



**neptronic®**

# **SKE4 Steam Humidifier**

## **Modbus Communication Module User Guide**



## Introduction

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The SKE4 Modbus Communication Module User Guide provides information for using Neptronic<sup>®</sup> 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 SKE4 devices.

The SKE4 Modbus Guide assumes that you are familiar with Modbus terminology.

The following are the requirements for Modbus:

- *Data Model.* The SKE4 Steam Humidifier 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 SKE4 Steam Humidifier Modbus server supports a limited function codes subset comprising:
  - Read Holding Registers (0x03)
  - Write Single Register (0x06)
  - Write Multiple Registers (0x10)
- *Exception Responses.* The SKE4 Steam Humidifier Modbus server supports the following exception codes:
  - Illegal data address
  - Illegal data value
  - Slave device busy
- *Serial Line.* The SKE4 Steam Humidifier 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 SKE4 Steam Humidifier 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	400001	Modbus Address and Product Type	Unsigned	MSB = Product type, not writable LSB = Modbus Address (1 to 247), writable	W	
1	400002	Device Baud Rate	Unsigned <i>Scale 100</i>	0, 9600, 19200, 38400, and 57600, 0 = Auto Baud Rate Detection Value/100 (e.g. 38400 baud = 384)	W	19200
2	400003	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	400004	Product Name (characters 8 & 7)	ASCII	MSB = char 6, LSB = char 7	W	
4	400005	Product Name (characters 6 & 5)	ASCII	MSB = char 4, LSB = char 5	W	
5	400006	Product Name (characters 4 & 3)	ASCII	MSB = char 2, LSB = char 3	W	
6	400007	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	400008	Product Actual Firmware Version (in Integer x100)	Unsigned Scale 100	1 to 65535 (e.g. 100)	RO	
8	400009	Product Actual EEPROM Version (in Integer x100)	Unsigned Scale 100	1 to 65535 (e.g. 100)	RO	
2000	402001	Control Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 100 (e.g. 2V = 200)	RO	0V
2001	402002	Room RH Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 100 (e.g. 2V = 200)	RO	0V
2002	402003	Supply RH Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 100 (e.g. 2V = 200)	RO	0V
2003	402004	Water Level Signal	Unsigned Scale 1	Units: Hz, Range: 0 to 30000Hz Value x 1 (e.g. 10Hz = 10)	RO	0Hz
2004	402005	Water Level Low Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	0V
2005	402006	Water Level High Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	0V
2006	402007	Water Temperature Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	0V
2007	402008	Foam Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	0V
2008	402009	SSR Temperature Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	0V
2009	402010	Cabinet Temperature Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	0V
2010	402011	Current Sensor 1 Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 330V Value x 100 (e.g. 1V = 100)	RO	0V

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
2011	402012	Current Sensor 2 Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 330V Value x 100 (e.g. 1V = 100)	RO	0V
2012	402013	Board Temperature Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	0V
2013	402014	Main Power Supply	Unsigned Scale 10	Unit: Volt (V), Range: 0V to 40V Value x 10 (e.g. 2V = 20)	RO	0V
4000	404001	Power Output Feedback Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	0V
4001	404002	Heater SSR Stage	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6000	406001	Control Input	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6001	406002	Room RH	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6002	406003	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
6003	406004	Water Temperature Signal Min	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	0V
6004	406005	Water Temperature Signal Max	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 100 (e.g. 2V = 200)	RO	3V
6005	406006	Water Temperature	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 125°C or 32°F to 257°F Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	50°C or 122°F
6006	406007	Water Temperature Min	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 250°C or 32°F to 482°F Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	0°C or 32°F
6007	406008	Water Temperature Max	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 250°C or 32°F to 482°F Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	125°C or 257°F

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6008	406009	Water Temperature Bias	Signed Scale 100	Unit: °C/°F, Range: -10°C to 10°C or 14°F to 50°F Value x 100 (e.g. 5°C = 500 or 14°F = 1400)	RO	0°C or 32°F
6009	406010	SSR Temperature	Signed Scale 100	Unit: °C/°F, Range: -20°C to 100°C or -4°F to 212°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	0°C or 32°F
6010	406011	Cabinet Temperature	Signed Scale 100	Unit: °C/°F, Range: -20°C to 100°C or -4°F to 212°F Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	0°C or 32°F
6011	406012	Current Sensor 1 (0)	Unsigned Scale 100	Unit: Amps (A), Range: 0A to 150A Value x 100 (e.g. 10A = 1000)	RO	0A
6012	406013	Current Sensor 1 (1)		Unit: Amps (A), Range: 0A to 150A		
6013	406014	Current Sensor 2 (0)	Unsigned Scale 100	Unit: Amps (A), Range: 0A to 150A Value x 100 (e.g. 10A = 1000)	RO	0A
6014	406015	Current Sensor 2 (1)		Unit: Amps (A), Range: 0A to 150A		
6015	406016	Board Temperature	Unsigned Scale 100	Unit: °C/°F, Range: 0°C to 100°C or 32°F to 212°F Value x 100 (e.g. 5°C = 500 or 32°F = 3200)	RO	0°C or 32°F
6016	406017	Power Output Feedback	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6017	406018	Water Level	Unsigned Scale 10	Unit: %, Range: 0% to 120% Value x 10 (e.g. 10% = 100)	RO	78%
6018	406019	Water Probe Low Pos Reading	Unsigned Scale 1	Unit: Hz, Range: 0 to 30000 Hz Value x 1 (e.g. 1 Hz = 1)	RO	30000Hz
6019	406020	Water Probe High Pos Reading	Unsigned Scale 1	Unit: Hz, Range: 0 to 30000 Hz Value x 1 (e.g. 1 Hz = 1)	RO	30000Hz
6020	406021	Water Probe Abs Low Pos Reading	Unsigned Scale 1	Unit: Hz, Range: 0 to 30000 Hz Value x 1 (e.g. 1 Hz = 1)	RO	30000Hz
6021	406022	Water Probe Abs High Pos Reading	Unsigned Scale 1	Unit: Hz, Range: 0 to 30000 Hz Value x 1 (e.g. 1 Hz = 1)	RO	30000Hz

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6022	406023	Room RH Network Reading	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6023	406024	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
6024	406025	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
6025	406026	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
6026	406027	Room Demand	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6027	406028	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
6028	406029	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
6029	406030	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
6030	406031	Humidity Control Network Demand	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	0% RH
6031	406032	Humidity Control Network High Limit	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	W	100% RH
6032	406033	Humidity Demand	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6033	406034	SDU Fan Off Delay	Unsigned Scale 1	Unit: Minutes (min), Range: 5 to 20 mins Value x 1 (e.g. 5 mins = 5)	W	5 min
6034	406035	Humidity Demand Low Dead Band (0)	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	1%
6035	406036	Humidity Demand Low Dead Band (1)		Unit: %, Range: 0% to 100%		

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6036	406037	Control Network Timeout (0)	Unsigned Scale 1	Unit: Seconds (sec), Range: 1 to 900 sec <i>Value x 1 (e.g. 10sec = 10)</i>	W	900 sec
6037	406038	Control Network Timeout (1)		Unit: Seconds (sec), Range: 1 to 900 sec		
6038	406039	System Power Output	Unsigned Scale 100	Unit: %, Range: 0% to 100% <i>Value x 100 (e.g. 10% = 1000)</i>	RO	0%
6039	406040	System Steam Capacity	Unsigned Scale 10	Unit: kg/hr or lb/hr, Range: 0 to 300 kg/hr or 0 to 661 lb/hr <i>Value x 10 (e.g. 10kg/hr = 100 or 10lb/hr = 100)</i>	RO	0 kg/hr or 0 lb/hr
6040	406041	Boiler Demand	Unsigned Scale 100	Unit: %, Range: 0% to 100% <i>Value x 100 (e.g. 10% = 1000)</i>	W	0%
6041	406042	Boiler Capacity	Unsigned Scale 10	Unit: kg/hr or lb/hr, Range: 0 to 300 kg/hr or 0 to 661 lb/hr <i>Value x 10 (e.g. 10kg/hr = 100 or 10lb/hr = 100)</i>	RO	0 kg/hr or 0 lb/hr
6042	406043	Boiler Power Output	Unsigned Scale 100	Unit: %, Range: 0% to 100% <i>Value x 100 (e.g. 10% = 1000)</i>	RO	0%
6043	406044	Boiler Run Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 2147483647 h <i>Value x 100 (e.g. 10 h = 1000)</i>	RO	0h
6044	406045	Boiler Run Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6045	406046	Boiler Run Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		
6046	406047	Boiler Run Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		
6047	406048	Boiler On Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 2147483647 h <i>Value x 100 (e.g. 10 h = 1000)</i>	RO	0h
6048	406049	Boiler On Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6049	406050	Boiler On Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		
6050	406051	Boiler On Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		



Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6051	406052	Boiler Service Run Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 2147483647 h Value x 100 (e.g. 10 h = 1000)	RO	0h
6052	406053	Boiler Service Run Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6053	406054	Boiler Service Run Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		
6054	406055	Boiler Service Run Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		
6055	406056	Boiler 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
6056	406057	Boiler Service On Time (1)		Units: Hours (h), Range: 0 to 2147483647 h		
6057	406058	Boiler Service On Time (2)		Units: Hours (h), Range: 0 to 2147483647 h		
6058	406059	Boiler Service On Time (3)		Units: Hours (h), Range: 0 to 2147483647 h		
6059	406060	Boiler Minimum Steam Output	Unsigned Scale 1	Unit: %, Range: 1 to 25% Value x 1 (e.g. 1% = 1)	W	5%
6060	406061	Boiler Drain Interval	Unsigned Scale 1	Units: Hours (h), Range: 0 to 24 h Value x 1 (e.g. 1 h = 1)	W	6h
6061	406062	Boiler Drain Volume	Unsigned Scale 1	Unit: %, Range: 25 to 100% Value x 1 (e.g. 30% = 30)	W	100%
6062	406063	Boiler Max Steam Output	Unsigned Scale 1	Unit: %, Range: 0 to 100% Value x 1 (e.g. 1% = 1)	W	100%
6063	406064	Boiler Idle Time Drain	Unsigned Scale 1	Unit: Hours (h), Range: 0 to 72 h Value x 1 (e.g. 1 h = 1)	W	24h
6064	406065	Boiler Idle Temperature Setpoint	Unsigned Scale 1	Unit: °C/°F, Range: 0°C to 60°C or 32°F or 140°F Value x 1 (e.g. 5°C = 500 or 10°F = 1000)	W	0°C or 32°F
6065	406066	Boiler Blowdown Rate	Unsigned Scale 1	Unit: %, Range: 0% to 100% Value x 1 (e.g. 10% = 10)	W	0%

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6066	406067	Boiler Service Interval	Unsigned Scale 1	Unit: Hours (h), Range: 1000 to 3000 h Value x 1 (e.g. 1500 h = 1500)	W	1000h
6067	406068	Boiler Idle Tank Rinse Interval	Unsigned Scale 1	Unit: Days, Range: 1 to 7 days Value x 1 (e.g. 1 day = 1)	W	3day
6068	406069	Boiler Anti-Freeze Drain (0)	Signed Scale 100	Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	1°C or 34°F
6069	406070	Boiler Anti-Freeze Drain (1)		Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F		
6070	406071	Boiler Anti-Freeze Keep Warm Setpoint (0)	Signed Scale 100	Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	30°C or 86°F
6071	406072	Boiler Anti-Freeze Keep Warm Setpoint (1)		Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F		
6072	406073	Boiler Anti-Freeze Keep Warm (0)	Signed Scale 100	Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	10°C or 50°F
6073	406074	Boiler Anti-Freeze Keep Warm (1)		Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F		
6074	406075	HRL Temperature	Signed Scale 100	Unit: °C/°F, Range: -40°C to 260°C or -40°F to 500°F, Value x 100 (e.g. 5°C = 500 or 10°F = 1000)	RO	0°C or 32°F
6075	406076	HRL Humidity	Unsigned Scale 100	Unit: %, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6076	406077	Modbus TCP IP Keep Alive Time Out (0)	Unsigned Scale 1	Unit: Minutes (min), Range: 1 to 1440 mins Value x 1 (e.g. 5 mins = 5)	W	5 min
6077	406078	Modbus TCP IP Keep Alive Time Out (1)		Unit: Minutes (min), Range: 1 to 1440 mins		
10000	410001	Air Flow	Unsigned Scale 1	0 = Closed 1 = Open	RO	Closed
10001	410002	Supply High Limit	Unsigned Scale 1	0 = Closed 1 = Open	RO	Closed
10002	410003	Interlock	Unsigned Scale 1	0 = Closed 1 = Open	RO	Closed

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
10003	410004	Binary External Demand	Unsigned Scale 1	0 = 0% 1 = 100%	RO	0%
10004	410005	Water Leak Detection	Unsigned Scale 1	0 = Ok 1 = Leak	RO	Ok
10005	410006	Thermal Cutout	Unsigned Scale 1	0 = Closed 1 = Open	RO	Closed
10006	410007	RS485 Interface	Unsigned Scale 1	0 = No 1 = Yes	RO	No
10007	410008	Ethernet Interface	Unsigned Scale 1	0 = No 1 = Yes	RO	No
10008	410009	Contactors PCB Fuse	Unsigned Scale 1	0 = Normal 1 = Blown Fuse	RO	Normal
10009	410010	Control PCB Fuse	Unsigned Scale 1	0 = Normal 1 = Open Fuse	RO	Normal
11000	411001	Alarm Warning Relay	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11001	411002	Service Warning Relay	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11002	411003	Water Level Valve	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11003	411004	Tank Water Valve	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11004	411005	Drain Cooler Valve	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11005	411006	Drain Pump	Unsigned Scale 1	0 = Off 1 = On	RO	Off

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
11006	411007	Drain Valve	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11007	411008	Main Contactor	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11008	411009	Heater Stage 1	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11009	411010	Heater Stage2	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11010	411011	Heater Stage 3	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11011	411012	SDU Fan	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11012	411013	Alarm LED	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11013	411014	Power LED	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11014	411015	Buzzer	Unsigned Scale 1	0 = Off 1 = On	RO	Off
12000	412001	System Production Test Done	Unsigned Scale 1	0 = Inactive 1 = Active	RO	Inactive
12001	412002	Network Control State	Unsigned Scale 1	0 = Normal 1 = Fault	W	Normal
12002	412003	Water Level Low	Unsigned Scale 1	0 = Inactive 1 = Active	RO	Inactive
12003	412004	Water Level High	Unsigned Scale 1	0 = Inactive 1 = Active	RO	Inactive

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
12004	412005	Foam Sensor	Unsigned Scale 1	0 = NoFoam 1 = Foam	RO	NoFoam
12005	412006	SDU Fan Fault	Unsigned Scale 1	0 = Off 1 = On	RO	Off
12006	412007	Boiler Service Operation	Unsigned Scale 1	0 = Not Allowed 1 = Allowed	W	Allowed
12007	412008	Boiler Service Due	Unsigned Scale 1	0 = Off 1 = On	RO	Off
12008	412009	Boiler Foam State	Unsigned Scale 1	0 = NotFoaming 1 = Foaming	RO	NotFoaming
12009	412010	HRL Lock Setpoint	Unsigned Scale 1	0 = Unlock 1 = Lock	W	Unlock
15000	415001	System Log Verbose Level	Unsigned Scale 1	0 = None 1 = Emergency 2 = Alert 3 = Critical 4 = Error 5 = Warning 6 = Notice 7 = Info 8 = Debug	W	Debug
15001	415002	Modbus Server Units	Unsigned Scale 1	0 = Metric 1 = Imperial	W	Metric
15002	415003	Control Profile	Unsigned Scale 1	0 = ExternAnalog 1 = ExternNetwork 2 = InternAnalog 3 = InternNetwork 4 = HRL 5 = Custom	W	ExternAnalog
15003	415004	Modulating High Limit Profile	Unsigned Scale 1	0 = Disabled 1 = ExternAnalog 2 = ExternNetwork 3 = InternAnalog 4 = InternNetwork 5 = Custom	W	Disabled
15004	415005	Occupancy State	Unsigned Scale 1	0 = Occupied 1 = Unoccupied 2 = Vacant 3 = Off	RO	Occupied

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
15005	415006	Room RH Source	Unsigned Scale 1	0 = None 1 = RoomRH 2 = Network	W	None
15006	415007	Room RH Setpoint Source	Unsigned Scale 1	0 = None 1 = Internal 2 = ControllInput	W	None
15007	415008	Supply High Limit Reading Source	Unsigned Scale 1	0 = None 1 = SuppyHLRH 2 = Network	W	None
15008	415009	Supply High Limit Setpoint Source	Unsigned Scale 1	0 = None 1 = Internal 2 = ControllInput	W	None
15009	415010	Humidity Control Demand Source	Unsigned Scale 1	0 = None 1 = ControllInput 2 = RoomDemand 3 = Network	W	ControllInput
15010	415011	Humidity Control High Limit Source	Unsigned Scale 1	0 = None 1 = ControllInput 2 = SupplyHLDemand 3 = Network	W	None
15011	415012	Humidity Control Cutout State	Unsigned Scale 1	0 = Off 1 = Normal 2 = LowLimit 3 = HighLimit 4 = NoAirFlow 5 = Interlock	RO	Off
15012	415013	SDU Fan Target	Unsigned Scale 1	0 = None 1 = SDUFan	W	None
15013	415014	Boiler Power State	Unsigned Scale 1	0 = Off 1 = On	RO	Off
15014	415015	Boiler Request	Unsigned Scale 1	0 = None 1 = Reset Alarms 2 = Drain 3 = Reset Counters 4 = Filling 5 = WaterCalib	W	None
15015	415016	Boiler State	Unsigned Scale 1	0 = Off 1 = Idle 2 = LineRinse 3 = TankRinse 4 = Filling 5 = Draining 6 = Heating 7 = Boiling 8 = Alarm	RO	Off

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
15016	415017	Boiler Fill Mode	Unsigned Scale 1	0 = OneShot 1 = Pulsed	W	Pulsed
15017	415018	Boiler Alarm	Unsigned Scale 1	0 = Normal 1 = FailedPump 2 = FillTimeout 3 = BlockedPiping 4 = HeatTimeout 5 = Overheat 6 = WaterLeak 7 = Service 8 = Foaming	RO	Normal
15018	415019	Boiler Idle Tank Rinse On	Unsigned Scale 1	0 = Off 1 = On	W	Off
15019	415020	Boiler Idle Tank Rinse Off	Unsigned Scale 1	0 = Off 1 = On	W	Off
15020	415021	Water Probe Auto Calib.	Unsigned Scale 1	0 = None 1 = Once 2 = Always	W	Always
15021	415022	Boiler Startup Tank Rinse	Unsigned Scale 1	0 = Off 1 = On	W	Off



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