Johnson Controls

Unitary Products
Technical Services
Service Tips Letter

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Date: September 12, 2017

To: All Unitary Products Branch Service Managers
All Unitary Products Distribution Service Managers

Subject: SSE Control - Discussion on Operational and Operating Values

Product: Commercial Products Equipped with SSE Controls

Summary: This letter is intended to explain the importance and use of the operational sensor values and operating setpoints in the SSE control

The SSE control has inputs for several sensors. All sensor values can be viewed from the User Interface (UI) on the control, using a MAP Gateway, or from a BAS. In addition, the control has many setpoints for control of the various functions. However, in some cases, the sensor value or the setpoint is not the important value to use when viewing operation or troubleshooting a problem. The SSE control uses Operational or Operating values to implement the sequences. The word operational is usually used for sensor values and the word operating is used for setpoints. These operational values are what the control is currently using for functionality, and they are the values that must be used in any troubleshooting activity. In addition, the control can show us the source of any the operational sensor values.

The most commonly used operational value is the space temperature (OprST). The operational space temperature value can come from four possible sources. These sources, in descending order of priority, are:

Network Override – used when a BAS communicates a value to NetST
NetSensor – used when a NetSensor is connected on the SA bus
Space Temperature input (ST) – used when a space sensor is connected
Return Air Temperature input (RAT) – used in the absence of any other source

The control will use the highest priority value it is given as OprST. The actual source of the value can be viewed using Space Temperature Source (STSrc). The indications for STSrc are:

BAS Override – displayed when a Bas sends a communicated value to NetST
Network Sensor – displayed when a NetSensor input is detected
Local Input – displayed when a space temperature sensor input is detected
Return Air Temp – displayed when using the Return Air Temp sensor

These source values can help us determine that the control is actually using the proper input. For example, if a NetSensor is connected for space temperature and verification is needed to prove that it is using the NetSensor value, the STSrc will indicate Network Sensor. If a BAS is sending a communicated space temperature value and proof is needed that the control is receiving it, the STSrc will indicate BAS Override.

Another useful value is the operational occupancy (OprOcc). The current occupancy state can be viewed with this parameter. The possible states are:

Occupied
Unoccupied
Bypass
Standby

The occupied source (OccSrc) can be used to determine the source of the occupancy command. The possible sources are:

Local Input – 24 vac is present on the OCC thermostat input
Local Network Sensor – occupancy command has been sent from a NetSensor on the SA bus
BAS Network Request – BAS has sent an occupancy command on NetOcc
Local Schedule – the control is using the internal schedule
Temporary Occupancy – the ST and COM terminals have been shorted by the override button on a space sensor

The occupied source can help verify that the desired occupancy command is being used. For example, if a BAS wants to determine that their command is actually being used, they can view OccSrc to verify that it displays BAS Network Request. One common occurrence is the BAS sending an unoccupied command on NetOcc but the OprOcc staying occupied. The OccSrc value can then be viewed to determine what source is keeping it occupied. Usually, in this case, OccSrc will display Local Input, meaning that the jumper is still in place between R and OCC on the control.

In addition to the operational sensor values the control also has some Operating Setpoints. These include the cooling and heating setpoints for both vav and constant volume applications. As stated previously, the operating value is what the control is using at any given time. Using a constant volume unit as an example, the programmed occupied cooling setpoint (ClgOcc-Sp) can be altered by two things. First, and most commonly used, is the space temperature offset adjustment from a space or NetSensor. Second, and rarely used, is the temperature/humidity function of the control. The CV Operating Cooling Setpoint (OprCVClg-Sp) adjusts the programmed setpoint based on inputs from these two other values. The following is an example of how the operating setpoint is determined:

Programmed occupied cooling setpoint (ClgOcc-Sp)	72 F
Offset adjustment from a space sensor (OprSSO)	+2 F
Operating cooling setpoint (OprCVClg-Sp)	74 F

A common mistake is comparing space or operational space temperature to the programmed setpoint. The ClgOcc-Sp might be 72 with an OprST of 74 with no cooling operation. It would appear that there is something wrong. But there might be a setpoint offset from the space sensor and the OprCVClg-Sp is actually 74 making the space completely satisfied.

The SSE control has operating setpoints for all of the following:

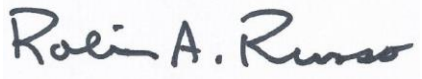
CV Cooling	OprCVClg-Sp
CV Heating	CVOprHtg-Sp
VAV Cooling	OprVAVClg-Sp
VAV Heating	VAVOprHtg-Sp

The SSE control has operational and source values for the following:

Space Temperature	OprST	STSrc
Setpoint Offset	OprSSO	SSOSrc
Outdoor Air Temperature	OprOAT	OATSrc
Outdoor Air Humidity	OprOAH	OAHSrc
Indoor Air (Space) Humidity	OprSH	SHSrc
Indoor Air Quality (CO2)	OprIAQ	IAQSrc
Outdoor Air Quality (CO2)	OprOAQ	OAQSrc
Purge Command	OprPurgeCmd	PurgeCmdSrc
Fan Request	OprFanReq	FanReqSrc
Occupancy	OprOcc	OccSrc

There are several sensors that read only the factory-installed sensor value and do not have operational values in order to properly protect the unit. These include supply air temperature (SAT), return air temperature (RAT), evaporator coil sensors (EC1-4), and condenser coil sensors (CC1-2).

In conclusion, always remember to use the operational or operating values when viewing unit operation or troubleshooting a problem. It is also a good idea to inform any BAS that is communicating to our equipment that the important points to map or display on any graphics are the operational values.



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