MARKSMAN
SMART PUMPS

“Marksman Smart Pump”

User Manual



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Introduction

The **Marksman Smart Pump** is an intelligent, high-precision fluid transfer system designed for winery, beverage, and industrial applications where consistency, traceability, and user control are critical. Built on a modern microcontroller platform with an intuitive touchscreen interface, the system allows operators to perform a range of tasks—from automated batching and gentle barrel filling to manual operation and automatic pressing—with complete confidence.

Whether transferring delicate wine, juice, or other fluids, the pump adapts to the task with features that minimize turbulence, prevent overflow, and ensure accuracy down to the last litre. Smart flow control, pressure monitoring, and customizable parameters give users unmatched flexibility and repeatability across production runs.

With built-in history logging, user access tracking, and on-screen diagnostics, the Marksman Smart Pump is more than a piece of equipment—it's a production partner.

Key Features

- **Automated Batching** with volume setpoint and real-time feedback
- **Barrel Filling/Emptying** modes for seamless cellar operations
- **Pressing Mode** with yield tracking and live juice output
- **Manual Control** for more versatility and precision top-ups
- **Custom Parameters** to tune flow, speed, and pump behaviour
- **On-Screen Help Menus** for every function
- **User Login and History Tracking** for accountability

Pump Components

The **Marksman Smart Pump** consists of the following components:

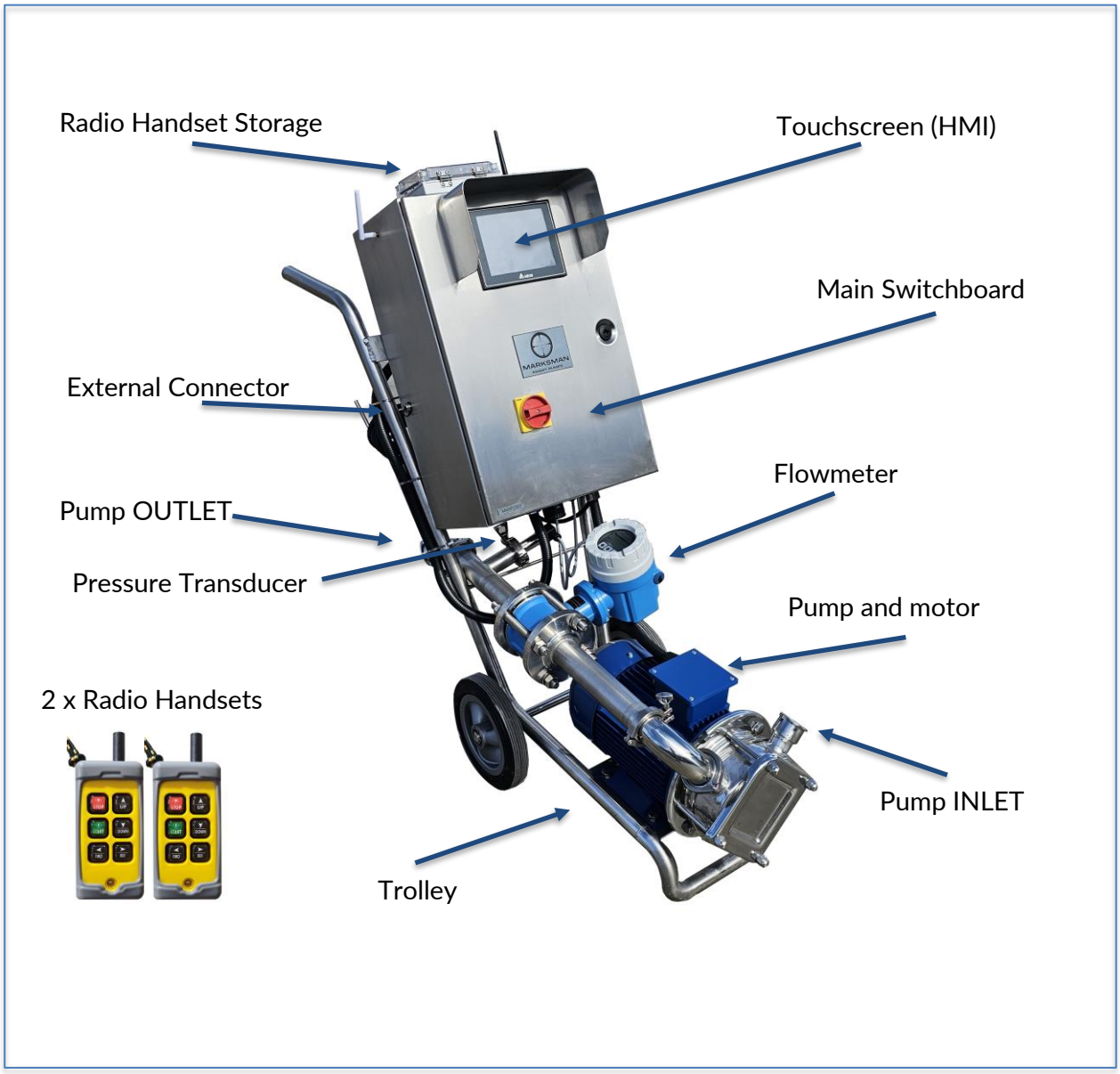


Figure 1

Radio & Communication Systems

There are 3 communications systems in the Marksman Smart Pump, these being:

- **General radio for manual control and barrel filling/emptying**
- **Long range radio for optional add-on systems** (such as barrel or tank sensors)
- **Modem with 4G or Wifi access**

The antennae for these systems can be seen below:

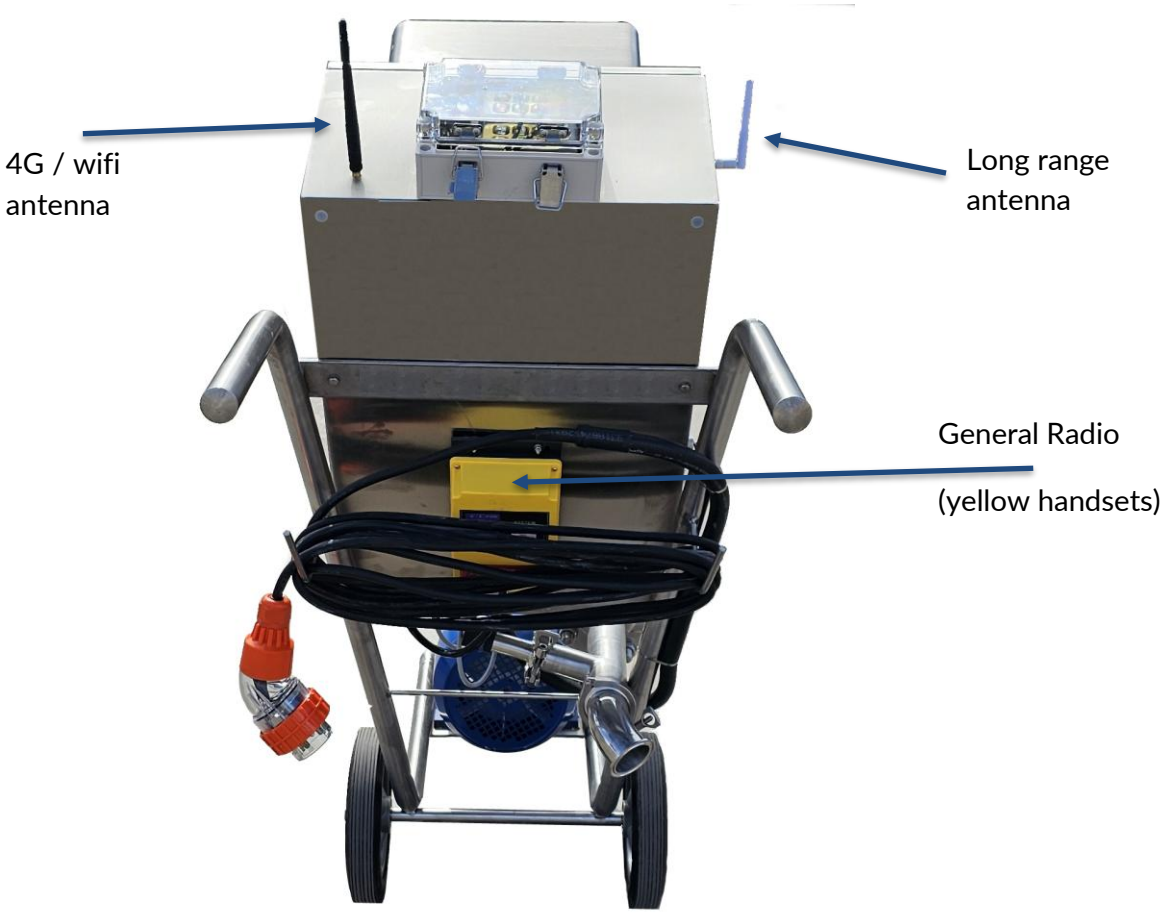


Figure 2

Help Menu and System

Included in the software is an extensive help system that can be accessed from the "Help Menu", or directly from each screen.

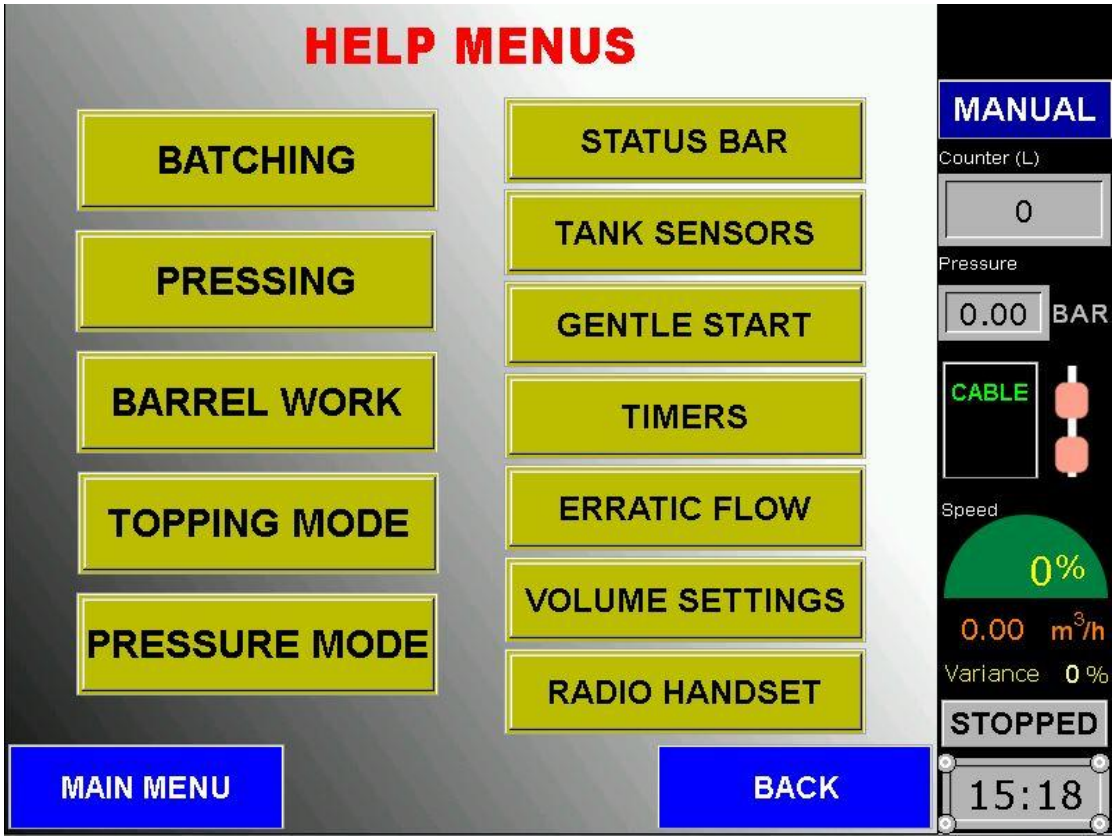


Figure 3

The Help Menu screen provides direct access to detailed instructions for all major operational modes and key system features. Each help menu offers a quick, easy-to-understand guide explaining the function, purpose, and best practices for using specific parts of the pump system.

On all operational screens, you can navigate directly to a relevant help screen wherever you see a button as follows:



Available Help Topics

- **Batching:**
  Instructions for setting volumes, starting batches, and handling batch completion.

- **Pressing:**
  Guidance on entering tonnes, managing free run and pressing stages, and recording yields.

- **Barrel Work:**
  Covers **both** barrel filling and emptying processes, with tips for volume tracking and gentle start control.

- **Topping Mode:**
  Describes manual topping procedures using the radio remote or topping controller.

- **Pressure Mode:**
  Explains pressure control settings and behaviour.

- **Status Bar:**
  Defines each live status indicator visible on the right side of every operational screen.

- **Tank Sensors:**
  Instructions for using wired or wireless tank-level sensors to automate stop/start behaviour.

- **Gentle Start:**
  Details how the pump ramps up slowly to minimize surge and foam.

- **Timers:**
  Explains system timers and how they manage speed changes and alarms based on flow behaviour.

- **Erratic Flow:**
  Settings and alarms for detecting unstable flow rates and protecting the pump.

- **Volume Settings:**
  Covers totalizer setup and fine-tuning.

- **Radio Handset:**
  Instructions for using the wireless remote control to operate the pump without touching the main screen.

Main Menu

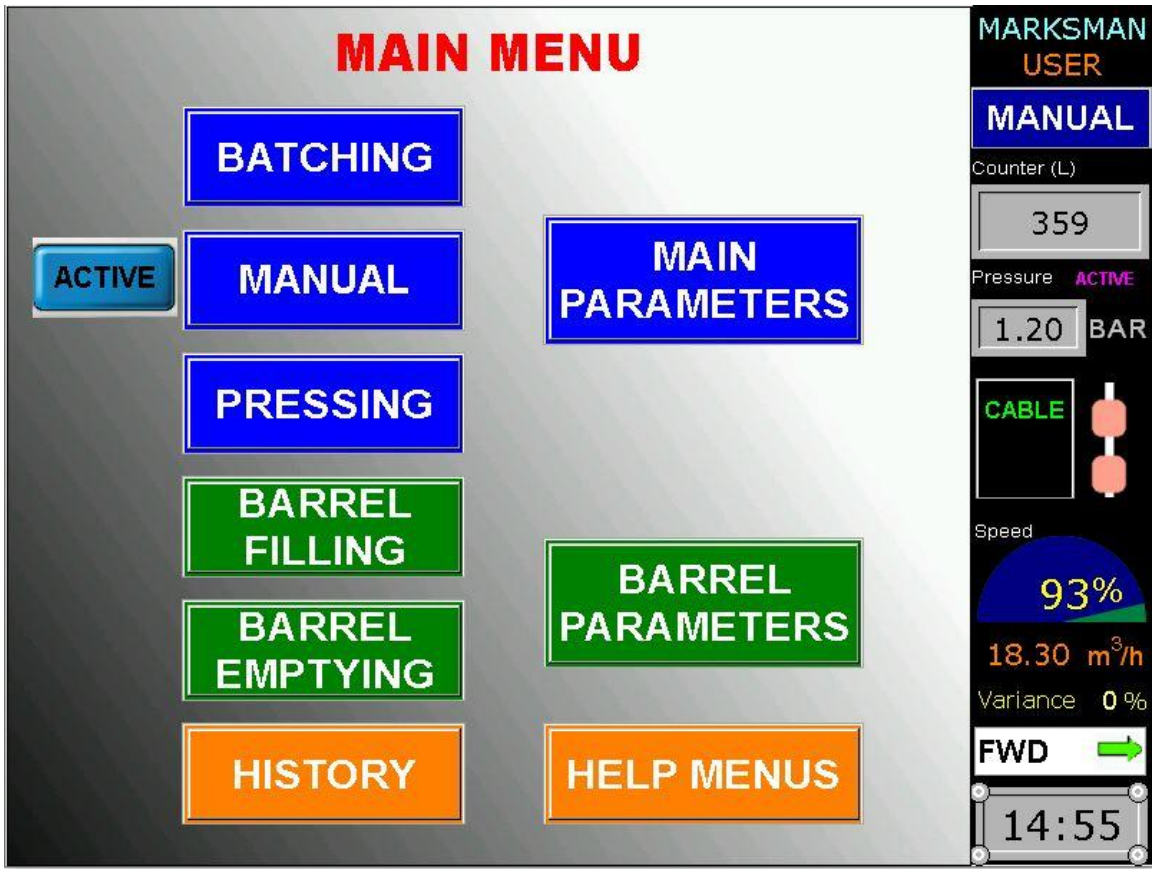


Figure 4

The **Main Menu** is the central navigation hub of the Marksman Smart Pump system. It provides quick access to all major operational modes and configuration tools. Designed with clarity and usability in mind, the menu ensures that operators can move efficiently between tasks, whether they're batching, pressing, or managing barrel operations.

The "Active" indicator immediately shows which process the pump is currently performing.

Menu Options

- **Batching**
  Launches the automated batching mode, where operators can enter a target volume and let the pump run automatically with real-time monitoring and stop conditions.
- **Manual**
  Opens the manual operation screen, allowing for hands-on control of flow direction and speed.
- **Pressing**
  Used for juice or wine pressing applications. Provides calculations for yield and tracks total volume per press.
- **Barrel Filling**
  Controls the filling of barrels with live level indicators, set volume limits, and gentle start features to prevent foam or overflow.
- **Barrel Emptying**
  Enables controlled emptying of barrels into tanks, tracking volume removed and number of barrels completed.
- **Main Parameters**
  Opens system-wide settings, including pump speeds, pressure targets, and alarm settings.
- **Barrel Parameters**
  Configures settings specific to barrel filling/emptying—like speed ramping, ullage volume, and overfill protection.
- **History**
  Displays a log of previous pump operations, including time-stamped records of volumes, modes used, and user names.
- **Help Menus**
  Provide on-screen instructions for each function, alarm or parameter.

Status Bar

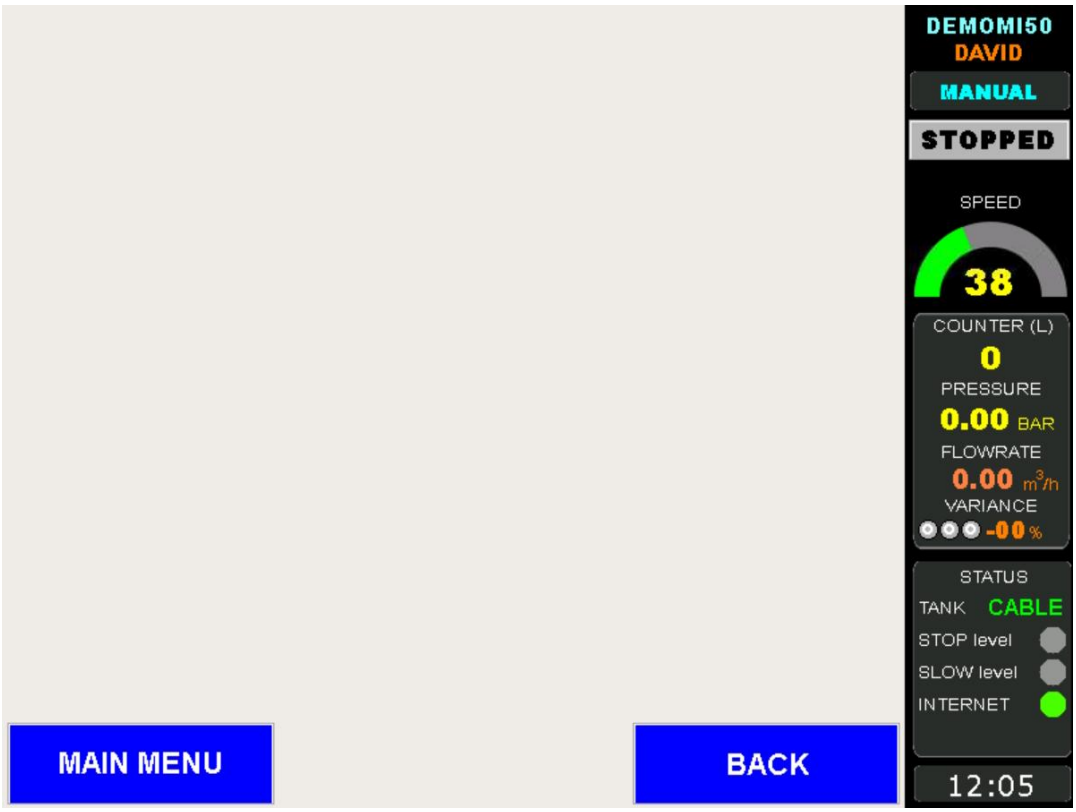


Figure 5

Located along the right-hand side of all operational screens, the **Status Bar** provides a real-time summary of key pump data and system conditions. It ensures that operators can monitor critical performance metrics at a glance—regardless of the current function being used.

Status Bar Indicators

- **Pump Name**
  Displays the identifier assigned to the pump (e.g., *MARKSMAN*), helpful in multi-pump environments.
- **Current User Name**
  Shows the name of the logged-in operator, ensuring accountability and proper access tracking.
- **Current Process Status**
  Indicates the current mode the system is operating in (e.g., *MANUAL*, *BATCHING*, *PRESSING*).
- **Current Totaliser Value (L)**
  Real-time counter that shows the total volume pumped during the current session or cycle.
- **Current Liquid Pressure (BAR)**
  Displays the instantaneous liquid pressure within the system, allowing operators to ensure proper operation and identify issues.

Tank Sensor Status

- **STOP level**
  Automatically halts pump operation when the top-level sensor is triggered—preventing overfilling.
- **SLOW level**
  Reduces pump speed when a minimum level is reached—helpful for careful topping or slowing before shutdown.
- **CABLE**
  Indicates that a **wired connection** is being used for tank level sensing.
- **RADIO**
  Signals that a **wireless radio sensor** is active (requires transmitter to be powered and paired).
- **INTERNET**

  Shows current internet connection status

Additional Live Data

- **Current Pump Speed Setting**
  Shows the percentage of pump speed in real time, providing insight into how quickly the fluid is being moved.
- **Current 5-Second Average Flowrate (m^3/h)**
  Short-term flow average, helping to detect fluctuations and confirm steady output.
- **Flowrate Variation (%)**
  Displays how much the flow rate is varying from the above average, useful for identifying inconsistent flow behaviour and fine-tuning the erratic flow alarm.
- **Pump Status**
  Shows whether the pump is **RUNNING**, **PAUSED**, or **STOPPED**—updated instantly with system activity.

Figure 6

Radio Handset

The Radio Handset allows wireless control of the Marksman Smart Pump during manual and barrel operations. It is especially useful when direct access to the touchscreen interface is impractical—such as when handling hoses, operating at a distance, or multitasking during barrel filling or emptying.

In Manual Mode

Pressing START will energise the handset.

Once activated, the buttons will perform the actions labelled:

STOP: Halts all pump activity and de-energises the handset.

UP / DOWN: Used to increase or decrease pump speed.

FWD / REV: Runs the pump in the forward or reverse direction.

Once STOP is pressed, the handset will need to be re-energised by pressing START again.

In Topping Mode

Pressing START will immediately start the pump (at the speed set on the slider bar).

Pressing STOP will immediately stop the pump.

In Barrel Mode

Pressing START will initiate barrel filling or emptying.

If the barrel set volume is reached during filling, the REV button will perform a topping function (momentary running at slow speed to fine-tune the fill level).

Pressing STOP instructs the system to move on to the next barrel, logging the current one as complete. Pressing START again will start filling the next barrel.

Handset Layout Summary

Button	Function
STOP	Stop all functions
START	Energise handset / begin operation
UP / DOWN	Adjust speed
FWD / REV	Forward or reverse pump direction

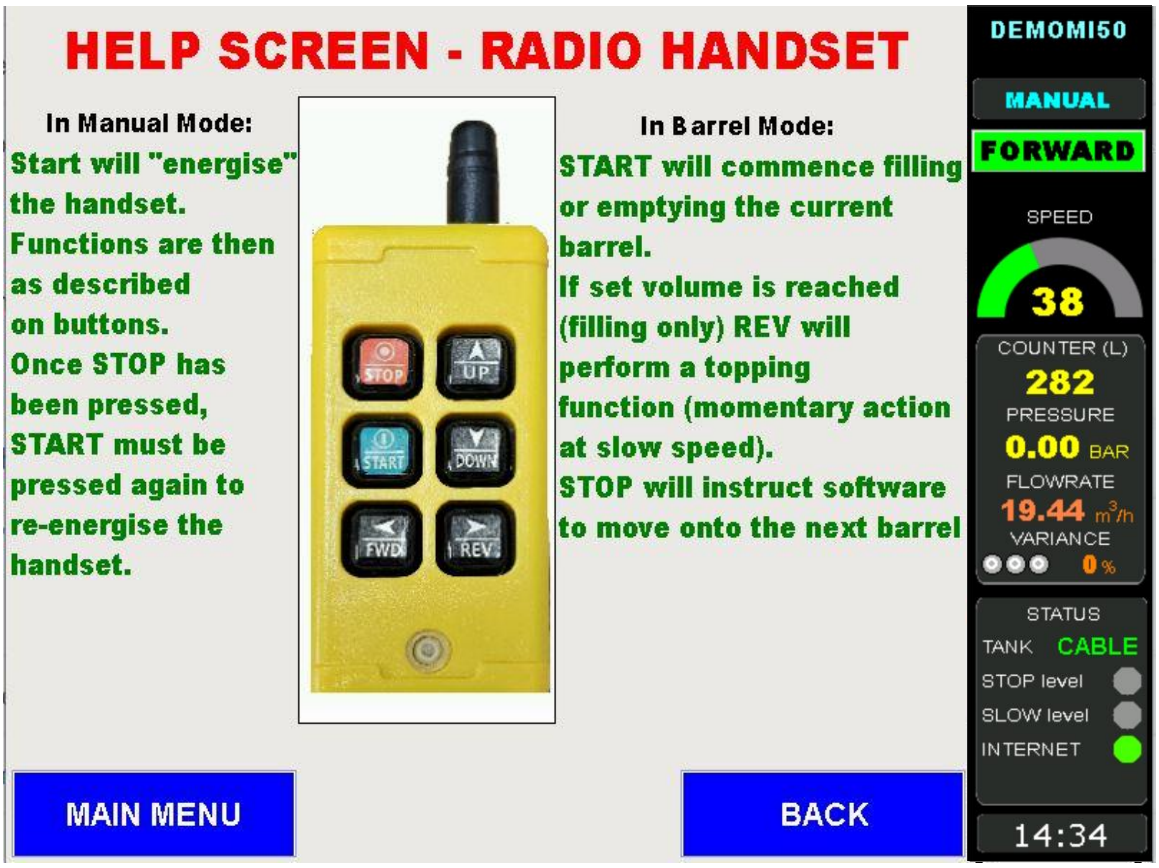


Figure 7

Main Parameters

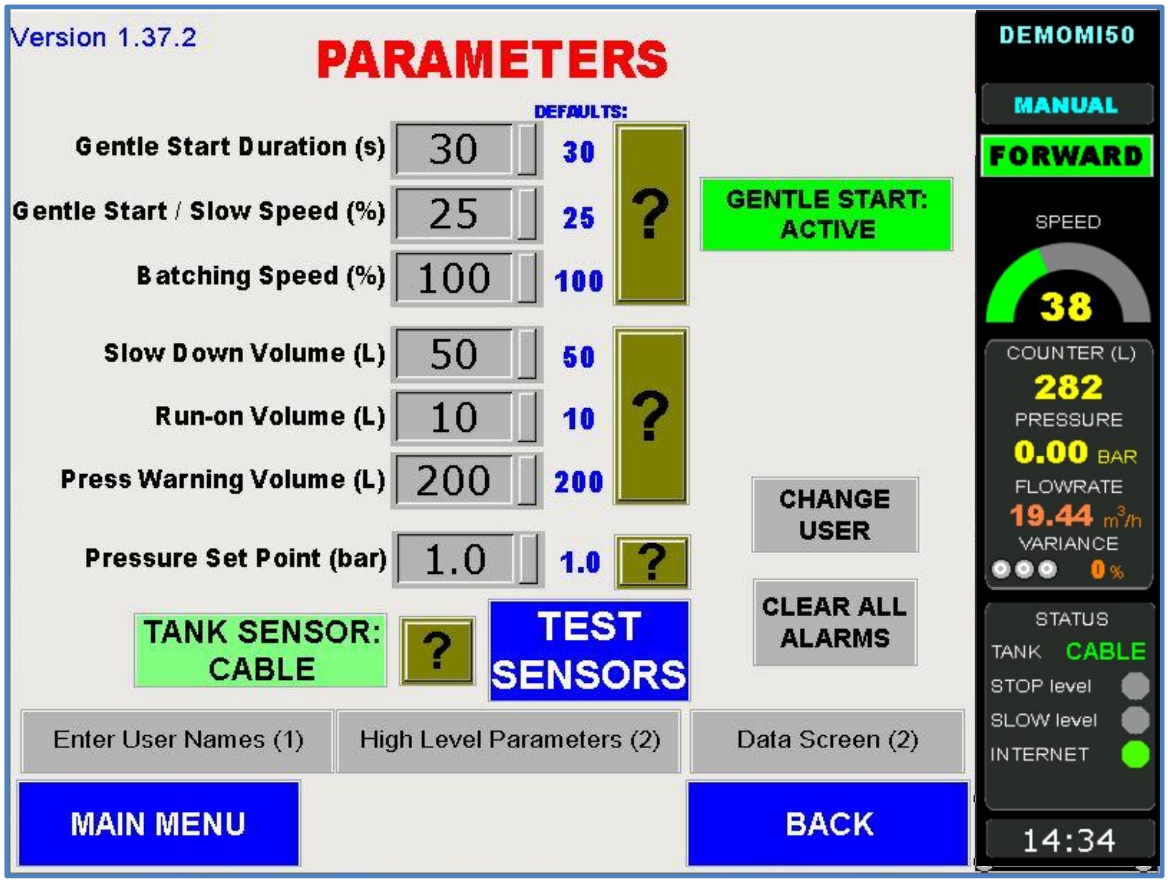


Figure 8

The **Parameters** screen provides direct access to all critical system settings that influence batching behaviour, pump performance, and operational safety. It's designed to be both user-friendly and powerful, enabling fine-tuning of batching dynamics.

Adjustable Settings

- **Gentle Start Duration (s)**
  Time (in seconds) the system takes to gradually ramp up to operational speed—reduces mechanical stress and fluid shock.
- **Gentle Start / Slow Speed (%)**
  The starting speed used during the gentle start phase, and also the speed setting once the "Slow down volume" has been reached.
- **Batching Speed (%)**
  Maximum operating speed during the batch process.

- **Slow Down Volume (L)**
  The volume before reaching the setpoint where the pump begins to slow down for a smoother stop.
- **Run-on Volume (L)**
  The expected overshoot volume after the pump is commanded to stop (used for accuracy calibration).
- **Press Warning Volume (L)**
  A threshold at which the system gives an early warning for incoming press volume, allowing you to prepare for a press cut. Only valid in "Pressing Mode".
- **Pressure Set Point (bar)**
  Target pressure value that will automatically be maintained if "pressure mode" is active. This function is available in Batching and Manual modes.

Status & Actions

- **Gentle Start Status**
  Visibly shows if **Gentle Start** is currently active.
- **Tank Sensor Detection**
  Indicates whether a **Tank or Barrel Sensor** is connected via cable or radio. If a radio system has been used and then switched off, you must select "Cable" on this screen to allow the pump to be used without the radio. If a radio transmitter is activated it will automatically switch to "Radio".
- **Test Sensors Button**
  Triggers a diagnostic check of all connected sensors.
- **Change User**
  Allows operators to switch user profiles for logging and access control.
- **Clear All Alarms**
  Resets any active system alarms.

Navigation Shortcuts

- **Main Menu / Back**
  Return to the main interface or previous screen.
- **Tabs**
  Access additional screens:
  - **Enter User Names (password level 1)**
  - **High-Level Parameters (password level 2)**
  - **Data Screen (password level 2)**
- **Passwords are provided to key personnel with the pump, or upon request.**

Parameters – High Level

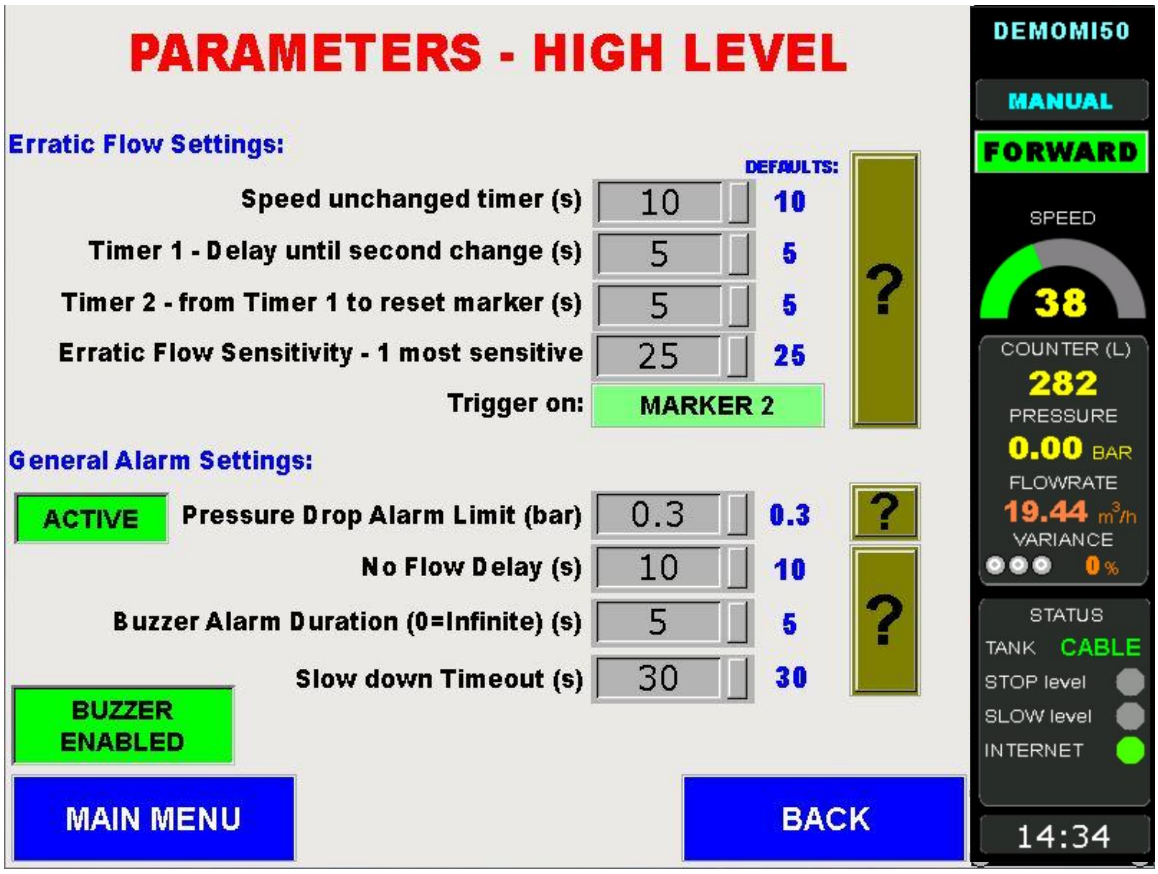


Figure 9

The **High-Level Parameters** screen is focused on fine-tuning the system's flow behaviour and alarm responses. It's primarily used for configuring sensitivity and response logic to detect irregular flow conditions, an empty source tank or other issues.

Status Indicators

- **Erratic Flow "Trigger on:" status**
  Displays if the erratic flow alarm will trigger on 1 fluctuation or 2, as per figure 10.
- **Pressure Drop Alarm status**
  Displays if the pressure drop alarm is active or not.
- **Buzzer**
  Status indicator for whether the audible alarm is currently **ENABLED**.

Erratic Flow Settings

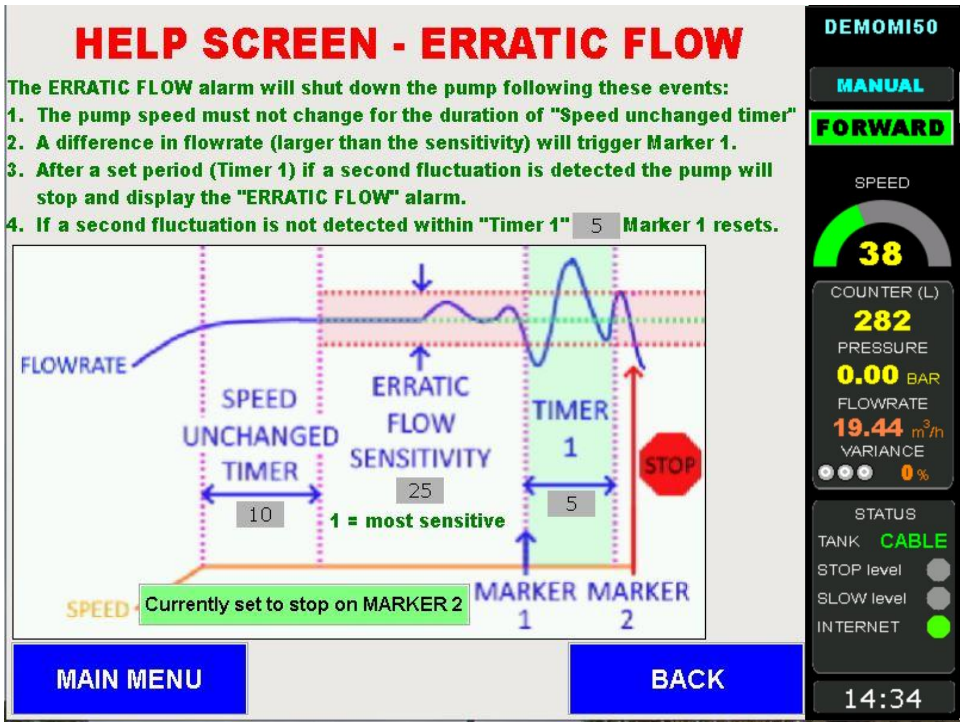


Figure 10

- **Speed Unchanged Timer (s)**
  Defines how long the speed must remain constant before the erratic flow alarm becomes active.

- **Timer 1 – Delay Until Second Change (s)**
  A delay period to confirm that a flow change is truly erratic and not a brief fluctuation.

- **Timer 2 – From Timer 1 to Reset Marker (s)**
  This defines a reset window to prevent repeated alarms from transient events.

- **Erratic Flow Sensitivity (1–most sensitive)**
  Sets the system's sensitivity to irregular flow behaviour. Lower values trigger alarms more readily.

- **Trigger On**
  Identifies the sensor or marker used to detect irregular flow (e.g., **Marker 1 or Marker 2**).

General Alarm Settings

- **Pressure Drop Alarm Limit (bar)**
  If the system detects a drop in pressure above this threshold, an alarm is triggered.
- **No Flow Delay (s)**
  The period of time that will trigger an alarm if no flow is detected. This could be due to a closed circuit or no product.
- **Buzzer Alarm Duration (s)**
  How long the buzzer will sound when an alarm is triggered. A value of **0** means it stays on until manually acknowledged.
- **Slow Down Timeout (s)**
  If using the tank sensors, this is the allowed amount of time from the time the "Slow down" (lower switch) signal is received from the transmitter. If the "Stop" sensor (upper switch) has not been triggered in this time frame the pump will automatically stop.

Gentle Start

The **Gentle Start** feature is designed to minimize fluid surging, foaming, and pressure spikes at the beginning of a transfer—particularly important when handling delicate liquids such as wine or juice.

When **ACTIVE**, Gentle Start will perform the following actions:

1. At the start of a batch or barrel operation, the pump will begin operating at the **LOW SPEED** setting. The speed slider bar will have a flashing indicator showing that Gentle Start is active.
2. Over the duration defined by the **Gentle Start Duration** (in seconds), the pump will gradually ramp up to the configured **HIGH SPEED** setting.
3. Once the ramp-up period has completed, the pump will continue running at the full HIGH SPEED for the remainder of the operation.

When It Works:

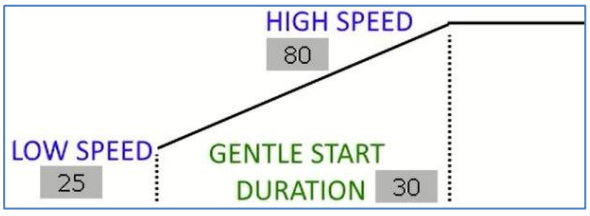
- **Active In:**
  - Batching
  - Barrel Filling
  - Barrel Emptying

When INACTIVE:

If Gentle Start is turned off, the pump will **immediately start at HIGH SPEED**, which may be suitable for non-sensitive products or fast transfers where surging is not a concern.

Example Settings:

- **Low Speed:** 25%
- **High Speed:** 80%
- **Gentle Start Duration:** 30 s



Batching

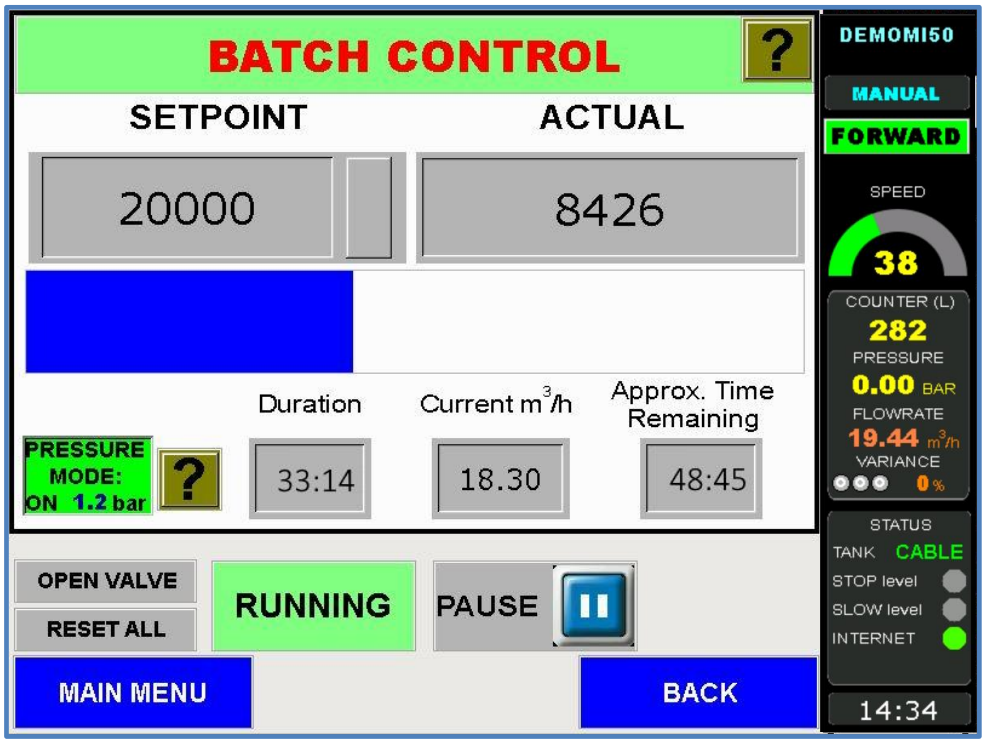


Figure 11

The **Batch Control** screen provides real-time monitoring and control over the batching process. It is designed for precision delivery of liquid volumes with detailed feedback on system performance.

Key Features

Gentle Start
To reduce splashing, and possibly cavitation at the start of a transfer, the Gentle Start option can be selected before starting a batch. This should be selected if going into an empty tank.

Pressure Mode
If you require a pressure to be maintained (such as when filtering a set volume) you can select Pressure Mode. This will control the speed of the pump to automatically maintain the pressure that is set on the Parameters page.

Setpoint vs Actual Volume

The operator sets the desired batch volume under **SETPOINT**. As the batch progresses, the **ACTUAL** field displays the volume delivered so far, allowing for precise control.

Progress Bar

A visual blue progress bar indicates the percentage of the batch completed, providing at-a-glance confirmation of operation status. The status bar changes colour towards the end of the batch to provide visual notification from a distance.

Flow Metrics

Duration: Total elapsed time since batch started.
Current m^3/h: Real-time flow rate.
Approx. Time Remaining: Estimated time left to complete the batch based on current flow rate.

Pressure Monitoring

The system can operate in **Pressure Mode**, maintaining a constant pressure (e.g., 1.2 bar) by regulating pump speed.

Status Indicators

RUNNING: Indicates active batching process.
PAUSE: Temporarily halts the batch without cancelling it.
OPEN VALVE / RESET ALL: Allows manual override and system reset functions.

Speed & Performance

A speed dial shows the pump's current speed (e.g., 96%), along with flow rate and variance for accuracy checks.

To start a batch process

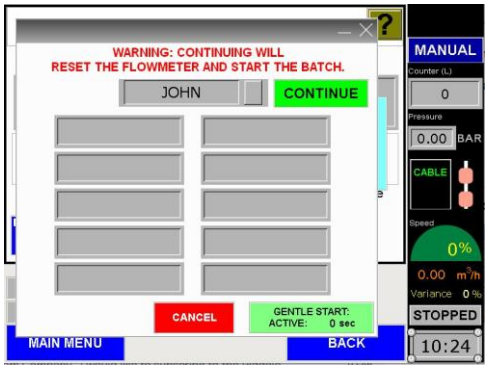
1. Enter the "SETPOINT" volume you wish to achieve.

2. Push the "START BATCH" button.

3. Enter a job and tank description in the popup window, then push “Continue”:

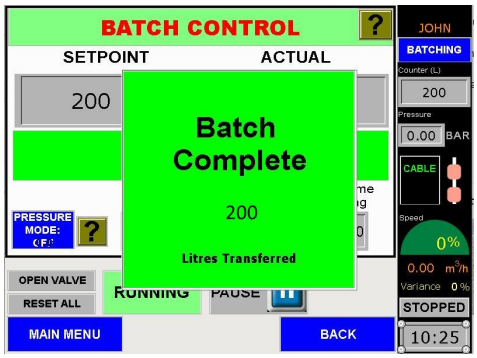


4. Confirm your name from the USER list or manually add your name.



5. Once you confirm your name, the pump will automatically start.

6. Once the batch is complete, the pump will stop and display a message:



7. Upon completion, a history record will be stored showing the details of the completed batch.

8. If the optional tank sensors are being used, triggering a “Stop” will prompt the operator to confirm whether the tank limit has been reached. This feature is especially useful when filling multiple containers—such as a multi-compartment tanker—as it allows each compartment to be filled individually. After confirming with “Yes,” the system will record a history entry and stop the batch.



⚠ Notes

1. During a batch, pressing the "PAUSE" button will stop the pump.

2. Once PAUSED, you will have the option to "RESTART" or "CANCEL".

3. Pushing "RESTART" will continue the batch from where it was PAUSED.

4. Pushing "CANCEL" will end the batch and record the history entry.

Manual Operation

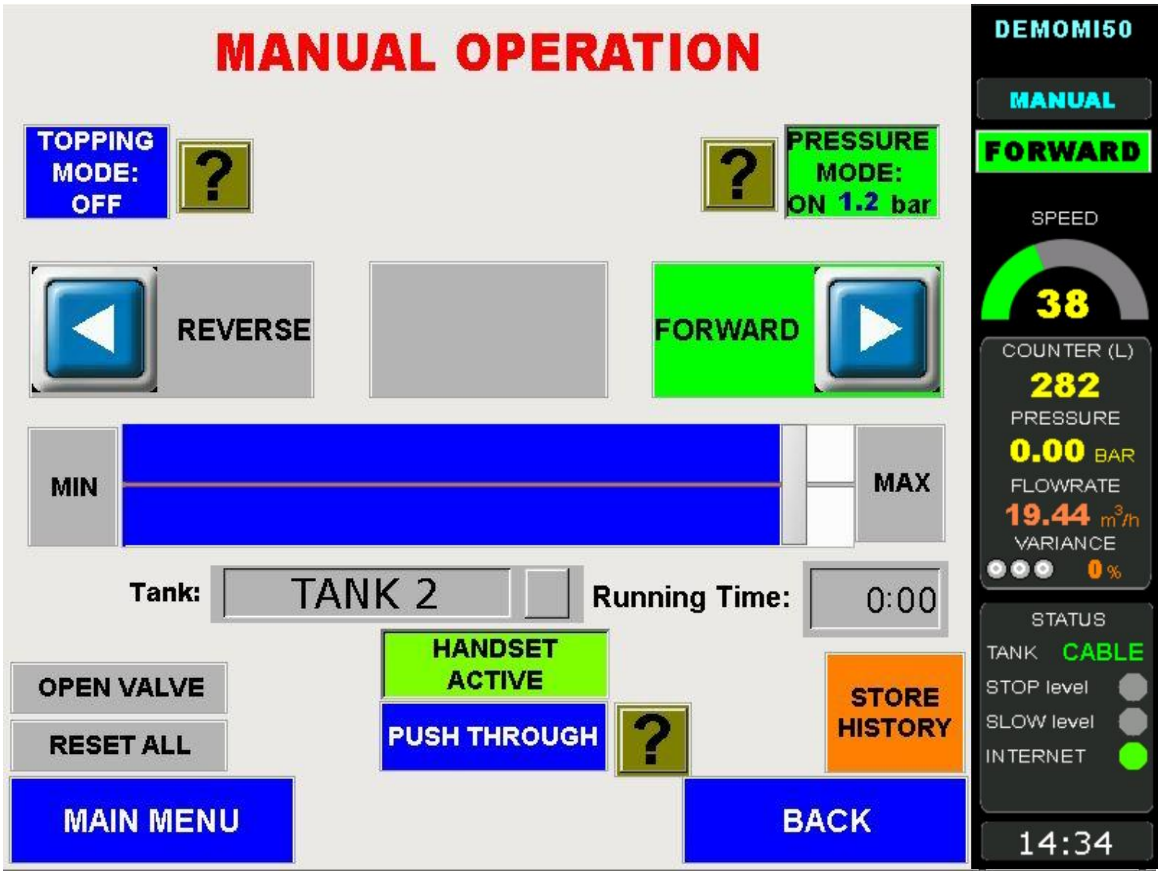


Figure 12

The **Manual Operation** screen provides hands-on control for fluid handling systems. It's ideal for direct operator intervention when automation is not required.

Key Controls

- **Reverse / Forward Directional Control**
  Large, intuitive arrows allow the operator to manually pump in either direction:
- **Topping Mode (ON/OFF)**
  When enabled, Topping Mode allows fine-tuned additions to reach exact tank or barrel levels.

- **Speed Indicator**
  A horizontal progress bar showing the speed of the pump.
- **Tank Selection**
  Operators can input the tank name for the history function, or to display the current transfer.

Operational Feedback

- **Pressure Mode Indicator**
  Indicates whether pressure regulation is active and at what value (e.g., **1.2 bar**).
- **Handset Active**
  Displays if a handheld remote is currently controlling the operation. To use the radio handset in this mode you must activate it on screen. **If the handset is active you will not be able to activate any other process mode.** When active, the system will provide a short beep when the "Start" button is pressed on the handset.
- **Running Time**
  Tracks the total elapsed time of the manual session.
- **Speed & Flow Rate Display**
  Shows pump speed (e.g., **93%**), flow rate (e.g., **18.30 m³/h**), and variance—ideal for visualising the stability of flow (and directly connected to the "erratic flow" alarm).

Available Actions

- **Open Valve / Reset All**
  Control the main valve (on centrifugal pumps) manually or reset current counters.
- **Push Through**
  Disables the erratic flow alarm for 5 minutes to allow pushing through of product. The erratic flow alarm will automatically become active again after this time, or by pressing the button again to turn off.

- **Store History**
  Save a record of the current operation for logging and analysis.

Topping Mode

Topping Mode provides a simplified and highly responsive method of controlling the pump for precision fluid delivery—ideal for applications such as barrel topping or small-volume transfers. This mode ensures the operator can start or stop the pump instantly via external controls without using the touchscreen interface.

How Topping Mode Works

- **Activation Sources**
    - **Radio Handset**
      The operator uses the wireless remote to control the pump with **Start** and **Stop** buttons that respond immediately. 👉
    - **Topping Controller (Optional – see appendix D)** 👉
      A physical controller connected to the system. The pump will run **only while the button is held down**, allowing momentary control for fine topping.
- **Speed Control**

  In both cases, the pump runs at the **speed currently set** on the touchscreen display. The speed can be adjusted in the Manual Operation screen.

⚠️ **Notes**

- Topping Mode is **only available in Manual Mode**, however in Barrel Filling Mode the reverse button (yellow handset) can be used for topping up each barrel. 👉
- This mode does **not use automated setpoints** or batch calculations.
- It is ideal for situations where hands-on, real-time fluid management is required—especially when working alone or in tight spaces.

Pressing

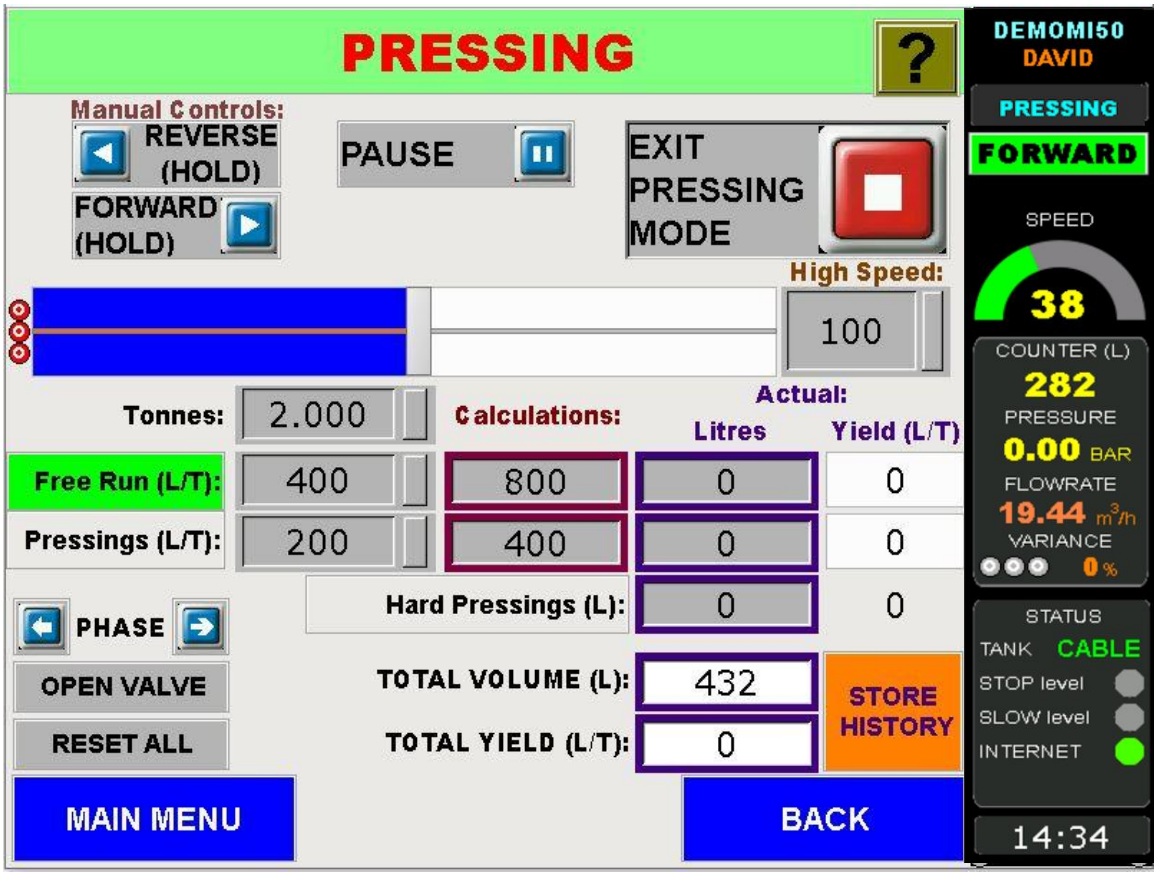


Figure 13

The **Pressing** screen provides full control and monitoring for liquid extraction processes—commonly used in winery, juice, and food production environments. This interface allows operators to measure, adjust, and analyse output in real time.

The optional pressing controller is required to get the full functionality of this process (see Appendix C – Press Controller).

To enter Pressing mode, you must select "Enter Pressing Mode".

Manual Controls

- **Reverse / Forward (HOLD)**
  Manual directional pump controls allow the operator to reverse or advance the process as needed.
- **Pause Button**
  Temporarily halts the press without cancelling the operation.
- **Exit Pressing Mode**
  Ends the current pressing cycle and returns to standard mode.
- **Speed Setting Slider**
  Adjusts the operational speed during pressing.
- **High Speed Setting**
  Adjusts the speed of the pump should the high level sensor become submersed. If the high speed setting does not clear the sensor with a few seconds an alarm will sound (however the pump will continue running).

Production Inputs

- **Tonnes Input**
  Enter the total **tonnes of must** placed into the press. This value is essential for calculating expected volumes.
  ⚠️ **Note:** You can start the pump **before** entering the tonne value. However, yield calculations and alarms will not function unless the tonnes field is filled.
- **Free Run & Pressings (L/T)**
  These two fields represent the expected **litres per tonne**:
  - **Free Run (L/T):** Juice extracted with low or no pressing force.
  - **Pressings (L/T):** Juice extracted during active pressing.
- **Automatic Calculations**
  Once the tonnes and L/T values are entered, the system will calculate expected volumes for **Free Run** and **Pressings** in litres.
- **Alarm Trigger**
  When calculated volumes are reached during pressing, an alarm will sound continuously **until acknowledged**. This acts as an alert that the expected yield has been met. A warning sound will notify you when the limit is approaching (Parameters: Press Warning Volume).

Calculations & Actuals

- **Calculation Columns**
  Automatically compute expected **litres** and **yield (L/T)** from entered input values.
- **Actual Columns**
  These fields update in real-time as liquid is collected, allowing you to compare projections with live data. An alarm will sound once each phase reaches its setpoint.
- **Total Volume (L)**
  Live tally of the total liquid collected during the pressing operation.
- **Total Yield (L/T)**
  Overall extraction efficiency based on total volume and tonnes processed.

Controls & Actions

- **Phase Control**
  Used to shift between pressing stages or cycles manually.
- **Open Valve / Reset All**
  Control the system valve or reset settings and metrics as needed.
- **Store History**
  Save a snapshot of the current press session for quality tracking and auditing.

Performance Feedback

- **Counter (L)**
  Tracks the total live volume being delivered.
- **Pressure Display**
  Live display of system pressure (e.g., 1.20 bar).
- **Speed Dial & Flow Rate**
  Displays the current pump speed (e.g., **26%**) and flow rate (e.g., **9.80 m^3/h**) for monitoring performance.

Barrel Filling

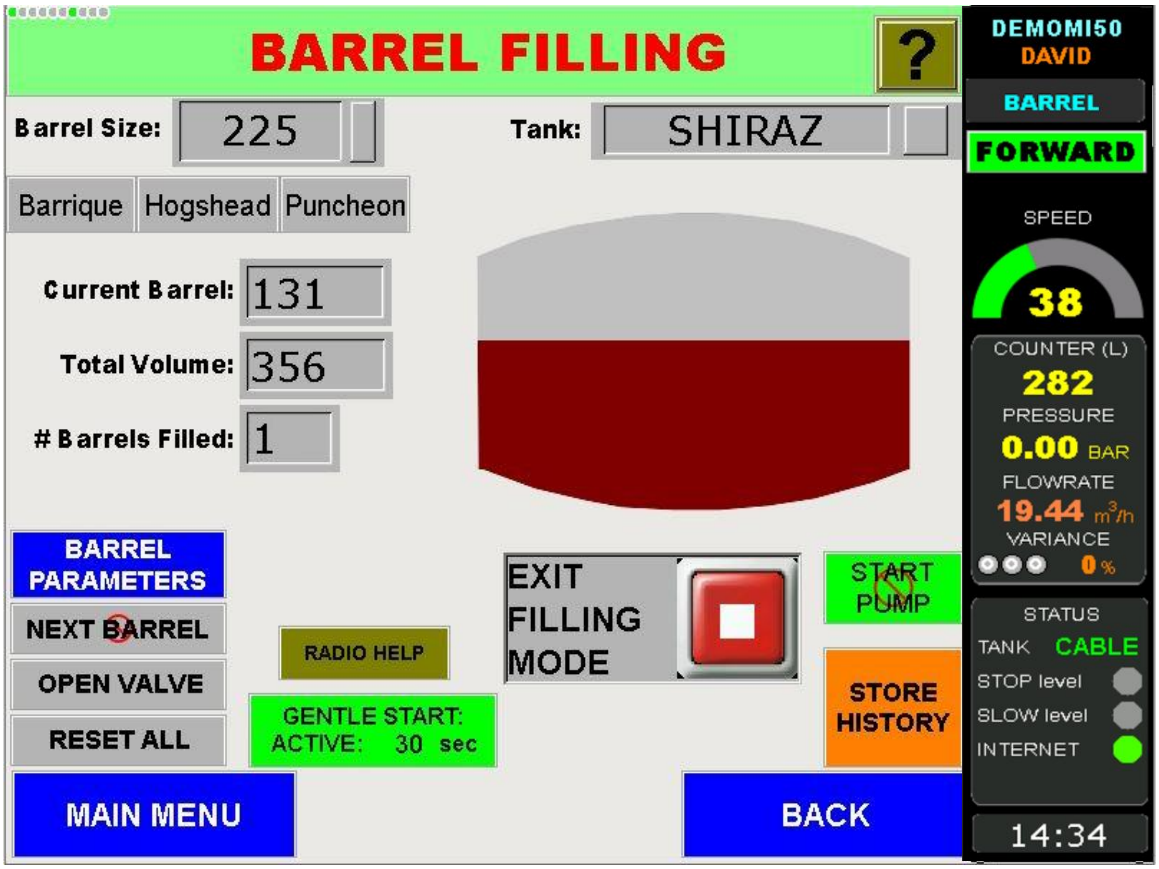


Figure 14

The **Barrel Filling** screen offers a controlled environment for transferring liquid into barrels with high accuracy. This interface helps track individual barrel volumes, supports different barrel sizes, and ensures smooth pump operation with minimal overspill or interruption.

To enter barrel filling mode, you must select "Enter Filling Mode".

Filling Parameters

- **Barrel Size (L)**
  Enter the capacity of the barrel being filled (e.g., 225 L). Common presets like **Barrique**, **Hogshead**, and **Puncheon** are available for quick selection.
- **Tank Selection**
  Identify the source tank (e.g., **SHIRAZ**) supplying the liquid to ensure traceability and correct batch logging.

Live Volume Tracking

- **Current Barrel**
  Displays the volume currently delivered into the active barrel.
- **Total Volume**
  Shows the cumulative amount delivered over multiple barrels in the session.
- **# Barrels Filled**
  Keeps a running count of how many barrels have been completed.
- **Visual Indicator**
  A graphical barrel fill level gauge updates in real-time as the barrel fills, aiding visual monitoring.

Controls & Actions

Using the yellow handsets, it's possible to perform basic barrel functions – please see the "Radio Handset" chapter for a list of commands. 👉

You can also use the optional barrel system for more accurate control and sensor functionality – please see Appendix B for further details. 👉

- **NEXT BARREL**
  Clears the current barrel count and prepares the system to begin filling the next.
- **OPEN VALVE / RESET ALL**
  Provides manual override to open the main valve or reset all counters and states.
- **EXIT FILLING MODE**
  Ends the current session and exits to the previous or default mode.
- **START PUMP**
  This is the same as pushing the start button on the radio handset.
- **STORE HISTORY**
  Logs the details of the session for records or analysis.
- **GENTLE START**
  Activates a ramp-up phase (e.g., 30 seconds) to prevent splashes or foam during barrel filling.

Barrel Emptying

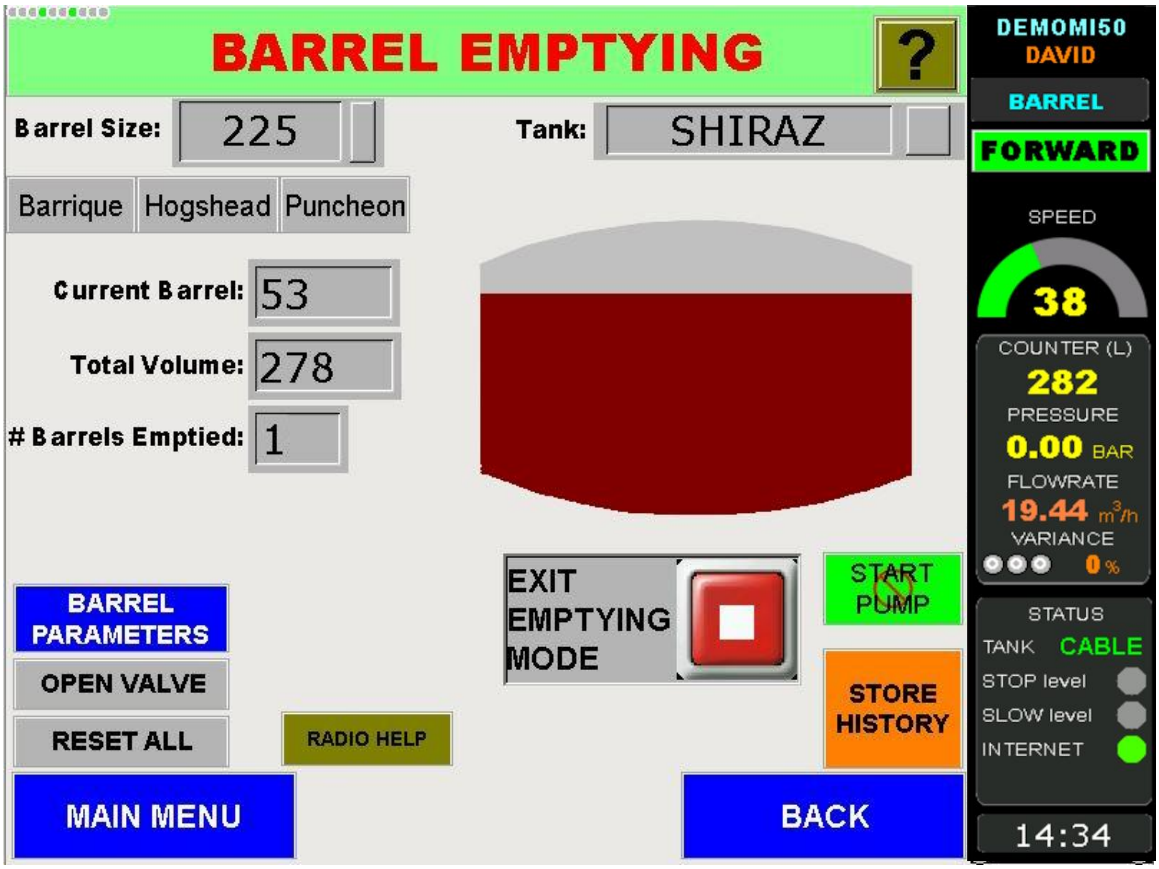


Figure 15

The **Barrel Emptying** screen allows operators to accurately and efficiently remove liquid from barrels into a tank. This mode is crucial in production settings where full recovery, flow control, and tracking of output are key to operational success.

To enter barrel emptying mode, you must select "Enter Emptying Mode".

Emptying Parameters

- **Barrel Size (L)**
  Specify the capacity of the barrel being emptied (e.g., 225 L). Quick selection options like **Barrique**, **Hogshead**, and **Puncheon** make it easy to match the correct format.
- **Tank Selection**
  Designate the destination tank receiving the emptied contents (e.g., **SHIRAZ**).

Live Volume Tracking

- **Current Barrel**
  Indicates how much liquid has been emptied from the current barrel.
- **Total Volume**
  Shows the combined amount emptied across multiple barrels in this session.
- **# Barrels Emptied**
  Displays a count of how many barrels have been processed during the current cycle.
- **Graphical Fill Indicator**
  A visual gauge illustrates the progress of the barrel being emptied.

Controls & Actions

Using the yellow handsets, it's possible to perform basic barrel functions – please see the "Radio Handset" chapter for a list of commands. 👉

You can also use the optional barrel system for more accurate control and sensor functionality – please see Appendix B for further details. 👉

- **BARREL PARAMETERS**
  Opens detailed settings for barrel flow rates, speed, and pressure.
- **OPEN VALVE / RESET ALL**
  Manual controls to open the valve or reset system values and counters.
- **EXIT EMPTYING MODE**
  Ends the current emptying cycle and returns to standard control.
- **START PUMP**
  This is the same as pushing the start button on the radio handset.
- **STORE HISTORY**
  Records the current session's data for later analysis or compliance purposes.

Barrel Parameters

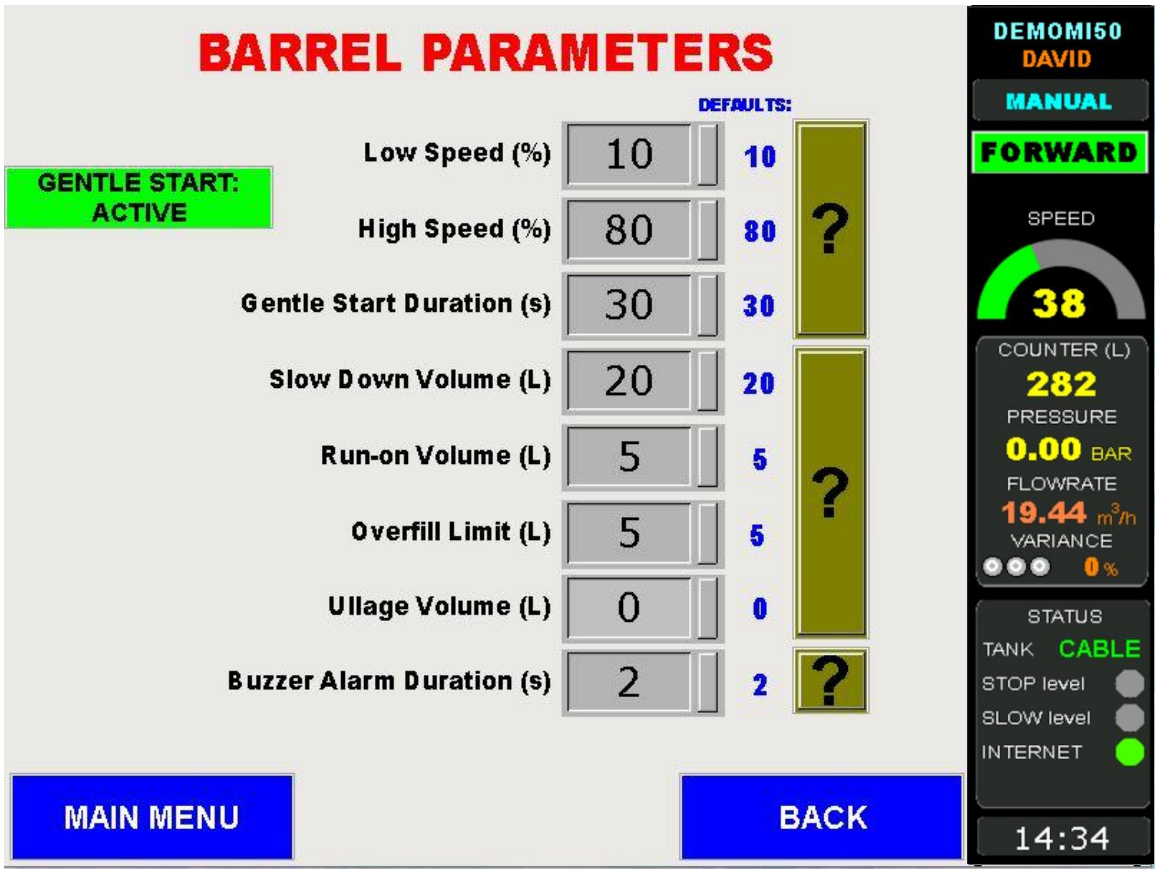


Figure 16

The **Barrel Parameters** screen provides fine-tuned control over the filling and emptying behaviour specific to barrel operations. These settings help prevent overfill, ensure gentle handling, and allow accurate recording of fluid transfer volumes.

Adjustable Settings

- **Low Speed (%)**
  The pump speed used for precision operations at the beginning of a gentle start, or end of a barrel (Slow Down Volume).
- **High Speed (%)**
  The maximum pump speed used for bulk transfer during the middle of the cycle.
- **Gentle Start Duration (s)**
  Time over which the system gradually ramps up from low to high speed, reducing surge and splashing.
- **Slow Down Volume (L)**
  Volume before reaching target where the system goes to slow speed, ensuring accuracy.
- **Run-on Volume (L)**
  Expected overshoot after stopping the pump—used to fine-tune the actual target delivery.
- **Overfill Limit (L)**
  Buffer zone above the target volume before the system triggers an overfill alarm.
- **Ullage Volume (L)**
  A reserved headspace (typically 0–5L) to account for expansion and avoid spillage.
- **Buzzer Alarm Duration (s)**
  Duration of buzzer activation for warning alarms (e.g., overflow). A short duration alerts operators without prolonged sound.

Status Display

- **Gentle Start Status**
  Confirms if **Gentle Start** is currently **ACTIVE**, visually assisting operators with system awareness.

Users screen

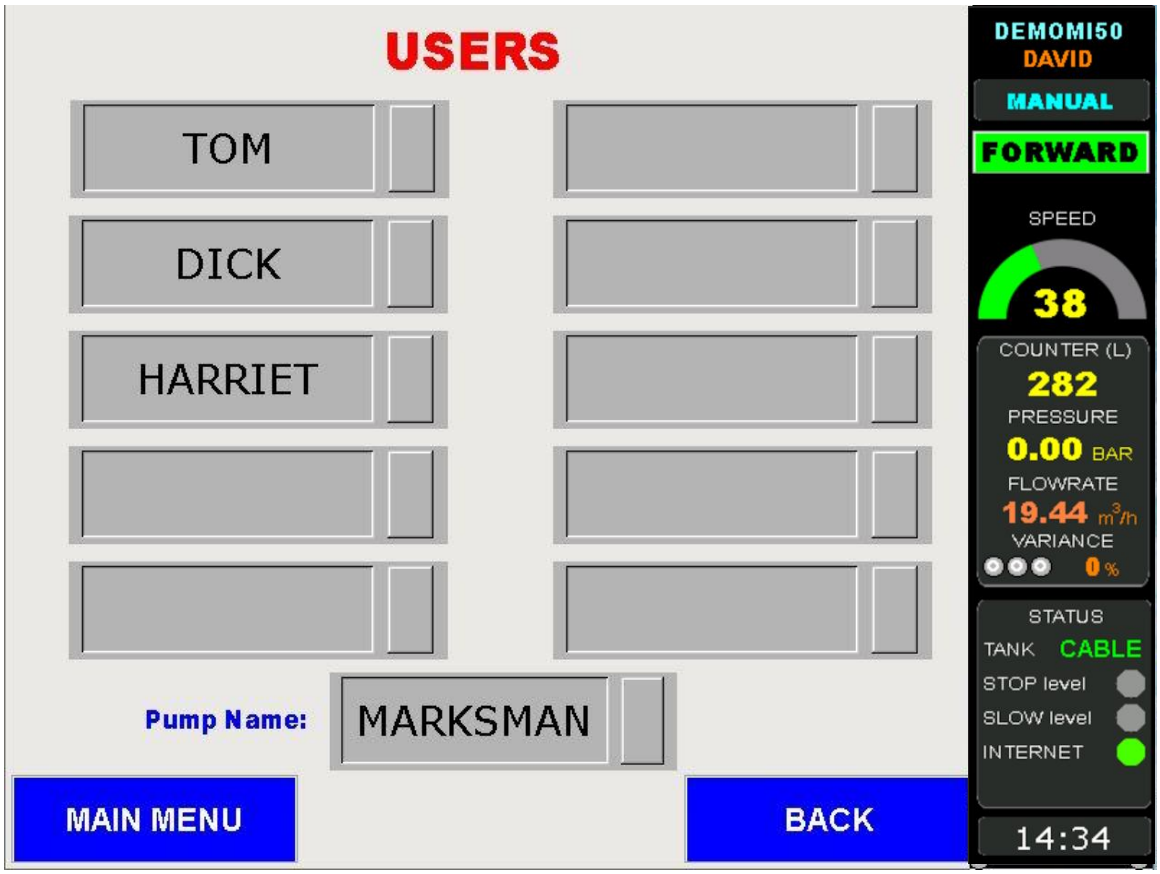


Figure 17

The **Users** screen allows you to enter up to 10 regular operators and the pump name, providing access control and user management for the system. Once populated it allows operators to log their name before a batch, or wherever a "Store History" function is available.

This function helps maintain clear records of who initiated each session and ensures that operational logs, alarms, and batch history are tied to identifiable personnel. It is a simple yet essential feature for regulated environments or collaborative workplaces.

Upon startup it is possible to go directly to a "User select" screen, meaning that at all times a user will be listed on the status bar. As default, upon startup the main menu will be displayed.

User List Interface

- **Predefined Users**
  Displays a list of saved user names such as **TOM**, **DICK**, and **HARRIET**. Operators can simply select their name to log in before beginning a session or when making a history entry.
- **Empty Slots**
  Blank name fields indicate available slots for future user entries or edits.
- **Edit Function**
  Each user can be edited, allowing changes to existing names or to add new users.

Pump Identification

- **Pump Name**
  The system allows for naming the pump (e.g., **MARKSMAN**) for clear identification—especially useful in multi-unit environments or remote access. A level 3 password is required to change this.

History Logging

The **Data** screen provides a historical record of pump operations, ensuring full traceability of batch, manual, and other activities. Each time a job is completed—or a key action is taken—a new entry is stored in the system memory.

This feature is especially useful for auditing, quality control, and verifying production records.

All data is stored on a USB flash drive connected to the back of the HMI. If required, the USB drive can be removed to access the file on a computer (stored as a CSV file).

⚠ **Note: Before removing the USB drive, you must press "REMOVE STORAGE" or you may lose all stored data.**

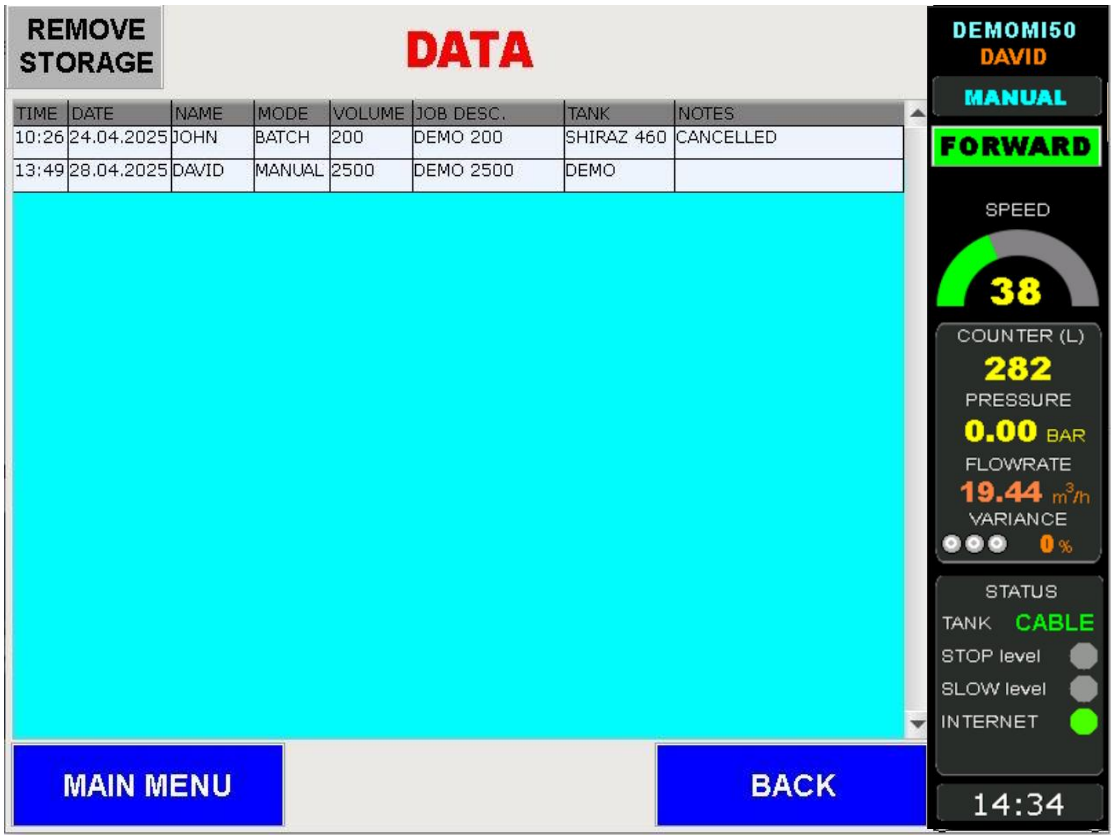


Figure 18

Recorded Information

- **Time**
  The exact time the job was recorded.
- **Date**
  The date the job was performed.
- **Name**
  The operator logged into the system at the time of the operation.
- **Mode**
  The pump mode used (e.g., **Batch**, **Manual**, **Pressing**).
- **Volume**
  The total volume processed during that operation.
- **Job Description**
  A free-text field allowing a short description of the task (e.g., Shiraz tfr).
- **Tank**
  The source or destination tank involved in the operation.
- **Notes**
  Any additional status notes such as “Completed” or "Cancelled," or breakdowns of barrels/pressing data.

Functions

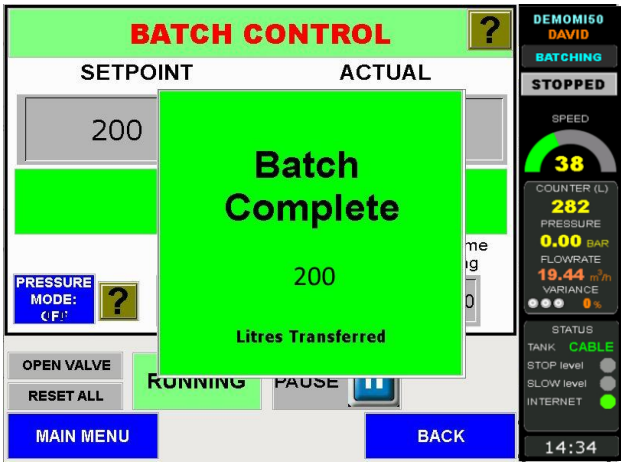
- **REMOVE STORAGE**
  This button must be pushed if you ever need to remove the USB drive from the HMI. If the USB drive is removed without performing this, it may lose all data.
- **Scroll**
  If many records exist, use the scrollbar on the right side to review earlier entries.

This screen ensures production transparency, supports regulatory compliance, and helps operators and supervisors track activity over time.

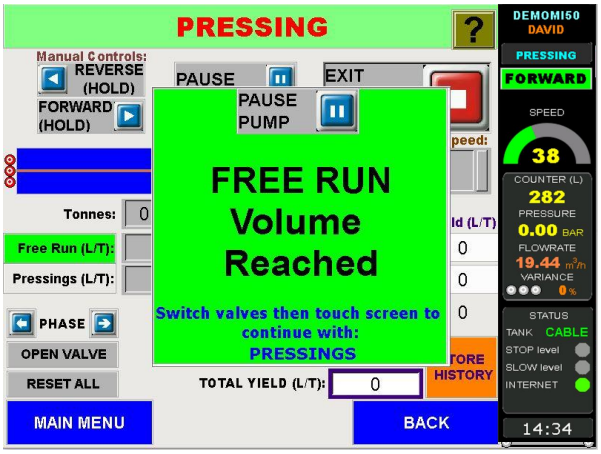
System Alarms & Warnings

Volume-Based Alarms

- **Batch Complete Alarm**
  Triggers when the actual volume reaches the setpoint during batching. The pump stops and a message is displayed.

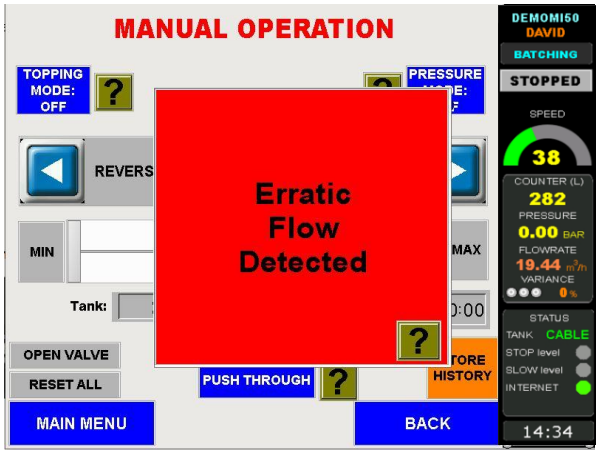


- **Pressing Yield Alarm**
  Sounds **continuously** when the expected **Free Run** or **Pressings** volume is reached.
  → Must be acknowledged by the user to stop.



Flow and Sensor Alarms

- **Erratic Flow Alarm**
  Activates when flow rate fluctuates abnormally, potentially from an empty source tank or disruption of flow.
    - **Speed unchanged timer**
    - **Erratic flow sensitivity**
    - **Marker trigger point**



→ Can be tuned in the **High-Level Parameters**.: If the erratic flow alarm is too sensitive, **increase** the sensitivity value in the high level parameters. 👉

- **Pressure Drop Alarm**
  Triggers if system pressure suddenly changes by more than the specified threshold (e.g., 0.3 bar). This could be due to a hose rupture or opening a valve. It's particularly useful for unattended transfers, but please note that small pressure differences (such as a leaking hose) will not be detected.
  → Can be tuned in the **High-Level Parameters**. 👉

- **No Flow Alarm**
  Alerts if no flow is detected for a configured period (e.g., 10 seconds). Helps detect blocked hoses, closed valves, or pump faults.

Buzzer

- **Buzzer Enabled/Duration**
  Sounder activates for a set duration (or indefinitely if set to 0). There are 2 buzzer durations – one for general alarms and one for barrel filling and emptying.

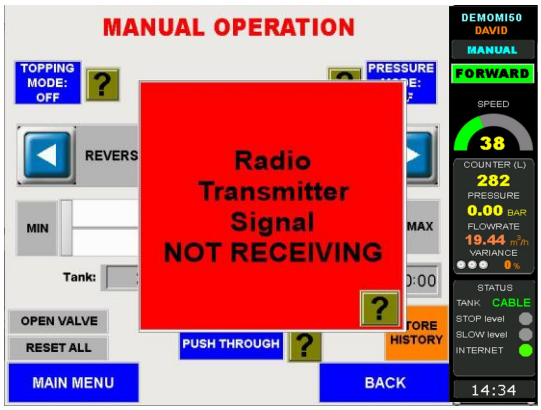
Barrel Control Alarms

- **Top Sensor Alarm (Stop Pump):**
  If the **top barrel sensor** (optional extra) is triggered, the pump stops to prevent overfilling.
- **Overfill Limit Alarm:**
  If actual barrel fill exceeds the configured **Overfill Limit (L)**, the system can trigger an alert. The Overfill Limit is an amount that is added to the set volume of the barrel, simply to allow for oversize barrels.

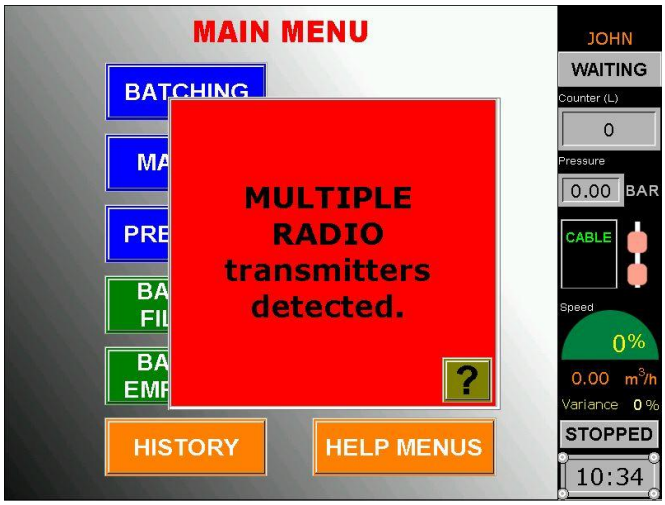
Radio Related Alarms

⚠️ **Note:** The following alarms are related to the optional radio accessories, such as the barrel controller or tank sensor. They are not referring to the yellow handsets.

- **Radio Transmitter Signal NOT RECEIVING**
  The radio transmitter sends a polling signal every few seconds to the pump. If one of these polling signals is not received within a specified time frame, the pump will trigger this alarm and stop running. Causes could be a flat battery in the transmitter, turning off the transmitter, or too much distance/interference between the transmitter and the pump.



- **MULTIPLE RADIO transmitters detected**
  This alarm is triggered if more than one radio transmitter is active at any one time, for example the barrel filler and a tank sensor. Only one radio unit can be active to clear this alarm.

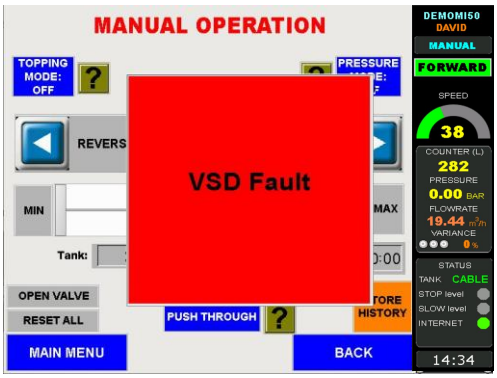


- **Tank Limit Reached**
  If the optional tank sensors are being used, triggering a “Stop” will prompt the operator to confirm whether the tank limit has been reached. This feature is especially useful when filling multiple containers—such as a multi-compartment tanker—as it allows each compartment to be filled individually. After confirming with “Yes,” the system will record a history entry (if in batching mode) or allow you to store a history entry if in manual mode.



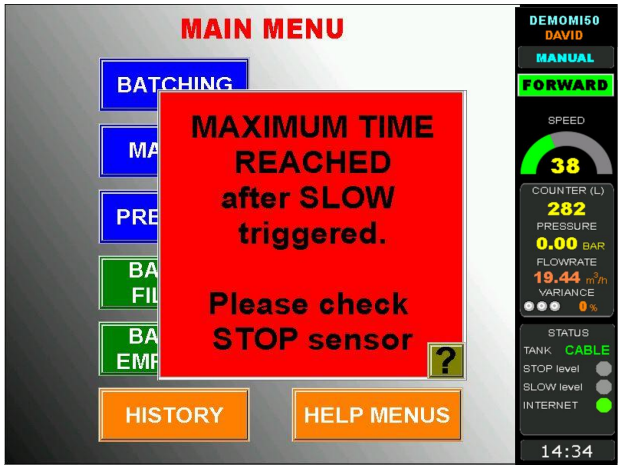
Other Alarms

- **VSD Fault**
  This indicates that the Variable Speed Drive (VSD) that controls the pump has an error, such as an overload.



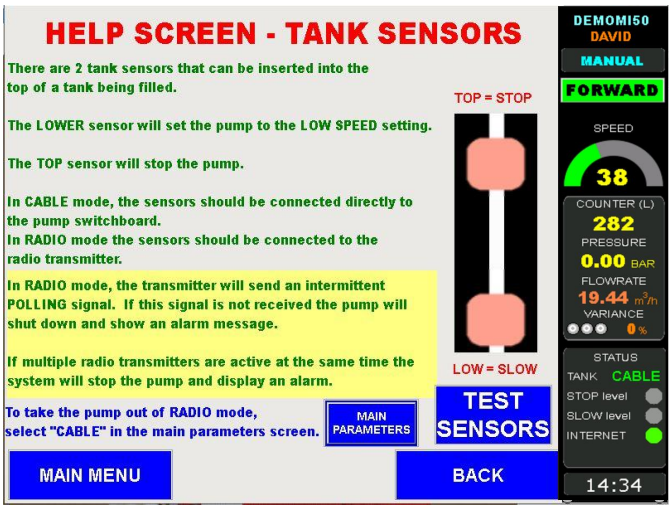
- To clear this alarm, the Marksman should be power cycled.
- For units supplied post April 2025, there is an option on the screen to reset the VSD. This can only be done with a level 2 password.
- <u>If this alarm becomes regular, please contact Marksman Smart Pumps.</u>

- **MAXIMUM TIME REACHED after SLOW triggered**
  When using the optional tank sensors, there is a time limit set that limits the time from the activation of the "slow" signal to the "stop" signal. It's a failsafe to ensure that the stop sensor is working correctly.



- If this alarm is encountered you should run a "TEST SENSORS" cycle in the Tank Sensors Help Screen (below) to ensure the sensors are working correctly. If the sensors are working properly you may need to increase the time parameter.

→ Can be tuned in the **High-Level Parameters**.



Appendices – Optional Extras

The Marksman Smart Pump is designed with modular flexibility in mind. To expand its functionality and tailor it to specific production environments, a range of optional extras are available. These add-ons enhance automation and operator convenience—allowing the pump system to grow alongside your operational needs.

Available Options

A. Tank-Level Sensors

Used to automate pump behaviour based on tank fill level.

Top Sensor: Stops the pump when a high level is reached (prevents overfilling).

Lower Sensor: Triggers slow-down near the fill target for more accurate final volumes.

Available in cabled or radio formats for flexible installation.

B. Barrel Filling and Emptying System

The **Barrel System** is purpose-built for wineries and liquid producers who require accurate, hands-free control when **filling or emptying barrels or containers.**

C. Pressing System

The **Pressing System** is purpose-built for wineries and liquid producers who require accurate, hands-free control when automatic level control is required to operate the pump.

D. Topping System

The **Topping System** is a simple device that can be used to manually add small amounts of liquid, such as for topping barrels.

Appendix A – Tank Sensor



The Marksman Smart Pump supports both cabled and radio-based tank sensors to automate pump behaviour based on liquid levels in the destination tank. These sensors improve safety, reduce operator oversight, and enhance efficiency during filling operations—especially when working with tanks that are out of direct view.

The system comprises 2 parts – the radio transmitter and the tank sensor bar.

Radio transmitter

The radio transmitter has a rechargeable power bank with a charging point in the base of the cabinet. To operate, tank sensor cable should be connected to the 4 pin connector underneath the cabinet and the power switch should be turned to “ON”. The “Stop” button will send a stop signal to the pump at any time.

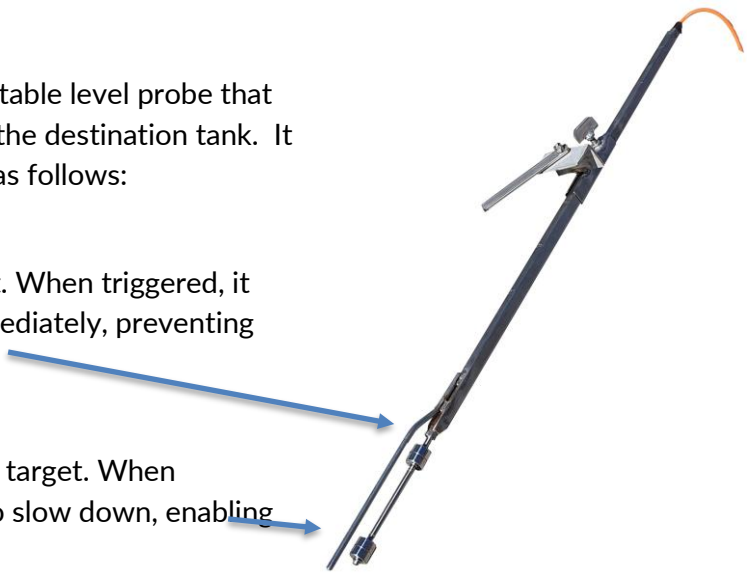
As soon as the transmitter is activated, the pump will detect it and the status bar will display “Radio ACTIVE”. The transmitter will now send a polling signal every 5 seconds to ensure continued communication with the pump. Should this signal not be received by the pump, the pump will stop and trigger an alarm.

Possible causes of this alarm are:

- The switch has been turned off
- The powerbank is flat
- The transmitter is too far away from the pump
- Interference of the signal.

⚠ **Note:** Should you then wish to use the pump without this transmitter, you need to switch the radio to “Cable” in the parameters screen.

Tank Sensor Bar



The Tank sensor bar is an adjustable level probe that can be inserted into the top of the destination tank. It has low and high level sensors as follows:

TOP SENSOR:
Positioned at the upper fill limit. When triggered, it instructs the pump to stop immediately, preventing overfill or spills.

LOWER SENSOR:
Detects the approach of the fill target. When triggered, it causes the pump to slow down, enabling more precise control.

Connection Modes:

CABLE Mode:
Requires a direct wired connection from the tank sensors to the pump's switchboard. This is an option for nearby tanks, tankers or fixed installations.

RADIO Mode:
Uses a wireless transmitter installed on the tank.
⚠ *The transmitter must be powered and within range to function correctly.*

During filling:

If the lower sensor is triggered, the pump slows to the configured low speed.

If the top sensor is triggered, the pump stops immediately and records the event in the history. The operator may be prompted to confirm whether the tank is full, allowing continuation to the next compartment (e.g., in a tanker with sections).

Benefits:

- Prevents overfilling and spillage
- Supports multi-compartment tanks (e.g., tankers)
- Enables hands-free operation during filling
- Works seamlessly with manual and batch modes.

Appendix B – Barrel System

The **Barrel System** within the Marksman Smart Pump is purpose-built for wineries and liquid producers who require accurate, hands-free control when **filling or emptying barrels**. It allows the operator to manage barrels individually or in succession while maintaining precise volume tracking, gentle flow control, and clean handoffs between tasks.

The system is designed to improve efficiency and consistency during barrel work—minimizing foaming, overflow, and user intervention.

The system also uses a radio transmitter similar to that in the tank sensor system. To operate, the sensor cables should be connected to the 2 pin connectors on the controller and the power switch should be turned to "ON".

As soon as the transmitter is activated, the pump will detect it and the status bar will display "Radio ACTIVE". The transmitter will now send a polling signal every 5 seconds to ensure continued communication with the pump. Should this signal not be received by the pump, the pump will stop and trigger an alarm.

Possible causes of this alarm are:

- The switch has been turned off
- The powerbank is flat
- The transmitter is too far away from the pump
- Interference of the signal.

⚠️ **Note:** Should you then wish to use the pump without this transmitter, you need to switch the radio to "Cable" in the parameters screen.

Key Features



- **Dedicated barrel spear**
  The modular barrel spear provided with this system includes a sight glass, ball valve (for liquid control during insertion and removal in barrels) and a filling and emptying sensor.
- **Barrel controller**
  The barrel controller is a rechargeable radio system similar to that in the tank sensor. It connects to the sensors for filling and emptying modes, and has start and stop buttons.
- **Barrel sensors**
  The filling sensor is an adjustable liquid sensor on the front of the spear, and has 2 stainless steel probes. It should be adjusted to slide into the barrel bunghole, and should the barrel fill up before the set limit this will stop the pump instantly.

  The emptying sensor is a stainless steel probe on the inside of the spear that will detect when air is inside the tube (i.e. when the barrel is empty).

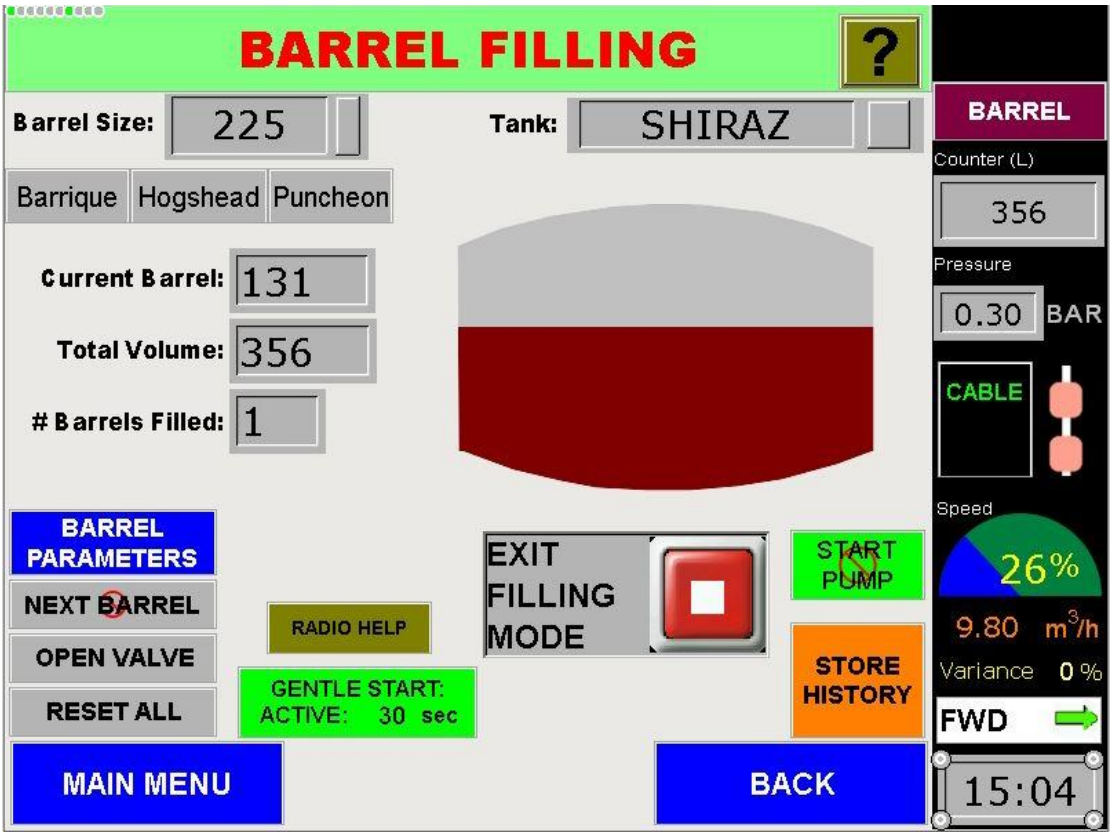
Operation

When filling or emptying barrels, you should always enter the barrel size. This will ensure that the pump stops according to your parameters, correctly shows the volume filled/emptied on screen, and correctly tracks the number of barrels.

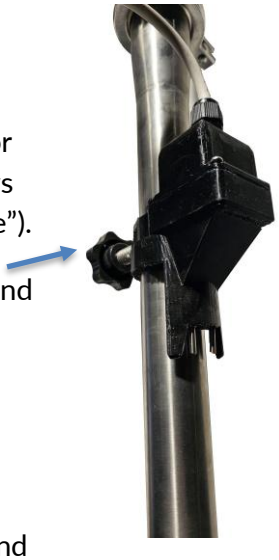
- **Barrel Size (L)**
  Enter the capacity of the barrel being filled (e.g., 225 L). Common presets like **Barrique**, **Hogshead**, and **Puncheon** are available for quick selection, or you can manually enter any value.

⚠️ Relevant parameters can be found in the “Barrel Filling” chapter. 👉

- **Tank Selection**
  Identify the source (or destination) tank (e.g., 2025 SHIRAZ) supplying the liquid to ensure traceability and correct batch logging.



Barrel Filling Mode



In filling mode, the sensors on the front of the barrel spear will stop the pump. It's important to still enter the barrel volume, not only for visual indication and records, but also to ensure that the pump slows down a few litres before completion (parameter "slow down volume").

The sensor is adjustable using the knob on the back of the sensor, and should be adjusted to be inside the barrel when the spear is fully inserted.

On the controller, "FILL" should be selected, and the front sensor cable should be connected to the top of the box.

When "start" is pressed, the current barrel volume will set to zero and the pump will start. If gentle start is active it will gently ramp up the speed as per your settings.

Upon completion of a barrel, the system will stop the pump allowing you to move the spear to the next barrel. Once inserted, press the "start" button again to commence filling.

Barrel Emptying Mode

In emptying mode, the sensor on the inside of the barrel spear will stop the pump. It's important to still enter the barrel volume, not only for visual indication and records, but also to ensure that the pump slows down a few litres before completion (parameter "slow down volume").

On the controller, "EMPTY" should be selected, and the rear sensor cable should be connected to the bottom of the box.

When "start" is pressed, the current barrel volume will set to zero and the pump will start. If gentle start is active it will gently ramp up the speed as per your settings.

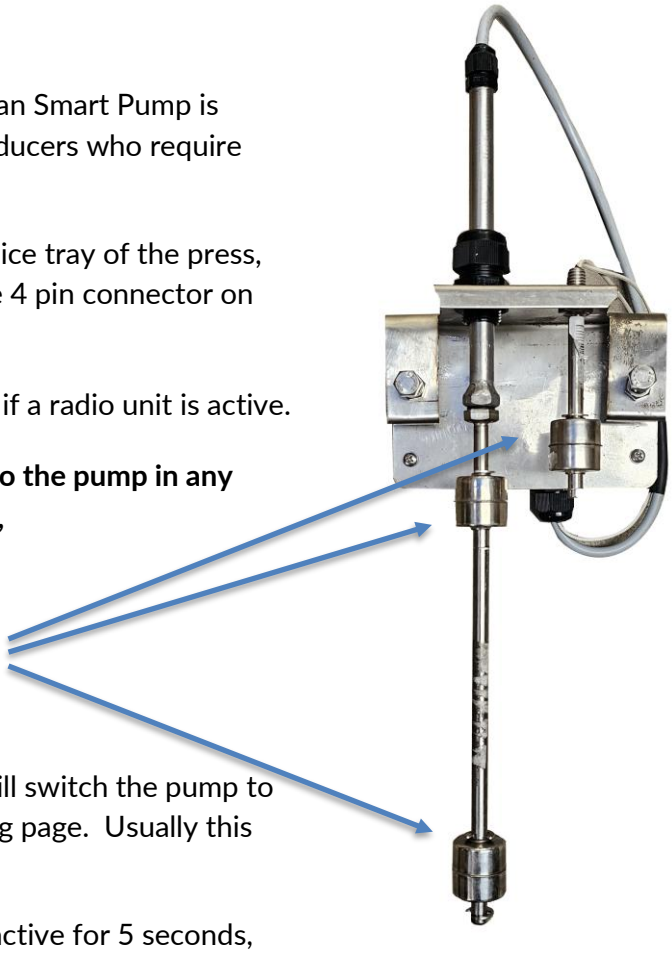
Upon completion of a barrel, the system will stop the pump allowing you to move the spear to the next barrel. Once inserted, press the "start" button again to commence emptying.

- **Automatic Gentle Start & Slow Down**
  Gradually ramps up speed to reduce turbulence, then slows down before the fill target is reached to improve topping accuracy.
- **Multi-Barrel Operation**
  Once a barrel is full or empty, the operator can quickly switch to the next barrel using the **"Next Barrel"** button. The system resets values and logs the previous operation automatically.
- **Tank & Wine Type Selection**
  Operators can assign a tank name or product label (e.g., SHIRAZ, GRENACHE) for each session, which is stored alongside each history record.
- **Visual Fill Level**
  The touchscreen displays a visual barrel fill gauge, giving the operator real-time feedback on progress and allowing for quick confirmation from across the room.

Ideal Applications:

- Filling new barrels from tank
- Emptying barrels during blending or transfers
- Barrel-by-barrel tracking of yields

Appendix C – Pressing System



The **Pressing System** within the Marksman Smart Pump is purpose-built for wineries and liquid producers who require accurate, hands-free control pressing.

The sensor should be inserted into the juice tray of the press, and the cable connected directly into the 4 pin connector on the side of the pump switchboard.

⚠️ **Note:** This controller cannot be used if a radio unit is active.

⚠️ **Note: It should NOT be connected to the pump in any other mode as it will affect functionality,**

There are 3 level sensors on the unit:

- **Top Sensor (high level)**

  This sensor is an alarm sensor that will switch the pump to the high speed setting on the pressing page. Usually this would be set to 100%.

  Should the high level sensor remain active for 5 seconds, this indicates that the pump is not able to keep up with the inflow of liquid. It will sound a continuous alarm while continuing to pump at full speed.

- **Middle Sensor (start pump)**

  This sensor will start the pump at the speed selected on the slider bar of the pressing page. It will continue running at this speed until the liquid level goes below the bottom sensor, at which point it will stop.

  Should the high level sensor remain active for 5 seconds, this indicates that the pump is not able to keep up with the inflow of liquid. It will sound a continuous alarm while continuing to pump at full speed.

- **Bottom Sensor (low level)**

  When the liquid is below this level the pump will not run.

Appendix D – Remote Access & Monitoring

Marksman Smart Pumps are fitted with a remote access communications module. This allows your pump's HMI screen to be viewed securely from anywhere in the world, and allows Marksman Smart Pumps to provide faster support, remote software updates and optional performance reporting.

What Remote Access Provides

- **Live monitoring:** View your pump's HMI screen live from any phone, tablet or PC using a standard web browser — no special software required.
- **Faster support:** Our team can connect directly to your pump to diagnose issues remotely, often resolving them without a site visit.
- **Remote software updates:** Software improvements can be installed on your pump remotely as they are released, without needing to schedule a technician visit.
- **Optional usage reports:** Weekly reports showing pump run time, connection history and any alerts, giving a clear picture of your system's performance.

How It Works

A small communications module is fitted inside the pump switchboard. It connects to the internet using the pump's built-in SIM card, or via your site's Wi-Fi network for units fitted with the Wi-Fi communications option. Once connected, it creates a secure, encrypted link back to the Marksman Smart Pumps support servers. No changes are made to your network, and there is no ongoing setup required once installation is complete.

⚠️ **Note:** The connection does not open any ports on your network, cannot access your computers or files, and is accessible only to authorised Marksman Smart Pumps personnel.

Connecting the Wi-Fi Communications Module

Pumps fitted with the Wi-Fi communications option need to be connected to your site's Wi-Fi network during installation, or after any change to your network name or password. The module's temporary Wi-Fi network name and login details are printed on a label underneath the module.

1. On your phone, tablet or PC, go to Wi-Fi settings and connect to the module's temporary network, printed on the label underneath the module (name begins with "RUT240_").
2. Open a web browser and go to http://192.168.1.1
3. Log in using the username "admin" and the password printed on the label ("admin01" by default).
4. Click the menu icon (≡), then go to Network > Wireless > Wireless Station Mode, and click Configure.

5. Tick Enable, click Scan, and select your Wi-Fi network from the list.
6. Set Encryption to WPA2, enter your Wi-Fi password, then click Save & Apply.
7. Reconnect your phone, tablet or PC to your regular Wi-Fi network. The module will now connect automatically every time it is powered on.

⚠️ **Note:** Your device will temporarily lose internet access while connected to the module's setup Wi-Fi network. This is normal and will restore once setup is complete.

For full step-by-step instructions with screenshots and a troubleshooting table, refer to the separate **Remote Access – Wi-Fi Setup Guide** supplied with your pump.

Security & Privacy

The remote connection uses high-grade WireGuard encryption. It provides access only to the pump control system and does not affect your network's speed, security or other connected devices. Further details are available in the Remote Access Security Overview, available on request.

Support

For help with remote access or Wi-Fi setup, or to confirm whether your pump's connection is active, contact Marksman Smart Pumps on +61 8 8326 8521 or sales@marksmansmartpumps.com.au.

Troubleshooting Guide

The following table lists common issues that may arise during pump operation, along with their likely causes and suggested solutions.

Problem	Possible Cause	Solution
Pump won't start	No power	Check power supply
	Radio mode enabled with no transmitter active	Check transmitter (if required) or switch to "Cable" mode in parameters screen
	Pump jammed	Check for foreign bodies in the pump
	Impeller age	Replace impeller
	Remote controller has a flat battery	Recharge battery
No flow detected	Closed valve or air in system	Open valve and check hoses for air
	Parameter is too low	Adjust parameter (recommend > 5 s)
Erratic flows are happening a lot	Sensitivity is too high	Adjust sensitivity in high level parameters. Note: To DECREASE the sensitivity, increase the value.
	Alarm is set to Marker 1, so alarm triggers on any single fluctuation outside the parameters	Set alarm to Marker 2, which requires 2 fluctuations in a period of time.
Pump stops unexpectedly	Top tank sensor triggered or alarm active	Check sensor status and acknowledge any alarms
Inaccurate volume readings	Air in line	Purge air
	Flowmeter not calibrated	Calibrate flowmeter
Alarm sounds continuously, even when acknowledged	Glitch	On the main menu, touch the time display (bottom right). A hidden button will silence the alarm.
Radio handset not responding	Flat battery or out of range	Charge handset or move closer to receiver

Overfilling despite correct setpoint	Run-on volume too high	Reduce run-on volume in parameters
Message on screen saying USB not detected	USB drive has come loose	Check USB drive on back of HMI inside switchboard

Thank You

Thank you for choosing the **Marksman Smart Pump**. We are committed to delivering innovative pumping solutions that combine precision, performance, and ease of use—built specifically for industries where quality and traceability matter most.

Whether you're managing batches, topping barrels, or simply transferring your valuable product, we hope this system enhances your workflow and gives you the confidence to focus on what matters most—your craft.

Need Assistance?

If you need support, training, or spare parts, we're here to help:

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Hackham, South Australia
📞 **Phone:** +61 8 8326 8521
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We value your feedback—please don't hesitate to reach out.

Marksman Smart Pumps

The pumps that hit their mark, every time.