

# \*fluiDroid NEO HPS CONTROLLER

# Evolving Excellence : Redefining Reliability



# Installation and Operating Instructions

Ver 1.0

Release Date: 04-04-2025



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# 1 Manual Introduction

#### 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.

#### 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



#### 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.



# 2 Identification, service and technical support:

# 2.1 Identification, service and technical support

The system is identified based on the text "~fluiDroid | NEO<sup>™</sup>" as given on the front of the system.

| Indication        | Meaning              |
|-------------------|----------------------|
| ~fluiDroid   NEO™ | Type of Control Unit |

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

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

# 2.2 Supplementary Documentation

Apart from this manual supplementary documentation can be downloaded from <u>www.amsattech.com</u>

Additional documentation available:

- ~fluiDroid | NEO Quick Start Guide
- ~fluiDroid | NEO VFDs Interfacing Handbook
- ~fluiDroid | NEO Installation Guide



# 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 EDC 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, bylaws 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 Hydropneumatic 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:

| ТҮРЕ                              | ~fluiDroid   NEO™        |
|-----------------------------------|--------------------------|
| 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<sup>™</sup> 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<sup>™</sup>, 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<sup>™</sup> ensures equal running hours for each pump of the system, including the back-up pump. The ~fluiDroid<sup>™</sup> 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 dustfree 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 ~fluiDroid | NEO™





### 8.1.2 ALARMS & FAULTS SCREEN OF ~fluiDroid | NEO™

To open the Alarms & Faults screen, touch either the Right or Left edge of the main screen. Also to go back to Main Screen touch either the Right or Left edge of the screen.

#### **EXAMPLE: NORMAL OPERATIONS**



EXAMPLE: NON-NORMAL OPERATION (Dry Run and Low-Pressure Faults present)





# 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<br>Exceeded  |
|              | Spinning Icon – Pump Running on VFD   |
|              | Spinning Icon – Pump Running on DOL   |
|              | <b>System Status Icon</b> – System Operations<br>Normal, No Faults                              |
|              | <b>System Status Icon</b> – Non Urgent Alarm, System Operations can continue in spite of fault. |
|              | <b>System Status Icon</b> – Urgent Alarm. System Operations cannot continue. System Tripped.    |



|    | <b>System Status Icon</b> – High Pressure Aalrm.<br>Discharge Pressure above set High Pressure<br>Alarm Threshold. System Tripped   |
|----|---|
|    | <b>System Status Icon</b> – Low Pressure Alarm.<br>Discharge Pressure below set Low Pressure<br>Alarm Threshold. System Tripped.  |
|    | <b>System Status Icon</b> – Run Dry Protection<br>Activated. System Tripped. Water not available<br>at intake.  |
| FS | <b>System Discharge Type Icon</b> – Fixed Speed<br>Discharge Type   |
| SV | <b>System Discharge Type Icon</b> – Single VFD<br>Changeover Discharge Type   |
| MV | <b>System Discharge Type Icon</b> – Multi VFD<br>Discharge Type   |
|    | Positive Safety Indicator – This icon blinks<br>every second indicating proper operation of<br>internal control software and also<br>communication between Main Board and<br>Display. |



# 8.2 Connecting to ~fluiDroid | NEO™ Over Wi-Fi

This guide explains how to connect your device to ~fluiDroid | NEO<sup>™</sup> 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<sup>™</sup> Network

- 1. Power On ~fluiDroid | NEO™
  - 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<sup>™</sup> System
  - After a successful Wi-Fi connection, the AMSAT Technologies EzConf<sup>™</sup> system will automatically start on your laptop, smartphone, or tablet.
  - No additional app or software download is required.
- 2. If EzConf<sup>™</sup> Does Not Start Automatically
  - Turn OFF Mobile Data
  - Open a web browser (Chrome, Firefox, Edge, or Safari).
  - In the address bar, type: <u>http://192.168.4.1/portal</u>

| 💿 New Tab                                     | × +                |
|---|--------------------|
| $\leftrightarrow$ $\rightarrow$ C $\triangle$ |                    |
|   | Chrome Address Bar |

• The EzConf<sup>™</sup> 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<sup>™</sup> will revert back to main screen.

#### Troubleshooting

#### EzConf<sup>™</sup> System Does Not Start Automatically

- Ensure that ~fluiDroid | NEO<sup>™</sup> 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<sup>™</sup> is powered on and the Wi-Fi module is active.
- Restart your laptop, smartphone, or tablet and try again.

#### Unable to Access the EzConf<sup>™</sup> 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<sup>™</sup> 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<sup>™</sup> 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<sup>™</sup> Parameter Configuration System



EzConf<sup>™</sup> 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 Explanation of the ~fluiDroid | NEO™ EzConf™ Configuration Screen

This screen is the **home page** of the **~fluiDroid | NEO™ 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).

• **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.
- 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<sup>™</sup> system.
- Provides support contact details:
  - Email: support@amsatedc.com | info@amsatedc.com
  - Website: <u>www.amsatedc.com</u> / <u>www.amsattech.com</u>
  - **Phone:** +91 7020502160

#### Firmware & Hardware Details



- Firmware Version: 2.0.0 (Godavari) Shows the currently installed firmware version.
- Release Date: 20.02.2025 Indicates when this firmware version was released.
- Hardware Compatibility: CRC Compatible Confirms hardware compatibility with CRC-based devices.
- Manufacturing Date: 29.03.2025 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)

#### Usage Notes for the User Manual

- This screen is the default landing page when logging into the EzConf<sup>™</sup> 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 Network Settings (~fluiDroid | NEO<sup>™</sup> EzConf<sup>™</sup>)



Action Button:

- Save Button:
  - Saves the entered SSID and password settings.
  - After clicking **Save**, the device will apply the changes, and users may need to reconnect if the SSID or password is modified.

Customizing AP SSID for Multiple Installations

If multiple **~fluiDroid | NEO**<sup>™</sup> systems are installed in close proximity, changing the AP SSID can help distinguish them.

This screen is part of the **EzConf™** configuration system for **~fluiDroid | NEO™**, specifically under the **Network** settings. It allows users to configure the device's Wi-Fi access point (AP) settings.

#### **Network Settings Section**

This section allows users to configure the Wi-Fi Access Point (AP) settings of the ~fluiDroid | NEO<sup>™</sup> system.

Fields Explained:

• AP SSID: Displays the current Wi-Fi network name (SSID) that the device broadcasts.

◦ In this case, the SSID is ~fluiDroid | NEO.

 $_{\rm O}$  This is the name users will see when connecting their devices via Wi-Fi.

• AP Password:

This field is where the user sets or updates the
 Wi-Fi password for the AP (Access Point).

 $_{\odot}$  The password is hidden for security.



#### **Example Scenario:**

- Suppose there are two **~fluiDroid | NEO™** 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.



# 8.3.3 System Settings (~fluiDroid | NEO<sup>™</sup> EzConf<sup>™</sup>)

|  | S        |
|--|----------|
| Sign in to ~fluiDroid   NEO                                    | 1.       |
| ~fluiDroid   NEO™ EzConf™ AMSAT <sup>®</sup> EDC               | •        |
| Home Network System Pressure Timmers                           | tr       |
| System Settings  | •        |
| Discharge Type: Single VFD Changeover  Maximum Power: 200      |          |
| Pumps on Sensor Fail: 0  |          |
| Pump 1:     Enabled     ~       Pump 2:     Enabled     ~      |          |
| Pump 3: Enabled ~<br>Pump 4: Enabled ~                         | C        |
| Sensor Pressure at 4mA: 0 kPa                                  | D        |
| Sensor Pressure at 20mA: 1000 kPa<br>Proportional Constant: 60 | a        |
| Integral Constant: 40  | Z.       |
| Differential Constant: 0                                       | ir<br>pi |
| Save   | •        |
|  | •        |
|  | se       |
|  | 0        |
|  | sim      |

#### System Settings Section

L. Discharge Type:

• A dropdown menu that allows users to select the **type of discharge control**.

- The options for **Discharge Type** are as follows:
- b Fixed Speed
- o Single VFD Changeover
- o Multi-VFD

The current selection, "Single VFD
 Changeover", indicates that a Variable Frequency
 Drive (VFD) is used to control motor speed, with
 automatic switching when needed.

#### 2. 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 × 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.

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

- Pump 1: Enabled
- Pump 2: Enabled
- Pump 3: Enabled
- Pump 4: Enabled

#### **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.



#### **Action Button**

- Save Button:
  - Saves the entered settings and applies them to the system.
  - Changes will take effect immediately.
  - Ensure to Save settings before switching to a different tab.

#### **Important Notes**

**V** 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.)



### 8.3.4 Pressure Settings (~fluiDroid | NEO<sup>™</sup> EzConf<sup>™</sup>)

| Sign in t | to ~fluiDroid  | d   NEO             |          | :          |
|-----------|----------------|---------------------|----------|------------|
| ~fluiDr   | oid   NEO™     | EzConf <sup>®</sup> | 4        | AMSAT® EDC |
| Home      | Network        | System              | Pressure | e Timmers  |
|           |                |                     |          |            |
| Pressu    | re Settings    |                     |          |            |
|           | Maximum S      | Setpoint: 80        | ) kPa    |            |
|           | S              | Setpoint: 50        | ) kPa    |            |
|           | Bai            | ndwidth: 10         | kPa      |            |
|           | Ну             | sterisis: 50        | kPa      |            |
|           | Accumulation P | ressure: 30         | kPa      |            |
|           |                | Save                |          |            |

This screen allows users to configure pressurerelated parameters for the **~fluiDroid | NEO™** 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 b.



# 8.3.5 Timer Settings (~fluiDroid | NEO<sup>™</sup> EzConf<sup>™</sup>)

| Sign in t | to ~fluiDroi                              | d   NEO                        | 0        | :                            |
|-----------|---|--------------------------------|----------|------------------------------|
| connectiv | itycheck.qsta<br>o <mark>id</mark>   NEO™ | tic.com<br>EzConf <sup>™</sup> |          | •<br>AMSAT® <mark>EDC</mark> |
| Home      | Network                                   | System                         | Pressure | Timmers                      |
| Alarms    |   |                                |          |                              |
| Timme     | Settings                                  |                                |          |                              |
|           | Minimum                                   | Runtime: 10                    | secs     |                              |
|           | Maximum                                   | Runtime: 8                     | Hrs 0    | mins                         |
|           | Sta                                       | art Delay: 10                  | secs     |                              |
|           | St  | op Delay: 10                   | secs     |                              |
|           | Optimum S                                 | tarts/Hr: 10                   |          |                              |
|           | No Fl                                     | ow Time: 20                    | secs     |                              |
|           |   | Save                           |          |                              |
|           |   |                                |          |                              |
|           |   |                                |          |                              |
|           |   |                                |          |                              |
|           |   |                                |          |                              |
|           |   |                                |          |                              |
|           |   |                                |          |                              |
|           |   |                                |          |                              |
|           |   |                                |          |                              |
|           |   |                                |          |                              |

This screen allows users to configure the timing settings for pump operations in the **~fluiDroid** | **NEO™** 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.



### 8.3.6 Alarm Configuration (~fluiDroid | NEO<sup>™</sup> EzConf<sup>™</sup>)

This screen allows users to configure the alarm settings for the **~fluiDroid | NEO™** 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.



### 8.3.7 Advanced Configuration (~fluiDroid | NEO<sup>™</sup> EzConf<sup>™</sup>)

| ~fluiDro                                  | id ∣ NEO <sup>™</sup> I         | EzConf                | 4                    | A               | MSAT® E                        |
|---|---------------------------------|-----------------------|----------------------|-----------------|--------------------------------|
| Home                                      | Network                         | System                | Pres                 | sure            | Timmers                        |
| Alarms                                    | Advanced                        | Firmwa                | are Upd              |                 |                                |
|   |                                 |                       |                      |                 |                                |
| Advanced Configura<br>Second Pump Control |                                 | ation                 | no Dolay             |                 |                                |
| Strategy:                                 |                                 |                       | le Delay             |                 | v                              |
| Secondary                                 | Cut In Pressure                 | 50                    | kPa                  |                 |                                |
| System Auto Tune:                         |                                 | Minimum<br>be tuned f | Frequent<br>Manually | → (<br>cy Of VF | If Disabled,<br>D will have to |
|   | Alarm Buzzer                    | Ena                   | abled                | ~               |                                |
| Au  | to Reset on Low<br>Pressure     | Ena                   | abled                | ~               |                                |
| Au  | to Reset on RDP:                | Ena                   | abled                | ~               |                                |
| Auto R                                    | eset on VFD Fail                | Ena                   | abled                | ~               |                                |
| 4-20mA                                    | Output Channel<br>Configuration |                       |                      |                 |                                |
| 4-20mA Channel 1 Max:                     |                                 | 300                   | (min-3               | 00 max          | 640)                           |
| 4-20mA Channel 2 Max:                     |                                 | 300                   | (min-30              | 0 max-6         | 40)                            |
| 4-20mA                                    | Channel 3 Max                   | 300                   | (min-30              | 0 max-6         | 40)                            |
| 4-20mA                                    | Channel 4 Max                   | 300                   | (min-30              | 0 max-6         | 40)                            |
|   | Factory Reset                   | t                     |                      |                 |                                |
|   | Factory Reset                   | Dis                   | abled                |                 | ~                              |
|   |                                 | Cours                 |                      |                 |                                |

This screen allows users to fine-tune advanced settings for the **~fluiDroid | NEO™** 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 Tunning 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.



# 8.3.8 Firmware Update (~fluiDroid | NEO<sup>™</sup> EzConf<sup>™</sup>)

| Sign in t   | o ~fluiDroid  | H NEO             | 4         |                        |
|-------------|---------------|-------------------|-----------|------------------------|
| connectivi  | tycheck.qstat | ic.com<br>EzConf™ |           | AMSAT <sup>®</sup> EDC |
|             |               |                   |           |                        |
| Home        |               | System            |           | Timmers                |
| Alarms      | Advanced      | Firmwar           | re Update |                        |
| Firmwar     | e Update      |                   |           |                        |
| Choose file | e             |                   |           |                        |
| Update      | e             |                   |           |                        |
|             |               |                   |           |                        |
|             |               |                   |           |                        |
|             |               |                   |           |                        |
|             |               |                   |           |                        |
|             |               |                   |           |                        |
|             |               |                   |           |                        |
|             |               |                   |           |                        |

The **Firmware Update** screen allows users to update the system's firmware to the latest version provided by AMSAT Technologies. Firmware updates improve system performance, fix bugs, and add new features.

Steps to Update the Firmware:

1. **Obtain the latest firmware file** from AMSAT Technologies to ensure compatibility.

2. Click on **"Choose file..."** and select the firmware file from your device.

3. Click the **"Update"** button to begin the update process.

4. A **progress bar** will appear, indicating the firmware update progress.

5. Once the update is complete, the system will **restart automatically**.

How to Check the Updated Firmware Version:

• After the system restarts, navigate to the main screen of EzConf to view the updated firmware version and release date.

A Important Note:

- Always ensure you are using the correct and most up-to-date firmware file to prevent compatibility issues.
- Check hardware compatibility with AMSAT Technologies before proceeding with the update.
- For updating firmware, always do it using EzConf system in one of the listed browsers using the link http://192.168.4.1/portal.



# 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)





# 9.1.5 Example Connection to Pressure Transducer/Transmitter



# 9.1.6 Example for Connecting Trip Inputs





# 10 Panel Build In Diagram:



**~fluiDroid | NEO**<sup>™</sup> Panel Mounting Drawing:

All Dimension in mm.



11 Electrical Connections



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