



<b>Client:</b>	<b>Project Name:</b>	<b>Project No:</b>	
<b>Area:</b>	<b>Drawing No's:</b>	<b>Date:</b>	<b>Sheet: 1 of 5</b>
<b>Check Conducted By:</b>	<b>Signature:</b>	<b>Check Approved By:</b>	<b>Signature:</b>

## INTRODUCTION

### AI - Analogue Input: (Temp Sensor, RH Sensor, Pressure Sensor...)

The on-site commissioning procedure aims to check the operation of all Generic analogue input to verify their wiring and operation.

For each point, a change of status of the equipment should be simulated or produced, and the monitoring function of the Systems is be verified on the software online tool. For each control point, the corresponding equipment's should be controlled by the software online tool to manually command outputs to be driven to the desired value. The following procedures describe the best practice steps to commissioning each device to verify its correct operation.

It is expected that the point's lists are used to record the results of the point to point commissioning.

### Procedure recommended general checks

1. Visibly check installation against approved shop drawings
2. Check that general construction and standard of finish is acceptable
3. Record name point information and compare against the approved specification
4. Confirm no damage to the electric components
5. Check cabling for insulation stripped back satisfactorily, no stray copper strands and terminals are tight with no loose wires
6. Check power supply is isolated, has the correct power source, voltage, cable sizing

### Procedure recommended for testing operation

Each test should be performed in both manual and automatic modes.

1. Control the equipment being monitored to run under normal operating conditions by generating the appropriate control command. Verify the value of the analogue input point against the control criteria and verify the operational performance of the equipment.

If the analogue input point displays the desired value then the test has been successful and "S" should be recorded in the commissioning schedule/inspection and test plans. If the analogue input point does not display the desired value then the test has failed and "F" should be recorded in the commissioning schedule/inspection and test plans.



2. While the analogue input point displays the desired value adjust the device or equipment that the point is monitoring, e.g. increase the temperature setting on the thermostat.

If the analogue input point changes its value to the expected value then the test has been successful and "S" should be recorded in the commissioning schedule/inspection and test plans. If the analogue input point does not change to the expected value then this test has failed and "F" should be recorded in the commissioning schedule/inspection and test plans.

3. While the analogue input point displays the desired value, generate an alarm (where applicable).

If the analogue input point changes state from normal operating conditions to alarm condition then this test has been successful and "S" should be recorded in the commissioning schedule/inspection and test plans. If the point does not change state to alarm condition then this test has failed and "F" should be recorded in the commissioning schedule/inspection and test plans.

4. While the analogue input point displays the desired value, simulate a fault condition at the equipment or the FPU. E.g open circuit a data cable. (This test need only be performed on one point per virtual group).

If the analogue input point changes state and reports a fault condition and an alarm is generated on the alarm summary then this test has been successful and "S" should be recorded in the commissioning schedule/inspection and test plans. If the analogue input point does not change to fault condition or if an alarm is not generated on the alarm summary then this test has failed and "F" should be recorded in the commissioning schedule/inspection and test plans.

5. At the conclusion of the test return the equipment and the BMCS to displaying the status, condition and desired values for normal operating conditions.

When a point is commissioned tick the Checked Out box which will indicate the user, time and date checked out, then add comments in the Checkout Notes box (Actual, Recorded, and Offset)

**GENERAL:**

Check cabling for insulation stripped back satisfactorily, no stray copper strands and terminals are tight with no loose wires.

At the board end check the shields are all twisted together in groups neatly and are earthed

Once the above 3 points are checked write Setup OK in the Checkout Notes.

For humidity sensors, with your certified meter take a humidity reading at the sensor and compare to what is reading on the BMCS. Calibrate accordingly. Once the sensor calibration is verified write Reading xx Actual xx Adjust +/- xx % in the Checkout Notes.



**ACCURACY:**

For analogue sensor, with your certified meter take a reading at the sensor and compare to what is reading on the BMCS. Calibrate accordingly. Once the sensor calibration is verified write Reading xx Actual xx Adjust +/- xx % in the Checkout Notes.

Measured Variable	Reported Accuracy
Space Temperature	±0.5°C
Ducted Air	±0.5°C
Outside Air	±0.5°C
Dewpoint	±0.5°C
Water Temperature	±0.15°C
Delta-T	±0.15°C
Relative Humidity	±1% RH
Water Flow	±2% of full scale
Airflow (terminal)	±5% of full scale
Airflow (measuring stations)	±2.5% of full scale
Air Pressure (ducts)	±0.5% of full scale reading
Air Pressure (space)	0.5% of full scale reading
Water Pressure	±2% of full scale
Electrical (A, V, W, Power factor)	2% of reading
Carbon Monoxide (CO)	±3% of full scale
Carbon Dioxide (CO <sub>2</sub> )	±20 ppm

**REFERENCE STANDARDS**

CIBSE Commissioning Code C – Automatic Controls



**CHECKLIST**

<b>Generic Analogue Input Testing</b>				
BMCS Drawing Number				
	<b>ITEM</b>	<b>VERIFICATION METHOD</b>	<b>RESULT</b>	<b>RESULT</b>
1	Check installation against approved shop drawings	Site Inspection		
2	Check that general construction and standard of finish is acceptable	Site Inspection		
3	Record name point information and compare against the approved specification	Site Inspection		
4	Confirm no damage to the electric components	Site Inspection		
5	Check cabling for insulation stripped back satisfactorily, no stray copper strands and terminals are tight with no loose wires	Site Inspection		
6	Check power supply is isolated, has the correct power source, voltage, cable sizing	Site Inspection		
	<b>10K Thermistor Temperature Sensors:</b>			
7	Disconnect sensor cable to verify that you get an open circuit reading of -51 on the point at the corresponding equipment that the sensor is meant to control.	Site Inspection		
8	Once the sensor is verified write Proved True in the Checkout Notes.	Data / Point Sheet Record		
9	Check point is configured for Thermistor and is set to metric. Check jumper setting on controller input is set to Thermistor.	Data / Point Sheet Record		
10	With your certified Digi-temp meter take a temperature reading at the sensor and compare to what is reading on the BMCS. Calibrate accordingly.	Data / Point Sheet Record		
11	Once the sensor calibration is verified write Reading xx Actual xx Adjust +/- xx degrees in the Checkout Notes.	Data / Point Sheet Record		
	<b>Air Pressure Transducer:</b>			
12	Disconnect sensor cable to verify that you get an open circuit reading on the point at the corresponding equipment that the sensor is meant to control.	Site Inspection		



13	Once the sensor is verified write Proved True in the Checkout	Data / Point Sheet Record		
14	Check jumper setting on controller input is set to 0-10V or 0-5V.	Data / Point Sheet Record		
15	Check point is configured for 0-10 V or 0-5 V in the point's checkout, depending on the type of controller you are using.	Data / Point Sheet Record		
16	Check the min and max scale parameters in the point setup match the devices scale. E.g. The Siemens air pressure sensors have a dipswitch which configures the scale (subject to model type) from 0-100 / 0-200 Pa, 0-250 / 0-500 Pa. Set dipswitch to match the equipment size and type.	Data / Point Sheet Record		
17	Confirm correct calibration of device	Data / Point Sheet Record		
	<b>0-20mA / 4-20mA Device:</b>			
18	Disconnect sensor cable to verify that you get an open circuit reading on the point at the corresponding equipment that the sensor is meant to control.	Data / Point Sheet Record		
19	Once the sensor is verified write Proved True in the Checkout	Data / Point Sheet Record		
20	Check jumper setting on controller input is set to 0-20mA.	Data / Point Sheet Record		
21	Check point is configured for 0-20mA or 4-20mA in the point's checkout, depending on the device you are using.	Data / Point Sheet Record		
22	Check the min and max scale parameters in the point setup match the devices scale. E.g. For relative humidity it should be scaled 0 to 100 %.	Data / Point Sheet Record		
23	Confirm correct calibration of device	Data / Point Sheet Record		
Certified By Sub Contractor (initial): Date:				
Confirmed By (Head Contractor / Client) (initial): Date:				