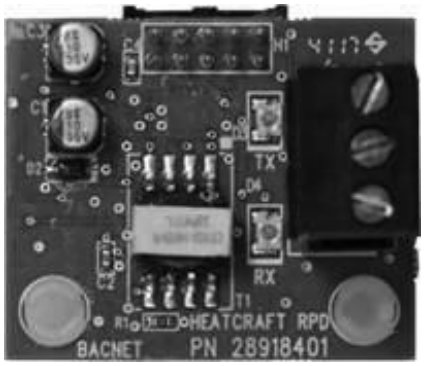
Installation & Operation Manual

intelliGen™ Webserver Card (iWC) and Integration Card (iIC)

OCTOBER 2018
PART NO. 25010401

iWC

iIC



Legend

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

TABLE OF CONTENTS

iWC- intelliGen WEBSERVER CARD

Installation

- While system is powered down, align and insert iWC's pins into intelliGen Refrigeration Controller (iRC) board's plug
- Secure with mounting screws. For proper mounting, the #6-32x1 inch screws should be torqued to 64 oz.-inch.
- Connect CAT5 Ethernet cable to iWC
- Connect other end of Ethernet cable to a network router

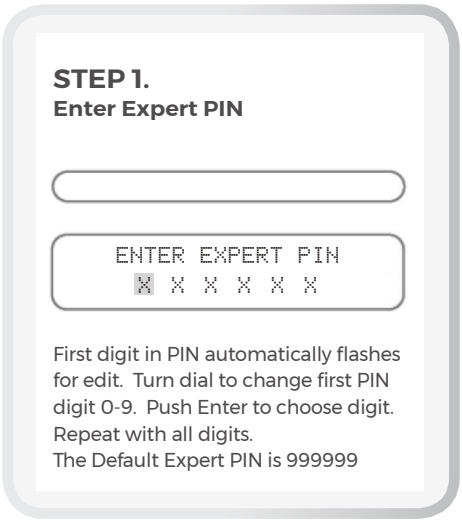
Configuration and Initial Setup

Local Access

IF SYSTEM HAS NOT BEEN PREVIOUSLY CONFIGURED

- Follow steps in intelliGen Quick Start Guide to configure system via iRCUI on an evaporator OR following the next steps
- Connect iWC to a network point/router before beginning webserver configuration
- Follow steps to obtain IP address:

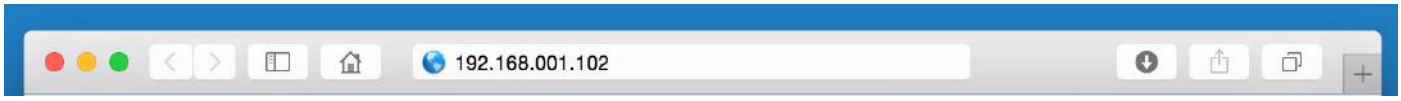
STEP 1
Enter Expert PIN



STEP 2
Select Configuration Mode

STEP 3
IP Address Generation

STEP 4
Type IP Address into Browser

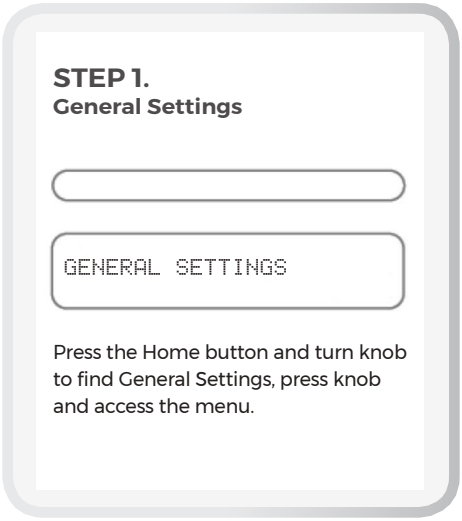


Type IP address into web browser and follow the prompts to complete system configuration

IF SYSTEM HAS BEEN PREVIOUSLY CONFIGURED

- Connect iWC to a network point/router before commencing webserver configuration
- Follow steps to obtain IP address:

STEP 1
Go To General Setting Menu



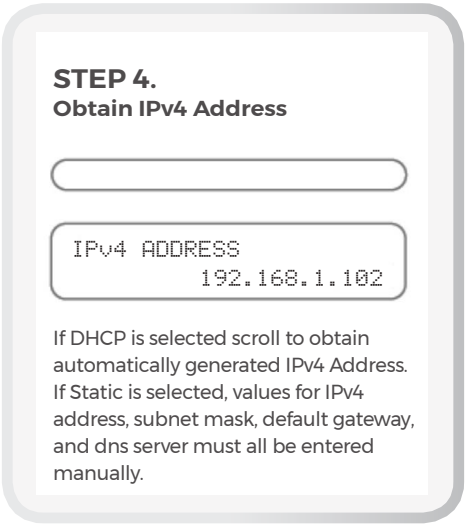
STEP 2
Select IP Address and Submask

STEP 3
Configure IP address information

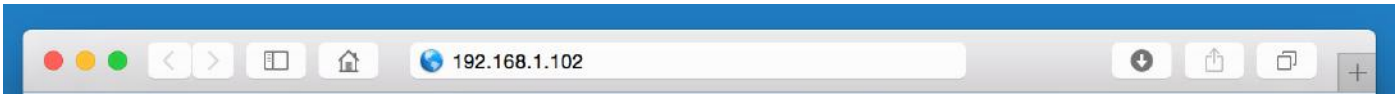
NOTE:

IPv4 Defaults to DHCP, this setting will work with most networks. Highly secured networks may require a static IP address. Contact your IT department for additional support.

STEP 4
Obtain IPv4 address



STEP 5
Enter IPv4 address in Browser



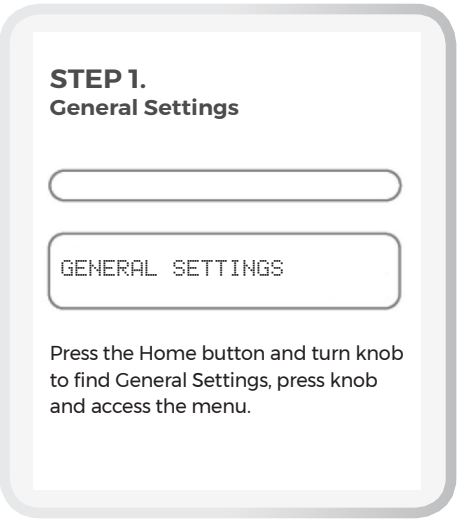
Type IPv4 address into web browser on a device that is connected to the local network to access system information through the web.

Remote Access

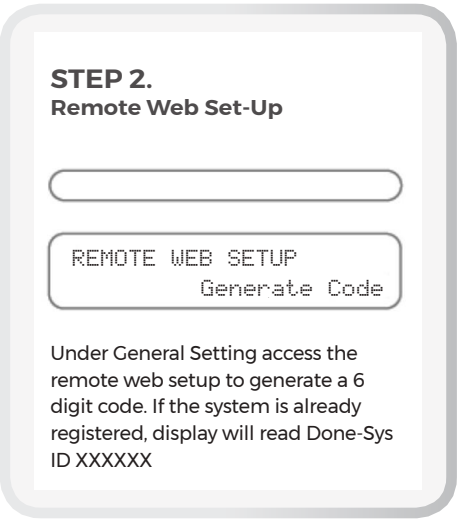
USER SETUP : *Log-in information including passwords and 6 digit pin*

- iWC must be configured per Local Access instructions
- Create an account by visiting: **https://intelligen.online**
- Log in and select 'REGISTER NEW SYSTEM'. A prompt for a 6 digit PIN will appear
- To obtain PIN follow these steps

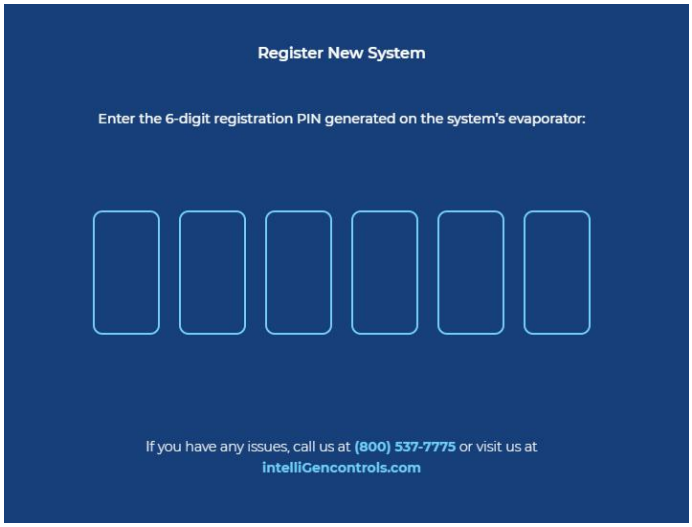
STEP 1
Go To General Setting Menu



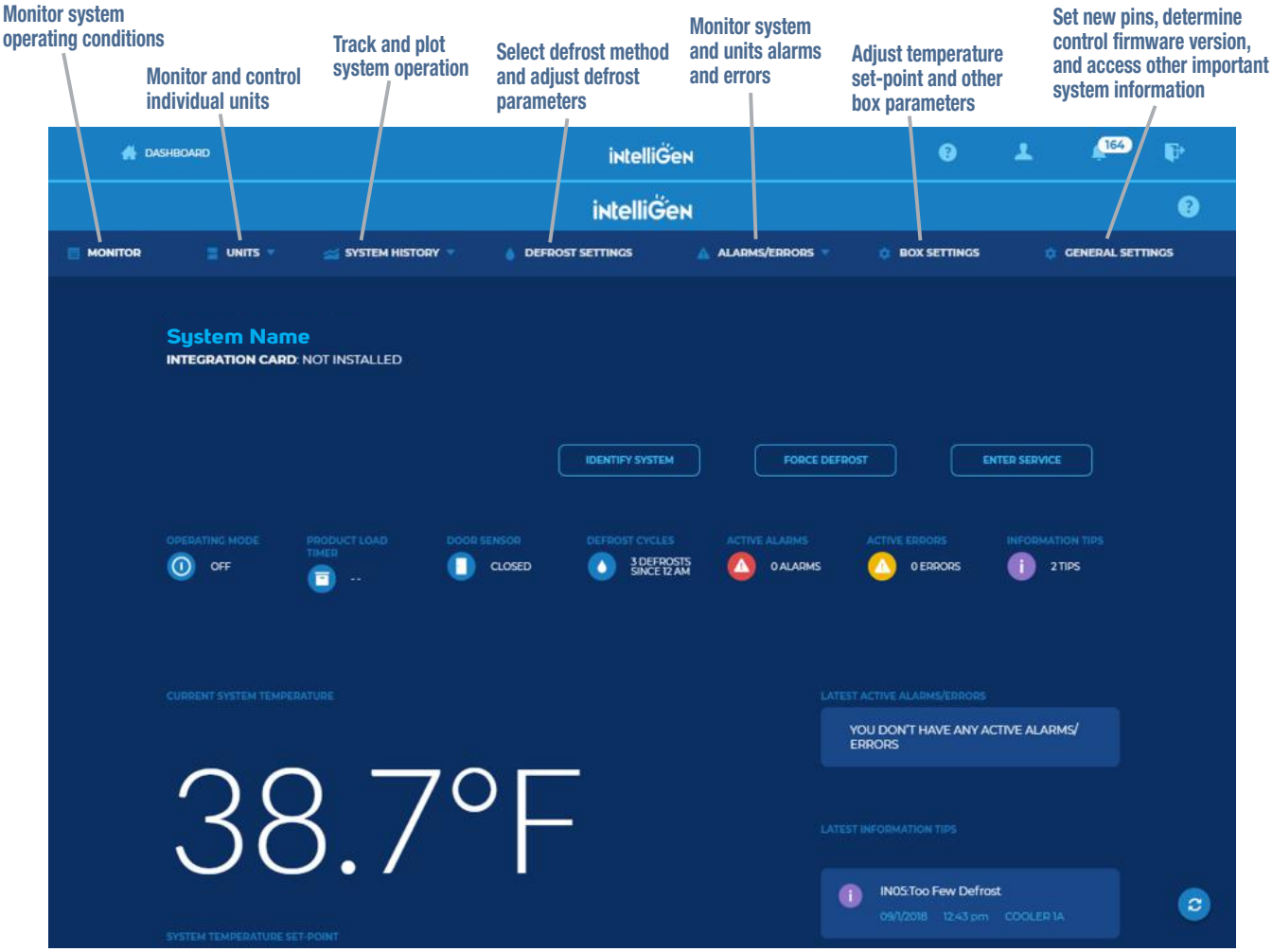
STEP 2
Remote Web Set-Up



When registering a new system, enter 6 digit code that was generated on the iRCUI into the web browser



WEB NAVIGATION



Dashboard Menu Options:

DASHBOARD: Lists all your sites in a single location

QUESTION MARK: Takes you to the Heatcraft Support Site (internet Connectivity required)

PROFILE: Change User settings, including E-mail and Text Alerts and Alert Frequency

NOTIFICATIONS: Lists all the notifications from all your systems

LOG OUT: To Exit the Dashboard

System Menu Options:

MONITOR: Monitor system operating conditions

UNITS: Monitor and control individual units

SYSTEM HISTORY: Track and plot system operation

DEFROST SETTINGS: Select defrost method and adjust defrost parameters

ALARMS/ERRORS: Monitor system and units alarms and errors

BOX SETTINGS: Adjust temperature set-point and other box parameters

GENERAL SETTINGS: Set new pins, determine control firmware version, and access other important system information.

TROUBLESHOOTING GUIDE

Local Webserver Access

Problem:	Step:	Action Item:	If OK:	If Not OK:
Cannot Access Local Webpage	**1)** Confirm IP address is assigned to intelliGen controller	**1)** Navigate to 'GENERAL SETTINGS' > 'IP ADDRESS & SUBNET MASK' > 'IPv4 ADDRESS'. Confirm a valid IP address is displayed, this should be a value other than 0.0.0.0	**1)** Go to Next Step	**1a)** Power off the unit that has the iWC connected for 30 seconds, then re-apply power and wait 5 minutes for the iWC to acquire a valid IP address. **1b)** Remove Ethernet cable from iWC and connect it to a laptop or PC. Disable wireless connection on computer. Open 'command prompt' application and type command "ipconfig". Confirm IPv4 Address is being assigned. If no address is assigned, have local IT check router/switch settings.
	2) Ping intelliGen controller	**2)** If using Windows OS, open 'command prompt' application and type "ping XXX.XXX.XXX.XXX", where XXX.XXX.XXX.XXX is the IP address displayed at the iRCUI.	**2)** If ping response has data transmission information, then try a different web browser and/or review web browser settings to disable any proxy and firewall that may be blocking the local connection.	**2)** If ping results in "destination host unreachable" or "request timeout", then work with local IT to ensure the PC that is attempting to connect to the intelliGen controller has access to the same subnet as the intelliGen iWC.
Remote Webserver Access	**1)** Test local webserver connection and proceed through local webpage troubleshooting	**1)** Refer to Local Webserver Access Troubleshooting Steps	**1)** Go to Next Step	**1)** -
	2) Confirm port 443 is open	**2)** Consult local IT		

Blue Steps: Requires some basic network troubleshooting skills - may require local IT assistance

iIC- intelliGen INTEGRATION CARD

Installation

- If an iWC (webserver card) is used in the system, be sure to connect the iIC (integration card) to the same evaporator board. If no iWC is present in the system, the iIC may be connected to ANY evaporator board.
- While system is powered down, align & insert iIC's pins into iRC board's plug, insert card into board.
- Secure with mounting screws. For proper mounting, the #6-32x1 inch screws should be torqued to 64 oz-inch.
- 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.
- iIC can be used with an existing building management system.

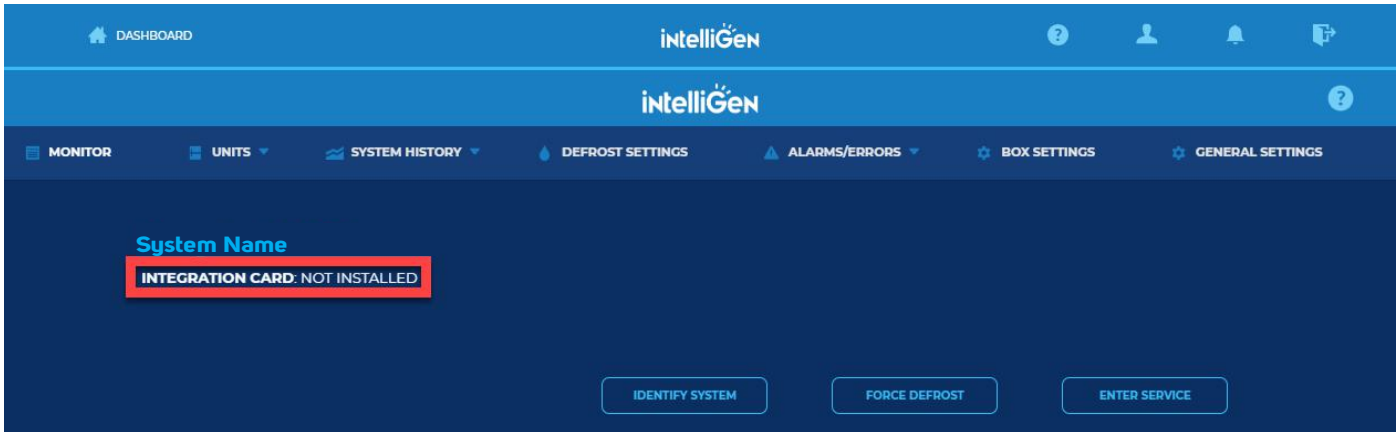
Configuration and Initial Setup

PROTOCOLS SUPPORTED

- BACnet MS/TP
- Modbus (RTU)

OPTION 1: CONFIGURE OVER WEB PAGE (IF IWC 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 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 **GENERAL SETTINGS** 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 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 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- 38400 (Fixed)
- 8 Data Bits
- 1 Stop Bit
- Even Parity

TO READ/WRITE PARAMETERS OVER BACnet:

- Baud rate must be set to 38400/9600
- All temperature values to be read according to the parameter value “Temperature Units” either °F or °C

BACnet Mapping – "Global Settings Object Type"

OBJECT ID – 129

S.No	Property Name	Property ID	Type	Read/Write	Decoding:
1	Date/Time	513	BACnet date-time	Read	Time in UTC, Byte 1 – Year MSB, Byte 2 – Year LSB, Byte 3 – Month, Byte 4 – Day, Byte 5 – Hour, Byte 6 – Minutes, Byte 7 – Seconds, Byte 8 – Week Day
2	Defrost Type	514	Integer	Read	AIR -0, Medium Temp Electric – 1, Low Temp Electric - 2
3	Defrost Style	515	Integer	Read	TIMED -0, SMART – 1, DEMAND - 2
4	Refrigerant	516	Integer	Read	R404A - 0, R507A - 1, R407A - 2, R407C - 3, R407F - 4, R22 - 5, R448A - 6, R449A - 7
5	Box Temperature Setpoint	517	Real	RW	When reading, divide read number by 10; Example: Byte 1 – 0x01 Byte 2 – 0x5E > To be read as 35.0 F When writing, multiply desired setpoint by 10; Example- to set box temp set-point to 20.0F, Write 0x00C8. Box Temp Setpoint must be in whole number increments, non-whole number inputs will be rounded to the nearest ones place.
6	Box Temperature Setpoint Differential	518	Integer	Read	Real number divided by 10
7	Box Load Mode Time Delay	519	Integer	Read	Unit - Minutes
8	Low Superheat Setpoint	521	Real	Read	Real number divided by 10
9	Box Load Mode Maximum Override Time	520	Integer	Read	Unit - Minutes
10	Minimum Runtime	522	Integer	Read	Unit – Minutes
11	Minimum Off Time	523	Integer	Read	Unit – Minutes
12	Temperature Units	524	Integer	Read	CELSIUS – 1, FAHRENHEIT - 0
13	Pressure Units	525	Integer	Read	PSIG – 0, KPA -1, BAR – 2

BACnet Mapping – "Global Settings Object Type"

S.No	Property Name	Property ID	Type	Read/Write	Decoding:
14	Drain Down Period	526	Integer	Read	Unit - Minutes
15	Dual Coil Termination	527	Boolean	Read	1-Yes/ 0-No
17	Number of Defrosts	529	Integer	Read	
18	Defrost 1 Schedule	530	Integer	Read	Time in minutes since 12 am; Example- Byte 1 – 02 Byte 2 – D0 720 minutes in decimal for 12 pm
19	Defrost 2 Schedule	531	Integer	Read	Same as Defrost 1 schedule
20	Defrost 3 Schedule	532	Integer	Read	Same as Defrost 1 schedule
21	Defrost 4 Schedule	533	Integer	Read	Same as Defrost 1 schedule
22	Defrost 5 Schedule	534	Integer	Read	Same as Defrost 1 schedule
23	Defrost 6 Schedule	535	Integer	Read	Same as Defrost 1 schedule
24	Defrost 7 Schedule	536	Integer	Read	Same as Defrost 1 schedule
25	Defrost 8 Schedule	537	Integer	Read	Same as Defrost 1 schedule
26	Defrost 9 Schedule	538	Integer	Read	Same as Defrost 1 schedule
27	Defrost 10 Schedule	539	Integer	Read	Same as Defrost 1 schedule
28	Defrost 11 Schedule	540	Integer	Read	Same as Defrost 1 schedule
29	Defrost 12 Schedule	541	Integer	Read	Same as Defrost 1 schedule
30	Defrost Failsafe Time	542	Integer	Read	Unit - Minutes
31	Defrost End Temperature Setpoint	543	Integer	Read	Real number divided by 10
32	Refreeze Time Safety	544	Integer	Read	Unit – Minutes
33	Refreeze Suction Setpoint	545	Real	Read	Real number divided by 10
34	Alarm High Box Temperature Setpoint	546	Real	Read	Real number divided by 10
35	Alarm Low Box Temperature Setpoint	547	Real	Read	Real number divided by 10
36	Alarm Delay Time	548	Integer	Read	Unit – Minutes
37	Alarm Door Open Time	549	Integer	Read	Unit – Minutes
38	Country	550	Integer	Read	USA-0, CANADA-1

BACnet Mapping – "Global Settings Object Type"

S.No	Property Name	Property ID	Type	Read/Write	Decoding:
39	Time Zone	551	Integer	Read	MST-0, NST-1, AST-2, EST-3, CST-4, MST-5, PST-6, AKST-7, HAST-8, SST-9, CHST-10, WAKT-11
40	UTC Offset	552	Integer	Read	MST-0, NST-1, AST-2, EST-3, CST-4, MST-5, PST-6, AKST-7, HAST-8, SST-9, CHST-10, WAKT-11
41	Follow DST	553	Integer	Read	1 – YES, 0 – NO
42	Operation Mode	554	ENUM	Read	OP_OFF-0, OP_COOLING-1, OP_DEFROST-3, OP_DRAIN-4, OP_DELAY-5, OP_PRODUCTLOAD-6, OP_REFREEZE-10, OP_SERVICE-11
43	Box Temperature	555	Real	Read	Real number divided by 10
44	Force Defrost	559	Integer	Write	
45	Alarm System Startup Failure	562	Boolean	Read	0-Alarm Inactive; 1-Alarm Active
46	Alarm Door Open	565	Boolean	Read	0-Alarm Inactive; 1-Alarm Active
47	Primary Auxiliary Sensor	556	Boolean	Read	0-Aux sensor not set as primary; 1-Aux sensor set as primary
48	Number Of Unit Records	557	Integer	Read	Number of Evaporators connected to system
49	System Custom Name	558	String	Read	ASCII characters sent in data bytes
50	Alarm High Box Temperature	560	Real	Read	Real number divided by 10
51	Alarm Low Box Temperature	561	Real	Read	Real number divided by 10

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

Field Name	Read/Write (22):	Data Address (3344):	# Registers to read (5566):	Data Type:	Decoding Method
System Custom Name	Read (0x03)	0x4000	0001	String	ASCII characters sent in data bytes
Operation Mode	Read (03)	0x400A	0001	ENUM	OP_OFF-0, OP_COOLING-1, OP_DEFROST-3, OP_DRAIN-4, OP_DELAY-5, OP_PRODUCTLOAD-6, OP_REFREEZE-10, OP_SERVICE-11
Date/Time Type	Read (03)	0x400B	0001	Integer	Always 2
Date/Time	Read (03)	0x400C	0001	Integer	Time in UTC, Byte 1 – Year MSB, Byte 2 – Year LSB, Byte 3 – Month, Byte 4 – Day, Byte 5 – Hour, Byte 6 – Minutes, Byte 7 – Seconds, Byte 8 – Week Day
Defrost Type	Read (03)	0x4010	0001	Integer	AIR -0, Medium Temp Electric – 1, Low Temp Electric - 2
Defrost Style	Read (03)	0x4011	0001	Integer	TIMED - 0, SMART - 1, DEMAND - 2
Refrigerant	Read (03)	0x4012	0001	Integer	R404A - 0, R507A - 1, R407A - 2, R407C - 3, R407F - 4, R22 - 5, R448A - 6, R449A - 7
Box Temperature Setpoint	Read (03)/ Write (06)	0x4013	0001	Signed Integer	When reading, divide read number by 10; Example: Byte 1 – 0x01 Byte 2 – 0x5E > To be read as 35.0 F When writing, multiply desired setpoint by 10; Example- to set box temp set-point to 20.0F, Write 0x00C8. Box Temp Setpoint must be in whole number increments, non-whole number inputs will be rounded to the nearest ones place.

Field Name	Read/Write (22):	Data Address (3344):	# Registers to read (5566):	Data Type:	Decoding Method
Box Load Mode Time Delay	Read (03)	0x4015	0001	Integer	Unit - Minutes
Box Load Mode Maximum Override Time	Read (03)	0x4016	0001	Integer	Unit - Minutes
Low Superheat Setpoint	Read (03)	0x4017	0001	Signed Integer	Real number divided by 10
Minimum Runtime	Read (03)	0x4018	0001	Integer	Unit – Minutes
Minimum Off Time	Read (03)	0x4019	0001	Integer	Unit – Minutes
Temperature Units	Read (03)	0x401A	0001	Integer	CELSIUS – 1, FAHRENHEIT - 0
Pressure Units	Read (03)	0x401B	0001	Integer	PSIG – 0, KPA -1, BAR – 2
Drain Down Period	Read (03)	0x401C	0001	Integer	Unit - Minutes
Dual Coil Termination	Read (03)	0x401D	0001	Boolean	1-Yes/ 0-No
Number of Defrosts	Read (03)	0x401F	0001	Integer	
Defrost 1 Schedule	Read (03)	0x4020	0001	Integer	Time in minutes since 12 am; Example- Byte 1 – 02 Byte 2 – D0 720 minutes in decimal for 12 pm
Defrost 2 Schedule	Read (03)	0x4021	0001	Integer	Same as Defrost 1 schedule
Defrost 3 Schedule	Read (03)	0x4022	0001	Integer	Same as Defrost 1 schedule
Defrost 4 Schedule	Read (03)	0x4023	0001	Integer	Same as Defrost 1 schedule
Defrost 5 Schedule	Read (03)	0x4024	0001	Integer	Same as Defrost 1 schedule
Defrost 6 Schedule	Read (03)	0x4025	0001	Integer	Same as Defrost 1 schedule
Defrost 7 Schedule	Read (03)	0x4026	0001	Integer	Same as Defrost 1 schedule
Defrost 8 Schedule	Read (03)	0x4027	0001	Integer	Same as Defrost 1 schedule
Defrost 9 Schedule	Read (03)	0x4028	0001	Integer	Same as Defrost 1 schedule
Defrost 10 Schedule	Read (03)	0x4029	0001	Integer	Same as Defrost 1 schedule
Defrost 11 Schedule	Read (03)	0x402A	0001	Integer	Same as Defrost 1 schedule
Defrost 12 Schedule	Read (03)	0x402B	0001	Integer	Same as Defrost 1 schedule
Defrost Failsafe Time	Read (03)	0x402C	0001	Integer	Unit - Minutes
Defrost End Temperature	Read (03)	0x402D	0001	Integer	Real number divided by 10
Refreeze Time Safety	Read (03)	0x402E	0001	Integer	Unit – Minutes
Refreeze Suction Setpoint	Read (03)	0x402F	0001	Signed Integer	Real number divided by 10

Field Name	Read/Write (22):	Data Address (3344):	# Registers to read (5566):	Data Type:	Decoding Method
Alarm Low Box Temperature	Read (03)	0x4031	0001	Signed Integer	Real number divided by 10
Alarm Delay Time	Read (03)	0x4032	0001	Integer	Unit – Minutes
Alarm Door Open Time	Read (03)	0x4033	0001	Integer	Unit – Minutes
Country	Read (03)	0x4034	0001	Integer	USA-0, CANADA-1
Time Zone	Read (03)	0x4035	0001	Integer	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	Read (03)	0x4036	0001	Integer	MST-0, NST-1, AST-2, EST-3, CST-4, MST-5, PST-6, AKST-7, HAST-8, SST-9, CHST-10, WAKT-11
Follow DST	Read (03)	0x4037	0001	Integer	1 – YES, 0 – NO
DST Offset	Read (03)	0x4038	0001	Integer	
12/24 Hour Clock	Read (03)	0x4039	0001	Integer	0 – 12 hour clock, 1 – 24 hour clock
Number of Units	Read (03)	0x403A	0001	Integer	
Controller Address	Read (03)	0x403B	0001	Integer	
Box Temperature	Read (03)	0x403C	0001	Signed Integer	Real number divided by 10
Force Defrost	Write (06)	0x403D	0001	Integer	Writing '1' will force defrost
System Alarms	Read (03)	0x403E	0001	Integer	Refer System Alarm Table for bit decoding
Enable	Read (03)	0x4040 + (n * 0xC)	0001	Integer	0 – Disabled; 1 – Enabled If Enabled is 0, below parameters should be ignored for that unit
Unit Address	Read (03)	0x4040 + (n * 0xC) + 1	0001	Integer	
Unit Type	Read (03)	0x4040 + (n * 0xC) + 2	0001	Integer	
EV Superheat Setpoint	Read (03)	0x4040 + (n * 0xC) + 3	0001	Signed Integer	Real number divided by 10
Unit Alarms/Errors	Read (03)	0x4040 + (n * 0xC) + 4	0001		Refer Unit Alarms Table for bit decoding
Short Unit Name	Read (03)	0x4040 + (n * 0xC) + 8	0001	Strings	ASCII characters sent in data bytes

Note: 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

BYTE							
BIT 31	BIT 30	BIT 29	BIT 28	BIT 27	BIT 26	BIT 25	BIT 24
Spare							
BIT 23	BIT 22	BIT 21	BIT 20	BIT 19	BIT 18	BIT 17	BIT 16
BYTE							
BIT 15	BIT 14	BIT 13	BIT 12	BIT 11	BIT 10	BIT 9	BIT 8
Spare	Spare	Spare	Spare	Spare	Spare	Spare	Reserved (Future)
BYTE							
BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
Reserved (Future)	Reserved (Future)	Door Switch Open Alarm	Reserved (Future)	Input Fault (Sensor Errors Alarm)	System Startup Failure Alarm	Low Box Temperature Alarm	High Box Temperature Alarm

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

UNIT ALARMS TABLE

BYTE							
BIT 63	BIT 62	BIT 61	BIT 60	BIT 59	BIT 58	BIT 57	BIT 56
Spare							
BIT 55	BIT 54	BIT 53	BIT 52	BIT 51	BIT 50	BIT 49	BIT 48
Spare							
BIT 47	BIT 46	BIT 45	BIT 44	BIT 43	BIT 42	BIT 41	BIT 40
Spare							
BIT 39	BIT 38	BIT 37	BIT 36	BIT 35	BIT 34	BIT 33	BIT 32
Spare							
BYTE							
BIT 31	BIT 30	BIT 29	BIT 28	BIT 27	BIT 26	BIT 25	BIT 24
Input Fault (Sensor Errors Alarm)	Spare	Spare	Spare	Spare	Spare	Spare	EV Connection Lost Error
BYTE							
BIT 23	BIT 22	BIT 21	BIT 20	BIT 19	BIT 18	BIT 17	BIT 16
System Connection Lost Error	Primary EV Temp Sensor Override Error	RCBUI to RCB Comm Failure Error	RCBUI Failure Error	Static Operation Error	Data Logging Disrupted Error	Replace RTC Backup Battery Error	Evap Auxiliary Temp Sensor Error
BYTE							
BIT 15	BIT 14	BIT 13	BIT 12	BIT 11	BIT 10	BIT 9	BIT 8
Reserved (Future)	Low Superheat During Cooling Error	24V Power Supply High Error	24V Power Supply Low Error	Spare Inputs Error	Reserved (Future)	Control Circuit Open Error	Reserved (Future)
BYTE							
BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
Reserved (Future)	Reserved (Future)	Reserved (Future)	Reserved (Future)	Evap Suction Pressure Transducer Error	Evap Suction Temp Sensor Error	Coil Temp Sensor Error	Box Temp Sensor Error

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.

Notes:

Heatcraft Refrigeration Products, LLC
2175 West Park Place Blvd., Stone Mountain, GA 30087
www.heatcraftrpd.com

Customer Service and Technical Support

Normal Business Hours – 8:00 AM – 8:00 PM EDT
(800) 321-1881

After Hours (after 5:00 PM EDT, weekends and holidays)
(877) 482-7238

Since product improvement is a continuing effort, we reserve the right to make changes in specifications without notice.

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BOHN THE COLD STANDARD

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