

Site & Visit Details	
Site Name	Four Seasons Shopping Centre
Site Contact	Shopping Centre Operations Manager
Client Order Number	BHM991299
Kendra Job Number	103M5163
Job Information	PPM Visit
Engineers Name	Richard Dodds
Date of Visit	03-07-2019

## Summary of Visit

Item	Check
Visit Completed	✓
Additional Works Required	✓
Field Quote Attached	✗

Site Attendance	Time
Time on Site	08:30
Time Left Site	13:30
Travel Time	4 hrs

Labour Utilisation	Hrs
PPM	8

System Type	Detail
Trend	IQ3

Customer Attention (Red Box)	Check
Faults Identified	<input checked="" type="checkbox"/>

Office Attention (Red Box)	Check
Remedial Quotation Required	<input checked="" type="checkbox"/>

## Extra Works/Recommendations

### Technical Extra Works Detail

Two off wireless sensors faulty reading minus 100°C.  
 2 off Trend TW/S wireless space sensor – see report for further information.

### Part Numbers



No	Check List	Check
1	Inform site contact that you are onsite and discuss any known issues or concerns.	✓
2	Risk assessment & Method statements read & understood prior to commencing any works.	✓
3	Dynamic Risk Assessment completed to cover additional risks not covered by standard RAMS.	✗
4	Software Backup taken and loaded to SharePoint?	✓
5	Provided a verbal overview of the visit to the customer highlighting any improvements or additional works.	✓
No	Proactive Tasks	Check
1	Were any energy saving initiatives carried out or identified?	✓
2	Have any improvements to the system been carried out or identified?	✓
3	Is the system current and up to date, with all components readily available?	✓
No	Site Specific Tasks	Check
1	Controller integrity checks.	✓
2	Controller strategy checks.	✓
3	Inspect analogue input devices and recalibrate were necessary.	✓
4	Check operation of digital Input devices.	✓
5	Check operation of analogue output points and their connected devices.	✓
6	Check operation of digital output points and their connected devices.	✓
7	Check control loop performance.	✓
8	Check controller battery condition.	✓
9	Ensure controller terminals are secure and enclosures are generally clean.	✓
10	Back-up controller data files	✓



	Controller	LAN	Location	Check
1	OS11 Identifier: Air Handling Unit 1 /IP Address: 192.168.1.11 / MAC Address: 00:10:70:00:8c:2c	LAN 001	Roof Top AHU	✓
2	OS12 Identifier: Air Handling Unit 2 /IP Address: 192.168.1.12 / MAC Address: 00:10:70:0d:98:ee	LAN 001	Roof Top AHU	✓
3	OS13 Identifier: Air Handling Unit 3 /IP Address: 192.168.1.13 / MAC Address: 00:10:70:0b:24:c0	LAN 001	Roof TOP AHU	✓
4	OS14 Identifier: Air Handling Unit 4 /IP Address: 192.168.1.14 / MAC Address: 00:10:70:0d:22:c7	LAN 001	Roof Top AHU	✓
5	OS15 Identifier: Air Handling Unit 5 /IP Address: 192.168.1.15 / MAC Address: 00:10:70:11:1b:57	LAN 001	Roof Top AHU	✓
6	OS16 Identifier: Air Handling Unit 6 /IP Address: 192.168.1.16 / MAC Address: 00:10:70:0d:4e:15	LAN 001	Roof Top AHU	✓
7	OS17 Identifier: Air Handling Unit 7 /IP Address: 192.168.1.17 / MAC Address: 00:10:70:0e:18:c4	LAN 001	Roof Top AHU	✓
8	OS18 Identifier: AHU Control Panel /IP Address: 192.168.1.18 / MAC Address: 00:10:70:0d:22:c6	LAN 001	Roof Top AHU	✓
9	OS20 Identifier: TREND_08_6B_FC / IP Address: 192.168.1.20 / MAC Address: 00:10:70:08:6b:fc	LAN 001	Control Panel IQView	✓



## Engineer's Report

### Technical Report

Attended site to carry out PPM visit on the existing Trend IQ3 system located throughout the shopping centre, the AHU controllers are contained within the AHU's located on the individual roofs.

### Security Managers Panel Time Zone

This has been set to operate in two-hour intervals

Day	Start 1	Stop 1	Start 2	Stop 2	Start 3	Stop 3
Monday	00:00	02:00	04:00	06:00	08:00	10:00
Tuesday	00:00	02:00	04:00	06:00	08:00	10:00
Wednesday	00:00	02:00	04:00	06:00	08:00	10:00
Thursday	00:00	02:00	04:00	06:00	08:00	10:00
Friday	00:00	02:00	04:00	06:00	08:00	10:00
Saturday	00:00	02:00	04:00	06:00	08:00	10:00
Sunday	00:00	02:00	04:00	06:00	08:00	10:00

Day	Start 4	Stop 4	Start 5	Stop 5	Start 6	Stop 6
Monday	12:00	14:00	16:00	18:00	20:00	22:00
Tuesday	12:00	14:00	16:00	18:00	20:00	22:00
Wednesday	12:00	14:00	16:00	18:00	20:00	22:00
Thursday	12:00	14:00	16:00	18:00	20:00	22:00
Friday	12:00	14:00	16:00	18:00	20:00	22:00
Saturday	12:00	14:00	16:00	18:00	20:00	22:00
Sunday	12:00	14:00	16:00	18:00	20:00	22:00

This control panel mimics the controllers on the remote AHU units and displays all inputs, outputs, temperature sensors and alarms. The AHU controls adjustable parameters can also be adjusted from the IQ View. Facility for alarm logging and temperature monitoring is also available.

The panel is fitted with Run / Trip indication and a 1-hour Boost button facility for each AHU. The master controller located within the security panel is the site time master for the site. And broadcasts run signals for each AHU dependent upon the weekly time schedule set up in the controller.

Should an area of the Mall become cold, when the AHU's are switched OFF, on the time schedule, pressing the 1-hour boost button, will switch it on for 1 hour. The button will illuminate if the AHU is overridden.

Trend TW wireless temperature sensors have been installed within the Mall to monitor temperatures within the following locations;

- Outside Air Temperature – This is a TW/S space sensor mounted above the door to the security office. The TW/S is a wall mounting thermistor space temperature sensor. The TW/S housing consists of 2 parts; front panel, and back plate, and can be either mounted onto a flat surface, or flush mounted using a standard wall box.
- East Mall Unit 57 – This is a TW/S space sensor
- Inter Square Unit 31&32 – This is a TW/S space sensor
- North Square Unit 46 – This is a TW/S space sensor
- South Mall Unit 14 – This is a TW/S space sensor
- Centre Square Unit 26 – This is a TW/S space sensor



These sensors are connected to the Trend system via BACnet communications.

However, at present we have two sensors reading a default value of 100°C within the control strategy.

**Mall Average Space Temp & Mall Minimum Space Temp calculations**

- East Mall Unit 57 reading 17.5°C
- Inter Square Unit 31&32 reading 100°C
- North Square Unit 46 reading 18.4°C
- South Mall Unit 14 reading 17°C
- Centre Square Unit 26 reading 100°C

I have removed the two faulty sensors from control strategy

**OS11 Identifier: Air Handling Unit 1 /IP Address: 192.168.1.11 / MAC Address: 00:10:70:00:8c:2c.**



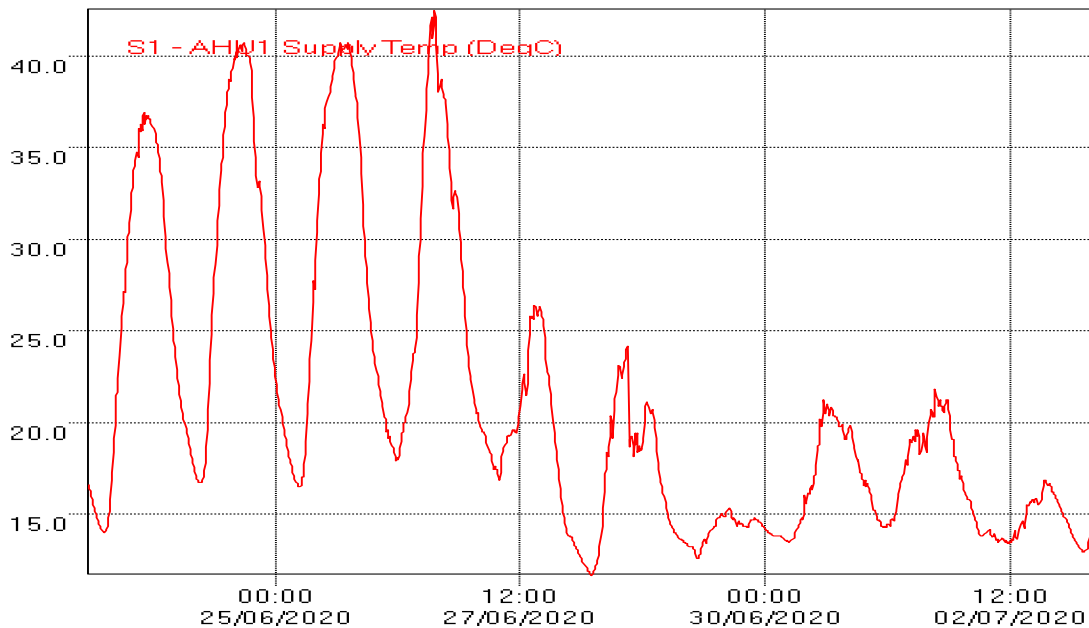
This is a gas fired burner ahu with a variable speed supply fan and a outside air damper. The AHU time schedule located within the controller is set to operate, to the times listed below if software switch W9 "Use Local Schedule" has a status of 1, currently this switch has a status of 0, so the AHU is being enabled via IC Comms from the manager's operation, control panel located within the security room.

### AHU Local Time Zone

Day	Start 1	Stop 1	Start 2	Stop 2	Start 3	Stop 3
Monday	07:00	10:00	14:00	16:00	0:00	0:00
Tuesday	07:00	10:00	14:00	16:00	0:00	0:00
Wednesday	07:00	10:00	14:00	16:00	0:00	0:00
Thursday	07:00	10:00	14:00	16:00	0:00	0:00
Friday	07:00	10:00	14:00	16:00	0:00	0:00
Saturday	07:00	10:00	14:00	16:00	0:00	0:00
Sunday	07:00	10:00	14:00	16:00	0:00	0:00

The AHU Temperature control set point is set @ 18°C however as you can see from the graph below, the actual supply air temperature is 14.73°C, that the AHU is not reaching supply air temperature set point, the gas burner demand is currently at 70%. The two off gas fired burners for this AHU are not showing any faults. Unable to access the roof mounted AHU to investigate further.

### AHU 1 Supply Air Temperature.



**OS12 Identifier: Air Handling Unit 2** /IP Address: 192.168.1.12 / MAC Address: 00:10:70:0d:98:ee

This is a gas fired burner ahu with a variable speed supply fan and a outside air damper.

The AHU time schedule located within the controller is set to operate, to the times listed below if software switch W9 "Use Local Schedule" has a status of 1, currently this switch has a status of 0, so the AHU is being enabled via IC Comms from the manager's operation, control panel located within the security room.

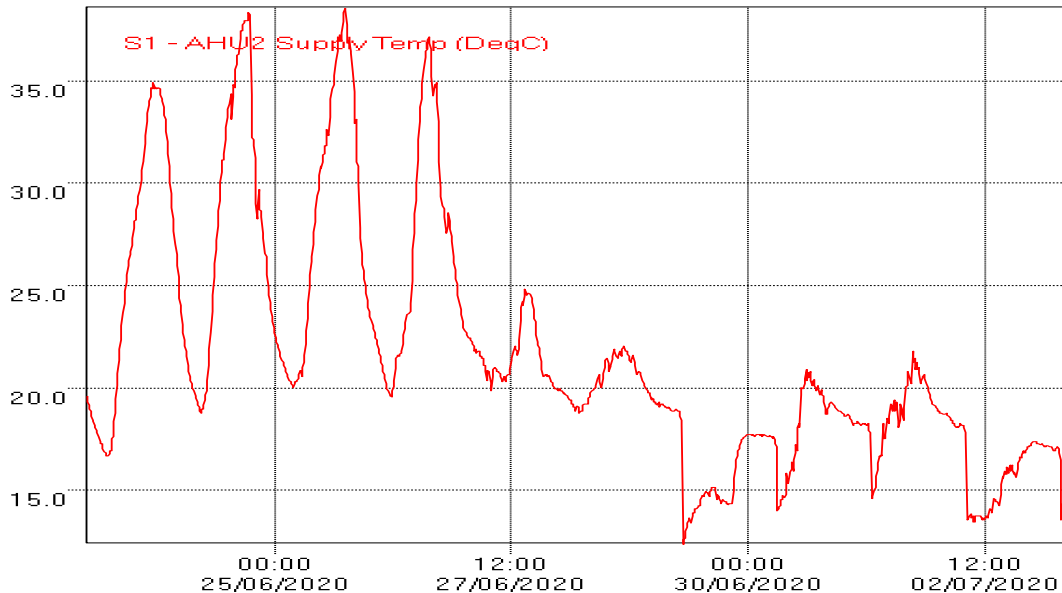
As per AHU 1 the AHU is controlled via the managers panel, all time zones match.

**AHU Local Time Zone**

Day	Start 1	Stop 1	Start 2	Stop 2	Start 3	Stop 3
Monday	07:00	10:00	14:00	16:00	0:00	0:00
Tuesday	07:00	10:00	14:00	16:00	0:00	0:00
Wednesday	07:00	10:00	14:00	16:00	0:00	0:00
Thursday	07:00	10:00	14:00	16:00	0:00	0:00
Friday	07:00	10:00	14:00	16:00	0:00	0:00
Saturday	07:00	10:00	14:00	16:00	0:00	0:00
Sunday	07:00	10:00	14:00	16:00	0:00	0:00

The AHU Temperature control set point is set @ 18°C however as you can see from the graph below, the actual supply air temperature is 14.64°C, that the AHU is not reaching supply air temperature set point, the gas burner demand is currently at 100%. The two off gas fired burners for this AHU are not showing any faults. Unable to access the roof mounted AHU to investigate further.

**AHU 2 Supply Air Temperature.**





**OS13 Identifier: Air Handling Unit 3** /IP Address: 192.168.1.13 / MAC Address: 00:10:70:0b:24:c0

This is a gas fired burner ahu with a variable speed supply fan and a outside air damper.

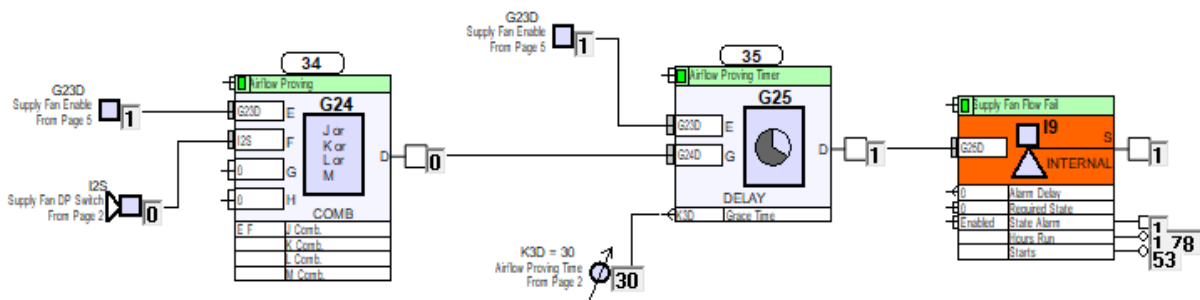
The AHU time schedule located within the controller is set to operate, to the times listed below if software switch W9 "Use Local Schedule" has a status of 1, currently this switch has a status of 0, so the AHU is being enabled via IC Comms from the manager's operation, control panel located within the security room.

As per AHU 1 the AHU is controlled via the managers panel, all time zones match.

**AHU Local Time Zone**

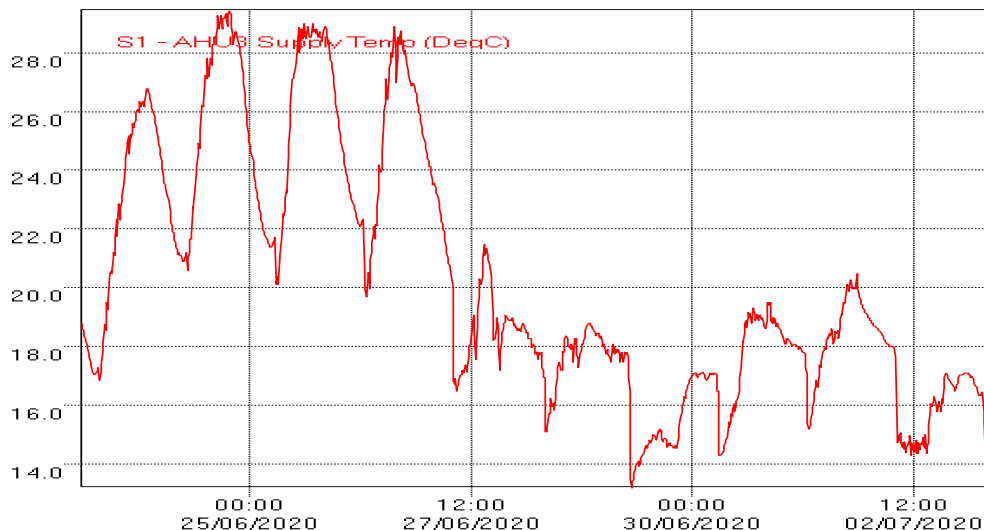
Day	Start 1	Stop 1	Start 2	Stop 2	Start 3	Stop 3
Monday	07:00	10:00	14:00	16:00	0:00	0:00
Tuesday	07:00	10:00	14:00	16:00	0:00	0:00
Wednesday	07:00	10:00	14:00	16:00	0:00	0:00
Thursday	07:00	10:00	14:00	16:00	0:00	0:00
Friday	07:00	10:00	14:00	16:00	0:00	0:00
Saturday	07:00	10:00	14:00	16:00	0:00	0:00
Sunday	07:00	10:00	14:00	16:00	0:00	0:00

The AHU Temperature control set point is set @ 18°C however as you can see from the graph below, the actual supply air temperature is 14.82°C, that the AHU is not reaching supply air temperature set point, the gas burner demand is currently at 0%. The one-off gas fired burner for this AHU is not showing any faults. However, the AHU is in an air flow fail alarm, see below.



Unable to access the roof mounted AHU to investigate further.

**AHU 3 Supply Air Temperature.**







**OS14 Identifier: Air Handling Unit 4** /IP Address: 192.168.1.14 / MAC Address: 00:10:70:0d:22:c7

This is a gas fired burner ahu with a variable speed supply fan and a outside air damper.

The AHU time schedule located within the controller is set to operate, to the times listed below if software switch W9 "Use Local Schedule" has a status of 1, currently this switch has a status of 0, so the AHU is being enabled via IC Comms from the manager's operation, control panel located within the security room.

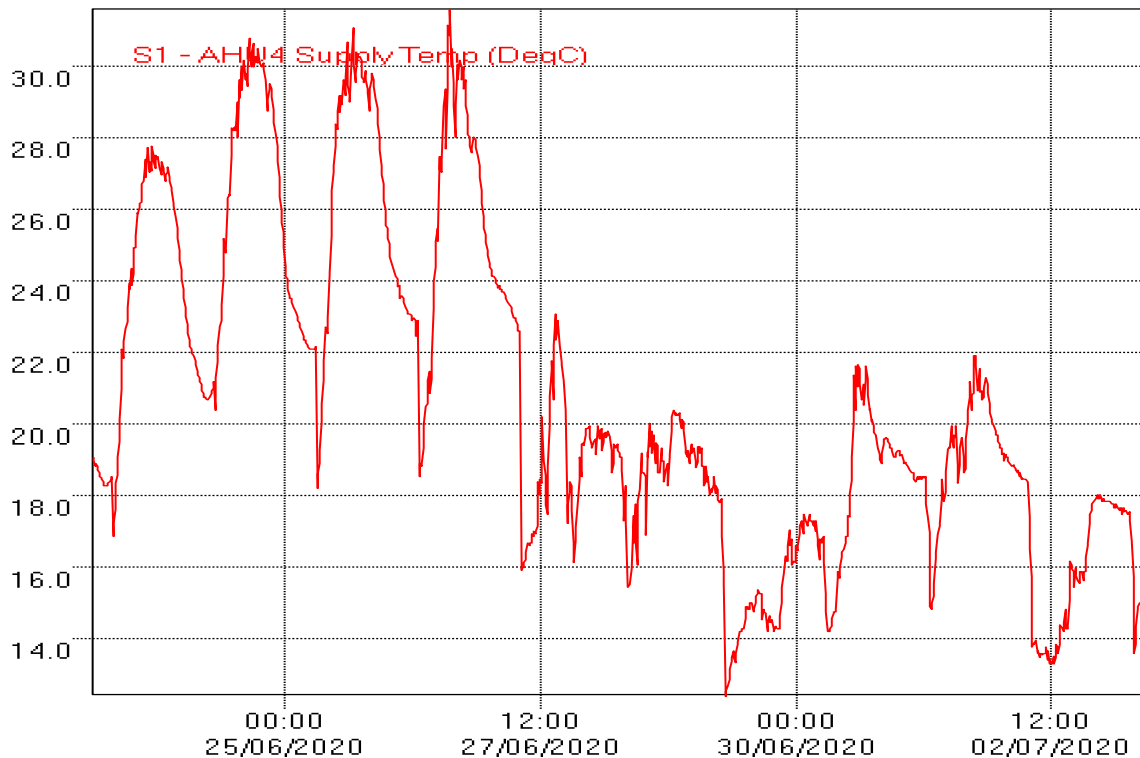
As per AHU 1 the AHU is controlled via the managers panel, all time zones match.

**Local Time Zone**

Day	Start 1	Stop 1	Start 2	Stop 2	Start 3	Stop 3
Monday	07:00	10:00	14:00	16:00	0:00	0:00
Tuesday	07:00	10:00	14:00	16:00	0:00	0:00
Wednesday	07:00	10:00	14:00	16:00	0:00	0:00
Thursday	07:00	10:00	14:00	16:00	0:00	0:00
Friday	07:00	10:00	14:00	16:00	0:00	0:00
Saturday	07:00	10:00	14:00	16:00	0:00	0:00
Sunday	07:00	10:00	14:00	16:00	0:00	0:00

The AHU Temperature control set point is set @ 18°C however as you can see from the graph below, the actual supply air temperature is 15.16°C, that the AHU is not reaching supply air temperature set point, the gas burner demand is currently at 100%. The two-off gas fired burners for this AHU are not showing any faults. Unable to access the roof mounted AHU to investigate further.

**AHU 4 Supply Air Temperature.**



**OS15 Identifier: Air Handling Unit 5 /IP Address: 192.168.1.15 / MAC Address: 00:10:70:11:1b:57**

This is a gas fired burner ahu with a variable speed supply fan and a outside air damper.

The AHU time schedule located within the controller is set to operate, to the times listed below if software switch W9 "Use Local Schedule" has a status of 1, currently this switch has a status of 0, so the AHU is being enabled via IC Comms from the manager's operation, control panel located within the security room.

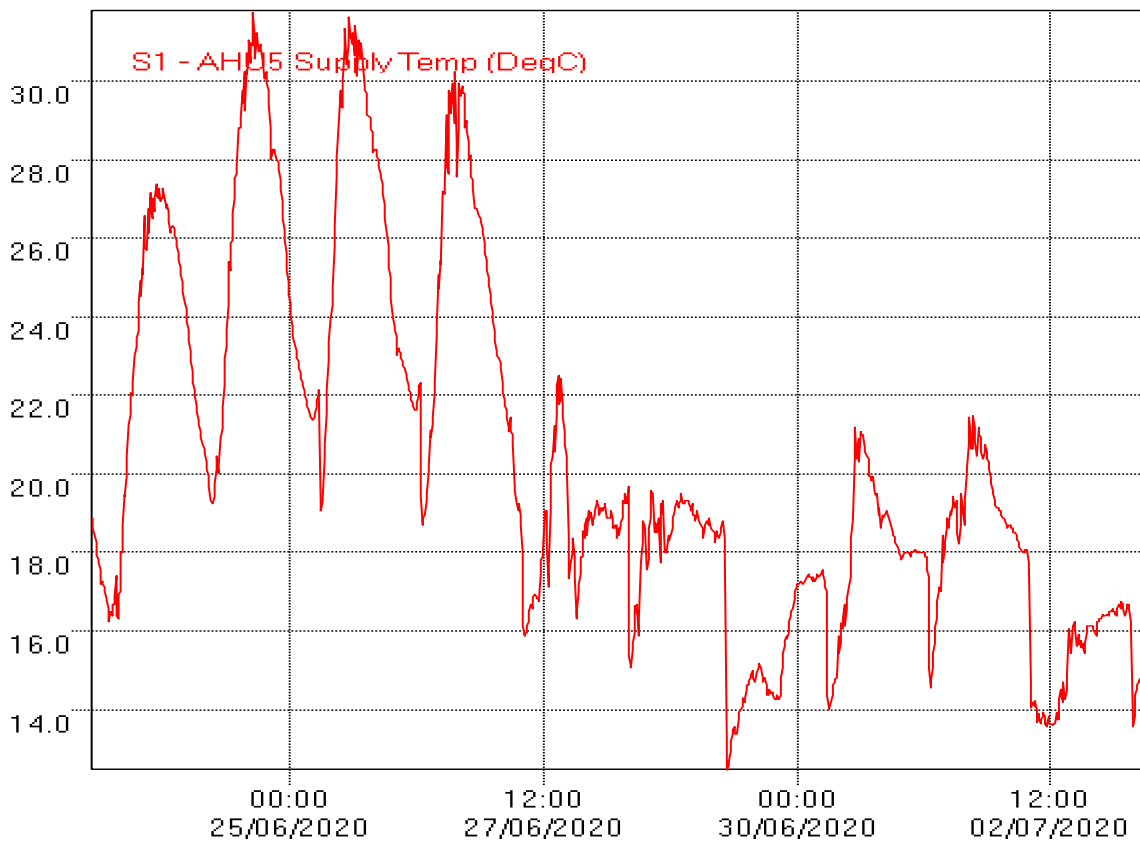
As per AHU 1 the AHU is controlled via the managers panel, all time zones match.

**Local Time Zone**

Day	Start 1	Stop 1	Start 2	Stop 2	Start 3	Stop 3
Monday	07:00	10:00	14:00	16:00	0:00	0:00
Tuesday	07:00	10:00	14:00	16:00	0:00	0:00
Wednesday	07:00	10:00	14:00	16:00	0:00	0:00
Thursday	07:00	10:00	14:00	16:00	0:00	0:00
Friday	07:00	10:00	14:00	16:00	0:00	0:00
Saturday	07:00	10:00	14:00	16:00	0:00	0:00
Sunday	07:00	10:00	14:00	16:00	0:00	0:00

The AHU Temperature control set point is set @ 18°C however as you can see from the graph below, the actual supply air temperature is 14.99°C, that the AHU is not reaching supply air temperature set point, the gas burner demand is currently at 100%. The two-off gas fired burners for this AHU are not showing any faults. Unable to access the roof mounted AHU to investigate further.

**AHU 5 Supply Air Temperature.**



**OS16 Identifier: Air Handling Unit 6 /IP Address: 192.168.1.16 / MAC Address: 00:10:70:0D:4E:15**

This is a gas fired burner ahu with a variable speed supply fan and a outside air damper.

The AHU time schedule located within the controller is set to operate, to the times listed below if software switch W9 "Use Local Schedule" has a status of 1, currently this switch has a status of 0, so the AHU is being enabled via IC Comms from the manager's operation, control panel located within the security room.

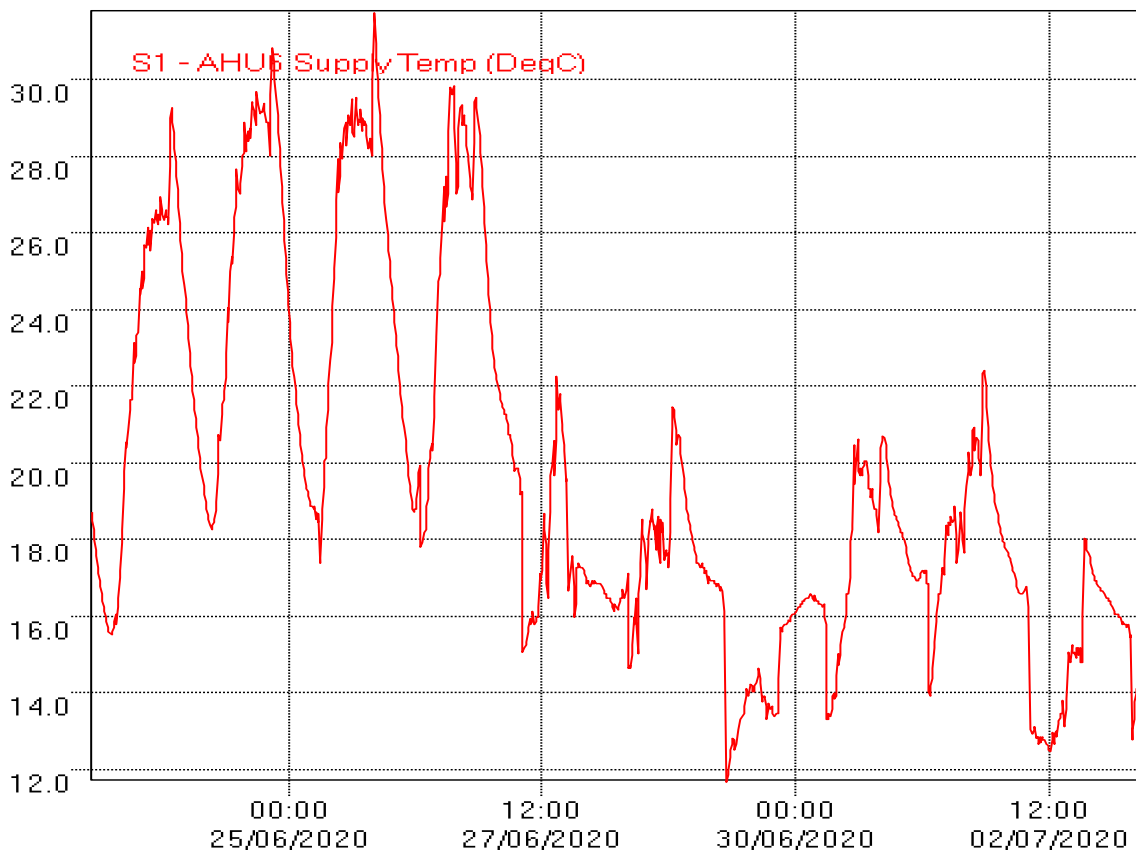
As per AHU 1 the AHU is controlled via the managers panel, all time zones match.

**Local Time Zone**

Day	Start 1	Stop 1	Start 2	Stop 2	Start 3	Stop 3
Monday	07:00	10:00	14:00	16:00	0:00	0:00
Tuesday	07:00	10:00	14:00	16:00	0:00	0:00
Wednesday	07:00	10:00	14:00	16:00	0:00	0:00
Thursday	07:00	10:00	14:00	16:00	0:00	0:00
Friday	07:00	10:00	14:00	16:00	0:00	0:00
Saturday	07:00	10:00	14:00	16:00	0:00	0:00
Sunday	07:00	10:00	14:00	16:00	0:00	0:00

The AHU Temperature control set point is set @ 18°C however as you can see from the graph below, the actual supply air temperature is 14.47°C, that the AHU is not reaching supply air temperature set point, the gas burner demand is currently at 100%. The two-off gas fired burners for this AHU are not showing any faults. Unable to access the roof mounted AHU to investigate further.

**AHU 6 Supply Air Temperature.**



**OS17 Identifier: Air Handling Unit 7 /IP Address: 192.168.1.17 / MAC Address: 00:10:70:0E:18:C4**

This is a gas fired burner ahu with a variable speed supply fan and a outside air damper.

The AHU time schedule located within the controller is set to operate, to the times listed below if software switch W9 "Use Local Schedule" has a status of 1, currently this switch has a status of 0, so the AHU is being enabled via IC Comms from the manager's operation, control panel located within the security room.

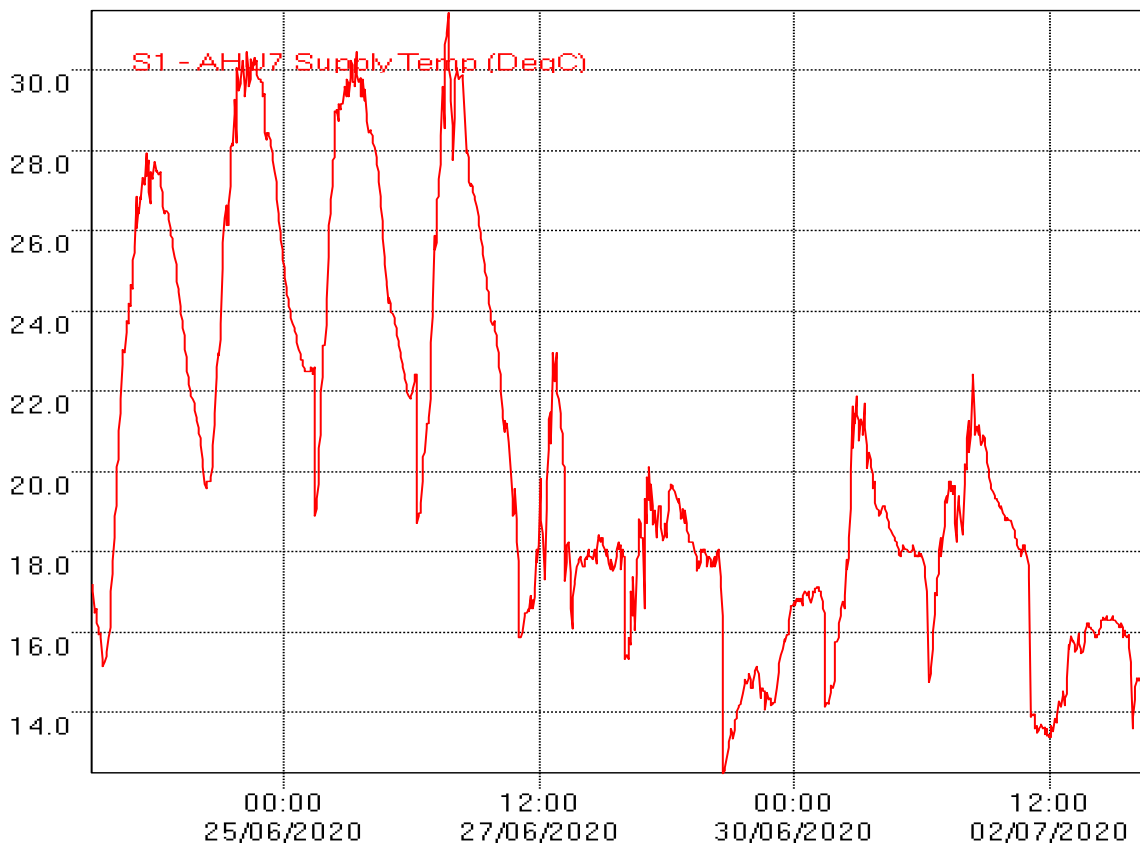
As per AHU 1 the AHU is controlled via the managers panel, all time zones match.

**Local Time Zone**

Day	Start 1	Stop 1	Start 2	Stop 2	Start 3	Stop 3
Monday	07:00	10:00	14:00	16:00	0:00	0:00
Tuesday	07:00	10:00	14:00	16:00	0:00	0:00
Wednesday	07:00	10:00	14:00	16:00	0:00	0:00
Thursday	07:00	10:00	14:00	16:00	0:00	0:00
Friday	07:00	10:00	14:00	16:00	0:00	0:00
Saturday	07:00	10:00	14:00	16:00	0:00	0:00
Sunday	07:00	10:00	14:00	16:00	0:00	0:00

The AHU Temperature control set point is set @ 18°C however as you can see from the graph below, the actual supply air temperature is 15.26°C, that the AHU is not reaching supply air temperature set point, the gas burner demand is currently at 100%. The two-off gas fired burners for this AHU are not showing any faults. Unable to access the roof mounted AHU to investigate further.

**AHU 7 Supply Air Temperature.**



**OS18 Identifier: AHU Control Panel** /IP Address: 192.168.1.18 / MAC Address: 00:10:70:0d:22:c6

The security room managers panel mimics the controllers on the remote AHU units and displays all inputs, outputs, temperature sensors and alarms. The AHU controls adjustable parameters can also be adjusted from the IQ View. Facility for alarm logging and temperature monitoring is also available. The panel is fitted with Run / Trip indication and a 1-hour Boost button facility for each AHU. The master controller located within the security panel is the site time master for the site. And broadcasts run signals for each AHU dependent upon the weekly time schedule set up in the controller. Should an area of the Mall become cold, when the AHU's are switched OFF, on the time schedule, pressing the 1-hour boost button, will switch it on for 1 hour. The button will illuminate if the AHU is overridden.

As reported previously there are two wireless sensors are not operating.

Trend TW wireless temperature sensors have been installed within the Mall to monitor temperatures within the following locations;

- Sensor 1: Outside Air Temperature – This is a TW/S space sensor mounted above the door to the security office. The TW/S is a wall mounting thermistor space temperature sensor. The TW/S housing consists of 2 parts; front panel, and back plate, and can be either mounted onto a flat surface, or flush mounted using a standard wall box. **Currently reading 15.4°C, this sensor is not graphable.**
- Sensor2: East Mall Unit 57 – This is a TW/S space sensor. **Currently reading 17.5°C, this sensor is not graphable.**
- Sensor 3: Inter Square Unit 31&32 – This is a TW/S space sensor. **Currently reading default fixed value of minus 100°C, this sensor is not graphable.**
- Sensor 4: North Square Unit 46 – This is a TW/S space sensor. **Currently reading 18.4°C, this sensor is not graphable.**
- Sensor 5: South Mall Unit 14 – This is a TW/S space sensor. **Currently reading 17.8°C, this sensor is not graphable.**
- Sensor 6: Centre Square Unit 26 – This is a TW/S space sensor. **Currently reading default fixed value of minus 100°C, this sensor is not graphable.**

Two of these sensors are connected to the Trend system via BACnet communications.

However, at present sensors 2 & 6 are reading a default value of 100 deg C in the control software.

- On site we have a XW/R/IQ receiver & a ACCW/RW/IQ Repeater, which is used to boost the wireless communications, these appear to be operating correctly
- The wireless sensors measure the space temperatures and transmit them regularly to the XW/R/IQ receiver. I suspect sensors S3 & S6 are faulty and require replacing.

These are the users set up within the controllers.

- OEM – Pin 5372
- Manager – Pin 1623
- Maintenance – Pin 5010
- Mitie – Pin 1966
- Kendra – Pin 1066

**Notes:**

Looking at the AHU supply air temperatures, and all AHUs were calling for the gas burners to fire I suspect as the weather is warmer, that the gas burners have been switched off at the AHUs to save energy. The current supply air temperatures are neat to the outside air temperature.

