



neptronic®

SKS4 Steam to Steam Humidifier

Modbus Communication Module User Guide



Introduction

The SKS4 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 SKS4 devices.

The SKS4 Modbus Guide assumes that you are familiar with Modbus terminology.

The following are the requirements for Modbus:

- *Data Model.* The SKS4 Steam to 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 SKS4 Steam to 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 SKS4 Steam to Steam Humidifier Modbus server supports the following exception codes:
 - Illegal data address
 - Illegal data value
 - Slave device busy
- *Serial Line.* The SKS4 Steam to 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 SKS4 Steam to 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	
7	400008	Product Actual Firmware Version (in Integer x100)	Unsigned <i>Scale 100</i>	1 to 65535 (e.g. 100)	RO	

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
8	400009	Product Actual EEPROM Version (in Integer x100)	Unsigned Scale 100	1 to 65535 (e.g. 100)	RO	
2000	402001	Cabinet Temperature Signal	Unsigned Scale 1000pl;	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
2001	402002	Control Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 1000 (e.g. 1V = 1000)	RO	0V
2002	402003	Room RH Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 1000 (e.g. 1V = 1000)	RO	0V
2003	402004	Supply RH Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 15V Value x 1000 (e.g. 1V = 1000)	RO	0V
2004	402005	Water Level Signal	Unsigned Scale 1	Units: Hz, Range: 0 to 30000Hz Value x 1 (e.g. 10Hz = 10)	RO	0Hz
2005	402006	Water Level Low Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
2006	402007	Water Level High Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
2007	402008	Water Temperature Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
2008	402009	Foam Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
2009	402010	Board Temperature Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
2010	402011	Main Power Supply	Unsigned Scale 10	Unit: Volt (V), Range: 0V to 40V Value x 10 (e.g. 1V = 10)	RO	0V
2011	402012	Steam Valve Feedback Signal	Unsigned Scale 1000	Units: Volt (V), Range: 0V to 10.5V Value x 1000 (e.g. 1V = 1000)	RO	0V

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
4000	404001	Steam Output Feedback Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
4001	404002	Steam Valve Signal	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
6000	406001	Water Level Replace Interval	Unsigned Scale 1	Unit: Days, Range: 0 day to 7 days Value x 1 (e.g. 1 day = 1)	W	7day
6001	406002	Control Input	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%
6002	406003	Control Min	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%
6003	406004	Control Max	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%
6004	406005	Control Bias	Signed Scale 100	Unit: %, Range: -10% to 10% Value x 100 (e.g. 10% = 1000)	W	0%
6005	406006	Room RH	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6006	406007	Room RH Min	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6007	406008	Room RH Max	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6008	406009	Room RH Bias	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6008	406010	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
6010	406011	Supply High Limit RH Min	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6011	406012	Supply High Limit RH Max	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%
6012	406013	Supply High Limit RH Bias	Signed Scale 100	Unit: %, Range: -10% to 10% Value x 100 (e.g. 10% = 1000)	W	0%
6013	406014	Water Temperature Signal Min	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
6014	406015	Water Temperature Signal Max	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	RO	0V
6015	406016	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 40°F = 4000)	RO	50°C or 122°F
6016	406017	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 40°F = 4000)	RO	0°C or 32°F
6017	406018	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 40°F = 4000)	RO	125°C or 257°F
6018	406019	Water Temperature Bias	Unsigned Scale 100	Unit: °C/°F, Range: -10°C to 10°C or -18°F to 18°F Value x 100 (e.g. 5°C = 500 or 14°F = 1400)	RO	0°C or 32°F
6019	406020	Cabinet Temperature	Unsigned 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
6020	406021	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
6021	406022	Power Output Feedback Bias	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	W	0V
6022	406023	Power Output Feedback Min	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	W	0V
6023	406024	Power Output Feedback Max	Unsigned Scale 1000	Unit: Volt (V), Range: 0V to 10V Value x 1000 (e.g. 1V = 1000)	W	0V

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6024	406025	Power Output Feedback	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6025	406026	Steam Valve Control	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6026	406027	Water Level	Unsigned Scale 10	Unit: %, Range: 0% to 120% Value x 10 (e.g. 10% = 100)	RO	78%
6027	406028	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
6028	406029	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
6029	406030	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
6030	406031	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
6031	406032	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
6032	406033	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
6033	406034	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
6034	406035	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
6035	406036	Room Demand Proportional Gain	Unsigned Scale 10	No Unit, Range: 1 to 200 Value x 10 (e.g. 10 = 100)	W	20
6035	406037	Room Demand Integral Time	Unsigned Scale 10	Unit: sec, Range: 0 to 900 sec Value x 10 (e.g. 10sec = 100)	W	0 sec
6037	406038	Room Demand Derivative Time	Unsigned Scale 10	Unit: sec, Range: 0 to 60 sec Value x 10 (e.g. 10sec = 100)	W	0 sec

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6038	406039	Room Demand	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6039	406040	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
6040	406041	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
6041	406042	Supply High Limit Proportional Gain	Unsigned Scale 10	No Unit, Range: 1 to 200 Value x 10 (e.g. 10 = 100)	W	10
6042	406043	Supply High Limit Integral Time	Unsigned Scale 10	Unit: sec, Range: 0 to 900 sec Value x 10 (e.g. 10sec = 100)	W	0 sec
6043	406044	Supply High Limit Derivative Time	Unsigned Scale 10	Unit: sec, Range: 0 to 60 sec Value x 10 (e.g. 10sec = 100)	W	0 sec
6044	406045	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
6045	406046	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
6046	406047	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
6047	406048	Humidity Demand	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 10% RH = 1000)	RO	0% RH
6048	406049	System Power Output	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6049	406050	System Steam Capacity	Unsigned Scale 10	Unit: kg/hr or lb/hr, Range: 0 to 300 kg/hr or 0 to 66 lb/hr Value x 10 (e.g. 10 kg/hr = 100 or 10 lb/hr = 100)	RO	0 kg/hr or 0 lb/hr
6050	406051	Boiler Demand	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	0%

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6051	406052	Boiler Capacity	Unsigned Scale 10	Unit: kg/hr or lb/hr, Range: 0 to 3000kg/hr or 0 to 6613.8lb/hr Value x 10 (e.g. 10 kg/hr = 100 or 10 lb/hr = 100)	RO	15 kg/hr or 33.06 lb/hr
6052	406053	Boiler Power Output	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	RO	0%
6053	406054	Boiler Run Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 21474836.47 h Value x 100 (e.g. 10h = 1000)	RO	0h
6054	406055	Boiler Run Time (1)		Units: Hours (h), Range: 0 to 21474836.47 h		
6055	406056	Boiler Run Time (2)		Units: Hours (h), Range: 0 to 21474836.47 h		
6056	406057	Boiler Run Time (3)		Units: Hours (h), Range: 0 to 21474836.47 h		
6057	406058	Boiler On Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 21474836.47 h Value x 100 (e.g. 10h = 1000)	RO	0h
6058	406059	Boiler On Time (1)		Units: Hours (h), Range: 0 to 21474836.47 h		
6059	406060	Boiler On Time (2)		Units: Hours (h), Range: 0 to 21474836.47 h		
6060	406061	Boiler On Time (3)		Units: Hours (h), Range: 0 to 21474836.47 h		
6061	406062	Boiler Service Run Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 21474836.47 h Value x 100 (e.g. 10h = 1000)	RO	0h
6062	406063	Boiler Service Run Time (1)		Units: Hours (h), Range: 0 to 21474836.47 h		
6063	406064	Boiler Service Run Time (2)		Units: Hours (h), Range: 0 to 21474836.47 h		
6064	406065	Boiler Service Run Time (3)		Units: Hours (h), Range: 0 to 21474836.47 h		
6065	406066	Boiler Service On Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 21474836.47 h Value x 100 (e.g. 10h = 1000)	RO	0h
6066	406067	Boiler Service On Time (1)		Units: Hours (h), Range: 0 to 21474836.47 h		
6067	406068	Boiler Service On Time (2)		Units: Hours (h), Range: 0 to 21474836.47 h		
6068	406069	Boiler Service On Time (3)		Units: Hours (h), Range: 0 to 21474836.47 h		

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6069	406070	Boiler Minimum Steam Output	Unsigned Scale 1	Unit: %, Range: 1% to 25% Value x 1 (e.g. 1% = 1)	W	5%
6070	406071	Boiler Drain Interval	Unsigned Scale 1	Units: Hours (h), Range: 0 to 24 h Value x 1 (e.g. 1 h = 1)	W	6h
6071	406072	Boiler Drain Volume	Unsigned Scale 1	Unit: %, Range: 25% to 100% Value x 1 (e.g. 30% = 300)	W	100%
6072	406073	Boiler Max Steam Output	Unsigned Scale 1	Unit: %, Range: 0% to 100% Value x 1 (e.g. 30% = 300)	W	100%
6073	406074	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
6074	406075	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 32°F = 3200)	W	0°C or 32°F
6075	406076	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 40°F = 4000)	RO	0°C or 32°F
6076	406077	HRL Humidity	Unsigned Scale 100	Unit: % RH, Range: 0% RH to 100% RH Value x 100 (e.g. 1% RH = 100)	RO	0% RH
6077	406078	Boiler Blowdown Rate	Unsigned Scale 1	Unit: %, Range: 0% to 100% Value x 1 (e.g. 1% = 1)	W	0%
6078	406079	Boiler Service Interval	Unsigned Scale 1	Unit: Hours (h), Range: 1000 to 3000 h Value x 1 (e.g. 1500 h = 1500)	W	1000h
6079	406080	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
6080	406081	Boiler Idle Tank Rinse Interval	Unsigned Scale 1	Unit: Days, Range: 1 to 7 days Value x 1 (e.g. 1 day = 1)	W	3 day
6081	406082	Steam Valve Feedback	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 1% = 100)	RO	0%

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
6082	406083	Actuator Deadband	Unsigned Scale 1	Unit: %, Range: 0% to 25% Value x 1 (e.g. 5% = 5)	W	5%
6083	406084	Humidity Demand Low Dead Band	Unsigned Scale 100	Unit: %, Range: 0% to 100% Value x 100 (e.g. 10% = 1000)	W	1%
6084	406085	Network Timeout	Unsigned Scale 1	Unit: Seconds (sec), Range: 1 to 900 sec Value x 1 (e.g. 10sec = 10)	W	900 sec
6085	406086	Room Demand Proportional Band	Unsigned Scale 10	Unit: %, Range: 1% to 100% Value x 10 (e.g. 10% RH = 100)	W	5%
6086	406087	Supply High Limit Proportional Band	Unsigned Scale 10	Unit: %, Range: 1% to 100% Value x 10 (e.g. 10% RH = 100)	W	10%
6087	406088	Boiler Manual Calibration Time (0)	Unsigned Scale 100	Units: Hours (h), Range: 0 to 21474836.47 h Value x 100 (e.g. 10h = 1000)	RO	0h
6088	406089	Boiler Manual Calibration Time (1)		Units: Hours (h), Range: 0 to 21474836.47 h		
6089	406090	Boiler Manual Calibration Time (2)		Units: Hours (h), Range: 0 to 21474836.47 h		
6090	406091	Boiler Manual Calibration Time (3)		Units: Hours (h), Range: 0 to 21474836.47 h		
6091	406092	HRL Temperature Bas	Signed Scale 10	Unit: °C/°F, Range: -10°C to 10°C or -18°F to 18°F Value x 10 (e.g. 5°C = 50 or 14°F = 140)	W	0°C or 32°F
6092	406093	HRL Humidity Bias	Signed Scale 10	Unit: %RH, Range: -10%RH to 10%RH Value x 10 (e.g. 5%RH = 50)	W	0%RH
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

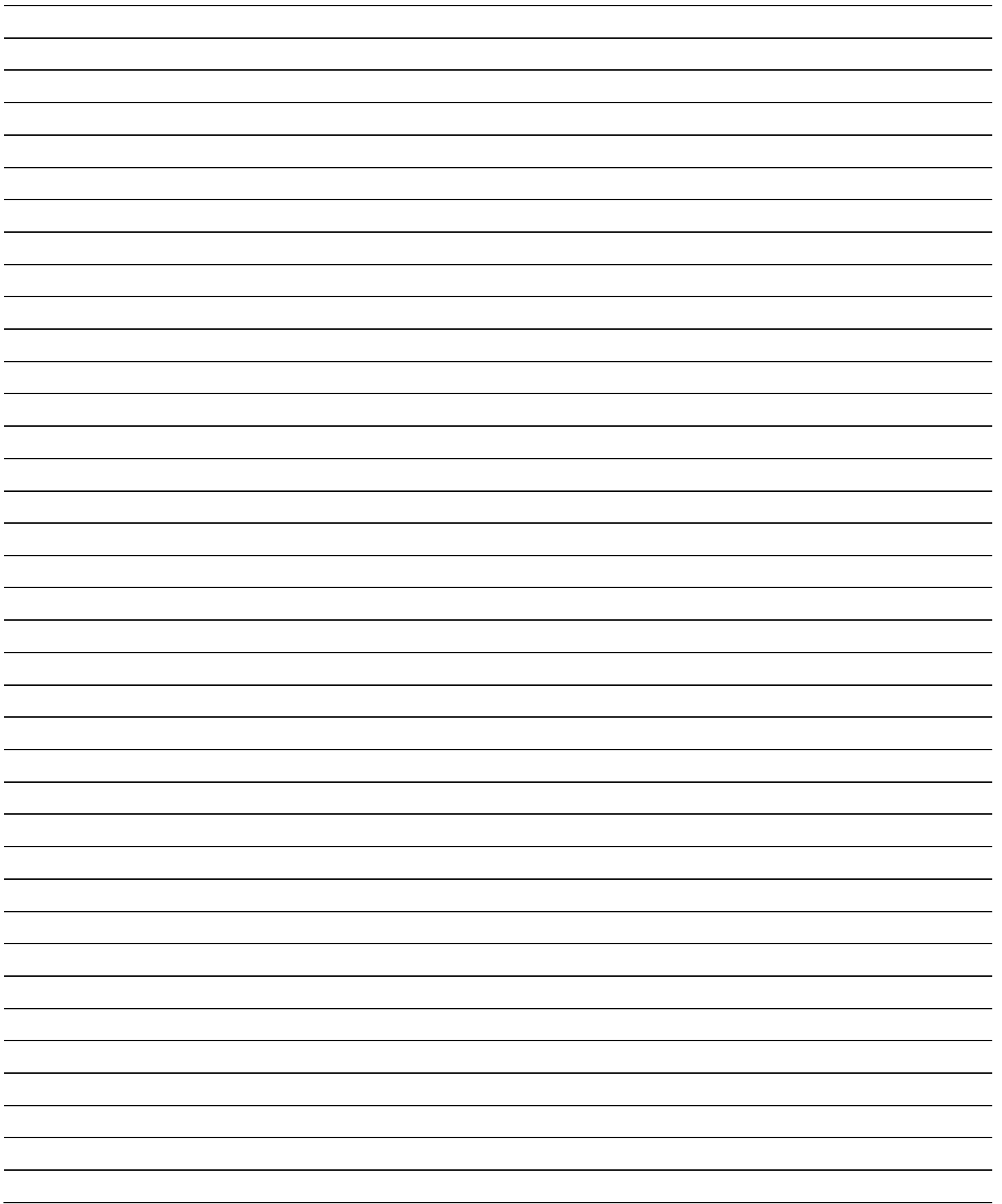
Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
10003	410004	Binary External Demand	Unsigned Scale 1	0 = 0% 1 = 100%	RO	0%
10004	410005	Water Leak Detection	Unsigned Scale 1	0 = Ok 1 = Leak	RO	Ok
10005	410006	Thermal Cutout	Unsigned Scale 1	0 = Closed 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

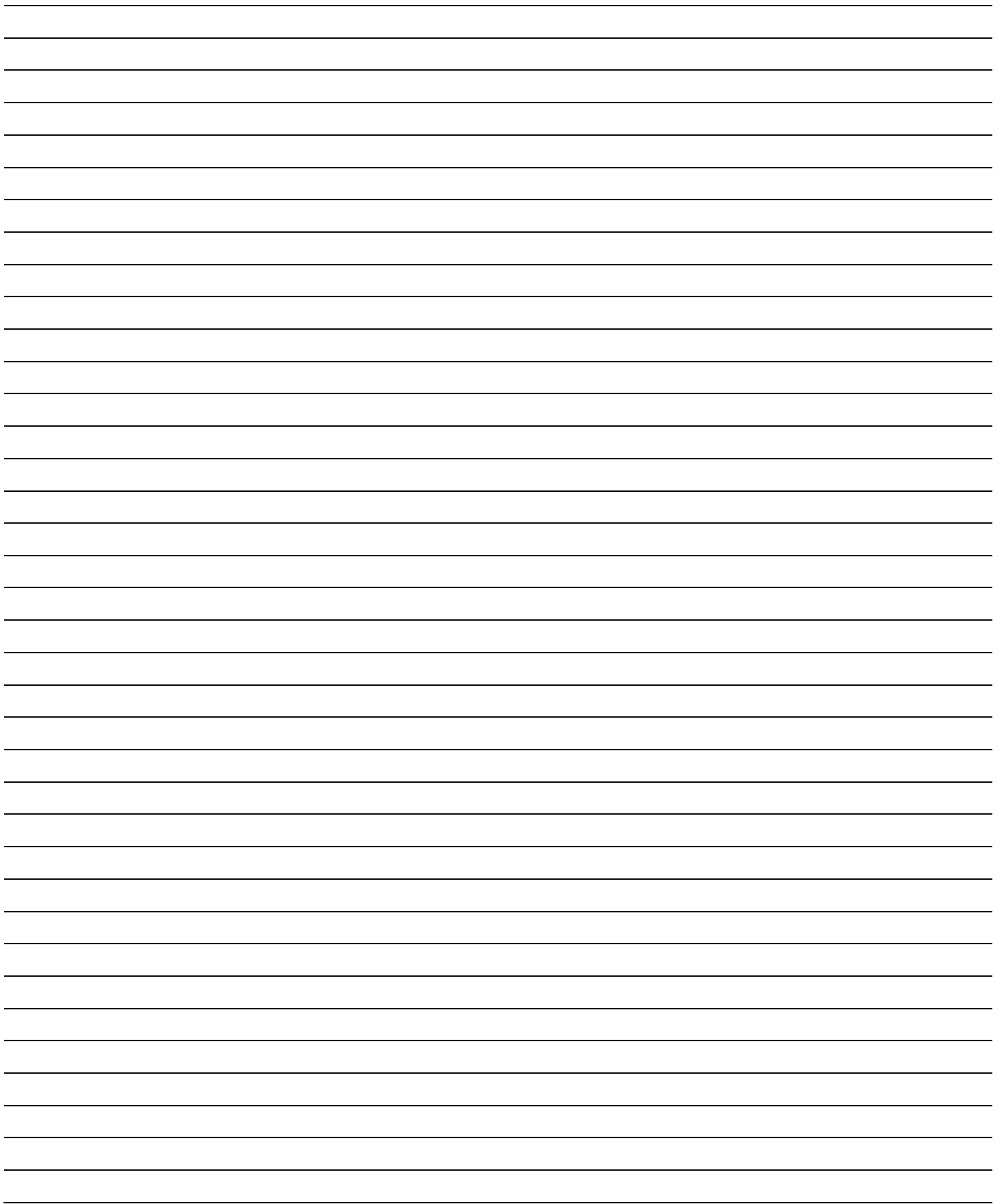
Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
11006	411007	Drain Valve	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11007	411008	Drain Pump 2	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11008	411009	Drain Pump 3	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11009	411010	Alarm LED	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11010	411011	Power LED	Unsigned Scale 1	0 = Off 1 = On	RO	Off
11011	411012	Buzzer	Unsigned Scale 1	0 = Off 1 = On	RO	Off
12000	412001	Water Level Low	Unsigned Scale 1	0 = Inactive 1 = Active	RO	Inactive
12001	412002	Water Level High	Unsigned Scale 1	0 = Inactive 1 = Active	RO	Inactive
12002	412003	Foam Sensor	Unsigned Scale 1	0 = NoFoam 1 = Foam	RO	NoFoam
12003	412004	Boiler Service Operation	Unsigned Scale 1	0 = Not Allowed 1 = Allowed	W	Allowed
12004	412005	Boiler Service Due	Unsigned Scale 1	0 = Off 1 = On	RO	Off
12005	412006	Foam	Unsigned Scale 1	0 = Ok 1 = Detected	RO	Ok
12006	412007	Boiler Line Rinse	Unsigned Scale 1	0 = Off 1 = On	W	On

Protocol Base	Holding Register	Description	Data Type	Units, Limits, State Texts	Writable	Default Value
12007	412008	HRL Lock Setpoint	Unsigned Scale 1	0 = Unlock 1 = Lock	W	Unlock
12008	412009	Network Control State	Unsigned Scale 1	0 = Normal 1 = Fault	W	Normal
12009	412010	Inhibit Resistive Probe	Unsigned Scale 1	0 = No 1 = Yes	W	No
12010	412011	Notify Alarm	Unsigned Scale 1	0 = Off 1 = On	W	Off
12011	412012	Notify Warning	Unsigned Scale 1	0 = Off 1 = On	W	Off
12012	412013	Notify App Msg	Unsigned Scale 1	0 = Off 1 = On	W	Off
12013	412014	Power Up Drain	Unsigned Scale 1	0 = Off 1 = On	W	Off
12014	412015	Manual Water Calibration State	Unsigned Scale 1	0 = Ok 1 = Required	RO	Ok
12015	412016	AntiFreeze Warning	Unsigned Scale 1	0 = Inactive 1 = Drain	RO	Inactive
15000	415001	Modbus Server Units	Unsigned Scale 1	0 = Metric 1 = Imperial	W	Metric
15001	415002	Control Signal Type	Unsigned Scale 1	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15002	415003	Room RH Signal Type	Unsigned Scale 1	0 = 0-10Vdc 1 = 2-10Vdc 2 = 4-20mA 3 = 0-20mA	W	0-10Vdc
15003	415004	Supply 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
15004	415005	Control Profile	Unsigned Scale 1	0 = ExternAnalog 1 = ExternNetwork 2 = InternAnalog	3 = InternNetwork 4 = HRL 5 = Custom	W	ExternAnalog
15005	415006	Modulating High Limit Profile	Unsigned Scale 1	0 = Disabled 1 = ExternAnalog 2 = ExternNetwork	3 = InternAnalog 4 = InternNetwork 5 = Custom	W	Disabled
15006	415007	Occupancy State	Unsigned Scale 1	0 = Occupied 1 = Unoccupied	2 = Vacant 3 = Off	RO	Occupied
15007	415008	Room RH Source	Unsigned Scale 1	0 = None 1 = RoomRH	2 = Network	W	None
15008	415009	Room RH Setpoint Source	Unsigned Scale 1	0 = None 1 = Internal	2 = ControllInput	W	None
15009	415010	Supply High Limit Reading Source	Unsigned Scale 1	0 = None 1 = SupplyHLRH	2 = Network	W	None
15010	415011	Supply High Limit Setpoint Source	Unsigned Scale 1	0 = None 1 = Internal	2 = ControllInput	W	None
15011	415012	Humidity Control Demand Source	Unsigned Scale 1	0 = None 1 = ControllInput	2 = RoomDemand 3 = Network	W	ControllInput
15012	415013	Humidity Control High Limit Source	Unsigned Scale 1	0 = None 1 = ControllInput	2 = SupplyHLDemand 3 = Network	W	None
15013	415014	Humidity Control Cutout State	Unsigned Scale 1	0 = Off 1 = Normal 2 = LowLimit	3 = HighLimit 4 = NoAirFlow 5 = Interlock	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 is Reserved 9 = TankBlocked 10 = RefillDelay	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	System Power State	Unsigned Scale 1	0 = Off 1 = On W	Off	
15022	415023	Boiler Startup Tank Rinse	Unsigned Scale 1	0 = Off 1 = On	W	Off
15023	415024	Water Level Probe Warning	Unsigned Scale 1	0 = Ok 1 = Replace	RO	OK
15024	415025	Water Level Probe Failure	Unsigned Scale 1	0 = None 1 = Capacitive 2 = Resistive 3 = Both	RO	None
15025	415026	Water Level Probe Alarm	Unsigned Scale 1	0 = OK 1 = Defect 2 = NoCalib	RO	Ok







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