fi network to which the controller will connect for Internet access.

This network provides connectivity for:

- GANIT Cloud telemetry
 - Remote monitoring
 - Remote configuration
 - Firmware updates (where supported)
-

Site Wi-Fi Password

Enter the password for the selected Wi-Fi network.

The password is securely stored within the controller and is used whenever the controller reconnects to the network.

Cloud Host

Specifies the MQTT server or cloud endpoint used by the controller.

Under normal operation, this value is automatically configured during device provisioning and **should not be modified** unless instructed by AMSAT Technologies.

Device UID

The unique identification number assigned to the controller.

Each controller has a globally unique Device UID that identifies it on the GANIT Cloud platform.

This field is automatically generated during manufacturing and is **read-only**.

Device Secret

The Device Secret is a secure authentication key used by the controller to establish an encrypted and authenticated connection with the GANIT Cloud.

This value is unique to every controller and should never be shared or modified.

Portal AP SSID

Defines the Wi-Fi Access Point name broadcast by the controller.

When users wish to configure the controller locally, they connect their mobile phone, tablet, or laptop to this Access Point.

The default SSID is typically:

~fluidroid | NEO

This name may be customized if required.

Portal AP Password

The password required to connect to the controller's Access Point.

Changing the password improves security and prevents unauthorized users from accessing the controller configuration portal.

PIN

The **PIN** secures access to the unit's **touchscreen configuration interface**, preventing unauthorized users from modifying controller settings. Users must enter the correct PIN before any configuration changes can be made from the touchscreen.

The factory default PIN can be changed to enhance system security. It is recommended to change the default PIN during commissioning to prevent unauthorized access to the controller's configuration.

Modbus Slave ID

Specifies the Modbus RTU Slave Address of the controller.

This address is used when the controller communicates with external PLCs, SCADA systems, HMIs, or Building Management Systems over the RS-485 Modbus RTU network.

Each device on the Modbus network must have a unique Slave ID.

Modbus Baud Rate

Selects the communication speed for the Modbus RTU interface.

Typical values include:

- 9600 bps
- 19200 bps
- 38400 bps
- 57600 bps
- 115200 bps

The selected baud rate must match the settings of all other devices connected to the Modbus network.

Modbus Data Format

Defines the serial communication format used by the Modbus RTU interface.

Common formats include:

- 8N1
- 8E1
- 8O1

The communication format must match the configuration of the connected Modbus master.

Saving Network Settings

After making any changes, click **Save** to store the updated configuration.

Some network-related changes, such as Wi-Fi credentials or cloud settings, may cause the controller to disconnect temporarily while it reconnects using the new configuration.

Once reconnection is complete, verify that the **Wi-Fi**, **MQTT**, and **ONLINE** status indicators show a successful connection.

Tip: A strong Wi-Fi signal (typically **better than -65 dBm**) is recommended for reliable cloud connectivity and uninterrupted telemetry. If the signal strength is consistently below **-75 dBm**, consider relocating the Wi-Fi router or installing a Wi-Fi extender to improve communication reliability.

Customizing AP SSID for Multiple Installations

If multiple **~fluidroid | NEO 2™ Series Controllers** systems are installed in close proximity, changing the AP SSID can help distinguish them.

Example Scenario:

- Suppose there are two **~fluiDroid | NEO 2™ Series Controllers** systems in the same area:
 1. One is used for a **Flushing System**.
 2. The other is used for a **Domestic System**.
 - To avoid confusion, you can rename the SSIDs as follows:
 - Change the **Flushing System's SSID** to "**Flushing System**".
 - Change the **Domestic System's SSID** to "**Domestic System**".
 - Next time you scan for Wi-Fi networks, you will see these names, making it easy to **identify and connect to the correct system** for parameter adjustments.
-

Important Notes

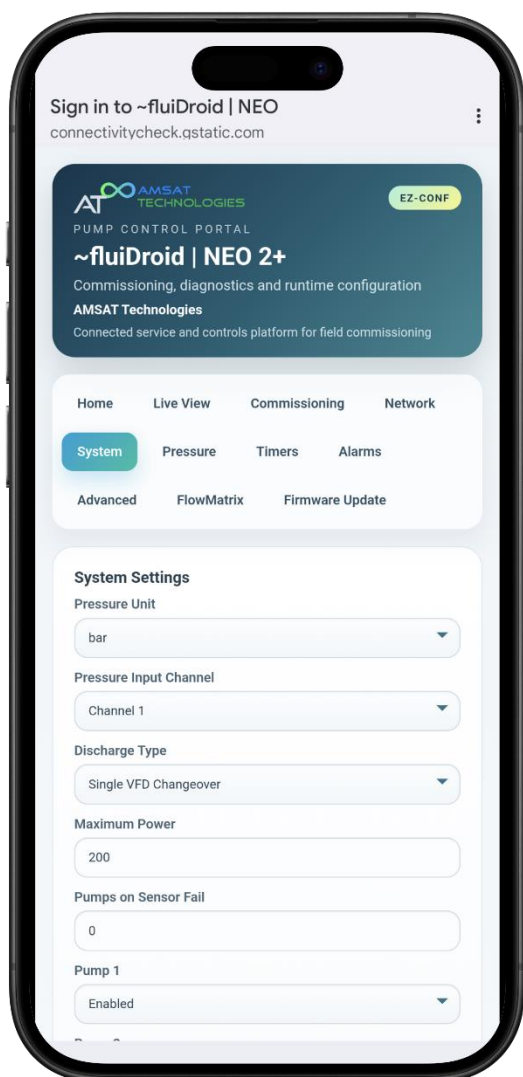
- ✓ **Always remember the Wi-Fi password if it is changed. Write it down or store it securely.**
 - ✓ **If the password is forgotten, contact AMSAT Technologies for the procedure to reset the system.**
-

Usage Notes for the User Manual

- This page is used to configure or update the device's **Wi-Fi access credentials**.
- If changes are made to the **SSID or password**, users will need to reconnect to the updated Wi-Fi network.
- The **Save button** must be clicked to apply any changes.

Ensure the **Wi-Fi password is strong** to prevent unauthorized access.

8.3.6 System Settings



The **System Settings** page contains the fundamental configuration parameters that define how the controller operates. These settings allow the controller to be adapted to different pumping systems, pressure sensors, pump configurations, and control strategies.

Most of these parameters are configured during commissioning and generally do not require frequent modification. Care should be taken when changing these settings, as incorrect values may affect system performance.

Pressure Unit

Selects the engineering unit used throughout the controller for pressure measurement.

The selected unit is displayed on:

- Live View / Pressure graphs
- Fault messages / Event logs
- All TFT Display Screens & Configuration screens

Changing the pressure unit automatically updates all displayed pressure values without affecting the controller's internal operation.

Pressure Input Channel

Selects the analogue input channel (Channel 1 or Channel 2) connected to the discharge pressure transmitter. The controller uses this input as the primary feedback signal for pressure regulation. Ensure that the selected input corresponds to the physical wiring of the pressure sensor.

Discharge Type:

- A dropdown menu that allows users to select the **type of discharge control**.
- The options for **Discharge Type** are as follows:
 - Fixed Speed
 - Single VFD Changeover
 - Multi-VFD
 - Multi-VFD FlowMatrix
- The current selection, "**Single VFD Changeover**", indicates that a **Variable Frequency Drive (VFD)** is used to control motor speed, with automatic switching when needed.

Maximum Power:

The **Maximum Power** setting controls how many pumps can run at the same time.

- Each pump is considered **100% power**.
- If **3 pumps are enabled** and **Maximum Power is set to 200%**, it means:
 - At any given time, **only 2 pumps will run simultaneously** ($200\% = 2 \times 100\%$).
 - **One pump will always be on standby**, but it won't always be the same pump.
 - The system **automatically selects which pumps to run** based on:
 - **Total running hours** (to balance wear and tear).
 - **Number of start-stops in the previous hour** (to optimize performance).

This ensures **even usage of all pumps**, improving efficiency and longevity.

Pumps on Sensor Fail:

- Determines how many pumps will **automatically start** if the pressure sensor fails.
- The value **0** means that no additional pumps will start upon sensor failure.

Pump Control Section

Each installed pump can be individually enabled or disabled.

Disabling a pump removes it from the automatic control sequence while allowing the remaining pumps to continue normal operation.

This feature is useful during:

- Pump maintenance
- Equipment replacement
- Fault isolation
- Temporary shutdown of individual pumps

Each pump can be manually set to **Enabled** or **Disabled** based on operational requirements and actual number of pumps present in the system.

Pressure Sensor Calibration Section

Defines how the **pressure sensor readings** are mapped to electrical signals.

- **Sensor Pressure at 4mA: 0 kPa**
 - Indicates the pressure level when the sensor outputs **4mA** current (lowest range).
 - **Sensor Pressure at 20mA: 1000 kPa**
 - Indicates the pressure level when the sensor outputs **20mA** current (highest range).
-

PID Control Parameters

These parameters define how the system dynamically **adjusts pump speed** to maintain desired pressure.

- **Proportional Constant (P): 60**
 - Controls the response speed to pressure deviations. A higher value increases responsiveness.
 - **Integral Constant (I): 40**
 - Helps eliminate steady-state errors by adjusting based on past deviations.
 - **Differential Constant (D): 0**
 - Controls the rate of change to prevent overshooting. Set to **0**, meaning no derivative control is applied.
-

Saving System Settings

After modifying any parameter, click **Save** to store the updated configuration.

The controller immediately validates and applies the new settings where applicable. Some configuration changes may affect pump operation and should therefore only be performed by qualified personnel during commissioning or maintenance.

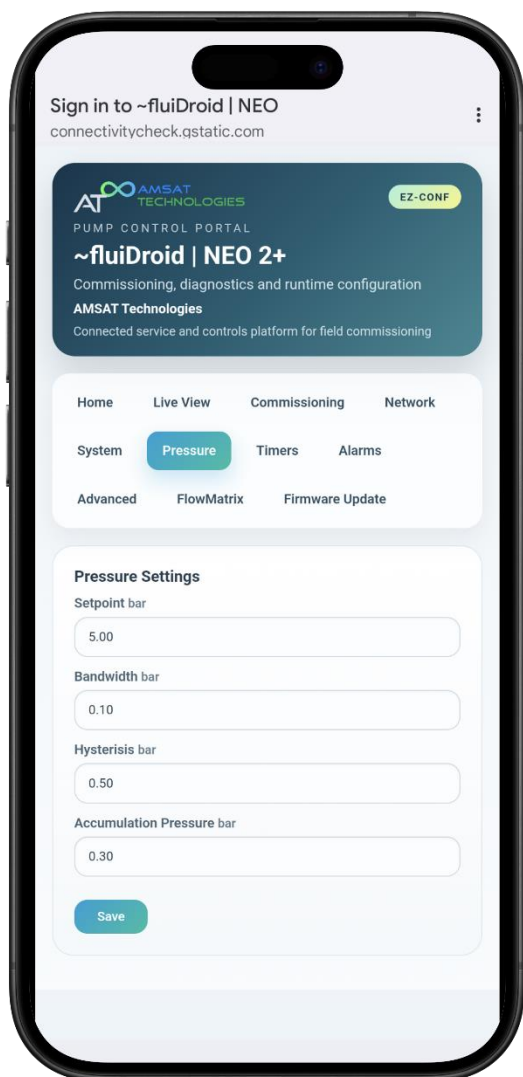
Note: Ensure that the pressure transmitter scaling (4 mA and 20 mA values) matches the installed sensor specifications and the pressure on the gauge before placing the system into automatic operation. Incorrect scaling may result in inaccurate pressure readings and improper pump control.

Important Notes

- ✓ **Ensure correct PID values** to prevent system instability.
- ✓ **Modify "Pumps on Sensor Fail" settings cautiously** to avoid unexpected pump operations.

✓ **Adjust maximum power limits carefully** based on the pump's specifications and requirements as per site conditions and necessary system configuration (**Example:** 2Working + 1Standby , 1Working +1Standby, 3Working No Standby, 3Working + 1 Standby etc.)

8.3.7 Pressure Settings

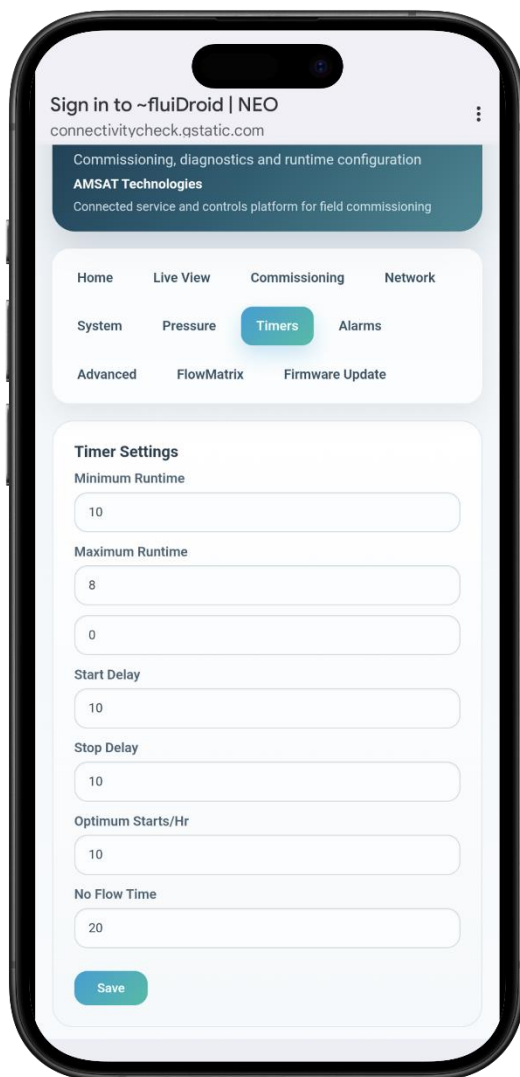


This screen allows users to configure pressure-related parameters for the **~fluidDroid | NEO 2™ Series Controllers** system. Below are the settings and their functions:

- **Maximum Setpoint:** The highest pressure limits the user can program before stopping further increases.
- **Setpoint:** The target pressure the system tries to maintain during operation.
- **Bandwidth:** The range within which pressure is regulated. A smaller value ensures tighter control, while a larger value allows more variation.
- **Hysteresis:** The pressure difference required before the system starts or stops a pump, preventing frequent switching. **(Only Applicable for Fixed Speed Discharge Type)**
- **Accumulation Pressure:** The additional pressure that builds up in the system to ensure the pressure tank is filled up before shutting down the last pump.

After adjusting these settings, press "**Save**" to apply the changes, before switching to a different tab.

8.3.8 Timer Settings

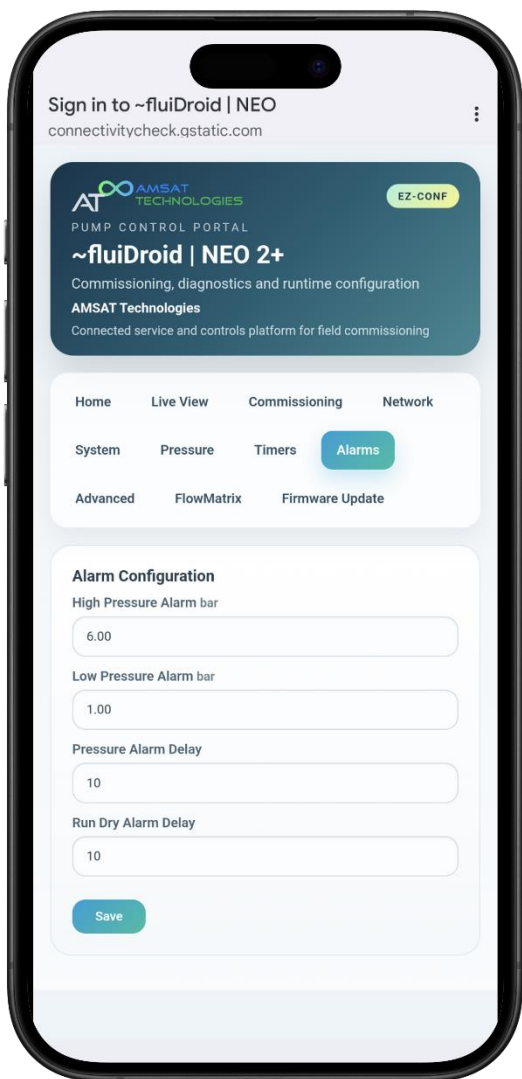


This screen allows users to configure the timing settings for pump operations in the **~fluidroid | NEO 2™ Series Controllers** system. Below is a breakdown of each setting:

- **Minimum Runtime:** The shortest duration a pump must run once started, preventing frequent switching.
- **Maximum Runtime:** The longest duration a pump can operate continuously before it must stop and switch to a different pump to prevent overheating or excessive wear. **(Always ensure minutes is non zero)**
- **Start Delay:** The time delay before a pump starts after receiving a command, preventing sudden surges in operation.
- **Stop Delay:** The time delay before a pump stops after it is signalled to turn off, ensuring smooth transitions.
- **Optimum Starts/Hr:** The maximum recommended number of times a pump can start in an hour to balance efficiency and wear.
- **No Flow Time:** The time the system waits before shutting down the pump if no flow is detected, preventing churn of the pumps.

After adjusting the settings, press "**Save**" to apply the changes, before switching to a different tab.

8.3.9 Alarm Configuration

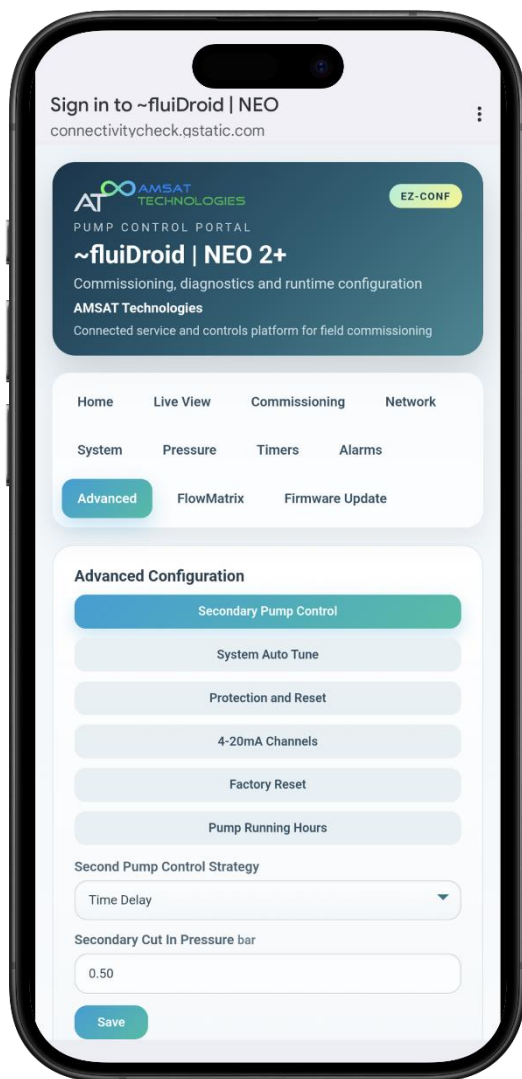


This screen allows users to configure the alarm settings for the **~fluidDroid | NEO 2™ Series Controllers** system. Proper alarm settings help protect the pump system from damage and ensure safe operation. Below is a breakdown of each parameter:

- **High Pressure Alarm:** If system pressure exceeds this value (in kPa), an alarm is triggered and the system halts operations to prevent potential damage from overpressure.
- **Low Pressure Alarm:** If system pressure drops below this value (in kPa), an alarm is activated and the system halts operations to indicate potential leaks or pump failure or non-availability of water at intake.
- **Pressure Alarm Delay:** The system waits for this duration (in seconds) before triggering a pressure-related alarm, helping to avoid false alarms due to short fluctuations.
- **Run Dry Alarm Delay:** If no water flow is detected at intake for this set duration (in seconds), the system will trigger a "Run Dry" alarm to prevent pump damage due to dry running.

After setting the desired alarm thresholds and delays, press **"Save"** to apply the changes, before switching to a different tab.

8.3.10 Advanced Configuration



This screen allows users to fine-tune advanced settings for the **~fluidroid | NEO 2™ Series Controllers** system. Each setting plays a crucial role in pump control, alarm handling, and analog output configurations. Below is a breakdown of the key options available:

Pump Control Settings:

• Second Pump Control Strategy

The **Second Pump Control Strategy** decides when the second pump should turn on. This setting is only applicable for **Single VFD Changeover Type Discharge**.

You have two options:

1. **Time Delay:** The second pump turns on **after a set time delay** once the first pump on VFD is running at full speed, **no matter what the pressure is**.
2. **Pressure Dependent:** The second pump turns on **only if the pressure drops below a set level**, and the first pump on VFD is already running at full speed and “Start Delay” is over.

Basically:

- **Time Delay** = Turns on after a set time.
- **Pressure Dependent** = Turns on only if pressure is low.
- **Secondary Cut-In Pressure:** The pressure threshold (in kPa) at which the second pump is triggered to maintain system pressure. (Pressure at which next pump will start = Set-Point – Secondary Cut-In Pressure). For example, Setpoint = 500 kPa and Secondary Cut-In Pressure = 50 kPa. Then in this case the next pump will only start when the discharge pressure falls below 450 kPa (500 kPa – 50 kPa = 450 kPa) and the first pump is running at 100% power and the “Start Delay” is over.

System Auto-Tuning:

The **System Auto Tune** feature decides whether the system can automatically adjust itself or if it needs manual setup.

If Auto Tune is Enabled:

- The system constantly monitors the **discharge pressure** (the pressure of water being pumped out).
- If the discharge pressure goes **above the setpoint** but is still **below Setpoint + Accumulation Pressure**, and the pump is running at its **minimum power (5%)** for a certain amount of time (**No Flow Time** setting), the system assumes that there is very little or no water usage.
- At this point, the system **gradually increases power** to push the pressure **above Setpoint + Accumulation Pressure**.
- Once the pressure reaches this level, the system **automatically stops the pump**.

If Auto Tune is Disabled:

- The system **does not** adjust itself.
- Instead, you **must manually set** the **minimum speed** of the pump (also called the **minimum frequency of the VFD**) (**The minimum speed/minimum frequency needs to be set in the VFD**).
- This setting ensures that when there is no water flow, the **pressure naturally increases** and eventually **triggers a stop condition**.
- If this is not set properly, the system may **fail to stop**, or it may **turn off too soon**, causing pressure problems. (Refer System Tuning Manual for more information)

Alarm & Auto-Reset Settings:

- **Alarm Buzzer:** Enables or disables the buzzer sound when an alarm is triggered.
- **Auto Reset on Low Pressure:** If enabled, the system will automatically reset after a low-pressure alarm is cleared. (Before enabling this, ensure Dry Running of pumps is not possible (Air in Pumps after dry run etc.) (AMSAT Technologies recommends, as long as possible **do not enable** in **negative suction systems**)
- **Auto Reset on RDP:** Allows the system to automatically reset after a **Run Dry Protection (RDP)** alarm has been cleared.
- **Auto Reset on VFD Fail:** If enabled, the system attempts to reset automatically after a **VFD failure** alarm is cleared.

4-20mA Output Channel Configuration:

- These settings define the maximum signal output for each **4-20mA analog output channel** (used for communication with external monitoring systems).
- **Channels 1-4 Max:** Users can configure the maximum values for each channel (between **300** and **640**).

Important: DO NOT CHANGE THE ABOVE SETTINGS. ONLY for Authorized and trained technicians.

Factory Reset:

- **Factory Reset:** Allows users to restore system settings to default values. If set to "Enabled", performing a reset will erase all custom configurations.
- **Factory Reset** also resets and zeroes the individual Pump running hours.
- **Factory Reset** does not Reset/Zeroes Total System Running Hours.

Saving Settings:

After adjusting the desired parameters, press "**Save**" to apply the changes, before switching to a different tab.

This screen provides critical control over the system's automation, alarms, and external signal communication.

Pump Running Hours

The controller maintains the cumulative running hours of each pump. These values are used by the pump rotation algorithm to balance wear and ensure that all pumps accumulate similar operating hours over time.

Two maintenance options are available:

Equalize

Selecting **Equalize** identifies the pump with the **highest accumulated running hours** and updates the running hours of all other pumps to match this value. No pump's running hours are reduced; instead, the remaining pumps are brought up to the highest recorded value.

Reset

Selecting **Reset** clears the running hours of **all pumps**, setting them to **0 hours**.

When should these options be used?

These options are primarily intended for maintenance situations. For example, if a pump is removed for servicing or replaced and later reinstalled, its accumulated running hours will be significantly lower than those of the other pumps.

Since the controller uses running hours as one of the criteria for pump rotation, the serviced pump may be selected more frequently because it appears to be the least-used pump. Although the controller also considers other operating parameters such as the maximum number of starts per hour, this behaviour may still be undesirable.

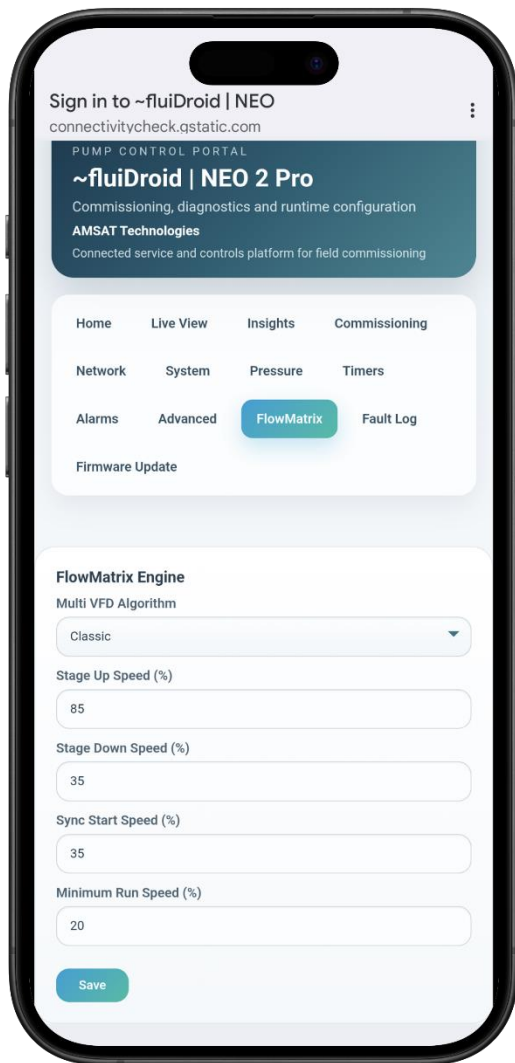


To prevent this:

- Use **Equalize** if you want the serviced or replaced pump to rejoin the rotation on an equal basis with the other pumps.
- Use **Reset** if you want to start tracking running hours from zero for the entire pump set, such as after commissioning a new installation or performing a complete overhaul.

Note: These functions affect only the stored running hour counters of the Individual Pumps, it does not alter the Total System Running Hours. Also they do not alter any pump configuration, operating parameters, or protection settings.

8.3.11 FlowMatrix™



The **FlowMatrix Engine** is the intelligent pump staging algorithm used by the controller to manage multiple VFD-operated pumps. It automatically determines when additional pumps should be started or stopped based on the operating speed of the active VFD pump, ensuring stable pressure control, improved energy efficiency, and balanced pump utilization.

Multi VFD Algorithm

Selects the operating logic used by the FlowMatrix Engine.

Classic

- Traditional lead-lag control strategy.
- Pumps are staged up or down based on configurable speed thresholds.
- Recommended for most hydro-pneumatic booster systems.

Additional algorithms may be available in future firmware releases depending on the application.

Stage Up Speed (%)

Defines the VFD speed at which the controller starts an additional pump.

When the running VFD reaches or exceeds this speed for the required decision period, the controller assumes that the current pump can no longer satisfy the demand efficiently and starts the next available pump.

Typical Setting: 80–90%

Higher Value

- Delays the starting of additional pumps.
- Maximizes utilization of the running pump.
- Suitable for systems with moderate demand fluctuations.

Lower Value

- Starts additional pumps earlier.
- Improves pressure stability during sudden increases in demand.
- May result in more pump starts.

Stage Down Speed (%)

Defines the VFD speed below which an additional pump is removed from service.

If the operating VFD speed remains below this value, the controller determines that the system demand has reduced and stops one of the running pumps.

Typical Setting: 30–40%

Higher Value

- Pumps are stopped sooner.
- Improves energy efficiency during light demand.

Lower Value

- Pumps remain in operation longer.
- Reduces frequent staging during fluctuating demand.

Important: The Stage Down Speed should always be significantly lower than the Stage Up Speed to prevent frequent pump cycling.

Sync Start Speed (%)

Defines the speed at which a newly started VFD synchronizes with the running pump before taking part in load sharing.

When a new pump starts, its VFD ramps up to the configured synchronization speed, allowing both pumps to transition smoothly without causing pressure fluctuations or hydraulic shocks.

Typical Setting: 30–40%

A lower synchronization speed provides a gentler transfer of load, while a higher value allows faster load sharing.

Minimum Run Speed (%)

Specifies the minimum operating speed permitted for any running VFD.

The controller will not command the VFD below this speed, even if the pressure demand is very low.

This parameter helps to:

- Maintain adequate motor cooling.
- Prevent unstable operation at very low frequencies.
- Ensure reliable pump performance.
- Avoid operating below the pump manufacturer's recommended minimum speed.

Typical Setting: 20–30%

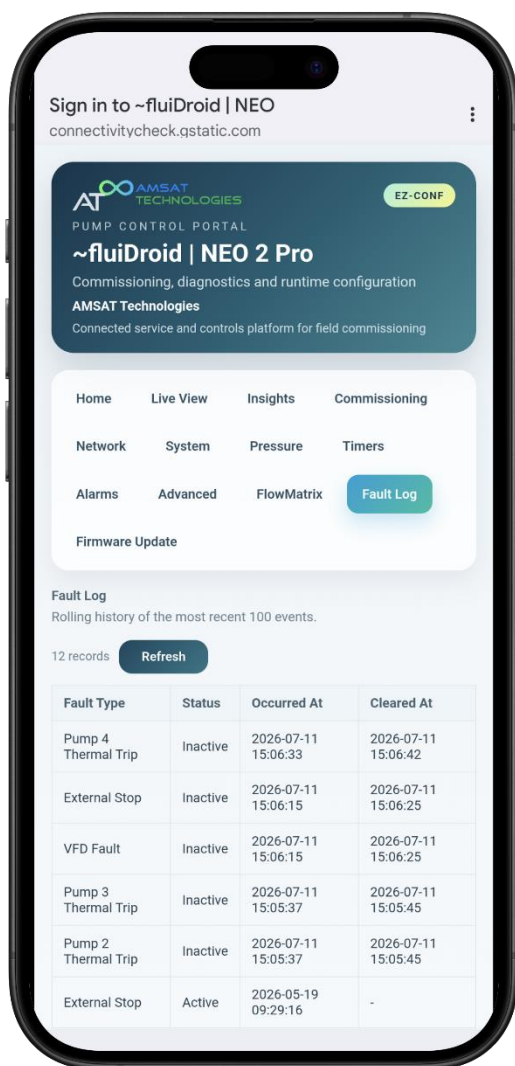
Note: Always ensure that this value complies with the minimum operating speed specified by the pump and VFD manufacturers.

Recommended Default Settings

Parameter	Typical Value
Stage Up Speed	70%
Stage Down Speed	35%
Sync Start Speed	35%
Minimum Run Speed	20%

These values provide stable operation for most hydro-pneumatic booster applications and should only be modified by qualified commissioning personnel after evaluating the system characteristics.

8.3.12 Fault Log (~fluidroid | NEO 2 Pro Only)



The **Fault Log** provides a chronological history of fault and alarm events recorded by the controller. It is intended for troubleshooting, maintenance, and system diagnostics.

The controller stores the **most recent 100 fault events** in a rolling log. When the log reaches its maximum capacity, the oldest records are automatically removed as new events are recorded.

Refresh

Press **Refresh** to retrieve the latest fault records from the controller.

This is useful after clearing faults or when monitoring live system operation during commissioning and troubleshooting.

Fault Log Information

Each entry in the log contains the following information:

Fault Type

Displays the fault or alarm that occurred.

Examples include:

- Pump Thermal Trip
- VFD Fault
- External Stop
- Dry Run
- Low Pressure
- High Pressure
- Sensor Failure
- Motor Overload

The exact fault types available depend on the controller configuration and connected equipment.

Status

Indicates whether the fault is currently present.

- **Active** – The fault condition still exists and has not been cleared.
- **Inactive** – The fault has been cleared and the system has returned to normal operation.

Occurred At

Displays the **date and time** when the fault was first detected by the controller.

This timestamp helps identify the sequence of events leading to a system shutdown or abnormal operation.

Cleared At

Displays the **date and time** when the fault condition was cleared.

If the fault is still active, this field is displayed as "-", indicating that the fault has not yet been resolved.

Using the Fault Log

The Fault Log is a valuable diagnostic tool for service personnel. It can be used to:

- Identify recurring faults.
- Determine the duration of fault conditions.
- Verify that faults have been successfully cleared.
- Investigate pump trips and VFD shutdowns.
- Analyse system behaviour during maintenance or commissioning.

By comparing the **Occurred At** and **Cleared At** timestamps, service personnel can determine how long a fault remained active and correlate events with external conditions or operator actions.

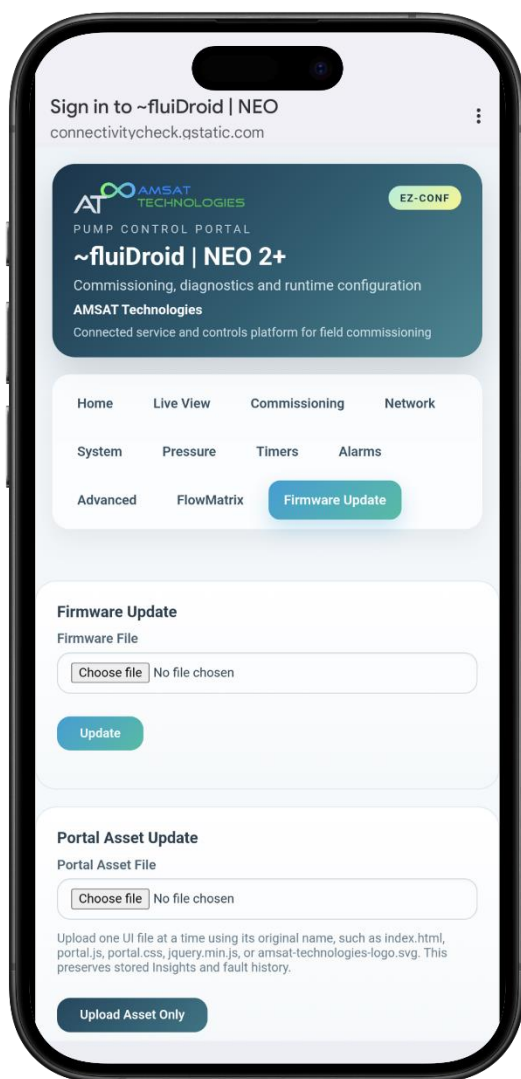
Note: The Fault Log is intended for diagnostic purposes only. Clearing a fault from the controller does not remove its historical record from the Fault Log. Entries remain available until they are automatically overwritten as newer events are recorded.

8.3.13 Firmware Update



The **Firmware Update** page allows authorized personnel to update the controller firmware or the embedded web portal without removing the controller from service. Firmware updates may include new features, performance improvements, bug fixes, and support for additional hardware.

Important: Firmware and portal updates should only be performed using files provided by **AMSAT Technologies**.



The **Firmware Update** section is used to install a new firmware version on the controller.

Firmware File

Click **Choose File** and browse to the firmware update file supplied by AMSAT Technologies.

After selecting the file, press **Update** to begin the firmware upgrade.

During the update process:

- The firmware is uploaded to the controller.
- The controller verifies the integrity of the firmware.
- The firmware is written to internal memory.
- The controller automatically reboots after a successful update.

Do not disconnect the power supply or close the browser while a firmware update is in progress. Interrupting the update may render the controller temporarily inoperable.

After the controller restarts, reconnect to the portal and verify that the new firmware version is displayed under the **System Information** page.

Portal Asset Update

The **Portal Asset Update** section allows the embedded web portal (HTML, JavaScript, CSS, images, etc.) to be updated independently of the controller firmware.

This feature enables interface improvements and bug fixes without affecting the controller's operating software or configuration.

Portal Asset File

Click **Choose File** and select the portal asset file to upload.

Each asset must be uploaded **one file at a time**, using its **original filename**, for example:

- index.html
- portal.css
- portal.js
- jquery.min.js

The controller replaces the existing file with the uploaded version while preserving all controller settings and operational data.

Press **Upload Asset Only** to upload the selected file.

Benefits of Portal Asset Updates

Updating portal assets allows:

- User interface improvements.
- Addition of new web portal features.
- Corrections to display or usability issues.
- Branding or logo updates.
- Faster deployment of portal enhancements without modifying controller firmware.

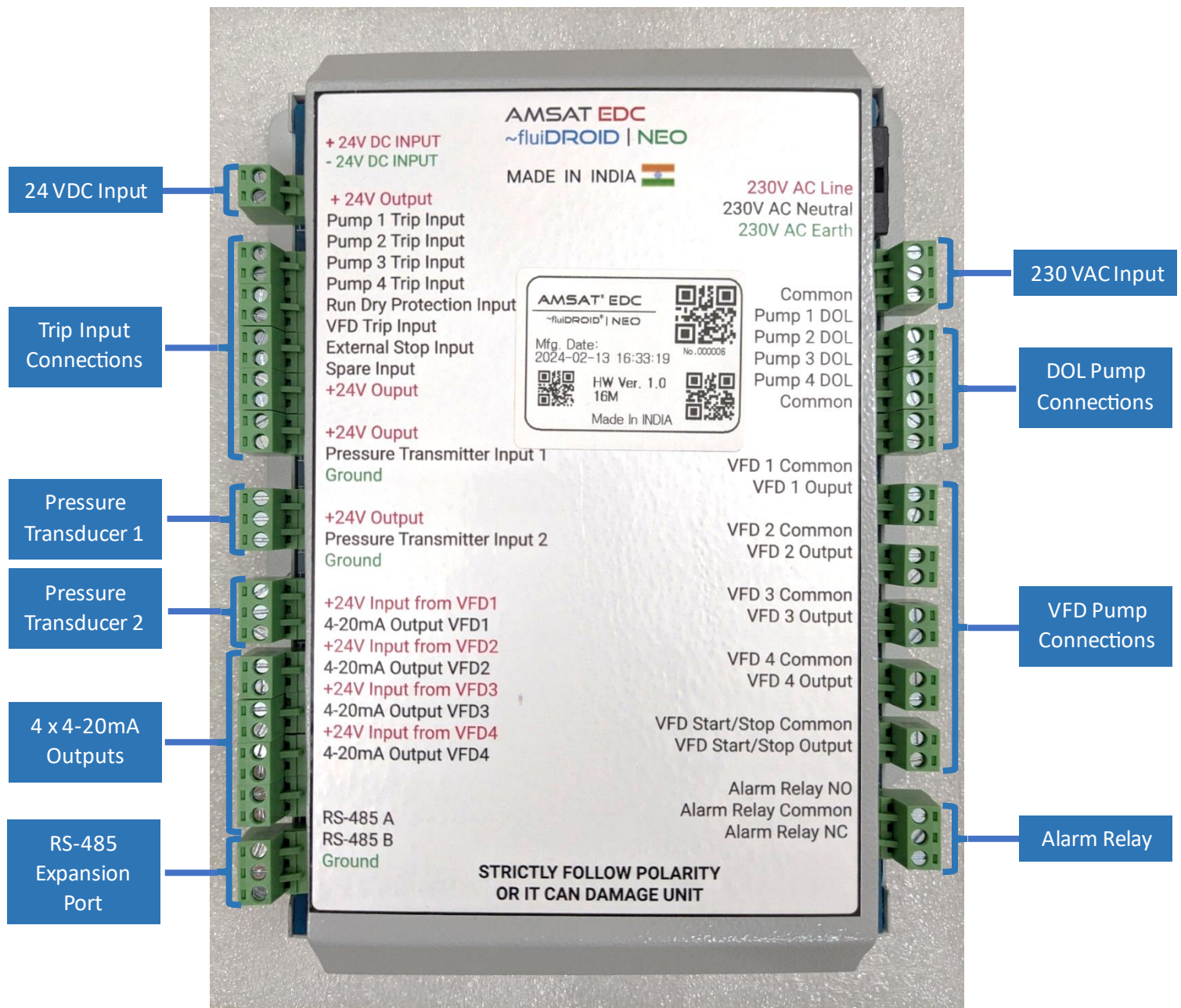
Because only the web interface files are updated, **stored Insights data, fault history, controller configuration, and operating parameters remain unaffected**.

Best Practices

- Always use firmware and portal files provided by **AMSAT Technologies**.
- Ensure the controller has a stable power supply throughout the update process.
- Do not refresh or close the browser until the update has completed.
- Verify normal controller operation after the update.
- Retain a copy of the previous firmware version whenever possible, allowing it to be restored if required.

Note: Firmware updates modify the controller's operating software, whereas **Portal Asset Updates** modify only the embedded web interface. Configuration settings, Insights data, and Fault Log history are preserved during portal asset updates.

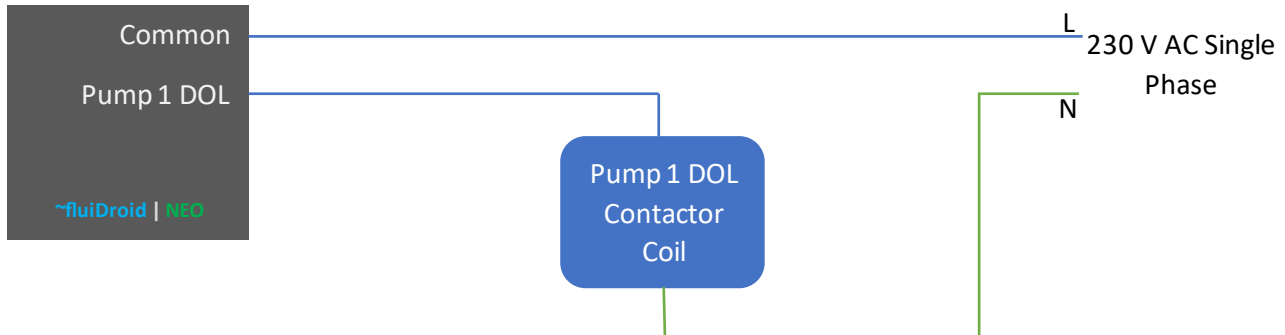
9 Terminals and Connections



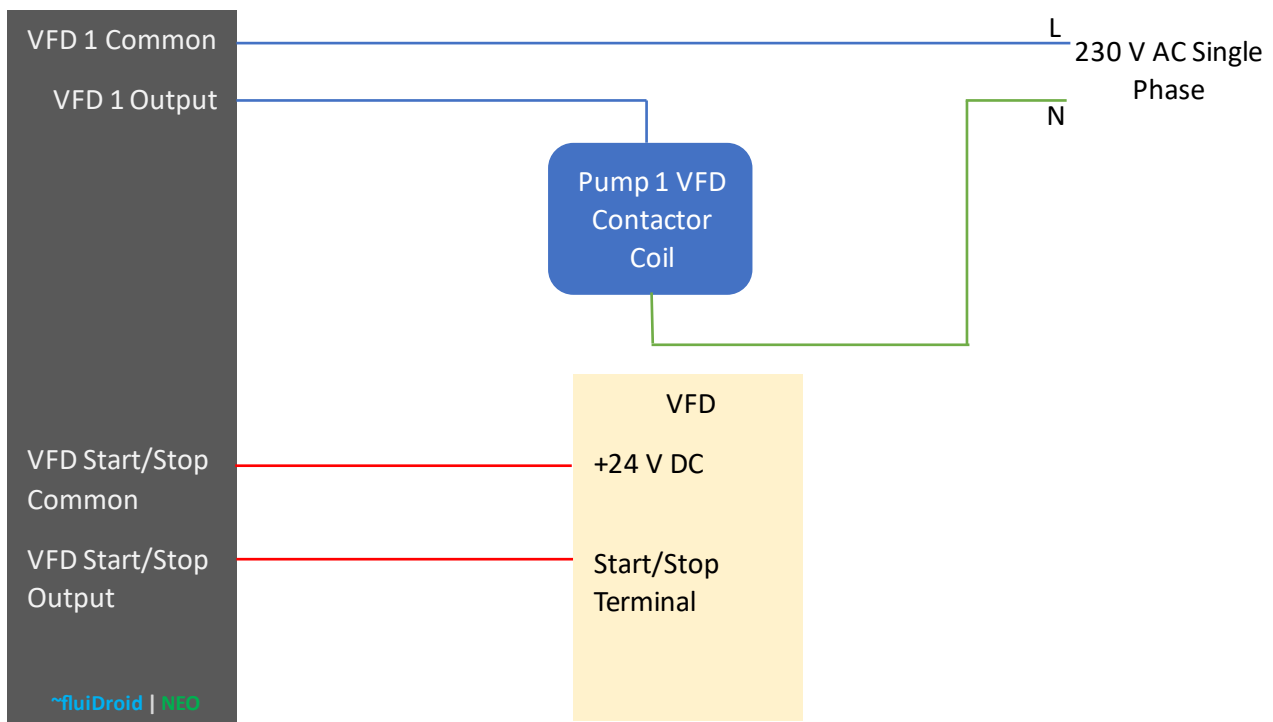
9.1 Examples of Terminal Connections

Refer Electrical Connections Section for detailed connections. This section gives examples for connections in focus sections, which can be expanded for multiple pumps or inputs.

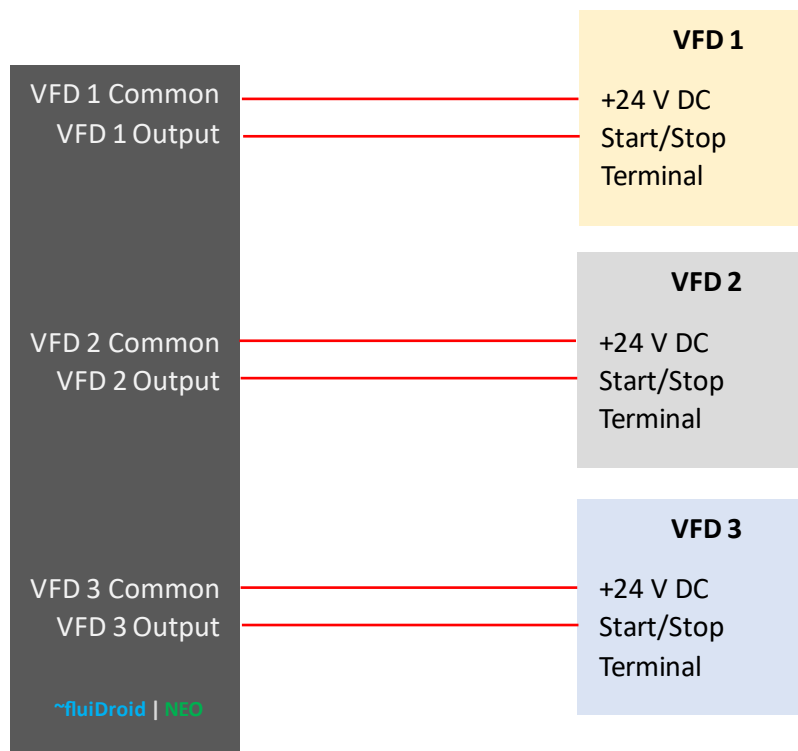
9.1.1 Example DOL Pump Connections (Applicable for Fixed Speed & Single VFD Changeover Discharge Types)



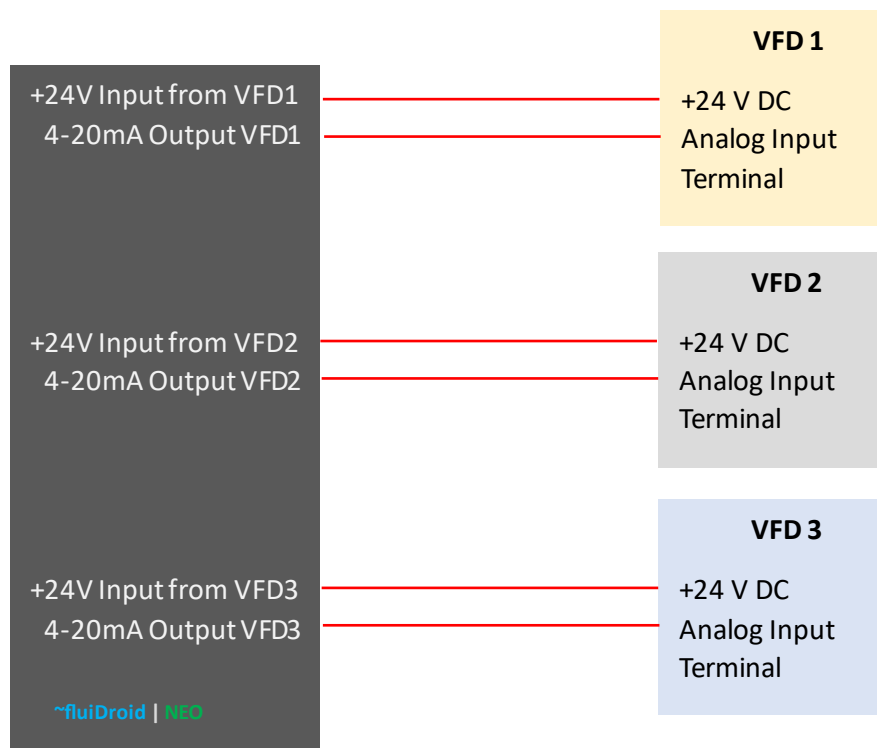
9.1.2 Example VFD Pump Connections (For Single VFD Changeover Discharge Type)



9.1.3 Example for VFD Connections (Start/Stop Commands for Multi-VFD Discharge Type)

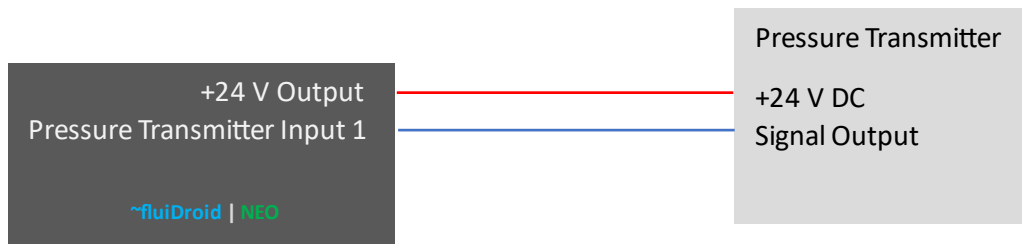


9.1.4 Example for Connecting 4-20mA Control Output to VFD (For Multi-VFD Discharge Type)

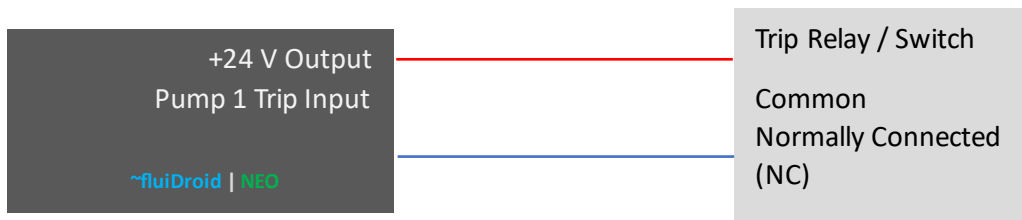


In case of Single VFD Discharge Type, only one 4-20mA Channel will be used. Any one of the four output channels can be used.

9.1.5 Example Connection to Pressure Transducer/Transmitter

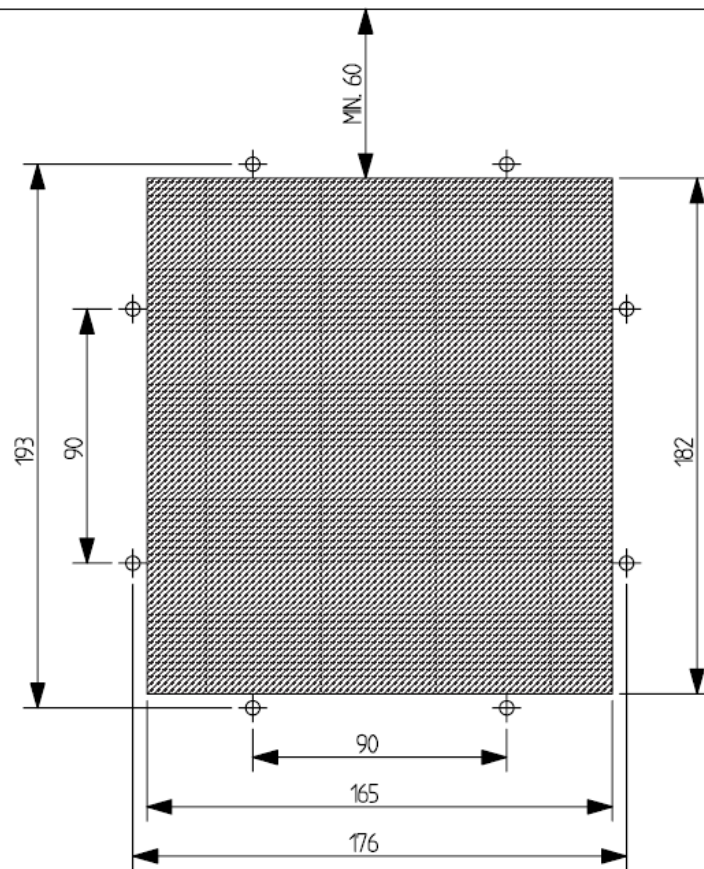


9.1.6 Example for Connecting Trip Inputs

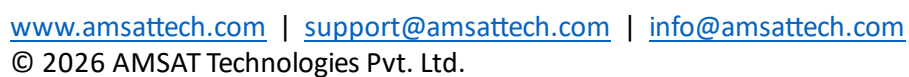


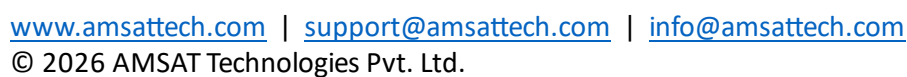
10 Panel Build In Diagram:

~fluidDroid | NEO 2™ Series Controllers Panel Mounting Drawing:



All Dimension in mm.



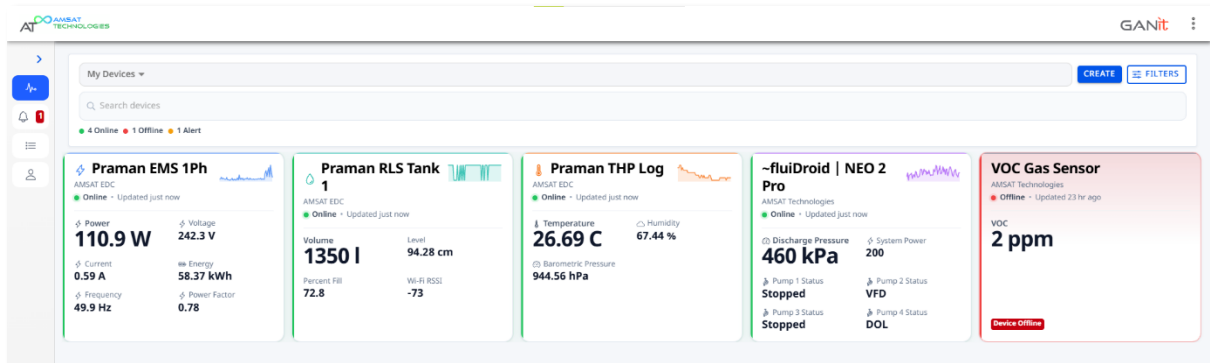


12 GANIT Industrial Intelligence Platform Connectivity

GANIT Operations Command & Control Centre (O3C)



The **GANIT Operations Control Centre (OCC)** provides a secure web-based interface for monitoring, analysing, and managing one or more **~fluidDroid | NEO 2 Pro** controllers from anywhere with an internet connection.



After the controller is provisioned and connected to the GANIT Cloud, all operational data is transmitted securely to the cloud and displayed in real time. This enables plant operators, maintenance personnel, system integrators, and facility managers to monitor system performance without being physically present at the installation.

Dashboard Overview

The **My Devices** dashboard displays all devices associated with the user's account.

Each controller appears as a device card containing:

- Device Name
- Device Type
- Online / Offline Status
- Last Update Time
- Live telemetry indicator
- Primary operating parameters
- Current alarm status

The dashboard provides an instant overview of the health and operating condition of every connected installation.

Device Summary

Selecting a device opens its detailed dashboard. The header displays key operating information including:

- Device Name
- Current Connection Status
- Last Synchronization Time
- System Pressure
- Controller Operating Mode
- Individual Pump Status
- Overall System Status

This information allows the operator to quickly assess the current condition of the pumping system.

Communication Status

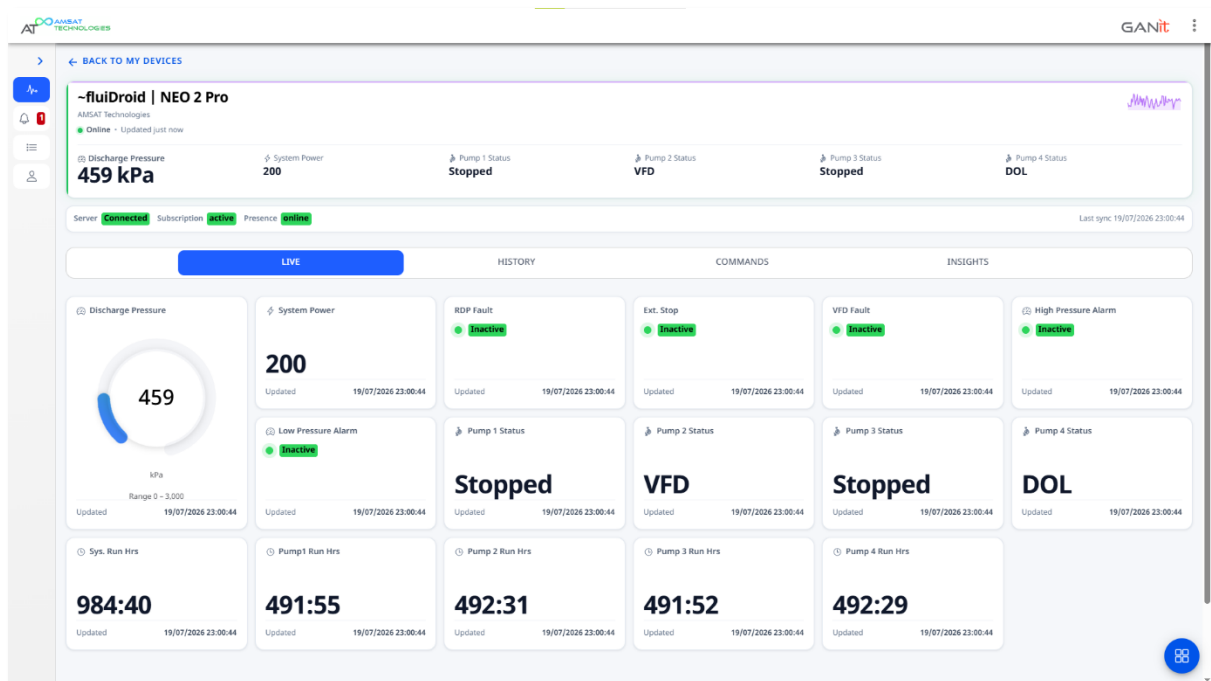
The dashboard continuously reports the communication status between the controller and the GANIT Cloud.

The following indicators are displayed:

- **Server** – Indicates whether the controller is connected to the cloud server.
- **Subscription** – Displays the current cloud subscription status.
- **Presence** – Indicates whether the controller is actively communicating with the cloud.

These indicators help identify communication or connectivity issues without requiring access to the controller itself.

Live Dashboard



The **Live** tab displays the most recent operating values received from the controller.

Typical information includes:

- Discharge Pressure
- System Power
- Low Pressure Alarm
- High Pressure Alarm
- Remote Disable (RDP) Status
- External Stop Status
- VFD Fault Status
- Individual Pump Status
- Pump Running Hours
- Total System Running Hours

Each widget displays:

- Current value
- Last update timestamp
- Operating status

The dashboard automatically refreshes whenever new data is received from the controller.

Historical Data

The **History** tab provides access to previously recorded operating data stored within the GANIT Cloud.

Historical records can be used to:

- Analyse pressure trends
- Review pump operation
- Investigate abnormal events
- Compare system performance over time
- Support preventive maintenance activities

The availability of historical data depends on the subscription plan and configured data retention period.

Remote Commands

The **Commands** tab enables authorized users to remotely interact with the controller.

Depending on the permissions assigned to the user account and the controller configuration, available commands may include:

- Acknowledge alarms
- Reset faults
- Setting of Parameters
- Perform maintenance operations
- Execute remote control functions

Only authenticated users with the appropriate access privileges can issue remote commands.

Insights

The **Insights** section presents analytical information generated from the collected operational data. Insights may include:

- Pump utilisation analysis
- Running hour comparison
- Pressure performance trends
- Energy consumption analysis
- Operating efficiency
- Alarm frequency
- Predictive maintenance indicators

These analytics assist maintenance personnel in identifying performance issues before they result in equipment failure.

Pump Status

The dashboard displays the operating state of each configured pump.

Typical status indications include:

- **Stopped** – Pump is available but not currently running.
- **Running (VFD)** – Pump is operating under Variable Frequency Drive control.
- **Running (DOL)** – Pump is operating in Direct-On-Line mode.
- **Fault** – Pump has been disabled due to a fault condition.
- **Unavailable** – Pump has been isolated or removed from service.

This provides immediate visibility into how the FlowMatrix algorithm is managing the pumping system.

Alarm Monitoring

Alarm widgets continuously display the current state of critical protection functions.

Typical monitored alarms include:

- Low Pressure
- High Pressure
- VFD Fault
- External Stop
- Dry Run Protection
- Remote Disable (RDP)

Each alarm is displayed as either:

- **Active** – Fault condition currently exists.
 - **Inactive** – System operating normally.
-

Running Hours

The dashboard displays both total system operating hours and individual pump running hours.

These values assist in:

- Maintenance scheduling
- Service planning
- Pump rotation verification
- Equipment life assessment

The running hour information is synchronized with the controller and updated automatically.

Real-Time Synchronization

Every measurement displayed within the *O3C* includes the timestamp of its most recent update.

This allows operators to verify:

- When the data was last received.
- Whether the controller is actively communicating.
- The freshness of displayed information.

If communication is interrupted, the dashboard retains the last received values while indicating that the controller is offline.

Multi-Site Monitoring

The *GANIT Operations Command & Control Centre (O3C)* is designed to manage multiple installations from a single account.

Users can monitor:

- Residential booster systems
- Commercial buildings
- Hotels
- Hospitals
- Industrial facilities
- Municipal pumping stations

This centralized approach enables maintenance teams and service providers to supervise geographically distributed pumping systems from a single dashboard.

Note: The features available within the *GANIT Operations Command & Control Centre* may vary depending on the controller model, firmware version, and the subscribed *GANIT Cloud* service plan.

12.1 Accessing GANIT Industrial Intelligence Platform

The **GANIT Operations Command & Control Centre (O3C)** is accessible through any modern web browser, allowing users to securely monitor and manage their connected **~fluidroid | NEO 2 Pro** controllers from desktops, laptops, tablets, and smartphones without installing dedicated software.

For an enhanced user experience, the GANIT O3C is also available as a **Progressive Web App (PWA)**. The PWA can be installed directly from a supported web browser and provides an app-like experience with faster access, full-screen operation, and convenient home screen or desktop shortcuts.

The GANIT PWA is supported on:

- **Windows** (Microsoft Edge or Google Chrome)
- **Android** smartphones and tablets
- **Apple iPhone and iPad (iOS/iPadOS)** using Safari

The PWA uses the same secure cloud platform and user account as the web portal, ensuring that device information, historical data, alarms, and analytics remain synchronized across all supported devices.

Note: An active internet connection is required to access real-time data and cloud-based features. Some capabilities may vary depending on the user's subscription plan and assigned access permissions.

12.2 GANIT Industrial Intelligence Platform Subscription

The **GANIT Industrial Intelligence Platform** is an **optional subscription-based service** that provides secure remote monitoring, historical data storage, analytics, alarms, and centralized device management through the GANIT Operations Command & Control Centre (O3C).

The **~fluidroid | NEO 2 Pro** is fully functional as a standalone controller and **does not require a cloud subscription** for its normal operation. All local control, protection, sequencing, and commissioning features remain available without cloud connectivity.

To allow users to experience the benefits of remote monitoring, **every new ~fluidroid | NEO 2 Pro includes a complimentary one-year Basic GANIT Cloud Subscription**, starting from the date the controller is **activated**.

The complimentary Basic subscription includes access to essential cloud features such as:

- Remote device monitoring
- Live operating data
- Alarm and fault notifications
- Basic historical data
- Access through the GANIT web portal and Progressive Web App (PWA)

After the complimentary subscription period expires, users may choose to continue using the GANIT Cloud by renewing their subscription. Various subscription plans are available, offering additional features such as extended data retention, advanced analytics, enhanced reporting, and support for larger deployments.

Note: Cloud subscription services are optional. The controller continues to operate normally even if the cloud subscription expires; however, cloud-based features such as remote monitoring, historical data, notifications, and analytics will no longer be available until the subscription is renewed.

NOTES