Evaporative Cooler

SKVF Series

Modbus Communication Module User Guide

Introduction

The SKVF Modbus Communication Module User Guide provides information for using Neptronic® communication feature. The controller uses Modbus communication protocol over serial line in the RTU mode and provides a Modbus network interface between client devices and Neptronic SKVF devices.
The SKVF Modbus Guide assumes that you are familiar with Modbus terminology.

The following are the requirements for Modbus:

- *Data Model*. The Evaporative Cooler Modbus server data model uses only the Modbus Registers table.
- *Register Address*:
    - As per protocol base (base 0); for PLC add 1 to protocol base.
    - As per holding register (base 400001).

    Note: Ensure that the Modbus communication software used does not have a limit on the range of the register addresses that can be viewed and supports 6-digit holding registers.

- *Function Codes*. The Evaporative Cooler Modbus server supports a limited function codes subset comprising:
    - Read Holding Registers (0x03)
    - Write Single Register (0x06)
    - Write Multiple Registers (0x10)
- *Exception Responses*. The Evaporative Cooler Modbus server supports the following exception codes:
    - Illegal data address
    - Illegal data value
    - Slave device busy
- *Serial Line*. The Evaporative Cooler Modbus over serial line uses RTU transmission mode over a two-wire configuration RS485 (EIA/TIA-485 standard) physical layer.
    - The physical layer can use fixed baud rate selection or automatic baud rate detection (default) as per the **Modbus Auto Baud Rate** device menu item or holding register index 1.
    - The supported baud rates are 9600, 19200, 38400, and 57600.
    - The physical layer also supports variable parity control and stop bit configuration as per the **Modbus Comport Config** device menu item or holding register index 2.
    - In auto baud rate configuration, if the device detects only consecutive bad frames (2 or more) for one second with any given baud rate, it will reinitialize itself to the next baud rate.
- *Addressing*. The Evaporative Cooler device only answers at the following address:
    - The device's unique address (1 to 246) that can be set through the device menu or through holding register index 0.

Modbus Registers

Table Glossary

Name	Description	Name	Description
W	Writable Register	ASCII	For registers containing ASCII (8-bit) characters
RO	Read Only Register	MSB	Most Significant Byte
Unsigned	For range of values from 0 to 65,535, unless otherwise specified	LSB	Least Significant Byte
Signed	For range of values from -32,768 to 32,767, unless otherwise specified	MSW	Most Significant Word
Bit String	For registers with multiple values using bit mask (example, flags)	LSW	Least Significant Word

Modbus Registers Table

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
0	40000**1**	Modbus Address and Product Type	Unsigned	MSB = Product type, not writable LSB = Modbus Address (1 to 247), writable	W	
1	40000**2**	Device Baud Rate	Unsigned *Scale 100*	0, 9600, 19200, 38400, and 57600, 0 = Auto Baud *Rate Detection Value/100 (e.g. 38400 baud = 384)*	W	19200
2	40000**3**	Modbus Slave Communication Port Configuration	Unsigned	0 = No parity, 2 Stop bits 1 = Even parity, 1 Stop bit 2 = Odd parity, 1 Stop bit	W	No parity, 2 Stops bits
3	40000**4**	Product Name (characters 8 & 7)	ASCII	MSB = char 6, LSB = char 7	W	
4	40000**5**	Product Name (characters 6 & 5)	ASCII	MSB = char 4, LSB = char 5	W	
5	40000**6**	Product Name (characters 4 & 3)	ASCII	MSB = char 2, LSB = char 3	W	
6	40000**7**	Product Name (characters 2 & 1)	ASCII	MSB = char 0, LSB = char 1	W	

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
7	40000**8**	Product Actual Firmware Version (in Integer x100)	Unsigned *Scale 100*	1 to 65535 (e.g. 100)	RO	
8	40000**9**	Product Actual EEPROM Version (in Integer x100)	Unsigned *Scale 100*	1 to 65535 (e.g. 100)	RO	
2000	40**2001**	Control Signal	Unsigned *Scale 1000*	Units: Volt (V), Range: 0V to 15V *Value x 1000 (e.g. 2V = 2000)*	RO	0V
2001	40**2002**	Room RH Signal	Unsigned *Scale 1000*	Units: Volt (V), Range: 0V to 15V *Value x 1000 (e.g. 2V = 2000)*	RO	0V
2002	40**2003**	Supply RH Signal	Unsigned *Scale 1000*	Units: Volt (V), Range: 0V to 15V *Value x 1000 (e.g. 2V = 2000)*	RO	0V
2003	40**2004**	ECM Fan Feedback	Unsigned *Scale 1*	Units: Hz, Range: 0 to 30000Hz *Value x 1 (e.g. 10Hz = 10)*	RO	0Hz
2004	40**2005**	Float Switch Signal	Unsigned *Scale 1000*	Unit: Volt (V), Range: 0V to 10V *Value x 1000 (e.g. 2V = 2000)*	RO	0V
2005	40**2006**	Board Temperature Signal	Unsigned *Scale 1000*	Unit: Volt (V), Range: 0V to 10V *Value x 1000 (e.g. 2V = 2000)*	RO	0V
2006	40**2007**	Main Power Supply	Unsigned *Scale 10*	Unit: Volt (V), Range: 0V to 40V *Value x 10 (e.g. 2V = 20)*	RO	0V
2007	40**2008**	ECM Fan Feedback 2	Unsigned *Scale 1*	Units: Hz, Range: 0 to 30000Hz *Value x 1 (e.g. 10Hz = 10)*	RO	0Hz
2008	40**2009**	Room Temperature Signal	Unsigned *Scale 1000*	Units: Volt (V), Range: 0V to 15V *Value x 1000 (e.g. 2V = 2000)*	RO	0V
2009	40**2010**	Supply Temperature Signal	Unsigned *Scale 1000*	Units: Volt (V), Range: 0V to 15V *Value x 1000 (e.g. 2V = 2000)*	RO	0V
2010	40**2011**	Control Signal	Unsigned *Scale 1000*	Units: Volt (V), Range: 0V to 15V *Value x 1000 (e.g. 2V = 2000)*	RO	0V

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
4000	40**4001**	Power Output Feedback Signal	Unsigned *Scale 1000*	Unit: Volt (V), Range: 0V to 10V *Value x 1000 (e.g. 2V = 2000)*	RO	0V
4001	40**4002**	ECM Fan Signal	Unsigned *Scale 100*	Unit: Volt (V), Range: 0V to 10V *Value x 1000 (e.g. 2V = 2000)*	RO	0V
6000	40**6001**	Demand	Unsigned *Scale 100*	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	RO	0%
6001	40**6002**	Power Output	Unsigned *Scale 100*	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	RO	0%
6002	40**6003**	Control Input	Unsigned *Scale 100*	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	W	0%
6003	40**6004**	Control Min	Unsigned *Scale 100*	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	W	0%
6004	40**6005**	Control Max	Unsigned *Scale 100*	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	W	0%
6005	40**6006**	Control Bias	Signed *Scale 100*	Unit: %, Range: -10% to 10% Value x 100 (e.g. 10% = 1000)	W	0%
6006	40**6007**	Room RH	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	RO	0% RH
6007	40**6008**	Room RH Min	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	W	0% RH
6008	40**6009**	Room RH Max	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	W	0% RH
6009	40**6010**	Room RH Bias	Unsigned *Scale 100*	Unit: % RH, Range: -10% RH to 10% RH *Value x 100 (e.g. 10% RH = 1000)*	W	0% RH
6010	40**6011**	Supply High Limit RH	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	RO	0% RH

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6011	40**6012**	Supply High Limit RH Min	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	W	0% RH
6012	40**6013**	Supply High Limit RH Max	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	W	0% RH
6013	40**6014**	Supply High Limit RH Bias	Signed *Scale 100*	Unit: %, Range: -10% RH to 10% RH *Value x 100 (e.g. 10% RH = 1000)*	W	0% RH
6014	40**6015**	Run Time (0)	Unsigned *Scale 100*	Units: Hours (h), Range: 0 to 2147483647 h *Value x 100 (e.g. 10 h = 1000)*	RO	0h
6015	40**6016**	Run Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6016	40**6017**	Run Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		
6017	40**6018**	Run Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		
6018	40**6019**	On Time (0)	Unsigned *Scale 100*	Units: Hours (h), Range: 0 to 2147483647 h *Value x 100 (e.g. 10 h = 1000)*	RO	0h
6019	40**6020**	On Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6020	40**6021**	On Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		
6021	40**6022**	On Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		
6022	40**6023**	Water Treated Volume (0)	Unsigned *Scale 100*	Units: Litres (l), Range: 0 to 9999999 l *Value x 100 (e.g. 10 h = 1000)*	RO	0l
6023	40**6024**	Water Treated Volume (1)		Units: Litres (l), Range: 0 to 9999999 l		
6024	40**6025**	Water Treated Volume (2)		Units: Litres (l), Range: 0 to 9999999 l		
6025	40**6026**	Water Treated Volume (3)		Units: Litres (l), Range: 0 to 9999999 l		
6026	40**6027**	Service On Time (0)	Unsigned *Scale 100*	Units: Hours (h), Range: 0 to 2147483647 h *Value x 100 (e.g. 10 h = 1000)*	RO	0h
6027	40**6028**	Service On Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6028	40**6029**	Service On Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6029	40**6030**	Service On Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		
6030	40**6031**	Dead Band	Unsigned *Scale 1*	Unit: %, Range: 1% to 100% *Value x 1 (e.g. 10% = 10)*	W	5%
6031	40**6032**	Minimum Production Output	Unsigned *Scale 1*	Unit: %, Range: 0% to 100% *Value x 1 (e.g. 10% = 10)*	W	10%
6032	40**6033**	Maximum Production Output	Unsigned *Scale 1*	Unit: %, Range: 0% to 100% *Value x 1 (e.g. 10% = 10)*	W	100%
6033	40**6034**	Idle Fan Speed	Unsigned *Scale 1*	Unit: %, Range: 0% to 100% *Value x 1 (e.g. 10% = 10)*	W	0%
6034	40**6035**	Service Interval	Unsigned *Scale 1*	Units: Hours (h), Range: 1000 to 3000 h *Value x 1 (e.g. 10 h = 10)*	W	1000h
6035	40**6036**	Board Temperature	Unsigned *Scale 100*	Unit: ºC/ºF, Range: 0°C to 100°C or 32°F to 212°F *Value x 100 (e.g. 5°C = 500 or 32ºF = 3200)*	W	0°C or 32°F
6036	40**6037**	Power Output Feedback Bias	Unsigned *Scale 1000*	Unit: V, Range: 0V to 10V *Value x 1000 (e.g. 1V = 1000)*	W	0V
6037	40**6038**	Power Output Feedback Min	Unsigned *Scale 1000*	Unit: V, Range: 0V to 10V *Value x 1000 (e.g. 1V = 1000)*	W	0V
6038	40**6039**	Power Output Feedback Max	Unsigned *Scale 1000*	Unit: V, Range: 0V to 10V *Value x 1000 (e.g. 1V = 1000)*	W	10V
6039	40**6040**	Power Output Feedback	Unsigned *Scale 100*	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	RO	0%
6040	40**6041**	Dilution Ratio	Unsigned *Scale 1*	Unit: %, Range: 0% to 300% *Value x 1 (e.g. 10% = 10)*	W	100%
6041	40**6042**	Drain Interval	Unsigned *Scale 1*	Unit: Hours (h), Range: 0 to 24 h *Value x 1 (e.g. 10h = 10)*	W	4h

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6042	40**6043**	Fixed Drain Time	Unsigned *Scale 1*	Unit: Hours (h), Range: 4 to 72 h *Value x 1 (e.g. 10h = 10)*	W	6h
6043	40**6044**	Line Rinse Time	Unsigned *Scale 1*	Unit: Seconds (sec), Range: 0sec to 2000sec *Value x 1 (e.g. 10sec = 10)*	W	180 sec
6044	40**6045**	Water Treatment Service Volume	Unsigned *Scale 1*	Unit: Litres (l), Range: 2500 to 10000 l *Value x 1 (e.g. 10h = 10)*	W	7500 l
6045	40**6046**	Water Supply Duty Cycle	Unsigned *Scale 1*	Unit: %, Range: 8% to 70% Value x 1 (e.g. 10% = 10)	W	10%
6046	40**6047**	Water Supply Period	Unsigned *Scale 1*	Unit: Seconds (sec), Range: 0sec to 180sec *Value x 1 (e.g. 10sec = 10)*	W	60 sec
6047	40**6048**	Room RH Network Reading	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	W	0% RH
6048	40**6049**	Room RH Setpoint	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10%* RH = *1000)*	W	40% RH
6049	40**6050**	Room RH Unoccupied Setpoint	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10%* RH = *1000)*	W	30% RH
6050	40**6051**	Room RH Vacant Setpoint	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10%* RH = *1000)*	W	20% RH
6051	40**6052**	Room RH Demand Proportional Gain	Unsigned *Scale 10*	No Unit, Range: 1 to 200 *Value x 10 (e.g. 10 = 100)*	W	28.5
6052	40**6053**	Room RH Demand Integral Time	Unsigned *Scale 10*	Unit: Seconds (sec), Range: 0 to 900 sec *Value x 10 (e.g. 10 sec = 100)*	W	0 sec
6053	40**6054**	Room RH Demand Derivative Time	Unsigned *Scale 10*	Unit: Seconds (sec), Range: 0 to 60 sec *Value x 10 (e.g. 10 sec = 100)*	W	0 sec
6054	40**6055**	Room RH Demand	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10%* RH = *1000)*	RO	0% RH

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6055	40**6056**	RH Supply High Limit Network Reading	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	W	0% RH
6056	40**6057**	RH Supply High Limit Setpoint	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	W	80% RH
6057	40**6058**	RH Supply High Limit Unoccupied Setpoint	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	W	80% RH
6058	40**6059**	RH Supply High Limit Vacant Setpoint	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	W	80% RH
6059	40**6060**	RH Supply High Limit Proportional Gain	Unsigned *Scale 10*	No Unit, Range: 1 to 200 *Value x 10 (e.g. 10 = 100)*	W	28.5
6060	40**6061**	RH Supply High Limit Integral Time	Unsigned *Scale 10*	Unit: Seconds (sec), Range: 0 to 900 sec *Value x 10 (e.g. 10 sec = 100)*	W	0 sec
6061	40**6062**	RH Supply High Limit Derivative Time	Unsigned *Scale 10*	Unit: Seconds (sec), Range: 0 to 60 sec *Value x 10 (e.g. 10 sec = 100)*	W	0 sec
6062	40**6063**	RH Supply High Limit Demand	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10% RH = 1000)*	RO	0% RH
6063	40**6064**	Control Network Demand	Unsigned Scale 100	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	W	0%
6064	40**6065**	Control Network High Limit	Unsigned Scale 100	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	W	0%
6065	40**6066**	User Demand	Unsigned *Scale 100*	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	RO	0%
6066	40**6067**	System Steam Capacity	Unsigned *Scale 10*	Unit: kg/hr or lb/hr, Range: 0 to 3000 kg/hr or 0 to 6614 lb/hr *Value x 10 (e.g. 10kg/hr = 100 or 10lb/hr = 100)*	RO	0 kg/hr or 0 lb/hr

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6067	40**6068**	Room Temperature	Signed *Scale 100*	Unit: C or F, Range**:** -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C *Value x 100 (e.g. 10°C = 1000)*	W	20.0°C or 68.0°F
6068	40**6069**	Room Temperature Min	Signed *Scale 100*	Unit: C or F, Range**:** -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C *Value x 100 (e.g. 10°C = 1000)*	W	0.0°C or 32.0°F
6069	40**6070**	Room Temperature Max	Signed *Scale 100*	Unit: C or F, Range**:** -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C *Value x 100 (e.g. 10°C = 1000)*	W	40.0°C or 104.0°F
6070	40**6071**	Room Temperature Bias	Signed *Scale 100*	Unit: C or F, Range**:** -18.0°F, max: 18.0°F or -10.0°C, max: 10.0°C *Value x 100 (e.g. 10°C = 1000)*	W	0.0°C or 0.0°F
6071	40**6072**	Room Temperature Network Reading	Unsigned *Scale 100*	Unit: ºC/ºF, Range: -40°C to 260°C or -40°F to 500°F, *Value x 100 (e.g. 5°C = 500 or 10ºF = 1000)*	W	0°C or 32°F
6072	40**6073**	Room Temperature Setpoint	Unsigned *Scale 100*	Unit: ºC/ºF, Range: 0°C to 40°C or 32°F to 104°F, *Value x 100 (e.g. 5°C = 500 or 10ºF = 1000)*	W	22°C or 71.6°F
6073	40**6074**	Room Temperature Unoccupied Setpoint	Unsigned *Scale 100*	Unit: ºC/ºF, Range: 0°C to 40°C or 32°F to 104°F, *Value x 100 (e.g. 5°C = 500 or 10ºF = 1000)*	W	24°C or 75.2°F
6074	40**6075**	Room Temperature Vacant Setpoint	Unsigned *Scale 100*	Unit: ºC/ºF, Range: 0°C to 40°C or 32°F to 104°F, *Value x 100 (e.g. 5°C = 500 or 10ºF = 1000)*	W	26°C or 78.8°F
6075	40**6076**	Room Temperature Demand Proportional Gain	Unsigned *Scale 10*	No Unit, Range: 1 to 200 *Value x 10 (e.g. 10 = 100)*	W	28.5
6076	40**6077**	Room Temperature Demand Integral Time	Unsigned *Scale 10*	Unit: Seconds (sec), Range: 0 to 900 sec *Value x 10 (e.g. 10 sec = 100)*	W	0 sec
6077	40**6078**	Room Temperature Demand Derivative Time	Unsigned *Scale 10*	Unit: Seconds (sec), Range: 0 to 60 sec *Value x 10 (e.g. 10 sec = 100)*	W	0 sec

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6078	40**6079**	Room Temperature Demand	Unsigned *Scale 100*	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	RO	0%
6079	4**06080**	HRL Temperature	Signed *Scale 100*	Unit: ºC/ºF, Range: -40°C to 260°C or -40°F to 500°F, *Value x 100 (e.g. 5°C = 500 or 10ºF = 1000)*	RO	0°C or 32°F
6080	40**6081**	HRL Humidity	Unsigned *Scale 100*	Unit: % RH, Range: 0% RH to 100% RH *Value x 100 (e.g. 10%* RH = *1000)*	RO	0% RH
6081	40**6082**	Room Temp Demand Proportional Band	Unsigned *Scale 10*	Unit: %, Range: 1% to 100% *Value x 10 (e.g. 10% = 100)*	W	5%
6082	40**61083**	Temp Supply High Limit Network Reading	Signed Scale 100	Unit: ºC/ºF, Range: -40°C to 100°C or -40°F to 212°F, *Value x 100 (e.g. 5°C = 500 or 10ºF = 1000)*	W	0°C or 32°F
6083	40**6084**	Temp Supply High Limit Setpoint	Unsigned Scale 100	Unit: ºC/ºF, Range: 0°C to 40°C or 32°F to 104°F, *Value x 100 (e.g. 5°C = 500 or 10ºF = 1000)*	W	15°C or 59°F
6084	40**6085**	Temp Supply High Limit Unoccupied Setpoint	Unsigned Scale 100	Unit: ºC/ºF, Range: 0°C to 40°C or 32°F to 104°F, *Value x 100 (e.g. 5°C = 500 or 10ºF = 1000)*	W	17°C or 62.6°F
6085	40**6086**	Temp Supply High Limit Vacant Setpoint	Unsigned Scale 100	Unit: ºC/ºF, Range: 0°C to 40°C or 32°F to 104°F, *Value x 100 (e.g. 5°C = 500 or 10ºF = 1000)*	W	16°C or 60.8°F
6086	40**6087**	Temp Supply High Limit Proportional Gain	Unsigned *Scale 10*	No Unit, Range: 1 to 200 *Value x 10 (e.g. 10 = 100)*	W	28.0
6087	40**6088**	Temp Supply High Limit Integral Time	Unsigned *Scale 10*	Unit: Seconds (sec), Range: 0 to 900 sec *Value x 10 (e.g. 10 sec = 100)*	W	0 sec
6088	40**6089**	Modbus TCP IP Keep Alive Time Out	Unsigned *Scale 1*	Unit: Minutes (min), Range: 1 to 1440 mins *Value x 1 (e.g. 5 mins = 5)*	W	5 min
6089	40**6090**	Temp Supply High Limit Derivative Time	Unsigned *Scale 10*	Unit: Seconds (sec), Range: 0 to 60 sec *Value x 10 (e.g. 10 sec = 100)*	W	0 sec
6090	40**6091**	Temp Supply High Limit Demand	Unsigned *Scale 100*	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	RO	0%

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6091	40**6092**	Temp Supply High Limit Proportional Band	Unsigned *Scale 10*	Unit: %, Range: 1% to 100% *Value x 100 (e.g. 10% = 100)*	RO	10%
6092	40**6093**	Supply High Limit Temperature	Signed *Scale 100*	Unit: C or F, Range**:** -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C *Value x 100 (e.g. 10°C = 1000)*	W	20.0°C or 68.0°F
6093	40**6094**	Supply High Limit Temperature Min	Signed *Scale 100*	Unit: C or F, Range**:** -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C *Value x 100 (e.g. 10°C = 1000)*	W	0.0°C or 32.0°F
6094	40**6095**	Supply High Limit Temperature Max	Signed *Scale 100*	Unit: C or F, Range**:** -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C *Value x 100 (e.g. 10°C = 1000)*	W	40.0°C or 104.0°F
6095	40**6096**	Supply High Limit Temperature Bias	Signed *Scale 100*	Unit: C or F, Range**:** -18.0°F, max: 18.0°F or -10.0°C, max: 10.0°C *Value x 100 (e.g. 10°C = 1000)*	W	20.0°C or 68.0°F
6096	40**6097**	Control Input	Signed *Scale 100*	Unit: C or F, Range**:** -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C *Value x 100 (e.g. 10% = 1000)*	W	20.0°C or 68.0°F
6097	40**6098**	Control Min	Signed *Scale 100*	Unit: C or F, Range**:** -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C *Value x 100 (e.g. 10% = 1000)*	W	0.0°C or 32.0°F
6098	40**6099**	Control Max	Signed *Scale 100*	Unit: C or F, Range**:** -40.0°F, max: 212.0°F or -40.0°C, max: 100.0°C *Value x 100 (e.g. 10% = 1000)*	W	40.0°C or 104.0°F
6099	40**6100**	Control Bias	Signed *Scale 100*	Unit: C or F, Range**:** -18.0°F, max: 18.0°F or -10.0°C, max: 10.0°C *Value x 100 (e.g. 10% = 1000)*	W	20.0°C or 68.0°F
6100	40**6101**	Demand Low Dead Band	Unsigned Scale 100	Unit: %, Range: 0% to 100% *Value x 100 (e.g. 10% = 1000)*	W	1%

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6101	40**6102**	Network Timeout	Unsigned Scale 1	Unit: Seconds (sec), Range: 1 to 900 sec *Value x 1 (e.g. 10sec = 10)*	W	900 sec
6102	40**6103**	Room RH Demand Proportional Band	Unsigned *Scale 10*	Unit: %, Range: 1% to 100% *Value x 10 (e.g. 10% = 100)*	W	5%
6103	40**6104**	RH Supply High Limit Proportional Band	Unsigned *Scale 10*	Unit: %, Range: 1% to 100% *Value x 100 (e.g. 10% = 100)*	RO	10%
6104	40**6105**	Completely Dry Delay	Unsigned *Scale 1*	Unit: Hours (h), Range: 0 to 24 h Value x 1 (e.g. 10h = 10)	W	2h
6105	40**6106**	Hour of Day Drying Cycle	Unsigned *Scale 1*	Unit: Hours (h), Range: 0 to 24 h Value x 1 (e.g. 10h = 10)	W	0h
6106	40**6107**	Drying Fan Speed	Unsigned *Scale 1*	Unit: %, Range: 0% to 100% Value x 1 (e.g. 10% = 10)	W	100%
6107	40**6108**	HRL Temperature Bias	Signed *Scale 100*	Unit: C or F, Range**:** -18.0°F, max: 18.0°F or -10.0°C, max: 10.0°C *Value x 100 (e.g. 10°C = 1000)*	W	0.0°C or 0.0°F
6108	40**6109**	HRL Humidity Bias	Unsigned *Scale 100*	Unit: % RH, Range: -10% RH to 10% RH *Value x 100 (e.g. 10%* RH = *1000)*	RO	0% RH
10000	4**10001**	Air Flow	Unsigned *Scale 1*	0 = Closed 1 = Open	RO	Closed
10001	4**10002**	Supply High Limit	Unsigned *Scale 1*	0 = Closed 1 = Open	RO	Closed
10002	4**10003**	Interlock	Unsigned *Scale 1*	0 = Closed 1 = Open	RO	Closed
10003	4**10004**	Binary External Demand	Unsigned *Scale 1*	0 = 0% 1 = 100%	RO	0%
10004	4**10005**	Water Leak Detection	Unsigned *Scale 1*	0 = Ok 1 = Leak	RO	Ok

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
10005	4**10006**	RS485 Interface	Unsigned *Scale 1*	0 = No 1 = Yes	RO	No
10006	4**10007**	Ethernet Interface	Unsigned *Scale 1*	0 = No 1 = Yes	RO	No
10007	4**10008**	Relay Fuse	Unsigned *Scale 1*	0 = Normal 1 = Blown Fuse	RO	Normal
10008	4**10009**	Control PCB Fuse	Unsigned *Scale 1*	0 = Normal 1 = Open Fuse	RO	Normal
11000	4**11001**	Alarm Warning Relay	Unsigned *Scale 1*	0 = Off 1 = On	RO	Off
11001	4**11002**	Service Warning Relay	Unsigned *Scale 1*	0 = Off 1 = On	RO	Off
11002	4**11003**	Water Supply Valve	Unsigned *Scale 1*	0 = Off 1 = On	RO	Off
11003	4**11004**	Drain Valve	Unsigned *Scale 1*	0 = Off 1 = On	RO	Off
11004	4**11005**	Circulation Pump	Unsigned *Scale 1*	0 = Off 1 = On	RO	Off
11005	4**11004**	Alarm LED	Unsigned *Scale 1*	0 = Off 1 = On	RO	Off
11006	4**11005**	Power LED	Unsigned *Scale 1*	0 = Off 1 = On	RO	Off
11007	4**11008**	Buzzer	Unsigned *Scale 1*	0 = Off 1 = On	RO	Off
12000	4**12001**	Float Switch	Unsigned *Scale 1*	0 = Inactive 1 = Active	RO	Inactive

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
12001	4**12002**	Water Treatment Service Due	Unsigned *Scale 1*	0 = No 1 = Yes	RO	No
12002	4**12003**	Service Due	Unsigned *Scale 1*	0 = Not Allowed 1 = Allowed	W	Not Allowed
12003	4**12004**	Run While Water Service Alarm	Unsigned *Scale 1*	0 = Not Allowed 1 = Allowed	W	Not Allowed
12004	4**12005**	Startup Line Rinse	Unsigned *Scale 1*	0 = Off 1 = On	W	Off
12005	4**12006**	Run While Service Alarm	Unsigned *Scale 1*	0 = Not Allowed 1 = Allowed	W	Allowed
12006	4**12007**	HRL Lock Setpoint	Unsigned *Scale 1*	0 = Unlock 1 = Lock	W	Unlock
12007	4**12008**	Network Control State	Unsigned *Scale 1*	0 = Normal 1 = Fault	W	Normal
12008	4**12009**	Notify Alarm	Unsigned *Scale 1*	0 = Off 1 = On	W	Off
12009	4**12010**	Notify Warning	Unsigned *Scale 1*	0 = Off 1 = On	W	Off
12010	4**12011**	Notify App Msg	Unsigned *Scale 1*	0 = Off 1 = On	W	Off
15000	4**15001**	Modbus Server Units	Unsigned *Scale 1*	0 = Metric 1 = Imperial	W	Metric
15001	4**15002**	Control Signal Type	Unsigned *Scale 1*	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15002	4**15003**	Room RH Signal Type	Unsigned *Scale 1*	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts		Writable	Default Value
15003	4**15004**	Supply RH Signal Type	Unsigned *Scale 1*	0 = 0-10Vdc 1 = 2-10Vdc	2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15004	4**15005**	Control Profile	Unsigned *Scale 1*	0 = ExternAnalog 1 = ExternNetwork 2 = InternHumAnalog 3 = InternHumNetwork	4 = InternCoolAnalog 5 = InternCoolNetwork 6 = HRLHum 7 = HRLCool 8 = Custom	W	ExternAnalog
15005	4**15006**	Modulating High Limit Profile	Unsigned *Scale 1*	0 = Disabled 1 = ExternAnalog 2 = ExternNetwork 3 = InternHumAnalog	4 = InternHumNetwork 5 = InternCoolAnalog 6 = InternCoolNetwork 7 = Custom	W	Disabled
15006	4**15007**	Occupancy State	Unsigned *Scale 1*	0 = Occupied 1 = Unoccupied	2 = Vacant 3 = Off	RO	Occupied
15007	4**15008**	Room RH Source	Unsigned *Scale 1*	0 = None 1 = RoomRH	2 = Network 3 = HRL	W	None
15008	4**15009**	Room RH Setpoint Source	Unsigned *Scale 1*	0 = None 1 = Internal	2 = ControlInput	W	None
15009	4**15010**	RH Supply High Limit Reading Source	Unsigned *Scale 1*	0 = None 1 = SuppyHLRH	2 = Network	W	None
15010	4**15011**	RH Supply High Limit Setpoint Source	Unsigned *Scale 1*	0 = None 1 = Internal	2 = ControlInput	W	None
15011	4**15012**	Control Demand Source	Unsigned *Scale 1*	0 = None 1 = ControlInput	2 = RoomDemand 3 = Network	W	ControlInput
15012	4**15013**	Control High Limit Source	Unsigned *Scale 1*	0 = None 1 = ControlInput	2 = RHSupplyHLDemand 3 = Network 4=TempSupplyHLDemand	W	None
15013	4**15014**	Control Cutout State	Unsigned *Scale 1*	0 = Off 1 = Normal 2 = LowLimit	3 = HighLimit 4 = NoAirFlow 5 = Interlock	RO	Off

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
15014	4**15015**	State	Unsigned *Scale 1*	0 = Off 1 = Idle 2 = LineRinse 3 = Filling 4 = Draining 5 = Running 6 = Alarm 7 = Drying	RO	Off
15015	4**15016**	System Alarm	Unsigned *Scale 1*	0 = Normal 1 = DrainTimeout 2 = FillTimeout 3 = WaterLeak 4 = FanDefect	RO	Normal
15016	4**15017**	Fan Request	Unsigned *Scale 1*	0 = Off 1 = Default 2 = On	W	Default
15017	4**15018**	Pump Request	Unsigned *Scale 1*	0 = Off 1 = Default 2 = On	W	Default
15018	4**15019**	Water Supply Request	Unsigned *Scale 1*	0 = Off 1 = Default 2 = On	W	Default
15019	4**15020**	Room Temperature Setpoint Source	Unsigned *Scale 1*	0 = None 1 = Internal 2 = ControlInput	W	None
15020	4**15021**	Temp Supply High Limit Reading Source	Unsigned *Scale 1*	0 = None 1 = SuppyHLTemp 2 = Network	W	None
15021	4**15022**	Temp Supply High Limit Setpoint Source	Unsigned *Scale 1*	0 = None 1 = Internal 2 = ControlInput	W	None
15022	4**15023**	Room Temperature Source	Unsigned *Scale 1*	0 = None 1 = RoomTemp 2 = Network 3 = HRL	W	None
15023	4**15024**	Room Temperature Signal Type	Unsigned *Scale 1*	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15024	4**15025**	Supply Temperature Signal Type	Unsigned *Scale 1*	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
15025	4**15026**	Control Signal Type	Unsigned *Scale 1*	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15026	4**15027**	System Power State	Unsigned *Scale 1*	0 = Off 1 = On	RO	Off
15027	4**15028**	Recirculation Request	Unsigned *Scale 1*	0 = None 1 = ResetAlarms 2 = Drain 3 = ResetServCnt 4 = ResetWtrServCnt 5 = Filling	W	None
15028	4**15029**	DirectFeed Request	Unsigned *Scale 1*	0 = None 1 = ResetAlarms 3 = ResetServCnt 4 = ResetWtrServCnt	W	None

Notes

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