

SPACES Winter Technical Meeting:
4th December 2018

SPACES Innovation award 2018

AK Connect

BMS user interface prototype Bere Regis Primary
School.

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Dorset Property

Environment, Infrastructure & Economy

Dorset County Council

Dorset Property

In house multi-disciplinary team of construction professionals capable of delivery of all types of projects in the built environment....

- Architects
- Landscape Architects
- Structural Engineers
- Mechanical Engineers
- Electrical Engineers
- Quantity Surveyors
- Project Managers
- Building Surveyors
- Clerks of Works
- Project Support



How did it all start?

- 2010 James Review of Education Capital (Post BSF)
- 2012 EFA Baseline Designs initiative
- Challenging net target cost £1,113/m²
- Stringent environmental performance parameters set



The Dorset Generic Design



Elevation A



Section AA

Downlands Primary School, Blandford

New class bases, internal modelling and new hard play areas



- A six classbase extension from 1.5 (FE) to 2.0 (FE)
- Two reception class bases, four key stage 1 classrooms and ancillary accommodation
- Alterations within existing school
- Main Contractor: ISG Construction Ltd

AK Controls. Review of possible cost savings

AKConnect General Overview
AK Controls Ltd
17 Fleetsbridge
Business Centre
Upton Road
Poole
(+44)1202 660061
office@akcontrols.com



www.akcontrols.co.uk

Fragmented control systems

- BMS Control System
- Energy recording, T&M systems
- Underfloor individual room temperature control
- High level window control.
- Classroom CO₂ and temperature monitoring

AK Controls

Options & Changes

- Metering, move towards Modbus meters.
- Link underfloor temperature and zone control back to BMS.
- High level window control use Modbus option, linked to BMS system.
- Classroom CO₂ and temperature monitoring, link back to BMS

AK Controls Solutions

Traditional BMS Solution

- Big increase in inputs and outputs required in main controller.
- Extensive wiring costs taking cabling back to central BMS panel.

Standard Genic Modbus controllers with onboard processors and memory

- More cost effective than using traditional BMS solutions by using local controllers, master and slave units.
- Modbus connections for meters, daisy chained together.
- Controllers link back to main BMS via cat 5 cabling
- Cabling for the system vastly reduced with shorter cable runs back to local controllers.
- More resilience. Active memory to run simple systems if communication lost to main controller.

Drivers for Development of AK Connect

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Development wish list

Visual, simple user interface to allow primary school staff to:

- Monitor boiler plant and to be able to see how the system is operating.
- Operate plant overrides and adjust operation times.
- Check operating temperatures and CO₂ levels.
- Method of monitoring energy usage.

Plus

- Cost effective add on to main BMS system.
- More robust method of connecting remotely to the system.
- Development of YouTube tutorials.

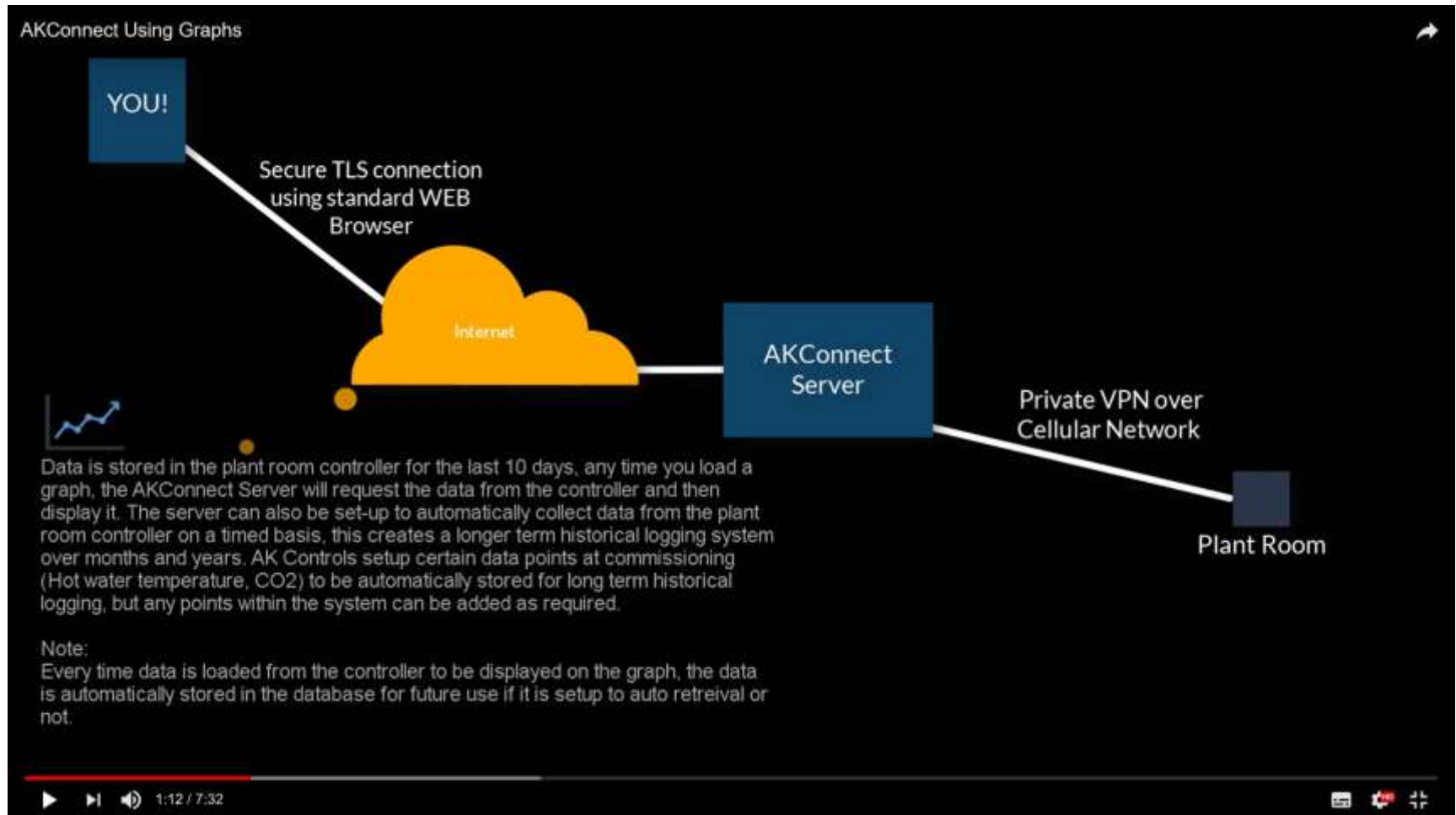
Bere Regis Primary School and Pre-School

Five class bases, hall, games court, grass playing field and pre-school facility



- Funded from savings from the Purbeck Reorganisation Programme
- A new 0.85 (FE) Primary School for 170 pupils
- Five classbases, hall and ancillary accommodation
- Completed November 2016
- Main Contractor: Morgan Sindall

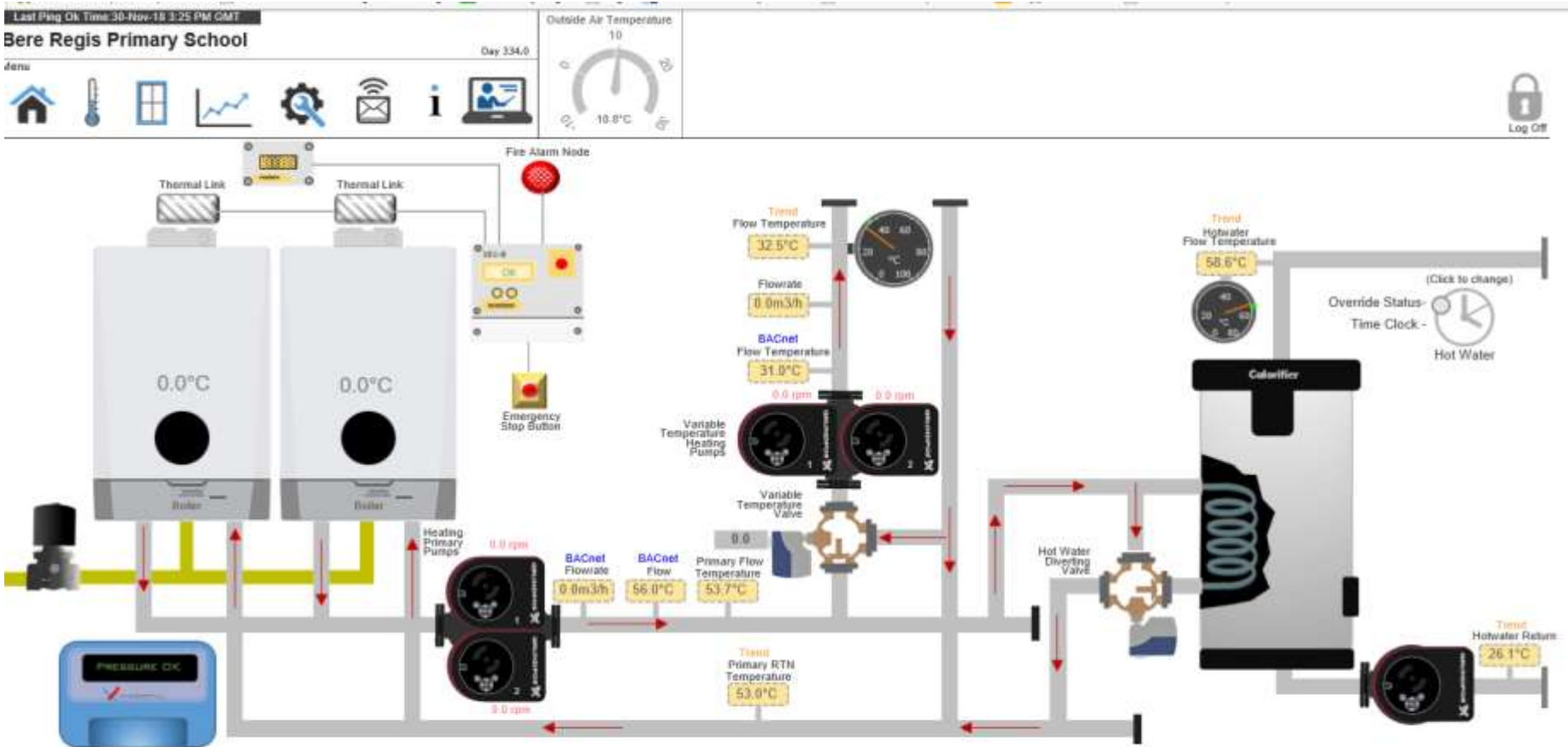
Remote connection to the interface.



Bere Regis Primary School Boiler Room

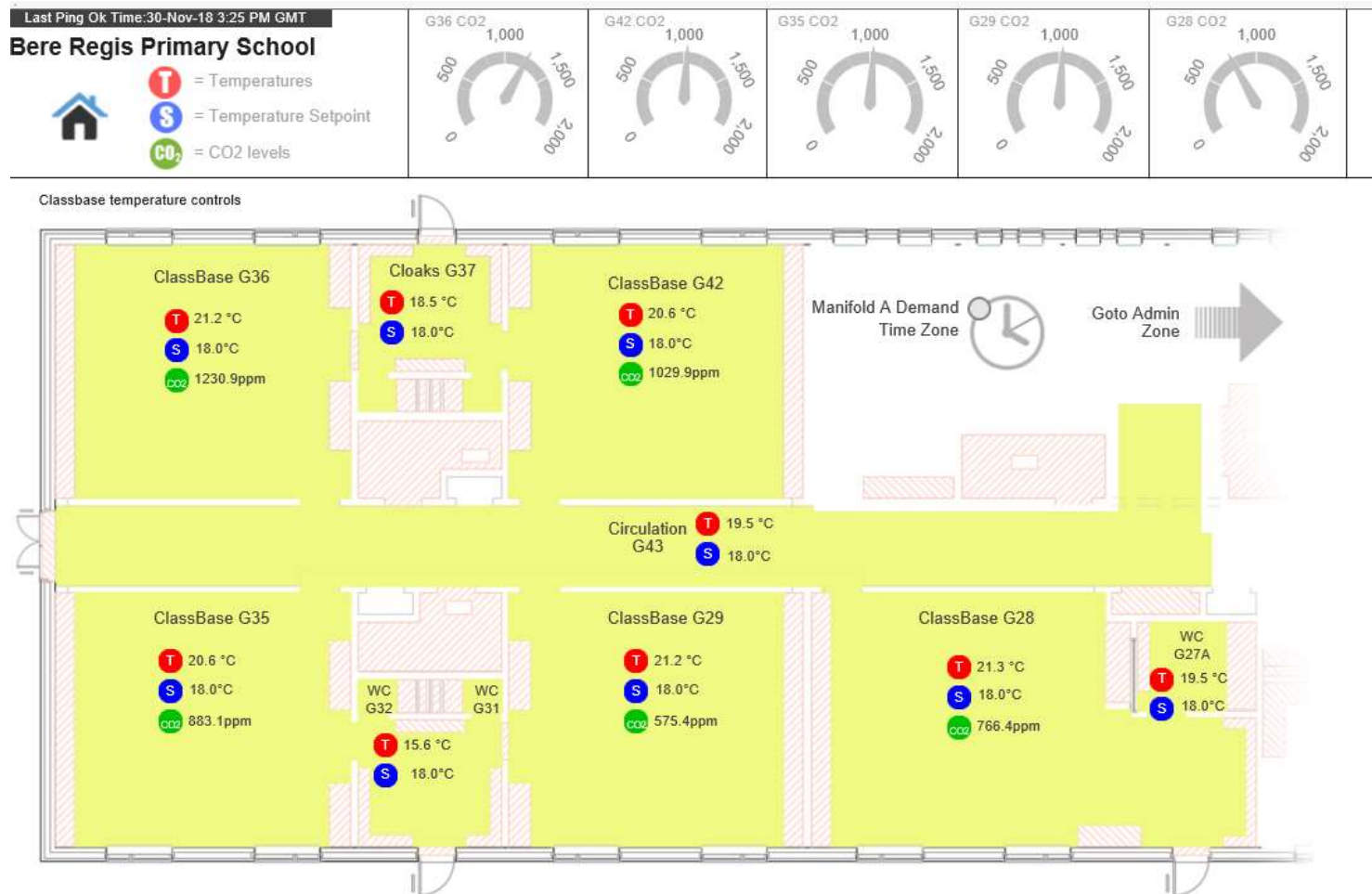


Bere Regis Primary School Main home page



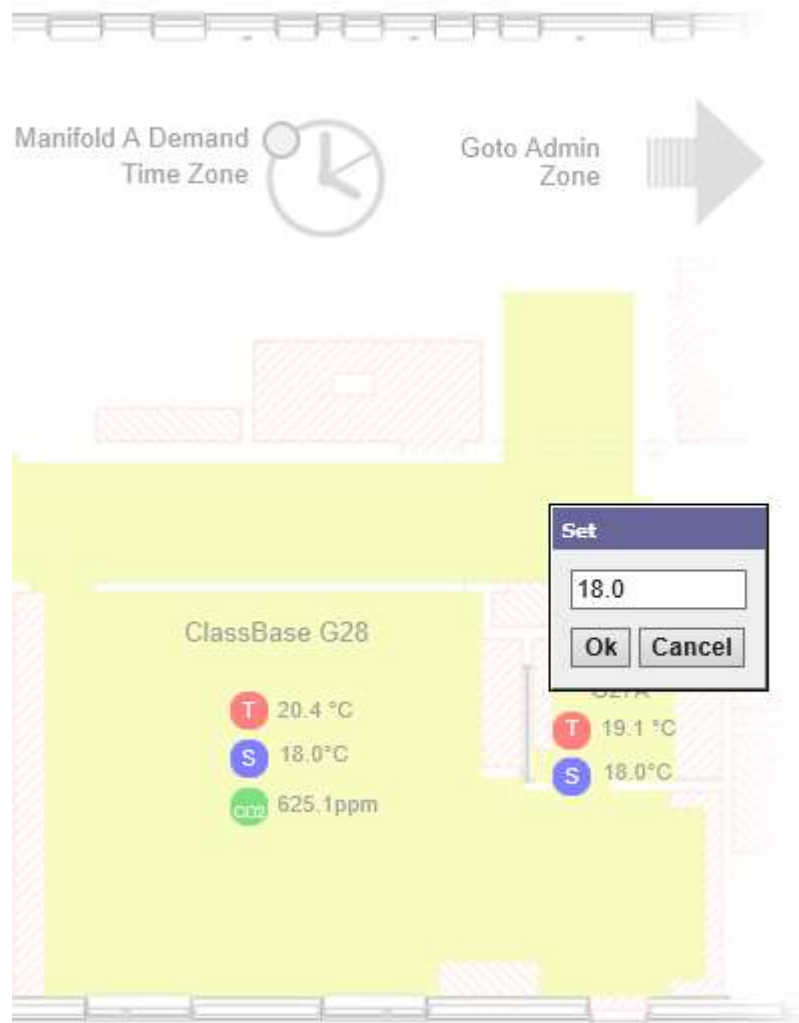
AK Connect

Temperature and CO₂ overview



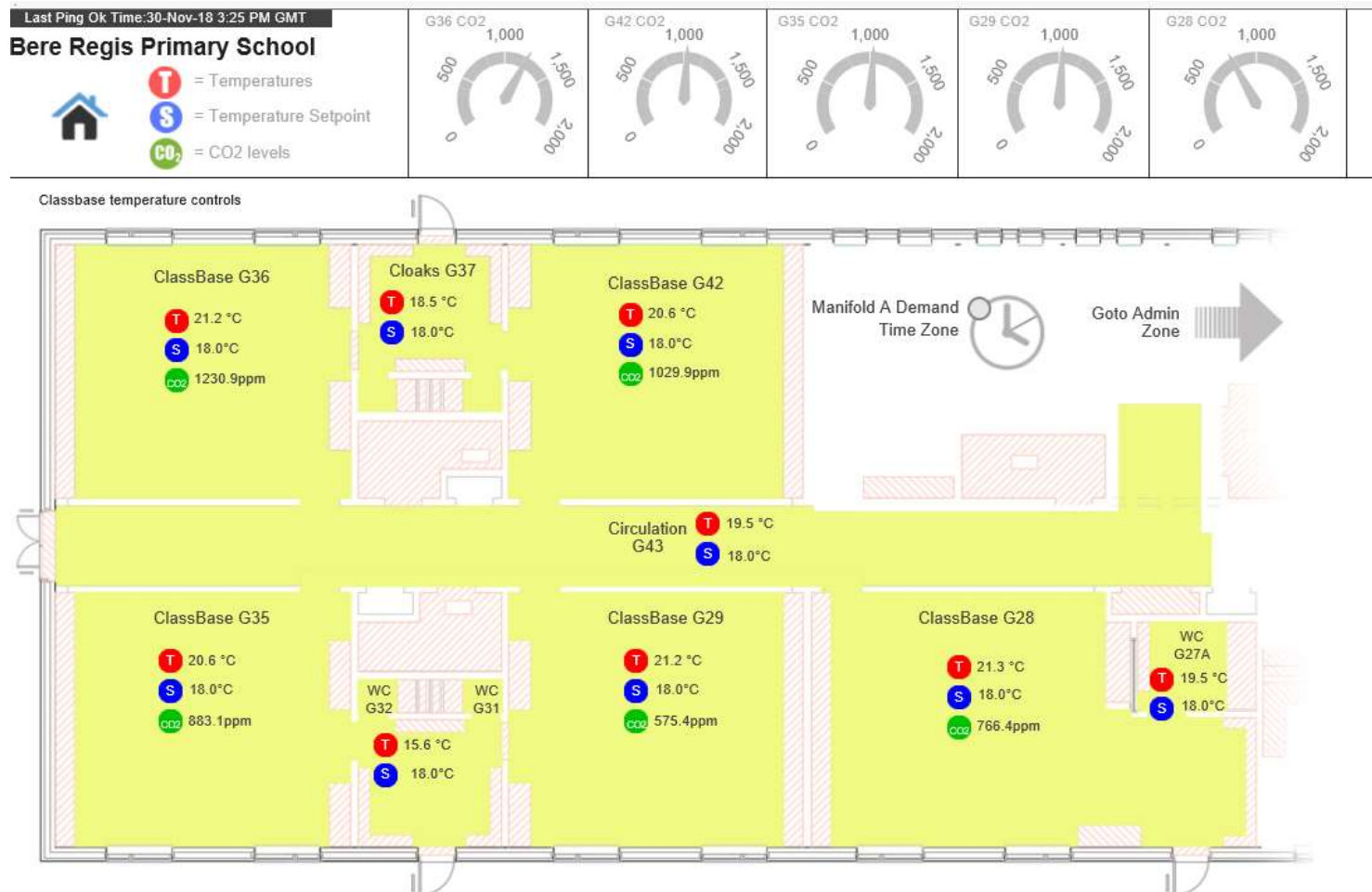
AK Connect

Temperature set point adjustment



AK Connect

Temperature and CO₂ overview





AK Connect Time Zone Adjustment

Last Ping

Ok

Time:30-Nov-18 5:12 PM GMT

Bere Regis Primary School

Time Zone Control

Update

State: Idle

Status: {ok}

Last Updated: 22-Oct-18 10:59 AM BST

Last Success: 22-Oct-18 11:00 AM BST

Classbase heating times

Weekly Schedule

Special Events

✕

📅

📄

🔍

⌂

🔄

📄

Sun	Mon	Tue	Wed	Thu	Fri	Sat
12:00 AM						12:00 AM
3:00 AM						3:00 AM
6:00 AM	true	true	true	true	true	6:00 AM
9:00 AM						9:00 AM
12:00 PM						12:00 PM
3:00 PM						3:00 PM
6:00 PM						6:00 PM
9:00 PM						9:00 PM
12:00 AM						12:00 AM

Start:

12

:

00

:

AM

GMT

Finish:

12

:

00

:

AM

GMT

Output:

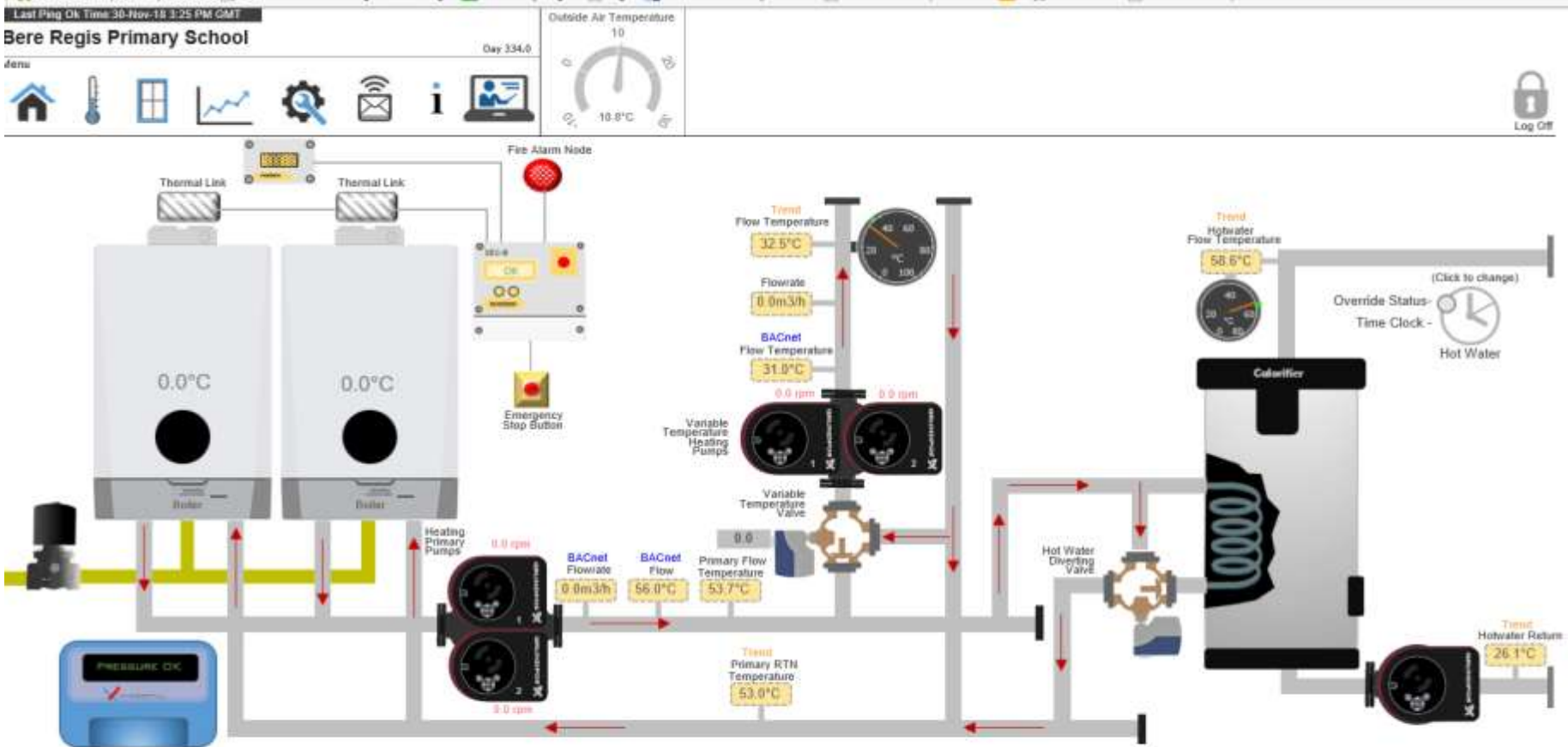
☐ null

☒ true

The Default Output for this Schedule is currently set to "false {ok}".

AK Connect

Bere Regis Primary School Main home page



Clearstory Window Control

Last Ping Ok Time 30-Nov-18 3:25 PM GMT

Bere Regis Primary School (Demo)

TimeClock



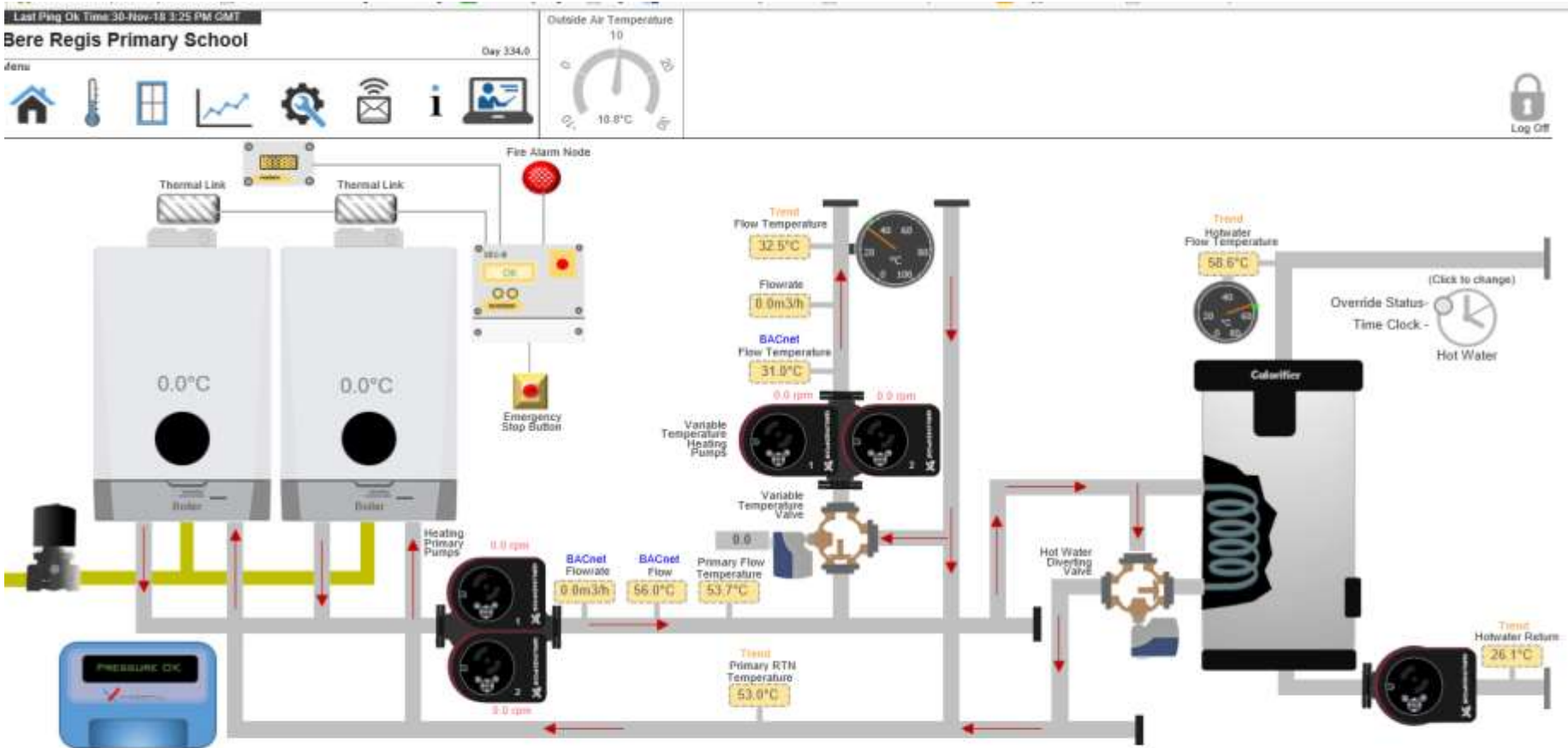
Outside Air
10.5

Corridor
19.8



AK Connect

Bere Regis Primary School Main home page



Grapical Information

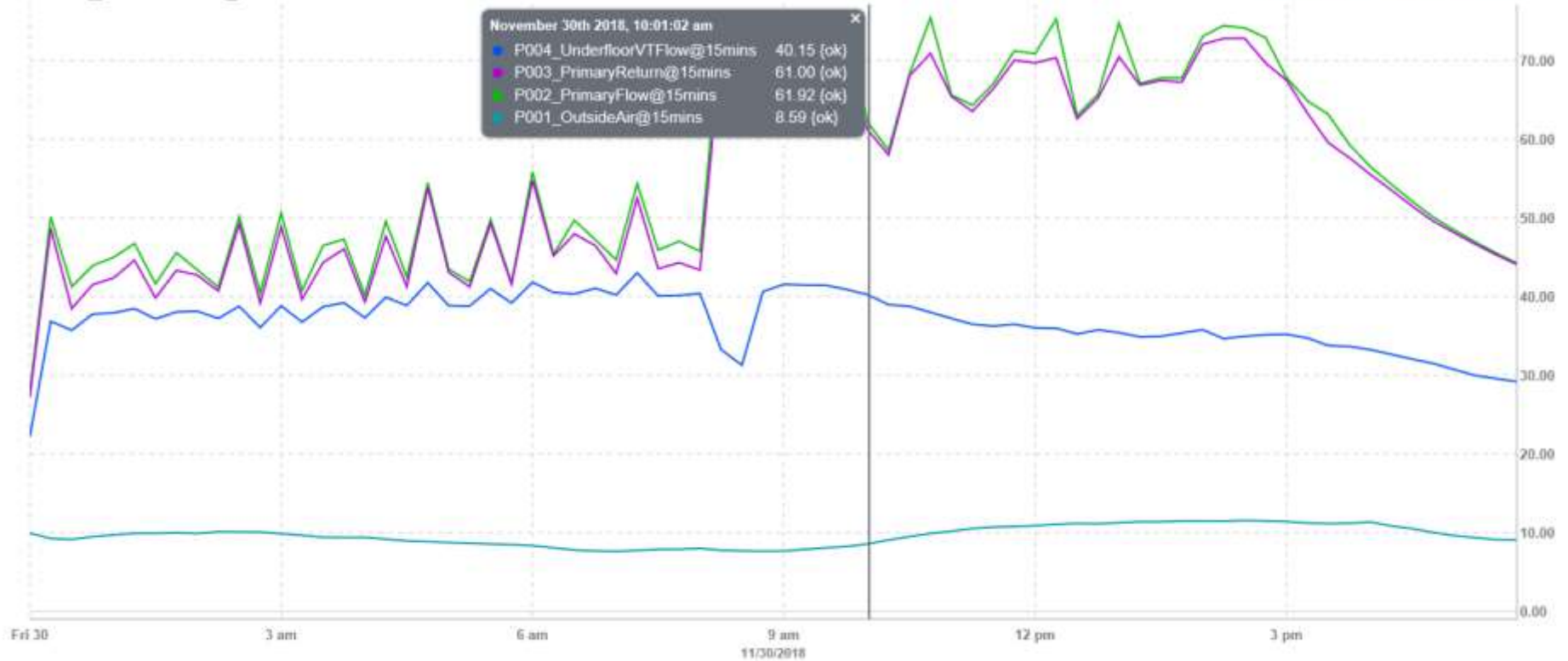
Last Ping Ok Time: 30-Nov-18 4:56 PM GMT

Bere Regis Primary School

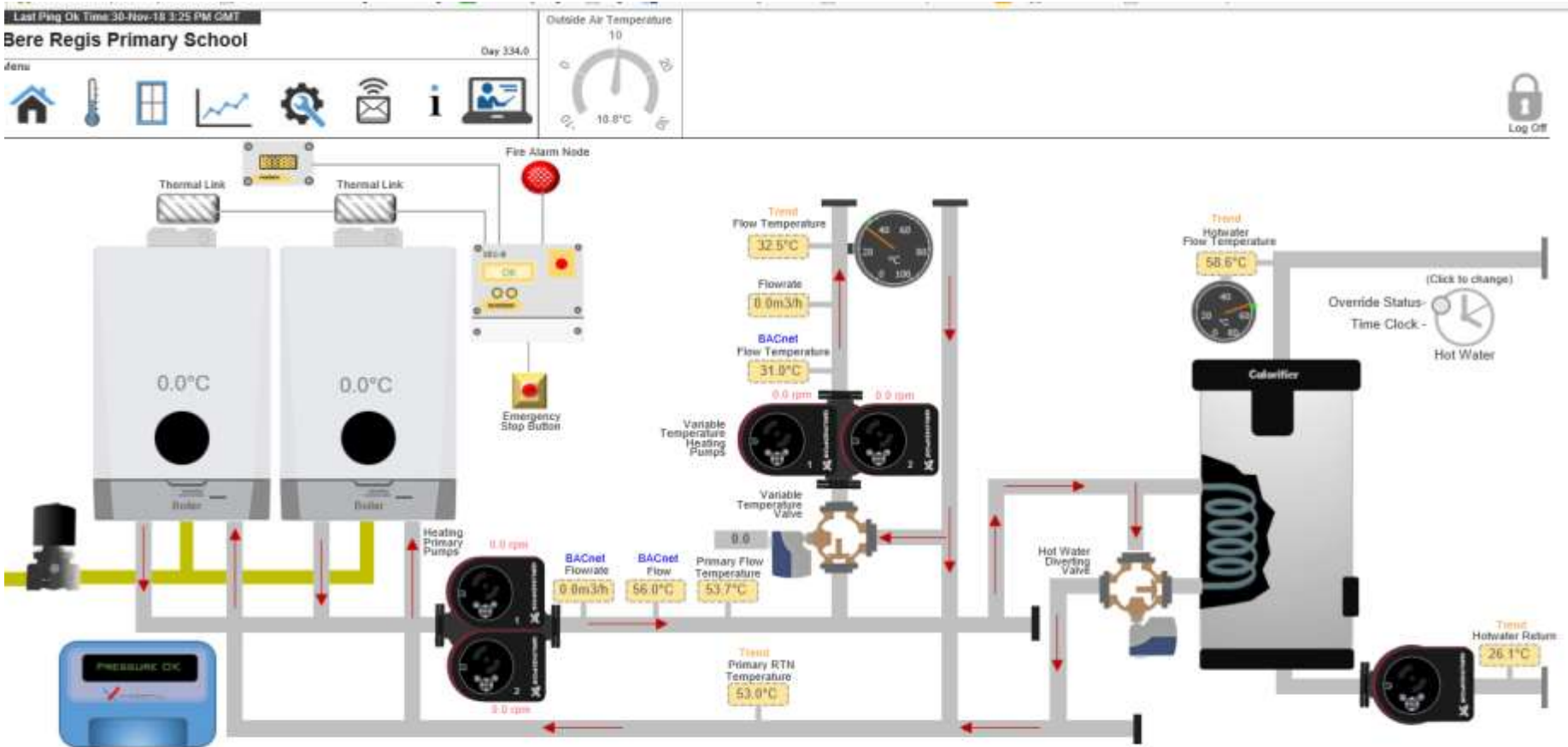


Today

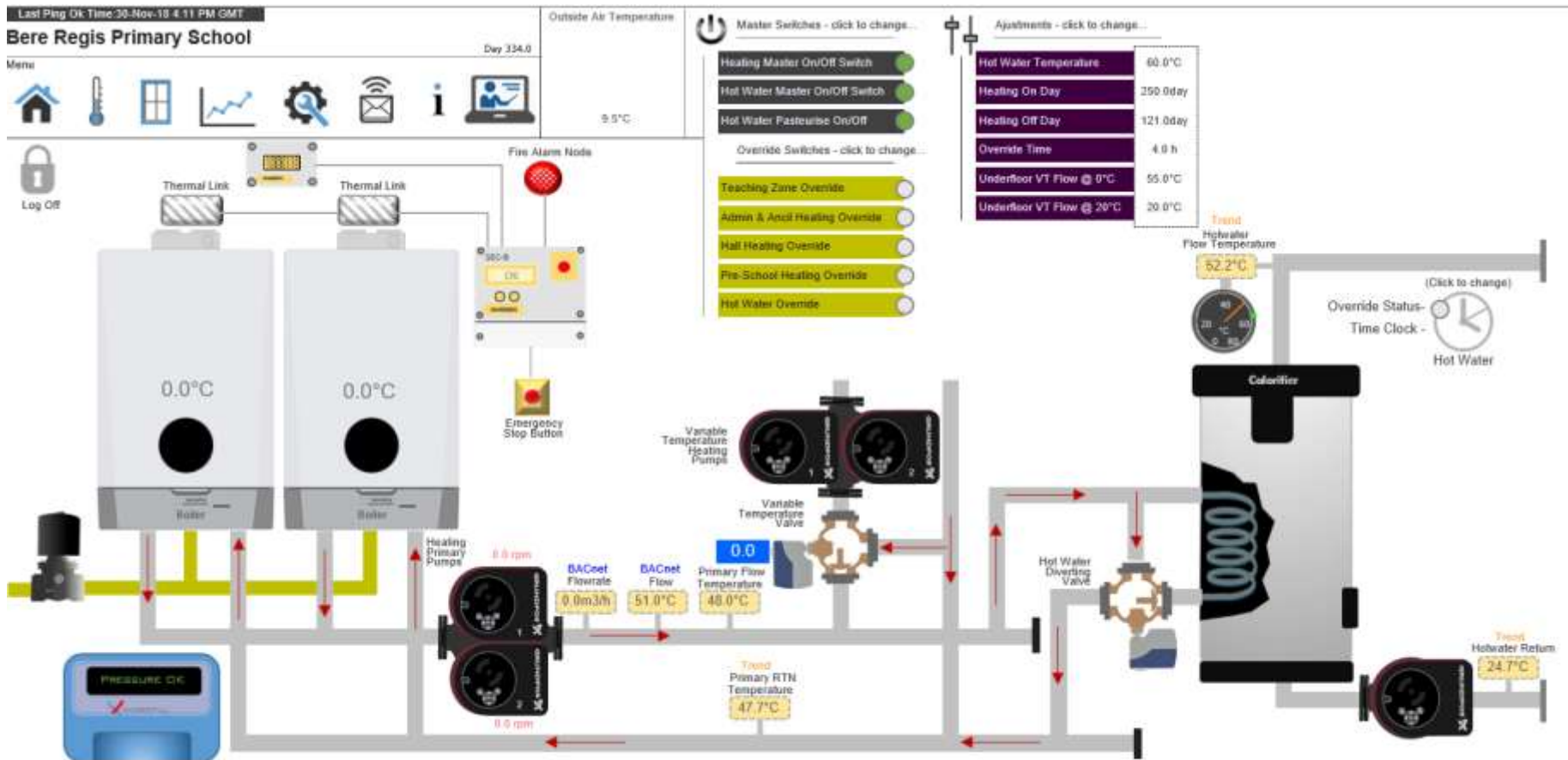
P001_OutsideAir@15mins



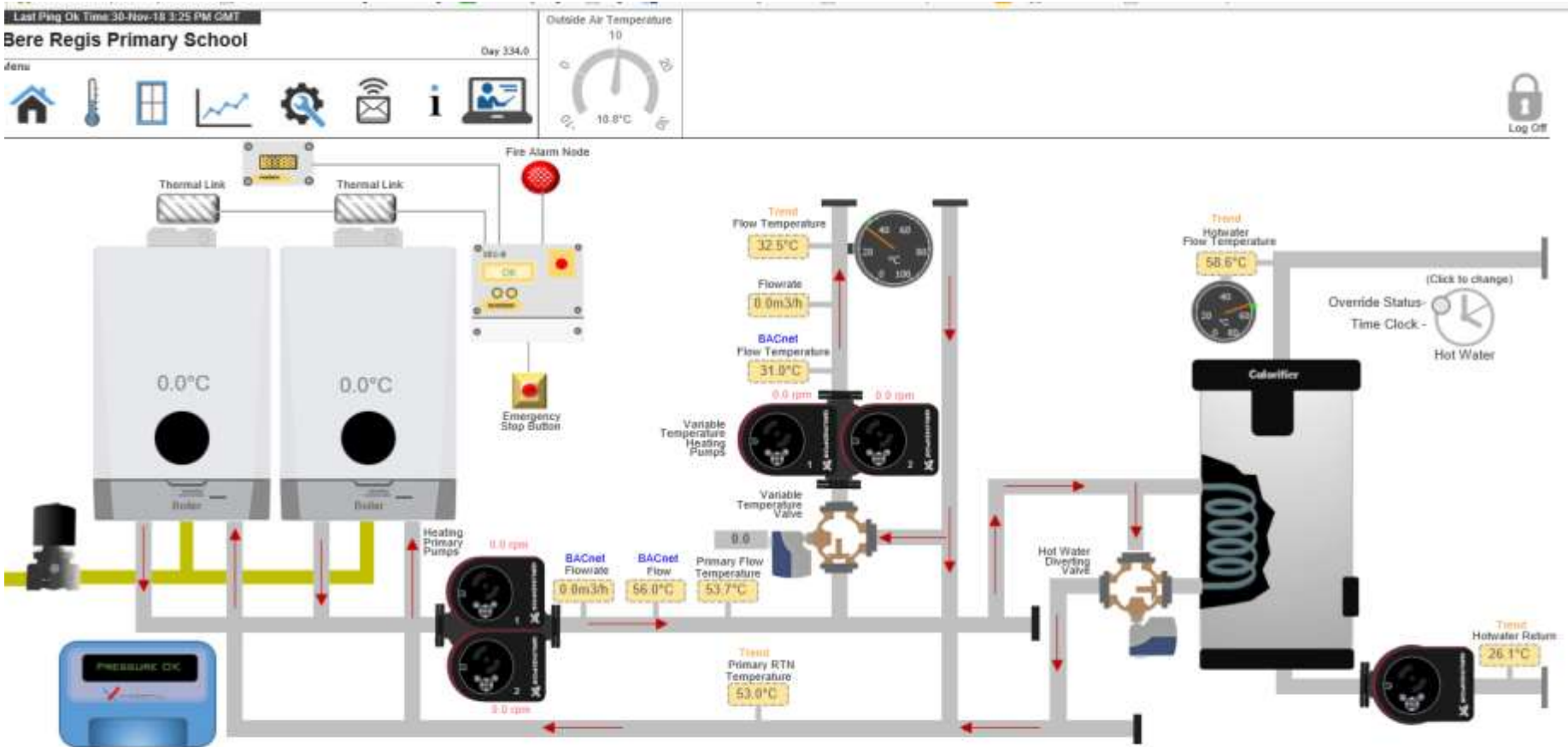
Bere Regis Primary School Main home page



AK Connect Settings Page



Email Alerts, Information and Help Video Links



St Osmunds School, Dorchester

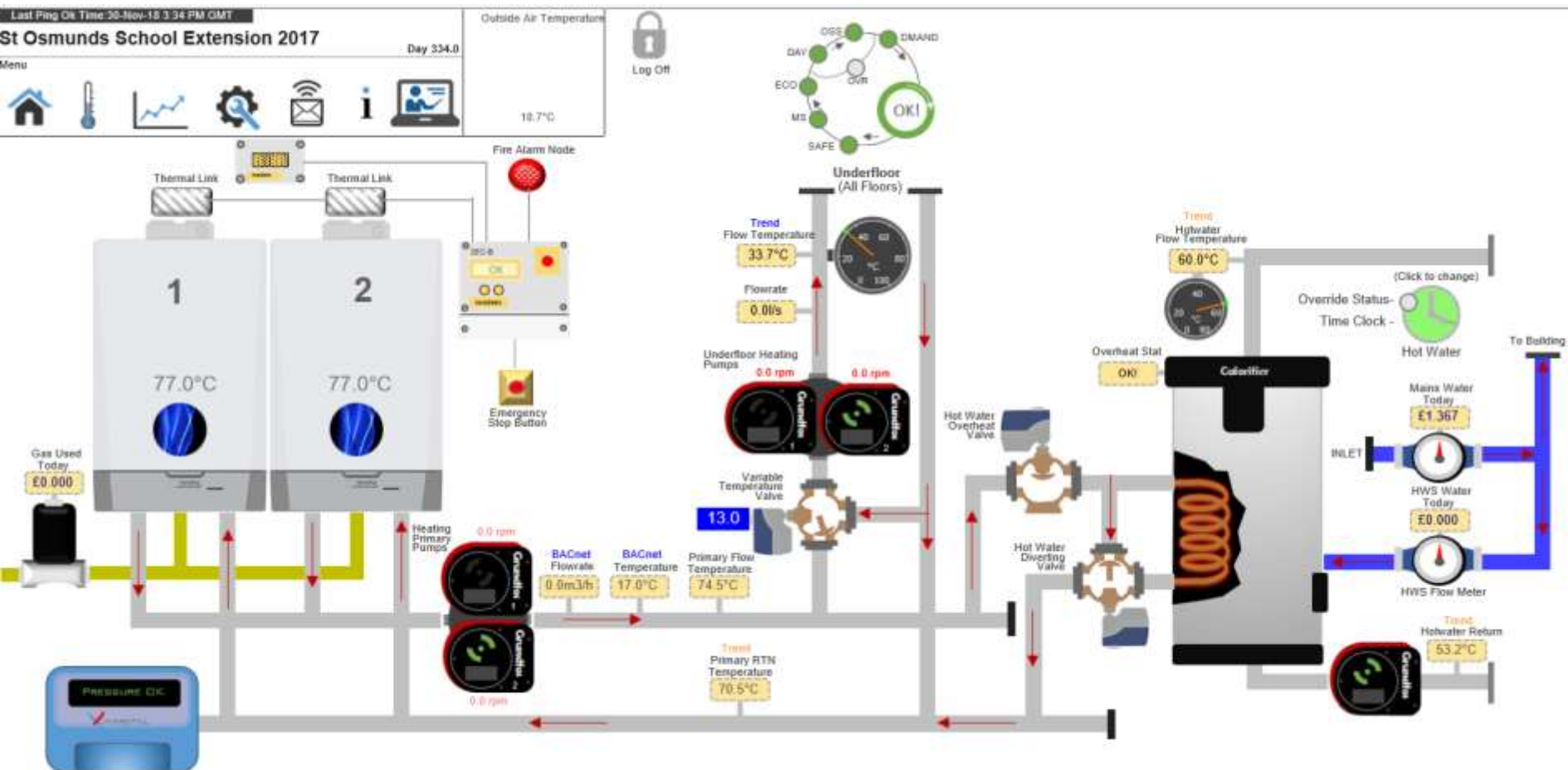
A new two storey detached building



- A new two storey block including 5 (FE) school to 6 (FE) for 720 pupils
- Four classrooms, multi-purpose resource teaching space and new dining hall and kitchen
- Completed: December 2017
- Main Contractor: Morgan Sindall

AK Connect

St Osmunds School Boiler Room Main Page



Boiler Demand Process Wheel



SAFE: Gas system, heating system pressure, fire.

MS: Master Heating Switch

ECO: Economy off, shuts heating down if system above 17C

DAY: Is the date within the normal heating period.

OSS: Optimum start/stop

OVR: Override activated

DEMAND: Either a heating or DHW demand

Last Ping Ok Time:

Pre-Formatted Graphs - Once Loaded Use you browser Back Button to Return

Twynham School - Resource Monitoring

Lighting Yesterday

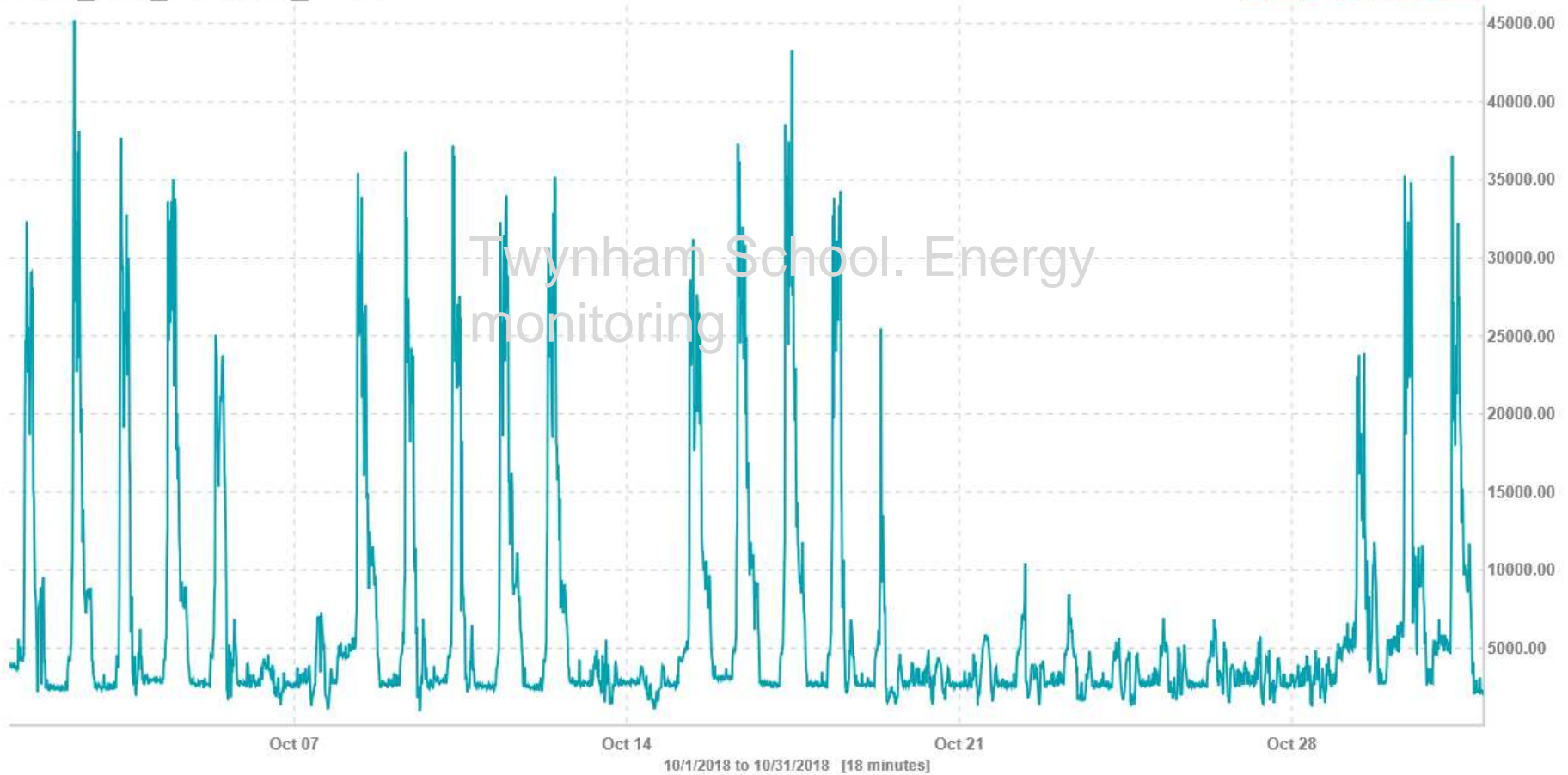
Power Yesterday

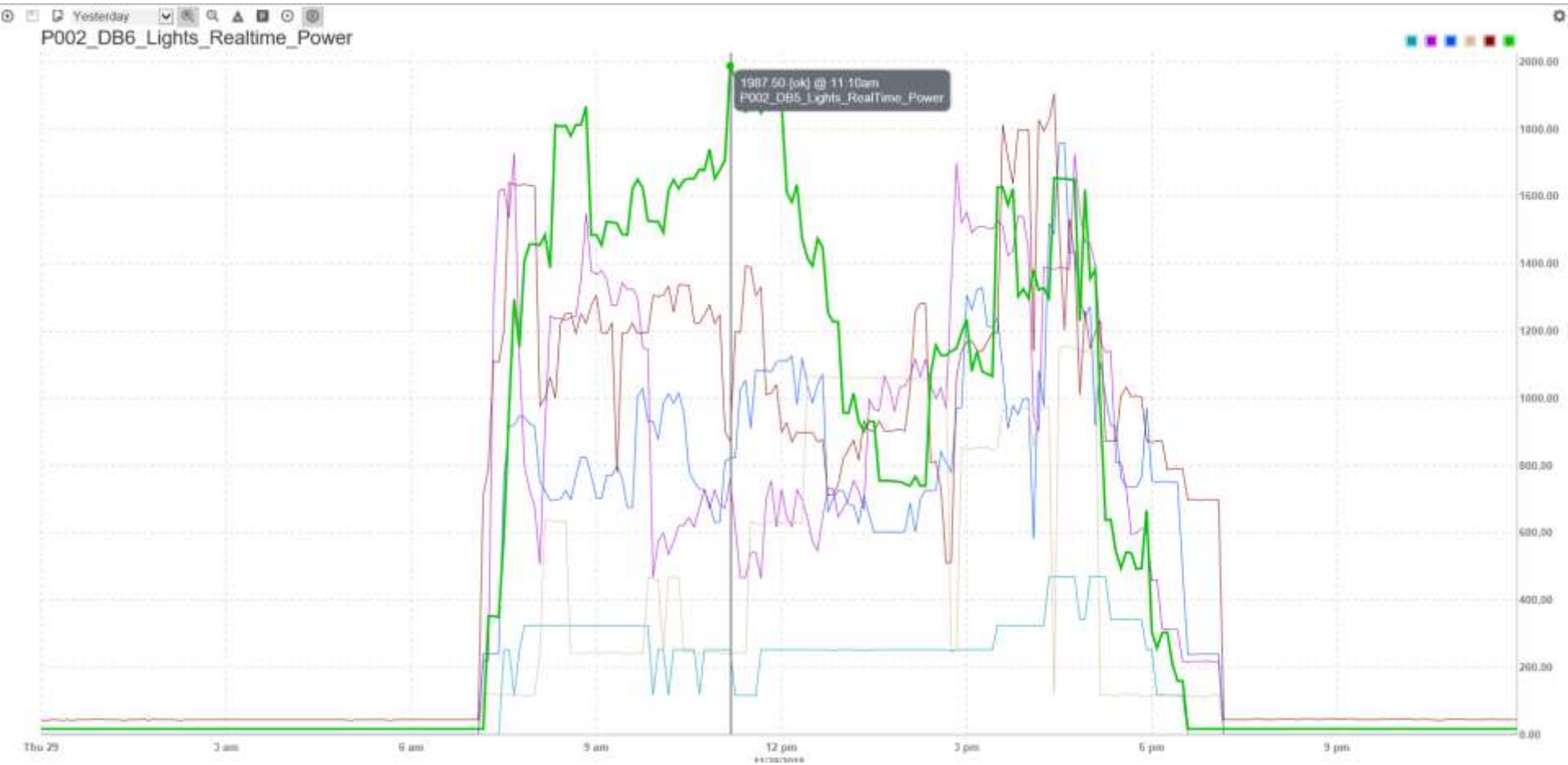


Last Month

P002_DB1_RealTime_Power

P002_DB1_RealTime_Power





The screenshot displays the Budmouth College - Everdene BMS interface. The top navigation bar includes icons for Home, Temperature, Trends, Settings, and User Management, along with a 'Log Off' button. The main area shows a detailed piping diagram with various components and their current status:

- Outside Air Temperature:** 0.0°C
- Hot Water Flow/Return Temperatures:** 0.0°C
- Average Space Temperature:** 0.0°C (for both Sixth Form Heating (Block B) and Everdene (Block A))
- BACnet Flow Temperature:** 0.0°C
- Flowrate:** nan/l/s
- Pump speeds:** 0.0 rpm
- Primary/Secondary Flow/Return Temperatures:** 0.0°C
- Pressure:** Pressure OK
- Flow Meter:** 0.0L, 1 pulse / 5Ltrs

The interface also includes a 'Projection Table = Projection Table' status bar at the bottom.

Budmouth. Site layout. Google Maps

Last Ping Ok Time:23-Oct-18 10:04 AM BST

Budmouth College - Everdene

Menu



Email alerts : Safe Water Temperatures

AK Controls Ltd

Safe Water Monitoring

Automatic Report

Budmouth College

Chickerell Road

Weymouth

DT4 9SY

Station Date/Time: 26-Feb-18 8:15 AM GMT

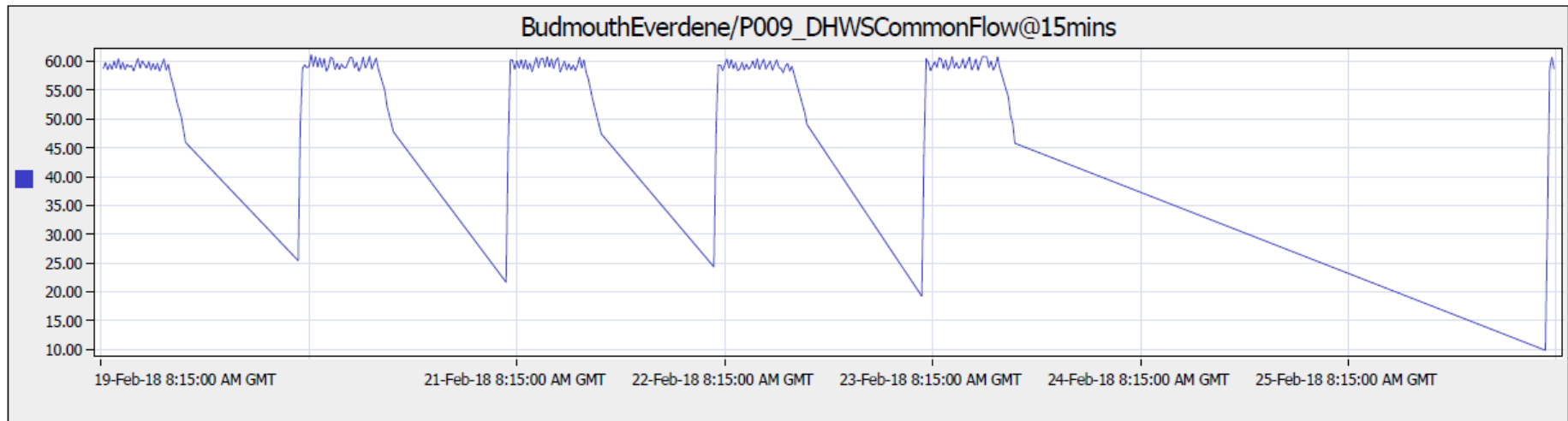
Station MAC Address: 00:10:70:0E:51:28

Reporting Period: Weekly

Maximum Temperature	Minimum Temperature	Average Temperature
61.12	9.73	34.72

Below are records over the past week in graph and tabular form relevant to domestic hot water temperatures.
The data table displays all temperature samples that are greater than 60°.

Calorifier Common Flow Temperature



26-Feb-18 8:15 AM GMT

Email Alerts; Gas pressure monitoring

AK Controls Ltd

Gas Monitoring

Automatic Report

Budmouth College
Chickerell Road
Weymouth
DT4 9SY

Station Date/Time: 26-Feb-18 8:27 AM GMT

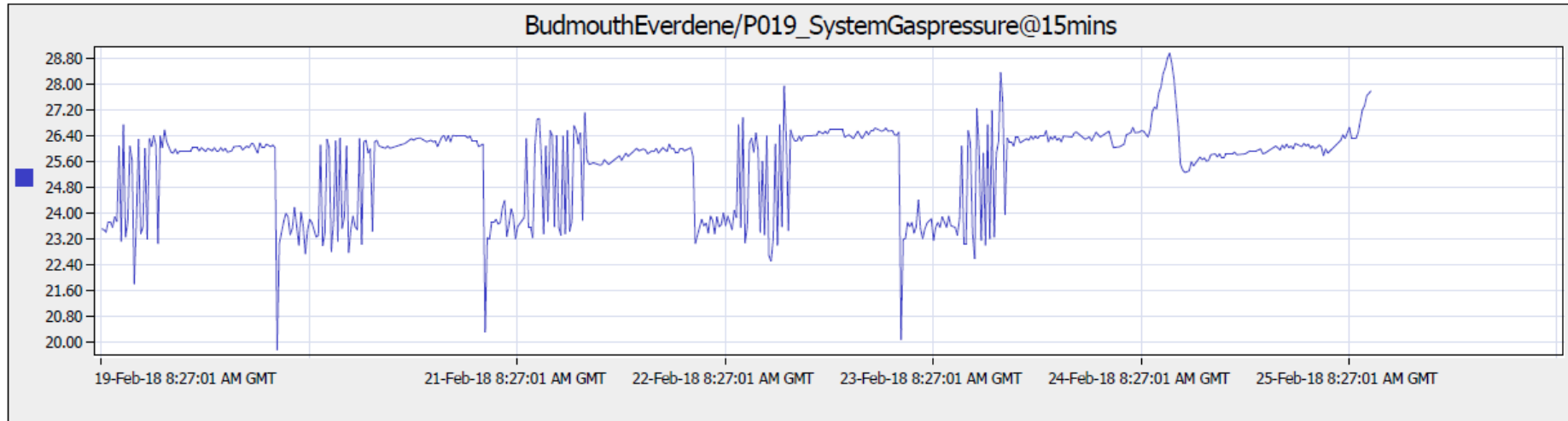
Station MAC Address: 00:10:70:0E:51:28

Reporting Period: Weekly

Maximum Pressure	Minimum Pressure	Average Pressure
28.95	19.75	25.51

Below are records over the past week in graph and tabular form relevant to gas pressures.

System Gas Pressure



26-Feb-18 8:27 AM GMT

Questions

Costs

Help Video Link

<https://youtu.be/wPHqY-rg7Xw>