

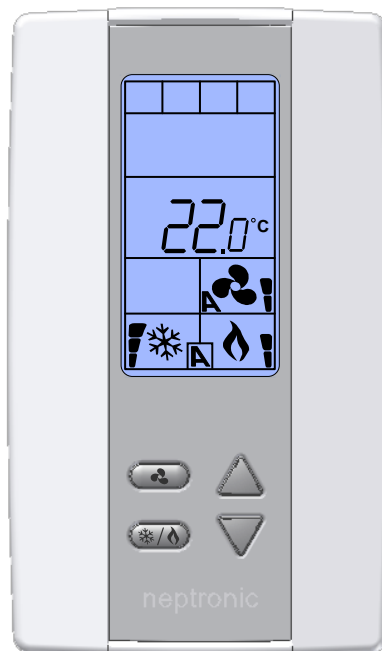


neptronic®

Universal Wall-Mount Controller

TUCB & TUHB Series

Modbus Communication Module User Guide



TUCB24C6X2 with Internal Temperature Sensor (6 binary/2 analog outputs)

TUHB24C6X2 with Internal Temperature and Humidity Sensor (6 binary/2 analog outputs)



Introduction

The TUCB & TUHB Series Modbus Communication Module User Guide provides information for using the Neptronic[®] controller communication feature. The uses Modbus communication protocol over serial line in the RTU mode and provides a Modbus network interface between client devices and Neptronic TUCB & TUHB Series devices.

The TUCB & TUHB Series Modbus Guide assumes that you are familiar with Modbus terminology.

The following are the requirements for Modbus:

- *Data Model.* The controller Modbus server data model uses only the Holding Registers table.
- *Function Codes.* The controller Modbus server supports a limited function codes subset comprising:
 - Read Holding Registers (0x03)
 - Write Single Register (0x06)
 - Write Multiple Registers (0x10)
- *Exception Responses.* The controller Modbus server supports the following exception codes:
 - Illegal data address
 - Illegal data value
 - Slave device busy
- *Serial Line.* The controller 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 controller 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.

Holding Registers Table

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

Holding Register Table

Register Index	Description	Data Type	Range	Writable
40000	Address - Neptronic ID and Modbus address of current device.	Unsigned	MSB = 22, LSB = 1-246	W
40001	MSTP Baud Rate.	Unsigned <i>Scale 100</i>	0, 9600, 19200, 38400, or 57600, 0 = Auto Baud Rate Detection <i>Value/100 (e.g. 38400 baud = 384)</i>	W
40002	Communication port configuration.	Unsigned	1 = No parity, 2 Stop bits, 2 = Even parity, 1 stop bit, 3 = Odd parity, 1 stop bit	W
40003	ProdName_87, characters 8-7 of 8 name characters.	ASCII	MSB = 84 (T), LSB = 85 (U)	W
40004	ProdName_65, characters 6-5 of 8 name characters.	ASCII	MSB = 67 (C), LSB = 66 (B)	W
40005	ProdName_43, characters 4-3 of 8 name characters.	ASCII	MSB = 50 (2), LSB = 52 (4)	W
40006	ProdName_21, characters 2-1 of 8 name characters.	ASCII	MSB = 32 (Space), LSB = 0 (Null)	W
40007	Controller Product_Version, actual firmware version.	Unsigned	1 to 65535 (e.g. 115)	RO
40008	Controller parameters version.	Unsigned	1 to 65535 (e.g. 102)	RO
40009	System Status 1.	Bit String	[B1, B5, B7 – B15]: Reserved B0: System operation <i>0 = Normal, 1 = Fault</i> B2: System override by NSB or OCC <i>0 = Normal, 1 = OFF</i> B3: ChangeOverMode <i>0 = Cooling, 1 = Heating</i> B4: AL_FlowSwitch <i>0 = No alarm, 1 = Alarm activated</i> B6: AL_DirtyFilter <i>0 = No alarm, 1 = Alarm activated</i>	RO

Register Index	Description	Data Type	Range	Writable
40010	System Status 2.	Bit String	[B1, B3-B6, B14]: Reserved B0: Selector Switch Status <i>0 = Remote Mode, 1 = Local Mode</i> B2: CO2 Alarm <i>0 = Normal, 1 = Alarm</i> B7: AL_Override <i>0 = Off, 1 = On</i> B8: AL_WindowOpened <i>0 = Off, 1 = On</i> B9: AL_DoorOpened <i>0 = Off, 1 = On</i> B10: AL_BI1 <i>0 = Off, 1 = On</i> B11: AL_BI2 <i>0 = Off, 1 = On</i> B12: AL_AI1 <i>0 = Off, 1 = On</i> B13: AL_AI2 <i>0 = Off, 1 = On</i> B15: AL_OverHeat <i>0 = Off, 1 = On</i>	RO
40011	Internal temperature sensor reading.	Signed Scale 100	Unit: °C/°F, Range: 0°C to 50°C or 32°F to 122°F <i>Value x 100 (e.g. 23°C = 2300 or 33°F = 3300)</i>	RO
40012	External temperature sensor reading.	Signed Scale 100	Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F <i>Value x 100 (e.g. 23°C = 2300 or 33°F = 3300)</i>	RO
40013	Changeover temperature sensor reading.	Signed Scale 100	Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F <i>Value x 100 (e.g. 23°C = 2300 or 33°F = 3300)</i>	RO
40014	Control temperature reading.	Signed Scale 100	Unit: °C/°F, Range: -40°C to 100°C or -40°F to 212°F <i>Value x 100 (e.g. 23°C = 2300 or 33°F = 3300)</i>	W
40015	Internal humidity sensor reading. Only available on model TUHB24C6X2.	Unsigned Scale 10	Unit: % RH, Range: 5%RH to 100%RH, <i>Value x 10 (e.g. 30%RH = 300)</i>	RO
40016	External humidity sensor reading.	Unsigned Scale 10	Unit: % RH, Range: 5%RH to 100%RH, <i>Value x 10 (e.g. 30%RH = 300)</i>	RO
40017	Analog input 1 reading.	Signed Scale 100	Unit: Volts or °C/°F, Range: 0V to 10V, -40 to 100°C or -40 to 212°F, 0 (open), 1 (close). <i>Value x 100 (e.g. 3 V = 300/18°C = 1800 or 33°F = 3300)</i>	RO
40018	Analog input 2 reading.	Signed Scale 100	Unit: Volts or °C/°F, Range: 0V to 10V, -40 to 100°C or -40 to 212°F, 0 (open), 1 (close). <i>Value x 100 (e.g. 3 V = 300/18°C = 1800 or 33°F = 3300)</i>	RO
40019	CO2 sensor value in ppm.	Signed Scale 1	Unit: ppm, 100 to 5000, <i>Value x 1 (e.g. 500 ppm = 500)</i>	RO

Register Index	Description	Data Type	Range	Writable
40020	Binary input statuses of 2 binary inputs.	Bit String	[B2-B15]: Reserved B0: Binary Input 1 0 = Open, 1 = Close B1: Binary Input 2 0 = Open, 1 = Close	RO
40021	Actual system occupancy state.	Unsigned	1 = NoOccupancy, 2 = Occupancy, 3 = Override	RO
40022	Actual night setback state of the system.	Unsigned	1 = Day, 2 = Night, 3 = Override	RO
40023	Actual heating demand of ramp 1.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40024	Actual heating demand of ramp 2.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40025	Actual cooling demand of ramp 1.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40026	Actual cooling demand of ramp 2.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40027	Actual changeover demand.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40028	Actual fan demand.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40029	Actual dehumidification demand.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40030	Actual humidification demand.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40031	CL_HT_SwitchTimerCount - countdown until the system is able to swap the demand.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 7200 seconds, Value/1 (e.g. 100 secs = 100)	RO
40032	Analog output 1 value.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	W
40033	Analog output 2 value.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	W

Register Index	Description	Data Type	Range	Writable
40034	Binary output - 6 relays output status.	Bit String	[B6-B15]: Reserved B0: Binary Output 1 <i>0 = Open, 1 = Close</i> B1: Binary Output 2 <i>0 = Open, 1 = Close</i> B2: Binary Output 3 <i>0 = Open, 1 = Close</i> B3: Binary Output 4 <i>0 = Open, 1 = Close</i> B4: Binary Output 5 <i>0 = Open, 1 = Close</i> B5: Binary Output 6 <i>0 = Open, 1 = Close</i>	W
40035	System command.	Bit String	[B2, B6, B9 - B15]: Reserved B0: Cfg_ServiceDisplayAddress <i>0 = Normal, 1 = Display address on LCD</i> B1: Cfg_CoolingRampLock <i>0 = Off, 1 = On</i> B3: Cfg_HeatingRamp1Lock <i>0 = Off, 1 = On</i> B4: Cfg_HeatingRamp2Lock <i>0 = Off, 1 = On</i> B5: Cfg_ChangeOverRampLock <i>0 = Off, 1 = On</i> B7: Cfg_HumidifyRampLock <i>0 = Off, 1 = On</i> B8: Cfg_DehumidifyRampLock <i>0 = Off, 1 = On</i>	W
40036	System mode status.	Unsigned	1 = Auto [Register 40074 allows Auto Mode (1 or 5)] 2 = Heating [Register 40074 allows Heating Mode (1, 2 or 4)] 3 = EMH [Register 40041 Bits 2 and 1 = On and Enable (1) and Register 40074 allows Heating Mode (1, 2 or 4)] 4 = Cooling [Register 40074 allows Cooling Mode (1, 3 or 4)] 5 = Fan [Register 40040 Bit 12 = Advanced (1) and Bit 13 = Enable] 6 = Off [Register 40039 Bit 8 = Enable (0)]	W
40037	Fan speed selection by user.	Unsigned	1 = Auto, 2 = Low, 3 = Med, 4 = High	W
40038	Temperature setpoint in occupancy or day mode.	Signed Scale 10	Unit: °C/°F, Range: min to max setpoint, <i>Value x 10 (e.g. 18°C = 180)</i>	W

Register Index	Description	Data Type	Range	Writable
40039	System option 1.	Bit String	<p>[B5-B6]: Reserved</p> <p>B0: Cfg_TempUnitTstat 0 = °C, 1 = °F</p> <p>B1: Cfg_TempUnitModbus 0 = °C, 1 = °F</p> <p>B2: Cfg_TempSetPointLock 0 = Off, 1 = On</p> <p>B3: Cfg_HumSetPointLock 0 = Off, 1 = On</p> <p>B4: Cfg_ProgramModeLock 0 = Off, 1 = On</p> <p>B7: AL_FreezeProtection 0 = Off, 1 = On</p> <p>B8: Cfg_UserSysOffModes 0 = Enable, 1 = Disable</p> <p>B9: Cfg_KeyPadBottomLeftLock 0 = Off, 1 = On</p> <p>B10: Cfg_KeyPadUpperLeftLock 0 = Off, 1 = On</p> <p>B11: Cfg_KeyPadArrowsLock 0 = Off, 1 = On</p> <p>B12: Cfg_UserFanAutoMode 0 = Enable, 1 = Disable</p> <p>B13: Cfg_NightOrNoOccMode 0 = Setpoint, 1 = OFF</p> <p>B14: Cfg_HumControlSource 0 = Intern Sensor, 1 = Extern Sensor (Writable only if an intern RH option is available) Only available on model TUHB24C6X2.</p> <p>B15: Time Mode 0 = 24h, 1 = 12h</p>	W

Register Index	Description	Data Type	Range	Writable
40040	System option 2.	Bit String	<p>[B15]: Reserved</p> <p>B0: Cfg_WindowOpenedMode 0 = Setpoint, 1 = OFF</p> <p>B1: Cfg_DoorOpenedMode 0 = Setpoint, 1 = OFF</p> <p>B2: Baud Rate 0 = Auto, 1 = Manual</p> <p>B3: Cfg_ActivateSchedule 0 = Off, 1 = On</p> <p>B4: Cfg_AnalogOutput1Direction 0 = Direct, 1 = Reverse</p> <p>B5: Cfg_AnalogOutput2Direction 0 = Direct, 1 = Reverse</p> <p>B6: Cfg_BinaryOutput1Direction 0 = Direct, 1 = Reverse</p> <p>B7: Cfg_BinaryOutput2Direction 0 = Direct, 1 = Reverse</p> <p>B8: Cfg_BinaryOutput3Direction 0 = Direct, 1 = Reverse</p> <p>B9: Cfg_BinaryOutput4Direction 0 = Direct, 1 = Reverse</p> <p>B10: Cfg_BinaryOutput5Direction 0 = Direct, 1 = Reverse</p> <p>B11: Cfg_BinaryOutput6Direction 0 = Direct, 1 = Reverse</p> <p>B12: Cfg_FanSpeedOption 0 = Standard, 1 = Advanced (OE1)</p> <p>B13: Cfg_UserSysFanMode 0 = Disable, 1 = Enable</p> <p>B14: Cfg_HideFanDisplay 0 = NO, 1 = Yes</p>	W
40041	System option 3.	Bit String	<p>[B6-B15]: Reserved</p> <p>B0: DAYLIGHT_SAVINGS_STATUS 0 = Normal, 1 = Summer</p> <p>B1: Cfg_EMHOutput 0 = Disable, 1 = Enable</p> <p>B2: Cfg_HeatPumpMode 0 = Off (General Unit), 1 = On (HeatPump)</p> <p>B3: Cfg_ReversingValve (O/B) 0 = O, 1 = B</p> <p>B4: Cfg_EMHAutoMode 0 = No, 1 = Yes</p> <p>B5: Cfg_Y2Output 0 = Disable, 1 = Enable</p>	W
40042	System option 4.	Bit String	[B0-B15]: Reserved	W

Register Index	Description	Data Type	Range	Writable
40043	Display information.	Unsigned	1 = Temperature and Demand, 2 = Setpoint and Demand, 3 = Temperature Only, 4 = Setpoint Only, 5 = Off	W
40044	Temperature control source.	Unsigned	1 = Network Temp, 2 = Intern Temp, 3 = Extern Temp	W
40045	Network fallback timeout.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 60, <i>Value/1 (e.g. 30 mins = 30)</i>	W
40046	Minimum occupancy/day setpoint.	Signed Scale 10	Unit: °C/°F, Range: 10°C to max or 50°F to max <i>Value x 10 (e.g. 18°C = 180 or 60°F = 600)</i>	W
40047	Maximum occupancy/day setpoint.	Signed Scale 10	Unit: °C/°F, Range: min to 40°C or min to 104°F <i>Value x 10 (e.g. 18°C = 180 or 60°F = 600)</i>	W
40048	Cooling temperature setpoint in unoccupied or night mode.	Signed Scale 10	Unit: °C/°F, Range: 10°C to 40°C or 50°F to 104°F <i>Value x 10 (e.g. 18°C = 180 or 60°F = 600)</i>	W
40049	Heating temperature setpoint in unoccupied or night mode.	Signed Scale 10	Unit: °C/°F, Range: 10°C to 40°C or 50°F to 104°F <i>Value x 10 (e.g. 18°C = 180 or 60°F = 600)</i>	W
40050	Heating proportional band for ramp 1.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W
40051	Heating proportional band for ramp 2.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W
40052	Cooling proportional band for ramp 1.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W
40053	Cooling proportional band for ramp 2.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W
40054	Changeover proportional band.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W
40055	Heating deadband for ramp 1.	Unsigned Scale 10	Unit: depends on system unit, 0°C to 5°C or 0°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W
40056	Heating deadband for ramp 2.	Unsigned Scale 10	Unit: depends on system unit, 0°C to 5°C or 0°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W
40057	Cooling deadband for ramp 1.	Unsigned Scale 10	Unit: depends on system unit, 0°C to 5°C or 0°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W
40058	Cooling deadband for ramp 2.	Unsigned Scale 10	Unit: depends on system unit, 0°C to 5°C or 0°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W
40059	Changeover deadband.	Unsigned Scale 10	Unit: depends on system unit, 0°C to 5°C or 0°F to 9°F <i>Value x 10 (e.g. 1°C = 10 or 2°F = 20)</i>	W

Register Index	Description	Data Type	Range	Writable
40060	Changeover setpoint.	Signed Scale 10	Unit: depends on system unit, 10°C to 40°C or 50°F to 104°F Value x 10 (e.g. 12°C = 120 or 60°F = 600)	W
40061	Fan time out in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 255 seconds, Value x 1 (e.g. 100 secs = 100)	W
40062	Fan damping factor in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 255 seconds, Value x 1 (e.g. 100 secs = 100)	W
40063	Heating integral time factor in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 250 seconds, Value x 1 (e.g. 100 secs = 100)	W
40064	Cooling integral time factor in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 250 seconds, Value x 1 (e.g. 100 secs = 100)	W
40065	CL_HT_SwitchTimer - Delay between cool and heat or vice versa.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 120 minutes, Value x 1 (e.g. 100 mins = 100)	W
40066	Cooling anticycle delay in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 minutes, Value x 1 (e.g. 10 mins = 10)	W
40067	NSB override delay in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 180 minutes, Value x 1 (e.g. 100 mins = 100)	W
40068	Unoccupied override delay in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 180 minutes, Value x 1 (e.g. 100 mins = 100)	W
40069	Occupancy minimum time in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 240 minutes, Value x 1 (e.g. 100 mins = 100)	W
40070	Unoccupied override delay count down in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 180 minutes, Value x 1 (e.g. 100 mins = 100)	W
40071	Fan mode (speed) in unoccupied or NSB mode.	Unsigned	1 = Low, 2 = Med, 3 = High, 4 = Auto	W
40072	Fan mode (speed) when window is opened (alarm).	Unsigned	1 = Low, 2 = Med, 3 = High, 4 = Auto	W
40073	Fan mode (speed) when door is opened (alarm).	Unsigned	1 = Low, 2 = Med, 3 = High, 4 = Auto	W
40074	System control mode.	Unsigned	1 = Auto, 2 = Heat, 3 = Cool, 4 = Heat or Cool, 5 = Auto Lock	W
40075	Override System occupancy/NSB mode.	Unsigned	1 = Locally, 2 = OFF, 3 = Occupied, 4 = Unoccupied, 5 = Day, 6 = Night	W
40076	Internal temperature sensor offset correction.	Signed Scale 100	Unit: depends on system unit, Range: ± 5°C or +/- 9°F Value x 100 (e.g. 2°C = 200 or 3°F = 300)	W

Register Index	Description	Data Type	Range	Writable
40077	Analog Input 1 signal.	Unsigned	1 = OFF 2 = Extern sensor 10K 3 = Change over sensor 4 = Change over normally cool 5 = Change over normally heat 6 = Outside air sensor 7 = Extern sensor 0-10V 8 = CO2 sensor 0-10V 9 = Occupancy binary input 10 = NSB binary input 11 = Override binary input 12 = Window binary input 13 = Door binary input 14 = Dirty Filter binary input 15 = Flow switch binary input 16 = OverHeat binary input 17 = Selector switch binary input 18 = Humidity sensor 0-10V	W
40078	Analog Input 2 signal.	Unsigned	1 = OFF 2 = Extern sensor 10K 3 = Change over sensor 4 = Change over normally cool 5 = Change over normally heat 6 = Outside air sensor 7 = Extern sensor 0-10V 8 = CO2 sensor 0-10V 9 = Occupancy binary input 10 = NSB binary input 11 = Override binary input 12 = Window binary input 13 = Door binary input 14 = Dirty Filter binary input 15 = Flow switch binary input 16 = OverHeat binary input 17 = Selector switch binary input 18 = Humidity sensor 0-10V	W
40079	External temperature sensor offset correction.	Signed Scale 100	Unit: depends on system unit, Range: $\pm 5^{\circ}\text{C}$ or $\pm 9^{\circ}\text{F}$ Value $\times 100$ (e.g. $2^{\circ}\text{C} = 200$ or $3^{\circ}\text{F} = 300$)	W
40080	Changeover control mode.	Unsigned	1 = Local, 2 = Cool, 3 = Heat	W
40081	Minimum external temperature reading.	Signed Scale 10	Unit: depends on system unit, Range: -40°C to 0°C or -40°F to 32°F Value $\times 10$ (e.g. $-20^{\circ}\text{C} = -200$ or $-20^{\circ}\text{F} = 200$)	W
40082	Maximum external temperature reading.	Signed Scale 10	Unit: depends on system unit, Range: 50°C to 100°C or 122°F to 212°F Value $\times 10$ (e.g. $60^{\circ}\text{C} = 600$ or $140^{\circ}\text{F} = 1400$)	W
40083	Maximum CO2 reading.	Signed Scale 1	Unit: PPM, Range: 1000 to 5000, Value $\times 1$ (e.g. $2000 = 2000$)	W
40084	Alarm level of CO2.	Signed Scale 1	Unit: PPM, Range: 1000 to CO2 range, Value $\times 1$ (e.g. $1000 = 1000$)	W
40085	Fan output signal.	Unsigned	1 = 1 speed, 2 = 2 speeds, 3 = 3 speeds, 4 = Analog, 5 = VFD	W
40086	Ramp to control analog output 1.	Unsigned	1 = Off 2 = Changeover with fan 3 = Cooling 1 with fan 4 = Cooling 2 with fan 5 = Heating 1 with fan 6 = Heating 2 with fan 7 = Heating 2 8 = Cooling 1 Heating 1 With Fan 9 = HumidifyWithFan 10 = CO2 alarm 11 = 6 way valve	W

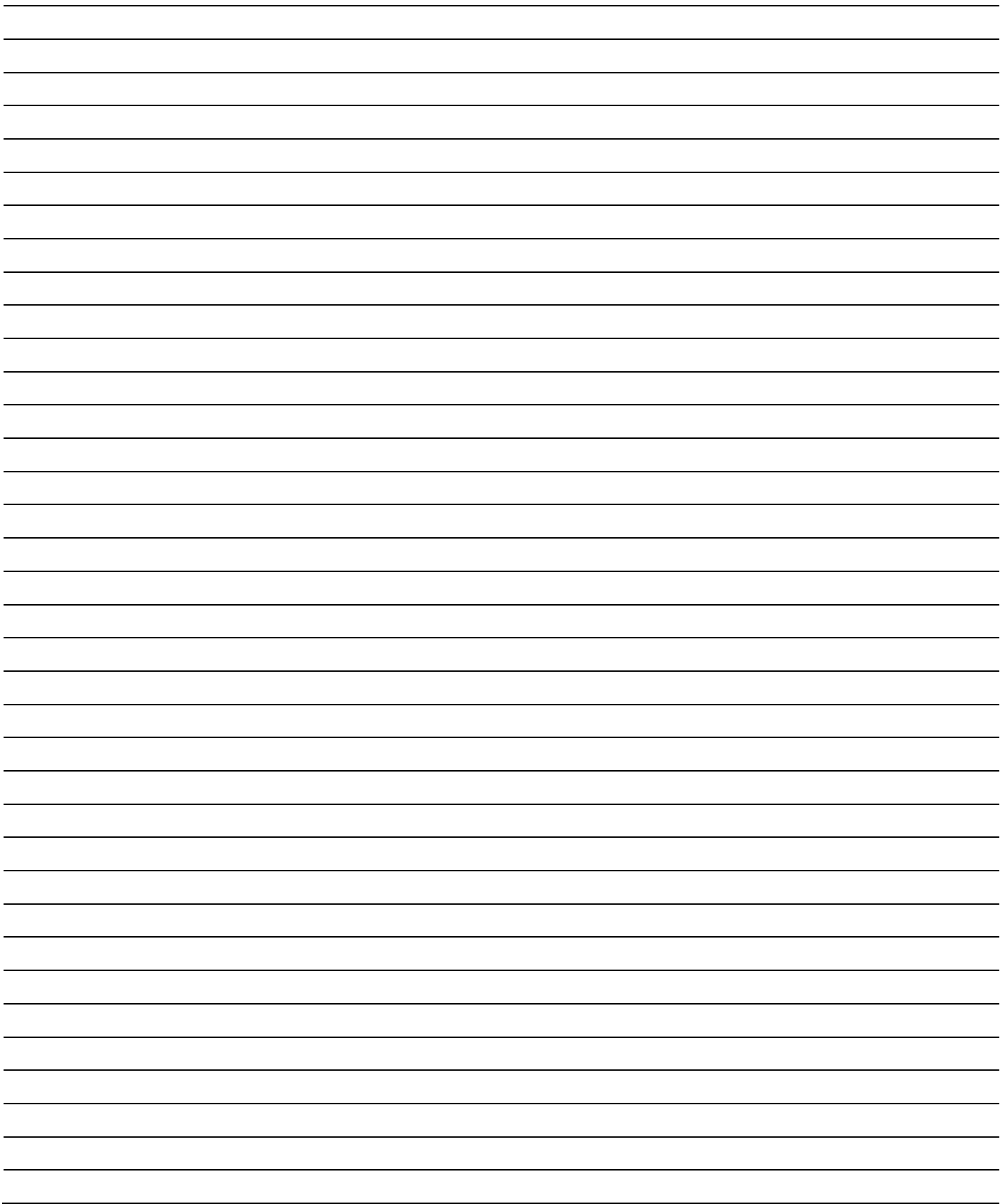
Register Index	Description	Data Type	Range	Writable
40087	Minimum voltage for analog output 1 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, <i>Value x 10</i> (e.g. 3 V = 30)	W
40088	Maximum voltage for analog output 1 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, <i>Value x 10</i> (e.g. 3 V = 30)	W
40089	Ramp to control analog output 2.	Unsigned	1 = Off 2 = Changeover with fan 3 = Cooling 1 with fan 4 = Cooling 2 with fan 5 = Heating 1 with fan 6 = Heating 2 with fan 7 = Heating 2 8 = Cooling 1 Heating 1 With Fan 9 = HumidifyWithFan 10 = CO2 alarm 11 = 6 way valve 12 = FAN	W
40090	Minimum voltage for analog output 2 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, <i>Value x 10</i> (e.g. 3 V = 30)	W
40091	Maximum voltage for analog output 2 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, <i>Value x 10</i> (e.g. 3 V = 30)	W
40092	Position of CH1 AO output while heating (%).	Unsigned Scale 1	Unit: %, Range: 0% to 100%, <i>Value x 1</i> (e.g. 10% = 10)	W
40093	Ramp to control binary output 1.	Unsigned	1 = Off 2 = Changeover with fan 3 = Cooling 1 with fan 4 = Cooling 2 with fan 5 = Heating 1 with fan 6 = Heating 2 with fan 7 = Heating 2 8 = Cooling 1 Heating 1 With Fan 9 = HumidifyWithFan 10 = CO2 alarm	W
40094	Delay before activation of BO1 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 Minutes, <i>Value x 1</i> (e.g. 5 mins = 5)	W
40095	Close position percentage for contact BO1.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1</i> (e.g. 20% = 20)	W
40096	Open position percentage for contact BO1.	Unsigned Scale 1	Unit: %, Range: 0% to BO1closepos-4%, <i>Value/1</i> (e.g. 20% = 20)	W
40097	Ramp to control binary output 2.	Unsigned	1 = Off 2 = Changeover with fan 3 = Cooling 1 with fan 4 = Cooling 2 with fan 5 = Heating 1 with fan 6 = Heating 2 with fan 7 = Heating 2 8 = Cooling 1 Heating 1 With Fan 9 = HumidifyWithFan 10 = CO2 alarm	W
40098	Delay before activation of BO2 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 Minutes, <i>Value x 1</i> (e.g. 5 mins = 5)	W

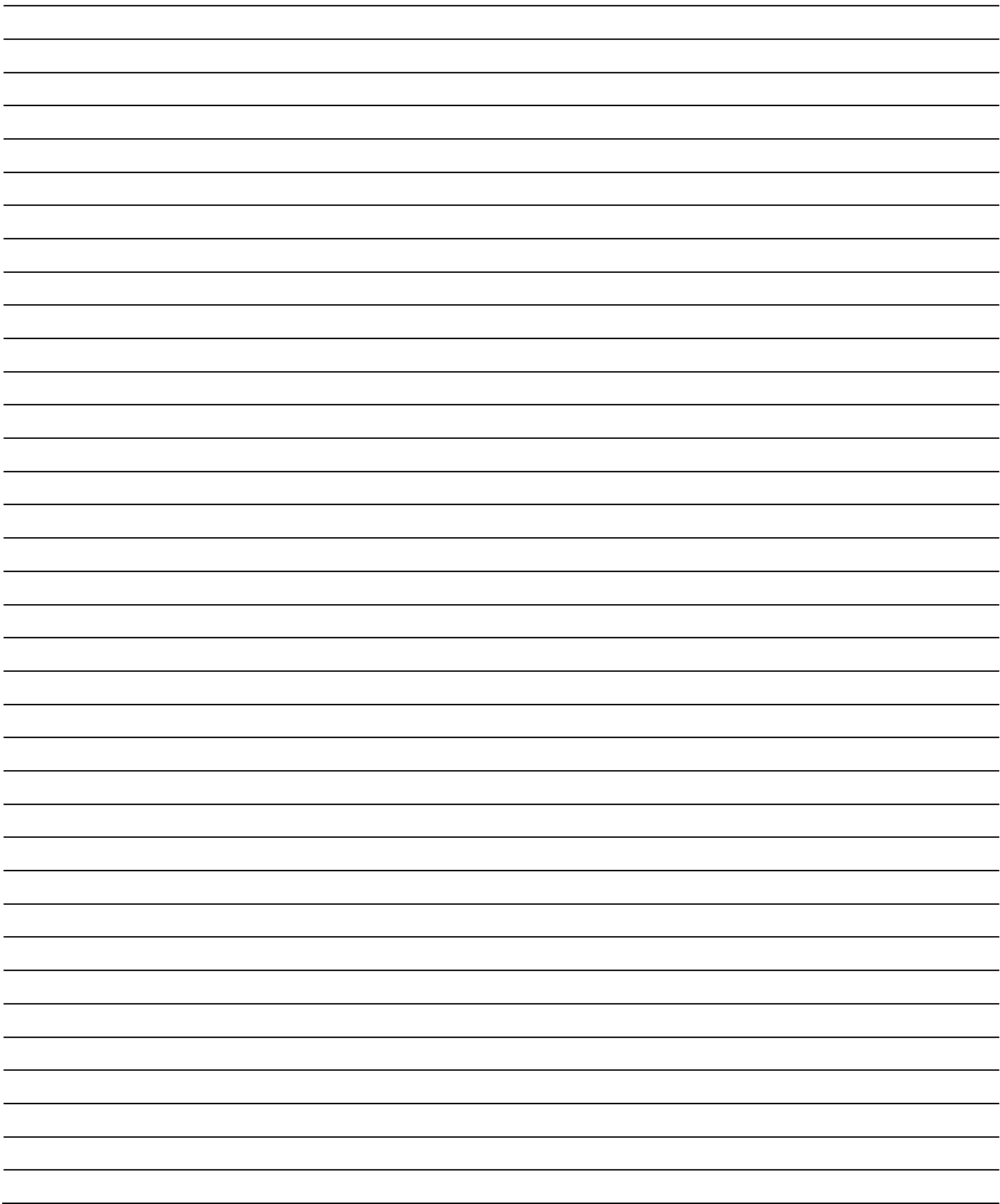
Register Index	Description	Data Type	Range	Writable
40099	Close position percentage for contact BO2.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40100	Open position percentage for contact BO2.	Unsigned Scale 1	Unit: %, Range: 0% to BO2closepos-4%, <i>Value x 1 (e.g. 20%= 20)</i>	W
40101	Ramp to control binary output 3.	Unsigned	1 = Off 2 = Changeover with fan 3 = Cooling 1 with fan 4 = Cooling 2 with fan 5 = Heating 1 with fan 6 = Heating 2 with fan 7 = Heating 2 8 = Cooling 1 Heating 1 With Fan 9 = HumidifyWithFan 10 = CO2 alarm	W
40102	Delay before activation of BO3 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 Minutes, <i>Value x 1 (e.g. 5 mins = 5)</i>	W
40103	Close position percentage for contact BO3.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40104	Open position percentage for contact BO3.	Unsigned Scale 1	Unit: %, Range: 0% to BO3closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40105	Ramp to control binary output 4.	Unsigned	1 = Off 2 = Changeover with fan 3 = Cooling 1 with fan 4 = Cooling 2 with fan 5 = Heating 1 with fan 6 = Heating 2 with fan 7 = Heating 2 8 = Cooling 1 Heating 1 With Fan 9 = HumidifyWithFan 10 = CO2 alarm 11 = FAN	W
40106	Delay before activation of BO4 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 Minutes, <i>Value x 1 (e.g. 5 mins = 5)</i>	W
40107	Close position percentage for contact BO4.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40108	Open position percentage for contact BO4.	Unsigned Scale 1	Unit: %, Range: 0% to BO4closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40109	Ramp to control binary output 5.	Unsigned	1 = Off 2 = Changeover with fan 3 = Cooling 1 with fan 4 = Cooling 2 with fan 5 = Heating 1 with fan 6 = Heating 2 with fan 7 = Heating 2 8 = Cooling 1 Heating 1 With Fan 9 = HumidifyWithFan 10 = CO2 alarm 11 = FAN	W
40110	Delay before activation of BO5 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 Minutes, <i>Value x 1 (e.g. 5 mins = 5)</i>	W

Register Index	Description	Data Type	Range	Writable
40111	Close position percentage for contact BO5.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40112	Open position percentage for contact BO5.	Unsigned Scale 1	Unit: %, Range: 0% to BO5closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40113	Ramp to control binary output 6.	Unsigned	1 = Off 2 = Changeover with fan 3 = Cooling 1 with fan 4 = Cooling 2 with fan 5 = Heating 1 with fan 6 = Heating 2 with fan 7 = Heating 2 8 = Cooling 1 Heating 1 With Fan 9 = HumidifyWithFan 10 = CO2 alarm 11 = FAN (available only if fan type is 1-2-3 speeds)	W
40114	Delay before activation of BO6 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 Minutes, <i>Value x 1 (e.g. 5 = 5 mins)</i>	W
40115	Close position percentage for contact BO6.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40116	Open position percentage for contact BO6.	Unsigned Scale 1	Unit: %, Range: 0% to BO6closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40117	Input contact of binary input 1, 2 and analog input 1, 2.	Bit String	[B4-B15]: Reserved B0: Binary input 1 <i>0 = Normally Open, 1 = Normally Close</i> B1: Binary input 2 <i>0 = Normally Open, 1 = Normally Close</i> B2: Analog input 1 <i>0 = Normally Open, 1 = Normally Close</i> B3: Analog input 2 <i>0 = Normally Open, 1 = Normally Close</i>	W
40118	Configuration of binary input 1 mode.	Unsigned	1 = OFF 2 = Override 3 = Window 4 = Door 5 = DirtyFilter 6 = FlowSwitch 7 = OverHeat 8 = SelectorSwitch (warning, must be used with FlowSwitch, in local mode Fan stay off) 9 = Change over normally cool 10 = Change over normally heat 11 = NSB 12 = Occupancy	W
40119	Delay before activation of BI1 in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 3600 seconds, <i>Value x 1 (e.g. 20 secs = 20)</i>	W

Register Index	Description	Data Type	Range	Writable
40120	Configuration of binary input 2 mode.	Unsigned	1 = OFF 2 = Override 3 = Window 4 = Door 5 = DirtyFilter 6 = FlowSwitch 7 = OverHeat 8 = SelectorSwitch (warning, must be used with FlowSwitch, in local mode Fan stay off) 9 = Change over normally cool 10 = Change over normally heat 11 = NSB 12 = Occupancy	W
40121	Delay before activation of BI2 in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 3600 seconds, <i>Value x 1 (e.g. 20 secs = 20)</i>	W
40122	Delay before activation of AI1 in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 3600 seconds, <i>Value x 1 (e.g. 20 secs = 20)</i>	W
40123	Delay before activation of AI2 in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 3600 seconds, <i>Value x 1 (e.g. 20 secs = 20)</i>	W
40124	Humidity control mode status.	Unsigned	1 = Auto, 2 = Dehumidification, 3 = Humidification, 4 = Off	W
40125	Humidity setpoint (%RH) in occupancy or day mode.	Unsigned Scale 10	Unit: %RH, Limited by min/max humidity setpoint, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40126	Dehumidification setpoint (%RH) in unoccupied or night mode.	Unsigned Scale 10	Unit: %RH, Range: 10%RH to 65%RH, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40127	Humidification setpoint (%RH) in unoccupied or night mode.	Unsigned Scale 10	Unit: %RH, Range: 10%RH to 65%RH, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40128	Minimum user setpoint.	Unsigned Scale 10	Unit: %RH, Range: 10%RH to max, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40129	Maximum user setpoint.	Unsigned Scale 10	Unit: %RH, Range: min to 90%RH, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40130	Humidity proportional band.	Unsigned Scale 10	Unit: %RH, Range: 3%RH to 10%RH, <i>Value x 10 (e.g. 4%RH = 40)</i>	W
40131	Humidity deadband.	Unsigned Scale 10	Unit: %RH, Range: 0%RH to 5%RH, <i>Value x 10 (e.g. 4%RH = 40)</i>	W
40132	Internal humidity sensor offset correction. Only available on model TUHB24C6X2.	Signed Scale 10	Unit: %RH, Range: ± 5%RH, <i>Value x 10 (e.g. 2%RH = 20)</i>	W
40133	External humidity sensor offset correction.	Signed Scale 10	Unit: %RH, Range: ± 5%RH, <i>Value x 10 (e.g. 2%RH = 20)</i>	W
40134	Voltage required for closing the 6-way valve.	Unsigned Scale 100	Unit: V, Range: 0 to 11 V, <i>Value x 100 (e.g. 2V = 200)</i>	W

Register Index	Description	Data Type	Range	Writable
40135	Minimum output voltage required for cooling for the 6-way valve.	Unsigned Scale 100	Unit: V, Range: 0 to 11 V, <i>Value x 100 (e.g. 2V = 200)</i>	W
40136	Minimum output voltage required for heating for the 6-way valve.	Unsigned Scale 100	Unit: V, Range: 0 to 11 V, <i>Value x 100 (e.g. 2V = 200)</i>	W
40137	6-way valve size selection in inches.	Unsigned	1 = 1/2, 2 = 3/4, 3 = 1	W







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