# SRC-21x Series Climate Controllers with BACnet MS/TP

The SRC-21x series controllers have been designed for climate control in room spaces. The controllers have up to two heating and cooling temperature control stages and fan speed control. The units can be used in various climate control applications including fan coil units, VAV units and chilled ceiling control.The controllers can operate as Proportional Only or as Proportional + Integral Controllers.

The controllers have four (4) analogue outputs that can be individually configured for any of the heating/cooling stages, or fan speed control. The digital outputs can be configured as 3-point, PWM (thermic) or On/Off control.

The SRC-210 controller is typically connected to an external room unit (TER-NTC10-SP) that provides temperature measurement and setpoint adjustment. SRC-211 models have two external temperature sensors.

SRC-212 models have 2 x 0-10Vdc inputs instead of resistive inputs. They are used for external temperature (0..10V = 0..50°C) and for CO2 sensor (0..10V = 0..2,000ppm).


The controllers have built-in BACnet MS/TP for connection to BMS systems.

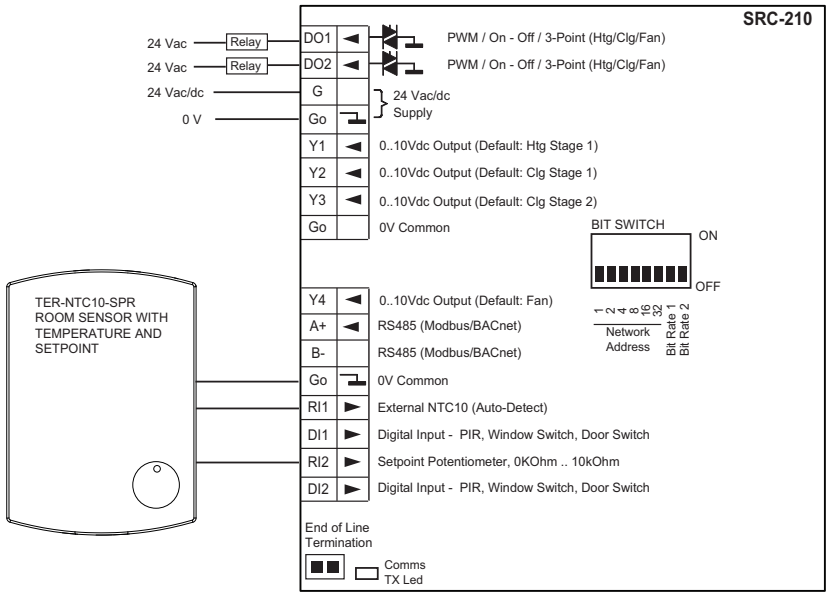
| **Model Type** | Model | Description |
|---|---|---|
| | **SRC210-BAC** | Space Climate Controller with Heating and Cooling Outputs, Fan Speed Control, DIN-Rail Mounted, BACnet MS/TP, 1xRI, 1xSP |
| | **SRC211-BAC** | Space Climate Controller with Heating and Cooling Outputs, Fan Speed Control, DIN-Rail Mounted, BACnet MS/TP, 2xRI |
| | **SRC-212-BAC** | Space Climate Controller with Heating and Cooling Outputs, Fan Speed Control, CO2 Control, DIN-Rail Mounted, BACnet MS/TP, 2 x 0-10Vdc Inputs |
| | **-RA** | Alternative Bit Switch Range, Bit Switches 1..7 Used for MAC Address, Bit Switch 8 Used for Baud Rate |
| | **SW-DCT-USB** | Windows Device Configuration Tool with 1.8m USB Cable |

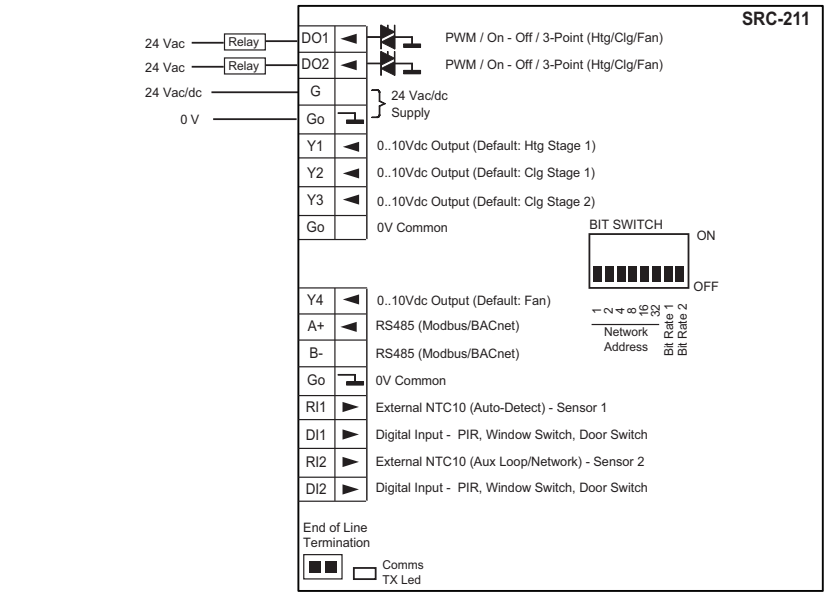
**Technical Data**

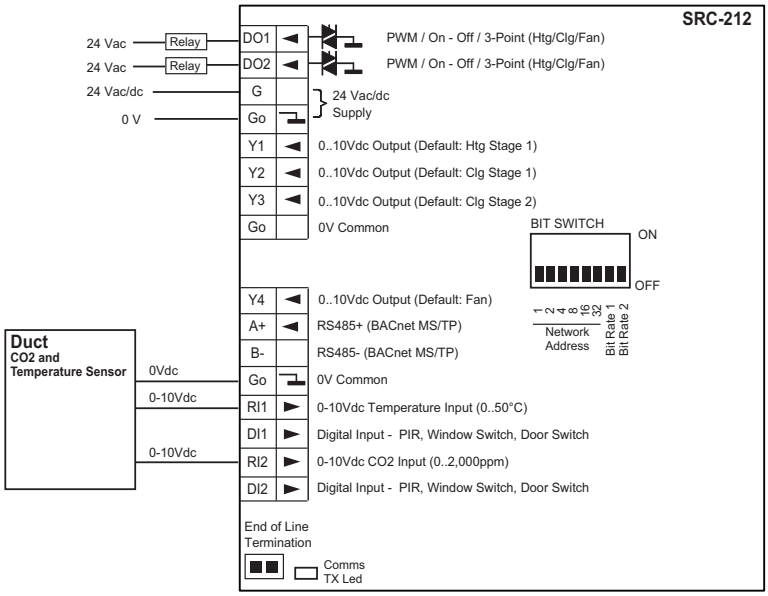
| | | |
|---|---|---|
| Power Supply | Power supply | 24Vac -10%/+15% <1VA |
| Signal Outputs | Analogue Outputs | 4 x 0..10V < 5mA |
| | Digital Outputs | 2 x 24Vac Triacs; 1A maximum; requires 24Vac Power Supply |
| Signal Inputs | Resistive Inputs (SRC-210/211): | SRC-210/211: 1 x External NTC10K3 Sensor (RI1)<br>SRC-210:1 x Setpoint Potentiometer, 0..10kOhm (RI2)<br>SRC-211:1 x Additional External NTC10K3 Sensor (RI2) |
| | Analogue Inputs (SRC-212): | 1 x 0..10Vdc Temperature Input (0..10V = 0..50°C)<br>1 x 0..10Vdc CO2 Input (0..10V = 0..2,000ppm) |
| | Digital Inputs | 2 x Digital Input, Volt-Free Contact, Impedance <1KOhm |
| Communication | BACnet Communications | |
| | Protocol | BACnet MS/TP |
| | Interface | RS485; maximum 63 devices |
| | MAC Addressing | 0..63 via a bit switch; 0..247 via tool / network |
| | Communication | 9k6/19k2/38k4/76k8 Baud; Parity None/Even/Odd, 1 or 2 Stop Bits (baud rate adjustable through bit switch) |

| | | |
|---|---|---|
| Connections | Terminal Connections | Solid and Stranded Cable, Plug-In Connectors<br>Maximum Size: 0.05 to 2.5mm$^2$ (EN ISO) / 12 to 30 AWG (UL)<br>Rising Clamp: Size 2.5 x 2.4mm |
| Environmental Conditions | Operating | |
| | Temperature | 0°C...+50°C (32..122°F) |
| | Humidity | 0...95%rh (non-cond.) |
| | Storage | |
| | Temperature | -30°C...+70°C (-22..158°F) |
| | Humidity | 0...95%rh (non-cond.) |
| Standards | CE Conformity | CE Directive 2004/108/EY<br>EN61000-6-3: 2001 (Generic Emission)<br>EN61000-6-1: 2001 (Generic Immunity). |
| | Degree of Protection | IP20 |
| Housing | Housing Material | ABS Plastics, Self Extinguishing |
| | Mounting | DIN-Rail Mounting |
| | Dimensions | W106 x H97 x D38mm |
| | Weight | 180g |

**Wiring Connections**





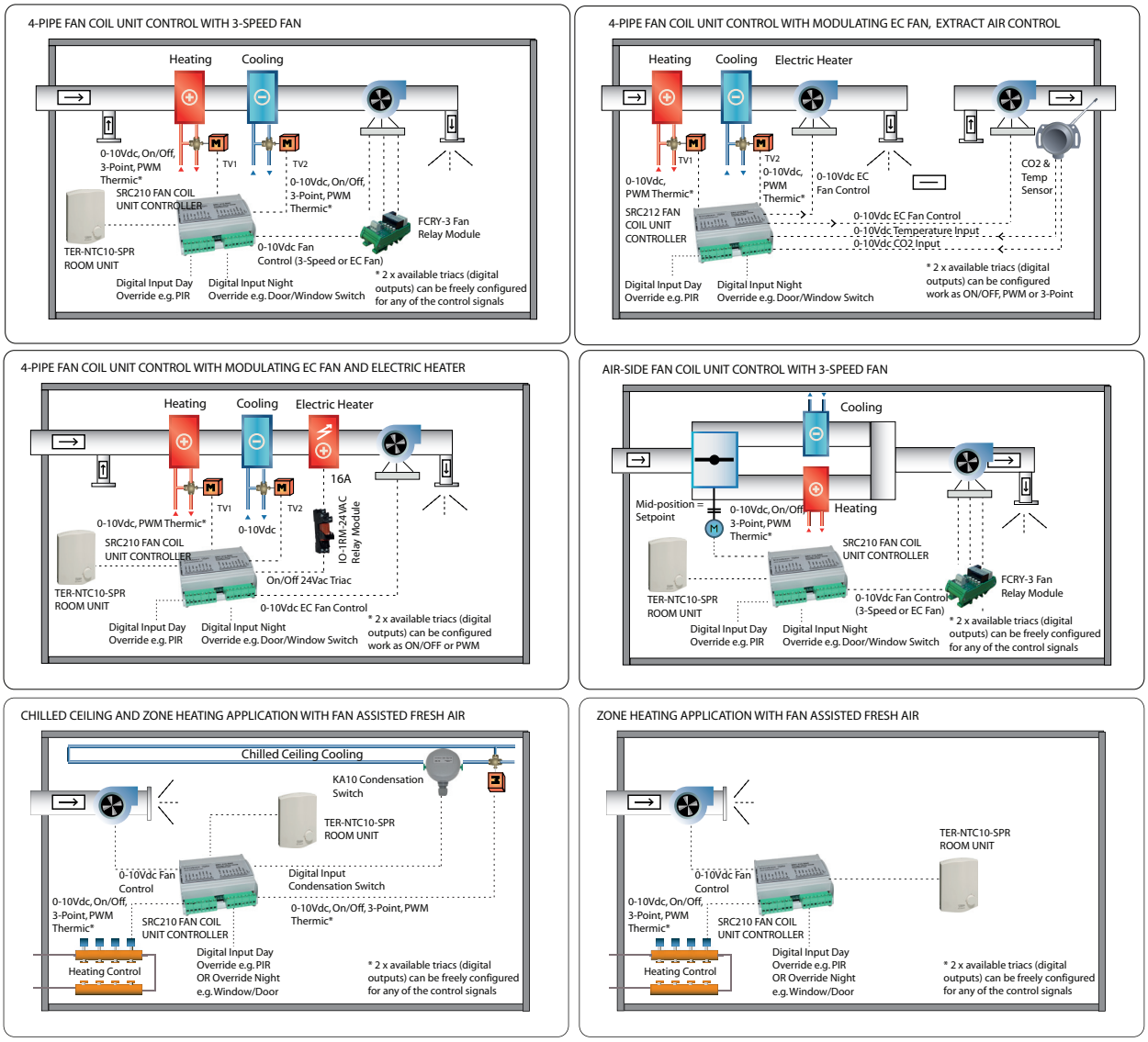

| | |
|---|---|
| DO1 | 24Vac Triac; PWM, On/Off; 3-Point Open |
| DO2 | 24Vac Triac; PWM, On/Off; 3-Point Close |
| G | 24Vac/dc Power Supply |
| G0 | 0V Common |
| Y1 | 0..10Vdc Output |
| Y2 | 0..10Vdc Output |
| Y3 | 0..10Vdc Output |
| G0 | 0V Common |
| Y4 | 0..10Vdc Output |
| A+ | RS485 A+ Connection (BACnet) |
| B- | RS485 B- Connection (BACnet) |
| G0 | 0V Common |
| RI1 | SRC-210/211: External NTC10 Sensor (Auto-detect for Main Loop)<br>SRC-212: External 0-10Vdc Input for Temperature |
| DI1 | Digital Input; PIR Input, Windows/Condensation Switch |
| RI2 | SRC-210: Setpoint Input, 0..10kOhm<br>SRC-211: NTC10K3A1 Sensor<br>SRC-212: 0-10Vdc for CO2 |
| DI2 | Digital Input; PIR Input, Windows/Condensation Switch |

**Wiring Precautions**

Switch off the power before any wiring is carried out.

## Application Examples

The below application diagrams show few examples of the SRC21x Fan Coil and Climate Controller applications. The controller is highly versatile and can be easily configured for many room heating and cooling applications including fan coil unit control, chilled ceiling and zone heating. Please refer to individual set up pages for further details or contact SyxthSense Sales Team for advice.




## Main Temperature Control Loop Operation

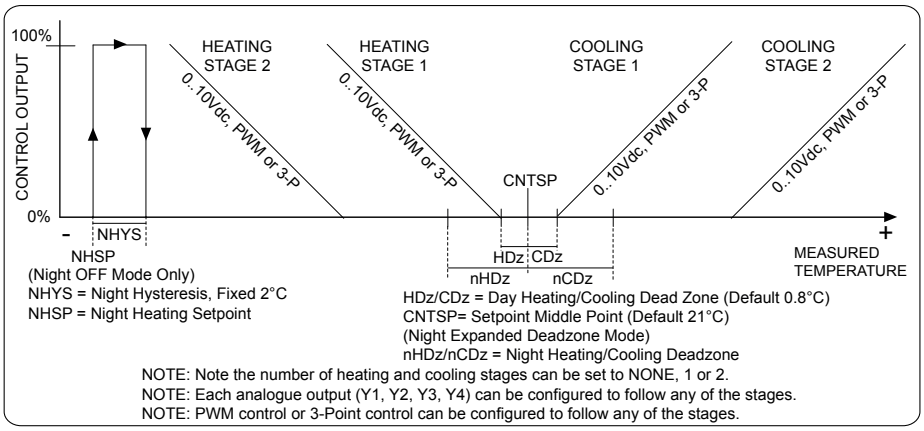
The controllers can have up to 2 heating stages and up to 2 cooling stages (as default one heating stage and one cooling stage) for temperature control. The controller modulates the heating and cooling demand outputs according to the calculated setpoint and measured temperature. The control can be either P-control or PI-control.

As default, heating stage 1 output is linked to Y1 for fully modulating 0..10Vdc control, cooling stage 1 is linked to analogue output Y2 and cooling stage 2 to analogue output Y3.

The controller has also two digital outputs that can be configured to work as PWM or 3-Point control. The PWM or 3-Point control can then be linked to any of the control stages (Heating Stage 1/2 or Cooling Stage 1/2) as required. As default DO1 is linked to PWM control of heating stage 1 and DO2 is linked to the PWM control of cooling stage 1.

**NOTE:SRC-210/211 controllers use external NTC10 sensor connected to RI1. SRC-212 uses 0..10Vdc temperature transmitter connected to RI1 to measure the temperature (e.g. HDK combined CO2 and temperature sensor).**

Please note that it is possible to set the control loop outputs to direct/reverse, which reverses the control output (valve) running direction (valve drives from 100% to 0%). This can be configured individually for each stage in the Configuration Tool.




Between heating and cooling stage 1 is a control deadzone. This prevent rapid switching between heating and cooling. The deadzone is divided to heating and cooling part that allows asymmetric deadzones to be configured.

DZ Mode (PI-Control)

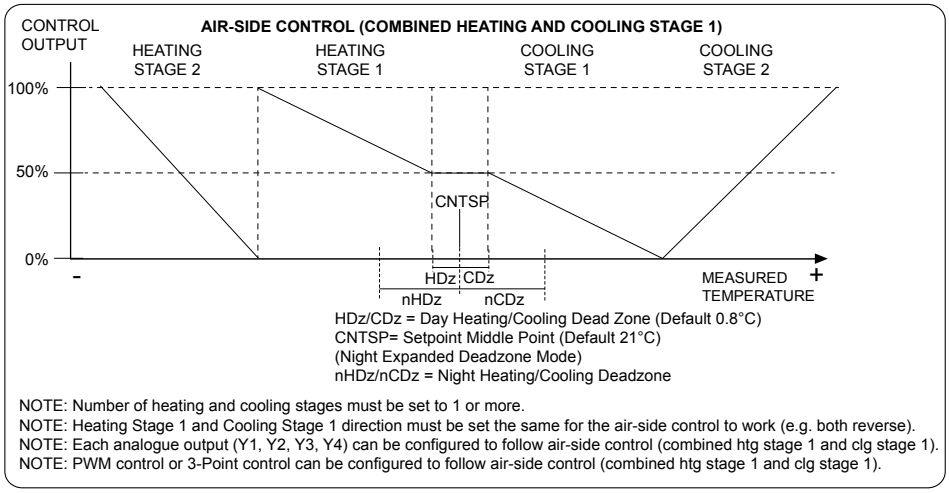
The DZ mode parameter sets the integral action operation (applicable to PI-control only) between heating and cooling stages when the temperature is within the deadzone. As default the mode is set to HOLD where the integral term is held inside the deadzone. This reduces the plant wear and tear. By setting the parameter to MODULATE, the integral term modulates to zero within the deadzone if the temperature remains within the deadzone. This drives the heating and cooling outputs to zero.

**Day and Night Control**

The controller has Day and Night operation modes. When in Day mode the control loop operates with the (Day) Deadzone value. In the Night time the controller controls with the Night Deadzone, if the night mode has been configured to operate in the Expanded Deadzone mode. If Night Off mode has been enabled the outputs are Off unless the temperature drops below the Frost Setpoint (8°C, adjustable). In case of frost the Heating Loop Stage 1 and 2 outputs are 100% until the temperature reaches Frost Setpoint + 2°C.

**Air-Side Control Logic**

Air-side control is implemented by combining the Heating Stage1 and Cooling Stage 1 demands. As such to use air-side the number of heating stages must be set to 1 or more and the number of cooling stages must be set to 1 or more. In normal operation the stage direction for heating stage 1 and cooling stage 1 should be set the same.




**Note:** The effective proportional band of the Air-side control is twice that of the Heating2 and Cooling2 stages due to the fact there is only one proportional band setting for all stages.

**Night/Day Control Activation (Digital Input 1 and 2)**

The controller can be switched to operate between DAY MODE / NIGHT MODE via the communication bus or via the digital inputs (volt-free contact).

The Digital Inputs have multiple modes; PIR MODE (override to Day), WINDOW SWITCH MODE (override to Night), CONDENSATION SWITCH MODE (disable cooling).

- In the PIR MODE the controller DAY MODE is activated when the digital input is closed. If the digital input opens, the controller returns to NIGHT MODE (automatic control) after an adjustable time delay

- In the WINDOW SWITCH MODE the controller goes to NIGHT MODE if the digital is open. If the digital input closes, the controller returns to DAY MODE (automatic control) after an adjustable time delay. This can be, for example, used for window contacts or door cards.
- In the CONDENSATION SWITCH MODE, the cooling stages are disabled when the digital input closes.

Local overrides have priority over the communication network. Condensation switch mode has priority over the PIR mode. The PIR mode has priority over the window switch mode.

**Fan Speed Control**

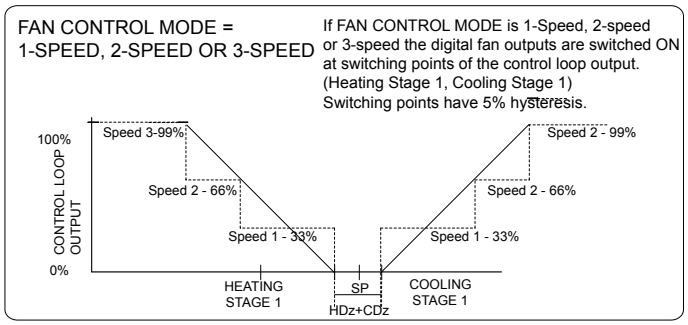
Fan speed control logic adjusts the fan speed based on the demand (as default based on heating stage 1 and cooling stage 1 demands). The fan speed control can operate in 1-speed, 2-speed, 3-speed, or EC fan control modes.

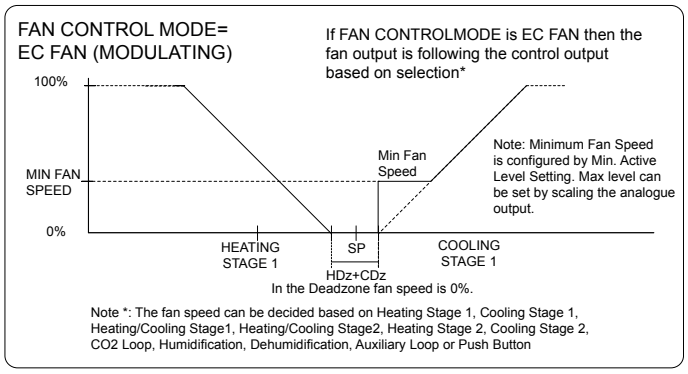
The fan speed control type (EC fan, 0-1, 0-1-2, 0-1-2-3) is configured in the Configuration Parameters.

The fan is as default controlled based on the heating stage 1 and cooling stage 1. It is possible to change the fan control source to follow also only the heating stage 1, or only the cooling stage 1, heating/cooling stage 2, heating stage 2 or cooling stage 2.

**NOTE:Note: In the Expanded Night Deadzone mode the fan speed is also controlled based on the Heating Stage 1 and/or Cooling Stage 1 demand. In the Night Off mode, the fan speed is controlled based on the Frost Stage demand.**

**NOTE:Note: Using external fan control modules such as FCRY-3, it is possible to driver 3-speed fan motors directly. In this case connect analogue output, set to MODULATING FAN, to the FCRY-3 module.**



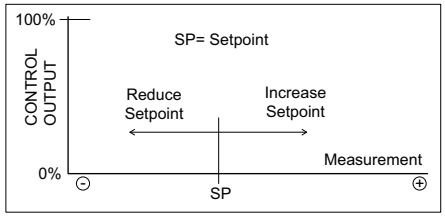




**External Sensor Input R1 (Main Sensor)**

The SRC-210/211 controllers uses NTC10 sensor for the main control loop. Connect sensor such as TER-NTC10 room sensor or TEKY-NTC10 flying lead sensor to this input.

The SRC-212 controller provides 0-10Vdc input at the RI1 for the temperature sensor connection. The 0..10Vdc is scaled as 0..50°C. This is used, for example, with combined duct CO2 and temperature sensors.

**Remote Setpoint Adjustment Input RI2 (SRC-210 Only)**

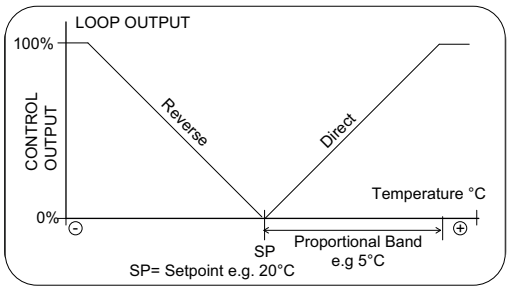



It is possible to connect the SRC-210 controller to a remote setpoint unit, typically to TER-NTC10-SPR room sensor, to terminals RI2. The remote setpoint uses 0..10kOhm potentiometer. This is auto-detected by the application. By rotating the setpoint knob on the remote sensor it is possible to adjust the current temperature control setpoint +/-3°C. The adjustment shifts temperature setpoint up and down. Via the configuration tool it is possible to adjust the setpoint centre, and the min and max adjustments of the setpoint.

**External Temperature Sensor Input RI2 (SRC-211 Only)**

SRC-211 controller has a second NTC10 sensor input at terminals RI2. This can be used either for network monitoring, or for the auxiliary temperature control loop. When tehe auxiliary control loop is activated, the auxiliary loop uses the Sensor 2 NTC10 temperature reading to calculate the required control output.

The auxiliary loop can be configure to operate direct or reverse.

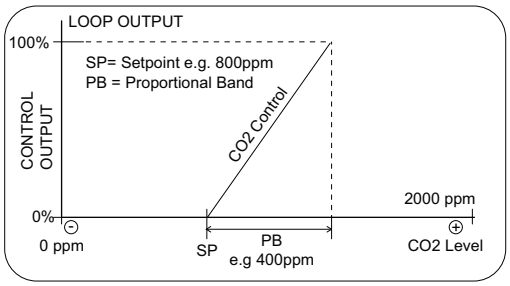



**External CO2 Sensor Input RI2 (SRC-212 Only)**

The SRC-212 controller RI2 input acts as a 0..10Vdc input for CO2 measurement. The 0..10Vdc input is scaled by the application as 0..2,000ppm (parts per million) of CO2 concetration. The CO2 measurement can be used for the CO2 control or monitoring the CO2 levels over the network

**CO2 Control (SRC-212 Only)**

The SRC-212 controller 0..10Vdc input RI2 can be connected to CO2 sensor e.g a duct CO2 sensor such as HDK. The CO2 measurement can then be used in demand based control applications via the CO2 control loop. The CO2 control loop output corresponds to the CO2 setpoint and the CO2 proportional band. If configured as Direct Control (typical), then if the CO2 level increases above the setpoint the loop output starts to modulate to 100%. When the CO2 level is the amount of the Proportional Band above the setpoint, the loop output is 100%. The configuration is done via the configuration parameters. The CO2 control loop can also be configured to operate as Proportional + Integral control by changing the Integral Action Time from 0 to a required value. The actuator direction can be changed via Output Direction parameter (Direct, Reverse).




The CO2 control output can be configured to linked to any of the physical control outputs Y1, Y2, Y3 or Y4. In the Night Off mode the CO2 loop output is set to 0%. In the Expanded Deadzone Night mode the CO2 loop operates as in the day mode.

Maximum VAV Control

Each of the analogue outputs can also be configured as "Maximum VAV Demand". In this case the corresponding output (Y1, Y2, Y3, Y4) takes the maximum of the CO2 Loop and Cooling Temperature Loop demand output. This is typically used in demand based ventilation (VAV) to control fresh air damper when there is either demand for more fresh air, or demand for temperature cooling (typically fresh air cools down the room space).

Maximum Fan Demand

Each of the analogue outputs can also be configured ad "Maximum Fan Demand". In this configuration the corresponding output (Y1, Y2, Y3, Y4) takes the maximum demand of the CO2 Control Loop and Fan Speed Control Loop. This can provide fan speed boost at high CO2 level and when the fan speed temperature loop has increased the demand. You can also link fan speed loop to follow the heating stage and in this case the output can take the maximum of CO2 loop and the Heating control loop.

**Output Scaling / Output Limitation**

Each of the analogue outputs (Y1,Y2,Y3,Y4) can have

- Output minimum voltage (percentage)
- Output maximum voltage (percentage)

The connected control loop output 0..100%is then scaled from minimum voltage to maximum voltage.

For example in the EC fan control, the minimum control output voltage is set to 10% (1V) and the maximum output 70% (7V). In this case the output is 1V when the control loop output is 0% and the output is 7V when the control loop output is 100%. This allows maximum noise levels to be limited and the fan to have a minimum fan speed. In this example the fan is running at 10% within the deadzone.

The values are available via the communication network from network master read/write. This allows them to be used e.g. in the natural ventilation application limit the window damper position to different values in winter and summer.

**Digital Output Triac Operating Modes, (Thermic Control, 3-Point Control, On/Off Control, Fan Control)**

The digital outputs (24Vac Triacs that switch 24Vac to 0V) can be configured to operate as 3-point control, as PWM control (pulse width modulation control) or as On/Off control. They can also be configured as outputs to fan speed control (when 1-speed or 2-speed mode selected). The type of the control is selected via the configuration parameters. If the 3-point actuator mode is selected, the controller modulates the DO1 on when valve is required to be opened and DO2 when the valve is required to be closed. The 3-point operation can be configured to follow any of the heating/cooling stages or fan speed.

It is also possible to reverse the output operation by reversing the corresponding loop output.

When the 3-point output is driven fully open or closed, the output is driven against the edge for a "run on" period (default 6 seconds) and this will be repeated every 10 minutes. The run on time time adjustable via the configuration parameters and this behaviour can be disabled completely by setting the run on time to 0.

If PWM actuator is used the duty cycle is 30 seconds as default (configurable via the tool). E.g. if the output is at 50% then the output is ON for 15 seconds and OFF for 15 seconds.

If the PWM mode has been set to On/Off, then the corresponding digital output is switched ON at the Max Level (default 100%) and are switched OFF at the Min level (default 0%).

**Note:** Please note digital outputs switch to 0V (24Vac is switched to 0V through the triac).

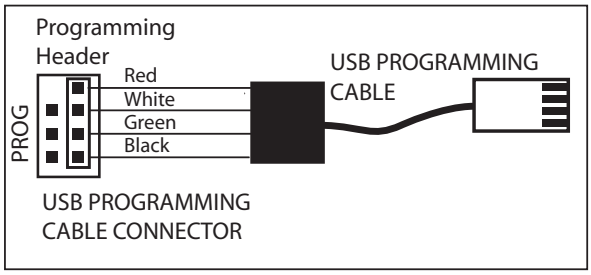
By setting the Analogue Output Y1, Y2, Y3, Y4 to 3-Point Open or 3-Point Close, the analogue output emulates the digital output. If the 3-point logic drives open, and if the analogue output is set to 3-Point Open, the analogue output is set 10V when opening, otherwise 0V. If the 3-point logic drives close, and if the analogue output is set to 3-Point Close, the analogue output is set 10V when closing, otherwise 0V. This can be used with natural ventilation wiring center to drive window actuators.

The 3-point actuator can have two modes, Linear and Stepped. In Linear Mode the 3-point output operates as standard 3-point control. In Stepped Mode the 3-point loop output will not change until the demand has exceeded the configured step amount. This allows the 3-point loop output to be configured to provide e.g. only output values of 0-25-50-75-100%. This reduces the wear and tear on the Windows actuators. The number of steps is defined by the "Push Button Steps" parameter.

Note: DO1/DO2 can also be configured to switch the DI1/DI2 status. The Digital Input Delay parameter applies.

**Controller Configuration via Software Configuration Tool**

The controller parameter options can be configured either via the Device Configuration Tool software. The DCT tool is connected via the PC USB cable to the programming header of the controller as shown on the image below.




The correct process for connecting the controller via the USB is as follows:-

- Disconnect USB Connector from PC
- Disconnect the Controller from Power
- Plug-In the 4-Way Connector to the Sensor
- Connect the USB to the PC
- Power Up the Controller

***NOTE: Always disconnect USB from PC before plugging the cable into the controller.***

| **Common Parameters** | |
|---|---|
| **Parameter Name** | **Description** |
| Defaults | Reloads the default configuration from the sensor non-volatile memory. **Note: All modified settings are lost.** |
| Reset | Performs soft reset of the controller. Apply after major changes. |
| Read | Reads the controller data. |
| Write | Writes the new settings to the controller (automatically stored in the non-volatile memory) |
| COM Port | Select the COM port for the USB Cable or Bluetooth. USB cable driver must be installed in order the Serial to TTL connection to operate. |

| **Live IO-View** | | |
|---|---|---|
| **Parameter Name** | **Description** | **Range** |
| **INPUTS** | | |
| Internal Sensor | Not Applicable | |
| External Sensor 1 (SRC-210/211) | External Temperature Sensor 1 Reading (RI1) | 0..50°C (32..122°F) |
| External Sensor 2 (SRC-211 Only) | External Temperature Sensor 2 Reading | 0..50°C (32..122°F) |
| 0-10V Input 1 (SRC-212 Only) | RI1 0-10V Input Measurement in °C | 0.0..50.0°C |
| 0-10V Input 2 (SRC-212 Only) | RI2 0-10V Input Measurement | 0.0..100.0% |

| Live IO-View | | |
|---|---|---|
| **Parameter Name** | **Description** | **Range** |
| Humidity Sensor | Not Applicable | |
| LUX Sensor | Not Applicable | 0..3,000 LUX |
| Setpoint Adjust | Current Setpoint Adjustment (SRC-210 Only) | -20..+20°C/°F |
| Occupancy | Not Applicable | |
| Digital Input 1 | Digital Input 1 Status | Off - On |
| Digital Input 2 | Digital Input 2 Status | Off - On |
| Configuration Switch | Bit Switch Position | 00000000-11111111 |
| **OUTPUTS** | | |
| Triac 1 | Digital Output 1 | Off - On |
| Triac 2 | Digital Output 2 | Off - On |
| Analogue Output 1 | Analogue Output 1 | 0..100% |
| Analogue Output 2 | Analogue Output 2 | 0..100% |
| Analogue Output 3 | Analogue Output 3 | 0..100% |
| Analogue Output 4 | Analogue Output 4 | 0..100% |
| Thermic1 Position | Thermic Output 1 Position | 0..100% |
| Thermic2 Position | Thermic Output 2 Position | 0..100% |
| Three Point Position | Three Point Output Position | 0..100% |
| **CONTROL** | | |
| Calculated Setpoint | Calculated Temperature Control Setpoint | 12..86°C/°F |
| Heating Demand | Heating Control Loop Output | 0..100% |
| Cooling Demand | Cooling Control Loop Output | 0..100% |
| CO2 Demand (SRC-212 only) | CO2 Demand | 0..100% |
| Humidification Demand | Not Applicable | |
| De-Humidification Demand | Not Applicable | |
| Fan Speed Demand | Fan Control Loop Output | 0..100% or 0-1-2-3 |
| Aux Loop Demand | Not Applicable | |
| Override State | Controller Operating Mode Status | 0 = None / Day<br>1 = Night |

| Control Parameters | | |
|---|---|---|
| **Parameter Name** | **Description** | **Range** |
| Setpoint | Setpoint Middle Position. | 12..86°C/°F (Default 21.0°C) |
| Setpoint Adjust Max | Temperature Setpoint Maximum Adjustment | 0.0...20°C/°F (Default 3.0) |
| Setpoint Adjust Min | Temperature Setpoint Minimum Adjustment | -20.0...0°C/°F (Default -3.0) |
| Setpoint Adjustment Save | Not Applicable | |
| Setpoint Adjustment Reset | Not Applicable | |
| Proportional Band | Proportional Ban | 1.0..50.0 °C/°F (Default 4.0) |
| Integral Action Time | Integral Action time of the control loop. Set to 0 to disable. | 0..1,200 seconds (Default 600s) |
| Heating Deadzone | Deadzone Between Heating Stages and Setpoint in Day Mode | 0.0..6.0°C/°F (Default 0.8°C) |
| Cooling Deadzone | Deadzone Between Cooling Stages and Setpoint in Day Mode | 0.0..6.0°C/°F (Default 0.8°C) |
| Relaxed Heating Deadzone | Deadzone Between Heating Stages and Setpoint in Night Mode (Expanded Deadzone Mode) | 0.0..40.0°C/°F (Default 3.0°C) |
| Relaxed Cooling Deadzone | Deadzone Between Cooling Stages and Setpoint in Night Mode (Expanded Deadzone Mode) | 0.0..40.0°C/°F (Default 3.0°C) |
| Night Mode | Night Control Mode | 0 = Expanded Deadzone (Default)<br>1 = Night OFF Mode |
| Night Frost Setpoint | Night Frost Setpoint (Night OFF Mode) | 0.0...71.0°C/°F (Default 8.0°C) |
| DZ Mode | Integral Action Operation in Deadzone | 0 = Hold (Default)<br>1 = Modulate |
| Heating Stages | Number of Heating Stages | 0 = None<br>1 = 1-Stage (Default)<br>2 = 2-Stages |

| Control Parameters | | |
|---|---|---|
| **Parameter Name** | **Description** | **Range** |
| Heating Stage 1 Direction | Heating Stage 1 Direction | 0 = Reverse (Default)<br>1 = Direct |
| Heating Stage 2 Direction | Heating Stage 2 Direction | 0 = Reverse (Default)<br>1 = Direct |
| Cooling Stages | Number of Cooling Stages | 0 = None<br>1 = 1-Stage (Default)<br>2 = 2-Stages |
| Cooling Stage 1 Direction | Cooling Stage 1 Direction | 0 = Reverse<br>1 = Direct (Default) |
| **CO2 CONTROL - ONLY APPLICABLE TO SRC-212** | | |
| CO2 Control Setpoint | CO2 Setpoint | 0..5000ppm (Default 1,000 ppm) |
| CO2 Proportional Band | CO2 Proportional Band | 10..5000 ppm (Default = 300 ppm) |
| CO2 Control Integral Action | Integral Action time of the CO2 control loop. Set to 0 to disable. | 0..10,000 seconds (Default 0) |
| Output Direction | Direction of the CO2 control actuator. | 0 = Reverse Acting<br>1 = Direct Acting (Default) |
| **HUMIDITY - NOT APPLICABLE** | | |
| | | |
| **FAN SPEED CONTROL** | | |
| Fan Speed Mode Selection | Selecting the Fan Speed Mode | 0 = 0..100% Modulating<br>1 = 0 - 1<br>2 = 0 - 1 - 2 (default)<br>3 = 0 - 1 - 2 - 3<br>4 = None |
| Fan Speed By | Fan Speed Control Source | 0 = Heating 1 and Cooling 1 Stage (Default)<br>1 = Heating Stage1<br>2 = Cooling Stage 1<br>3 = Heating and Cooling Stage 2<br>4 = Heating Stage 2<br>5 = Cooling Stage 2<br>6 = CO2 (SRC-212)<br>7 = Humidification (N/A)<br>9 = De-humidification (N/A) |
| **AUXILIARY CONTROL LOOP (NOT APPLICABLE)** | | |

| Inputs / Outputs | | |
|---|---|---|
| **Parameter Name** | **Description** | **Range** |
| **INPUTS** | | |
| Internal Sensor Offset | Not Applicable | |
| External Sensor 1 Offset (SRC-210/211) | One Point External Temperature Calibration Field for Sensor Input 1 | -10.0..+10.0°C/°K<br>(Default 0°C) |
| External Sensor 2 Offset (SRC-211 Only) | One Point External Temperature Calibration Field for Sensor Input 2 | -10.0..+10.0°C/°K<br>(Default 0°C) |
| External Sensor 1 (RI1) Offset (SRC-212) | One Point External RI1 0-10V Input Calibration Field (temperature) | -10.0..+10.0°C |
| CO2 Sensor Offset (SRC-212) | CO2 Sensor Calibration for External 0-10V Input | -500...+500 ppm |
| Humidity Sensor Offset | Not Applicable | |
| DI1 Function | Digital Input 1 Function | 0 = Override Day (PIR Mode) - Default<br>1 = Override Night (Windows Switch Mode)<br>2 = Disable Cooling (Condensation Switch Mode)<br>3 = None |
| DI1 Delay | Delay Time Setting for Digital Input 1 | 0..7200 Seconds (Default 0s) |

| Inputs / Outputs | | |
|---|---|---|
| **Parameter Name** | **Description** | **Range** |
| DI2 Function | Digital Input 2 Function | 0 = Override Day (PIR Mode) - Default<br>1 = Override Night (Windows Switch Mode)<br>2 = Disable Cooling (Condensation Switch Mode)<br>3 = None |
| DI2 Delay | Delay Time Setting for Digital Input 2 | 0..7200 Seconds (Default 0s) |
| Push Button Boost | Not Applicable | |
| Push Button Off Delay | Not Applicable | |
| Push Button Mode | Not Applicable | |
| Push Button Steps | Sets the number of steps when "Stepped Mode" is used with Stepped Analogue Output. | 0..5 |
| Occupancy Sensor Mode | Not Applicable | |
| Occupancy Off Delay | Not Applicable | |
| **OUTPUT ASSIGNMENTS** | | |
| AO1 (Y1) | Analogue Output Y1 Mode | 0 = Network Value<br>1 = None<br>2 = Heating Stage 1 (Default)<br>3 = Heating Stage 2<br>4 = Cooling Stage 1<br>5 = Cooling Stage 2<br>6 = Air-Side<br>7 = Modulating Fan (EC or Step)<br>8 = CO2 Control (SRC-212))<br>9 = Maximum VAV (SRC-212))<br>10 = Maximum Fan (SRC-212))<br>11 = Humidification (N/A)<br>12 = De-humidification (N/A)<br>13 = Aux Control Loop (N/A)<br>14 = 3-Point Open<br>15 = 3-Point Close<br>16 = Push Button (N/A) |
| AO2 (Y2) | Analogue Output Y2 Mode | 0 = Network Value<br>1 = None<br>2 = Heating Stage 1<br>3 = Heating Stage 2<br>4 = Cooling Stage 1 (Default)<br>5 = Cooling Stage 2<br>6 = Air-Side<br>7 = Modulating Fan (EC or Step)<br>8 = CO2 Control (SRC-212)<br>9 = Maximum VAV (SRC-212)<br>10 = Maximum Fan (SRC-212)<br>11 = Humidification (N/A)<br>12 = De-humidification (N/A)<br>13 = Aux Control Loop (N/A)<br>14 = 3-Point Open<br>15 = 3-Point Close<br>16 = Push Button (N/A) |
| AO3 (Y3) | Analogue Output Y3 Mode | 0 = Network Value<br>1 = None<br>2 = Heating Stage 1<br>3 = Heating Stage 2<br>4 = Cooling Stage 1<br>5 = Cooling Stage 2 (Default)<br>6 = Air-Side<br>7 = Modulating Fan (EC or Step)<br>8 = CO2 Control (SRC-212)<br>9 = Maximum VAV (SRC-212)<br>10 = Maximum Fan (SRC-212)<br>11 = Humidification (N/A)<br>12 = De-humidification (N/A)<br>13 = Aux Control Loop (N/A)<br>14 = 3-Point Open<br>15 = 3-Point Close<br>16 = Push Button (N/A) |

| Inputs / Outputs | | |
|---|---|---|
| **Parameter Name** | **Description** | **Range** |
| AO4 (Y4) | Analogue Output Y4 Mode | 0 = Network Value<br>1 = None<br>2 = Heating Stage 1<br>3 = Heating Stage 2<br>4 = Cooling Stage 1<br>5 = Cooling Stage 2<br>6 = Air-Side<br>7 = Modulating Fan (EC or Step) (Default)<br>8 = CO2 Control (SRC-212)<br>9 = Maximum VAV (SRC-212)<br>10 = Maximum Fan (SRC-212)<br>11 = Humidification (N/A)<br>12 = De-humidification (N/A)<br>13 = Aux Control Loop (N/A)<br>14 = 3-Point Open<br>15 = 3-Point Close<br>16 = Push Button (N/A) |
| AO1 (Y1) Minimum Output | Analogue Output Y1 Minimum Value | 0..100%(0% = default) |
| AO1 (Y1) Maximum Output | Analogue Output Y1 Maximum Value | 0..100% (100% = default) |
| AO2 (Y2) Minimum Output | Analogue Output Y2 Minimum Value | 0..100%(0% = default) |
| AO2 (Y2) Maximum Output | Analogue Output Y2 Maximum Value | 0..100% (100% = default) |
| AO3 (Y3) Minimum Output | Analogue Output Y3 Minimum Value | 0..100%(0% = default) |
| AO3 (Y3) Maximum Output | Analogue Output Y3 Maximum Value | 0..100% (100% = default) |
| AO4 (Y4) Minimum Output | Analogue Output Y4 Minimum Value | 0..100%(0% = default) |
| AO4 (Y4) Maximum Output | Analogue Output Y4 Maximum Value | 0..100% (100% = default) |
| Thermic/On-Off 1 | Thermic/On-Off Output 1 Mode (Linked to DO1) | 0 = Network Value<br>1 = None<br>2 = Heating Stage 1 (Default)<br>3 = Heating Stage 2<br>4 = Cooling Stage 1<br>5 = Cooling Stage 2<br>6 = Air-Side<br>7 = Modulating Fan (EC or Step)<br>8 = CO2 Control (SRC-212)<br>9 = Maximum VAV (SRC-212)<br>10 = Maximum Fan (SRC-212)<br>11 = Humidification (N/A)<br>12 = De-humidification (N/A)<br>13 = Aux Control Loop (N/A)<br>14= Push Button (N/A) |
| Thermic/On-Off 2 | Thermic/On-Off Output 2 Mode (Linked to DO2) | 0 = Network Value<br>1 = None<br>2 = Heating Stage 1<br>3 = Heating Stage 2<br>4 = Cooling Stage 1 (Default)<br>5 = Cooling Stage 2<br>6 = Air-Side<br>7 = Modulating Fan (EC or Step)<br>8 = CO2 Control (SRC-212)<br>9 = Maximum VAV (SRC-212)<br>10 = Maximum Fan (SRC-212)<br>11 = Humidification (N/A)<br>12 = De-humidification (N/A)<br>13 = Aux Control Loop (N/A)<br>14= Push Button (N/A) |

| Inputs / Outputs | | |
|---|---|---|
| **Parameter Name** | **Description** | **Range** |
| 3-Point | Three Point Output Mode (Linked to DO1 & DO2) NOTE: If selected Thermic 1 and Thermic 2 are automatically set to None. | 0 = Network Value<br>1 = None<br>2 = Heating Stage 1<br>3 = Heating Stage 2<br>4 = Cooling Stage 1 (Default)<br>5 = Cooling Stage 2<br>6 = Air-Side<br>7 = Modulating Fan (EC or Step)<br>8 = CO2 Control (SRC-212)<br>9 = Maximum VAV (SRC-212)<br>10 = Maximum Fan (SRC-212)<br>11 = Humidification (N/A)<br>12 = De-humidification (N/A)<br>13 = Aux Control Loop (N/A)<br>14= Push Button (N/A) |
| DO1 | Digital Output 1 Mode. Set to Control to activate PWM or On/Off control logic. | 0 = Network<br>1 = Fan Speed 1<br>2 = Fan Speed 2<br>3 = Thermic 1<br>4 = Thermic 2<br>5 = 3-Point Open<br>6 = 3-Point Close<br>7 = Digital Input 1<br>8 = Digital Input 2 |
| DO2 | Digital Output 2 Mode. Set to Control to activate PWM or On/Off control logic. | 0 = Network<br>1 = Fan Speed 1<br>2 = Fan Speed 2<br>3 = Thermic 1<br>4 = Thermic 2<br>5 = 3-Point Open<br>6 = 3-Point Close<br>7 = Digital Input 1<br>8 = Digital Input 2 |
| **THERMIC ACTUATORS** | | |
| Mode | Thermic Actuator Mode | 0 = PWM (Pulse Width Modulation, Default)<br>1 = On/Off |
| Min. Level | Minimum Output Level (Switch Off Level) | 0..100% (Default 0) |
| Max. Level | Maximum Output Level (Switch On Output) | 0..100% (Default 100) |
| PWM Period | Pulse Width Modulation Period | 0..255 seconds (Default 30) |
| **3-POINT ACTUATOR** | | |
| Stroke Time | 3-Point Actuator Running Time | 30..600 seconds (Default 150) |
| Run On Time | 3-Point Actuator Run On TIme when Fully Open /Closed | 0..30 seconds (Default 6) |
| Output Mode | Sets the 3-Point Output model. Linear = Standard 3-Point. Stepped = Follows the number of steps set in the Push Button Steps parameter. | 0 = Linear (Default)<br>1 = Stepped |

| Alarm/Display/Comms | | |
|---|---|---|
| **Parameter Name** | **Description** | **Range** |
| **DISPLAY - NOT APPLICABLE** | | |
| **COMMS** | | |
| BACnet Baud Rate | BACnet Baud Rate (can only be set if BR1 and BR2 are in OFF position) | 0 = 9600 (Default)<br>1 = 19200<br>2 = 38400<br>3 = 76800 |
| BACnet Parity | BACnet Parity | None (fixed) |
| Stop Bits | Stop Bits | 1 (fixed) |
| Address | BACnet Address (can only be set if all address bit switches are in OFF position) | 0..247<br>(Default 1) |
| Device ID | The BACnet Device ID. Change the value as required and activate the change by setting the MAC address via bit switches or by Reset Button. | 0..4,194,303<br>Default 651+MAC Address |
| **ALARMS - NOT APPLICABLE** | | |

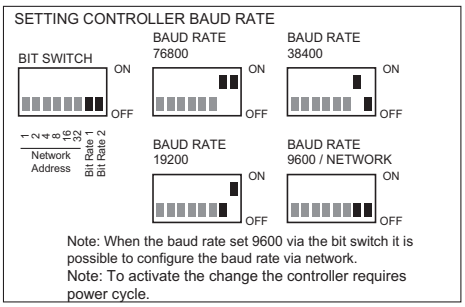
**Parameter Storage**

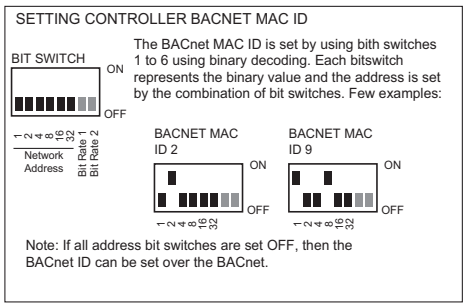
The configuration parameters are stored in the non-volatile memory. When the changes are carried out via the Configuration Tool, the parameters are stored in the non-volatile memory when the controller returns to a normal display mode.

**Setting Up BACnet Address and Baud Rate**

The SRC BACnet address and the baud rate is normally set through the bit switch. It is also possible to set the address and baud rate over the BACnet communication network.

***NOTE: The new settings are activated automatically after approx 5 seconds if the bit switch positions have not been moved. In this case the controller reset is applied to activate the new settings.*** .




**BACnet Standard Object Types Supported**

No dynamic Creation or Deletion supported. Objects, and object instances, are assigned to fixed functions within the proprietary control application of the product as follows:

| Object | Number Of Instances | Instance Assignments |
|---|---|---|
| Device Object | 1 | |
| Analog Input | 5 | AI(0) – Not Applicable<br>AI(1) – External Temperature Sensor 1 (SRC-210/211) - SRC212 AI1 Temp<br>AI(2) – Calculated Setpoint<br>AI(3) - CO2 Measurement (SRC-212)<br>AI(4) - Not Assigned<br>AI(5) - Not Assigned<br>AI(6) - External Sensor 2 (SRC-211)<br>AI(6) – AI2 Voltage (SRC-212) |
| Analog Outputs | 7 | AO(0) – Y1 Output<br>AO(1) – Y2 Output<br>AO(2) – Y3 Output<br>AO(3) - Y4 Output<br>AO(4) - Thermic1_Position<br>AO(5) - Thermic2_Position<br>AO(6) - ThreePoint_Position |
| Analogue Value | 13 | AV(0) – Temperature Setpoint<br>AV(1) – CO2 Setpoint (SRC-212)<br>AV(2) – Not Assigned<br>AV(3) – Not Assigned<br>AV(4) – Y1 Minimum<br>AV(5) – Y1 Maximum<br>AV(6) – Y2 Minimum<br>AV(7) – Y2 Maximum<br>AV(8) – Y3 Minimum<br>AV(9) – Y3 Maximum<br>AV(10) – Y4 Minimum<br>AV(11) – Y4 Maximum<br>AV(12) – Not Applicable |
| Binary Input | 4 | BI(0) – Override Input (DI1)<br>BI(1) – Override Input (DI2)<br>BI(2) – Not Appicable<br>BI(3) – Not Appicable |
| Binary Output | 5 | BO(0) – DO1 Output Status<br>BO(1) – DO2 Output Status<br>BO(2) = Night Mode Override<br>BO(3) = Not Appicable<br>BO(4) = NoVol Update |
| MutliState Input | 3 | MSI(0) - Alarm 1 Level<br>MSI(1) - Alarm 2 Level<br>MSI(3) - Alarm 3 Level |

**Device Object Properties**
**(Required Object Properties)**

| Property Name /ID | Attributes | Range | Default |
|---|---|---|---|
| Object Identifier | R/W | | MAC_Address + 651000 |
| Object Name | R/W | 32 Characters Max | Concatenation of product type and MAC address i.e. "SRC_001" |
| Object Type | R | | 8 |
| System Status | R | | STATUS_OPERATIONAL |
| Vendor Name | R | | SyxthSense |
| Vendor Identifier | | | 651 |
| Model Name | R | | SRC2 |
| Firmware Revision | R | | V2.02 |
| Protocol Version | R | | 1 |
| Protocol Revision | R | | 10 |
| Max APDU Length | R | | 480 |
| Segmentation Support | R | | No |
| APDU Timeout | R | | 3000 ms |
| Number APDu Retries | R | | 3 |
| MaxMaster | R | | 127 |
| Max_Info_Frames | R | | 1 |
| Database Revision | R | | 0 |

**Analogue Input Objects**

| | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Required Object Properties** | Object Identifier | R | | |
| | Object Name | R | | AI(0) – Not Applicable<br>AI(1) – External Temperature Sensor (SRC-210/211)<br>AI(1) – AI1 0-10V Input (SRC-212)<br>AI(2) – Calculated Setpoint<br>AI(3) - CO2 Measurement (SRC-212)<br>AI(4) - Not Assigned<br>AI(5) - Not Assigned<br>AI(6) – Ext. Temperature Sensor 2 (SRC-211); SRC-212 ; Use AI(3) |
| | Object Type | R | | 0 |
| | Present Value | R/W | AI(0): 0..150<br>AI(1): 0..150<br>AI(2): 0..150 | |
| | Status Flag | R | | |
| | Event State | R | | |
| | Out-Of-Service | R/W | | FALSE |
| | Units | R | | AI(0): Not Applicable<br>AI(1): UNITS_DEGREES_CELCIUS or UNITS_DEGREES_FAHRENHEIT<br>AI(2): UNITS_DEGREES_CELCIUS or UNITS_DEGREES_FAHRENHEIT<br>AI(3): PARTS_PER_MILLION |
| **Optional Properties** | None | | | |
| **Proprietary Properties** | None | | | |

**Analogue Output Objects**

| | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Required Object Properties** | Object Identifier | R | | |
| | Object Name | R | | AO(0) = “Y1”<br>AO(1) = “Y2”<br>AO(2) = “Y3”<br>AO(3) = “Y4”<br>AO(4) = "Thermic1_Position"<br>AO(5) = "Thermic2_Position"<br>AO(6) = "ThreePoint_Position" |
| | Object Type | R | | 1 |
| | Present Value | R/W | 0..100 | |
| | Status Flag | R | | |
| | Event State | R | | |
| | Out-Of-Service | R/W | | FALSE |
| | Units | R | | UNITS_PRECENT |
| **Optional Properties** | None | | | |
| **Proprietary Properties** | None | | | |

**Analogue Value Objects**

| | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Required Object Properties** | Object Identifier | R | | |
| | Object Name | R | | AV(0) – Temperature Setpoint<br>AV(1) – CO2 Setpoint (SRC-212)<br>AV(2) – Not Assigned<br>AV(3) – Not Assigned<br>AV(4) – Y1 Minimum<br>AV(5) – Y1 Maximum<br>AV(6) – Y2 Minimum<br>AV(7) – Y2 Maximum<br>AV(8) – Y3 Minimum<br>AV(9) – Y3 Maximum<br>AV(10) – Y4 Minimum<br>AV(11) – Y4 Maximum<br>AV(12) – Not Applicable |
| | Object Type | R | | 2 |
| | Present Value | R/W | AV(0): 12..86<br>AV(1): 0..5000<br>AV(2): 0..100.0<br>AV(3): 0..10<br>AV(4,11): 0..100.0 | |
| | Status Flag | R | | |
| | Event State | R | | |
| | Out-Of-Service | R/W | | FALSE |
| | Units | R | | AV(0) = UNITS_DEGREES_CELSIUS or UNITS_DEGREES_FAHRENHEIT<br>AV(1): UNITS_PARTS_PER_MILLION<br>AV(2): UNITS_PRECENT<br>AV(3) = NO_UNITS<br>AV(4,11): UNITS_PRECENT |
| | Priority Array | R | | |
| | Relinquish Default | R/W | | AV(0) = Nonvol Temperature Setpoint<br>AV(1-3) = Not Assigned<br>AV(4,11) = Nonvol Min/Max Values |
| **Optional Properties** | None | | | |
| **Proprietary Properties** | None | | | |

**Binary Input Objects**

| | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Required Object Properties** | Object Identifier | R | | |
| | Object Name | R | | BI(0) = “DI1”<br>BI(1) = "DI2"<br>BI(2) = "Occupancy"<br>BI(3) = "Not Assigned" |
| | Object Type | R | | 3 |
| | Present Value | R/W | 0..1 | |
| | Status Flags | R | | |
| | Event State | R | | |
| | Out-Of-Service | R/W | | FALSE |
| | Polarity | R/W | | POLARITY_NORMAL |
| | Active Text | R | | "on" |
| | Inactive Text | R | | "off" |
| **Optional Properties** | None | | | |
| **Proprietary Properties** | None | | | |

**Binary Output Objects**

| | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Required Object Properties** | Object Identifier | R | | |
| | Object Name | R | | BO(0) = “DO1”<br>BO(1) = “DO2”<br>BO(2) = "Night_Mode_Override"<br>BO(3) = Not Assigned<br>BO(4) = Not Assigned |
| | Object Type | R | | 4 |
| | Present Value | R/W | 0..1 | |
| | Status Flags | R | | |
| | Event State | R | | |
| | Out-Of-Service | R/W | | FALSE |
| | Polarity | R/W | | POLARITY_NORMAL |
| | Priority Array | R | | |
| | Relinquish Default | R/W | | BINARY_INACTIVE |
| | Active Text | R | | "on" |
| | Inactive Text | R | | "off" |
| **Optional Properties** | None | | | |
| **Proprietary Properties** | None | | | |

**Multi-State Input Objects**

| | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Required Object Properties** | Object Identifier | R | | |
| | Object Name | R | | MSI(0) = "Alarm 1 Level"<br>MSI(1) = "Alarm 2 Level"<br>MSI(2) = "Alarm 3 Level" |
| | Object Type | R | | 13 |
| | Present Value | R/W | 1,2,3 (Green, Amber, Red) | |
| | Status Flags | R | | |
| | Event State | R | | |
| | Out-Of-Service | R/W | | FALSE |
| | Number-Of-States | R | | 3 |

| | Property Name /ID | Attributes | Range | Default |
|---|---|---|---|---|
| **Optional Properties** | None | | | |
| **Proprietary Properties** | None | | | |