Installation & Operation Manual

Equipment name: VPM4300 Series Acquisition & Display Module

Application : Flood Detection Systems with BLS9200/R switch input signals

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Table of Contents

Introduction 4
System options 5
Boot up 5
Mechanical Installation 5
Electrical Installation 6
Cable Types 6
Using the Display 7
Normal Operation 7
Normal operation Screen 8
Your Account 8
About 8
Sign out 8
Display Mode 8
System Status Indicators and Error / Alarm viewing 9
Alarm Enable / Disable 10
Display Screen Options 10
Menu Toggle 11
User Mode Menu 11
Alarms 12
Alarms - Active 12
Alarms- History 12
Alarms Config 13
Configuration / Service Mode 14
Service Portal 14
View Channel Data 16
View System Data 17
View Alarms 18
Sensor Fitting Height 20
System Input Offsets 20
Configuration 20
Configure Alarms 21
Configure Alarm Outputs 22
Configure Date & Time 24
Configuration Backup & Restore 24
Internal Backup & Restore System 25
USB Backup and Restore 26
USB Backup 26
USB Configuration Restore 27
Device USB Update 27
Diagnostics (Service Portal Main Menu) 28
Perform Internal Backup 28

Manual APT Pressure Calibration 29
APT Network Test 29
APT Sensor Information 29
APT Pressure Offset 29
Replace APT Sensor 29
Restart Device 29
Optional Modbus Output 30
ANNEX 1 – User Access Levels 30
Factory Set Passwords 30

Introduction

The PSM VPM 4300 Series is a complete family of data acquisition, signal processing and alarm reporting / display systems for different applications including Tank Gauging, Draught and Trim & Heel monitoring, and flood detection systems. These functions may be combined into a single display solution with one or more repeater displays or a system may be dedicated to a single function.

This manual specifically covers systems which have been delivered for the application of flood detection and alarm reporting, where PSM BLS9200/R switches are providing the input signal.

The overall system can be considered to have three components:

1) Hardware – the Central VPM4300 display acts as an acquisition module connecting to external measurement sensors via a serial RS485 interface. The exchange protocol with these external devices is Modbus RTU where the VPM is Modbus Master and interrogates the slave devices connected on the serial network, each of which will have its own unique Modbus ident number.

   PSM BLS9200/R Switches. These switches provide status values. An interface module is fitted between the switches and the VPM which interprets the switch signal and then converts it to a Modbus value for the VPM to read.
   Depending on the project requirements different types of input modules may be employed and will be detailed in the specific project documentation pack.
   The interface modules are multichannel input devices meaning several switches are connected to a single module. The BLS9200/R itself is fitted with internal resistors which are switched in or out according to the switch status. The interface modules supply the switches with an excitation voltage and monitor the loop current which will approximate to 4 mA for a clear status and 20mA for an Alarm active status.
   This method also allows 2 further states to be identified from the switch – an open circuit means no current flow and indicates a cable break or switch failure, and a short circuit will indicate a cable short or switch damage.

   Where some, or all of the flood detection points are in a Hazardous Area, the hardware will also include Safety Barriers to provide Intrinsic Safety compliance to the applicable standard. The VPM display and any associated Safety Barriers must be located in the Safe Area. Other system components such as mounting brackets and termination enclosures will be detailed in the project documentation pack.

2) Firmware - PSM's "Connect" operating firmware is used on all systems. This firmware embeds the core functionality of all of the different applications the VPM may be set up for.

3) Configuration – This is the term used for the specific parameters that are entered during manufacture to set the system up for a specific application. This will include the number and type of input channels, port settings, channel names, groups, screen presentation, etc. This will have been defined during the project engineering stage such that the system will normally be delivered fully configured for its intended application. The configuration is save in non-volatile onboard memory and a secondary micro SD card mounted to the mainboard is used to store a full backup. Note that it is possible to amend the configuration should changes be required. This will require either PSM attendance where the system is put into Engineering mode, or, more usually, an updated configuration file provided by PSM which the user may install via the systems USB port. Details of how this is done are covered in this manual.

This manual covers general installation considerations and both normal operation and service modes. For full details of a specific system refer to the documentation / drawing pack provided as part of the supply scope.

The VPM has an integral 7" touchscreen display where the information is presented. Two or more VPM units may be interconnected via a dedicated Ethernet network where they can share data from their directly connected inputs, meaning each VPM is able to display all monitored signals, or, if required, only those of relevance to a particular display location.

The VPM can also provide a Modbus output via a separate RS485 port. This output consists of a range of Modbus registers which is constructed to suit the specific project and will include current status of all input signals.
In this case the VPM acts as Modbus slave, with the receiving system AMS, IPMS, etc being the Modbus master. The project documentation pack will contain details of the specific Modbus map if applicable.

The VPM can also be equipped with a relay card. This card provides 4 discrete relay outputs with changeover contacts. These are generally used to trigger local or remote annunciators.

In normal operation the VPM continually interrogates each of the inputs on its own directly connected RS485 network using their unique ident number to read the current status. This interrogation is repeated in sequence such that the VPM holds a continually updated register of all inputs.

In a system with more than one VPM each unit then shares this data via their ethernet connection.

System options

Where a larger display is required for specific applications there are two options. VPM Remote and direct connection to a PC.
Both options connect to the VPM via the Ethernet network with the VPM (or VPM's if multiple units are connected) acting as a Server and the VPM Remote or PC acting as a client.
VPM Remote consists of a small cabinet housing a single board computer and may also contain the ethernet network switch depending on the specific system arrangement, and has HDMI and USB outputs to a connected touchscreen display.
Display of the tank gauging data is via an internet browser window, which in the case of the VPM Remote is opened in Kiosk mode. For the PC, the I.P. address of the VPM is entered to access the display.
Both options allow screen layouts and selection to be made independent of the VPM screen, i.e., each can show a different screen.

The additional size of the Remote / PC screen also allows further information and options to be displayed compared to the VPM where the layout is automatically optimised for its 7" touchscreen.

Boot up

The VPM is factory set to automatically power up when power is applied. Depending on how the system has been configured it will either automatically log in to user mode and a preselected display screen will be displayed (Auto Login) , or a log in screen will be displayed requiring the user to input the appropriate password (Password Login).
For Password Login the specific password for the required access must be entered. These are either "User" which is the normal operational mode, or "Service" which allows access to further diagnostic and service functionality.
Annex 1 of this manual lists the factory assigned passwords for these two operational modes.
As stated previously, the system will have been delivered with configuration data specific to the application and so these two modes, will provide access to all functionality needed for operation.

Mechanical Installation

With respect to Intrinsic Safety the VPM **MUST** be installed in a designated Safe Area as **MUST** the any Safety Barrier for the system.

Depending on the requirements for a specific project the VPM may either be supplied as a panel mount unit or supplied fitted in a wall mount steel cabinet suitable for direct bulkhead mounting where the VPM itself is mounted to the door of this cabinet.
When supplied in a wall mount cabinet this may also include a power supply module accepting

110/240 V AC single phase and providing a 24V DC output as required by the VPM, and other components such as signal isolators and network switches. Reference to the specific project drawings will provide details.

For panel mounting units refer to the project drawing pack for details of the panel cutout required. Similarly, the drawing pack will provide details of the mounting brackets and required fixing points.

In general, the unit should be located away from extremes of temperature and vibration and in a position where the display is readily viewable.
For wall mounted units, the location should allow for the side hinged door to be fully opened and latched to facilitate access to the internal terminals for electrical installation, and to the rear of the door mounted unit for access to the internal plugs.

Electrical Installation

The VPM requires 24V DC for operation. There is provision for two separate power sources to be connected i.e., primary and back-up. Provision of power will depend on the specific installation but for panel mounted units this may be from the installations own 24V Instrument supply with back up from the emergency 24V DC supply, and for wall mounted units which include a power supply module, from the installations own single phase supply plus the emergency 24V DC.
These aspects will have been discussed and agreed during the manufacturing phase of the equipment and detailed in the project documentation pack.

Hazard: for wall mounted units ensure that the AC power supply to the VPM is isolated at the distribution point before attempting to connect or make any changes to internal wiring of the unit.

For wall mounted units all internal connections between the plugs on the rear of the VPM and the field terminations are completed during manufacture. All external connections from the Sensor networks, the Ships Supply and any serial or VFCC outputs should be made to the provided terminals.
The base of the wall mount cabinet will have a removable gland plate to allow glands to be fitted by the installer of a size suitable for the cabling being used
All cabling should be identified with permanent markings in accordance with normal practice.

Cable Types

Suitable system interconnection cables are to be supplied by the Shipyard.

RS485 / 24V DC network Supply: A 4 core (2 x twisted pair) cable is required for this. One pair for DC power and one for the RS485 communication network This cable connects from the VPM to the RFM-ISR / RFM-12VDC then on to entire network. The cable must have an overall braided screen with a minimum of 95% coverage. It is essential that correct polarity is maintained throughout the entire network, i.e. positive and negative conductors for the DC power, and A & B conductors for the RS485 network.

Supply cable: Dependent upon power source.

RS485 output: 2 core twisted pair with overall braided screen.

VFCC relay output (where fitted): 2 or 3 core cable depending on how relay is to be used, i.e., 1 core for Common and 1 core for either or both normally closed / normally open contacts.

Using the Display

The 7” capacitive colour screen of the VPM is touch sensitive and can be operated by normal finger pressure. Where required the display has scroll bars for both vertical and horizontal movement of the displayed area. Alternatively, a single finger can be used to swipe vertically and horizontally.

Normal Operation

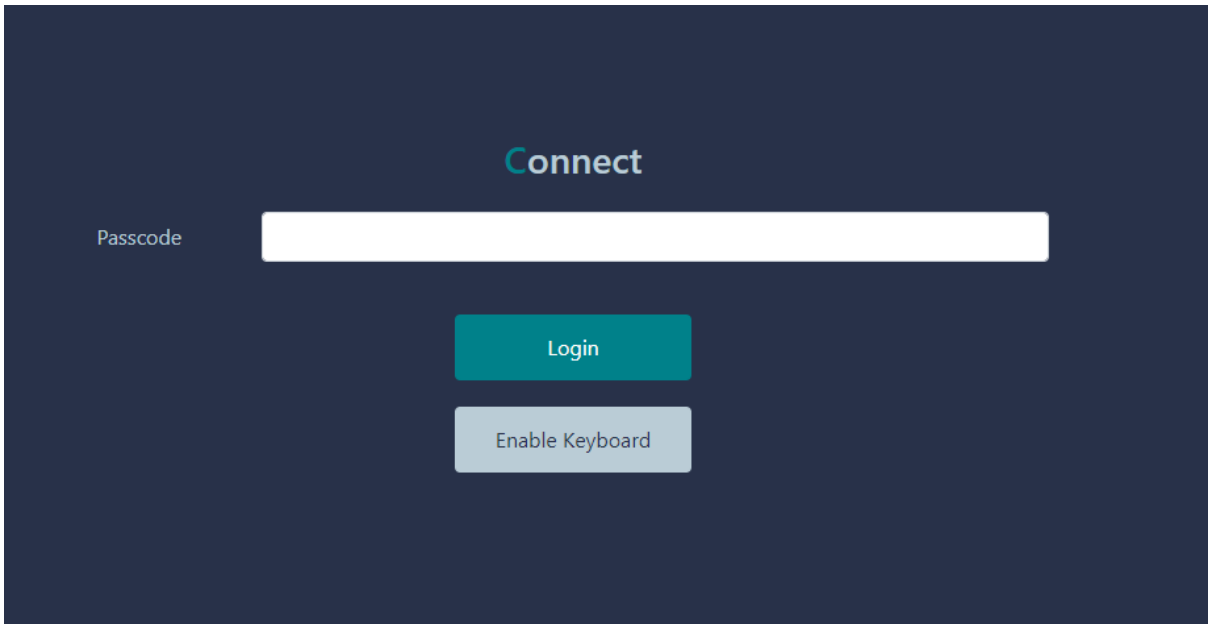
As stated in the introduction, the VPM is supplied fully factory configured with screen display layouts and all fixed parameters relating to the monitored inputs,
Therefore, following mechanical and electrical installation it should be ready for operation.

NOTE: the screen representations used throughout this manual are indicative of the type of display provided for each page. The content and information displayed will be different for specific projects.

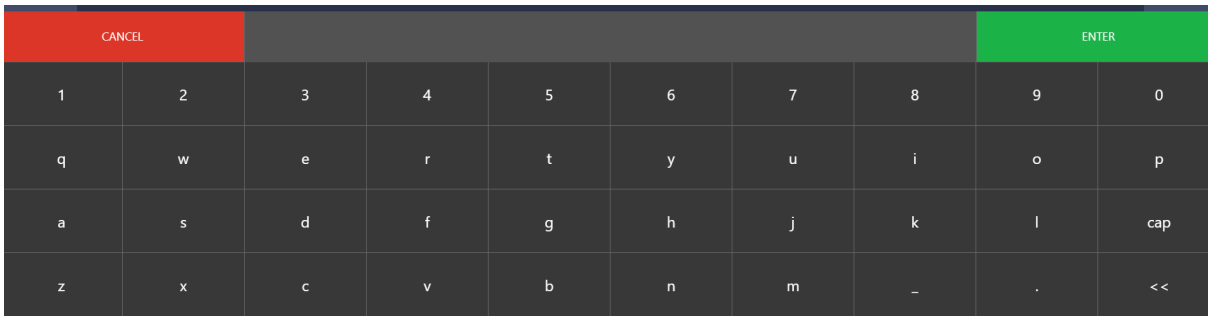
NOTE: The screen representations have been reformatted where appropriate to expand specific areas to ensure clarity of illustration. The actual equipment display may be slightly different in some cases.

Once the display has finished its power up sequence and where Auto login has been enabled in the configuration the unit will boot directly to a preselected display page.

Otherwise, the login screen will be presented.



Tapping in the text entry field will bring up an overlay keypad.



Key in the relevant password (refer to Annex 1) press enter and then Login from the main screen.

Normal operation Screen

The normal operation screen has a number of buttons from which different information can be displayed:

Your Account

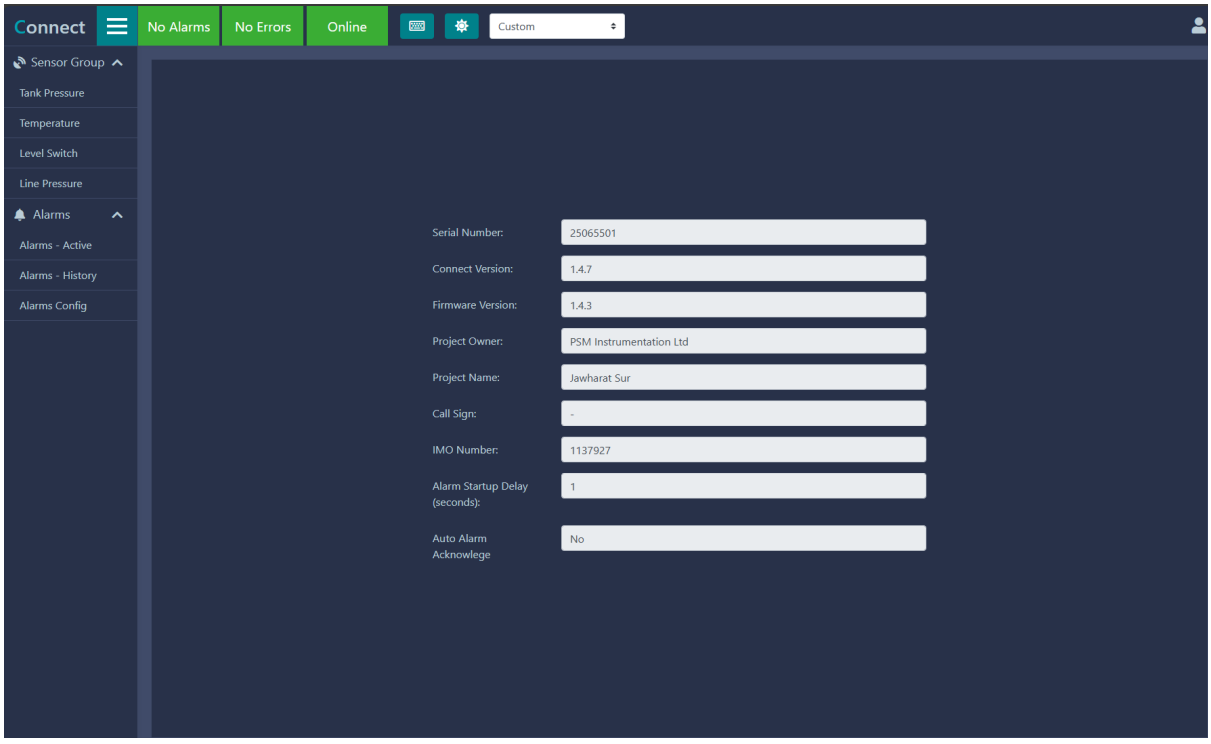


This provides the following options:

About



About - brings up an information screen similar to the typical screen below:



Select another menu option to exit this screen.

Sign out



Sign Out will end the current session and return to the initial login screen.

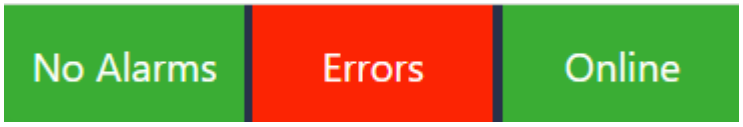
Display Mode

This button switches the display screen between light mode (daytime) and dark mode (nighttime).

 This is shown when the display is in light mode.

 This is shown when the display is in Dark Mode

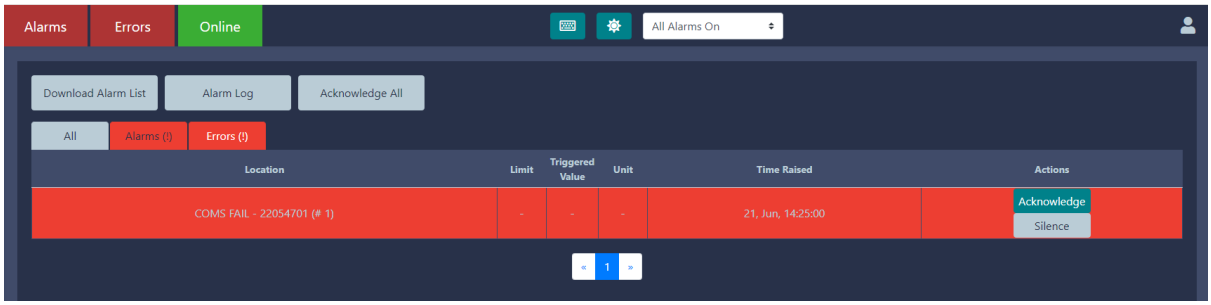
System Status Indicators and Error / Alarm viewing



These are displayed at the top of the VPM display and are present for all display screens

Online: When “Online” with a green background is displayed this indicates that the VPM is in normal operation and sending data requests to the sensor network.
If status changes to “Offline” on a red background this indicates an error in that the system has stopped communication to the sensor network.
To clarify further, this status indicator relates only to the display itself, it is not an indication of network health.
When Online the Display will continue to interrogate the input network even where there may be a fault on, or disconnection of the network. Where the display fails to receive data from one or more sensors this is indicated in the errors indicator as detailed below.

Errors: When showing “No Errors” with a green background this indicates that the display is receiving data from all inputs that it has been configured to interrogate. If the status changes to “Errors” on a flashing red background this indicates that there has been a communication loss with one or more connected input. When this status indicator changes to red it will become an active button.
Tapping on this button will open a screen which provides an overview of all active alarms and errors.

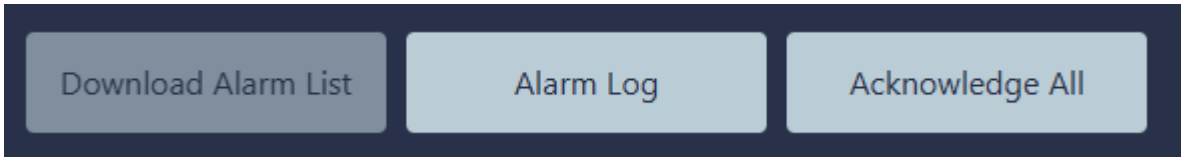


From this screen there are 3 tabs which allow viewing of active alarms, active errors, or All. These tabs will also flash red where there are active conditions.
To view the active errors, select the Errors tab and a screen similar to the above will be displayed.
Form this screen it is possible to acknowledge a specific error using the button in the “Actions” column, or to use the “Acknowledge All” button to acknowledge all active errors.
When an error is acknowledged its status in the Actions tab will change to “Acknowledged” and the red highlight on the alarm row will revert to normal operational colour. Note that while the error is still actually present, i.e., the communication with the sensor is not restored, the Error tab will continue to flash red, and the Error Status indicator will remain solid red.
When the issue is resolved (communication with the affected sensor is restored), The Error Status indicator will revert to green and show “No Errors” and the error record will be removed from the active error list to the History page. This is detailed later in this manual.

Alarms: This status indicator is used to indicate if there are any active alarms. When shown in green with “No Alarms” indicated there are no alarms present, and flashing red with “Alarms” shown indicates that there are alarms present.
Navigation of the alarm display and acknowledge functions are as described above for “Errors”.
A flashing red status indicator becomes an active button which when pressed will bring up the detailed Alarm / Error display page.
Selecting the alarm tab will show all active alarms which may be acknowledged in the same way as errors. All unacknowledged alarm rows will be shown flashing red and can be acknowledged individually or the “Acknowledge All” button used. Acknowledged alarms will remain in the list shown as acknowledged for as long as the alarm condition remains.
Once the alarm condition clears the record will be removed from the active list and to the History page located in the sidebar menu.

The “Silence” option in the Actions column enables the silencing of local audible alarms if fitted.

Note: there are two further buttons in the above screen shot of the Alarm / Error Status page:

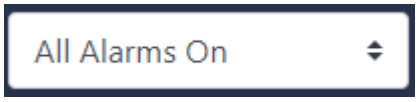


Due to screen optimisation for the 7” VPM display these buttons will not be present on the VPM itself, and are only available where the system has a VPM Remote repeater display included or a laptop is connected to the system.

Download Alarm List enables a CSV file to be downloaded the laptop does this work??
Alarm Log shows the historical Alarms or Errors that have now cleared. This is the same as the History display as detailed later in this manual.
Acknowledge All allows all active Alarms / Errors to be acknowledged in a single action

Alarm Enable / Disable

Using the selection box shown at the top of the screen it is possible to enable or disable all alarms.



In normal operation this should be set to All Alarms On and only switched to All Alarms Off when the Vessel is not in operation or service work is being undertaken such that changes in tank levels will not cause alarms to trigger.
Note: depending on the configuration settings and the level of password access, the option to turn off all alarms may be disabled while in the normal operation mode.
Note: For some systems alternative Alarm Modes may have been enabled, for example, Seagoing, Bunkering, Tank Cleaning. These will have been set during initial system configuration relevant to the type of installation the system is monitoring.

Display Screen Options

The available display screens will depend on which user type is logged into the system. The following options will be available in normal operator mode depending on the configuration.

Menu Toggle

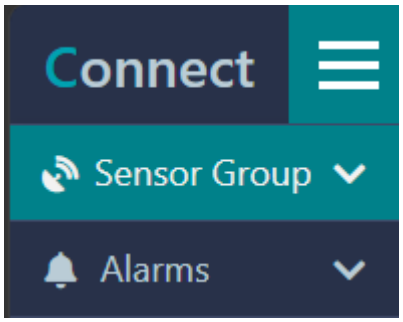


This button shows / hides the main sidebar menu from which the various display pages can be selected, each represented by a symbol. Once the required display screen has been selected this button can be used to hide the menu to provide additional space for the data display.

Note: for clarity of explanation the above illustration shows the function name alongside each symbol. For the 7" VPM screen only the symbols are shown to maximise the available area for information display.

Tap the screen to select a specific display menu page.

User Mode Menu



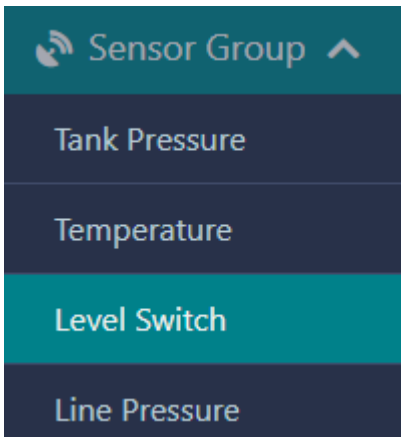
For flood detection systems there are two primary display options:

1) Input signal status
2) Alarm status.

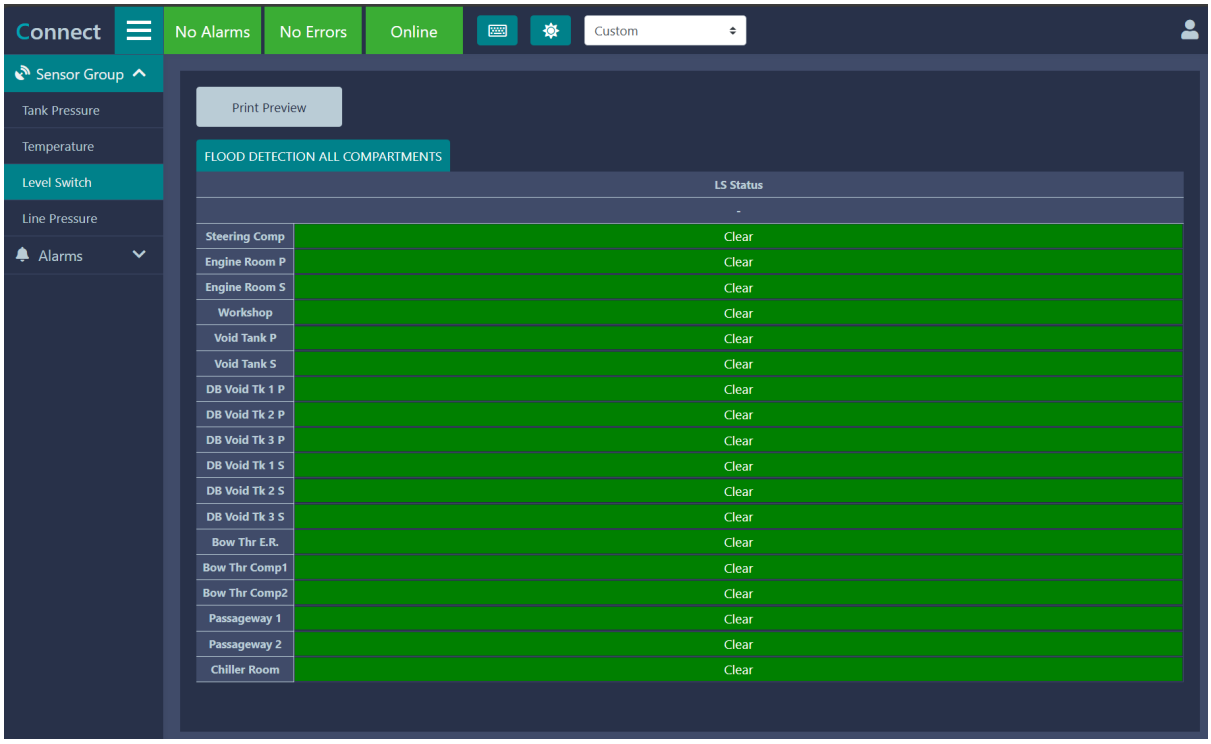
The input signal status is selected under the Sensor Group Menu.



For Flood Detection systems based on BLS9200/R switch type inputs the option "Level switch" should be selected



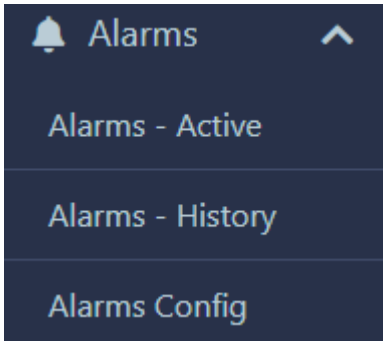
The display will show current status of all input signals as the following example



Alarms



Leads to a menu list



Alarms - Active

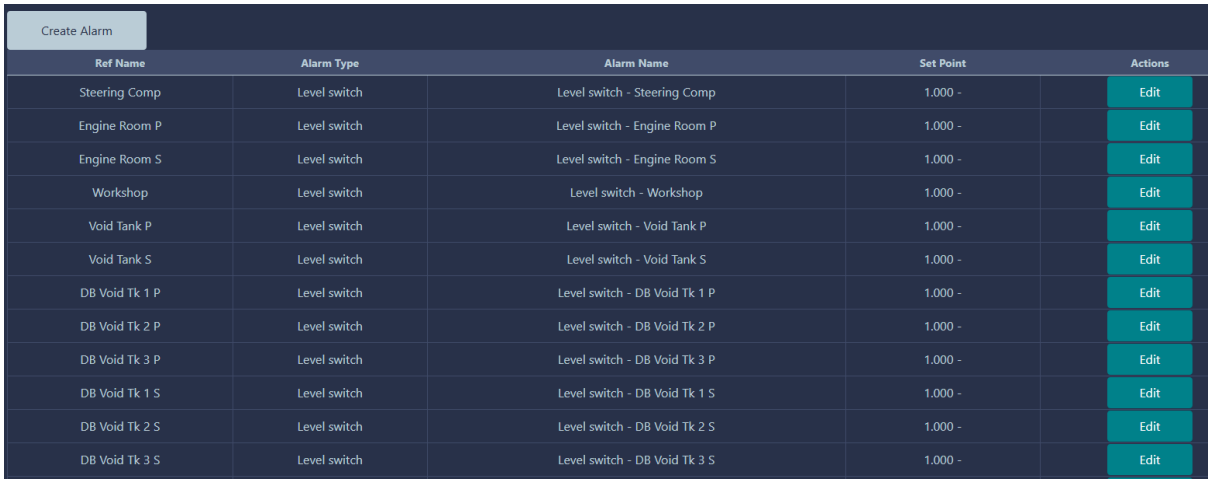
Directly accesses a display page which shows all active alarms. This is the same page as detailed earlier under System Status Indicators and Error / Alarm viewing but allows the page to be accessed directly whereas the top bar buttons only become active if there is an alarm or error active.

Alarms- History

Displays a list of all historical alarms / errors which have been acknowledged / cleared.

Alarms Config

This page provides a complete list of all alarms the system is configured with.



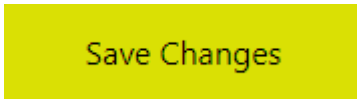
By pressing the edit button, it is possible to delete or change the current alarm settings.



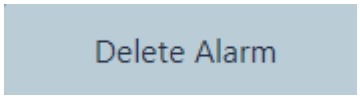
Alarm Type for a flood detection system using the BLS9200/R the Alarm Type must be selected as [Lev Switch] Level switch.
Reference Object is the tank the alarm relates to.
Name is the name that will appear in the alarm list.
Extra Details (optional) an optional text description for the alarm can be added.
Set Point (Active=1.0, Inactive=0.0)
Set Point Direction Use Make on Rise for a high-level Alarm and Make on Fall for a Low-level Alarm.
Trigger Delay (ms) the delay in milliseconds before the alarm is considered valid and acted upon.
Hysteresis Set Point (Volume %) this is the differential setting between the alarm active point and the level at which is resets. For a high-level alarm this setting should be below the alarm set point and for a low-level alarm it should be above the alarm set point.

Hysteresis timer (seconds) the time in seconds for which the level must be at, or below for high alarms, or above for low alarms, the hysteresis set point, before the alarm will reset.

Once all changes have been made:

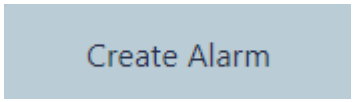


To save the changes made and return to the alarm list.



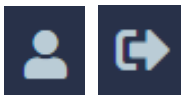
Deletes the alarm and returns to the alarm list.

At the top of the Alarms Config page there is a further button which allows creation of new alarms.

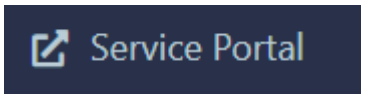


Configuration / Service Mode

This mode of operation is used when commissioning the system or performing any service or fault-finding checks.
To enter Service Mode the appropriate password must be used from the sign in screen. Refer to Annex 1 of this manual. If the display is in normal operation mode, first sign out using the Your Account button.



Once signed an additional option will now be presented in the menu bar.

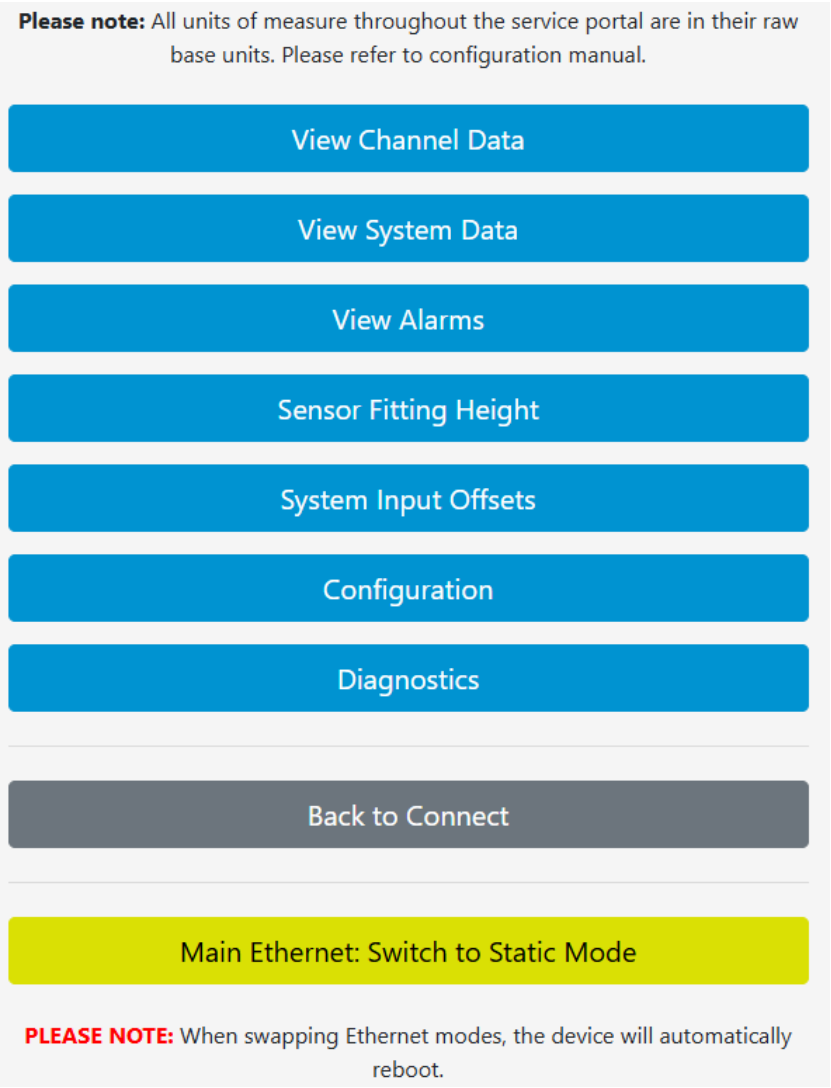


Service Portal

The service portal allows the user to view further information of the system, to check the status of inputs, see their live values, and to inspect and change various configuration settings.
The screens are formatted to provide a complete overview of relevant parameters for all inputs so that simple checks and comparisons can be made.

Note: The service functions detailed in the following pages cover all types of system that the VPM can be configured for. This manual is issued specifically for Flood Detection Systems and so some of the functions will not be applicable. Where a particular function is not applicable it will be noted as such.

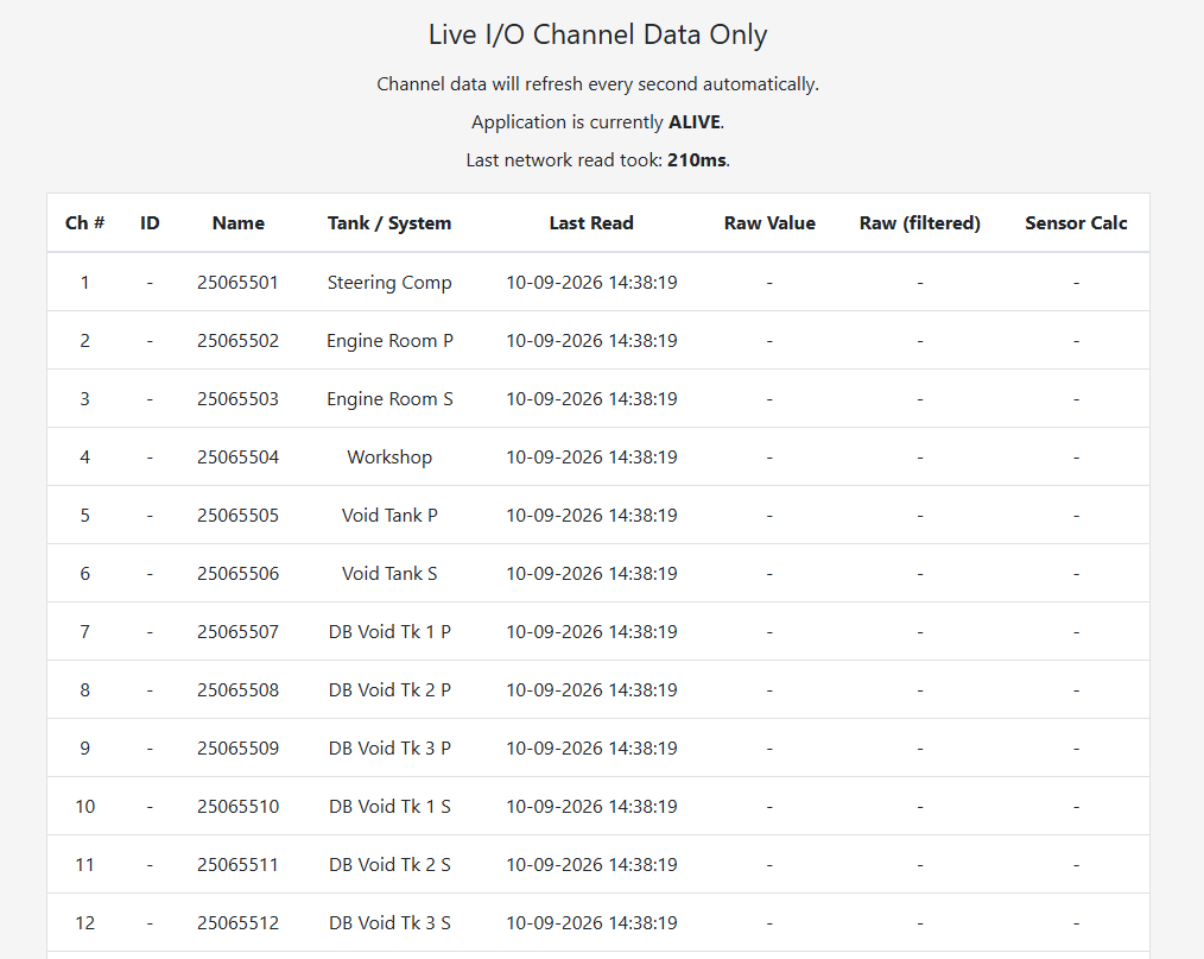
Selecting service portal leads to a further screen:



View Channel Data

View Channel Data

This page provides a live view of the current status of all inputs to the display.



Live I/O Channel Data Only

Channel data will refresh every second automatically.

Application is currently **ALIVE**.

Last network read took: **210ms**.

Ch #	ID	Name	Tank / System	Last Read	Raw Value	Raw (filtered)	Sensor Calc
1	-	25065501	Steering Comp	10-09-2026 14:38:19	-	-	-
2	-	25065502	Engine Room P	10-09-2026 14:38:19	-	-	-
3	-	25065503	Engine Room S	10-09-2026 14:38:19	-	-	-
4	-	25065504	Workshop	10-09-2026 14:38:19	-	-	-
5	-	25065505	Void Tank P	10-09-2026 14:38:19	-	-	-
6	-	25065506	Void Tank S	10-09-2026 14:38:19	-	-	-
7	-	25065507	DB Void Tk 1 P	10-09-2026 14:38:19	-	-	-
8	-	25065508	DB Void Tk 2 P	10-09-2026 14:38:19	-	-	-
9	-	25065509	DB Void Tk 3 P	10-09-2026 14:38:19	-	-	-
10	-	25065510	DB Void Tk 1 S	10-09-2026 14:38:19	-	-	-
11	-	25065511	DB Void Tk 2 S	10-09-2026 14:38:19	-	-	-
12	-	25065512	DB Void Tk 3 S	10-09-2026 14:38:19	-	-	-

Ch# Is the number of the channel.
ID is not used for flood detection systems
Name Is the specific name of the sensor which is connected to the channel.
Tank/System Identifies the specific point that this input is monitoring.
Last Read Time of last reading.
Raw Value Sensor value in mA.
Raw (filtered) Raw value with averaging applied for stabilisation.
Sensor Calc Is the raw and filtered value from the input sensor converted to the base units the system uses, i.e., Metres WG.

Use the button at the bottom of the screen to return to the main menu.

View System Data

View System Data

This page provides a live summary view of all active inputs to the system. For a Flood detection system based on BLS9200/R inputs only the switch input status will be shown.

Level Switch Data

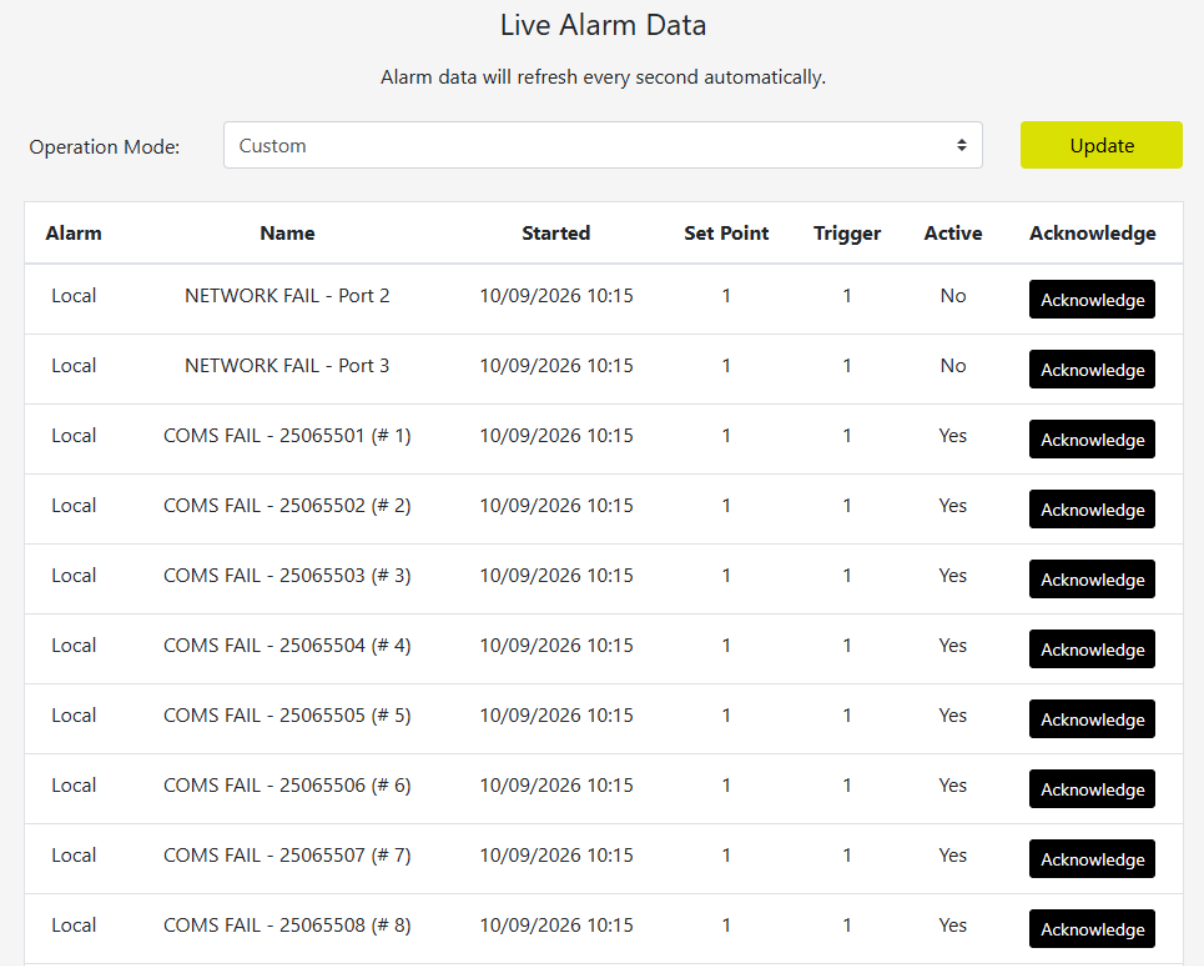
Name	State
Steering Comp	0.00
Engine Room P	0.00
Engine Room S	0.00
Workshop	0.00
Void Tank P	0.00
Void Tank S	0.00
DB Void Tk 1 P	0.00
DB Void Tk 2 P	0.00
DB Void Tk 3 P	0.00
DB Void Tk 1 S	0.00
DB Void Tk 2 S	0.00
DB Void Tk 3 S	0.00
Bow Thr E.R.	0.00

Name Of the input.
State 0.00 = inactive. 1.0 = Active.
Use the button at the bottom of the screen to return to the main menu.

View Alarms

View Alarms

This screen shows a summary live status of all Alarms and / or Errors.



Alarm	Name	Started	Set Point	Trigger	Active	Acknowledge
Local	NETWORK FAIL - Port 2	10/09/2026 10:15	1	1	No	Acknowledge
Local	NETWORK FAIL - Port 3	10/09/2026 10:15	1	1	No	Acknowledge
Local	COMS FAIL - 25065501 (# 1)	10/09/2026 10:15	1	1	Yes	Acknowledge
Local	COMS FAIL - 25065502 (# 2)	10/09/2026 10:15	1	1	Yes	Acknowledge
Local	COMS FAIL - 25065503 (# 3)	10/09/2026 10:15	1	1	Yes	Acknowledge
Local	COMS FAIL - 25065504 (# 4)	10/09/2026 10:15	1	1	Yes	Acknowledge
Local	COMS FAIL - 25065505 (# 5)	10/09/2026 10:15	1	1	Yes	Acknowledge
Local	COMS FAIL - 25065506 (# 6)	10/09/2026 10:15	1	1	Yes	Acknowledge
Local	COMS FAIL - 25065507 (# 7)	10/09/2026 10:15	1	1	Yes	Acknowledge
Local	COMS FAIL - 25065508 (# 8)	10/09/2026 10:15	1	1	Yes	Acknowledge

Alarm Identifies the alarm type.
Name Identifies the tank the alarm is associated with.
Started Shows the time the alarm activated.
Set Point Shows the alarm set point value (1 = Active)
Trigger Shows the delay in seconds before the alarm triggers.
Active Shows if the alarm is currently active (yes) or inactive (no)

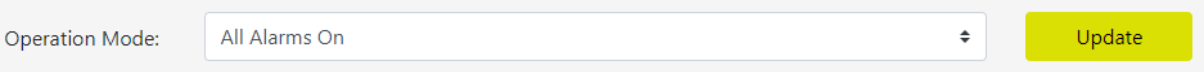
Acknowledge allows the alarm to be acknowledged by pressing the button, unacknowledged alarms will show as

Acknowledge

When the button is pressed to acknowledge this will change to

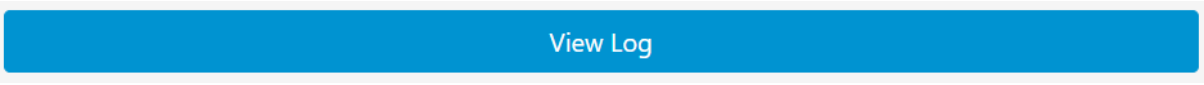
Acknowledged

At the top of the screen there is an option to change the alarm operation mode

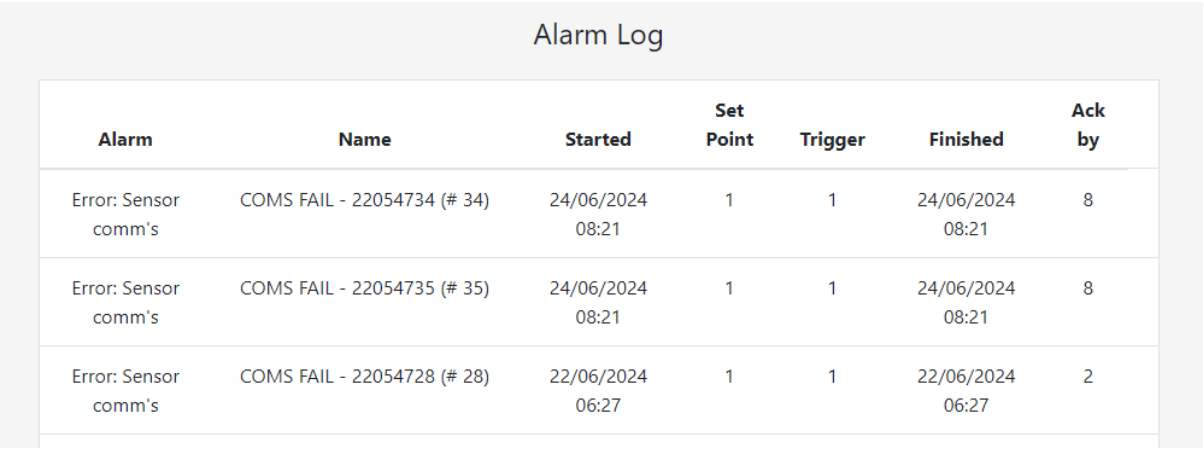


When in service mode it may be helpful to temporarily disable all alarms by updating this to **All Alarms Off.**
Note: before exiting Service Mode ensure that all alarms are re-enabled by changing this to **All Alarms On.**

At the foot of the page there is a further button:



This allows viewing of historical alarms.



Note that this page provides a historical summary of both High / Low tank level alarms and any System Errors that may have occurred.

Alarm Identifies the type of alarm.
Name Identifies which channel or parameter the alarm relates to.
Started Identifies the time the alarm first occurred.
Set Point shows the alarm set point
Trigger Shows the delay in seconds before the alarm triggers.
Finished Identifies the time the alarm was cleared.
Ack by Is the unique user ID of the login that acknowledged the alarm.

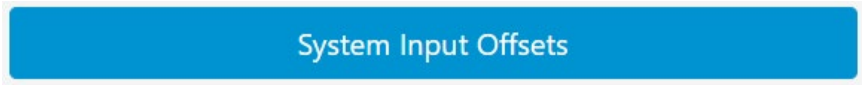
When finished press Live Alarm Data at the foot of the page to return to the previous screen and then Main menu to exit the Alarm display page to the main diagnostic menu.

Sensor Fitting Height



This function is not applicable to flood detection systems – the sensor fitting height should be set to 0 for all inputs.

System Input Offsets

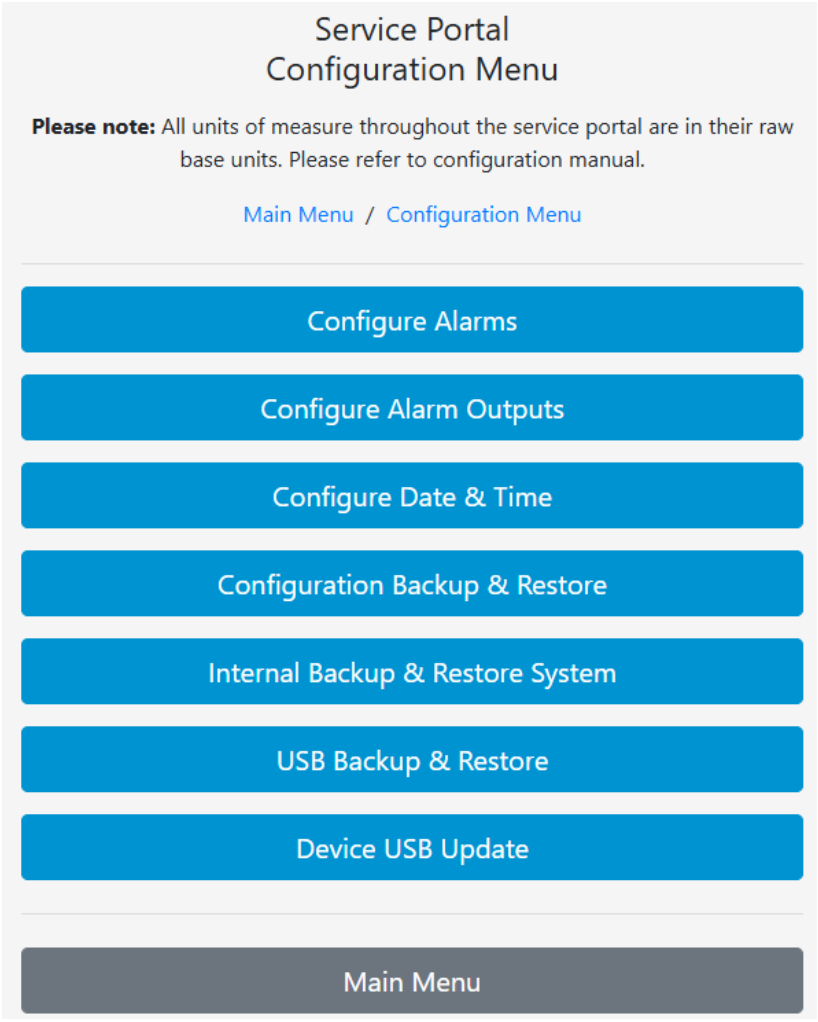


This function is not applicable to flood detection systems and should not be used

Configuration



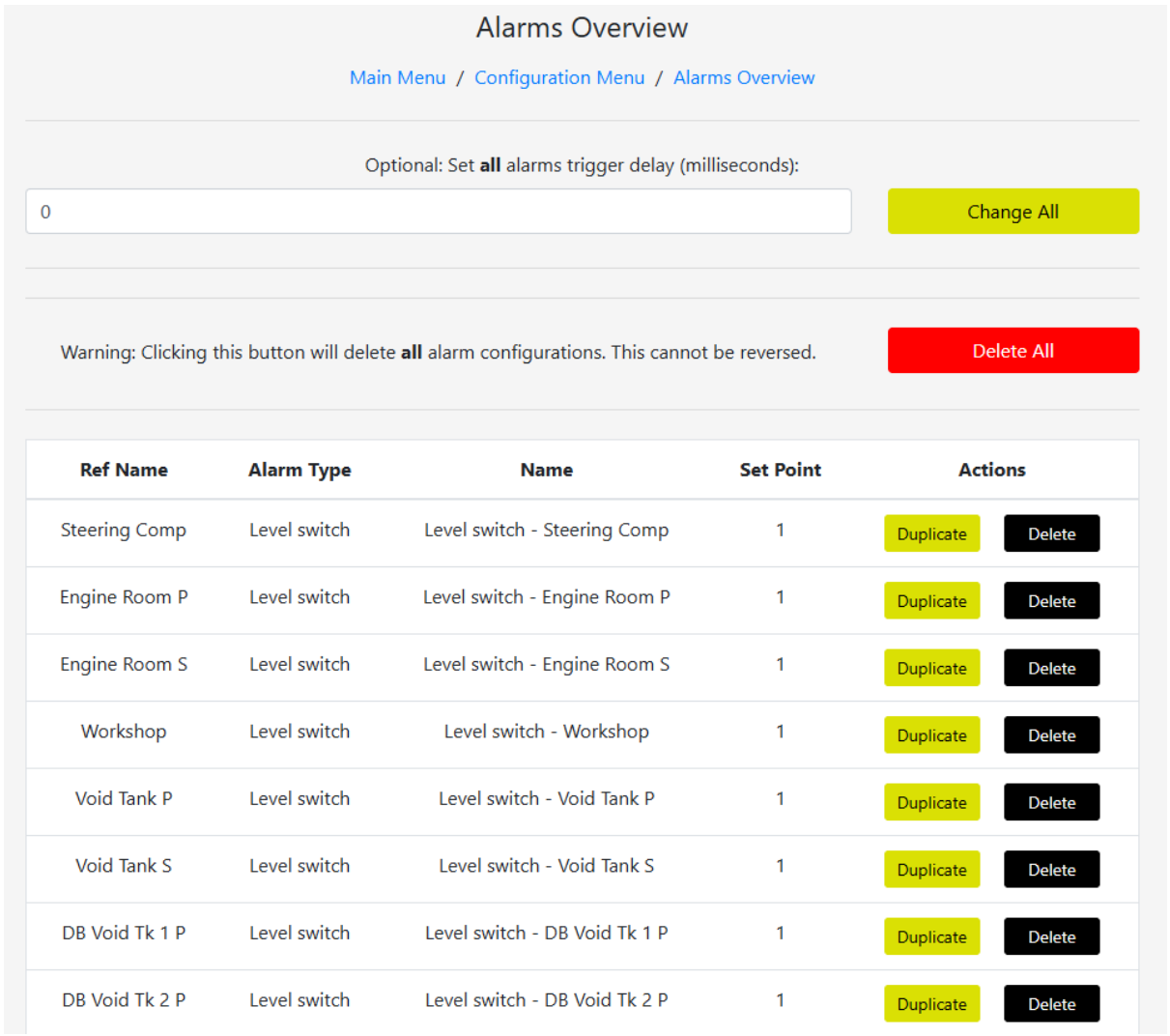
This leads to a further screen:



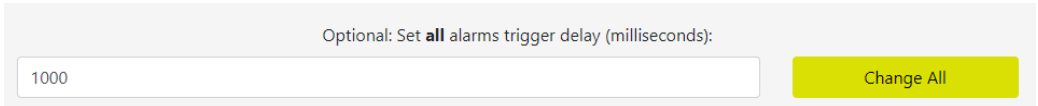
Configure Alarms



This leads to a further screen which shows all alarms the system is configured with.

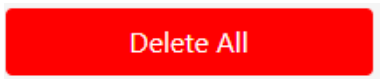


At the top of this screen it is possible to set a global trigger delay in milliseconds. This is applied to all alarms. A delay is suggested to prevent spurious alarms where the liquid level in the tank is in motion.



Enter the required value in milliseconds and then press change all.
Selecting a specific alarm by tapping on it will bring up all details for the alarm which may be edited as detailed in the earlier section Alarms Config.

Below this is an option to “Delete All” this will remove all saved alarm settings.



Alarms can be individually deleted or duplicated.

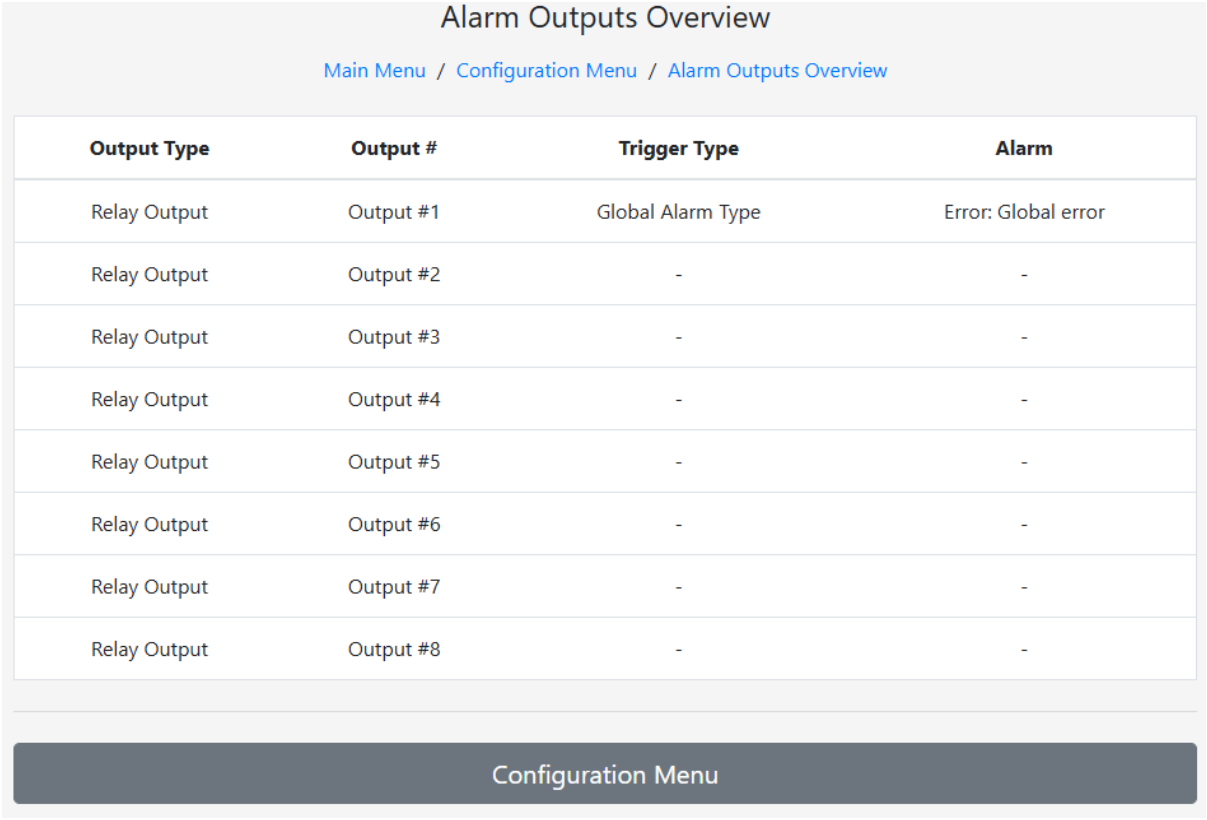


Deleting will remove the alarm completely.
Duplicating adds a copy of the alarm into the list (immediately below the original). By clicking on the new duplicated alarm, it can then be edited as detailed in the earlier section **Alarms Config.**

Configure Alarm Outputs

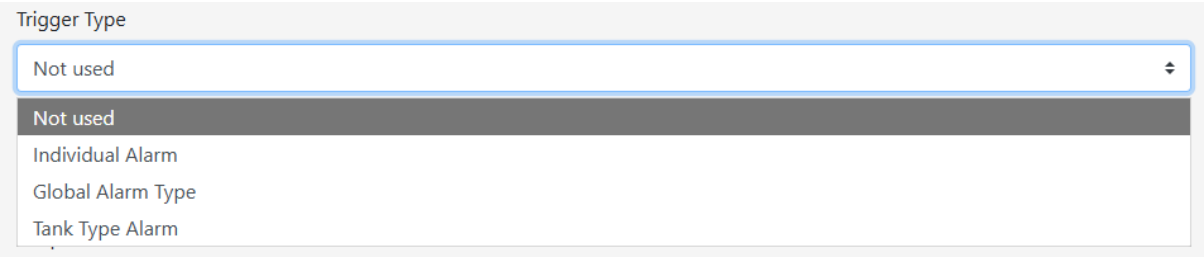


This leads to a further screen:



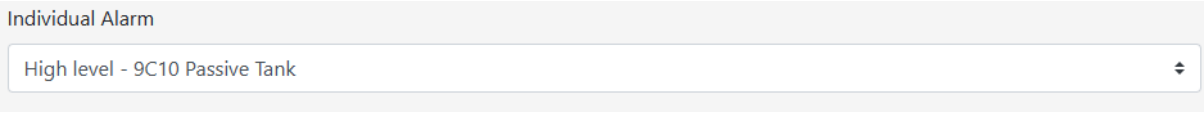
The VPM may be optionally equipped with 2 relay cards. These are plug in modules fitted to the rear of the display. Each module has 4 relays.
Generally these are intended to drive external visual and audible annunciators to alert operators of a common (global) alarm condition, e.g. a high or low alarm active on any tank, or a communications failure to one or more sensors, or a complete network loss of communication.
They may also be assigned to individual tanks that are especially critical.

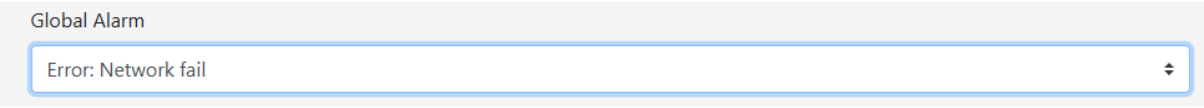
The type of alarm is defined in Trigger Type

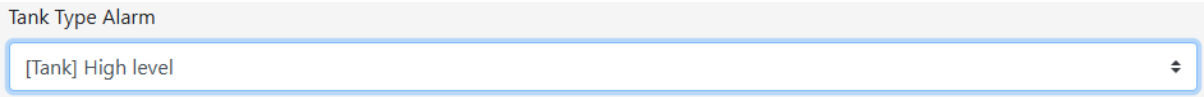


Not used Disabled
Individual Alarm Triggers in response to a specific tank level alarm.
Global Alarm Triggers in response to a common alarm condition from any of the tanks or other conditions such as communications failure or VPM memory backup failure
Tank Type Alarm Triggers in response to a common alarm condition from any of the tanks.

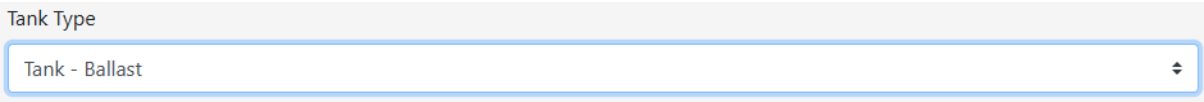
When the appropriate Trigger Type is selected the available options in the next selection field will be updated to allow selection of the actual parameter or condition which triggers the alarm.



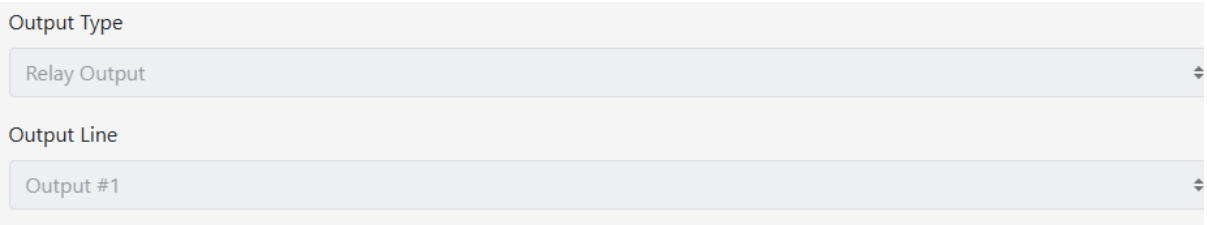




Note that the Tank Type Alarm also allows a specific Tank Type (the Tank group) to be selected

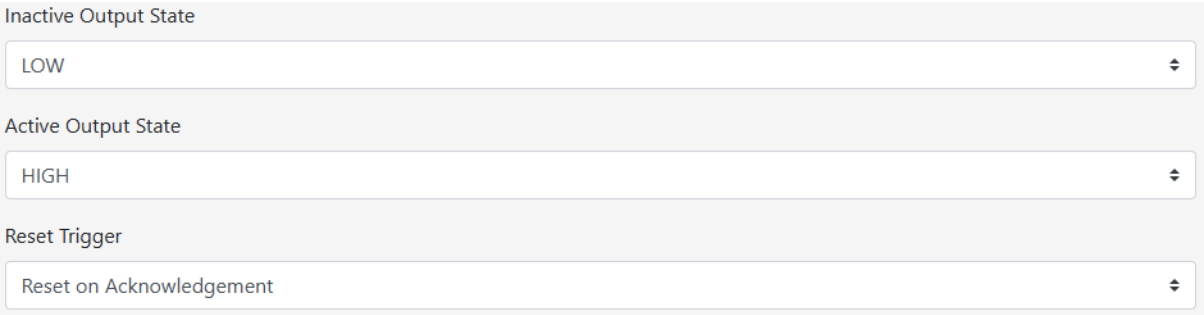


The Output Type and Output Line parameters are pre-selected according to the relay channel which is being configured



The final parameters which may be set define the status of the relay when inactive / active.
For example an Inactive Output State of LOW means the relay is de-energised when no alarm is active and an Active Output State of HIGH means the relay will be energised when the alarm condition is active.

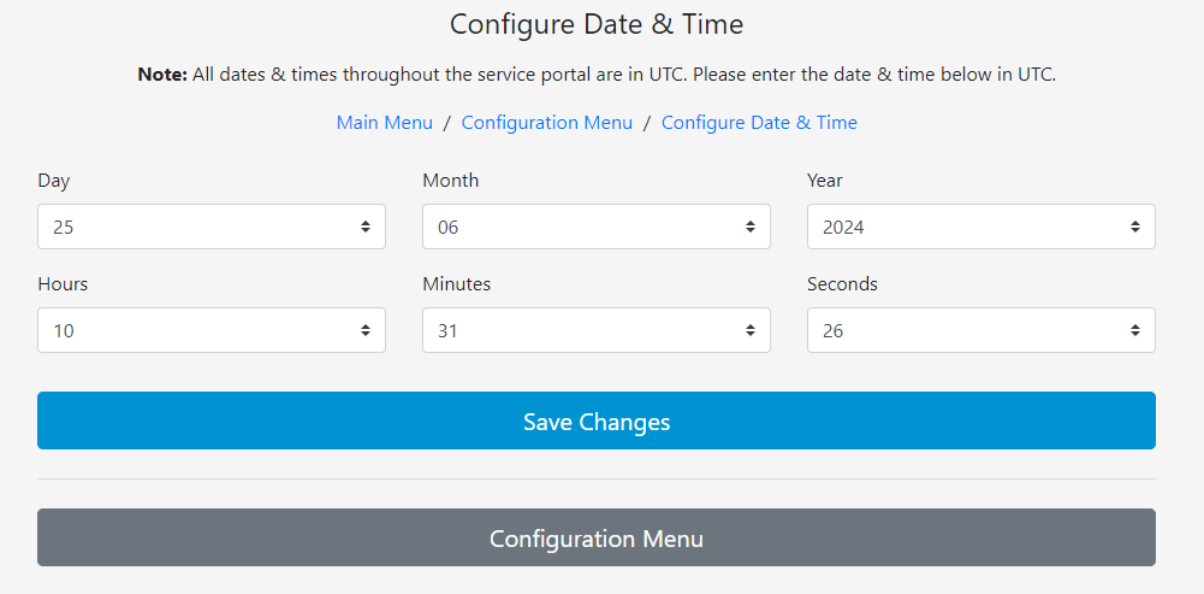
Reset Trigger has two options – Reset when alarm is acknowledged or Rest when the alarm becomes inactive.



Configure Date & Time



This leads to a further screen.



Note the requirement to enter the time as UTC.
The VPM has an internal supercapacitor backup for the real-time clock. This will retain UTC once set for a period of time. If, however, the system is powered down for an extended period it will be necessary to reset the time when powered up.

Configuration Backup & Restore

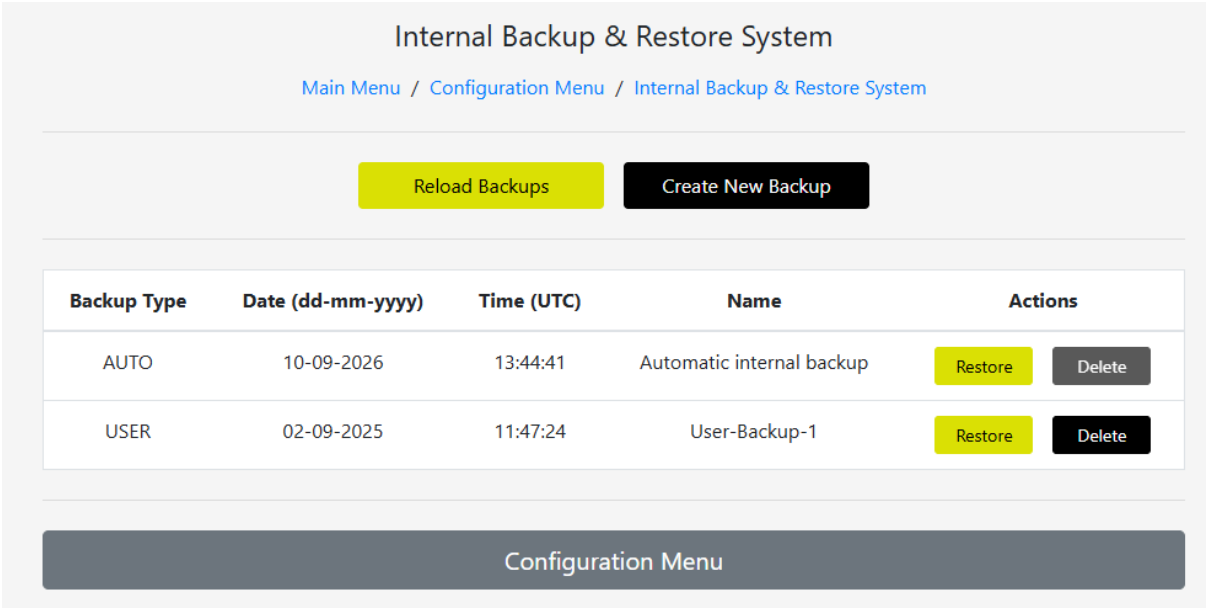


This menu option can only be used by service Engineers who have connected a laptop to the system. For backup and restore functions direct from the VPM unit refer to the next section

Internal Backup & Restore System

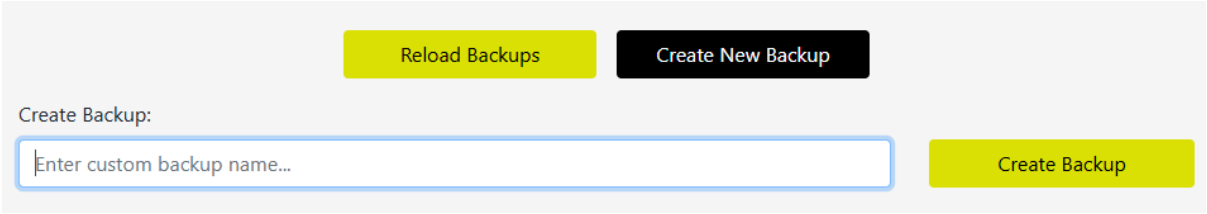


This leads to a further screen

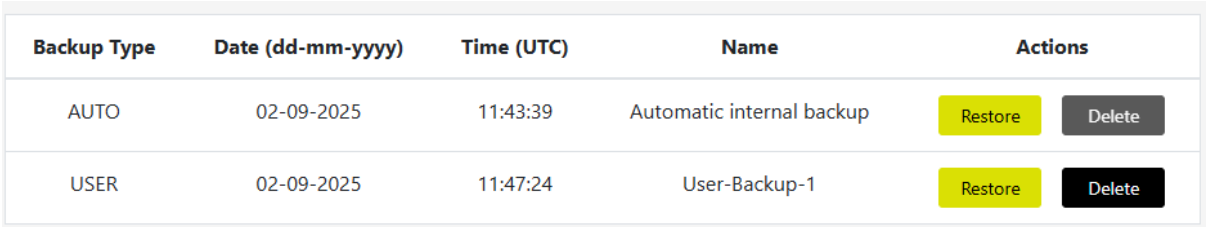


The VPM has an internal micro SD card which is used to save a copy of system backups. The VPM automatically creates a backup of any changes made to the systems configuration which is named “Automatic internal backup”.
In addition a user can create their own backups which can later be restored if required.

To create a user backup select Create New Backup then enter a suitable name and press Create Backup.



The newly created backup will then be shown on the list



Backups may be deleted using the Delete button.
Or loaded into the VPM overwriting the current configuration using the Restore button

Note: Typically a backup titled “Factory Backup” will be generated at the end of manufacture and configuration before the system is despatched. Where it is considered that incorrect changes have

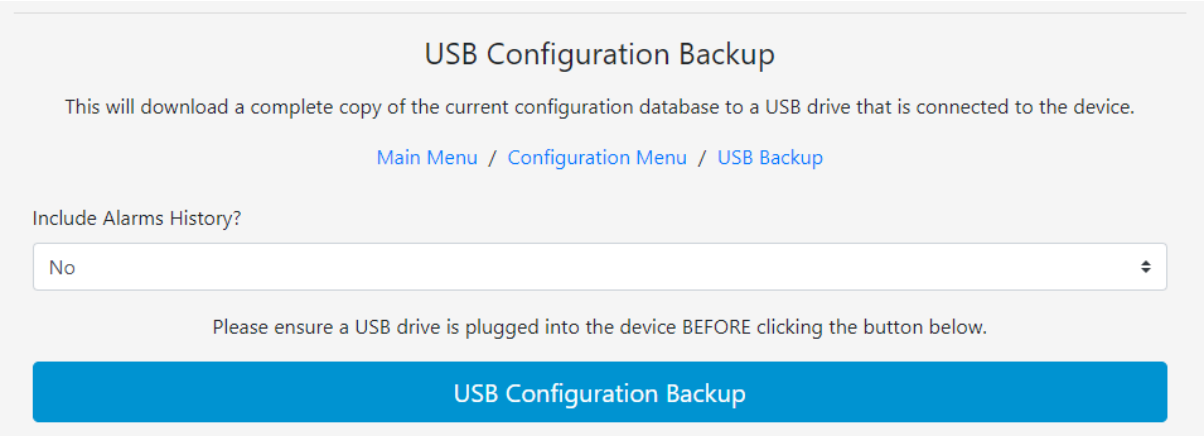
been made to the configuration this Backup may be used to restore the system to its original configuration.

USB Backup and Restore



The functions on this screen utilise the front panel USB port of the VPM where a suitably formatted (FAT32) USB Memory Device should be temporarily plugged in. It allows a full backup or restore of the unit's configuration settings.

USB Backup



As indicated on the screen, a complete copy of the current configuration settings will be downloaded to the USB device. If required a copy of the Alarm History log will also be included.

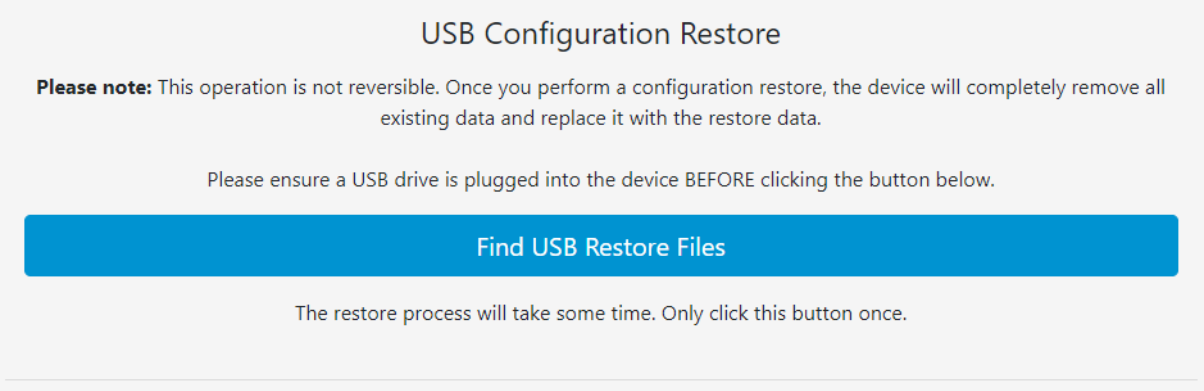
After ensuring the memory device is in place press USB Configuration Backup.
Once finished a message confirming successful backup will be displayed and the USB memory device may be removed.

The file is named based on date and time in the format vpms_(13-33-40_31-01-2024).sql and is saved to the root of the USB drive.

The database file is typically small – less than 500 kB.

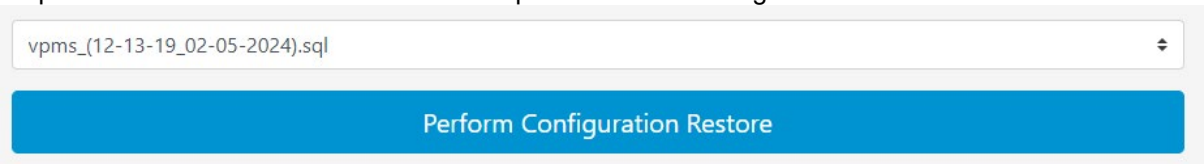
Note: It is recommended that a backup copy of the configuration file is saved in a safe place such that it can be used to restore original settings if needed as detailed below.

USB Configuration Restore



This function is used to overwrite the existing configuration with a new file. Note the onscreen warning that this operation cannot be reversed.
This new file may be a previous backup copy, or it may be a new file provided by PSM which includes new or updated configuration or functionality.

Insert the USB device which containing the new file on its root directory into the front USB port and press **Find USB Restore Files**. If more than one suitable file is present on the USB device use the drop-down list to select the correct unit and press Perform Configuration Restore.



Once completed, the system will confirm that the file has been successfully restored.

Device USB Update



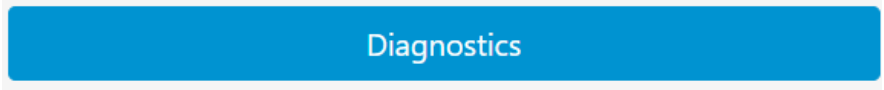
This screen is used to upload updated system firmware to the device. This is different to restoring the configuration settings as detailed in the previous section. System firmware is the underlying operating software whereas the Configuration settings are the data entered for the specific application.
System firmware may be updated by PSM to bring additional functionality or to address software bugs. It will be provided by PSM and is uploaded in the same way as backup / restore i.e., via a suitable USB memory device temporarily connected to the front USB port.



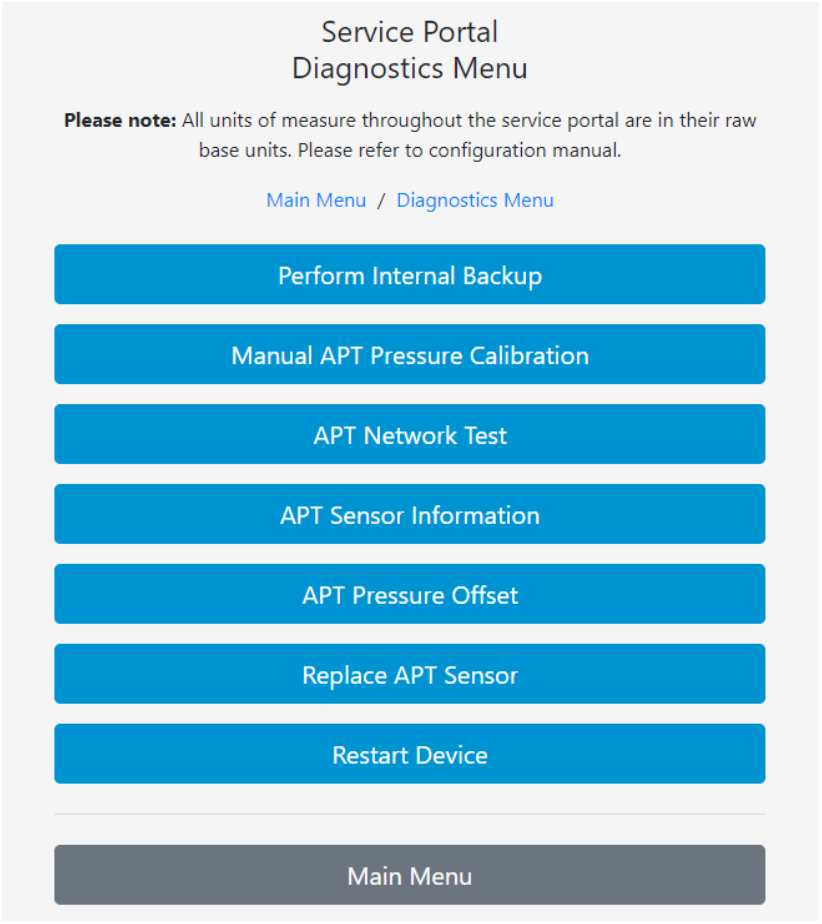
Once the USB device containing the updated firmware is plugged in press **Perform Device Update**.
Note that the update can take up to 2 minutes.
Once completed, a message confirming successful update is displayed.

Note: This process does not make any changes to the units' configuration settings which will normally still be appropriate. Where a Firmware update will necessitate changes to configuration settings an updated configuration file will also be provided. If this is the case, once the firmware update is completed the updated configuration file should then be uploaded using the Restore function as detailed in the previous section.

Diagnostics (Service Portal Main Menu)



This leads to a further sub-menu as follows:

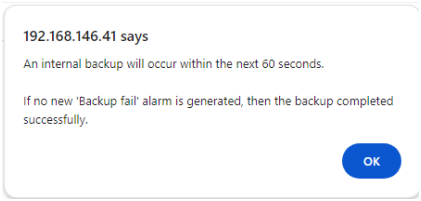


Perform Internal Backup



Selecting this option manually initiates an automatic internal backup of all system configuration data it duplicates the function detailed in the section Internal Backup & Restore System . The system will store all settings to a backup file on the internal Micro SD card.

A message will appear:



Manual APT Pressure Calibration



This function is not applicable to Flood Detection Systems

APT Network Test



This function is not applicable to Flood Detection Systems

APT Sensor Information



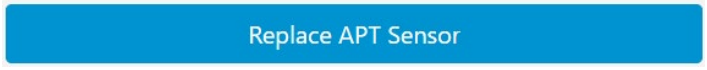
This function is not applicable to Flood Detection Systems

APT Pressure Offset



This function is not applicable to Flood Detection Systems

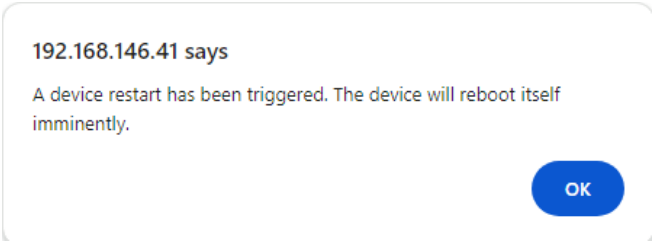
Replace APT Sensor



This function is not applicable to Flood Detection Systems

Restart Device

This will perform a full restart of the VPM display. A message similar to the following will be displayed confirming restart will occur.



Optional Modbus Output

The VPM has 3 RS485 serial ports. These can be assigned to either inputs (from APT1000 sensor networks) or outputs to external systems. Communication protocol is Modbus RTU where the external system is the Master and the VPM is the Slave and responds to requests for data.

For systems which include a Modbus Output the format and context of the registers will be agreed before delivery and a specific document issued which details the content and format of all registers as well as the data format settings.

ANNEX 1 – User Access Levels

The VPM may be configured with multiple passwords which permit different levels of access. This manual covers the two normal levels as detailed below. Where a specific system has additional access levels a supplement to this manual will be included.

User: This is the normal operational level which allows viewing of all display screens and changing of Specific Gravity values. It also allows system errors and tank level alarms to be viewed, acknowledged, and downloaded. Further, in the case of tank level alarms it also allows alarm setpoints to be adjusted.
Service: In addition to the User level, Service level provides access to certain system configuration parameters and various utilities to assist in troubleshooting and sensor replacement.

Should there be a need to change the fundamental configuration of the system this can be achieved either by a PSM Service Engineer attending the Vessel or by PSM preparing an updated configuration file which can be uploaded to the system by onboard operators.

Factory Set Passwords

User: 654321
Service: 789654