Polymaster C11 Multifunctional Controller Instruction Manual

Contents

Polymaster C11 Multifunctional Controller

Specifications:

- Main Isolator: Yes
- Sunlight Shield: Included
- Power Supply: Three Phase & Single Phase
- Alarm Reset Button: Yes
- Emergency Stop Switch: Yes

Product Usage Instructions

Controller Front Layout:

The controller front layout includes various components for operation:

1. Main Isolator: Used to isolate power supply to the controller.
2. Front Panel Locking Tab x2: Secure the front panel in place.

Controller Internal Layout:

The internal layout consists of essential components such as:

- PLC (Programmable Logic Controller): Controls the operation of the system.
- Contactor: Manages power distribution within the controller.

Input / Output Wiring:

Connect various sensors and switches to the controller using the provided terminals:

1. Bund Level Switch: Monitors the level of liquid in the tank.
2. Run Dry Sensor: Detects when the tank is running dry.

Radar Connection:

Connect Radar Sensor wires to Terminal 14 for radar functionality.

Output Test Button:

Use the OUTPUT CHECK button to test all outputs and customer contacts.

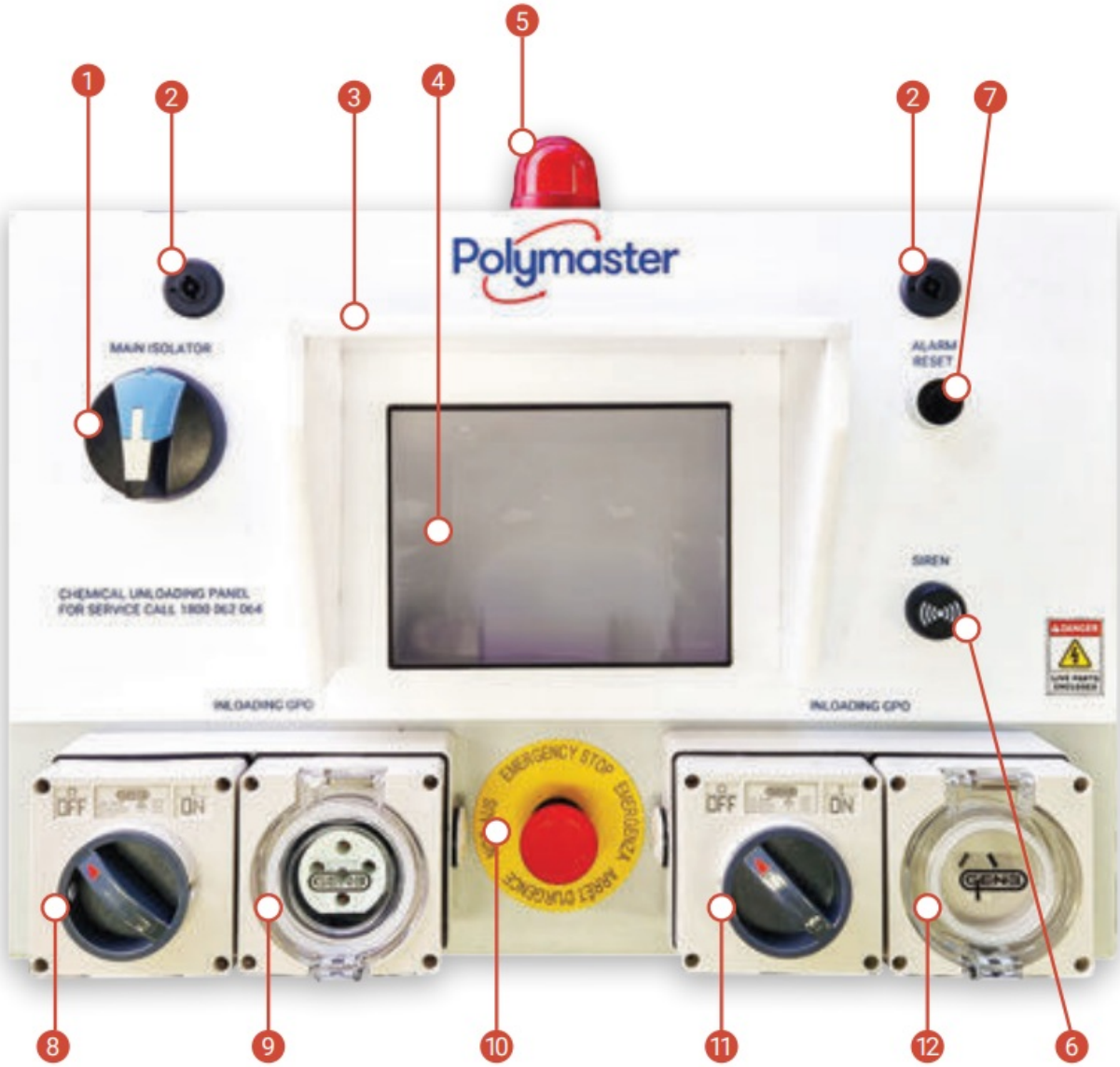
Display Screens:

Monitor power status and access setup screens for configuration.

FAQ

- **Q: How do I access the setup screen?**
  - A: Press SETUP from the home screen, enter the password, and click ENTER.
- **Q: How can I switch between Truck Fill Mode and Transfer Station Mode?**
  - A: Select the check box on the screen to change modes.

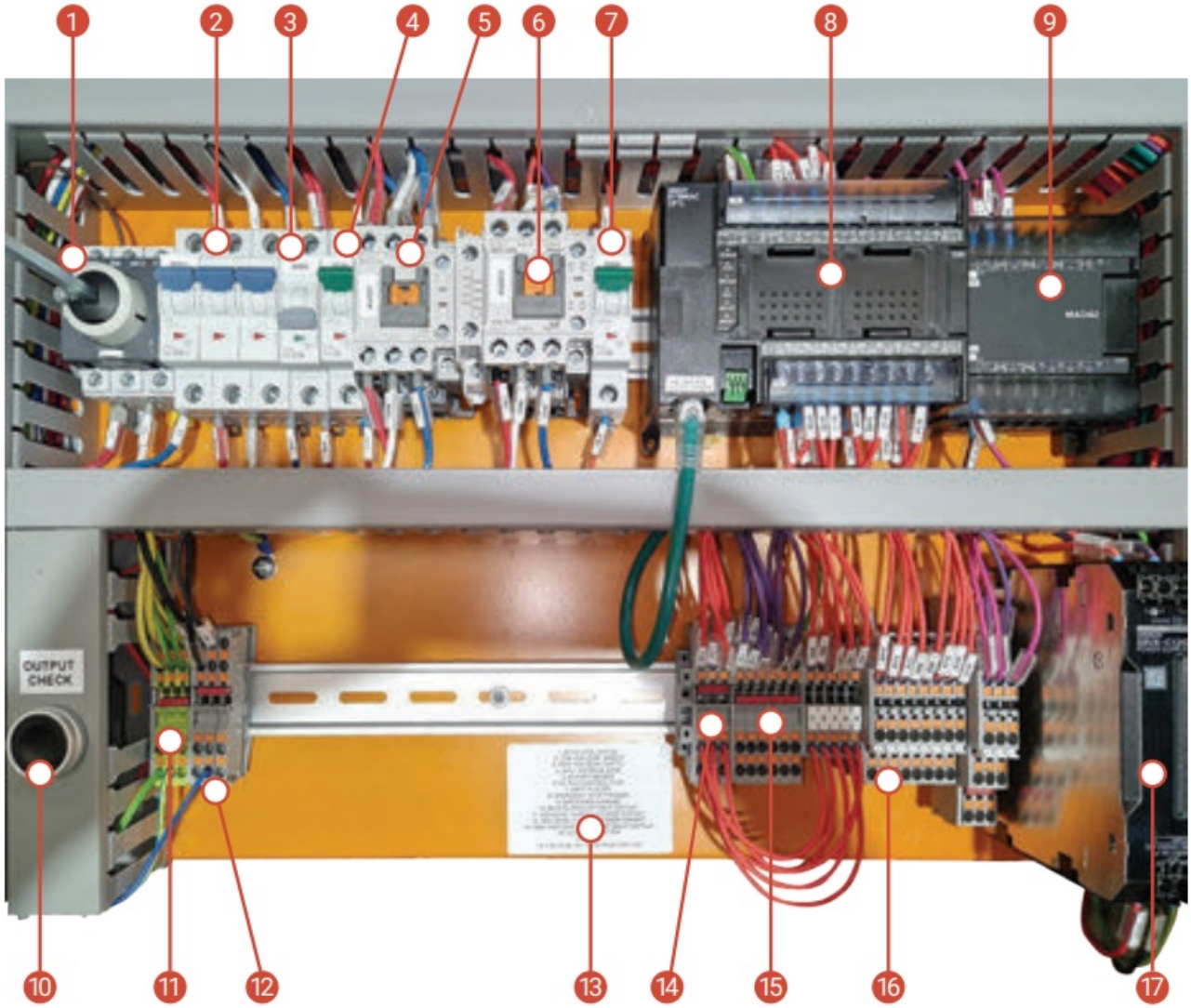
Controller Front Layout



NO	DESCRIPTION
1	MAIN ISOLATOR
2	FRONT PANEL LOCKING TAB x2
3	SUNLIGHT SHIELD
4	HMI SCREEN
5	LIGHT BEACON
6	SIREN

NO	DESCRIPTION
7	ALARM RESET BUTTON
8	THREE-PHASE POWER ON/OFF SWITCH
9	THREE-PHASE POWER OUTLET
10	EMERGENCY STOP SWITCH
11	SINGLE PHASE POWER ON/OFF SWITCH
12	SINGLE-PHASE POWER OUTLET

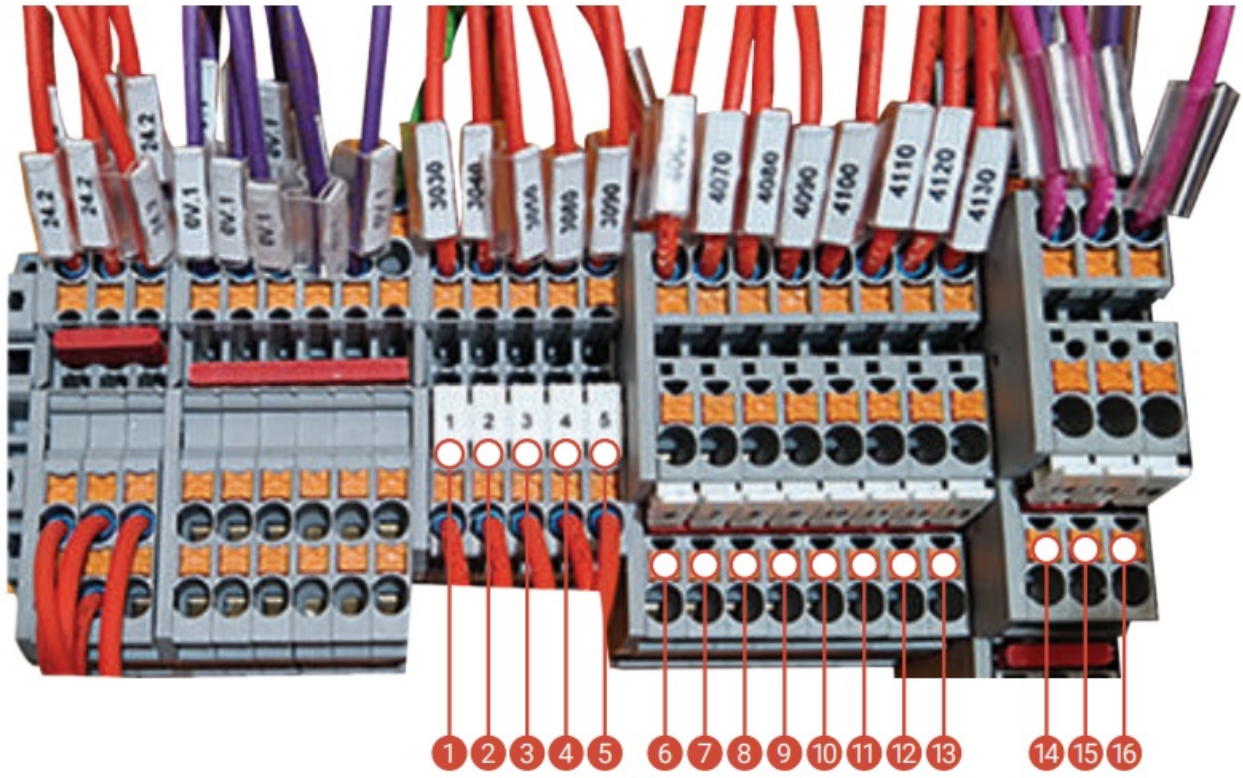
Controller Internal Layout



NO	DESCRIPTION
1	MAIN ISOLATOR
2	CIRCUIT BREAKER – 3-PHASE
3	CIRCUIT BREAKER – 1-PHASE
4	CIRCUIT BREAKER – POWER SUPPLY
5	20A CONTACTOR
6	16A CONTACTOR
7	CIRCUIT BREAKER – PLC & HMI
8	PLC
9	PLC EXPANSION

NO	DESCRIPTION
10	OUTPUT TESTER BUTTON
11	EARTH TERMINALS
12	NEUTRAL TERMINALS
13	INPUT & OUTPUT NUMBERING LABEL
14	24V TERMINALS
15	0V TERMINALS
16	INPUT / OUTPUT TERMINALS
17	24V 5A POWER SUPPLY

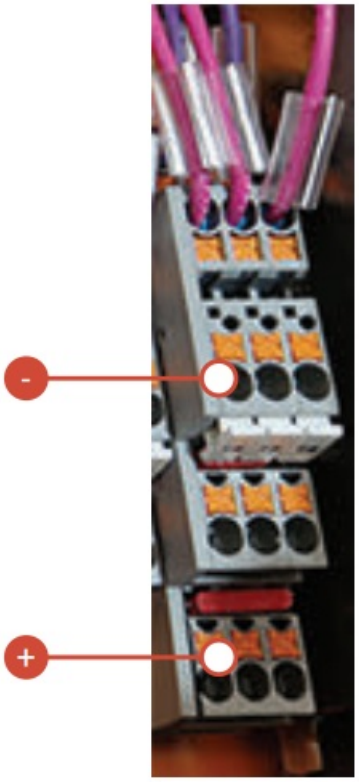
Input / Output Wiring



TERMINAL LABEL	DESCRIPTION	I/O Type	Contact Type
1	BUND LEVEL SWITCH	INPUT	NC
2	LOW LOW LEVEL SWITCH	INPUT	NC
3	HIGH HIGH LEVEL SWITCH	INPUT	NC
4	INPUT EXTERNAL STOP	INPUT	NC
5	RUN DRY SENSOR	INPUT	NC
6	EXTERNAL STOP CUSTOMER CONTACT	OUTPUT	NO
7	RUN DRY CUSTOMER CONTACT	OUTPUT	NO
8	EMERGENCY STOP PRESSED CUSTOM ER CONTACT	OUTPUT	NO
9	GPO POWER ENABLED CUSTOMER CO NTACT	OUTPUT	NO
10	BUND ALARM CUSTOMERS CONTACT	OUTPUT	NO
11	LOW LEVEL ALARM CUSTOMERS CONT ACT	OUTPUT	NO
12	HIGH LEVEL ALARM CUSTOMERS CON TACT	OUTPUT	NO
13	HIGH HIGH LEVEL ALARM CUSTOMER CONTACT	OUTPUT	NO
14	4-20mA INPUT LEVEL SENSOR	INPUT	ANALOGUE
15	SPARE		
16	4-20mA LEVEL OUT CUSTOMER CONTA CT	OUTPUT	ANALOGUE
17	EARTH SHIELDING		

Radar Connection

This connection is located at the bottom right of the controller. It is located in the “INPUT/OUTPUT TERMINALS” and is Terminal:14 Connect the wires of the Radar Sensor into the terminals shown below:



	Sensor Brand / Model	
Terminal	Siemens LR100	Vega C11
+	Black	Brown
–	White	Blue

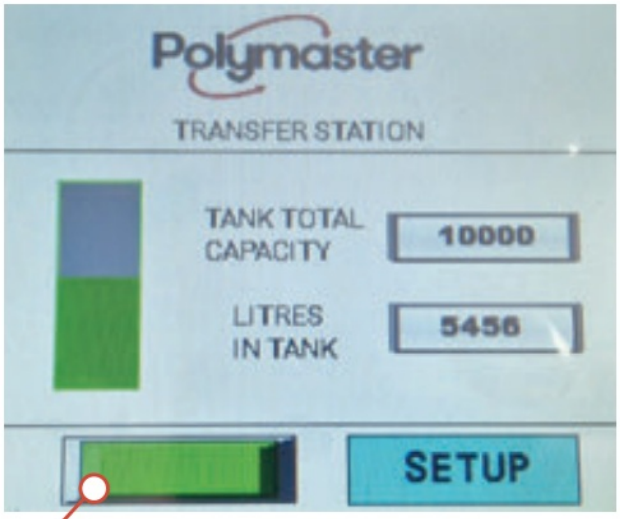
Output Test Button

Inside the controller you can use the OUPUT CHECK button to turn on all outputs. This can be useful to test the customer contacts to ensure they give the results expected at the customers end.

Display Screens

TRUCK FILL – HOME SCREEN

TRANSFER STATION – HOME SCREEN



The green box indicates that power is enabled to the GPOs. This will turn red when power is disabled.

SETUP SCREEN

- To get to the setup screen press SETUP from either of the home screens.

- The SETUP screen is password protected so only authorised users can edit the controller's functionality. See the password section in Appendix 2 for these details.

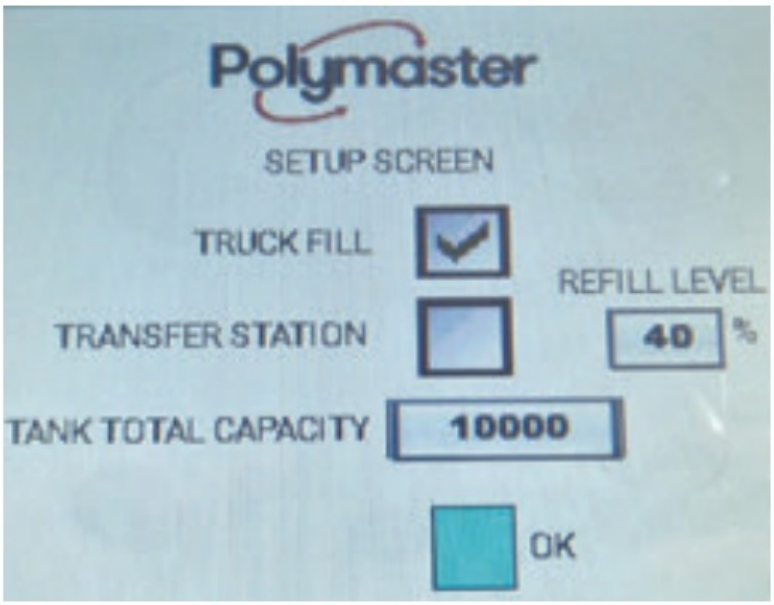
Click in the white box to enter the password.

- Type in the password using the keypad and then press ENTER.

From the SETUP screen, you are able to:

- Set the TANK WORKING CAPACITY.
- Select between TRUCK FILL MODE and TRANSFER STATION MODE.
- Set the REFILL LEVEL PERCENTAGE (for Transfer Station mode)

To change between TRUCK FILL MODE & TRANSFER STATION MODE select the check box.



ENTER TANK WORKING CAPACITY

To enter the TANK WORKING CAPACITY, click the box that the value is displayed on, \and the following keypad will appear. Type in the value and press ENTER to go back to the SETUP screen. It is important to enter the correct value. See Appendix 1 for working capacity calculation.

SET REFILL LEVEL

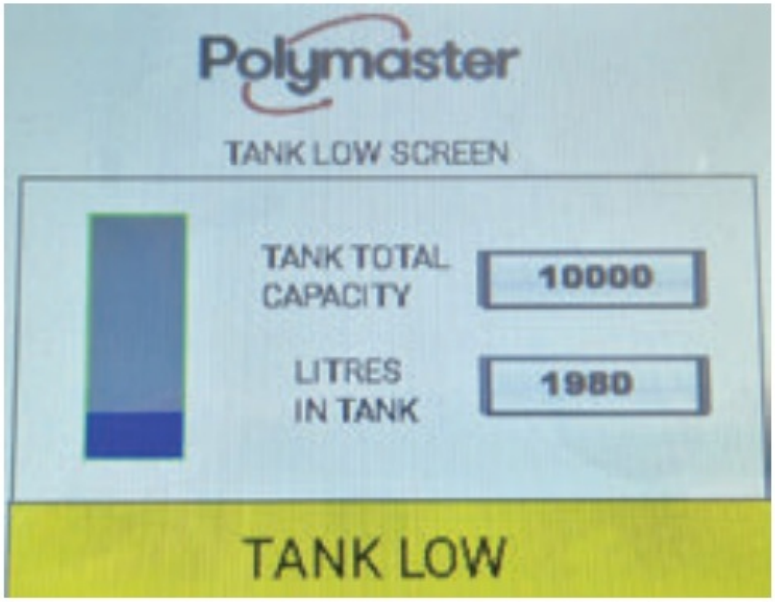
In TRANSFER STATION MODE there is a REFILL LEVEL which is set. Once the tank is filled the power to the GPOs is disabled and \will not be enabled until the level has dropped \below the REFILL LEVEL. This feature stops \the pump from short cycling. To change the TRANSFER STATION MODE REFILL LEVEL PERCENTAGE click the box that the default value of 40% is displayed in. The following keypad will appear. Enter a value between 20% – 70% and then press ENTER to go back to the SETUP screen.

To go back to the HOME SCREEN press OK.

Alarm Screens

TANK LOW SCREEN

If the liquid level goes below 20% full on the Radar Sensor or the Tank Low Level Sensor goes low then the TANK LOW warning will be displayed. Low Level Alarm Customer Contact will also be turned on.



TANK FULL SCREEN

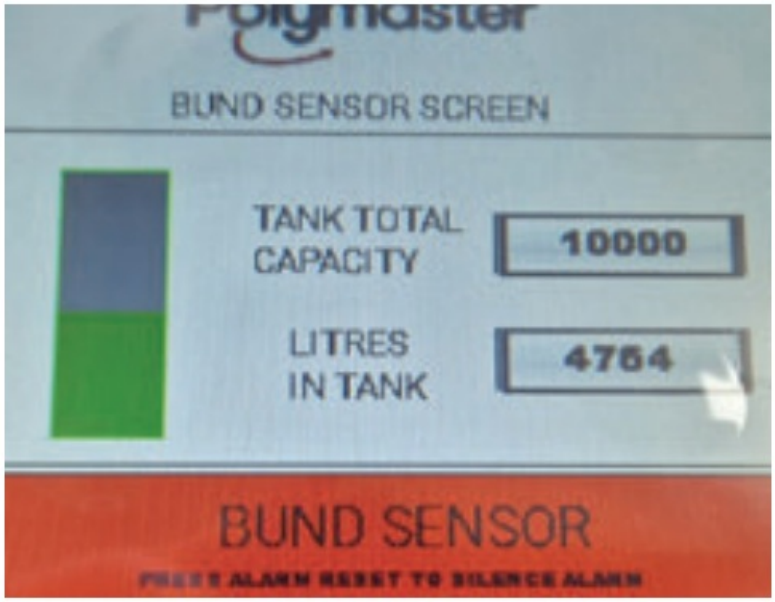
If the liquid level goes between 85% -95% full on the Radar Sensor then the TANK FULL warning will be displayed. High Level Alarm Customer Contact will also be turned on. Power to the GPOs will be disabled. An audible buzzer will sound. Press Alarm Reset to silence the alarm. Press and hold the Alarm Reset Button for 5 seconds to reenable power to the GPOs.

TANK OVER FULL-SCREEN

If the liquid level goes above 95% full on the Radar Sensor or the Tank High High Sensor goes Low then the TANK OVER FULL warning will be displayed. High High Level Alarm Customer Contact will also be turned on. Power to the GPOs will be disabled. An audible buzzer will sound. Press Alarm Reset to silence the alarm.

BUND ALARM SCREEN

If the Bund Sensor goes Low then the \BUND SENSOR warning will be displayed.\ Bund Alarm Customer Contact will also be turned on. Power to the GPOs will be disabled. An audible buzzer will sound. Press Alarm Reset to silence the alarm.

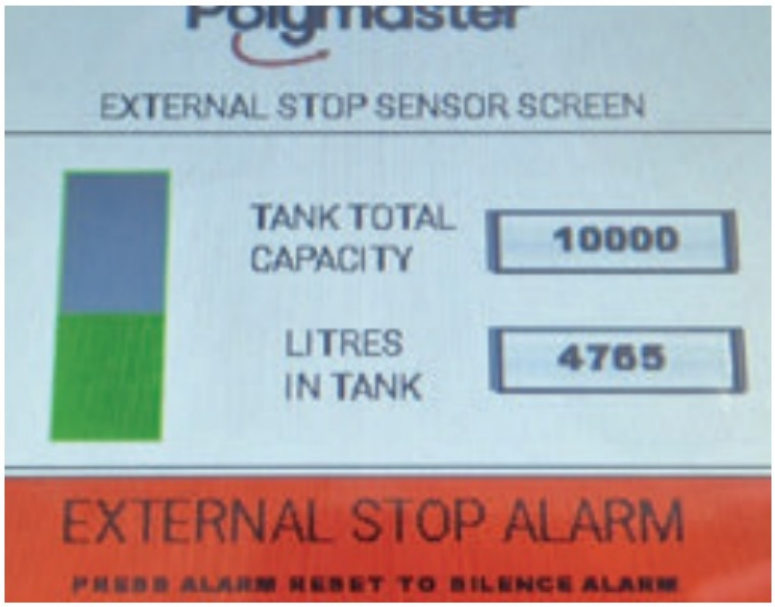


BUND & TANK OVER FULL ALARM SCREEN

If the Bund Sensor goes Low and the RADAR is measuring above 95% then the BUND SENSOR & TANK OVER FULL warning will be displayed. Bund Alarm & High High Level Alarm Customer Contacts will also be turned on. Power to the GPOs will be disabled. An audible buzzer will sound. Press Alarm Reset to silence the alarm.

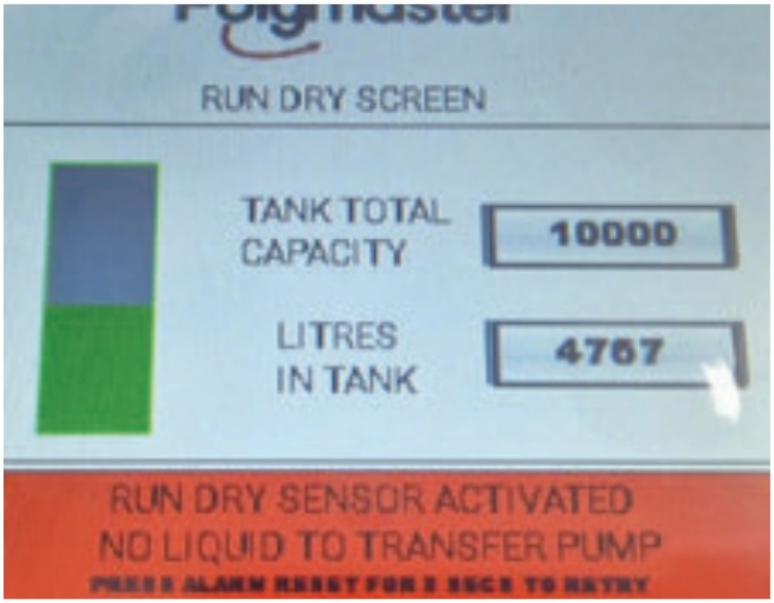
EXTERNAL STOP ALARM SCREEN

If External Stop input goes low show the EXTERNAL STOP ALARM warning. External Stop Customer Contacts will be turned on. Power to the GPOs will be disabled. An audible buzzer will sound. Press Alarm Reset to silence the alarm



RUN DRY SENSOR ALARM SCREEN

If Run Dry Sensor input goes low and the controller is in TRANFER STATION MODE show the RUN DRY SENSOR warning. Input Run Dry Customer Contact will also be turned on. Power to the GPOs will be disabled. An audible buzzer will sound. Press Alarm Reset to silence the alarm. Press and hold Alarm Reset for 5 seconds to run the pump. (Note you must keep holding the Alarm Reset Button to run the pump) If TRANSFER STATION MODE is not selected, then none of the above happens in TRUCK FILL MODE.



EMERGENCY STOP SCREEN

If Emergency Stop is pressed the EMERGENCY STOP SCREEN will be shown. Emergency Stop Pressed Customer Contact will also be turned on. Power to the GPOs will be disabled.

ALARM SCREENS ORDER OF PRIORITY

If multiple alarms are active at once the most important alarm will take priority and be displayed.

Priority	**Alarm Screen**
1	Emergency Stop
2	Bund Sensor & Tank Over Full
3	Bund Sensor
4	Tank Over Full

Priority	**Alarm Screen**
5	External Stop
6	Pump Run Dry
7	Tank Full
8	Tank Low

Appendix 1

TANK WORKING CAPACITY

A 10,000 Litre tank can not hold a working capacity of 10,000 Litres due to the overflow point. Therefore, the value entered into the SETUP SCREEN is important to be correct and needs to be calculated for each individual tank.\
The following section shows how to calculate the Tank Working Capacity and gives examples of values for our standard tanks. However, each tank should be checked as manufacturing tolerances may affect this.

WORKING AREA

The working area is the area inside the internal wall diameter. Examples of our tank range sizes are shown to the right

Tank Capacity (Litres)	Internal Diameter of Tank (m)	Working Area of Tank (m2)	Working Area of Tank * 1000
1500	0.986	0.76	760
2300	1.280	1.29	1290
3300	1.508	1.79	1790
5000	1.932	2.93	2930
7000	2.190	3.77	3770
10000	2.380	4.45	4450
13000	2.802	6.17	6170
21000	3.044	7.28	7280
30000	3.550	9.9	9900

WORKING HEIGHT

Working Height of Tank = Height from ground to bottom of overflow pipe – Tank Base Thickness.

- = (Measured Value) – 0.01m
- = m

To be exact you need to measure the real-world value. However, for our standard tanks that have not been customised the following table shows the working heights: (Note: This is for a Standard 90 PE fitting position)

Tank Capacity (Litres)	Height to bottom of Overfl ow (m)	Tank Base Thickness (m)	Tank Working Height (m)
1500	1.826	0.01	1.825
2300	1.660	0.01	1.650
3300	1.715	0.01	1.705
5000	1.635	0.01	1.625
7000	1.722	0.01	1.712
10000	2.080	0.01	2.070
13000	2.060	0.01	2.050
21000	2.822	0.01	2.812
30000	2.926	0.01	2.916

TANK WORKING CAPACITY

Tank Working Capacity = Working Area (m2 *1000) x Working Height (m)
=
Use the following table and multiply by working height to find the Tank Working Capacity.

Tank Capacity (Litres)	Working Area (m2*1000)
1500	760
2300	1290
3300	1790
5000	2930
7000	3770
10000	4450
13000	6170
21000	7280
30000	9900

Standard Tanks with 90 PE Overflow

For our standard tanks with 90 PE Overflow in the standard fitting position the following table applies.

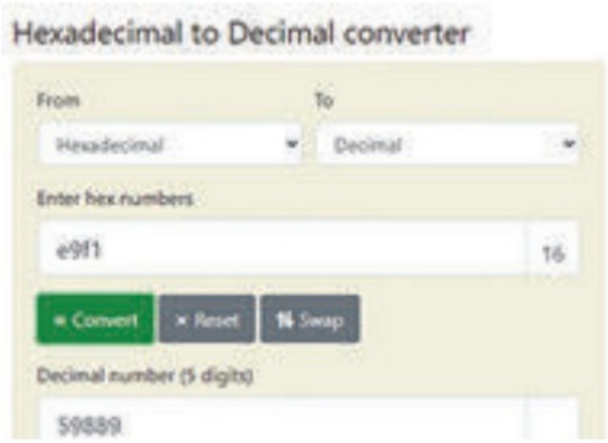
Tank Capacity (Litres)	Working Area (m2*1000)	Working Height (m)	Working Capacity (Litres)
1500	760	1.825	1393
2300	1290	1.650	2123
3300	1790	1.705	3045
5000	2930	1.625	4764
7000	3770	1.712	6449
10000	4450	2.070	9209
13000	6170	2.050	12641
21000	7280	2.812	20464
30000	9900	2.916	28863

Appendix 2

PASSWORD

The password is a conversion of the last 4 digits of the MAC address of the HMI screen from hexadecimal to decimal.
For example the HMI MAC ADDRESS can be found here:

For example the **HMI MAC ADDRESS** can be found here:



The last 4 digits are E9F1 Use the following link to use a Hexidecimal to Decimal converter:

https://www.rapidtables.com/convert/number/hex-to-decimal.html

- The password is, therefore: 59889

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Documents / Resources

	**Polymaster C11 Multifunctional Controller** [pdf] Instruction Manual C11 Multifunctional Controller, C11, Multifunctional Controller, Controller

References

- Hex to Decimal Converter
- User Manual