WARDEN

Warden WA4

Electronic Water Management System

Australasian designed and manufactured multi purpose plumbing control for:

- Multi shower
- Multi basin control
- Multi WC flushing
- Combinations for secure, detention, and health facilities
- Available with vandal resistant controls, water saving and anti-ligature fittings.

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Secure Plumbing Controls

Warden 4 secure plumbing control is an electronic plumbing control providing a vandal resistant means of operating plumbing fixtures.

Suitable for high security or high risk applications such as police stations, courthouses, correctional/detention facilities, and secure mental health facilities. This allows control over plumbing fixtures where vandalism, self injury, excessive water use and drug concealment can be major problems.

Warden 4 secure plumbing control is a fully programmable, standalone microprocessor based controller that acts independently of any other security or plumbing system. Selectable configurations of timing parameters and use count limitations provide a means of managing water usage and limiting the scope of water fixture abuse.

It is a low voltage system, so installation and maintenance of Warden 4 secure plumbing control can be substantially completed by a plumber without the need for other trades or specialised technicians.

Warden 4 can be integrated into a PC based management system allowing for status monitoring, water isolation, configuration changes, and use count resets.

Warden 4 can also be used in:
- Schools
- Gymnasiums
- Camp grounds
- Swimming pools

Offering water saving features and vandal resistance to showers, basins, WCs, and urinals in fact any plumbing product where control over use is required. Multi Shower, Multi Basin, and Multi WC configurations are available to allow the control of up to four fixtures from a single Warden 4.
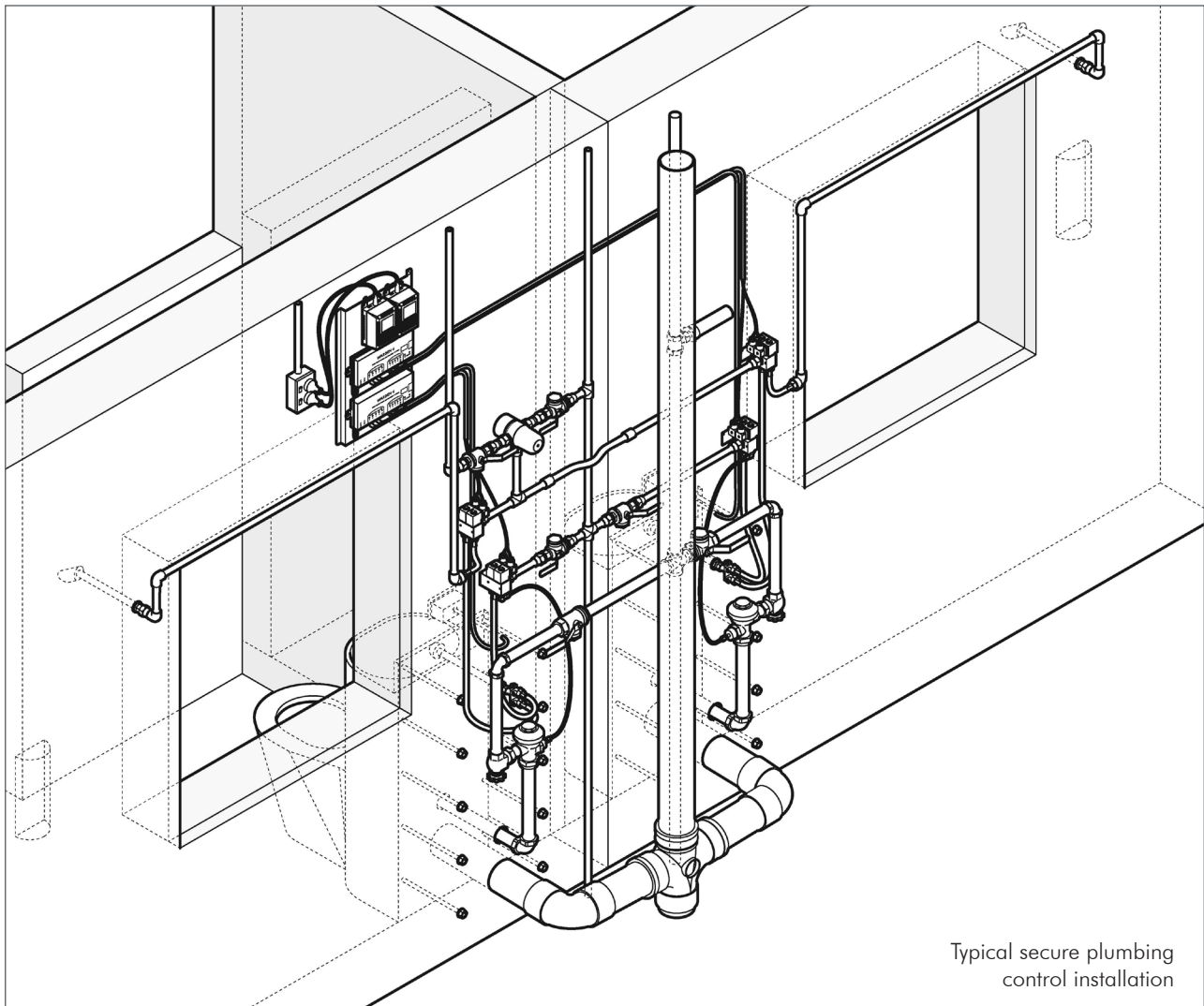
Operation

Pressing a piezo switch initiates a solenoid to open for a specific time. At the end of the "run time" the Warden 4 will prevent re-activation of that fixture for a "hold time". The run and hold times are programmed into Warden 4 to suit application requirements. The Warden 4 can be specifically programmed to suit the special requirements of high security applications.

Additional program features can further tailor the program to suit the application. For example, shower run times can include short solenoid "blips" to warn the user that their run time is nearing an end. Linked inputs can also prevent hot and cold taps being switched on simultaneously, or prevent a toilet being flushed when a shower is in use, trigger an extract fan.

Warden 4 is capable of controlling:
- Showers
- WC and urinal flushing
- Hot and cold basin taps
- Boot washing (sports fields)
- Auxiliary extract fans
- Floor gully trap primers
- Anti stagnation draining of shower lines

The Warden 4 has a highly flexible design that allows customised solutions to suit your Project needs, however there are a number of standardised solutions kits available for the most common applications. Talk to one of our Technical Consultants for recommendations and project planning advice.

Typical secure plumbing control installation

Programming

Warden 4 has the capability of storing up to 50 pre-set timing/use configurations. There are several libraries of configurations available depending on the application requirements. Two of the most common libraries are Correctional/Detention, and Mental Health. These are based on typical application requirements, but are also influenced by the requirements of Government authorities.

The parameters for each I/O channel in the configurations are:
- Function of fixture (e.g., Toilet, Hot basin, Cold basin, Shower, Auxiliary)
- Exclusion of another I/O channel to prevent simultaneous activation
- Secondary input (e.g., trigger Auxiliary fan when Shower activated)
- Output controlled by channel input
- Grace time (time before an activation is counted as a valid use count)
- Hold time (time after a completed activation cycle before re-activation can occur)
- Max Use Count (allowance of uses before re-activation is blocked)
- Run time (the time an output is activated for before automatically shutting off)
- Run time scaler (seconds or minutes)

Maximum use count: 255 uses
Minimum time setting: 0 seconds
Maximum GRACE/HOLD time setting: 255 seconds (4min 15secs)
Maximum RUN time setting: 255 minutes (4hrs 15mins)

If the maximum use count is reached and the I/O channel is blocked it will remain that way until the automatic autoreset time is reached, power is cycled to the controller, or the high-level interface commands a RESET. The autoreset time is by default set to 2a.m. every day, however this can be set to other time, and may also be configured to autoreset multiple times throughout the day for heavy use applications (e.g., every 1, 2, 4, 6, 8, 12hrs).

There are several additional autoreset options:
- Reset the Use count 24hrs after the last activation
- Vacation Trapfill mode to ensure that any fixture waste traps remain primed and sealed during extended periods of non-use.

Unique and project specific configurations can also be created.
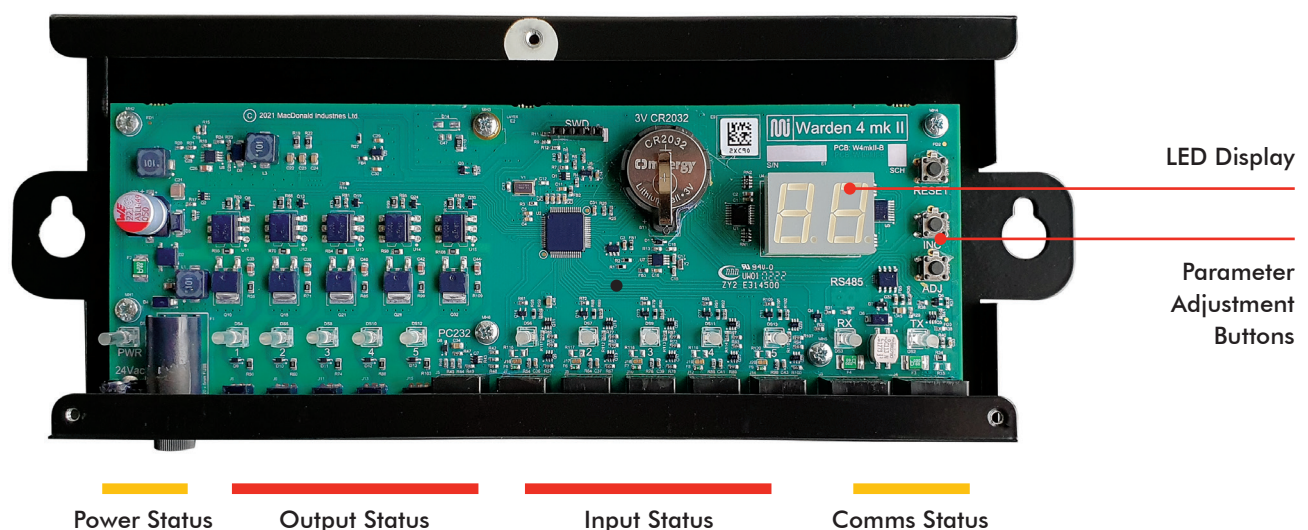
Choosing one of the pre-set configurations is a simple matter of selecting the required configuration number using the on-board Parameter Adjustment buttons.

These buttons also allow the setting and storing of the RS-485 serial communications (Comms) address of the Controller for use by the High-Level Interface system. Each Warden 4 controller on a RS-485 multi-drop sub-network must have a unique address in the range of 01 to 45 assigned to it.

Upon power-up and after completion of controller initialisation, the LED display will briefly show the configuration ID number currently selected then revert to displaying the Comms address assigned.

Consult your MacDonald Industries representative for the best advice.

Warden 4 Controller Layout

LED Display

Parameter Adjustment Buttons

Power Status   Output Status   Input Status   Comms Status
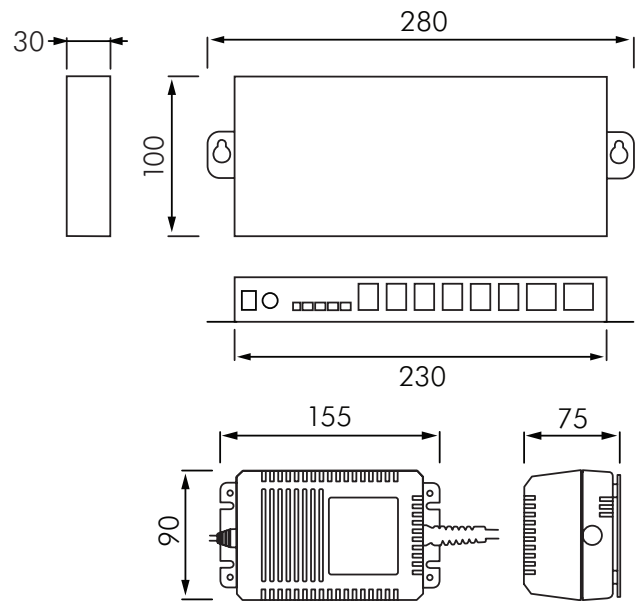
Components

Warden Controller

Warden 4 is a 24Vac 5x I/O electronic control system allowing connection of up to five piezo electric switches (inputs) and up to five 24Vac solenoid valves (outputs). The outputs may also be used to trigger 24Vac interposing relays for the control of other load devices such as auxiliary extract fans. LED indicators allow easy visual checking of Controller and I/O status.

Depending on the settings programmed into Warden 4 the solenoids will open for a specific run time once the appropriate piezo switch is pressed. Functionality of each I/O is dependent on the program set into Warden 4 at time of commissioning. Where Warden 4 is to be used for a secure facility each I/O is programmed to suit the customers' requirements including a maximum daily use allowance. For facilities that may experience extended periods of non-use, the Warden 4 can be configured to provide an automatic trap-priming function for maintaining the trap water seal.

Power to Warden 4 is provided by a dedicated 230V/24Vac 40VA transformer which mounts next to the Warden 4 control module and plugs directly to a 230Vac 10A supply socket (by others).

Warden 4 has 2x dedicated "COMMS" connectors allowing for a robust RS-485 based Modbus RTU daisy-chain network installation for use with a High Level Interface system.
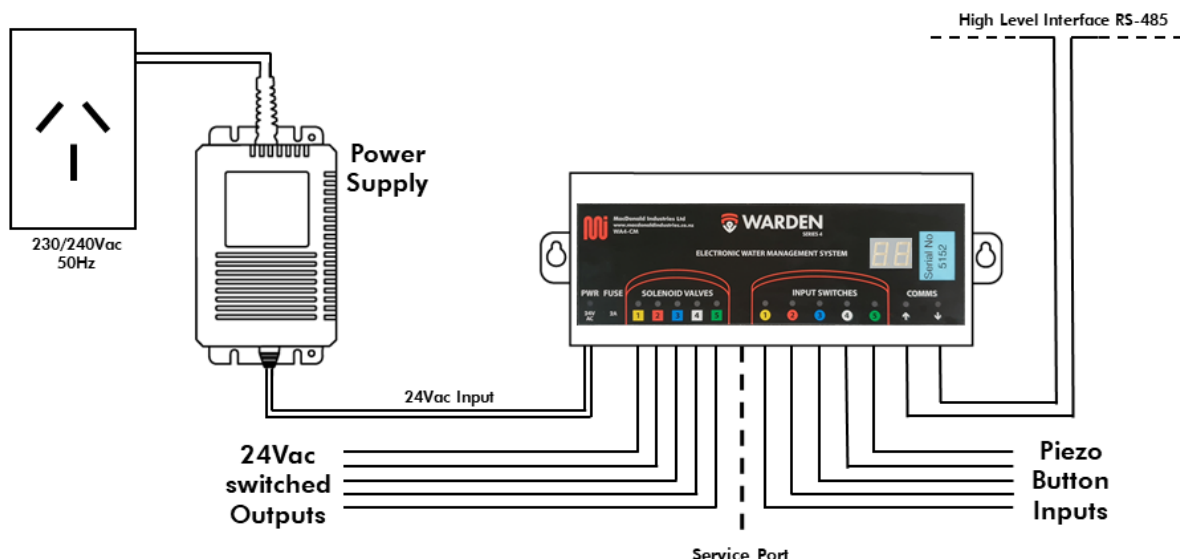
Specifications

Warden 4 Controller:
- Input Fuse: 2A slow 20x5mm
- Momentary input switch such as piezoelectric vandal resistant
- 24Vac rated Solenoid or Relay coil up to 15VAmax per channel
- Robust powder-coated steel enclosure
- Weight: 0.79kg
- Dimensions: W280mm x H100mm x D30mm

Power Supply:
- 230/240Vac 50Hz input via GPO
- 40VA double-insulated as standard
- 24Vac output
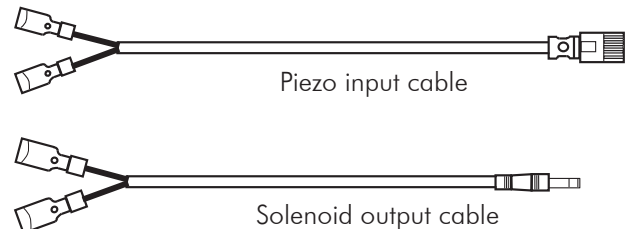- Weight: 1.35kg
- Dimensions: W86mm x H155mm x D73mm

Cabling

Warden 4 controllers, piezo switch plates and solenoid valves are often required to be installed in remote locations from each other. For an efficient and tidy wiring installation there are 1m, 2m, 4m, and 8m length cables available as standard. Other length options, and customised looms are available upon request to suit Project requirements.

Warden 4 controllers are usually mounted in a duct or in the ceiling cavity close to the fixture which they are serving. Piezo plates and solenoid valves are sometimes remotely mounted. It is VITAL that complete access to piezo switches and solenoids are given, not only

for installation purposes but also for future servicing. A minimum 25mm conduit must be laid between all fittings to allow ease of installation. Any conduit must be installed using radiused bends NOT elbows.

Piezo input cable

Solenoid output cable

Solenoid Valves

Fibreglass-reinforced polyamide 1/2" BSP (15mm) 24Vac N.C. solenoids are specified as standard. Each solenoid is plugged directly into the Warden controller using the supplied connector leads which are colour coded for easy efficient installation.

Options:

Solenoid valves using DIN or Faston QC connectors

Flush valve assemblies

Piezo Switch Plates

Warden 4 can control up to five piezo switches and these switches can be mounted on individual plates or all on the same plate depending on the product required. Plates are made to either security screw or pop rivet to metal electrical flush boxes (by others) that should be fitted into the wall framing prior to wall lining or cast into pre-cast walls.

Standard plates are 1.6mm brush finish stainless steel and are etched to suit the product specification.

Piezo switch buttons are 16mm anodised aluminium are supplied as standard and are coloured to suit the application.

Options:
Stainless steel 22mm piezo swith with laser etxhed marking of fixture function.

Heavier duty plates are available in 2mm or 3mm thicknesses with machined edges to discourage tampering and self harm.

High Level Interface

The Warden 4 is an independent system which does not require any other device to service the solenoids or switches it controls. As such it cannot be influenced by outside control systems without specific connections.

Some projects may require a level of remote control over the Warden 4 to enable:

- Water isolation in case of vandalism, civil unrest, drug searching
- Room use changes (e.g. occupancy level)
- Extra showers after work details or sport activities
- Room monitoring to check status of water use counts
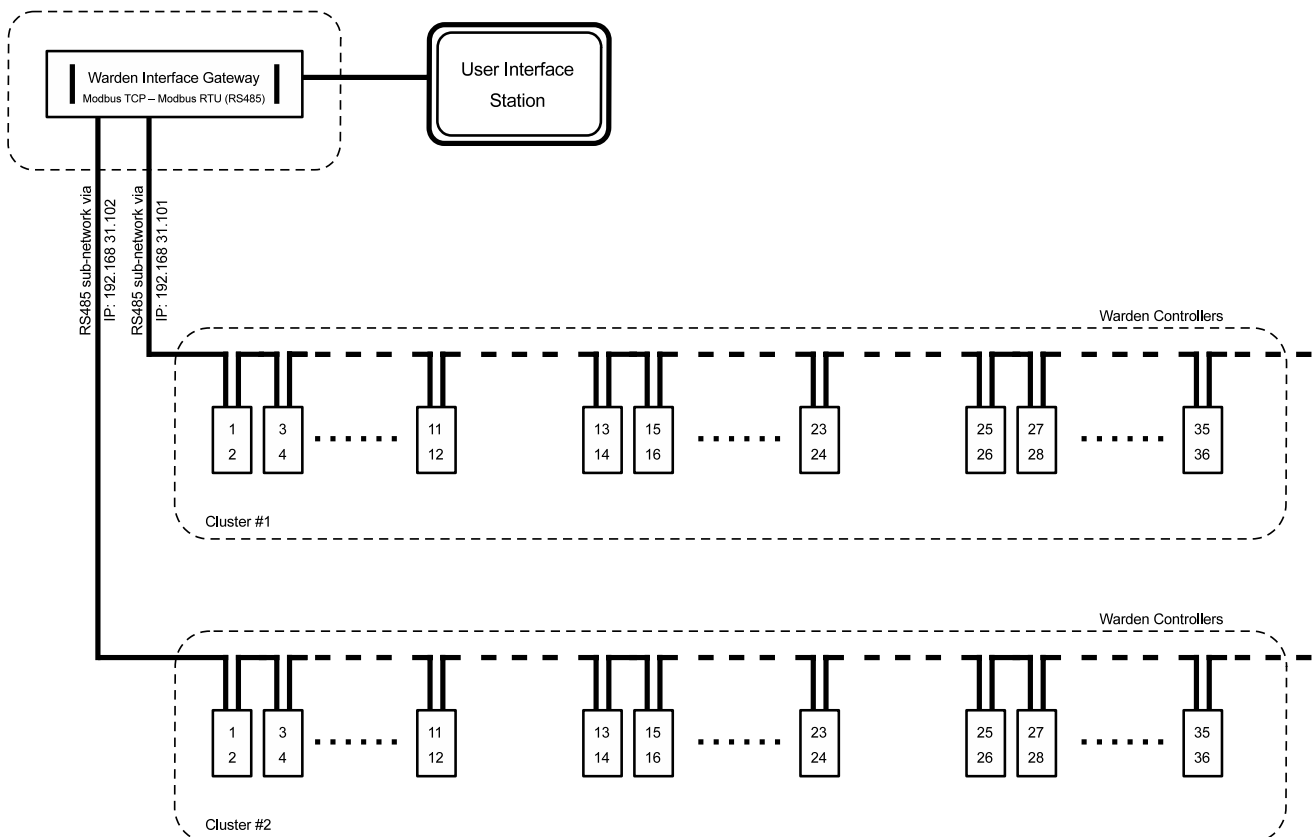- Diagnostic checks on Warden 4 controllers

Warden 4 uses a multi-drop RS-485 serial sub-network to interconnect controllers to a Modbus/TCP gateway adapter. Up to 45x Warden 4 controllers can be linked per gateway adapter. Typically, a gateway adapter is provided for each logical grouping of controllers, whether that is location/layout based or security level based. This allows for the use of Broadcast commands that affect all Warden 4 controllers on that gateway adapter simultaneously – extremely useful for the water isolation actions. The Modbus/TCP gateway adapters can then be linked via existing, or dedicated,

Ethernet infrastructure to provide site-wide access to the Warden 4 controllers. All cabling utilises industry standard RJ45 connections and 4-pair UTP Ethernet cabling (CAT5e/6). The "daisy-chain" connection of the Warden 4 multi-drop sub-network simplifies system layout and allows for an economical cabling solution.

The "Typical Data Wiring Structure" diagram shown below illustrates how multiple distributed clusters of Warden 4 Controllers can be linked together to allow high-level access and control of the Controller network. The multi-drop RS-485 serial sub-networks (or Clusters) can be grouped as levels of a multi-storey building, different security zones, or different wings of a building complex.

Each Warden 4 controller is addressable within the system to allow individual and precise control of each location. System design should be done in consultation with MacDonald Industries Ltd and your IT System integrators to ensure the most economical use of equipment and correct placement of interface gateways.
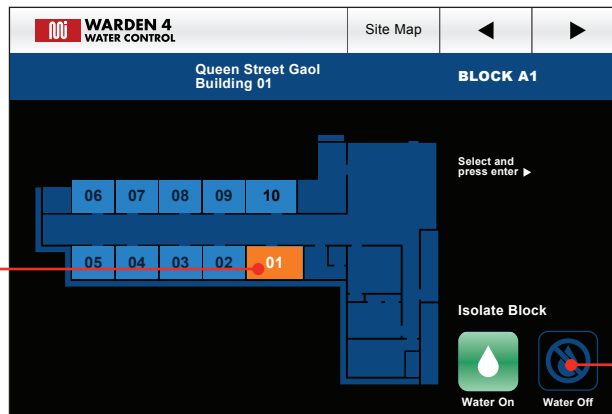
A full specification of the high level interface requirements is available on request.

Warden 4

Example of high level interface screens

Typical cell block view

Select nominated cell
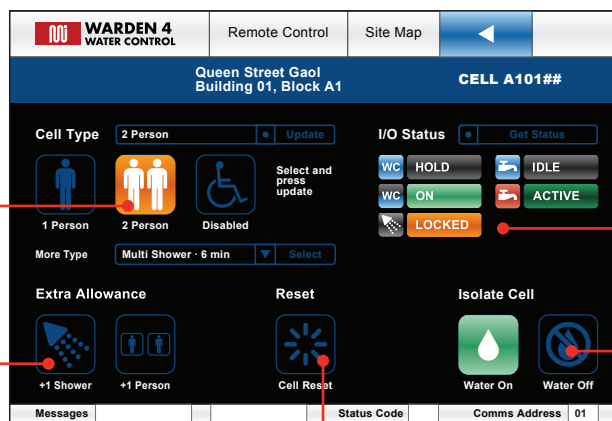To move to individual cell details below.

Cell water isolation
Provides cell water shut down for entire cell block.

Typical cell view

Cell type change
Allows configuration changes where cell use may periodically change. eg. 1person/ 2person / disabled

Extra shower
Gives the option of an additional shower over the allocated numbers.

Status
Allows staff to check whether cell "use" count has been reached. Graphical display indicating maximum use reached.

Cell water isolation
Provides cell water shut down for this cell only.

Use count reset
Reset the count on the number of "uses" per day. Note: May be password accessible.

Room type change
Allows the room configuration to be adapted to suit the needs of a patient/occupant.
eg. 1 person / Accessible Rose Shower / Accessible Handspray Shower.

Typical mental health accessible room