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Smart Flow Water Monitoring System

Smart Flow Hard Wired Overview

Document Date: 2026-01-30

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Smart Flow Monitoring Component Summary

The system consists of the following monitoring system components, quantities very by site:

Code	Description
SF-SAAS	Smart Flow AZURE SaaS Platform ongoing monthly SaaS licence fee paid for by the Facility (monthly fee per TMV)
SF-MANAGEDSERV	Smart Flow AZURE managed services ongoing monthly licence fee paid for by the Facility (monthly fee per TMV)
SFM9000-TMV	Smart Flow 2.0 Kit Per TMV includes required Hardware and System Commissioning
SFM4000-C	Stainless steel hub cabinet with a backbone connector
ATMSHL-350	Stainless steel hub cabinet lid
SFM5200	SMARTFLOW LAN INTERFACE 24V RACK MOUNT
SFM6100	SFM SERVER
SFM6510	SMARTFLOW BMS INTERFACE - BACNET
SFM9000C	SMARTFLOW CABLE TERMINATIONS PER TMV (OPTIONAL)

Items not included in above:

- Enware AquaBlend TMVs with Smart Flow mixing chamber
- CAT6 Backbone daisy chain cabling between the LAN interface and each of the hubs
    - We can offer a service to terminate the cables (see SFM9000C above)
- CAT6 Hub cabling between hubs and TMVs / fixtures
    - We can offer a service to terminate the cables (see SFM9000C above)

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System Overview

Smart Flow® addresses Health Industry challenges of complying with the policy obligations as defined by federal and state regulators, improving the overall patient experience, protecting brand reputation as well as revenue flows and addresses some of the sustainability challenges of operating a Health Facility. This is accomplished, whilst reducing operating costs by up to 65% against manual industry best practice.

Enware's system achieves this by providing auditable data and reporting in alignment with State and Federal Legislation and Guidelines. Key risk areas addressed include:

- **Stagnation Prevention:** Reporting identifies what and when to flush throughout the system to reduce the risks of stagnation. Smart Flow® achieves this while alleviating unnecessary wastage of Energy, Water and Labour
- **Specified Temperature Delivery:** Provides confirmation that the water supply and the Thermostatic Mixing Valve (TMV) are performing within the desired parameters while also identifying Temperature Alert and Alarm Events which present a scalding risk to Patients and Staff
- **Maintenance:** Provides confirmation and documentation required maintenance has been carried out within the set criteria as stipulated by the TMV manufacturer.

Smart Flow System Features

- 24/7 temperature monitoring of TMVs (End-Of-Line Fixture Monitoring - Optional)
- Alert status for over temperature events
- Stagnation Reporting
- TMV Monthly Temperature readings.
- Complete Historical Data for every TMV
- Complete Historical Data for every Alert event
- Performance reports on every TMV
- Historical Data Logs are third party NATA certified in the event of patient / visitor liability claims
- Full reporting options to meets engineering staff requirements
- BMS BACNET Interface

The system does not alter or change the performance of the TMV in any way but provides constant temperature readings for analysis. Smart Flow may be designed to meet the specific requirements of the client. Please contact Enware to discuss your specific requirements as needed.

The Cabled Smart Flow Monitoring System is ideal for new installations and may also be retrofitted to existing hospitals or aged care facilities using our Wireless retrofittable option.

Scope overview

The scope for the Smart Flow Water Monitoring System is as follows:

Enware Scope

- **SFM Backbone Dual Connectors:** Supply of backbone connectors
- **HUB Cabinets:** Supply of hub cabinets
- **Initial System Plans:** Supply of plans for all cable runs and locations
- **As Built Plans:** Supply of final As Built drawings based on markup plans
- **SFM LAN Interfaces:** Supply, configuration, installation and testing
- **SFM TFP HUBs:** Supply, addressing, installation and testing
- **TMV & Fixture Sensors:** Supply, installation and testing
- **Smart Flow Backbone Testing:** Confirming that all devices are connected on the RS485 network

Cabling Contractor Scope

- **RS485 Backbone cables**: Supply of CAT6 cable, installation, termination and testing
    - If SFM9000C is ordered Enware will terminate, test and label the cable that is supplied and roughed in by others
- **Hub to TMV & Fixture Cables**: Supply of CAT6 cable and RJ45 plugs, installation, termination, testing and labelling**.**
    - If SFM9000C is ordered Enware will terminate, test and label the cable that is supplied and roughed in by others
- **Conduit**: Supply and installation of conduit, we recommend 20mm from the TMV / Fixture to the ceiling and 40mm from the hub cabinet to the ceiling.
- **Testing**: Supply of test results for all cabling
- **Markup Plans:** Markup of any changes to initial system plans

Plumber Scope

- **Hub Cabinets**: Installation of hub cabinets in the walls including lids, preferred height of 1.5m
- **TMV & Fixture Schedule:** A spreadsheet linking the hub ports to the TMVs and fixtures and providing asset location information and information on the rooms serviced
- **Communication of changes**: regarding added or deleted TMVs or fixtures during the build

Builder Scope

- **Co-ordination**: Co-ordination of services
- **BMS Integration:** Co-ordination of BMS integration requirements
- **IP addresses**: Provision of IP address allocations and rack allocations
- **Room Naming**: Provision of Hospital wayfinding room naming information
- **Training**: Co-ordination of client training

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Contractor Responsibility Assignments

Component	Installed location	Supplied by	Installed by	Timing	Notes
System Engineering Design	n/a	Enware	n/a	Commencement of Project	Design to be supplied at commencement and modified and updated as required
SFM hub Cabinets	In corridor walls as shown on plans	Enware	**Plumber**	At plumbing rough in stage	Hub cabinets installed at the same time as TMVs
HUB to TMV & Fixture Cable Rough In (CAT6)	Walls and ceilings between hubs and TMVs / fixtures	Cabling Contractor	**Cabling Contractor**	At plumbing rough in stage	Cabling contractor to supply CAT6 cable and rough in.
HUB to TMV / fixture cable terminations & test (RJ45)	Walls	Cabling Contractor	**Cabling Contractor**	After Cable Rough in	Cabling contractor to supply RJ45 plug, terminate, test, label and markup plans. (unless SFM9000C is ordered)
Backbone Cable Rough In (CAT6)	Walls and ceilings between hubs	Cabling Contractor	**Cabling Contractor**	Prior to plastering	Cabling contractor to supply CAT6 cable and rough in.
Backbone Cable terminations & test (RJ45)	Walls	Enware	**Cabling Contractor**	Prior to plastering	Enware to supply backbone connectors Cabling contractor to terminate, test, label and markup plans. (unless SFM9000C is ordered)
Conduit	Walls	Cabling Contractor	**Cabling Contractor**	At plumbing rough in stage	We recommend: TMV / fixture and ceiling: 20mm Hub cabinet to ceiling: 40mm
SFM TFP HUBs	In hub cabinets	Enware	Enware	System commissioning	Not Installed until all plastering and painting is completed
Cable Audit	N/A	Enware	N/A	System commissioning	Enware will audit the backbone and hub to TMV / fixture cabling to ensure it is correct & matches the plans.
LAN Interfaces	Comms Rooms on each level	Enware	Enware	System commissioning	Installed when Comms rooms are completed and active equipment has been installed.
On-Prem Server	Central Comms Room	**Virtual Machine:** LHD IT	LHD IT	System commissioning	
		Physical: Enware	Enware		
SFM Azure Platform	Cloud	Enware	Enware	System commissioning	Commissioned once: - TMV / fixture schedule is finalized. - IP network details are finalized - On-prem server is commissioned - On-prem server to Azure connection is working

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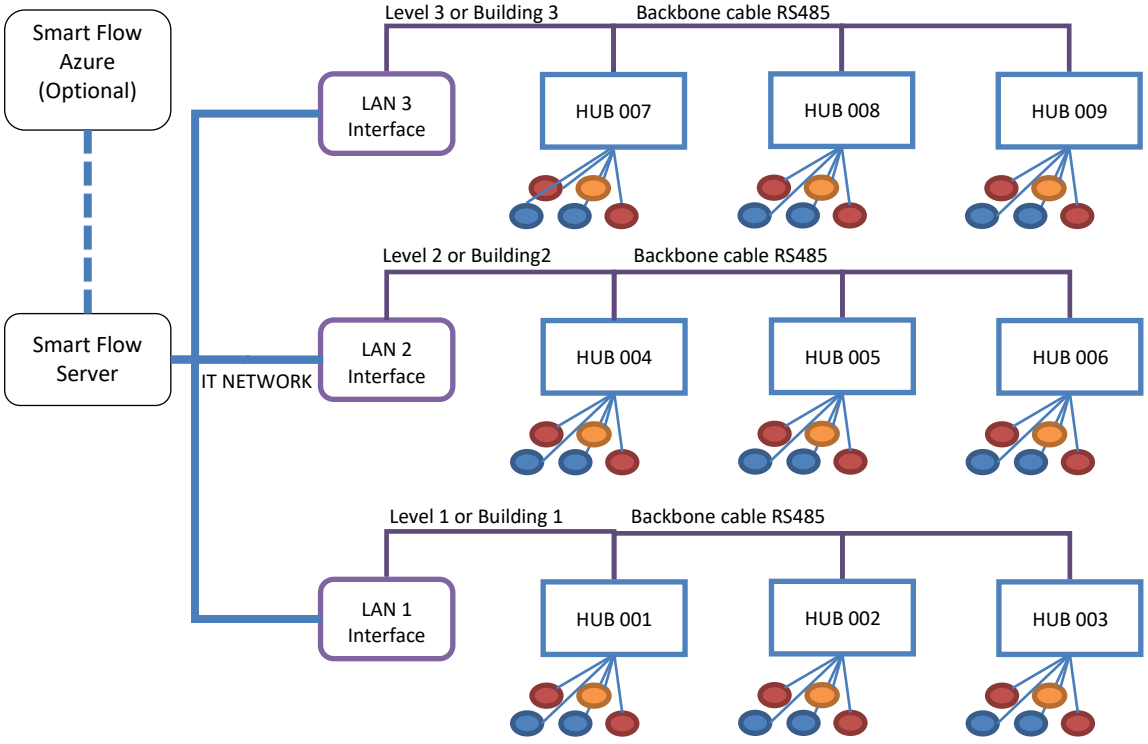
System Architecture

The Smart Flow System utilizes three cabling network components in the complete system architecture.

These are:

1. **Hospital IT Network** – supplied by others
2. **RS485 Backbone Network** – connects Smart Flow field devices (HUBs) together back to the Comms Room
3. **HUB Cabling** – connects sensors at TMVs and Fixtures back to HUBs

The system design can be replicated without limit over multiple levels and buildings. Each level will contain its own RS485 Network cabled back to a LAN Interface on each Level. Enware will supply Plans showing all HUB locations, the backbone system design, and all connected endpoints for sensors, either TMVs or fixtures.



Note: The RS485 Backbone Cable and hub to TMV / fixture cabling **<u>are not</u>** part of the structured cabling network. All cable should be installed by a qualified person.

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Hospital IT Network

The hospital IT network is not part of this scope, it is up to others to provide essential networking equipment such as space in the racks, switch ports, IP addresses etc.

The hospital IT network is the Structured Cabling Network and stands separate from Smart Flow System Cabling. The Smart Flow system utilizes the Hospital IT Network to efficiently communicate across the whole Hospital site.

Each floor of each building will typically have a single RS485 backbone between each of the hubs which run back to comms room where the LAN Interface is in the rack. The Smart Flow LAN Interface connects to the hospital IT network via ethernet. The LAN Interfaces are installed in the rack by Enware.

An on-premises server is typically required for each Smart Flow installation, this server may be a physical server provided by Enware (order code SFM6100) or a virtual machine provided by hospital IT. If it is a physical server, it will be installed in the rack by Enware.

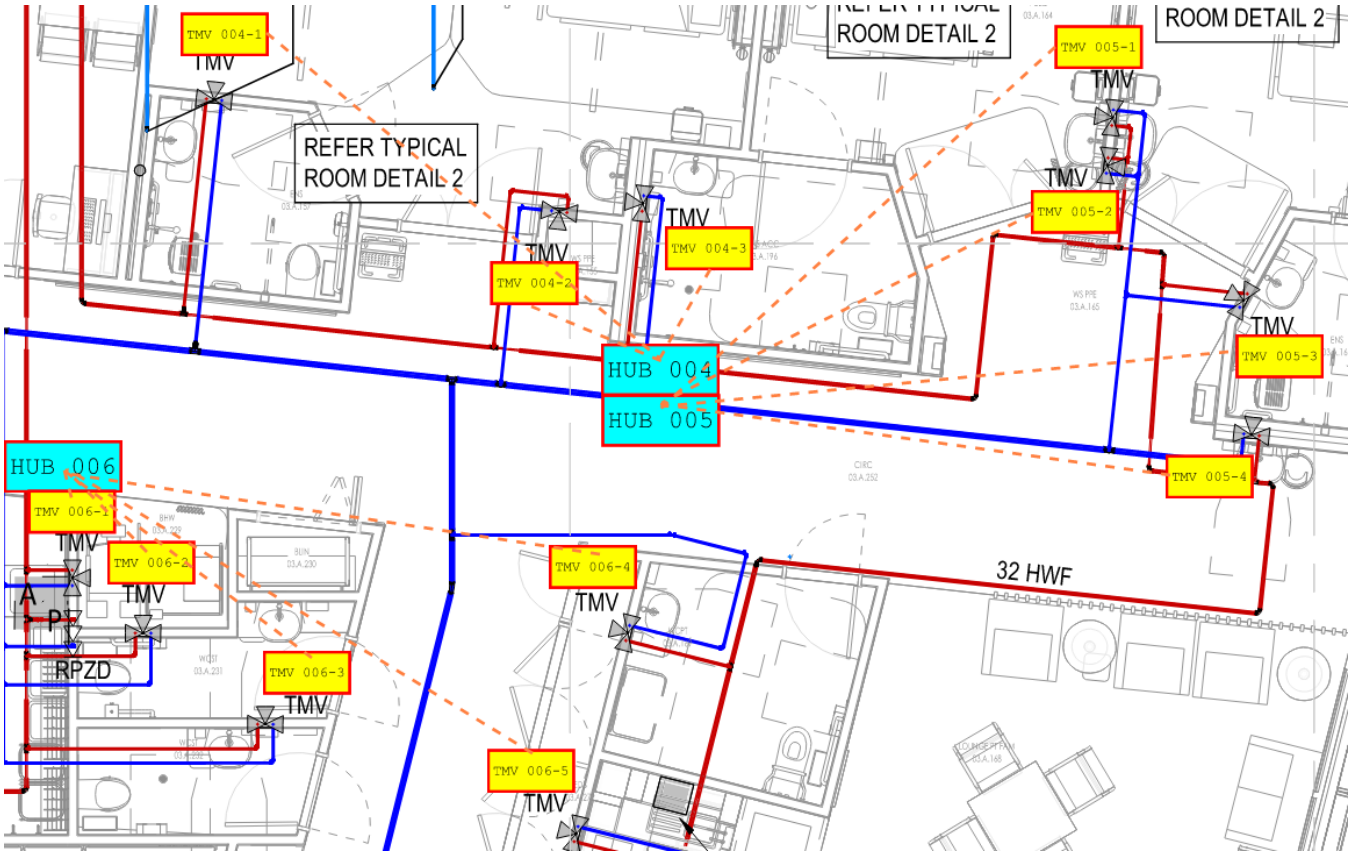
The LAN Interfaces communicate with the server via the hospital network, the server will communicate to both the BMS via BACnet IP and the Smart Flow Azure Cloud Service that aggregates multiple Smart Flow installations throughout a local health district or private operator into a single management portal ssf.smartflow.com.au.

TMV Monitoring Plans

The example below shows a typical plan that will be supplied to the contractor by Enware. This plan will show the suggested locations of HUB cabinets. As HUB cabinets installed in walls are considered an architectural item and should be included in the Architectural Plans, final locations will need to be confirmed by others. Hubs should be installed in the walls in the corridors.
The backbone cable should be run in the route shown, **any changes to backbone routing due to onsite practicalities shall be documented on the site plans and reported back to Enware.**
The hub cabling cable should be run to the hub and hub port shown on the plans, **any changes to hub cabling due to onsite practicalities shall be documented on the site plans and reported back to Enware.**

As can be seen on the plans, TMVs are labelled based on the hub number and port number in the format:

- "TMV YYY-Z" eg "TMV 004-1"
  - YYY is the hub number (address) starting at 001
  - Z is the hub port (sensor port position) starting at 1



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TMV & End-Of- Line Fixture Monitoring Plans

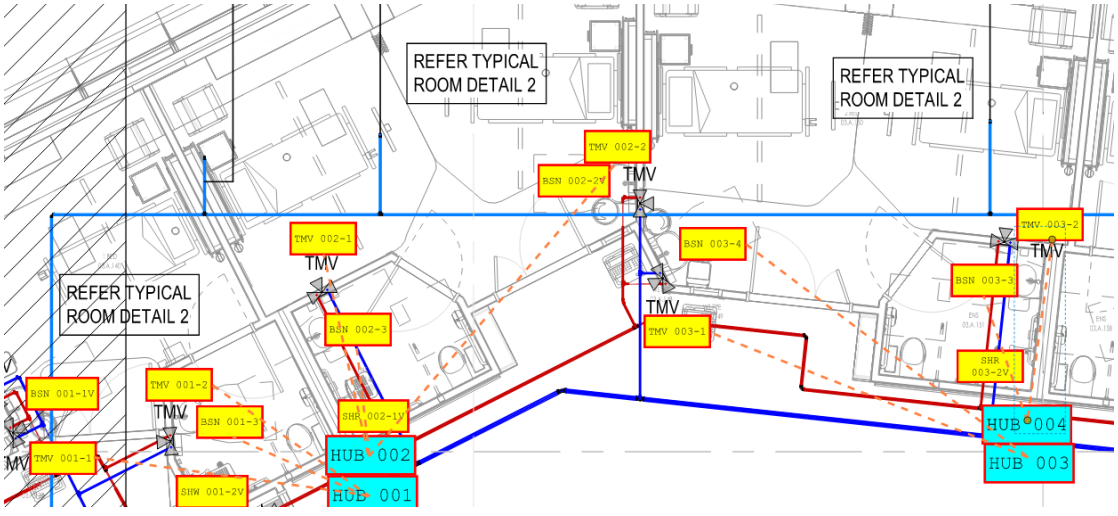
The example below shows a typical plan that will be supplied to the contractor by Enware. This plan will show the suggested locations of HUB cabinets. As HUB cabinets installed in walls are considered an architectural item and should be included in the Architectural Plans, final locations will need to be confirmed by others. Hubs should be installed in the walls in the corridors.
The backbone cable should be run in the route shown, **any changes to backbone routing due to onsite practicalities shall be documented on the site plans and reported back to Enware.**
The hub cabling cable should be run to the hub and hub port shown on the plans, **any changes to hub cabling due to onsite practicalities shall be documented on the site plans and reported back to Enware.**

As can be seen on the plans, TMVs and fixtures are labelled based on the hub number at port number in the format:

- "XXX YYY-Z" eg "TMV 001-1"
  - XXX: the asset type eg:
    - TMV: Thermastatic Mixing Valve
    - BSN: Basin
    - SWR: Shower
  - YYY is the hub number (address) starting at 001
  - Z is the hub port (sensor port position) starting at 1

For assets that are virtually monitored the following convention is used:

- "XXX YYY-ZV" eg "BSN 001-1V"
  - XXX: the asset type eg:
    - BSN: Basin
    - SWR: Shower
  - YYY is the hub number (address) starting at 001
  - Z is the hub port (sensor port position) of the upstream TMV



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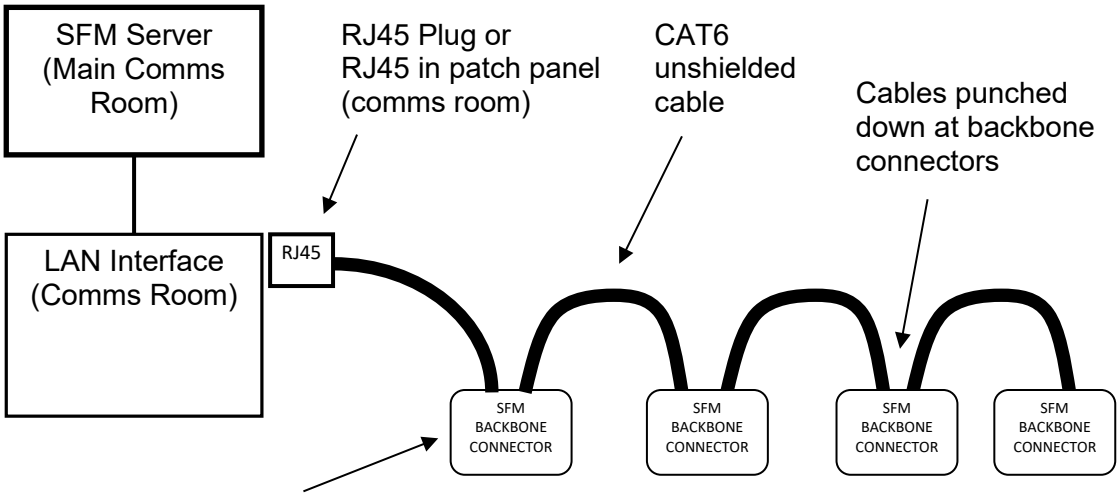
RS485 Backbone Cabling

Backbone Cabling Details

- Installed using CAT6 unshielded cable
- 0.5m service loop in the ceiling space above the hub encase additional cable is required.
- Architecture is daisy chained from hub cabinet to hub cabinet with termination to a SFM backbone dual connector.
- The incoming and outgoing cable are terminated in the backbone connector.
- One backbone connector is located in each hub cabinet.
- Hub cabinets can fit either 1 Hub with up to 5 TMVs/fixtures or 2 hubs to monitor up to 10 TMVs / fixtures as indicated on initial Enware supplied plans.
- The Backbone cable must be run in a manner that the HUBs are installed in sequential order.
- We strongly recommend installation of 40mm conduit between the hub cabinet and the ceiling space.
- Each backbone should have a maximum of 25 hubs
- Each building should have separate backbones
- Each level in buildings separate backbones



DESC: SFM BACKBONE DUAL CONNECTOR SURFACE MOUNT
MFR: Enware
CODE: SFM-BB-SURFACE

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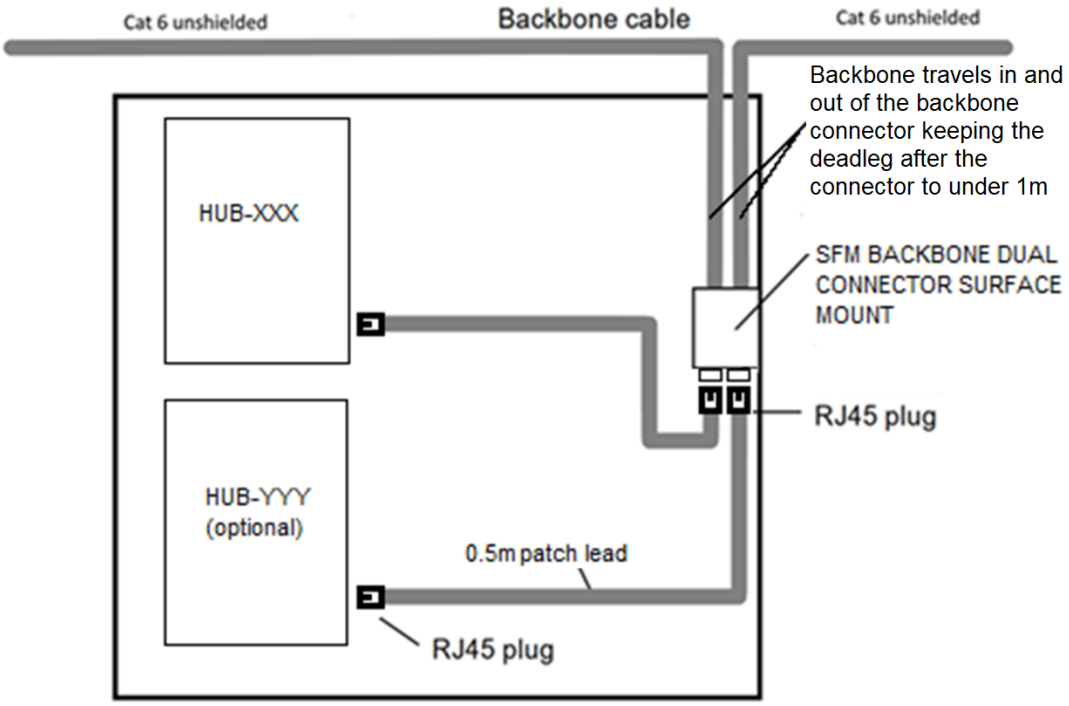
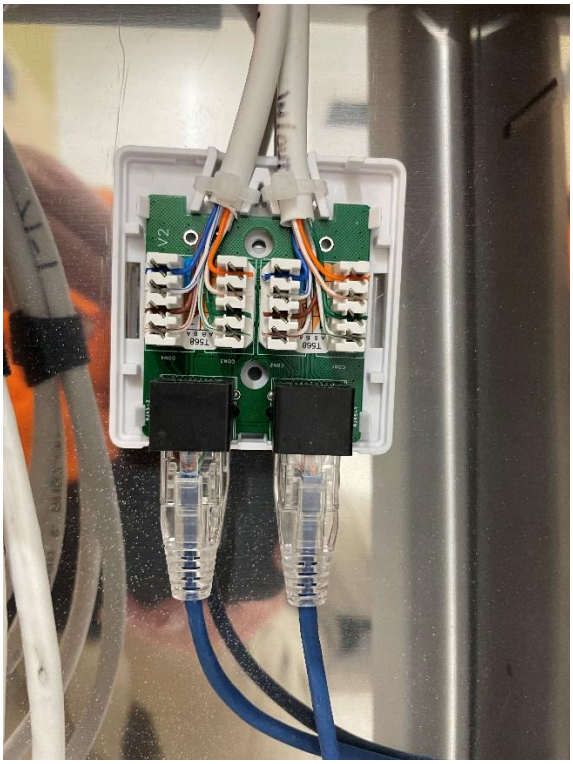
Backbone Cabinet Layout





Please see the "SFM Cabling Installation Scope" document for further details.

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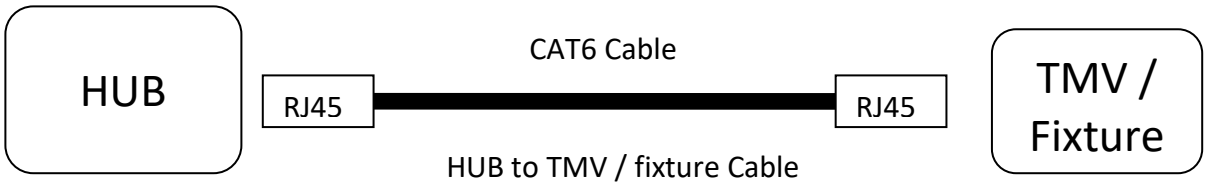
Hub Cabling (Hub to TMV / Fixture)

Hub Cabling Details

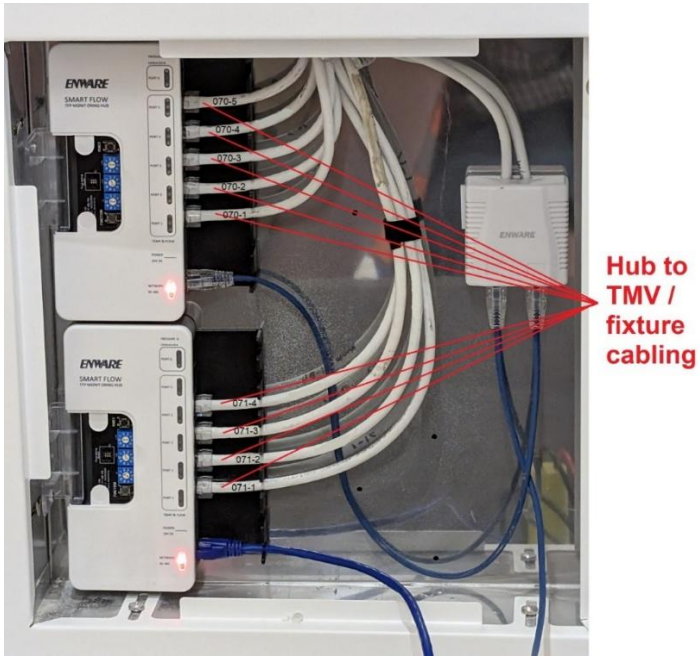
All HUB to TMV or Fixture cables are as follows:

- Cable – CAT6 Unshielded
- 0.5m service loop in the ceiling space above the hub and TMV / fixture encase additional cable is required.
- Terminations – RJ45 plugs both ends
- PIN output – T-568A
- We recommend installation of 20mm conduit between the TMV and the ceiling space
- The maximum length individual cables should be kept below 35m



Hub Cabling Cabinet Layout

Each hub can support up to 5 TMVs / fixtures on ports 1-5 and 2 pressure sensors on port 6.



Please see the "SFM Cabling Installation Scope" document for further details.

Smart Flow Azure

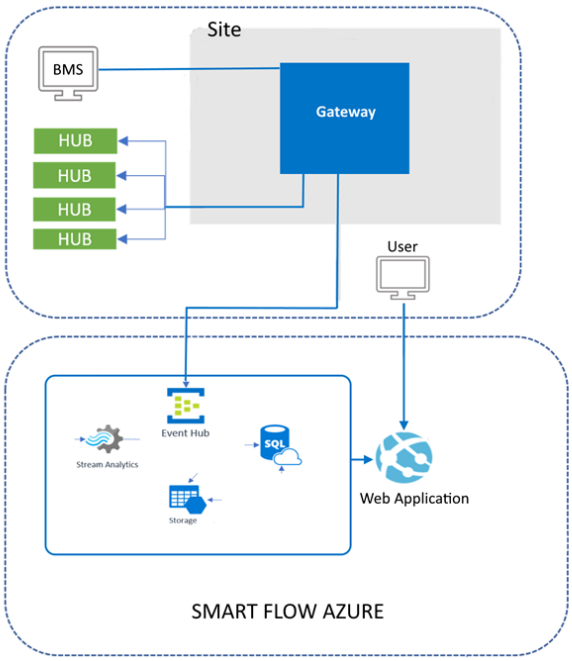
Enware's new Smart Flow in Azure cloud platform is the universal SAAS solution for TMV Monitoring, providing a seamless managed platform where Risk is minimised and compliance is enhanced. The release of the Smart Flow Azure enables a single solution for multiple sites, allowing both existing and new installations to be reported through a common user interface providing a fully integrated fleet management solution.

The multi-tenant Smart Flow platform provides an organisation with total fleet management in a single instance of the software. With Role Based Access Control, organisations can allow appropriate access to all sites or a single location for ease of management, compliance, and governance.

Azure Architecture

Facility IT Requirement: For deployment of the Smart Flow® system to the Cloud Application, the facility will need to provide a Secure VPN Connection.

Secure Cloud Based Application: Developed in Azure, the Smart Flow Application has been built under the controls of ISO:27001 to provide piece of mind. As the system transmits through a Lora Wan Radio Frequency network independent of the Facilities assets. The installation of Smart Flow® requires the facility to provide a secure VPN for the transmission of single directional data to the Azure based application.



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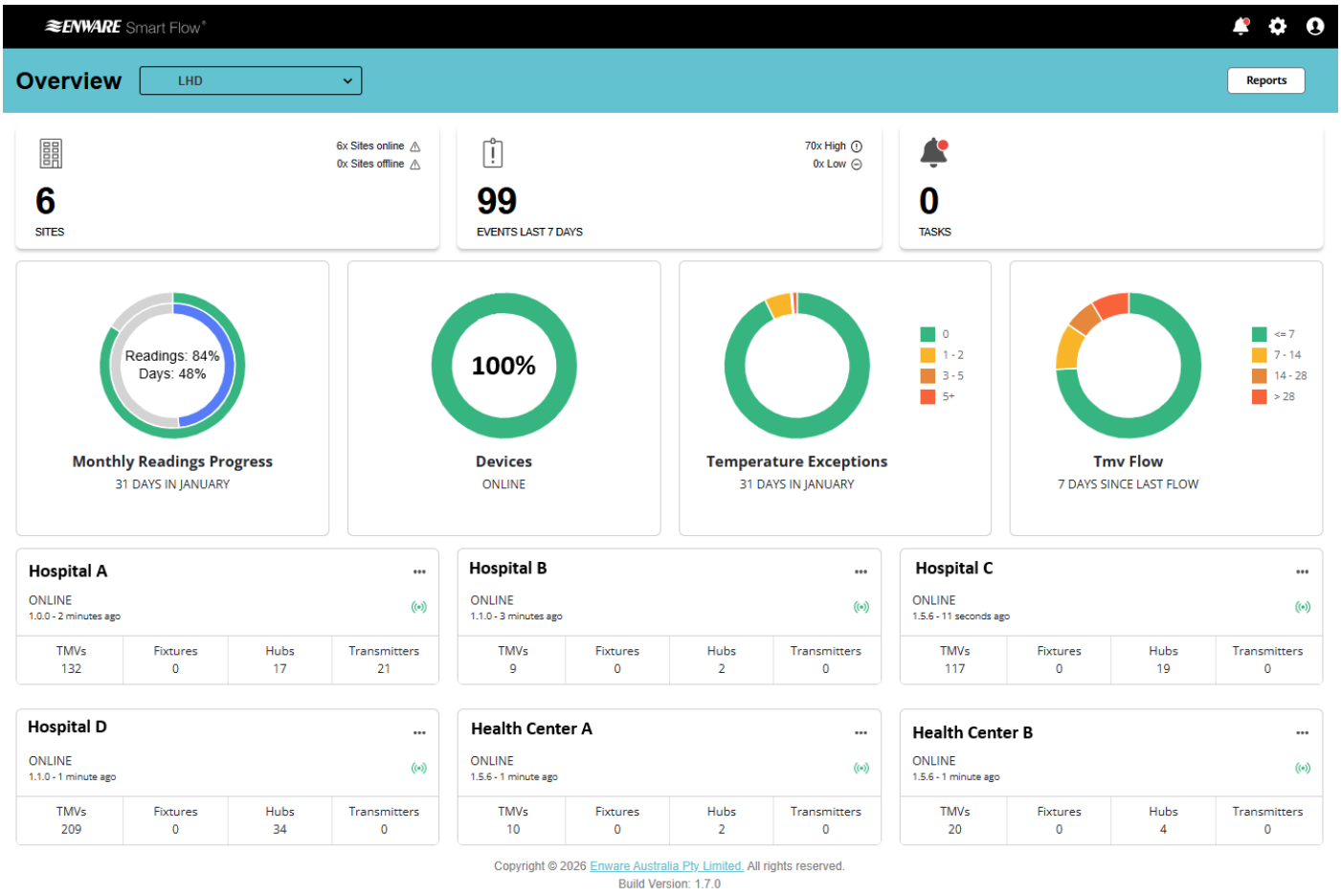
Benefits

- Multi-tenant Smart Flow instance
- Role based access control (RBAC)
- Support offered across all sites with equal response times
- Unified solution for all sites
- Feature upgrades rolled out simultaneously
- Guaranteed uptimes due to centralised monitoring
- Standardised training path for users
- Compliance standardisation

Due to the critical nature of this piece of infrastructure Enware strongly recommend adoption of the annual Service and Maintenance Contract to maintain the Smart Flow system. This includes technical Software support (via remote access recommended); telephone support, data interrogation, annual site visit, additional training, software upgrades and additional reporting documentation and annual, Smart Flow Software License fee. The fee for this contract is dependent on the size and location of the project and comes with a detailed document highlighting the contracts terms and conditions.

Aggregation of Existing Smart Flow Sites

With Smart Flow Azure multiple sites can be aggregated into a single management portal enabling simplified management from anywhere.



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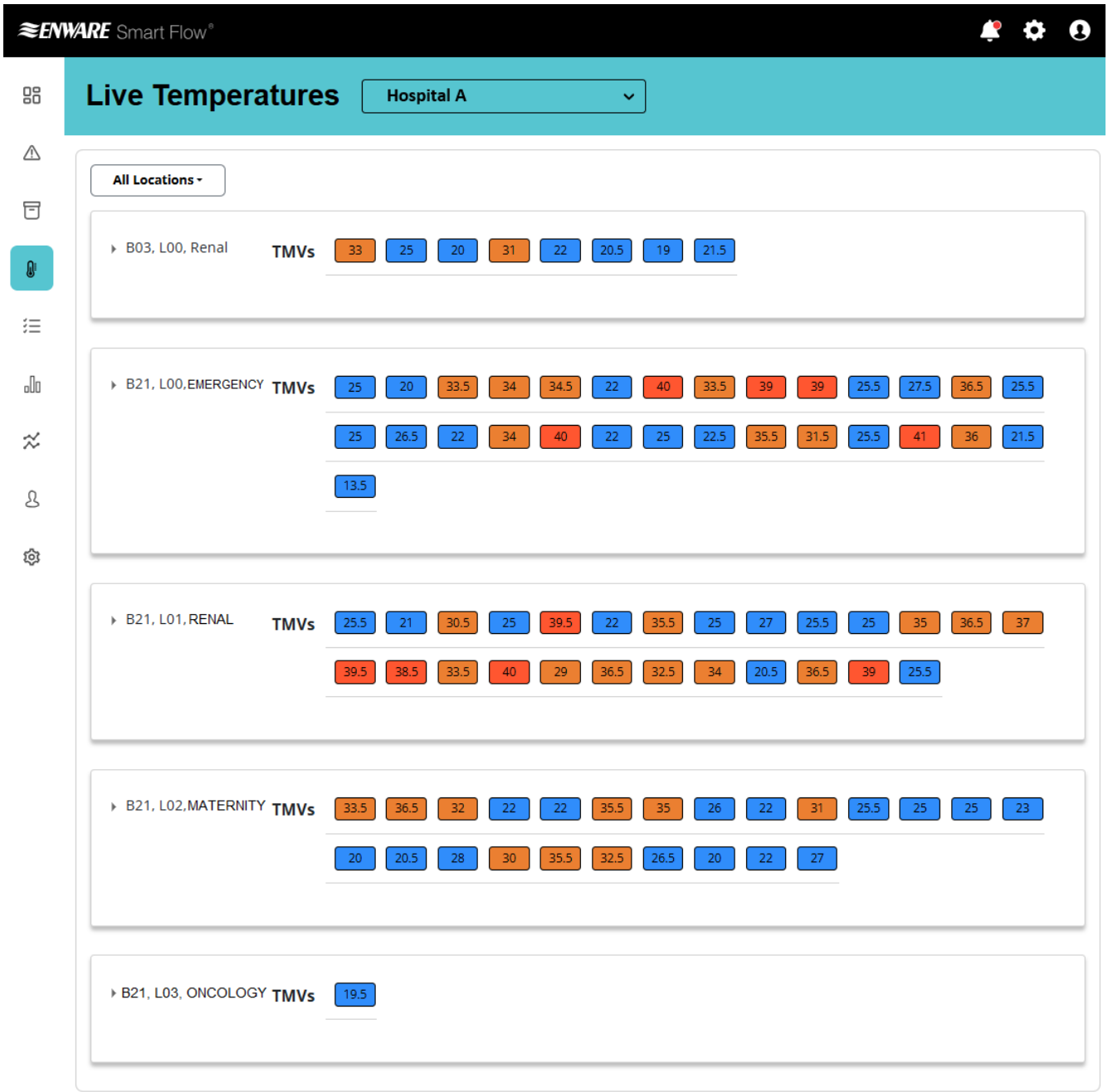
Live Temperature Monitoring



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Advanced Reporting

ENWARE — Temperature Exception Events - Detailed View — Fleet Health Report for October 2024

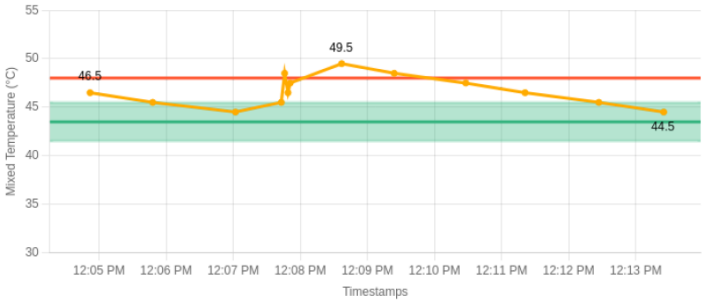
TMV ID
TMV 293

TMV Location
L2, Theatres, Female staff WC

Exception Details
Started at 25-Oct-2024 12:07:46 PM
and ended at 25-Oct-2024 12:10:28 PM

Duration
00:02:42

Comments
Excessive Over Temperature Events - recommend checking set temperature of TMV



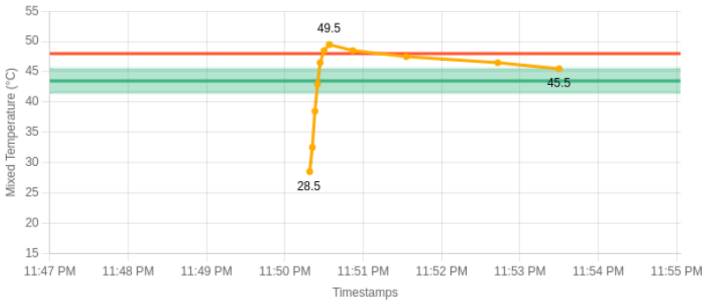
TMV ID
TMV 245

TMV Location
L3, Surgery, Male WC west side

Exception Details
Started at 04-Oct-2024 11:50:30 PM
and ended at 04-Oct-2024 11:51:33 PM

Duration
00:01:03

Comments
Excessive Over Temperature Events - recommend checking set temperature of TMV



ENWARE — Temperature Exception Details — Fleet Health Report for October 2024

GRADE	TMV ID	LOCATION	EXCEPTION COUNT	START TIME	END TIME
HIGH	TMV 293	L2, Theatres, Female staff WC	390	01-Oct-2024 07:29 AM	01-Oct-2024 07:34 AM
				01-Oct-2024 10:55 AM	01-Oct-2024 10:58 AM
				01-Oct-2024 11:47 AM	01-Oct-2024 11:48 AM
				01-Oct-2024 12:02 PM	01-Oct-2024 12:03 PM
				01-Oct-2024 12:21 PM	01-Oct-2024 12:25 PM
				01-Oct-2024 12:29 PM	01-Oct-2024 12:30 PM
				01-Oct-2024 12:49 PM	01-Oct-2024 12:53 PM
				01-Oct-2024 01:41 PM	01-Oct-2024 01:45 PM
				01-Oct-2024 01:46 PM	01-Oct-2024 01:49 PM
				01-Oct-2024 02:03 PM	01-Oct-2024 02:06 PM
				370 exceptions omitted	
				30-Oct-2024 02:00 PM	30-Oct-2024 02:02 PM
				30-Oct-2024 02:33 PM	30-Oct-2024 02:36 PM
				30-Oct-2024 03:35 PM	30-Oct-2024 03:40 PM
				30-Oct-2024 03:53 PM	30-Oct-2024 03:55 PM
				30-Oct-2024 03:57 PM	30-Oct-2024 03:59 PM
				30-Oct-2024 04:01 PM	30-Oct-2024 04:04 PM
				30-Oct-2024 04:04 PM	30-Oct-2024 04:07 PM
				30-Oct-2024 04:43 PM	30-Oct-2024 04:46 PM
				30-Oct-2024 09:52 PM	30-Oct-2024 09:55 PM
				31-Oct-2024 12:29 AM	31-Oct-2024 05:36 AM
HIGH	TMV 245	L3, Surgery, Male WC west side	119	01-Oct-2024 09:45 AM	01-Oct-2024 09:47 AM
				01-Oct-2024 12:52 PM	01-Oct-2024 12:57 PM
				01-Oct-2024 01:24 PM	01-Oct-2024 01:27 PM
				01-Oct-2024 02:50 PM	01-Oct-2024 02:52 PM
				01-Oct-2024 03:30 PM	01-Oct-2024 03:33 PM
				01-Oct-2024 09:28 PM	01-Oct-2024 09:30 PM
				01-Oct-2024 09:43 PM	01-Oct-2024 09:50 PM
				01-Oct-2024 10:43 PM	01-Oct-2024 10:48 PM
				02-Oct-2024 09:13 AM	02-Oct-2024 09:18 AM
				02-Oct-2024 12:56 PM	02-Oct-2024 12:59 PM

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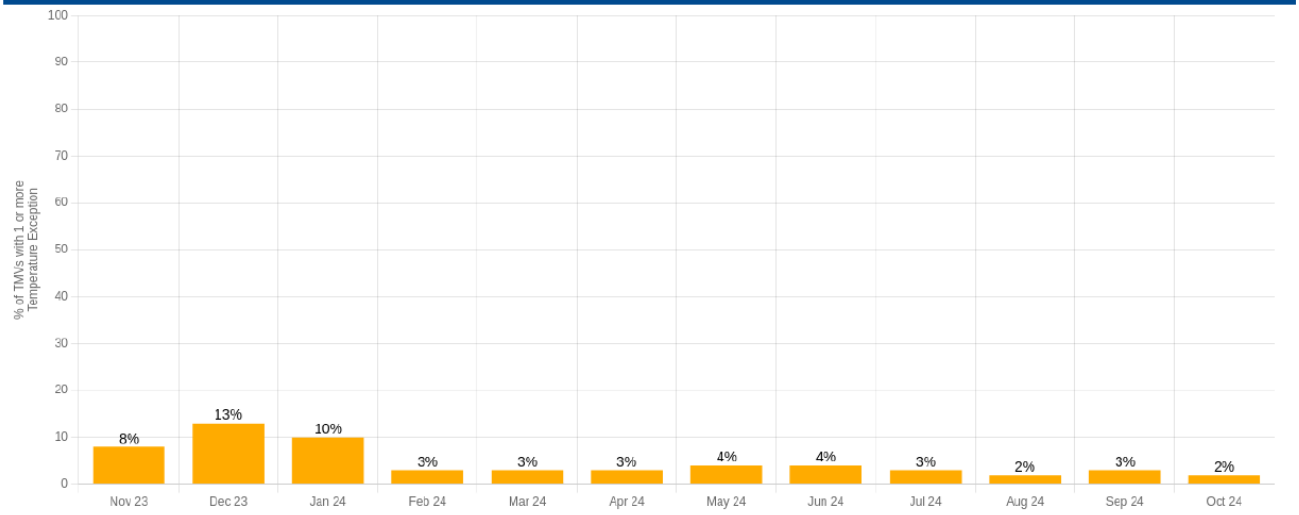
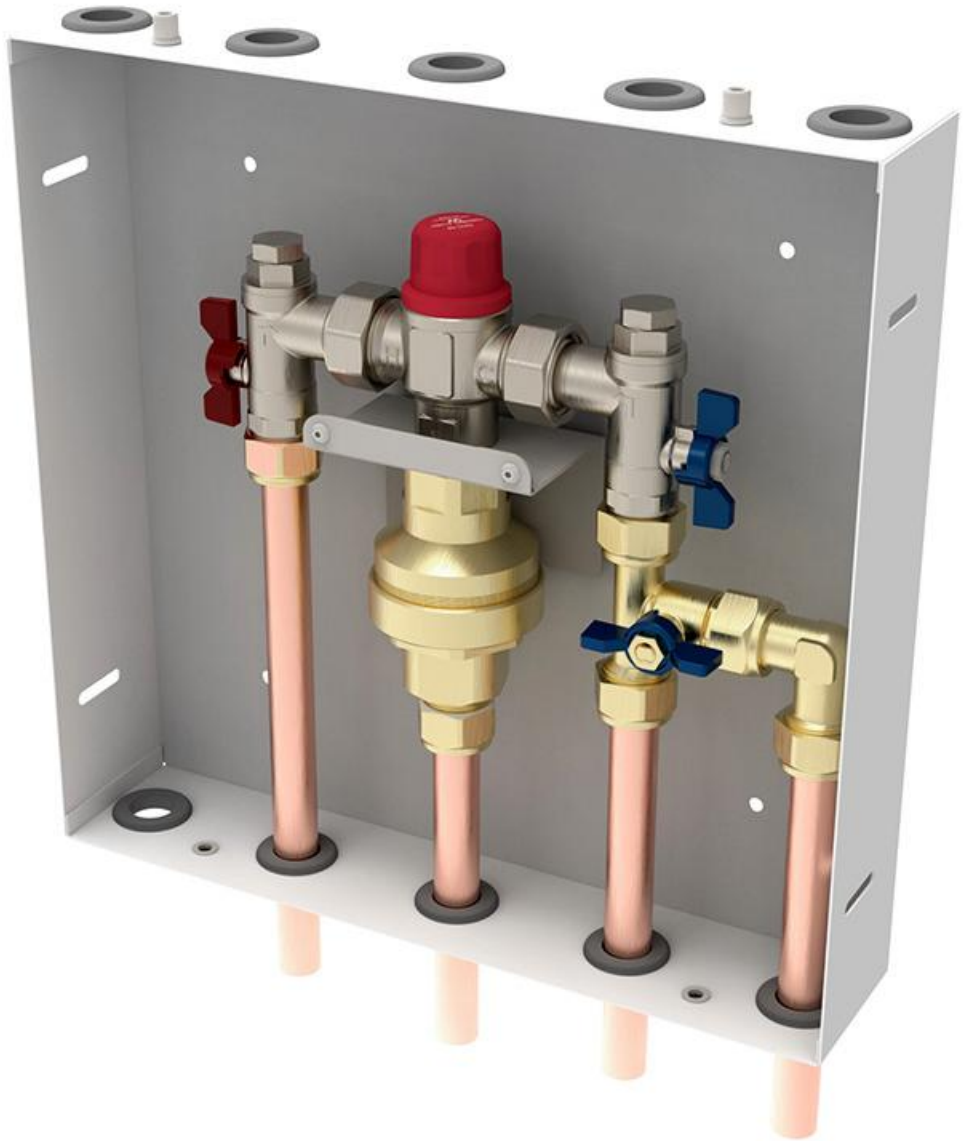
Temperature Exception Events



Compatible Thermostatic Mixing Valves (TMV)

The Smart Flow system should be installed with Enware Aquablend TMVs that include a Smart Flow mixing chamber with an integral temperature probe.

Below is an example (ATMS719SF-350) of a typical Aquablend 1500 TMV with a Smart Flow Mixing Chamber.



Background Information

Company Introduction

Enware is a leading local manufacturer of tapware & valves for the commercial, industrial & institutional marketplace since 1937. With our manufacturing facility located at Caringbah in Southern Sydney, Enware has offices in various states of Australia, as well as offices in Singapore, Dubai, Europe & New Zealand, where we supply our government & infrastructure based clientele such as hospitals, prisons, police stations, universities, councils & schools with our durable locally made and designed tapware, valves and associated monitoring systems.

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Smart Flow SFM Installations

With our extensive experience supplying Healthcare facilities throughout Australia and overseas for over 70 years, Enware Australia understands the unique hydraulic requirements within such facilities. The Smart Flow TMV monitoring system was developed to meet the mandatory NSW Department of Health requirements of monthly temperature testing imposed in the early 2000s (refer DOH circular C2004/10) and has been successfully installed into numerous health projects in NSW and interstate over the last 10 years.

Projects include:

- Gold Coast University Hospital
- Mater Hospital Newcastle
- Lismore Hospital Mental Health Unit
- Dubbo Hospital
- Nepean Hospital Stages 1,2,3,4,
- Mackay Hospital
- Wagga Hospital Mental Health Unit
- Auburn Hospital
- Belmont Hospital
- Lismore Hospital Integrated Cancer Care Unit
- Nyngan Hospital
- John Hunter Hospital
- RPA Lifehouse
- Port Macquarie Base Hospital
- Wollongong Hospital
- Parkes Hospital
- Forbes Hospital
- Liverpool Hospital
- Westmead Hospital CASB
- Griffith Base Hospital
- Campbelltown Hospital
- Hornsby Hospital
- Baptist Care Elderslie
- Baptist Care Caloola
- Canberra Hospital – SPIRE
- North Canberra Hospital
- Macquarie University Hospital
- Prince Of Wales CASB
- Sydney Children's Hospital

Warranty

Please refer to the warranty document on our website https://www.enware.com.au/pages/service-warranty

Quality Assurance & Standards

Enware Australia is a fully accredited quality endorsed company to ISO 9001. The Standard has formed the basis of our work principles to ensure the highest quality products and workmanship and safe working environment. The Enware Smart Flow system meets all requirements of AS3718. All outlets carry minimum 4 star WELS rating with showers being 3 star rated (maximum rating for showers).