Installation & Operation Manual

intelliGen™ Integration Card (iIC)

SEPTEMBER 2026
PART NO. 25011901

intelliGen Integration Card (iIC) for BAS Integration

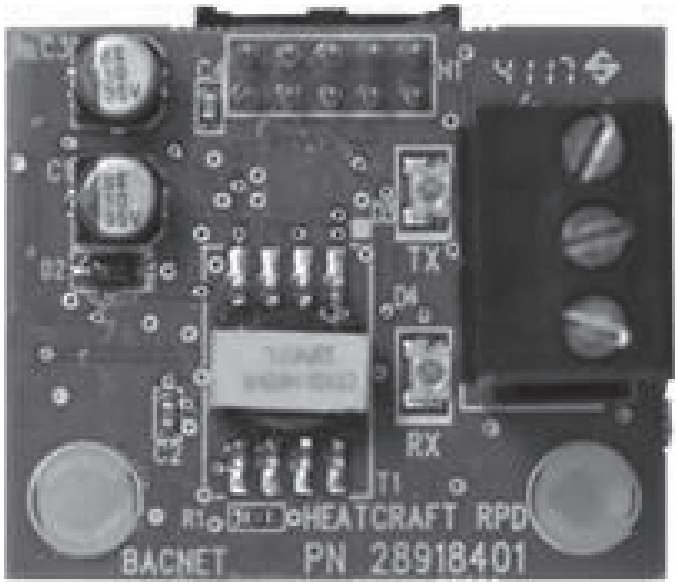


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Legend

Abbrev. Name	Long Name
iIC	intelliGen Integration Card
iRC	intelliGen Refrigeration Controller
iRCUI	intelliGen Refrigeration Controller User Interface
DHCP	Dynamic Host Configuration Protocol
BAS	Building Automation System
MS/TP	Master Slave Token Passing
RTU	Remote Terminal Unit
MAC	Media Access Control
RDS	Refrigerant Detection System

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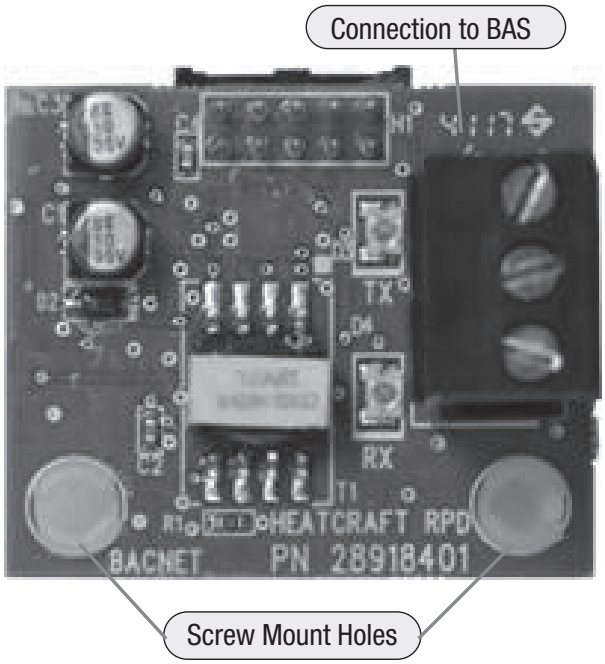
intelliGen Integration Card (iIC)

The intelliGen Integration Card (iIC) is an add-on card to enable the intelliGen System to integrate with a Building Automation System (BAS) for centralized monitoring and control. It could be remote monitored also if the BAS system has the remote monitoring capability.

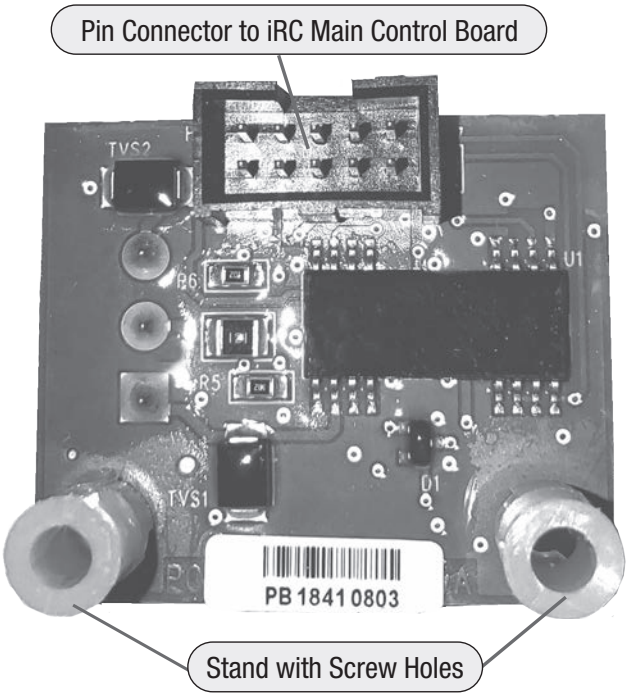
The iIC card connects to a BAS system via a two-wire shielded RS-485 cable. It supports both BACnet MS/TP and Modbus RTU communication protocols. The iIC card connects to intelliGen's iRC main control board via a 10-pin connector.

iIC Card Layout

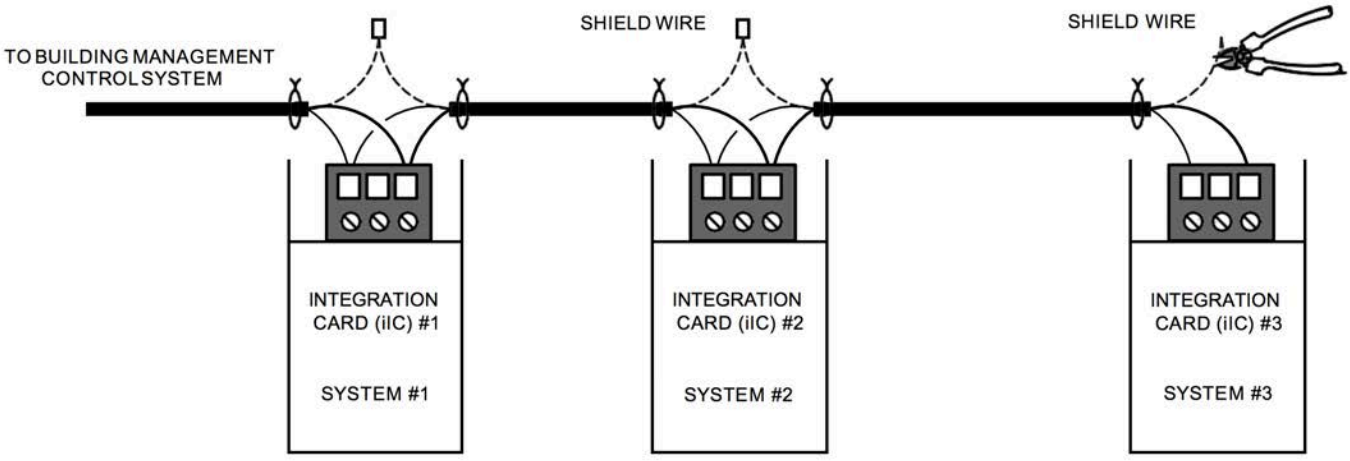
Front View



Back View



Integration Card Wiring Diagram



Installation

1.) TURN OFF POWER TO THE IRC BOARD.

2.) MOUNTING THE INTEGRATION CARD (IIC)

To enable access to the intelliGen system through a Building Automation System, an Integration Card can be mounted to the iRC. There is a 10-pin connector at the back and top of the card which must plug into sockets on the iRC board located above the clock battery.

Take care when plugging the card into the board to not bend any of these pins. After the pins on the card are settled into the board, mounting screws are required to secure the card to the board. Do not over tighten. For proper mounting, #6-32x1 inch stainless steel machine screws should be used.

3.) BAS ACCESS

To connect to the intelliGen system to a Building Automation System requires wiring to the 3-pin black communication pluggable terminal block and plugging it into the connector on the right side of the card. Wiring to the pluggable terminal block must be in accordance to the wiring prescribed by your BAS connection protocol. RS-485, 22 or 24 AWG shielded twisted pair cables, such as Belden 9841 or equivalent, is recommended.

Note: If an iWC (Webserver Card) or a MSC (Multi-System Control Card) is used in the system, be sure to connect the iIC (integration card) to the same evaporator board. If no iWC or MSC is present in the system, the iIC may be connected to ANY evaporator board.

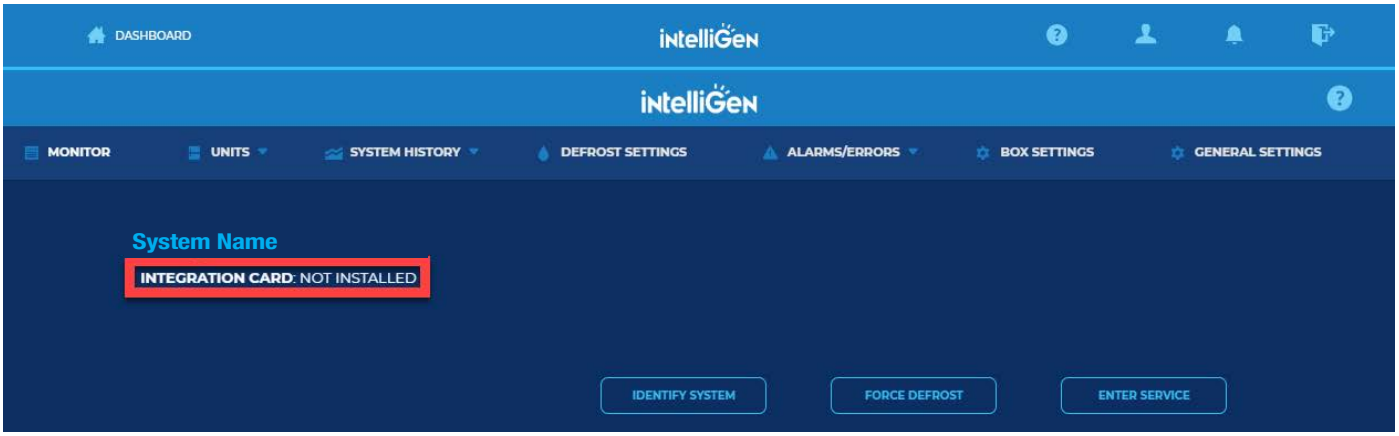
Configuration and Initial Setup

PROTOCOLS SUPPORTED

- BACnet MS/TP
- Modbus (RTU)

OPTION 1: CONFIGURE OVER WEB PAGE (IF IWC/MSC IS IN USE)

- Confirm iIC is installed by checking the status on the intelliGen Dashboard



- In **GENERAL SETTINGS** tab, under the **ADVANCED** section, select the protocol to be used. Either **MODBUS** or **BACnet**

If selecting BACnet protocol

- Enter the External Address ranging from 1 – 127
- Select BACnet Baud Rate (9600, 19200, or 38400)

If selecting MODBUS protocol

- Enter the External Address ranging from 1 – 246

OPTION 2: CONFIGURE THROUGH CONTROLLER USER INTERFACE AFTER QUICK CONFIGURATION

- Under **CONTECTIVITY Menu** select the protocol to be used

If selecting BACnet protocol

- EXTERNAL MODBUS ADDR must be set to 0
- Enter the External Address ranging from 1 – 127
- Select BACnet Baud Rate (9600, 19200, or 38400)

If selecting MODBUS protocol

- EXTERNAL BACnet ADDR must be set to 0
- Enter the External Address ranging from 1 – 246

Integration Guide

BACnet SETTINGS

- Baud Rate (9600, 19200, or 38400)
- Set all BACnet devices on an MS/TP network to consecutive MAC addresses, starting at 1, so that there are no gaps between MAC address values.

MODBUS SETTINGS

- Baud Rate- (9600, 19200, or 38400)
- 8 Data Bits
- 1 Stop Bit
- Even Parity

TO READ/WRITE PARAMETERS OVER BACnet:

- All temperature values to be read according to the parameter value “Temperature Units” either °F or °C

BACnet Mapping - Standard BACnet Objects

Parameter	Global/Local	Object Type	Object Instance	Write Over BACnet?	Available In Service Mode?	Proprietary Property ID	Range
DST Offset	Global	Analog Input	1	No	NA	655	-
Number Of Unit Records	Global	Analog Input	2	No	NA	557	1 to 8
System Alarms	Global	Analog Input	3	No	NA	560, 561, 562, 564, 565	Bit mapped Alarm status (Refer BACnet Alarms Bit Mapping Table) 0 - Clear, 1 - Set
Operating mode	Global	Analog Input	4	No	NA	554	OP_OFF-0, OP_COOLING-1, OP_PUMPDOWN-2, OP_DEFROST-3, OP_DRAIN-4, OP_DELAY-5, OP_BOXLOAD-6, OP_MANUAL_EXV-7 OP_REFREEZE-10, OP_SERVICE-11, OP_A2L_OVERRIDE-12
Box temperature	Global	Analog Input	5	No	NA	555	-58°F to +158°F
Date/Time Type	Global	Analog Input	6	No	NA	657	2 (Always 2)
Box Temperature Sensor Calibration (8x)	Local	Analog Input	16-23	No	NA	603	-10 to +10°F
EV Suction Temperature Sensor Calibration (8x)	Local	Analog Input	24-31	No	NA	604	-10 to +10°F
EV Suction Pressure Sensor Calibration (8x)	Local	Analog Input	32-39	No	NA	605	-10 to +10 psig
EV Auxiliary Temperature Sensor Calibration (8x)	Local	Analog Input	40-47	No	NA	606	-10 to +10°F
EV Coil Temperature Sensor Calibration (8x)	Local	Analog Input	48-55	No	NA	607	-10 to +10°F
EXV Step Position (8x)	Local	Analog Input	56-63	No	NA	609	0 to 2500 (when EXV Type is EXV_Sporlan) 0 to 255 (when EXV Type is EXV_Carel)
Evap suction tempearature (8x)	Local	Analog Input	64-71	No	NA	615	-58F to 158F
SST	Local	Analog Input	72-79	No	NA	616	-52F to 127F
Evap Suction pressure	Local	Analog Input	80-87	No	NA	617	0 to 300 psia
Evap superheat (8x)	Local	Analog Input	88-95	No	NA	618	-64F to 63F
Primary Temperature Sensor Value	Local	Analog Input	96-103	No	NA	619	-58 to 158F
Auxiliary Temperature Sensor Value	Local	Analog Input	104-111	No	NA	620	-58 to 158F
Coil Temperature Sensor Value	Local	Analog Input	112-119	No	NA	621	-58 to 158F

* Refer to Read Write Special Cases section

NOTE: BACnet standard objects are supported by firmware 01.03.xxxx and later versions.

BACnet Mapping - Standard BACnet Objects (cont.)

Parameter	Global/Local	Object Type	Object Instance	Write Over BACnet?	Available In Service Mode?	Proprietary Property ID	Range
Unit Address (8x)	Local	Analog Input	128-135	No	NA	608	1 to 246
Object Installed/Enable (8x)	Local	Analog Input	136-143	No	NA	595	NA
EV Length of Last Defrost	Local	Analog Input	144-151	No	NA	623	NA
EV RCB Control Voltage	Local	Analog Input	152-159	No	NA	624	NA
Local Alarms	Local	Analog Input	160-167	No	NA	571 to 574, 581, 582, 584 to 586, 588, 589, 563	Bit mapped Alarm status (Refer BACnet Alarms Bit Mapping Table) 0 - Clear, 1 - Set
RDS SW Version(8x)	Local	Character String Value	14-21	No	NA	NA	7 characters of text (eg 001.001)
EXV Type (8x)	Local	Analog Input	168-175	No	NA	NA	0 - Carel(0 to 255), 1 - Sporlan(0 to 2500) 2 - TXV 3 - EXV-CCMT 3L 5L 8L 4 - EXV-Emerson CV4-7 5 - EXV-CCMT 2 4 8 6 - EXV-CCMT 16 7 - EXV-CCMT 24 8 - EXV-CCMT 30 9 - EXV-CCMT 42
RDS Mitigation Controller Communication Status (8x)	Local	Analog Input	176-183	No	NA	NA	1 - Initializing, 2 - Active, 3 - Communication Failure
RDS Mitigation Controller Sensor count (8x)	Local	Analog Input	184 - 191	No	NA	NA	0 - 3
RDS Mitigation Controller state(8x)	Local	Analog Input	192 - 199	No	NA	NA	0 - Null, 1- Initializing, 2 - Monitoring, 3 - Mitigating, 4 - Servicing, 5 - Fault, 6 - User Test, 7 - Factory Reset
RDS Sensor x status(8x3)	Local	Analog Input	200 - 223	No	NA	NA	0 - Normal, 1 - Service, 2 - Fault, 3 - Mitigation
RDS Sensor x %LFL(8x3)	Local	Analog Input	224 - 247	No	NA	NA	0.0 - 100.0 %
RDS Sensor x Temperature(8x3)	Local	Analog Input	248 - 271	No	NA	NA	-40 to 95 deg C
RDS Sensor x Relative Humidity(8x3)	Local	Analog Input	272 - 295	No	NA	NA	0.0 - 100.0 %
RDS Sensor x Supported Refrigerant (8x3)	Local	Analog Input	296 - 319	No	NA	NA	Bit mapped Refigerant configuration 0 - Clear, 1 - Set
RDS Sensor x Mitigation Threshold(8x3)	Local	Analog Input	320 - 343	No	NA	NA	0.0 - 100.0 %
RDS Model Number (8x)	Local	Analog Input	344 - 351	No	NA	NA	32 bit integer
A2L Unit alarm (8x)	Local	Analog Input	352 - 359	No	NA	NA	Bit mapped A2L unit alarms 0 - Clear, 1 - Set
Defrost Style	Global	Analog Value	1	Yes	Yes	515	TIMED-0, SMART-1, DEMAND-2
Box Temperature Differential	Global	Analog Value	2	Yes	No	518	1 to 10°F

* Refer to Read Write Special Cases section

NOTE: BACnet standard objects are supported by firmware 01.03.xxxx and later versions.

BACnet Mapping - Standard BACnet Objects (cont.)

Parameter	Global/Local	Object Type	Object Instance	Write Over BACnet?	Available In Service Mode?	Proprietary Property ID	Range
Product Load Mode Time Delay	Global	Analog Value	3	Yes	No	519	0 to 60 min
Product Load Mode Timer	Global	Analog Value	4	Yes	No	520	5 to 1440 min (Incement in steps of 5)
Low Superheat Setpoint	Global	Analog Value	5	Yes	No	521	0°F to 3°F
Minimum Runtime	Global	Analog Value	6	Yes	No	522	1 min to 4 min
Minimum Offtime	Global	Analog Value	7	Yes	No	523	2 min to 10 min
Drain Down Period	Global	Analog Value	8	Yes	No	526	1 to 10 min
Number of Defrosts	Global	Analog Value	9	Yes	No	529	1 to 12
Defrost 1 Schedule	Global	Analog Value	10	Yes	No	530	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 2 Schedule	Global	Analog Value	11	Yes	No	531	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 3 Schedule	Global	Analog Value	12	Yes	No	532	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 4 Schedule	Global	Analog Value	13	Yes	No	533	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 5 Schedule	Global	Analog Value	14	Yes	No	534	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 6 Schedule	Global	Analog Value	15	Yes	No	535	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 7 Schedule	Global	Analog Value	16	Yes	No	536	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 8 Schedule	Global	Analog Value	17	Yes	No	537	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 9 Schedule	Global	Analog Value	18	Yes	No	538	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 10 Schedule	Global	Analog Value	19	Yes	No	539	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 11 Schedule	Global	Analog Value	20	Yes	No	540	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 12 Schedule	Global	Analog Value	21	Yes	No	541	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)

* Refer to Read Write Special Cases section

NOTE: BACnet standard objects are supported by firmware 01.03.xxxx and later versions.

BACnet Mapping - Standard BACnet Objects (cont.)

Parameter	Global/Local	Object Type	Object Instance	Write Over BACnet?	Available In Service Mode?	Proprietary Property ID	Range
Defrost Failsafe Time	Global	Analog Value	22	Yes	No	542	10 to 200 min
Defrost End Setpoint	Global	Analog Value	23	Yes	No	543	40°F to 100°F
Refreeze Time Safety	Global	Analog Value	24	Yes	No	544	1 to 10 min
Refreeze Suction Setpoint	Global	Analog Value	25	Yes	No	545	20°F to 35°F
Alarm High Box Temperature setpoint	Global	Analog Value	26	Yes	No	546	-40°F to +90°F
Alarm Low Box Temperature setpoint	Global	Analog Value	27	Yes	No	547	-40°F to +90°F
Alarm Delay Time	Global	Analog Value	28	Yes	No	548	2 to 120 min
Alarm Door Open Time	Global	Analog Value	29	Yes	No	549	5 to 240 min
Country	Global	Analog Value	30	Yes	Yes	550	0-USA, 1-CANADA
Time Zone	Global	Analog Value	31	Yes	Yes	551	MST-0, NST-1, AST-2, EST-3, CST-4, MST-5, PST-6, AKST-7, HAST-8, SST-9, CHST-10, WAKT-11
UTC Offset	Global	Analog Value	32	Yes	Yes	552	-11 to +14 (Increment in steps of 5)
Follow DST (DayLight Savings)	Global	Analog Value	33	Yes	Yes	553	Proprietary: Yes, No Standard: 0 -No, 1 - Yes
Defrost Type	Global	Analog Value	34	Yes	Yes	514	AIR -0, MTEL -1, LTEL - 2
Refrigerant	Global	Analog Value	35	Yes	Yes	516	R404A - 0, R507A - 1, R407A - 2, R407C - 3, R407F - 4, R22 - 5, R448A - 6, R449A - 7 R-744(CO2) - 8, R454A(A2L) - 9, R454C(A2L) - 10, R455A(A2L) - 11
Temperature Units	Global	Analog Value	36	Yes	No	524	FAHRENHEIT - 0, CELSIUS - 1
Pressure Units	Global	Analog Value	37	Yes	No	525	PSIG – 0, KPA -1, BAR – 2
Dual Coil Termination	Global	Analog Value	38	Yes	Yes	527	Yes, No
12/24 Hour Clock	Global	Analog Value	39	Yes	Yes	656	0 -12H, 1 -24H
Force Defrost	Global	Analog Value	40	Yes	No	559	1 (Write 1 would trigger Force defrost)
Primary EV Address	Global	Analog Value	41	Yes	Yes	660	1 to 246
BACnet Baud rate	Global	Analog Value	42	Yes	NA	658	0 - 9600, 2 - 38400
Enter Service mode	Global	Analog Value	43	Yes	NA	659	0-Exit Service Mode 1-Enter Service Mode

* Refer to Read Write Special Cases section
NOTE: BACnet standard objects are supported by firmware 01.03.xxxx and later versions.

BACnet Mapping - Standard BACnet Objects (cont.)

Parameter	Global/Local	Object Type	Object Instance	Write Over BACnet?	Available In Service Mode?	Proprietary Property ID	Range
Light Bar Enable	Global	Analog Value	44	Yes	No	650	Proprietary: True - On, False - Off Standard: 0 - Off, 1 - On
external MODbus address	Global	Analog Value	45	No	No	651	1 to 246
externalBACnet address	Global	Analog Value	46	Yes	No	652	1 to 127
Condensing unit wired	Global	Analog Value	47	Yes	Yes	654	0 - NO , NON-ZERO - RCB address
Box Temperature Setpoint	Global	Analog Value	48	Yes	No	517	-30°F to 75°F
EXV Control Algorithm Reset	Global	Analog Value	49	Yes	Yes	NA	1 (Write 1 would trigger EXV control algo reset)
Digital Scroll Comp Support Enable	Global	Analog Value	50	Yes	Yes	NA	0 - Disable, 1 - Enable
DSC Rolling Average Period	Global	Analog Value	51	Yes	Yes	NA	1 to 60 (Seconds)
DSC EXV Update Rate	Global	Analog Value	52	Yes	Yes	NA	5 to 60 (Seconds)
CO2 System Type	Global	Analog Value	53	Yes	Yes	NA	0 - Low Temp 1 - Medium Temp
CO2 Max Operating Pressure	Global	Analog Value	54	Yes	Yes	NA	300 - 500
Lead Lag Alarm Delay Period	Global	Analog Value	55	Yes	NA	NA	2 to 120 min
Lead Lag Slope Set Point	Global	Analog Value	56	Yes	NA	NA	-10 to 10 deg/min
Lead Lag Box Temp Set Point	Global	Analog Value	57	Yes	NA	NA	-30°F to 75°F
Lead Lag Differential	Global	Analog Value	58	Yes	NA	NA	1°F to 10°F
EV Fan Control Style (8x)	Local	Analog Value	61-68	Yes	No	596	0 - Standard, 1 - Two Speed, 2 - Variable, 3 - Off
EV Fan Stir Enable (8x)	Local	Analog Value	69-76	Yes	No	597	0 - Off, 1 - On
EV Fan Stir Cycle Frequency (8x)	Local	Analog Value	77-84	Yes	No	598	12 to 30 min
EV Fan Stir Duty Cycle (8x)	Local	Analog Value	85-92	Yes	No	599	60%, 70%, 80% (Increment in steps of 10)
EV Fan Speed (Off Cycle) (8x)	Local	Analog Value	93-100	Yes	No	600	30% to 100% (Increment in steps of 2)
Door Switch Configuration	Local	Analog Value	101-108	Yes	No	NA	0 - None, 1 - Normally Closed, 2 - Normally Open
Pressure Transducer Type	Local	Analog Value	109-116	Yes	No	NA	0 - 139.7 psia 1 - 300 psia 2 - 500 psia 3 - 650 psia (Emerson 800-2650) 4 - 0 to 652 psig (Sporlan 952579) 5 - 870.2 psia (Danfoss 060G6342) 6 - 1000 psia (Emerson 800-2710) 7 - 2000 psig (Sporlan 9520010)

NOTE: BACnet standard objects are supported by firmware 01.03.xxxx and later versions.

BACnet Mapping - Standard BACnet Objects (cont.)

Parameter	Global/Local	Object Type	Object Instance	Write Over BACnet?	Available In Service Mode?	Proprietary Property ID	Range
EV Superheat Setpoint (8x)	Local	Analog Value	117-124	Yes	No	566	4°F to 20°F
Lead Lag Group Name	Global	Character String Value	2	No	No	NA	32 characters of text
Short Unit Name (8x)	Local	Character String Value	5-13	No	NA	594	4 characters of text (e.g. F1A)
Date/Time	Global	Date Time Value	1	Yes	Yes	513	01/01/2019 to 31/12/2036
Enter Manual EXV Mode	Global	Analog Value	59	Yes	No	NA	0 - Exit Manual EXV Mode, 1 - Enter Manual EXV Mode
RDS Mitigation Controller Early warning Threshold value (%LFL)	Global	Analog Value	60	Yes	Yes	NA	5.0% - 12.0%(Increment in steps of 0.5)
Adjust EXV Step Position (8x)	Local	Analog Value	125 - 132	Yes	No	NA	0 to 2500 (when EXV Type is EXV_Sporlan) 0 to 255 (when EXV Type is EXV_Carel) (Increment in steps of 1) Not applicable for TXV
RDS Installed?(8x)	Local	Analog Value	133-140	Yes	No	NA	0 - No, 1 - Yes
Language	Global	Analog Value	1001	Yes	No	528	1-English, 2-Spanish, 3-French

Note 1: Writing to ""Local Parameter"" (through AV) of an EV which is not existed in the system, neither generates error nor writes the value; it just displays the dafult value for that object instance.
i.e. in a 2 EV system, writing to ""Local Parameter"" of 3rd EV will result in a default value."

Note 2: All local errors/alarms are bitmapped into a single 32 bit value through single AV object (Local Alarms) in firmware 01.03.xxxx and later versions, where in the prior versions of the firmware each error/alarm is considered as one proprietary property with values as 0 or 1.

Note 3: All system alarms are bitmapped into a single 32 bit value through single AV object (System Alarms) in firmware 01.03.xxxx and later versions, where in the prior versions of the firmware each alarm is considered as one proprietary property with values as 0 or 1.

* Refer to Read Write Special Cases section
NOTE: BACnet standard objects are supported by firmware 01.03.xxxx and later versions.

BACnet Mapping - Alarms Bit Mapping for Standard Objects

System Alarms (AI_3)		
BIT POSITION	ALARM	STATUS
BIT 0	High Box Temperature Alarm (AL01)	0 - Clear, 1 - Set
BIT 1	Low Box Temperature Alarm (AL02)	0 - Clear, 1 - Set
BIT 2	System Startup Failure Alarm (AL03)	0 - Clear, 1 - Set
BIT 3	Reserved	0 - Clear, 1 - Set
BIT 4	Reserved	0 - Clear, 1 - Set
BIT 5	Door Switch Open Alarm (AL06)	0 - Clear, 1 - Set
BIT 6-31	Reserved	0 - Clear, 1 - Set

Local Errors/Alarms (AI_160 to AI_167)		
BIT POSITION	ERROR/ALARM	STATUS
BIT 0	ER01 - Box Temp Sensor Error	0 - Clear, 1 - Set
BIT 1	ER02 - Coil Temp Sensor Error	0 - Clear, 1 - Set
BIT 2	ER03 - Evap Suction Temp Sensor Error	0 - Clear, 1 - Set
BIT 3	ER04 - Evap Suction Pressure Transducer Error	0 - Clear, 1 - Set
BIT 4	ER11 - Control Circuit Open Error	0 - Clear, 1 - Set
BIT 5	ER14 - 24V Power Supply Low Error	0 - Clear, 1 - Set
BIT 6	ER15 - 24V Power Supply High Error	0 - Clear, 1 - Set
BIT 7	ER16 - Low Super Heat During Cooling Error	0 - Clear, 1 - Set
BIT 8	ER18 - Evap auxiliary Temp Sensor Error	0 - Clear, 1 - Set
BIT 9	ER19 - Replace RTC Backup Battery Error	0 - Clear, 1 - Set
BIT 10	ER20 - Data Logging Disrupted Error	0 - Clear, 1 - Set
BIT 11	ER22 - RCB UI Failure Error	0 - Clear, 1 - Set
BIT 12	ER26 - EV Connection Lost Error	0 - Clear, 1 - Set
BIT 13	ER27 - High Humidity Error	0 - Clear, 1 - Set
BIT 14	ER28 - Low Humidity Error	0 - Clear, 1 - Set
BIT 15	ER29 - Humidity Sensor Error	0 - Clear, 1 - Set
BIT 16	AL04 - Input Fault Alarm	0 - Clear, 1 - Set
BIT 17	ER30- Evaporator maximum operating pressure	0 - Clear, 1 - Set
BIT 18	ER31- Lead Lag Controller Communication Loss	0 - Clear, 1 - Set
BIT 20	Reserved	0 - Clear, 1 - Set
BIT 24	Reserved	0 - Clear, 1 - Set
BIT 27	Reserved	0 - Clear, 1 - Set
BIT 28	Reserved	0 - Clear, 1 - Set
BIT 29	Reserved	0 - Clear, 1 - Set
BIT 31	Reserved	0 - Clear, 1 - Set

BACnet Mapping - Alarms Bit Mapping for Standard Objects

A2L Sensor Refrigerant Configuration(AI_296 to AI_319)		
BIT POSITION	**REFRIGERANT**	**STATUS**
BIT 0	R32	0 - Clear, 1 - Set
BIT 1	R1234YF	0 - Clear, 1 - Set
BIT 2	R454A	0 - Clear, 1 - Set
BIT 3	R454B	0 - Clear, 1 - Set
BIT 4	R454C	0 - Clear, 1 - Set
BIT 5	R455A	0 - Clear, 1 - Set
BIT 6-31	Reserved	0 - Clear, 1 - Set

A2L Local Errors/Alarms (AI_352 to AI_359)		
BIT POSITION	**ERROR/ALARM**	**STATUS**
BIT 0	ER37: A2L Mitigation Controller Communication Loss	0 - Clear, 1 - Set
BIT 1	AL12: A2L Override - RCB system enters A2L OVERRIDE mode.	0 - Clear, 1 - Set
BIT 2	Spare - 0	0 - Clear, 1 - Set
BIT 3	Spare - 1	0 - Clear, 1 - Set
BIT 4	Spare - 2	0 - Clear, 1 - Set
BIT 5	Spare - 3	0 - Clear, 1 - Set
BIT 6	Spare - 4	0 - Clear, 1 - Set
BIT 7	Spare - 5	0 - Clear, 1 - Set
BIT 8	ER32: A2L Early Warning - 1	0 - Clear, 1 - Set
BIT 9	ER32: A2L Early Warning - 2	0 - Clear, 1 - Set
BIT 10	ER32: A2L Early Warning - 3	0 - Clear, 1 - Set
BIT 11	ER33: A2L Sensor Fault - 1	0 - Clear, 1 - Set
BIT 12	ER33: A2L Sensor Fault - 2	0 - Clear, 1 - Set
BIT 13	ER33: A2L Sensor Fault - 3	0 - Clear, 1 - Set
BIT 14	ER34: A2L Service - 1	0 - Clear, 1 - Set
BIT 15	ER34: A2L Service - 2	0 - Clear, 1 - Set
BIT 16	ER34: A2L Service - 3	0 - Clear, 1 - Set
BIT 17	ER35: A2L Mitigation - 1	0 - Clear, 1 - Set
BIT 18	ER35: A2L Mitigation - 2	0 - Clear, 1 - Set
BIT 19	ER35: A2L Mitigation - 3	0 - Clear, 1 - Set
BIT 20	ER36: A2L Refrigerant Mismatch - 1	0 - Clear, 1 - Set
BIT 21	ER36: A2L Refrigerant Mismatch - 2	0 - Clear, 1 - Set
BIT 22	ER36: A2L Refrigerant Mismatch - 3	0 - Clear, 1 - Set

BACnet Mapping – Global Settings Proprietary Object Type

S.No	Property Name	Property ID	Type	Service Mode	RW/RO
1	Date/Time	513	BACnet date-time Time in UTC	Yes	RW
2	Defrost Type	514	AIR -0, MTEL-1, LTEL-2	Yes	RW
3	Defrost Style	515	TIMED-0, SMART-1, DEMAND-2	Yes	RW*
4	Refrigerant	516	R404A - 0, R507A - 1, R407A - 2, R407C - 3, R407F - 4, R22 - 5, R448A - 6, R449A - 7	Yes	RW
5	Box Temperature Setpoint	517	Real	No	RW
6	Box Temperature Setpoint Differential	518	Real	No	RW
7	Box Load Mode Time Delay	519	Integer	No	RW
8	Low Superheat Setpoint	521	Real	No	RW*
9	Box Load Mode Maximum Override Time	520	Integer	No	RW
10	Minimum Runtime	522	Integer	No	RW
11	Minimum Off Time	523	Integer	No	RW
12	Temperature Units	524	CELSIUS - 1, FAHRENHEIT – 0	No	RW
13	Pressure Units	525	PSIG – 0, KPA -1, BAR – 2	No	RW
14	Drain Down Period	526	Integer	No	RW
15	Dual Coil Termination	527	Boolean	Yes	RW
17	Number of Defrosts	529	Integer	No	RW
18	Defrost 1 Schedule	530	Integer	No	RW*
19	Defrost 2 Schedule	531	Integer	No	RW*
20	Defrost 3 Schedule	532	Integer	No	RW*
21	Defrost 4 Schedule	533	Integer	No	RW*
22	Defrost 5 Schedule	534	Integer	No	RW*
23	Defrost 6 Schedule	535	Integer	No	RW*
24	Defrost 7 Schedule	536	Integer	No	RW*
25	Defrost 8 Schedule	537	Integer	No	RW*
26	Defrost 9 Schedule	538	Integer	No	RW*
27	Defrost 10 Schedule	539	Integer	No	RW*
28	Defrost 11 Schedule	540	Integer	No	RW*
29	Defrost 12 Schedule	541	Integer	No	RW*
30	Defrost Failsafe Time	542	Integer	No	RW
31	Defrost End Temperature Setpoint	543	Real	No	RW
32	Refreeze Time Safety	544	Integer	No	RW*

* Refer to Read Write Special Cases section

BACnet Mapping – Global Settings Proprietary Object Type

S.No	Property Name	Property ID	Type	Service Mode	RW/RO
33	Refreeze Suction Setpoint	545	Real	No	RW*
34	Alarm High Box Temperature Setpoint	546	Real	No	RW
35	Alarm Low Box Temperature Setpoint	547	Real	No	RW
36	Alarm Delay Time	548	Integer	No	RW
37	Alarm Door Open Time	549	Integer	No	RW
38	Country	550	USA-0, CANADA-1	Yes	RW
39	Time Zone	551	MST-0, NST-1, AST-2, EST-3, CST-4, MST-5, PST-6, AKST-7, HAST-8, SST-9, CHST-10, WAKT-11	Yes	RW*
40	UTC Offset	552	Real	Yes	RW*
41	Follow DST	553	Boolean	Yes	RW
42	Operation Mode	554	OP_OFF-0, OP_COOLING-1, OP_PUMPDOWN-2, OP_DEFROST-3, OP_DRAIN-4, OP_DELAY-5, OP_BOXLOAD-6, OP_FACTORY_TEST-9 OP_REFREEZE-10, OP_SERVICE-11	No	RO
43	Box Temperature	555	Real	No	RO (Box temp thermistor value of the iRC iIC is attached with)
44	Force Defrost	559	Boolean	No	RW*
45	Alarm System Startup Failure	562	Boolean	No	RO
46	Alarm Door Open	565	Boolean	No	RO
48	Number Of Unit Records	557	Integer	No	RO
49	System Custom Name	558	String	No	RW (Max 20 character allowed)
50	Alarm High Box Temperature	560	Boolean	No	RO
51	Alarm Low Box Temperature	561	Boolean	No	RO
52	Alarm High Liquid Pressure	564	Boolean	No	RO
53	Light Bar Enable	650	Integer	No	RW
54	External Modbus Address	651	Integer	No	RW
55	External BACnet Address	652	Integer	No	RW
56	Condenser Wired Address	654	Integer	Yes	RW
57	12/24 Hour Clock	656	Integer	Yes	RW
58	BACnet Baudrate	658	Integer	No	RW
59	Service Mode	659	Integer	No	RW
60	Primary EV Address	660	Integer	Yes	RW*

* Refer to Read Write Special Cases section

BACnet Mapping – Unit Local Settings Proprietary Object Type

S.No	Property Name	Property ID	Type	RW/RO
1	EV superheat setpoint	566	Real	RO
2	Short unit name	594	String	RO
3	EV Fan Control Style	596	Integer	RW
4	EV Fan Stir Enable	597	Integer	RW*
5	EV Fan Stir Cycle Frequency	598	Integer	RW*
6	EV Fan Stir Duty Cycle	599	Integer	RW*
7	EV Fan Speed Off Cycle	600	Integer	RW*
8	Box Temperature Sensor Calibration	603	Real	RO
9	Box Suction Temperature Sensor Calibration	604	Real	RO
10	Box Suction Pressure Sensor Calibration	605	Real	RO
11	EV Auxiliary Temperature Sensor Calibration	606	Real	RO
12	EV Coil Temperature Sensor Calibration	607	Real	RO
13	EXV Step Position	609	Integer	RO
14	EV Suction Temperature	615	Real	RO
15	EV SST	616	Real	RO
16	EV Suction Pressure	617	Real	RO
17	EV Superheat Temperature	618	Real	RO
18	EV Primary Temperature Sensor	619	Real	RO
19	EV Auxiliary Temperature Sensor	620	Real	RO
20	EV Coil Temperature Sensor	621	Real	RO
21	Error 1 box temperature	571	Boolean	RO
22	Error 2 coil temperature	572	Boolean	RO
23	Error 3 evaporator suction temperature sensor	573	Boolean	RO
24	Error 4 evaporator suction pressure sensor	574	Boolean	RO
25	Error 11 Control circuit open	581	Boolean	RO
26	Error 12 Comm wiring	582	Boolean	RO
27	Error 14 power supply low	584	Boolean	RO
28	Error 15 power supply high	585	Boolean	RO
29	Error 16 low superheat	586	Boolean	RO

* Refer to Read Write Special Cases section

BACnet Mapping – Unit Local Settings Proprietary Object Type

S.No	Property Name	Property ID	Type	RW/RO
30	Error 18 evaporator auxiliary temperature sensor	588	Boolean	RO
31	Error 19 replace battery	589	Boolean	RO
32	Error 20 log disrupted	590	Boolean	RO
33	Error 22 RCBUI failure	592	Boolean	RO
34	Alarm input fault	563	Boolean	RO
35	Object Installed	595	Boolean	RO
36	Error 26 EV Connection Lost	622	Boolean	RO
37	EV Length of Last Defrost	623	Integer	RO
38	EV RCB Control Voltage	624	Real	RO

* Refer to Read Write Special Cases section

ERRORS FOR READ/WRITE PROPERTIES:

- ERROR_CODE_UNKNOWN_PROPERTY– If the property address does not exist in the system.
- ERROR_CODE_WRITE_ACCESS_DENIED – Invalid Value (i.e. within the range some intermediate values are not valid).
- ERROR_CODE_VALUE_OUT_OF_RANGE - If the values are not in the specified range.

Modbus Register Mapping

TO READ/WRITE PARAMETERS OVER EXTERNAL MODBUS:

- Required Baud rate fixed to 38400
- Function codes
  - Read Holding Registers – 0x03
  - Write Holding Registers – 0x06
- All temperature values to be read according to the parameter value "Temperature Units" either °F or °C

Parameter	Global/ Local	Modbus Address	Quantity of Registers	Write over Modbus?	Available in Service Mode?	Range
System Custom Name	Global	0x4000	10	Yes	No	20 characters of text
Operating mode	Global	0x400A	1	No	NA	OP_OFF-0, OP_COOLING-1, OP_PUMPDOWN-2, OP_DEFROST-3, OP_DRAIN-4, OP_DELAY-5, OP_BOXLOAD-6, OP_MANUAL_EXV-7 OP_REFREEZE-10, OP_SERVICE-11 OP_A2L_OVERRIDE-12
Date/Time Type	Global	0x400B	1	No	NA	2 (Always 2)
Date/Time	Global	0x400C	4	Yes	Yes	01/01/2019 to 31/12/2036 Time in UTC Byte 1 – Year MSB Byte 2 – Year LSB Byte 3 – Month (0-11) Byte 4 – Day Byte 5 – Hour Byte 6 – Minutes Byte 7 – Seconds Byte 8 – Week Day (0-4)
Defrost Type	Global	0x4010	1	Yes	Yes	AIR -0, MTEL -1, LTEL - 2
Defrost Style	Global	0x4011	1	Yes	Yes	TIMED-0, SMART-1, DEMAND-2
Refrigerant	Global	0x4012	1	Yes	Yes	R404A - 0, R507A - 1, R407A - 2, R407C - 3, R407F - 4, R22 - 5, R448A 6, R449A - 7 R-744(CO2) 8, R454A(A2L) - 9, R454C(A2L) 10, R455A(A2L) - 11
Box Temperature Setpoint	Global	0x4013	1	Yes	No	-30°F to +75°F Real number multiplied by 10; Example – Byte 1 – 0x01 Byte 2 – 0x5E To be read as 35.0 F
Box Temperature Differential	Global	0x4014	1	Yes	No	1 to 10°F Real number multiplied by 10;
Product Load Mode Time Delay	Global	0x4015	1	Yes	No	0 to 60 min
Product Load Mode Timer	Global	0x4016	1	Yes	No	5 to 1440 min (Incement in steps of 5)
Low Superheat Setpoint	Global	0x4017	1	Yes	No	0°F to 3°F Real number multiplied by 10;

* Refer to Read Write Special Cases section

Modbus Register Mapping

TO READ/WRITE PARAMETERS OVER EXTERNAL MODBUS (cont.)

Parameter	Global/ Local	Modbus Address	Quantity of Registers	Write over Modbus?	Available in Service Mode?	Range
Minimum Runtime	Global	0x4018	1	Yes	No	1 min to 4 min Real number multiplied by 10;
Minimum Offtime	Global	0x4019	1	Yes	No	2 min to 10 min
Temperature Units	Global	0x401A	1	Yes	No	FAHRENHEIT - 0, CELSIUS - 1
Pressure Units	Global	0x401B	1	Yes	No	PSIG – 0, KPA -1, BAR – 2
Drain Down Period	Global	0x401C	1	Yes	No	1 to 10 min
Dual Coil Termination	Global	0x401D	1	Yes	Yes	Yes, No 1 - Yes 0- No
Language	Global	0x401E	1	Yes	No	1-English, 2-Spanish, 3-French
Number of Defrosts	Global	0x401F	1	Yes	No	1 to 12
Defrost 1 Schedule	Global	0x4020	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 2 Schedule	Global	0x4021	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 3 Schedule	Global	0x4022	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 4 Schedule	Global	0x4023	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 5 Schedule	Global	0x4024	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 6 Schedule	Global	0x4025	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 7 Schedule	Global	0x4026	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 8 Schedule	Global	0x4027	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 9 Schedule	Global	0x4028	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 10 Schedule	Global	0x4029	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 11 Schedule	Global	0x402A	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost 12 Schedule	Global	0x402B	1	Yes	No	00:00 to 23:55 (0 - 1435 min) (Increment in steps of 5)
Defrost Failsafe Time	Global	0x402C	1	Yes	No	10 to 200 min
Defrost End Setpoint	Global	0x402D	1	Yes	No	40°F to 100°F Real number multiplied by 10;
Refreeze Time Safety	Global	0x402E	1	Yes	No	1 to 10 min

* Refer to Read Write Special Cases section

Modbus Register Mapping

TO READ/WRITE PARAMETERS OVER EXTERNAL MODBUS (cont.)

Parameter	Global/ Local	Modbus Address	Quantity of Registers	Write over Modbus?	Available in Service Mode?	Range
Refreeze Suction Setpoint	Global	0x402F	1	Yes	No	20°F to 35°F Real number multiplied by 10;
Alarm High Box Temperature setpoint	Global	0x4030	1	Yes	No	-40°F to +90°F Real number multiplied by 10;
Alarm Low Box Temperature setpoint	Global	0x4031	1	Yes	No	-40°F to +90°F Real number multiplied by 10;
Alarm Delay Time	Global	0x4032	1	Yes	No	2 to 120 min
Alarm Door Open Time	Global	0x4033	1	Yes	No	5 to 240 min
Country	Global	0x4034	1	Yes	Yes	0-USA, 1-CANADA
Time Zone	Global	0x4035	1	Yes	Yes	MST-0, NST-1, AST-2, EST-3, CST-4, MST-5, PST-6, AKST-7, HAST-8, SST-9, CHST-10, WAKT-11
UTC Offset	Global	0x4036	1	Yes	Yes	-11 to +14 (Increment in steps of 0.5) Real number multiplied by 10;
Follow DST (DayLight Savings)	Global	0x4037	1	Yes	Yes	0 -No, 1 - Yes
12/24 Hour Clock	Global	0x4038	1	Yes	Yes	0 -12H, 1 -24H
Number Of Unit Records	Global	0x403A	1	No	NA	1 to 8
Controller Adddress	Global	0x403B	1	No	NA	1 to 247
Box temperature	Global	0x403C	1	No	NA	-58°F to +158°F Real number multiplied by 10;
Force Defrost	Global	0x403D	1	Yes	No	Writing '1' would force defrost
System Alarms	Global	0x403E	2	No	NA	Bit mapped Alarm status (Refer Modbus Alarms Bit Maping Table) 0 - Clear, 1 - Set
Light Bar Enable	Global	0X5000	1	Yes	No	0 - No, 1 - Yes
external MODbus address	Global	0X5001	1	Yes	No	0 to 246
externalBACnet address	Global	0X5002	1	No	No	0 to 127
EXV Control Algorithm Reset	Global	0X5003	1	Yes	Yes	Writing '1' would trigger EXV Control algorithm reset
Condensing unit wired	Global	0X5007	1	Yes	Yes	0 - NO , NON-ZERO - RCB address
Enter Service mode	Global	0X5009	1	Yes	NA	0-Exit Service Mode 1-Enter Service Mode
Primary EV Address	Global	0X500A	1	Yes	Yes	1 to 246 RCB Address –- 0 - 7 bit. Prim/aux - 8th bit. Primary – 0 Auxiliary – 1

* Refer to Read Write Special Cases section

Modbus Register Mapping

TO READ/WRITE PARAMETERS OVER EXTERNAL MODBUS (cont.)

Parameter	Global/ Local	Modbus Address	Quantity of Registers	Write over Modbus?	Available in Service Mode?	Range
Digital Scroll Comp Support Enable	Global	0X500B	1	Yes	Yes	0 - Disable, 1 - Enable
DSC Rolling Average Period	Global	0X500C	1	Yes	Yes	1 to 60 (Seconds)
DSC EXV Update Rate	Global	0X500D	1	Yes	Yes	5 to 60 (Seconds)
CO2 System Type	Global	0X500E	1	Yes	Yes	0 - Low Temp 1 - Medium Temp
CO2 Max Operating Pressure	Global	0X500F	1	Yes	Yes	300 - 500
Lead Lag Group Name	Global	0X5010	16	No	NA	32 characters of text
Lead Lag Slope Set Point	Global	0X5011	1	Yes	No	-10 to 10 deg/min
Lead Lag Box Temp Set Point	Global	0X5012	1	Yes	No	-30°F to 75°F
Lead Lag Differential	Global	0X5013	1	Yes	No	1°F to 10°F
Lead Lag Alarm Delay Period	Global	0X5014	1	Yes	No	2 to 120 min
Enter Manual EXV Mode	Global	0x501E	1	Yes	No	0-Exit Manual EXV Mode 1-Enter Manual EXV Mode
RDS Mitigation Controller Early warning Threshold value (%LFL)	Global	0x501F	1	Yes	Yes	50% - 120%(Increment in steps of 5) Real number multiplied by 10
Object Installed/Enable (8x)	Local	0x4040 + (n*0x0C)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	0 – Disabled; 1 – Enabled . If Enabled is 0, below parameters should be ignored for that unit
Unit Address (8x)	Local	0x4041 + (n*0x0C)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	1 to 246
EV Superheat Setpoint (8x)	Local	0x4043 + (n*0x0C)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	Yes	No	4°F to 20°F Real number multiplied by 10
Local Alarms (8x)	Local	0x4044 + (n*0x0C)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	4	No	NA	Bit mapped Alarm status (Refer Alarms Bit Maping Table) 0 - Clear, 1 - Set
Short Unit Name (8x)	Local	0x4048 + (n*0x0C)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	2	No	NA	4 characters of text (e.g. F1A)
EV Fan Control Style (8x)	Local	0x5500 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	Yes	No	0 - Standard, 1 - Two Speed, 2 - Variable, 3 - Off
EV Fan Stir Enable (8x)	Local	0x5501 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	Yes	No	0 - Off, 1 - On

* Refer to Read Write Special Cases section

Modbus Register Mapping

TO READ/WRITE PARAMETERS OVER EXTERNAL MODBUS (cont.)

Parameter	Global/ Local	Modbus Address	Quantity of Registers	Write over Modbus?	Available in Service Mode?	Range
EV Fan Stir Cycle Frequency (8x)	Local	0x5502 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	Yes	No	12 to 30 min
EV Fan Stir Duty Cycle (8x)	Local	0x5503 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	Yes	No	60%, 70%, 80% (Increment in steps of 10)
EV Fan Speed (Off Cycle) (8x)	Local	0x5504 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	Yes	No	30% to 100% (Increment in steps of 2)
Box Temperature Sensor Calibration (8x)	Local	0x5507 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-10 to +10°F Real number multiplied by 10
EV Suction Temperature Sensor Calibration (8x)	Local	0x5508 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-10 to +10°F Real number multiplied by 10
EV Suction Pressure Sensor Calibration (8x)	Local	0x5509 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-10 to +10 psig Real number multiplied by 10
EV Auxiliary Temperature Sensor Calibration (8x)	Local	0x550A + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-10 to +10°F Real number multiplied by 10
EV Coil Temperature Sensor Calibration (8x)	Local	0x550B + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-10 to +10°F Real number multiplied by 10
EXV Step Position (8x)	Local	0x550D + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	0 to 2500 (when EXV Type is EXV_Sporlan) 0 to 255 (when EXV Type is EXV_Carel)
EV Suction Tempearature (8x)	Local	0x5513 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	" -58F to 158F Real number multiplied by 10"
SST (8x)	Local	0x5514 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-52F to 127F Real number multiplied by 10
Evap Suction pressure (8x)	Local	0x5515 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	0 to 300 psia Real number multiplied by 10
Evap Superheat (8x)	Local	0x5516 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-64F to 63F Real number multiplied by 10
Primary Temperature Sensor Value (8x)	Local	0x5517 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-58 to 158F Real number multiplied by 10
Auxiliary Temperature Sensor Value (8x)	Local	0x5518 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-58 to 158F Real number multiplied by 10
Coil Temperature Sensor value (8x)	Local	0x5519 + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	-58 to 158F Real number multiplied by 10

* Refer to Read Write Special Cases section

Modbus Register Mapping

TO READ/WRITE PARAMETERS OVER EXTERNAL MODBUS (cont.)

Parameter	Global/ Local	Modbus Address	Quantity of Registers	Write over Modbus?	Available in Service Mode?	Range
EV Length of Last Defrost (8x)	Local	0x551A + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	NA
EV RCB Control Voltage (8x)	Local	0x551B + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	No	NA	NA
Door Switch Configuration (8x)	Local	0x551C + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	Yes	No	0 - None, 1 - Normally Closed, 2 - Normally Open
Pressure Transducer Type	Local	0X551D + (n*0x22)+n where 'n' is 0 to Max_EV-1; Max_EV = 8	1	Yes	No	0 - 139.7 psia 1 - 300 psia 2 - 500 psia 3 - 650 psia (Emerson 800-2650) 4 - 0 to 652 psig (Sporlan 952579) 5 - 870.2 psia (Danfoss 060G6342) 6 - 1000 psia (Emerson 800-2710) 7 - 2000 psig (Sporlan 9520010)
EXV type	Local	0x5800 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	No	0 - Carel(0 to 255), 1 - Sporlan(0 to 2500) 2 - TXV 3 - EXV-CCMT 3L 5L 8L 4 - EXV-Emerson CV4-7 5 - EXV-CCMT 2 4 8 6 - EXV-CCMT 16 7 - EXV-CCMT 24 8 - EXV-CCMT 30 9 - EXV-CCMT 42
Adjust EXV Step Position (8x)	Local	0x5801 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	Yes	Manual EXV mode ON	0 to 2500 (when EXV Type is EXV_Sporlan) 0 to 255 (when EXV Type is EXV_Carel) (Increment in steps of 1) Not applicable for TXV
RDS Installed?(8x)	Local	0x5802 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	Yes	Yes	0 - No, 1 - Yes
RDS Mitigation Controller Communication Status (8x)	Local	0x5803 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - Unknown, 1 - Initializing, 2 - Active, 3 - Communication Failure
RDS Mitigation Controller Sensor count (8x)	Local	0x5804 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - 3
RDS Mitigation Controller state(8x)	Local	0x5805 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - Unknown, 1- Initializing, 2 - Monitoring, 3 - Mitigating, 4 - Servicing, 5 - Fault, 6 - User Test
RDS Sensor 1 status(8x)	Local	0x5806 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - Normal, 1 - Service, 2 - Fault, 3 - Mitigation
RDS Sensor 2 status(8x)	Local	0x5807 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - Normal, 1 - Service, 2 - Fault, 3 - Mitigation
RDS Sensor 3 status(8x)	Local	0x5808 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - Normal, 1 - Service, 2 - Fault, 3 - Mitigation
RDS Sensor 1 %LFL(8x)	Local	0x5809 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - 100 % Real number multiplied by 10

* Refer to Read Write Special Cases section

Modbus Register Mapping

TO READ/WRITE PARAMETERS OVER EXTERNAL MODBUS (cont.)

Parameter	Global/ Local	Modbus Address	Quantity of Registers	Write over Modbus?	Available in Service Mode?	Range
RDS Sensor 2%LFL(8x)	Local	0x580A + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - 100 % Real number multiplied by 10
RDS Sensor 3%LFL(8x)	Local	0x580B + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - 100 % Real number multiplied by 10
RDS Sensor 1 Temperature(8x)	Local	0x580C + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	-40 to 95 deg C Real number multiplied by 10
RDS Sensor 2 Temperature(8x)	Local	0x580D + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	-40 to 95 deg C Real number multiplied by 11
RDS Sensor 3 Temperature(8x)	Local	0x580E + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	-40 to 95 deg C Real number multiplied by 12
RDS Sensor 1 Humidity(8x)	Local	0x580F + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 to 100% Real number multiplied by 10
RDS Sensor 2 Humidity(8x)	Local	0x5810 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 to 100% Real number multiplied by 10
RDS Sensor 3 Humidity(8x)	Local	0x5811 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 to 100% Real number multiplied by 10
RDS Mitigation Controller Sensor 1 Supported Refrigerant (8x)	Local	0x5812 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	Bit mapped Refigerant configuration 0 - Clear, 1 - Set
RDS Mitigation Controller Sensor 2 Supported Refrigerant (8x)	Local	0x5813 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	Bit mapped Refigerant configuration 0 - Clear, 1 - Set
RDS Mitigation Controller Sensor 3 Supported Refrigerant (8x)	Local	0x5814 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	Bit mapped Refigerant configuration 0 - Clear, 1 - Set
RDS Sensor x Mitigation Threshold(8x)	Local	0x5815 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - 100 % Real number multiplied by 10
RDS Sensor x Mitigation Threshold(8x)	Local	0x5816 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - 100 % Real number multiplied by 10
RDS Sensor x Mitigation Threshold(8x)	Local	0x5817 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	1	No	NA	0 - 100 % Real number multiplied by 10
RDS Model Number (8x)	Local	0x5818 + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	2	No	NA	32 bit Integer
A2L unit alarms(8x)	Local	0x581A + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	2	No	NA	Bit mapped A2L unit alarms 0 - Clear, 1 - Set
RDS SW Version(8x)	Local	0x581C + (n*0x22), Where 'n' is 0 to Max_Ev-1; Max_Ev = 8	4	No	NA	7 characters of text (eg 001.001)

* Refer to Read Write Special Cases section

TABLE 2

Field Name	Data Address	Type	Quantity of Registers	Decoding Method	RO/RW?
LED Bar Enable	0x5000	Integer	1	No-0, Yes-1	RW
External Modbus Address	0x5001	Integer	1	0 to 246	RW*
External BACnet Address	0x5002	Integer	1	0 to 127	RO
EXV Control Algorithm Reset	0X5003	Boolean	1	Writing "1" would trigger EXV reset	RW
CU Wired Address	0x5007	Integer	1	RCB Address.	RW*
BACnet Baudrate	0x5008	Integer	1	0-9600, 2-38400	RO
Enter Service Mode	0x5009	Integer	1	Exit Service Mode-0, Enter Service Mode-1	RW
Primary EV Address	0x500A	Integer	1	RCB Address –- 0 - 7th bit. Prim/aux - 8th bit. Primary – 0 Auxiliary – 1	RW

TABLE 3

Field Name	Data Address	Type	Quantity of Registers	Decoding Method	RO/RW?
EV Fan Control Style	0x5500 + (n * 0x22)	Integer	1	FAN_CNTRL_STYLE_STANDARD-0, FAN_CNTRL_STYLE_TWO_SPEED-1, FAN_CNTRL_STYLE_VARIABLE-2	RW
EV Fan Stir Enable	0x5500 + (n * 0x22) + 1	Integer	1	STIR_ENABLE_OFF-0, STIR_ENABLE_ON -1	RW*
EV Fan Stir Cycle Frequency	0x5500 + (n * 0x22) + 2	Integer	1	Unit – Minutes	RW*
EV Fan Stir Duty Cycle	0x5500 + (n * 0x22) + 3	Integer	1	60, 70, 80	RW*
EV Fan Speed Off Cycle	0x5500 + (n * 0x22) + 4	Integer	1	Range 30 to 100 increment by 2	RW*
Box Temperature Sensor Calibration	0x5500 + (n * 0x22) + 0x07	Signed Integer	1	Real number multiplied by 10; Example: Byte 1 – 0x01 Byte 2 – 0x5E To be read as 35.0 F	RO
Box Suction Temperature Sensor Calibration	0x5500 + (n * 0x22) + 0x08	Signed Integer	1	Real number multiplied by 10	RO
Box Suction Pressure Sensor Calibration	0x5500 + (n * 0x22) + 0x09	Signed Integer	1	Real number multiplied by 10	RO
EV Auxiliary Temperature Sensor Calibration	0x5500 + (n * 0x22) + 0x0A	Signed Integer	1	Real number multiplied by 10	RO
EV Coil Temperature Sensor Calibration	0x5500 + (n * 0x22) + 0x0B	Signed Integer	1	Real number multiplied by 10	RO
EXV Step Position	0x5500 + (n * 0x22) + 0x0D	Integer	1		RO
EV Suction Temperature	0x5500 + (n * 0x22) + 0x13	Signed Integer	1	Real number multiplied by 10	RO
EV SST	0x5500 + (n * 0x22) + 0x14	Signed Integer	1	Real number multiplied by 10	RO
EV Suction Pressure	0x5500 + (n * 0x22) + 0x15	Signed Integer	1	Real number multiplied by 10	RO
EV Superheat Temperature	0x5500 + (n * 0x22) + 0x16	Signed Integer	1	Real number multiplied by 10	RO
EV Primary Temperature Sensor	0x5500 + (n * 0x22) + 0x17	Signed Integer	1	Real number multiplied by 10	RO
EV Auxiliary Temperature Sensor	0x5500 + (n * 0x22) + 0x18	Signed Integer	1	Real number multiplied by 10	RO
EV Coil Temperature Sensor	0x5500 + (n * 0x22) + 0x19	Integer	1	Real number multiplied by 10	RO
EV Length of Last Defrost	0x5500 + (n * 0x22) + 0x1A	Integer	1	Unit – Minutes	RO
EV RCB Current Voltage	0x5500 + (n * 0x22) + 0x1B	Real	1	Real number multiplied by 10	RO
Door Switch Configuration (8x)	0x551C + (n*0x22)+0x1C	Integer	1	0 - None, 1 - NC, 2 - NO	RW

* Refer Read Write Special Cases section. n is an index into number of unit records ranging from [0 to N-1] EV units where max N = 8.

Alarm Tables

SYSTEM ALARMS TABLE

BIT POSITION	ALARM	STATUS
BIT 0	High Box Temperature Alarm (AL01)	0 - Clear, 1 - Set
BIT 1	Low Box Temperature Alarm (AL02)	0 - Clear, 1 - Set
BIT 2	System Startup Failure Alarm (AL03)	0 - Clear, 1 - Set
BIT 3	Reserved	0 - Clear, 1 - Set
BIT 4	Reserved	0 - Clear, 1 - Set
BIT 5	Door Switch Open Alarm (AL06)	0 - Clear, 1 - Set
BIT 6-31	Reserved	0 - Clear, 1 - Set

To Read System Alarms, send command **XX 03 40 3E 00 01 XX XX**
The read registers can be bit-mapped per the table above.
EX: If **00000000 00001001** is read, then there is an active high box temp alarm and an active input sensor fault.

Alarm Tables

LOCAL ERRORS AND ALARMS TABLE

BIT POSITION	ALARM	STATUS
BIT 0	ER01 - Box Temp Sensor Error	0 - Clear, 1 - Set
BIT 1	ER02 - Coil Temp Sensor Error	0 - Clear, 1 - Set
BIT 2	ER03 - Evap Suction Temp Sensor Error	0 - Clear, 1 - Set
BIT 3	ER04 - Evap Suction Pressure Transducer Error	0 - Clear, 1 - Set
BIT 4	Reserved	0 - Clear, 1 - Set
BIT 5	Reserved	0 - Clear, 1 - Set
BIT 6	Reserved	0 - Clear, 1 - Set
BIT 7	Reserved	0 - Clear, 1 - Set
BIT 8	Reserved	0 - Clear, 1 - Set
BIT 9	ER11 - Control Circuit Open Error	0 - Clear, 1 - Set
BIT 10	Reserved	0 - Clear, 1 - Set
BIT 11	Reserved	0 - Clear, 1 - Set
BIT 12	ER14 - 24V Power Supply Low Error	0 - Clear, 1 - Set
BIT 13	ER15 - 24V Power Supply High Error	0 - Clear, 1 - Set
BIT 14	ER16 - Low Super Heat During Cooling Error	0 - Clear, 1 - Set
BIT 15	Reserved	0 - Clear, 1 - Set
BIT 16	ER18 - Evap auxiliary Temp Sensor Error	0 - Clear, 1 - Set
BIT 17	ER19 - Replace RTC Backup Battery Error	0 - Clear, 1 - Set
BIT 18	ER20 - Data Logging Disrupted Error	0 - Clear, 1 - Set
BIT 20	ER22 - RCB UI Failure Error	0 - Clear, 1 - Set
BIT 24	ER26 - EV Connection Lost Error	0 - Clear, 1 - Set
BIT 27	ER27 - High Humidity Error	0 - Clear, 1 - Set
BIT 28	ER28 - Low Humidity Error	0 - Clear, 1 - Set
BIT 29	ER29 - Humidity Sensor Error	0 - Clear, 1 - Set
BIT 31	AL04 - Input Fault Alarm	0 - Clear, 1 - Set
BIT 32	ER31- Lead Lag Controller Communication Loss	0 - Clear, 1 - Set

To Read Unit Alarms, send command **XX 03 40 3E 00 01 XX XX**
The read registers can be bit-mapped per the table above.
EX: If **00000000 00000000 00000000 00001001** is read, then there is an active box temp sensor error and an active evap suction transducer error.

Alarm Tables

LOCAL ERRORS AND ALARMS TABLE

A2L SENSOR REFRIGERANT CONFIGURATION

BIT POSITION	REFRIGERANT	STATUS
BIT 1	R32	0 - Clear, 1 - Set
BIT 2	R1234YF	0 - Clear, 1 - Set
BIT 3	R454A	0 - Clear, 1 - Set
BIT 4	R454B	0 - Clear, 1 - Set
BIT 5	R454C	0 - Clear, 1 - Set
BIT 6	R455A	0 - Clear, 1 - Set
BIT 7 - 31	Reserved	0 - Clear, 1 - Set

A2L LOCAL ERRORS AND ALARMS

BIT POSITION	ERROR/ALARM	STATUS
BIT 0	ER37: A2L Mitigation Controller Communication Loss	0 - Clear, 1 - Set
BIT 1	AL12: A2L Override - RCB system enters A2L OVERRIDE mode.	0 - Clear, 1 - Set
BIT 2	Spare - 0	0 - Clear, 1 - Set
BIT 3	Spare - 1	0 - Clear, 1 - Set
BIT 4	Spare - 2	0 - Clear, 1 - Set
BIT 5	Spare - 3	0 - Clear, 1 - Set
BIT 6	Spare - 4	0 - Clear, 1 - Set
BIT 7	Spare - 5	0 - Clear, 1 - Set
BIT 8	ER32: A2L Early Warning - 1	0 - Clear, 1 - Set
BIT 9	ER32: A2L Early Warning - 2	0 - Clear, 1 - Set
BIT 10	ER32: A2L Early Warning - 3	0 - Clear, 1 - Set
BIT 11	ER33: A2L Sensor Fault - 1	0 - Clear, 1 - Set
BIT 12	ER33: A2L Sensor Fault - 2	0 - Clear, 1 - Set
BIT 13	ER33: A2L Sensor Fault - 3	0 - Clear, 1 - Set
BIT 14	ER34: A2L Service - 1	0 - Clear, 1 - Set
BIT 15	ER34: A2L Service - 2	0 - Clear, 1 - Set
BIT 16	ER34: A2L Service - 3	0 - Clear, 1 - Set
BIT 17	ER35: A2L Mitigation - 1	0 - Clear, 1 - Set
BIT 18	ER35: A2L Mitigation - 2	0 - Clear, 1 - Set
BIT 19	ER35: A2L Mitigation - 3	0 - Clear, 1 - Set
BIT 20	ER36: A2L Refrigerant Mismatch - 1	0 - Clear, 1 - Set
BIT 21	ER36: A2L Refrigerant Mismatch - 2	0 - Clear, 1 - Set
BIT 22	ER36: A2L Refrigerant Mismatch - 3	0 - Clear, 1 - Set

MODBUS:

- ERR_INVALID_ADDR - If the property address does not exist in the system.
- ERR_INVALID_DATAVAL - If the values are not in the specified range.
- ERR_INVALID_EXEC – If the property does not have write permission.

Read Write Special Cases (*):

1. The Defrost style parameter write permission is depends on the Defrost type value.
   - If the Defrost type value is AIR, then the Defrost style is allowed to write only TIMED.
   - If the Defrost type value is MTEL or LTEL, then the Defrost style is allowed to write TIMED or SMART or DEMAND.
2. The Refreeze time safety and Refreeze suction set point parameter write permissions are depends on the Defrost type value.
   - If the Defrost type value is MTEL or LTEL, then the Refreeze time safety and Refreeze suction set Point parameters are allowed to write valid values.
3. The Defrost schedules (1 to 12) properties are allowed to write depends on Number of defrost cycle count value. Same schedule time for more than one defrosts is not allowed. Ex: Defrost1 (2:00) and Defrost2 (2:00) schedule should not have same time.
4. The UTC offset property is writable only on NON-STANDARD Time zone value.
5. The Time zone parameter value is depending on the country parameter value.
   - If the country value is 0 (US) then the time zone parameter is not allowed to write NST-Newfoundland (1).
   - If the country value is 1 (CA) then the time zone parameter is allowed to write till 5 (0-NONSTD, 1-NST, 2-AST, 3-EST, 4-CST, and 5-MST).
6. The Fan stir cycle frequency and Fan stir duty cycle parameters allowed to write depends on the Fan control style, Fan stir enable parameters.
   - If the Fan control style property is STANDARD and Fan stir enable property value is ON or OFF, then the Fan stir cycle frequency and Fan stir duty cycle properties are allowed to write valid values.
7. The Fan speed property value is allowed to write only on Fan control style property value is VARIABLE.
8. The Primary Evap address property value should be segregated in to two parts.
   - Primary EV Address - 1 to 246 (0 to 7th bit).
   - Primary or Auxiliary sensor selection 0 or 1 (8th bit).
9. The Low Superheat Setpoint parameter (property-521 or object-(Analog Value,5)) is allowed to write, if the EXV Type is not TXV.
10. The Force Defrost parameter (property-559 or object-(Analog Value,40)) is allowed to write only if the System is not in Service Mode.
11. The EXV Control Algorithm Reset parameter (object-(Analog Value,49)) is allowed to write, if the EXV Type is not TXV.

List of Write Property Range Restrictions: (cont.)

List of Write Property Range Restrictions:

1. Global Settings:

- defrost type: integer, [0 to 2]
- defrost style: integer, [0 to 2]
- refrigerant: integer, [0 to 7]
- box temperature setpoint: real, [-30.0 to +60.0] Fahrenheit,1.0F/0.5C increments
- box temperature differential: integer, [+1 to +10] Fahrenheit, 1.0F/0.5C increments
- box load mode time delay: integer, [0 to 60] minutes
- box load mode max override time: integer: [5minutes to 24 hours] minutes,5 minutes increment
- low superheat setpoint: real, [0 to +3] Fahrenheit, 1.0F/0.5C increments
- minimum runtime: integer, [1 to 4] minutes
- minimum offtime: integer, [2 to 10] minutes
- temperature unit: boolean, [0-Fahrenheit, 1-Celsius]
- pressure unit: integer, [0- PSIG, 1-KPA, 2-BAR]
- drain down period: integer, [1 to 10] minutes
- dual coil termination: Boolean, [1-yes, 0-no]
- number of defrost: integer, [1 to 12]
- defrost 1 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 2 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 3 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 4 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 5 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 6 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 7 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 8 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 9 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 10 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 11 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost 12 schedule: integer, [0 to 1439] minutes, 5minutes increment
- defrost fail safe time: integer, [10 to 200] minutes
- defrost end setpoint: real, [+40 to +100] Fahrenheit
- refreeze time safety-point: integer, [1 to 10] minutes
- refreeze suction setpoint: real, [20 to 35] Fahrenheit
- alarm high box temperature setpoint: real, [-40, +90] Fahrenheit
- alarm low box temperature setpoint: real, [-40, +90] Fahrenheit
- alarm delay time: integer, [2 to 120] minutes
- alarm door open time: integer, [5 to 240] minutes
- country: integer, [0-USA, 1-CANADA]
- timezone: integer, [0 to 11]

List of Write Property Range Restrictions: (cont.)

- UTC offset: real, [-11 to 14] 0.5 unit increments
- follow DST: boolean, [yes, no]
- system custom name: string [20 characters]
- force defrost: : integer, [1]
- light bar enable: boolean, [on, off]
- external bacnet address: integer, [0 to 127]
- external modbus address: integer, [0 to 246]
- condensing unit wired address: integer, [0-not connected, 1 to 246-connected RCB address]
- 12/24 hour clock: integer [0-12H, 1-24H]
- baudrate: integer, [0-9800, 2-38400]
- service mode: boolean, [0, 1]
- primary EV address: integer, [1 to 246]

2. Local Settings

- EV fan control style: integer, [0 to 2]
- EV fan stir enable: boolean, [1-on, 0-off]
- EV fan stir cycle frequency: integer, [12 to 30] minutes
- EV fan stir duty cycle: integer, [60, 70, 80] percentage
- EV fan speed (off cycle): integer, [30 to 100] percentage, 2% increments

Notes

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BY HEATCRAFT REFRIGERATION PRODUCTS

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