



TECHNICAL GUIDE · CN-IC2E-10 · EXTERNAL

i-Controller 2.0e BMS Integration Specification – BACnet Protocol

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Title: i-Controller 2.0e BMS Integration Specification – BACnet Protocol

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Overview

The FLō i-Controller 2.0e has the capability to communicate with Building Management Systems (BMS) over Modbus or BACnet protocols. Set points, occupancy, and some site-specific parameters can be sent from the BMS to the i-Controller 2.0e as an “Input” for control customization. Unit status parameters can be mapped as “Outputs” to the BMS from the i-Controller to provide real-time status of the FLō unit.

The following sections explain the available Inputs and Outputs, along with associated rules and configuration parameters. For unit operation details, refer to CN-IC2E-21 R454B i-Controller 2.0e (6-70 Ton) MPU Generic Sequence Of Operations REV.301.

NOTE: This integration specification is only applicable for FLō units equipped with i-Controller 2.0e Revision 301 or greater. Not all points are available on all versions of REV 301.

Inputs

This section describes the values that can be sent to the i-Controller 2.0e from the BMS for control customization.

BACnet Inputs

End User Settings					
23	Occ Cool Set Point	°F	60 – 85°F	Analog Value	Write
24	Unocc Cool Set Point	°F	60 – 85°F	Analog Value	Write
21	Occ Heat Set Point	°F	50 – 80°F	Analog Value	Write
22	Unocc Heat Set Point	°F	50 – 80°F	Analog Value	Write
32	Occ Dew Point Set Point	°F	48 – 60°F	Analog Value	Write
33	Unocc Dew Point Set Point	°F	48 – 60°F	Analog Value	Write

82	VAV Heating Temperature Set Point	°F	50 – 90°F	Analog Value	Write
80	VAV Cooling Temperature Set Point	°F	60 – 90°F	Analog Value	Write
71	Max Outdoor Damper Position	%	0-100%	Analog Value	Write
36	Outdoor Damper CO2 Max Inc.	%	0-100%	Analog Value	Write
34	Reheat/Reclaim Set Point	°F	68 – 74°F	Analog Value	Write
0	Occupied / Unoccupied	-	-	Binary Value	Write
58	Enable/Disable*	-	-	Binary Value	Write
66	Alarm Reset	-	-	Binary Value	Write
4	Clear Overrides	-	-	Binary Value	Write
41	Outdoor Air Temperature	°F	≠ 0°F	Analog Value	Write
42	Outdoor Humidity	% RH	≠ 0.0%	Analog Value	Write
74	Exhaust Fan 1 Interlock	-	-	Binary Value	Write
75	Exhaust Fan 2 Interlock	-	-	Binary Value	Write
76	Exhaust Fan 3 Interlock	-	-	Binary Value	Write
72	Load Shed Input	-	-	Binary Value	Write
121	Exhaust Fan Min Speed	%	20-100%	Analog Value	Write

122	Exhaust Fan Max Speed	%	20-100%	Analog Value	Write
136	Dehumidification Test Mode	-	-	Binary Value	Write
137	Cooling Test Mode	-	-	Binary Value	Write
138	Heating Test Mode	-	-	Binary Value	Write
139	Fan Only Test Mode	-	-	Binary Value	Write
140	Occ Heating Supply Air Set Point	°F	55 - 100°F	Analog Value	Write
141	Unocc Heating Supply Air Set Point	°F	55 - 100°F	Analog Value	Write
142	Occ Duct Static Pressure Set Point	INWC	0-3 INWC	Analog Value	Write
143	Unocc Duct Static Pressure Set Point	INWC	0-3 INWC	Analog Value	Write

End User Settings					
144	VAV Terminal Load	%	-100% - 100%	Analog Value	Write
145	Preheat Enable Set Point	°F	-30 - 70°F	Analog Value	Write
146	Preheat Leaving Air Set Point	°F	0 - 90°F	Analog Value	Write
143	Auto Fan Mode	-	-	Binary Value	Write
153	Occ Building Pressure Set Point	INWC	+/- 0.20 INWC	Analog Value	Write

154	Unocc Building Pressure Set Point	INWC	+/- 0.20 INWC	Analog Value	Write
157	Mod Reclaim SAT Set Point	°F	70 – 100 °F	Analog Value	Write

*The FLO Unit Enable/Disable variable can be used to disable the FLO unit via the BMS. The value will be “TRUE” by default but can be sent a “FALSE” value to disable the FLO unit.

Outputs

This section describes the values that can be mapped from the i-Controller 2.0e to the BMS to view status of the FLO unit operation.

NOTE: All Network Variables do not pertain to all FLO units. Refer to the “Unit Type Applicability” column to determine if the Network Variable should be included for a specific unit. The “Design Options” section provides detailed information about the configuration of the FLO unit and can be used to determine if a feature is included for Network Variables with an “Unit Type Applicability” noted as “OPTION.”

BACnet Outputs

Operation Mode						
61	Current Mode	–	Analog Value	Read	ALL	0: Standby, 1: FanOnly, 2: Heating Only, 3: Cooling Only, 4: Dehum Only, 5: Dehum + Heat, 6: Dehum + Cool, 7: Pre-Emptive Ramp Up, 8: Shutdown; 9: Net Disable, 10: Return Temp CTRL, 11: Hyd Freeze Protection, 12: Econ Mode
Physical Inputs						
27	Space Temp	°F	Analog Value	Read	ALL	Average Space Temperature

25	Space Dewpoint	°F	Analog Value	Read	ALL	Calculated or Measured Space Dew Point
2	Return Air Temp	°F	Analog Value	Read	ALL	Temperature of Air in Return Duct
1	Outdoor Air Temp	°F	Analog Value	Read	ALL	Outdoor Air Temperature
14	Outdoor Air Dewpoint	°F	Analog Value	Read	OPTION	Calculated Outdoor Air Dewpoint
0	Supply Air Temp	°F	Analog Value	Read	ALL	Temperature of Air in Supply Duct
9	Suction Pressure Transducer A1	psi	Analog Value	Read	ALL	Suction pressure reading for Compressor A1
10	Discharge Pressure Transducer A1	psi	Analog Value	Read	ALL	Discharge pressure reading for Compressor A1
45	Suction Pressure Transducer A2	psi	Analog Value	Read	15 – 70 TON	Suction pressure reading for Compressor A2
46	Discharge Pressure Transducer A2	psi	Analog Value	Read	15 – 70 TON	Discharge pressure reading for Compressor A2
Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
Physical Inputs						
118	Suction Pressure Transducer B1	psi	Analog Value	Read	31 – 140 TON	Suction pressure reading for Compressor B1
54		psi		Read	31 – 140 TON	

	Discharge Pressure Transducer B1		Analog Value			Discharge pressure reading for Compressor B1
53	Suction Pressure Transducer B2	psi	Analog Value	Read	31 – 70 TON	Suction pressure reading for Compressor B2
55	Discharge Pressure Transducer B2	psi	Analog Value	Read	31 – 70 TON	Discharge pressure reading for Compressor B2
135	Suction Pressure Transducer C1	psi	Analog Value	Read	71 – 140 TON	Suction pressure reading for Tandem Compressor C1 & C2
136	Discharge Pressure Transducer C1	psi	Analog Value	Read	71 – 140 TON	Discharge pressure reading for Tandem Compressor C1 & C2
5	Reheat/ Reclaim Inlet Temp 1	°F	Analog Value	Read	OPTION	Temperature reading from inlet pipe of reheat/reclaim coil (if equipped)
158	Reclaim Outlet Temp 1	°F	Analog Value	Read	OPTION	Temperature reading from outlet pipe of reclaim coil (if equipped)
3	CO2 Level	ppm	Analog Value	Read	OPTION	Current CO2 level reading from CO2 sensor
161	CO2 Sensor 1	ppm	Analog Value	Read	OPTION	CO2 level reading from CO2 sensor 1
162	CO2 Sensor 2	ppm	Analog Value	Read	OPTION	CO2 level reading from CO2 sensor 2
25	Airflow Switch	–	Binary Value	Read	ALL	True if airflow switch is closed and fan proof is made

2	Phase Loss Input	–	Binary Value	Read	ALL	On if phase loss detection exists
44	Load Shed	–	Binary Value	Read	OPTION	On if load shed is called
140	Exhaust Fan Interlock	–	Binary Value	Read	ALL	On if physical input for exhaust fan interlock is closed
4	Outdoor Air Humidity	%RH	Analog Value	Read	OPTION	Outdoor Air %RH
12	Indoor Air Humidity	%RH	Analog Value	Read	OPTION	Indoor Air %RH
99	Entering Water Temp A	°F	Analog Value	Read	OPTION	Entering Water Temp Condenser A
Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
Physical Inputs						
100	Leaving Water Temp A	°F	Analog Value	Read	OPTION	Leaving Water Temp Condenser A
102	Leaving Water Temp B	°F	Analog Value	Read	OPTION	Leaving Water Temp Condenser B
95	Flow Switch A	–	Binary Value	Read	OPTION	Flow Switch Condenser A
96	Flow Switch B	–	Binary Value	Read	OPTION	Flow Switch Condenser B
124	Spare UI 1	–	Analog Value	Read	OPTION	Spare Universal Input 1 value
125	Spare UI 2	–	Analog Value	Read	OPTION	Spare Universal Input 2 value
174	Spare UI 3	–		Read	OPTION	Spare Universal Input 3 value

			Analog Value			
147	Duct Static Pressure	INWC	Analog Value	Read	OPTION	Duct static pressure for VAV units
148	MAU Exhaust Fan Interlock	-	Analog Value	Read	OPTION	Exhaust fan analog input for MAU
7	Space Temp 1	°F	Analog Value	Read	ALL	Space temperature sensor 1
163	Space RH 1	%RH	Analog Value	Read	OPTION	Space humidity sensor 1
11	Space Temp 2	°F	Analog Value	Read	OPTION	Space temperature sensor 2
164	Space RH 2	%RH	Analog Value	Read	OPTION	Space humidity sensor 2
13	Space Dewpoint	°F	Analog Value	Read	OPTION	Space dewpoint sensor
43	Clogged Filter	-	Binary Value	Read	OPTION	Clogged filter switch. On if filter switch is closed
138	Vestibule Temperature	°F	Analog Value	Read	OPTION	Temperature of air in vestibule area
149	Preheat Entering Air Temperature	°F	Analog Value	Read	OPTION	Preheater entering air temperature
150	Preheat Leaving Air Temperature	°F	Analog Value	Read	OPTION	Preheater leaving air temperature
155	Building Pressure	INWC	Analog Value	Read	OPTION	Building pressure
156	Return Air Humidity	%RH	Analog Value	Read	OPTION	Return Air % relative humidity

Physical Inputs						
148	A2L Airstream Leak	-	Binary Value	Read	ALL	A2L refrigerant leak detected in the airstream
149	A2L Cabinet Leak	-	Binary Value	Read	ALL	A2L refrigerant leak detected in the cabinet
171	Outdoor Airflow	CFM	Analog Value	Read	OPTION	Outdoor airflow measurement
172	Return Airflow	CFM	Analog Value	Read	OPTION	Return airflow measurement
173	Supply Airflow	CFM	Analog Value	Read	OPTION	Supply airflow measurement

Alarms						
16	Clogged Filter Alarm	-	Binary Value	Read	ALL	True if a clogged filter is detected
14	Fan Fail Alarm	-	Binary Value	Read	ALL	True if supply fan has failed to start
64	Phase Loss Alarm	-	Binary Value	Read	ALL	True if the phase monitor detects a voltage above the acceptable limit
49	Drain Pan Overflow Alarm	-	Binary Value	Read	ALL	True if the drain pan level has exceeded the acceptable limit
26	Unit Shutdown	-	Binary Value	Read	ALL	False if unit is in a shutdown mode (smoke, fan fail, phase loss, supply temp trip)
13	Heat Alarm	-	Binary Value	Read	OPTION	True heating module is not functioning properly (if equipped)

84	Reheat/ Reclaim Alarm	-	Binary Value	Read	OPTION	True if no proof of reheat or reclaim operation is made (if equipped)
154	Reheat/ Reclaim False Active Alarm	-	Binary Value	Read	OPTION	True if proof of reheat or reclaim operation is made when mode is off (if equipped)
63	Compressor A1 Status	-	Analog Value	Read	ALL	0: OK; 1: Compressor High Discharge Trip; 2: Compressor Proof Alarm, 3: Low Suction Pressure Alarm, 4: High Discharge Pressure Alarm, 5: High Suction Pressure Alarm, 6: Suction Pressure Transducer Error, 7: Discharge Pressure Transducer Error, 8: Not Used, 9: Low Suction, 10: Entr Wrt Temp SD, 11: No Cond Flow, 12: OA Lockout, 13: Econ Lockout
64	Compressor A2 Status	-	Analog Value	Read	15 – 70 TON	0: OK; 1: Compressor High Discharge Trip; 2: Compressor Proof Alarm, 3: Low Suction Pressure Alarm, 4: High Discharge Pressure Alarm, 5: High Suction Pressure Alarm, 6: Suction Pressure Transducer Error, 7: Discharge Pressure Transducer Error, 8: Not Used, 9: Low Suction, 10: Entr Wrt Temp SD, 11: No Cond Flow, 12: OA Lockout, 13: Econ Lockout

Alarms						
65	Compressor B1 Status	-	Analog Value	Read	31 – 140 TON	0: OK; 1: Compressor High Discharge Trip; 2: Compressor Proof Alarm, 3: Low Suction Pressure Alarm, 4: High

						Discharge Pressure Alarm, 5: High Suction Pressure Alarm, 6: Suction Pressure Transducer Error, 7: Discharge Pressure Transducer Error, 8: Not Used, 9: Low Suction, 10: Entr Wrt Temp SD, 11: No Cond Flow, 12: OA Lockout, 13: Econ Lockout
66	Compressor B2 Status	-	Analog Value	Read	31 – 70 TON	0: OK; 1: Compressor High Discharge Trip; 2: Compressor Proof Alarm, 3: Low Suction Pressure Alarm, 4: High Discharge Pressure Alarm, 5: High Suction Pressure Alarm, 6: Suction Pressure Transducer Error, 7: Discharge Pressure Transducer Error, 8: Not Used, 9: Low Suction, 10: Entr Wrt Temp SD, 11: No Cond Flow, 12: OA Lockout, 13: Econ Lockout
15	Smoke Alarm	-	Binary Value	Read	ALL	True if alarm is active (smoke detector has been tripped)
77	CO2 Alarm	-	Binary Value	Read	OPTION	True if alarm is active (CO2 level has exceeded upper limit)
69	VCCX Offline	-	Binary Value	Read	ALL	VCCX boards are offline
70	EM-1 Board Fault	-	Binary Value	Read	ALL	On if Expansion board 1 is expected but not communicating
71	RSM-A Board Fault	-	Binary Value	Read	ALL	On if RSM A board is expected but not communicating
106	RSM-B Board Fault	-	Binary Value	Read	31 – 70 TON	On if RSM B board is expected but not communicating
107	RSM-C Board Fault	-	Binary Value	Read	71 – 140 TON	On if RSM C board is expected but not communicating
59	Sensor Failures	-	Binary Value	Read	ALL	True if a sensor failure exists

108	Space Temp 1 Sensor Error	-	Binary Value	Read	ALL	On if an error is present with the Space Temperature 1 sensor
109	Space Temp 2 Sensor Error	-	Binary Value	Read	OPTION	On if an error is present with the Space Temperature 2 sensor

Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
Alarms						
110	Space Humidity Sensor 1 Error	-	Binary Value	Read	ALL	On if an error is present with the Space Humidity sensor
152	Space Humidity Sensor 2 Error	-	Binary Value	Read	OPTION	On if an error is present with the Space Humidity 2 sensor
111	Suction Pressure A1 Sensor Error	-	Binary Value	Read	10 – 140 TON	On if an error is present with the Suction Pressure sensor
112	Discharge Pressure A1 Sensor Error	-	Binary Value	Read	10 – 140 TON	On if an error is present with the Discharge Pressure sensor
113	Suction Pressure A2 Sensor Error	-	Binary Value	Read	15 – 70 TON	On if an error is present with the Suction Pressure sensor
114	Discharge Pressure A2 Sensor Error	-	Binary Value	Read	15 – 70 TON	On if an error is present with the Discharge Pressure sensor
115	Suction Pressure B1 Sensor Error	-	Binary Value	Read	31 – 140 TON	On if an error is present with the Suction Pressure sensor
116	Discharge Pressure B1 Sensor Error	-	Binary Value	Read	31 – 140 TON	On if an error is present with the Discharge Pressure sensor
117		-		Read	31 – 70 TON	

Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
	Suction Pressure B2 Sensor Error		Binary Value			On if an error is present with the Suction Pressure sensor
118	Discharge Pressure B2 Sensor Error	-	Binary Value	Read	31 – 70 TON	On if an error is present with the Discharge Pressure sensor
119	Supply Air Temperature Error	-	Binary Value	Read	ALL	On if an error is present with the Supply Temperature sensor
120	Outdoor Air Temperature Error	-	Binary Value	Read	ALL	On if an error is present with the Outdoor Air Temperature sensor
157	Outdoor Humidity Temperature Error	-	Binary Value	Read	OPTION	On if an error is present with the Outdoor Humidity Temperature sensor
155	Return Air Temperature Error	-	Binary Value	Read	ALL	On if an error is present with the Return Air Temperature sensor

Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
Alarms						
156	Return Air Humidity Error	-	Binary Value	Read	OPTION	On if an error is present with the Return Air Humidity sensor
141	Duct Static Pressure Error	-	Binary Value	Read	ALL	On if an error is present with the Duct Static Pressure sensor
158	CO2 Sensor 1 Error	-	Binary Value	Read	OPTION	On if an error is present with the CO2 sensor 1
159	CO2 Sensor 2 Error	-	Binary Value	Read	OPTION	On if an error is present with the CO2 sensor 2
160	Preheat Leaving Air	-	Binary Value	Read	OPTION	

Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
	Temperature 1 Error					On if an error is present with the Preheat Leaving Air Temperature sensor 1
161	Preheat Leaving Air Temperature 2 Error	-	Binary Value	Read	OPTION	On if an error is present with the Preheat Leaving Air Temperature sensor 2
162	Preheat Entering Air Temperature Error	-	Binary Value	Read	OPTION	On if an error is present with the Preheat Entering Air Temperature sensor 1
40	Supply Air Temperature High Alarm	-	Binary Value	Read	ALL	On if supply temp has increased above high safety limit
41	Supply Air Temperature Low Alarm	-	Binary Value	Read	ALL	On if supply temp has dropped below the low safety limit
42	Compressor Alarm	-	Binary Value	Read	10 – 140 TON	On if alarm is active (compressors are not functioning properly)
50	Compressor A1 Alarm	-	Binary Value	Read	10 – 140 TON	On if Compressor A1 alarm is active
51	Compressor A2 Alarm	-	Binary Value	Read	10 – 70 TON	On if Compressor A2 alarm is active
52	Compressor B1 Alarm	-	Binary Value	Read	31 – 140 TON	On if Compressor B1 alarm is active
53	Compressor B2 Alarm	-	Binary Value	Read	31 – 70 TON	On if Compressor B2 alarm is active
54	Compressor C1 Alarm	-	Binary Value	Read	71-140 TON OR 31-70 TON HP	On if Compressor C1 alarm is active
55	Compressor C2 Alarm	-	Binary Value	Read	71 – 140 TON	On if Compressor C2 alarm is active

Alarms						
163	Compressor D1 Alarm	-	Binary Value	Read	31 – 70 TON HP	On if Compressor D1 alarm is active
3	Override Active	-	Binary Value	Read	ALL	On if there is an active override in the controller
100	High Entering Water Temp A	-	Binary Value	Read	OPTION	High Entering Water Temp A
101	Low Entering Water Temp A	-	Binary Value	Read	OPTION	Low Entering Water Temp A
104	Condenser A Water Flow Alarm	-	Binary Value	Read	OPTION	Condenser A Water Flow Alarm
105	Condenser B Water Flow Alarm	-	Binary Value	Read	OPTION	Condenser B Water Flow Alarm
150	A2L Airstream Leak Alarm	-	Binary Value	Read	ALL	True if A2L refrigerant leak is detected in the airstream
151	A2L Cabinet Leak Alarm	-	Binary Value	Read	ALL	True if A2L refrigerant leak is detected in the cabinet
153	Main IC2 Offline	-	Binary Value	Read	ALL	True if Main IC2 board is expected but not communication with expansion
170	Low Outdoor Airflow	-	Binary Value	Read	OPTION	True if outdoor airflow is below 10% of design
171	High Outdoor Airflow	-	Binary Value	Read	OPTION	True if outdoor airflow is 10% above design
172	Outdoor AFMS Fault	-	Binary Value	Read	OPTION	True if there is a fault with the Airflow Measurement Station

Physical Outputs						
20	Supply Fan Speed	%	Analog Value	Read	ALL	Current VFD Operating %
1	Supply Fan Command	-	Binary Value	Read	ALL	Supply Fan Commanded State
67	Compressor Speed A1	%	Analog Value	Read	ALL	Compressor A1 Operating %
68	Compressor Speed A2	%	Analog Value	Read	15 – 70 TON	Compressor A2 Operating %
126	Compressor Speed B1	%	Analog Value	Read	31 – 140 TON	Compressor B1 Operating %
127	Compressor Speed B2	%	Analog Value	Read	31 – 70 TON	Compressor B2 Operating %
128	Compressor Speed C1	%	Analog Value	Read	71 – 140 TON	Compressor C1 Operating %
129	Compressor Speed C2	%	Analog Value	Read	71 – 140 TON	Compressor C2 Operating %
167	Compressor Speed D1	%	Analog Value	Read	31 – 70 TON HP	Compressor D1 Operating %
16	RA Damper	%	Analog Value	Read	ALL	Return Air Damper % Open
17	BA Damper	%	Analog Value	Read	ALL	Bypass Air Damper % Open
15	OA Damper	%	Analog Value	Read	ALL	Outdoor Air Damper % Open
130	Condenser Enable A1	-	Binary Value	Read	ALL	On if condenser A1 is activated
130	Condenser Speed A1	%	Analog Value	Read	ALL	Current condenser VFD Status
131	Condenser Enable A2	-	Binary Value	Read	15 – 70 TON	On if condenser A2 is activated

131	Condenser Speed A2	%	Analog Value	Read	15 – 70 TON	Current condenser VFD Status
132	Condenser Enable B1	-	Binary Value	Read	31 – 140 TON	On if condenser B1 is activated
132	Condenser Speed B1	%	Analog Value	Read	31 – 140 TON	Current condenser VFD Status
133	Condenser Enable B2	-	Binary Value	Read	31 – 70 TON	On if condenser B2 is activated
133	Condenser Speed B2	%	Analog Value	Read	31 – 70 TON	Current condenser VFD Status
134	Condenser Enable C1	-	Binary Value	Read	71 – 140 TON	On if condenser C1 is activated
Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
Physical Outputs						
134	Condenser Speed C1	%	Analog Value	Read	71 – 140 TON	Current condenser VFD Status
165	Condenser Enable D1	-	Binary Value	Read	31 – 70 TON HP	On if condenser D1 is activated
169	Condenser Speed D1	%	Analog Value	Read	31 – 70 TON HP	Current condenser VFD Status
51	Suction Pressure SP	psi	Analog Value	Read	ALL	Suction Pressure Set Point
78	Reheat/Reclaim Active	-	Binary Value	Read	OPTION	True if reheat or reclaim 1 is active (if equipped)
56	% Total Heat Capacity	%	Analog Value	Read	OPTION	% of total heating capacity that is currently active (if equipped)
31	% Total Compressor Capacity	%	Analog Value	Read	OPTION	% of total compressor capacity that is currently active

135	Vestibule Damper	-	Binary Value	Read	OPTION	Vestibule damper position
46	ERV Wheel	-	Binary Value	Read	OPTION	ERV Wheel Enable
47	ERV Power Exhaust	-	Binary Value	Read	OPTION	ERV Power Exhaust Enable
45	Exhaust Interlock 1	-	Binary Value	Read	OPTION	True if Exhaust Interlock 1 is ON
81	Exhaust Interlock 2	-	Binary Value	Read	OPTION	True if Exhaust Interlock 2 is ON
82	Exhaust Interlock 3	-	Binary Value	Read	OPTION	True if Exhaust Interlock 3 is ON
97	Hydronic Hot Water Valve	%	Analog Value	Read	HYDRONIC	Percent opening of Hydronic Heating Coil Valve
94	Hydronic Hot Water Pump	-	Binary Value	Read	HYDRONIC	Hydronic Hot Water Pump Enable
103	Condenser Valve A	%	Analog Value	Read	WATER SOURCE	Condenser A Valve Percent
104	Condenser Valve B	%	Analog Value	Read	WATER SOURCE	Condenser B Valve Percent
97	Reversing Valve	-	Binary Value	Read	HEAT PUMP	Reversing valve position – false is heating, true is cooling
107	Discharge Pressure Setpoint	PSI	Analog Value	Read	HEAT PUMP	Discharge Pressure Setpoint
123	Exhaust Fan Speed	%	Analog Value	Read	OPTION	Current VFD operating %

Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
Physical Outputs						

Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
137	Modulating Reheat Valve Percent	%	Analog Value	Read	OPTION	Modulating reheat valve percent output
142	Preheat Enable	-	Binary Value	Read	OPTION	Preheater enable state
151	Preheat Signal	%	Analog Value	Read	OPTION	Preheater output signal
144	Defrost Active	-	Binary Value	Read	HEAT PUMP	ASHP defrost mode
145	Comp Heating Low Ambient Lockout	-	Binary Value	Read	HEAT PUMP	ASHP low ambient compressor lockout for heating
146	Hydronic Chilled Water Enable	-	Binary Value	Read	HYDRONIC	Hydronic chilled water system enable
147	Hydronic Chilled Water Valve	-	Binary Value	Read	HYDRONIC	Hydronic chilled water valve
159	Mod Reclaim LVL	%	Analog Value	Read	OPTION	Modulating reclaim output signal
160	Boost Reclaim LVL 1	%	Analog Value	Read	OPTION	Boosted reclaim signal to refrigeration rack 1
166	SubCooling Reclaim Enabled	-	Binary Value	Read	OPTION	Refrigeration rack enable for subcooling reclaim mode
167	Active SubCooling Enabled	-	Binary Value	Read	OPTION	RTU enabled for active subcooling for refrigeration rack
168	DeSuperheat Reclaim 1 Enabled	-	Binary Value	Read	OPTION	Refrigeration rack 1 desuperheat enable

Design Options/ Parameters						
71	Max Outdoor Damper Position	%	Analog Value	Write	ALL	Max % opening of the Outdoor Air Damper during normal operation
36	Outdoor Damper CO2 Max Inc.	%	Analog Value	Write	OPTION	Additional max % opening of the Outdoor Air Damper during a CO2 call
73	Max Return Damper Position	%	Analog Value	Read	ALL	Max % opening of the Return Air Damper throughout Cool/Heat/Fan Only modes
72	Min Return Damper Position	%	Analog Value	Read	ALL	Min % opening of the Return Air Damper throughout Dehum mode
74	Min Bypass Damper Position	%	Analog Value	Read	ALL	Min % opening of the Bypass Air Damper throughout Cool/Heat/Fan Only modes
85	RH/Dew Point Sensor	-	Binary Value	Read	ALL	True if RH sensor, False if Dewpoint Sensor
57	Number of Condenser Fans	#	Analog Value	Read	ALL	Total # of Condenser Fans included on the unit
34	Condenser Fan Control	-	Binary Value	Read	ALL	True if Condenser Fan Control is Enabled in the control sequence
59	Number of Heat Stages	#	Analog Value	Read	OPTION	Total # of Auxiliary Heat Stages included on the unit
60	Reheat/Reclaim	-	Binary Value	Read	OPTION	True if Reclaim, False if Reheat
73		-	Binary Value	Read	OPTION	

	Reheat/ Reclaim Disable					True if neither Reheat or Reclaim coils are included on the unit
48	Auxiliary Heat Lockout	-	Binary Value	Read	OPTION	True if there is no auxiliary heating included in the CES unit
18	CO2 Sensor	-	Binary Value	Read	OPTION	True if a CO2 Sensor is included on the unit or used for control
58	Number of Compressors	#	Analog Value	Read	ALL	Total # of Compressors included on the unit
75	Number of Exhaust Interlocks	#	Analog Value	Read	OPTION	Total # of exhaust interlocks included on the unit
83	ERV Option	-	Binary Value	Read	OPTION	True if an ERV is included on the unit
49	Program Revision Number	#	Analog Value	Read	ALL	Indicates the firmware version loaded on the controller
113	Number of Water Condensers	-	Analog Value	Read	OPTION	Number of Water Condensers
98	Water Source Option	-	Binary Value	Read	OPTION	Water Source Option
99	Preheat Option	-	Binary Value	Read	OPTION	Preheat Option
Instance Number	Network Variables	Eng Units	BACnet Type	Read/Write	Unit Type Applicability	Description
Design Options/Parameters						
152	Unit Type	-	Analog Value	Read	ALL	Unit type configuration

114	Minimum Condenser Valve Percent	%	Analog Value	Read	OPTION	Minimum Condenser Valve Percentage
Sensor Offsets						
76	Space Temp 1 Offset	°F	Analog Value	Read	ALL	Space temperature sensor 1 calibration offset
78	Space Humidity 1 Offset	%	Analog Value	Read	ALL	Space humidity sensor 1 calibration offset
165	Space Temp 2 Offset	°F	Analog Value	Read	OPTION	Space temperature sensor 2 calibration offset
166	Space Humidity 2 Offset	%	Analog Value	Read	OPTION	Space humidity sensor 2 calibration offset
79	Supply Temp Offset	°F	Analog Value	Read	ALL	Supply temperature sensor calibration offset
77	Return Air Temp Offset	°F	Analog Value	Read	ALL	Return temperature sensor calibration offset
139	Vestibule Damper Temp Offset	°F	Analog Value	Read	OPTION	Vestibule damper temperature sensor calibration offset

0	Current Mode	-	MSV	Read	ALL	0: Standby, 1: FanOnly, 2: Heating Only, 3: Cooling Only, 4: Dehum Only, 5: Dehum + Heat, 6: Dehum + Cool, 7: Pre-Emptive Ramp Up, 8: Shutdown; 9: Net Disable, 10: Return Temp CTRL, 11: Hyd Freeze Protection, 12: Econ Mode
1	Compressor AI Status	-	MSV	Read	ALL	0: OK; 1: Compressor High Discharge Trip; 2: Compressor Proof Alarm, 3: Low Suction Pressure Alarm, 4:High Discharge Pressure Alarm, 5: High Suction Pressure Alarm, 6:

						Suction Pressure Transducer Error, 7: Discharge Pressure Transducer Error, 8: Not Used, 9: Low Suction, 10: Entr Wrt Temp SD, 11: No Cond Flow, 12: OA Lockout, 13: Econ Lockout
2	Compressor A2 Status	-	MSV	Read	OPTION	0: OK; 1: Compressor High Discharge Trip; 2: Compressor Proof Alarm, 3: Low Suction Pressure Alarm, 4: High Discharge Pressure Alarm, 5: High Suction Pressure Alarm, 6: Suction Pressure Transducer Error, 7: Discharge Pressure Transducer Error, 8: Not Used, 9: Low Suction, 10: Entr Wrt Temp SD, 11: No Cond Flow, 12: OA Lockout, 13: Econ Lockout
3	Compressor B1 Status	-	MSV	Read	OPTION	0: OK; 1: Compressor High Discharge Trip; 2: Compressor Proof Alarm, 3: Low Suction Pressure Alarm, 4: High Discharge Pressure Alarm, 5: High Suction Pressure Alarm, 6: Suction Pressure Transducer Error, 7: Discharge Pressure Transducer Error, 8: Not Used, 9: Low Suction, 10: Entr Wrt Temp SD, 11: No Cond Flow, 12: OA Lockout, 13: Econ Lockout
4	Compressor B2 Status	-	MSV	Read	OPTION	0: OK; 1: Compressor High Discharge Trip; 2: Compressor Proof Alarm, 3: Low Suction Pressure Alarm, 4: High Discharge Pressure Alarm, 5: High Suction Pressure Alarm, 6: Suction Pressure Transducer Error, 7: Discharge Pressure Transducer Error, 8: Not Used, 9: Low Suction, 10: Entr Wrt Temp SD, 11: No Cond Flow, 12: OA Lockout, 13: Econ Lockout

REVISION HISTORY

Revision (n-ddmonthyyyy)	Modification
1-4JUNE2021	Revision for Rev 300 as of 6/4/2021, Published
2-22FEB2022	Additional edits added by Richard Germany.

3-31OCT2023	Revised for Ver4 with 300.08 point additions & changing OADMax&Inc to writable
4-5FEB2024	Updated by AP & RG, Published by CA
5-19JUNE2026	Updated for R301 / IC2e

APPROVALS

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