Pi2R Display

Owners Manual
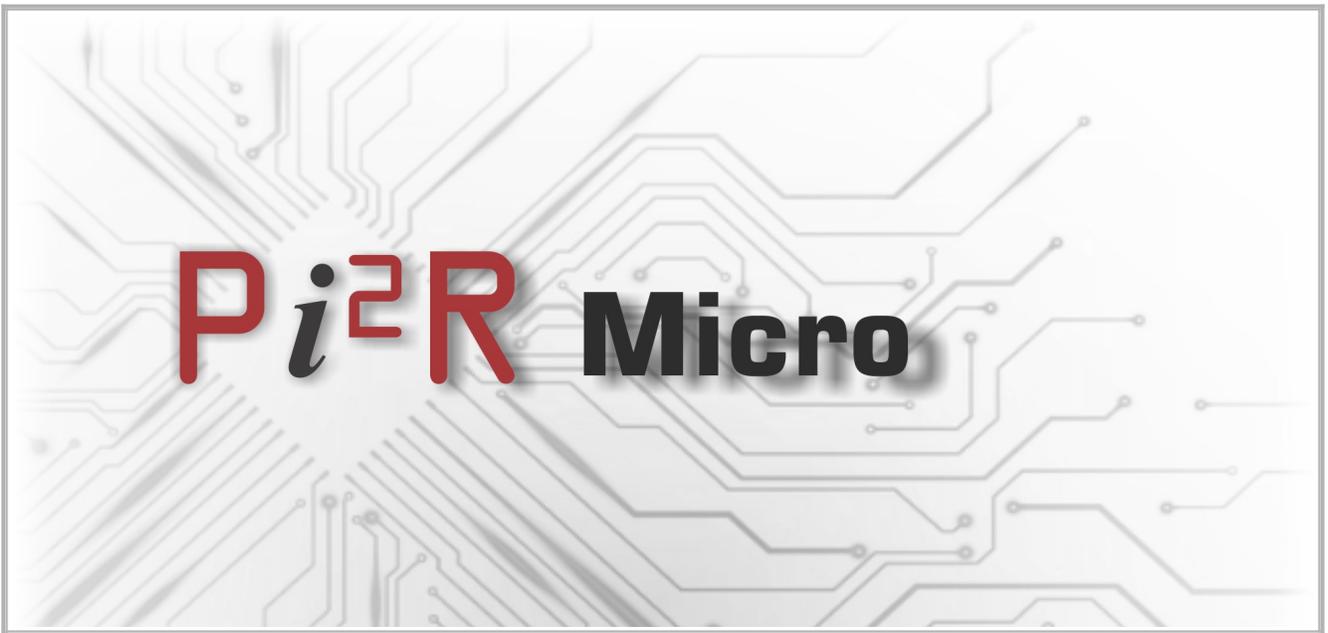
Table of Contents

1   Revision Information

Version	Date	Comments
1.0	3 April 2024	Initial version.

2   Specifications

Memory:
- 48 Hour minutely PV power data Graph
- 48 Hour minutely temperature data Graph

Backup power:
- Lithium chargeable battery
- Full charge time: 2 Hours
- Backup power to see temperature while power-out
- Backup power should last at least 4 hours

Communications:
- RS485 non-isolated
- BAUD 115200,8n1
- Wire length up to 250meter
- CRC Error detection

Thermostat:
- ±0.5º Celsius accuracy
- Wire length up to 10meter
- CRC Error detection
- Error on Temp > 85º Celsius

Suitable for use with Pi2R iX.

3   Operation

The iX is monitored by the Display unit.

All features such as Temperatures and Timers can be viewed and modified on the display, but is stored on the iX itself. This implies that should the Display get damaged for whatever reason, all functionality and settings stay put on the iX.

3.1 Main Screen

The main screen shows the most common status. External power comes from the iX module unit when either (or both) Grid Power / Solar Power is connected and available.

When neither Grid nor Solar is available, the display will run from battery and also power the iX module to enable it to set settings and read temperature. When the battery runs below 3.80 Volt, the display will switch off power to the iX module and enter a low power state maintaining all settings and keeping Time. This may typically happen when the unit is unplugged or during power outages at night. The Display will automatically resume normal operation when power becomes available again.

All values are updated roughly every five seconds.
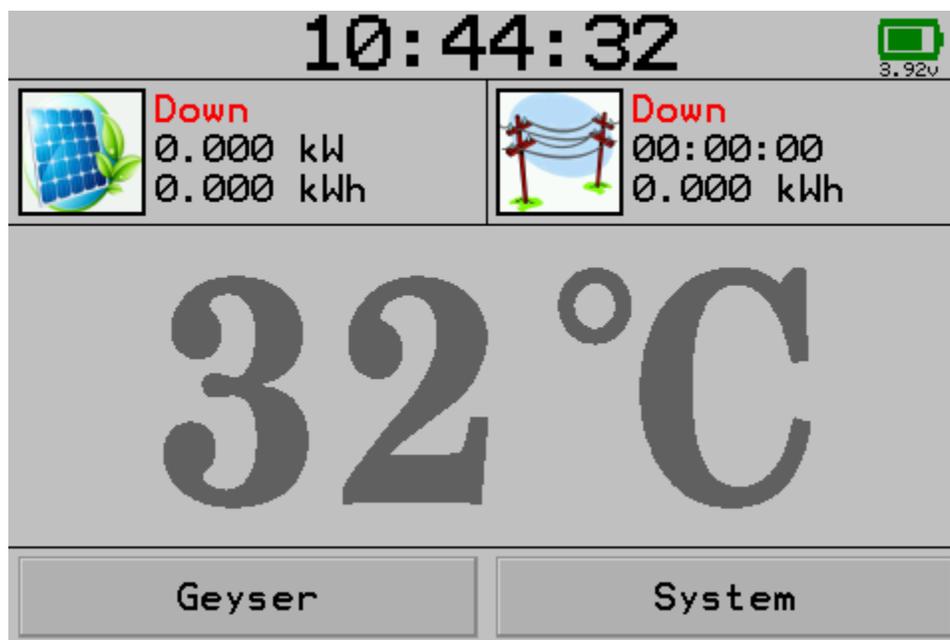
1   Figure 1: Main screen

Explanation of fields in the main screen:

- Top-Middle, the current time of day

- Top-Right, the battery status indicator

- Middle-Left, PV status

- Middle-Right, Grid status

- Center, Geyser temperature

- Bottom-Left, Button for Geyser setup

- Bottom-Right, Button for System setup

3.2 Temperature colours

The colour of the geyser temperature shows a quick status:

- Grey – System is idle due to no power available or Maximum temperature reached

- Green – System is currently using PV power to heat the geyser

- Red – System is currently using Grid power as a result of normal timer operation

- Purple – System is currently forced to use Grid power because of an override cycle

4 Menus

4.1 Quick Override or Cancel

When holding down the Geyser button for 3 seconds, an Override can be initiated or canceled depending on what is currently happening. When the button is held down a pop-up window will show an action message.

When no override is in progress, holding down the Geyser button will initiate an Override for a maximum of 120minutes or until 60°C.

When an override is currently in progress, holding down the Geyser button will cancel any active override and switch back to normal operation within 15 seconds.

4.2 Geyser setup
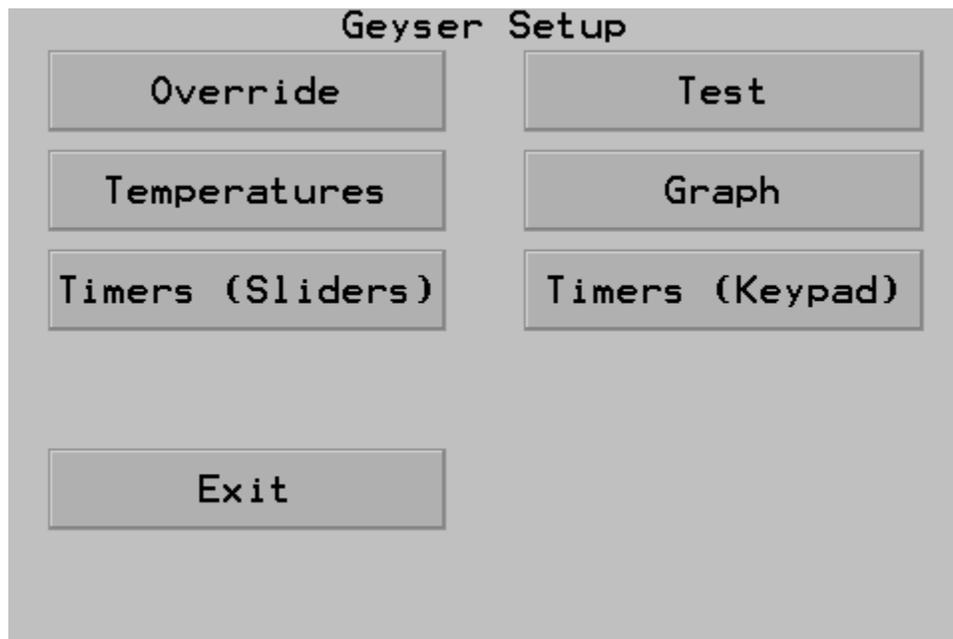
1   Figure 2: Geyser setup buttons

4.2.2 Override

This feature enables the user to boost the temperature "Once off". When this cycles ends, all operations will return to normal. This cycle ends either when the maximum Temperature is reached, or the Timeout ends.

Within this menu there are two sliders:

- Timeout with default 2hours
- Temperature default 60°C

After setting the desired Timeout and Temperature, select the "Override" button and exit to the main screen. When Override is active, the Geyser Temperature in the main screen will show Purple.

If unsure, exiting with the "Cancel" button will exit without affecting operations.

4.2.3 Test

Within this menu one can force the iX to one of three states:

- Off
- Grid
- Solar

On the right of the display it shows the current state of the iX. When in this state a technician can measure the output to verify that the iX module is switching correctly.

Note that when forcing a specific state, the iX will only remain in the set state for 15 seconds as to not interfere with normal operations.

It is safe to exit this menu at any time as the iX will resume normal operations after 15 seconds of exiting the menu.

4.2.4 Temperatures

In this menu the user can set one of two temperatures:

- Solar

- Grid

For optimal savings Grid should be set to the minimum acceptable temperature required. This enables a wide temperature range for Solar to work with while still ensuring acceptable water during bad weather.

When the water reaches "Grid-Temperature", the iX will use Solar even if the timers are active.

4.2.5 Graph

This is purely an information window displaying the past two days temperature and power harvest.

Press anywhere on the display to exit this screen.

4.2.6 Timers

There are two styles of editing the temperatures:

- Sliders

- Keypad

When one timer needs to be disabled, set the start and stop time equal. This gives zero minutes where the timer will be active.

When the desired temperatures are set, press "Save". To go back without changing settings, press "Cancel".

Note: For maximum savings and automatic top-up, set timers to start 120 minutes before normal water use and stop 15 minutes before water use. As soon as new cold water enters the geyser (when timer still active), the element will switch on and use power even though it may not have been needed.

Note: When hot water is needed at any time of day, it is recommended to set one timer to be active the whole day. Then focus only on the Grid/Solar temperatures to create savings. This will lower the savings as Grid will be used when the water falls below the set temperature even during good solar-time.

4.3   System Setup
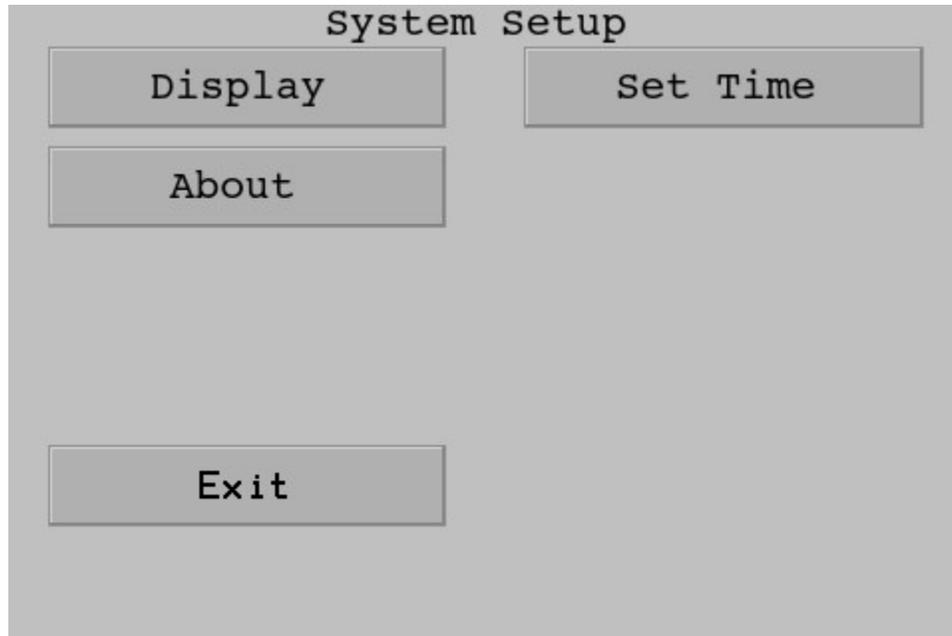
1   Figure 3: System Setup Buttons

4.3.2 Display

This menu sets the Active and Idle back-light intensity.

4.3.3 Set Time

This menu sets the system time which is used to activate the software timers on the iX.

4.3.4 About

This menu shows some diagnostics information such as Hardware and Software versions along with iX attributes.