

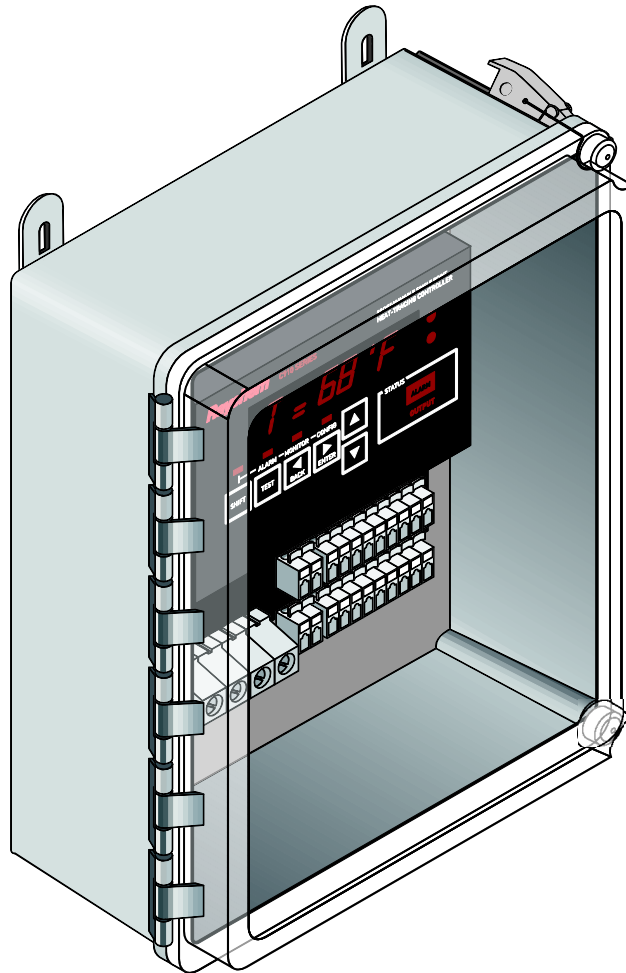
C910-485 Heat Trace Controller



RAYCHEM

MODBUS PROTOCOL INTERFACE MAPPING

For Firmware version V4.04.3



CONTENTS

Section 1 – Introduction	3
Section 2 – Modbus Functions Supported By the C910-485	3
Section 3 – Modbus Exception Response Supported By the C910-485.....	4
Section 4 – AC Analog Data Formats	5
Section 5 – General Controller Information	6
Section 6 – Range Information For Analog Values.....	6
Section 7 – Dynamic Output Status.....	7
Section 8 – Analog Readings	8
Section 9 – Latched Alarm Values.....	8
Section 10 – Maintenance Information.....	9
Section 11 – Control Parameters.....	12
Section 12 – Temperature Sensor Parameters	13
Section 13 – AC Analog Parameters	13
Section 14 – Controller Setup Parameters.....	14
Section 15 – Console Parameters	14
Section 16 – Communication Parameters	15
Section 17 – ACS Algorithm Parameters	16
Section 18 – Schedule Parameters	17
Section 19 – Alarm Status.....	18
Section 20 – Alarm Mask	19
Section 21 – Database Synchronization Parameters.....	19
Section 22 – Controller Setup Parameters.....	19
Section 23 – Reset Maintenance Information	18
Section 24 – ACS Coils.....	18
Section 25 – Controller Status	19

Section 1 INTRODUCTION

The nVent RAYCHEM C910-485 Heat Trace Controller (HTC) can communicate with a master computer system using the Modicon PLC Modbus protocol. This document gives the details on how the Modbus protocol is implemented in the C910-485 HTC.

Section 2 MODBUS FUNCTIONS SUPPORTED BY THE C910-485

addr = slave device address (=Modbus Address = 1 to 247)
dadh = BITS: 7-6=master ID; 5-1=sub address; 0=most significant bit of data address
dadl = 8 least significant bits of data address
adcnth = address count high
adcntl = address count low
bcount = byte count

<u>Func</u>	<u>Description</u>
-------------	--------------------

01	Read Output (Coil) Status = Read (R/W) Bits Tx: addr 01 dadh dadl adcnth adcntl Rx: addr 01 bcount data ... (8 coils/byte)	(Broadcast not supported) (No response given for data address > 255)
02	Read Input Status = Read (Read only) Bits Tx: addr 02 dadh dadl adcnth adcntl Rx: addr 02 bcount data ... (8 inputs/byte)	(Broadcast not supported) (No response given for data address > 255)
03	Read Holding Registers = Read (R/W) Words Tx: addr 03 dadh dadl adcnth adcntl Rx: addr 03 bcount data ... (2 bytes/register)	(Broadcast not supported)
04	Read Input Registers = Read (Read only) Words Tx: addr 04 dadh dadl adcnth adcntl Rx: addr 04 bcount data ... (2 bytes/register)	(Broadcast not supported)
05	Force Single Coil = Write single (R/W) Bit Tx: addr 05 dadh dadl datah datah Rx: addr 05 dadh dadl datah datah	(Broadcast not supported) (datah datah must = 00 00 (off) or FF 00 (on)) (Response is given AFTER the data is written)
06	Preset Single Register = Write single (R/W) Word Tx: addr 06 dadh dadl datah datah Rx: addr 06 dadh dadl datah datah	(Broadcast supported by address 6 and 7) (Response is given AFTER the data is written)
08	Diagnostics =Diagnostic Subfunctions Tx: addr 08 subfch subfcl datah datah Rx: addr 08 subfch subfcl datah datah Note: A list of all the Diagnostic Subfunctions is given below.	(Broadcast not supported) (Response is given AFTER the function is done)

- 15** Force Multiple Coils = Write multiple (R/W) Bits (Broadcast not supported)
 Tx: addr 0F dadh dadl adcnth adcntl bcount data ... (8 coils/byte, bcount = (adcnt+7) / 8)
 Rx: addr 0F dadh dadl adcnth adcntl (Response is given **AFTER** the data is written)
- 16** Preset Multiple Registers = Write multiple (R/W) Words (Broadcast not supported)
 Tx: addr 10 dadh dadl adcnth adcntl bcount data (2 bytes/register, bcount = 2 x adcnt)
 Rx: addr 10 dadh dadl adcnth adcntl (Response is given **AFTER** the data is written)
 Note: Since serial buffer in 910 can only hold 50 characters, maximum adcnt=8 in ASCII mode.

Section 3 MODBUS EXCEPTION RESPONSE SUPPORTED BY THE C910-485

Exception Description

- 01** Illegal Function Code
 Tx: addr 09 dadh dadl adcnth adcntl
 Rx: addr 89 **01**
- 02** Illegal Data Address
 Tx: addr 04 12 34 adcnth adcntl
 Rx: addr 84 **02**
- 03** Illegal Data Value
 Tx: addr 04 00 00 12 34
 Rx: addr 84 **03**

Section 4 AC ANALOG DATA FORMATS

This section provides details of the implicit data types used in the Modbus protocol. The data type and formats are used in the address map tables in sections later in this document.

Integer data sent from the HTC is sent Most Significant Byte first, Least Significant Byte Last. Data may be signed or unsigned and may require some scaling depending on the data being read. The implied attributes (signed/unsigned and scaling) for the data being returned is as follows:

Description	Data Format
Temperature	Signed Integer in 10ths of °C
Voltage	Unsigned Integer in 10ths of AC Volts
Current	Unsigned Integer in 100ths of Amps
Ground Fault	Unsigned Integer in 10ths of mAmps
Power	Unsigned Integer in Watts
Resistance	Unsigned Integer in 100ths of Ohms

Section 5 GENERAL CONTROLLER INFORMATION

Description	Data Address	Func Code	Data Format	Comments
Device Type	0	4	Integer	1024 = C910
Firmware Version	1	4	Integer	C910 Firmware Version-Major 0-255
Firmware Version	2	4	Integer	C910 Firmware Version-Minor 0-255
Firmware Version	3	4	Integer	C910 Firmware Version-Build 0-255
Manufactured Year	4	4	Integer	Format: YY
Manufactured Month	5	4	Integer	Range 1-12
Manufactured Day	6	4	Integer	Range 1-31
Controller's Serial Number			Integer	1 to 16777215
	7	4		Most significant word
	8	4		Least significant word
Reserved – for factory use only	9	4		
Reserved – for factory use only	10	4		
Reserved – for factory use only	11	4		
Reserved – for factory use only	12	4		
Reserved – for factory use only	13	4		
Reserved – for factory use only	14	4		
RESERVED	15 to 29	4		

Section 6 RANGE INFORMATION FOR ANALOG VALUES

Description	Data Address	Func Code	Data Format	Comments
Setpoint and TS Range Maximum	30	4	Temperature	
Setpoint and TS Range Minimum	31	4	Temperature	
Current Range Maximum	32	4	Current	
Current Range Minimum	33	4	Current	
GFI Range Maximum	34	4	Ground Fault	
GFI Range Minimum	35	4	Ground Fault	
RESERVED	36 to 49	4		

Section 7 DYNAMIC OUTPUT STATUS

Description	Data Address	Func Code	Data Format	Comments
Control Output Duty Cycle	50	4	Integer	0 to 100%: 0=full off, 100=full on
Tracing Control Status	51	4	Integer	<p>Only reports the highest priority if more than one condition exists.</p> <p><u>Lowest Priority</u></p> <p>0 = normal temperature control 1 = output override force off 2 = auto-cycle in progress 3 = not used 4 = not used 5 = output override force on 6 = TS high limit cutout active 7 = contactor no toggle for 0.8 sec 8 = overcurrent trip 9 = ground fault trip 10 = EEROM being programmed 11 = EEROM failure 12 = run time error detected 13 = point not used 14 = start-up delay active 15 = factory only condition 16 = factory only condition</p> <p><u>Highest Priority</u></p>
PASC On-Count	52	4	Integer	
PASC Off-Count	53	4	Integer	
PASC Next Switch Count	54	4	Integer	
PASC Percent On	55	4	Integer	
PASC Output State	56	4	Integer	
PASC Total Time	57	4	Integer	
Current Schedule Segment value	58	4	Current Schedule Segment value	<p>When using a schedule mode, displays the currently running segment. Undefined/invalid otherwise.</p> <p>Off = 0 Economy = 1 Maintain = 2 On = 3</p>
RESERVED	59	4		
EXT Transition Countdown	60	4		Countdown to switch in seconds
Cycle On Count	61	4		Number of seconds to stay on
Cycle Off Count	62	4		Number of seconds to stay off
Cycle Next Switch Count	63	4		Countdown to next switch in seconds
RESERVED	64 to 69	4		

Section 8 ANALOG READINGS

Description	Data Address	Func Code	Data Format	Comments
Average Control Temperature	70	4	Temperature	Temperature failure = +3000.0 °C
Average TS 1 Temperature	71	4	Temperature	TS 1 failure = +3000.0 °C TS 1 not used = +3200.0 °C
Average TS 2 Temperature	72	4	Temperature	TS 2 failure = +3000.0 °C TS 2 not used = +3200.0 °C
Average Load Current	73	4	Current	
Instantaneous Ground Fault Current	74	4	Ground Fault	
Average Voltage	75	4	Voltage	
Average Power Consumption	76	4	Power	Most significant word
	77	4		Least significant word
Average Tracing Resistance	78	4	Resistance	Most significant word
	79	4		Least significant word
				open circuit = 8000.00
RESERVED	80 to 89	4		

Section 9 LATCHED ALARM VALUES

Description	Data Address	Func Code	Data Format	Comments
High TS 1 Alarm Value	90	4	Temperature	Invalid alarm value = +3000.0 °C
Low TS 1 Alarm Value	91	4	Temperature	"
High TS 2 Alarm Value	92	4	Temperature	"
Low TS 2 Alarm Value	93	4	Temperature	"
Low Load Current Alarm Value	94	4	Current	"
GF High Alarm Value	95	4	Ground Fault	"
GF Current Trip Alarm Value	96	4	Ground Fault	"
RESERVED	97 to 119	4		

Section 10 MAINTENANCE INFORMATION

Description	Data Address	Func Code	Data Format	Comments
Maximum Control Temperature	120	4	Temperature	Highest control temperature ever measured (Invalid = -3000.0 °C)
Minimum Control Temperature	121	4	Temperature	Lowest control temperature ever measured (Invalid = +3000.0 °C)
Maximum TS 1 Temperature	122	4	Temperature	Highest TS 1 temperature ever measured (Invalid = -3000.0 °C)
Minimum TS 1 Temperature	123	4	Temperature	Lowest TS 1 temperature ever measured (Invalid = +3000.0 °C)
Maximum TS 2 Temperature	124	4	Temperature	Highest TS 2 temperature ever measured (Invalid = -3000.0 °C)
Minimum TS 2 Temperature	125	4	Temperature	Lowest TS 2 temperature ever measured (Invalid = +3000.0 °C)
Power Accumulator	126	4	Integer in 10ths of kW-hr	Most significant word
	127	4		Least significant word
Highest Instantaneous Load Current Ever Measured	128	4	Current	
Highest Instantaneous Ground Fault Current Ever Measured	129	4	Ground Fault	
Contactor Cycle Count	130	4	Integer	Most significant word
	131	4		Least significant word Number of off-on transitions
Number of Hours In Use	132	4	Integer	Most significant word
	133	4		Least significant word
Number of Hours Since Last Reset	134	4	Integer	
RESERVED	135 to 169	4		
NOT USED	170 to 511	4		

Section 11 CONTROL PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
Control Temperature Setpoint	0	3,6,16	Temperature	-17.7C to 93.3C
TS Control Mode	1	3,6,16	Integer	0 = TS 1 Fail off/on 1 = TS 1 Fail to TS 2 2 = TS 2 Fail off/on 3 = TS 2 Fail to TS 1 4 = Average Fail off/on 5 = Average Fail to good 6 = Lowest Fail off/on 7 = Lowest Fail to good
Switch Control Mode	2	3,6,16	Integer	2 = on/off 3 = PASC 6 = Duty Schedule 7 = Setpoint Schedule 8 = Bracketed Ambient 9 = EXT Control
Deadband	3	3,6,16	Temperature	1.0 °C to 10 °C
PASC Minimum Ambient Temperature	4	3,6,16	Temperature	Range:-73.0DegC (-730) to 51.0DegC (510) Default -40DegC
PASC Minimum Pipe Size	5	3,6,16	Integer	0= 1.3 cm 1= 2.5 cm 2= >= 5.1 cm
PASC Power Adjust	6	3,6,16	Integer	Range:10-200 Default 100
Remote Override Status	9	3,6,16	Integer	0 = Override Not Active 1 = Force On Override Active 2 = Inhibit Override Active
RESERVED	7 to 19	3,6,16		

Section 12 TEMPERATURE SENSOR PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
High TS 1 Alarm Setpoint	20	3,6,16	Temperature	-17.7 °C to +93.3 °C
Low TS 1 Alarm Setpoint	21	3,6,16	Temperature	-17.7 °C to +82.2 °C
High TS 2 Alarm Setpoint	22	3,6,16	Temperature	-17.7 °C to +93.3 °C
Low TS 2 Alarm Setpoint	23	3,6,16	Temperature	-17.7 °C to +82.2 °C
RESERVED	24 to 25	3,6,16		
TS1 Configuration	26	3,6,16	Integer	0 = normal (control only) 1 = high limit cutout enabled
TS2 Configuration	27	3,6,16	Integer	0 = normal (control only) 1 = high limit cutout enabled
RESERVED	28 to 31	3,6,16		
TS1 High Temperature Cutoff	32	3,6,16	The output is turned off when TS1 exceeds this value.	Default = 93.3 °C Range :-17.7 °C to +93.3 °C Units: tenths of degrees
TS2 High Temperature Cutoff	33	3,6,16	The output is turned off when TS2 exceeds this value.	Default = 93.3 °C Range :-17.7 °C to +93.3 °C Units: tenths of degrees
RESERVED	34 to 49	3,6,16		

Section 13 AC ANALOG PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
Low Load Current Alarm Setpoint	50	3,6,16	Current	0.30 A to 30.00 A
Ground Fault High Current Setpoint	51	3,6,16	Ground Fault	20.0 mA to 100.0 mA
Ground Fault Trip Current Setpoint	52	3,6,16	Ground Fault	20.0 mA to 100.0 mA
RESERVED	53 to 89	3,6,16		

Section 14 CONTROLLER SETUP PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
Controller's Identification Tag	90 to 99	3,6,16	ASCII	ABC...Z0123456789/-.# Two character per address. String terminators = Null or space Note: LSByte of 99 is always Null
Auto-cycle Interval	100	3,6,16	Integer	1 to 240 hours or minutes
Contactor Cycle Count Alarm Limit Setpoint	101 102	3,6,16 3,6,16	Integer	0 to 999999 (must write 101 together with 102 using function code 16) Most significant word Least significant word
External Input Configuration	103	3,6,16	Integer	0 = Override Not Active 2 = Inhibit Override Active 3 = Force On Override Active
RESERVED	104 to 119	3,6,16		

Section 15 CONSOLE PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
Console Security Passcode	120	3,6,16	Integer	1 to 9999; 0 = Passcode Disabled
RESERVED	121 to 139	3,6,16		

Section 16 COMMUNICATION PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
Modbus Address	140	3,6,16	Integer	1 to 247
Communications Protocol	141	3,6,16	Integer *	0 = HTCBus, 1 = Modbus ASCII 2 = Modbus RTU
Communications Baud Rate	142	3,6,16	Integer *	0=auto, 1=300, 2=600, 3=1200, 4=2400, 5=4800, 6=9600
Communications Modbus Parity	143	3,6,16	Integer *	0 = none, 1= odd, 2 = even
Communications I/O Driver	144	3,6,16	Integer *	0 = auto, 1 = modem, 2 = RS-232, 3 = RS-485
Communications Profile	145	3,6,16	Integer *	0 = auto 1 = 300 baud modem 2 = 1200 baud modem 4 = RS-485 5 = 3-wire RS-232
Communications TX Delay	146	3,6,16	Integer *	Time delay before reply is sent 0 to 250 in 10 msec. units
Communications Activity Time-out	147	3,6,16	Integer	0 to 255 seconds (used for load shedding and remote override)
RESERVED	148 to 159	3,6,16		

* Changes will not take effect until the controller is reset again.

Section 17 ACS ALGORITHM PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
Wall-clock Day of Week	160	3,16	Integer *	Sunday = 0 Monday = 1 Tuesday = 2 Wednesday = 3 Thursday = 4 Friday = 5 Saturday = 6
Wall-clock Hour	161	3,16	Integer *	0-23
Wall-Clock Minute	162	3,16	Integer *	0-59
Wall-clock Seconds	163	3,16	Integer *	0-59
RESERVED	164 to 169	3,6,16		
Schedule Cycle Period	170	3,6,16	Integer	Default = 400 60 – 3600 seconds
Economy Duty Cycle	171	3,6,16	Integer	Default = 33 0 – 100 as percentage
Maintain Duty Cycle	172	3,6,16	Integer	Default = 66 0 – 100 as percentage
Economy Setpoint	173	3,6,16	Temperature	Default = 16°C Range: -17.7C to 93.3C
Maintain Setpoint	174	3,6,16	Temperature	Default = 21°C Range: -17.7C to 93.3C
RESERVED	175 to 179	3,6,16		
Bracketed High Setpoint	180	3,6,16	Temperature	Default = -3°C Range: -17.7°C to 93.3°C
Bracketed Low Setpoint	181	3,6,16	Temperature	Default = -15°C Range: -17.7°C to 93.3°C
RESERVED	182 to 189	3,6,16		
Turn on Delay	190	3,6,16	Integer	Default = 0 Delay from the time EXT input closes to the time trace is turned on. Range: 0-1080 (0-18 hours)
Turn off Delay	191	3,6,16	Integer	Default = 0 Delay from the time EXT input closes to the time trace is turned off. Range: 0-1080 (0-18 hours)
RESERVED	192 to 199	3,6,16		

* Must be written together in a single write operation.

Section 18 SCHEDULE PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
Sunday 12AM - 3:30 AM	200	3,6,16	Integer	
Sunday 4AM - 7:30AM	201	3,6,16	Integer	
Sunday 8AM -11:30 AM	202	3,6,16	Integer	
Sunday 12 PM - 3:30 PM	203	3,6,16	Integer	
Sunday 4PM - 7:30PM	204	3,6,16	Integer	
Sunday 8PM -11:30 PM	205	3,6,16	Integer	
Monday 12AM - 3:30 AM	206	3,6,16	Integer	
Monday 4AM - 7:30AM	207	3,6,16	Integer	
Monday 8AM -11:30 AM	208	3,6,16	Integer	
Monday 12 PM - 3:30 PM	209	3,6,16	Integer	
Monday 4PM - 7:30PM	210	3,6,16	Integer	
Monday 8PM -11:30 PM	211	3,6,16	Integer	
Tuesday 12AM - 3:30 AM	212	3,6,16	Integer	
Tuesday 4AM - 7:30AM	213	3,6,16	Integer	0 is least significant bit, 15 is most significant bit.
Tuesday 8AM -11:30 AM	214	3,6,16	Integer	Bits 0/1 first/earliest half hour bits 2/3 second half hour
Tuesday 12 PM - 3:30 PM	215	3,6,16	Integer	Bits 4/5 third half hour
Tuesday 4PM - 7:30PM	216	3,6,16	Integer	Bits 6/7 fourth half hour
Tuesday 8PM -11:30 PM	217	3,6,16	Integer	Bits 8/9 fifth half hour
Wednesday 12AM - 3:30 AM	218	3,6,16	Integer	Bits 10/11 sixth half hour
Wednesday 4AM - 7:30AM	219	3,6,16	Integer	Bits 12/13 seventh half hour
Wednesday 8AM -11:30 AM	220	3,6,16	Integer	Bits 14/15 eighth/latest half hour
Wednesday 12 PM - 3:30 PM	221	3,6,16	Integer	
Wednesday 4PM - 7:30PM	222	3,6,16	Integer	Default for all = 0.
Wednesday 8PM -11:30 PM	223	3,6,16	Integer	
Thursday 12AM - 3:30 AM	224	3,6,16	Integer	
Thursday 4AM - 7:30AM	225	3,6,16	Integer	For each 2 bit segment:
Thursday 8AM -11:30 AM	226	3,6,16	Integer	Off = 0
Thursday 12 PM - 3:30 PM	227	3,6,16	Integer	Economy = 1
Thursday 4PM - 7:30PM	228	3,6,16	Integer	Maintain = 2
Thursday 8PM -11:30 PM	229	3,6,16	Integer	On = 3
Friday 12AM - 3:30 AM	230	3,6,16	Integer	
Friday 4AM - 7:30AM	231	3,6,16	Integer	
Friday 8AM -11:30 AM	232	3,6,16	Integer	
Friday 12 PM - 3:30 PM	233	3,6,16	Integer	
Friday 4PM - 7:30PM	234	3,6,16	Integer	
Friday 8PM -11:30 PM	235	3,6,16	Integer	
Saturday 12AM - 3:30 AM	236	3,6,16	Integer	
Saturday 4AM - 7:30AM	237	3,6,16	Integer	
Saturday 8AM -11:30 AM	238	3,6,16	Integer	
Saturday 12 PM - 3:30 PM	239	3,6,16	Integer	
Saturday 4PM - 7:30PM	240	3,6,16	Integer	
Saturday 8PM -11:30 PM	241	3,6,16	Integer	
NOT USED	243 to 511	3,6,16		

Section 19 ALARM STATUS

Description	Data Address	Func Code	Data Format	Comments
High TS 1	0	1,5,15	Alarm Status	Alarm mask not applied
Low TS 1	1	1,5,15	Alarm Status	Alarm mask not applied
TS 1 Failure	2	1,5,15	Alarm Status	Alarm mask not applied
High TS 2	3	1,5,15	Alarm Status	Alarm mask not applied
Low TS 2	4	1,5,15	Alarm Status	Alarm mask not applied
TS 2 Failure	5	1,5,15	Alarm Status	Alarm mask not applied
Control TS Failure	6	1,5,15	Alarm Status	Alarm mask not applied
Low Load Current	7	1,5,15	Alarm Status	Alarm mask not applied
High Ground Fault	8	1,5,15	Alarm Status	Alarm mask is applied
Ground Fault Trip	9	1,5,15	Alarm Status	Alarm mask is applied
Contactor Cycle Count	10	1,5,15	Alarm Status	Alarm mask not applied
Switch Failure	11	1,5,15	Alarm Status	Alarm mask not applied
EEROM Data Failure	12	1,5,15	Alarm Status	Alarm mask not applied
Serial EEROM Not Responding	13	1,5,15	Alarm Status	Cannot be masked
Modem Chip ID Is Invalid Or Modem Baud Rate Is Invalid	14	1,5,15	Alarm Status	Cannot be masked
RESERVED	15 to 22	1,5,15		
Wall-clock invalid	23	1,5,15	Alarm Status	Cannot be masked
TS1 High Temp. Cutoff	24	1,5,15	Alarm Status	Alarm mask not applied
TS2 High Temp. Cutoff	25	1,5,15	Alarm Status	Alarm mask not applied
RESERVED	26 to 39	1,5,15		

Alarm Status = Bit is only set by the controller when an alarm condition is detected. Writing 0 clears the bit.

Section 20 ALARM MASK

Description	Data Address	Func Code	Data Format	Comments
Alarm Mask	40 to 65	1,5,15	Option	0 = alarm disabled, 1= alarm enabled. One-to-one correspondence with Alarm Status
TS1 Hi Temp Cutoff	64			
TS2 Hi Temp Cutoff	65			
RESERVED	66 to 119	1,5,15		

Section 21 DATABASE SYNCHRONIZATION PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
Controller Was Reset	120	1,5,15	Status	0 = no, 1 = yes
Local Console Modified Database	121	1,5,15	Status	0 = no, 1 = yes
Remote Device modified Database	122	1,5,15	Status	0 = no, 1 = yes
Database Potentially Modified	123	1,5,15	Status	0 = no always
RESERVED	124 to 139	1,5,15		

Status = Bit can only be set by the controller. Writing a 0 will clear the bit.

Section 22 CONTROLLER SETUP PARAMETERS

Description	Data Address	Func Code	Data Format	Comments
Console Units In Imperial	140	1,5,15	Option	0 = metric (°C, mm), 1 = imperial (°F, inches)
TS Fail Mode	141	1,5,15	Option	0 = Fail off, 1 = Fail on
Alarm Output Normally Open	142	1,5,15	Option	0 = no (normally closed), 1 = yes
Auto-Cycle Enabled	143	1,5,15	Option	0 = no, 1 = yes
Auto-Cycle Interval In Minutes	144	1,5,15	Option	0 = no (hours), 1 = yes (minutes)
Override Source	145	1,5,15	Option	0 = remote 1 = ext. input '1' is only allowed if the controller's 'external input configuration' register (data address 103) is either set to 'inhibit' or 'force on'.
RESERVED	146 to 169	1,5,15		

Section 23 RESET MAINTENANCE INFORMATION

Description	Data Address	Func Code	Data Format	Comments
Reset All Max/Min Temperatures	170	5, 15	Write Only	*
Reset Power Accumulator	171	5, 15	Write Only	*
Reset Highest Instantaneous Load Current Ever Measured	172	5, 15	Write Only	*
Reset Highest Instantaneous Gnd Fault Current Ever Measured	173	5, 15	Write Only	*
Reset Contactor Cycle Count	174	5, 15	Write Only	*
Reset Number of Hours In Use	175	5, 15	Write Only	*
Force User Defaults	176	5,15	Write Only	All User values reset
RESERVED	177 to 179	5,15		

* When using function code 5, write 0xFF00 to reset. When using function code 15, write a '1' to reset.

Section 24 ACS COILS

Description	Data Address	Func Code	Data Format	Comments
Lock User Console	180	1,5,15	Option	Unlocked = 0 Locked = 1 When locked, the console does not accept user input, and displays the message "REMOTE MODE"
RESERVED	181 to 189	1,5,15		
Invert EXT Input	190	1,5,15	Option	0 = Active high/closed 1 = Active low/open
NOT USED	191 to 255	1,5,15		

Section 25 CONTROLLER STATUS

Description	Data Address	Func Code	Data Format	Comments
Raw External Input	0	2	Status	0 = 0V, 1 = 5V to 24V
Raw External Output	1	2	Status	Not applicable
Raw Alarm Output	2	2	Status	0 = relay open, 1 = relay closed
Raw Switch Output	3	2	Status	0 = off, 1 = on
Local Console Database Unlocked	4	2	Status	0 = no, 1 = yes if console security passcode = 0 or entered correctly
RESERVED	5 to 19	2		
NOT USED	20 to 255	2		

North America

Tel +1.800.545.6258
Fax +1.800.527.5703
thermal.info@nvent.com

Europe, Middle East, Africa

Tel +32.16.213.511
Fax +32.16.213.604
thermal.info@nvent.com

Asia Pacific

Tel +86.21.2412.1688
Fax +86.21.5426.3167
cn.thermal.info@nvent.com

Latin America

Tel +1.713.868.4800
Fax +1.713.868.2333
thermal.info@nvent.com



nVent.com Our powerful portfolio of brands:
CADDY ERICO HOFFMAN RAYCHEM SCHROFF TRACER

©2018 nVent. All nVent marks and logos are owned or licensed by nVent Services GmbH or its affiliates. All other trademarks are the property of their respective owners.
nVent reserves the right to change specifications without notice.

Raychem-AR-H58445-C910Modbus-EN-1805