



neptronic®

Fan Coil Controller

EFCB Series

Modbus Communication Module User Guide



EFCB10TU2 (24Vac / 2 relays)

EFCB10TU4 (24Vac / 4 relays)

EFCB11TU2 (120Vac / 2 relays)

EFCB11TU4 (120Vac / 4 relays)

EFCB12TU2 (240Vac / 2 relays)

EFCB12TU4 (240Vac / 4 relays)





Introduction

The EFCB Series 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 EFCB Series devices.

The EFCB Series Modbus Guide assumes that you are familiar with Modbus terminology.

The following are the requirements for Modbus:

- **Data Model.** The EFCB Series Modbus server data model uses only the Holding Registers table.
- **Function Codes.** The EFCB Series Modbus server supports a limited function codes subset comprising:
 - Read Holding Registers (0x03)
 - Write Single Register (0x06)
 - Write Multiple Registers (0x10)
- **Exception Responses.** The EFCB Series Modbus server supports the following exception codes:
 - Illegal data address
 - Illegal data value
 - Slave device busy
- **Serial Line.** The EFCB Series 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.
 - If the device does not detect any activity for one second or more, it will find a silent line to prevent a possible baud rate scan on the next frame it detects.
- **Addressing.** The EFCB Series 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

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	MB = Modbus Address (e.g. 110), LB = 1-247	W
40001	MSTP Baud Rate - BaudRate of device/100.	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	1 to 65,535 char 8: 0x0045 = E char 7: 0x0046 = F	W
40004	ProdName_65, characters 6-5 of 8 name characters.	ASCII	1 to 65,535 char 6: 0x0043 = C char 5: 0x0042 = B	W
40005	ProdName_43, characters 4-3 of 8 name characters.	ASCII	1 to 65,535 char 4: 0x0054 = T char 3: 0x0055 = U	W
40006	ProdName_21, characters 2-1 of 8 name characters.	ASCII	1 to 65,535 char 2: 0x0034 = 4 char 1: 0x0000 =	W

Register Index	Description	Data Type	Range	Writable
40007	Product actual firmware version.	Unsigned	1 to 65,535 (e.g. 210)	RO
40008	Product actual EEPROM version.	Unsigned	1 to 65,535 (e.g. 207)	RO
40009	System Status 1.	Bit String	[B1, B5, B7-B11]: Reserved B0: System operation 0 = Normal, 1 = Fault B2: System override by NSB 0 = Normal, 1 = OFF B3: Change Over Mode 0 = Cooling, 1 = Heating B4: Flow Switch Alarm 0 = No alarm, 1 = Alarm activated B6: Dirty Filter Alarm 0 = No alarm, 1 = Alarm activated B12: Analog Input 3 Mode 0 = Temp 10kΩ, 1 = 0-10Vdc B13: Analog Input 4 Mode 0 = Temp 10kΩ, 1 = 0-10Vdc B14: Analog Input 5 mode 0 = Temp 10kΩ, 1 = 0-10Vdc B15: Analog Input 6 Mode 0 = Temp 10kΩ, 1 = 0-10Vdc	RO
40010	System Status 2.	Bit String	[B0-B6, B12-B14]: Reserved B7: Override Alarm 0 = Off, 1 = On B8: Window Opened Alarm 0 = Off, 1 = On B9: Door Opened Alarm 0 = Off, 1 = On B10: DI1 Alarm 0 = Off, 1 = On B11: DI2 Alarm 0 = Off, 1 = On B13: DI4 Alarm 0 = Off, 1 = On B15: Overheat Alarm 0 = Off, 1 = On	RO
40011	Internal temperature sensor reading.	Unsigned Scale 100	Range: 0°C to 50°C or 32°F to 122°F Value x 100 (e.g. 23°C = 2300 or 33°F = 3300)	RO
40012	External temperature sensor reading.	Unsigned Scale 100	Range: 0°C to 50°C or 32°F to 122°F Value x 100 (e.g. 23°C = 2300 or 33°F = 3300)	RO
40013	Changeover temperature sensor reading.	Unsigned Scale 100	Range: 0°C to 50°C or 32°F to 122°F Value x 100 (e.g. 23°C = 2300 or 33°F = 3300)	RO
40014	Control temperature reading.	Unsigned Scale 100	Range: 0°C to 50°C or 32°F to 122°F Value x 100 (e.g. 23°C = 2300 or 33°F = 3300)	W
40015	Internal humidity sensor reading. Select models only.	Unsigned Scale 10	Unit: % RH, Range: 5%RH to 100%RH Value x 10 (e.g. 30%RH = 300)	RO

Register Index	Description	Data Type	Range	Writable
40016	External Humidity sensor reading. Select models only.	Unsigned Scale 10	Unit: % RH, Range: 5%RH to 100%RH Value x 10 (e.g. 30%RH = 300)	RO
40017	Analog input 3 reading.	Signed Scale 100	Unit: Volts or °C/°F, Range: 0V to 10V, -40°C to 100°C or -40°F to 212°F Value x 100 (e.g. 3 V = 300/18°C = 1800 or 33°F = 3300)	RO
40018	Analog input 4 reading.	Signed Scale 100	Unit: Volts or °C/°F, Range: 0V to 10V, -40°C to 100°C or -40°F to 212°F Value x 100 (e.g. 3 V = 300/18°C = 1800 or 33°F = 3300)	RO
40019	Analog input 5 reading.	Signed Scale 100	Unit: Volts or °C/°F, Range: 0V to 10V, -40°C to 100°C or -40°F to 212°F Value x 100 (e.g. 3 V = 300/18°C = 1800 or 33°F = 3300)	RO
40020	Analog input 6 reading.	Signed Scale 100	Unit: Volts or °C/°F, Range: 0V to 10V, -40°C to 100°C or -40°F to 212°F Value x 100 (e.g. 3 V = 300/18°C = 1800 or 33°F = 3300)	RO
40021	Digital input status of 4 digital inputs.	Bit String	[B8-B15]: Reserved B0: Digital input 1 0 = Open, 1 = Close B1: Digital input 2 0 = Open, 1 = Close B2: Digital input 3 0 = Open, 1 = Close B3: Digital input 4 0 = Open, 1 = Close B4: AI3 Digital input 0 = Open, 1 = Close B5: AI4 Digital input 0 = Open, 1 = Close B6: AI5 Digital input 0 = Open, 1 = Close B7: AI6 Digital input 0 = Open, 1 = Close	RO
40022	Actual system occupancy state.	Unsigned	1 = NoOccupancy 2 = Occupancy 3 = Override	RO
40023	Actual night setback state of the system. Not available on all models.	Unsigned	1 = Day 2 = Night 3 = Override	RO
40024	Actual heating demand.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40025	Actual local reheat demand.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40026	Actual cooling demand.	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

Register Index	Description	Data Type	Range	Writable
40029	Actual dehumidification demand. Select models only.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40030	Actual humidification demand. Select models only.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40031	Switch timer countdown until the system is able to swap the demand.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 120 minutes, Value x 1 (e.g. 5 mins = 5)	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
40034	Analog output 3 value.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	W
40035	Analog output 4 value.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	W
40036	Floating output 1 value.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40037	Floating output 2 value.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40038	Pulsing output 1 value.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40039	Pulsing output 2 value.	Unsigned Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40040	Pulsing output 3 value.	Signed Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40041	Pulsing output 4 value.	Signed Scale 10	Unit: %, Range: 0% to 100%, Value x 10 (e.g. 100% = 1000)	RO
40042	TRIAC output on-off mode status.	Bit String	[B4-B15]: Reserved B0: On Off output 1 0 = Off, 1 = On B1: On Off output 2 0 = Off, 1 = On B2: On Off output 3 0 = Off, 1 = On B3: On Off output 4 0 = Off, 1 = On	W

Register Index	Description	Data Type	Range	Writable
40043	Digital output - 7 relays output status.	Bit String	[B7-B15]: Reserved B0: Digital output 1 0 = Open, 1 = Close B1: Digital output 2 0 = Open, 1 = Close B2: Digital output 3 0 = Open, 1 = Close B3: Digital output 4 0 = Open, 1 = Close B4: FAN Output High 0 = Open, 1 = Close B5: FAN Output Med 0 = Open, 1 = Close B6: FAN Output Low 0 = Open, 1 = Close	W
40044	System command.	Bit String	[B6, B9-B15]: Reserved B0: Service Display Address 0 = Off; 1 = Display address on LCD B1: Cooling Ramp Lock 0 = Off; 1 = On B2: Condensation Alarm 0 = Off; 1 = On B3: Heating Ramp Lock 0 = Off; 1 = On B4: Reheat Ramp Lock 0 = Off; 1 = On B5: Changeover Ramp Lock 0 = Off; 1 = On B7: Humidify Ramp Lock 0 = Off; 1 = On B8: Dehumidify Ramp Lock 0 = Off; 1 = On	W
40045	System mode status.	Unsigned	1 = Auto 2 = Heat 3 = Cool 4 = Off	W
40046	Fan speed selection by user.	Unsigned	1 = Auto 2 = Low 3 = Med 4 = High	W
40047	Temperature setpoint in occupancy or day mode.	Signed Scale 10	Unit: Volts or °C/°F, Range: min to max setpoint Value x 10 (e.g. 3 V = 300/18°C = 180 or 60°F = 600)	W

Register Index	Description	Data Type	Range	Writable
40048	System options1.	Bit String	B0: Temp unit displayed on Digital Room Sensor 0 = °C, 1 = °F B1: Temp unit displayed in Modbus 0 = °C, 1 = °F B2: Temp SetPoint Lock 0 = Off, 1 = On B3: Humidity SetPoint Lock 0 = Off, 1 = On B4: Program Mode Lock 0 = Off, 1 = On B5: Floating TO1/TO2 Direction 0 = Direct, 1 = Reverse B6: Floating TO3/TO4 Direction 0 = Direct, 1 = Reverse B7: Freeze Protection Alarm 0 = Off, 1 = On B8: User System Off Modes 0 = Enable, 1 = Disable B9: Keypad Bottom Left Lock 0 = Off, 1 = On B10: Keypad Upper Left Lock 0 = Off, 1 = On B11: Keypad Arrows Lock 0 = Off, 1 = On B12: User Fan Auto Mode 0 = Enable, 1 = Disable B13: Night SetBack Mode 0 = Setpoint, 1 = OFF B14: Humidity Control Source 0 = Intern Sensor, 1 = Extern Sensor B15: Time Mode 0 = 24h, 1 = 12h	W

Register Index	Description	Data Type	Range	Writable
40049	System options 2.	Bit String	[B0-B1]: Reserved B2: Baud Rate <i>0 = Auto, 1 = Manual</i> B3: Schedule On or Off <i>0 = Off, 1 = On</i> B4: Analog Output 1 Direction <i>0 = Direct, 1 = Reverse</i> B5: Analog Output 2 Direction <i>0 = Direct, 1 = Reverse</i> B6: Analog Output 3 Direction <i>0 = Direct, 1 = Reverse</i> B7: Analog Output 4 Direction <i>0 = Direct, 1 = Reverse</i> B8: TO1 Direction <i>0 = Direct, 1 = Reverse</i> B9: TO2 Direction <i>0 = Direct, 1 = Reverse</i> B10: TO3 Direction <i>0 = Direct, 1 = Reverse</i> B11: TO4 Direction <i>0 = Direct, 1 = Reverse</i> B12: Digital Output 1 Direction <i>0 = Direct, 1 = Reverse</i> B13: Digital Output 2 Direction <i>0 = Direct, 1 = Reverse</i> B14: Digital Output 3 Direction <i>0 = Direct, 1 = Reverse</i> B15: Digital Output 4 Direction <i>0 = Direct, 1 = Reverse</i>	W
40050	System options 3.	Bit String	[B0, B2, B5-B6, B8-B15]: Reserved B1: ECM Fan Enable <i>0 = Off, 1 = On</i> B3: Display CO2 <i>0 = Off, 1 = On</i> B4: CO2 Source Select <i>0 = TFL, 1 = Analog</i> B7: Occupancy Control Source <i>0 = DigitalInput3, 1 = InternSensor</i>	W
40051	System option4.		[B0-B15]: Reserved	W
40052	TFL/TDF display information.	Unsigned	1= Temperature and Demand 2= Setpoint and Demand 3= Temperature Only 4= Setpoint Only 5= Off	W
40053	Temperature control source.	Unsigned	1= Network Temp 2= Intern Temp 3= Extern Temp	W
40054	Network fallback timeout Present Value.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 60 minutes, <i>Value x 1 (e.g. 30 mins = 30)</i>	W
40055	Minimum occupancy/day setpoint.	Signed Scale 10	Unit: Volts or °C/°F, Range: 10°C to max or 50°F to max <i>Value x 10 (e.g. 3 V = 30/18°C = 180 or 60°F = 600)</i>	W

Register Index	Description	Data Type	Range	Writable
40056	Maximum occupancy/day setpoint.	Signed Scale 10	Unit: Volts or °C/°F, Range: min to 40°C or min to 104°F Value x 10 (e.g. 3 V = 30/18°C = 180 or 60°F = 600)	W
40057	Cooling temperature setpoint in unoccupied or night mode.	Signed Scale 10	Unit: Volts or °C/°F, Range: 10°C to 40°C or 50°F to 104°F Value x 10 (e.g. 3 V = 300/18°C = 180 or 60°F = 600)	W
40058	Heating temperature setpoint in unoccupied or night mode.	Signed Scale 10	Unit: Volts or °C/°F, Range: 10°C to 40°C or 50°F to 104°F Value x 10 (e.g. 3 V = 300/18°C = 180 or 60°F = 600)	W
40059	Heating proportional band.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9° Value x 10 (e.g. 1°C = 10 or 2°F = 20)	W
40060	Local reheat proportional band.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F Value x 10 (e.g. 1°C = 10 or 2°F = 20)	W
40061	Cooling proportional band.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F Value x 10 (e.g. 1°C = 10 or 2°F = 20)	W
40062	Change over proportional band.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F Value x 10 (e.g. 1°C = 10 or 2°F = 20)	W
40063	Heating dead band.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F Value x 10 (e.g. 1°C = 10 or 2°F = 20)	W
40064	Local reheat dead band.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F Value x 10 (e.g. 1°C = 10 or 2°F = 20)	W
40065	Cooling dead band.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F Value x 10 (e.g. 1°C = 10 or 2°F = 20)	W
40066	Change over dead band.	Unsigned Scale 10	Unit: depends on system unit, 0.5°C to 5°C or 1°F to 9°F Value x 10 (e.g. 1°C = 10 or 2°F = 20)	W
40067	Change over 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
40068	Fan time out in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 255 seconds, Value x 1 (e.g. 100 secs = 100)	W
40069	Fan damping factor in seconds.	Unsigned Scale 1	Unit: Seconds, Range: 0 to 255 seconds, Value x 1 (e.g. 100 secs = 100)	W
40070	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
40071	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

Register Index	Description	Data Type	Range	Writable
40072	Delay between cooling and heating or vice versa.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 120 minutes, <i>Value x 1 (e.g.10 mins = 10)</i>	W
40073	Cooling anticycle delay in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 minutes, <i>Value x 1 (e.g.100 mins = 100)</i>	W
40074	NSB override delay in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 180 minutes, <i>Value x 1 (e.g.100 mins = 100)</i>	W
40075	Unoccupied override delay in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 180 minutes, <i>Value x 1 (e.g.100 mins = 100)</i>	W
40076	Occupancy minimum time in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 240 minutes, <i>Value x 1 (e.g.100 mins = 100)</i>	W
40077	Unoccupied override delay count down in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 180 minutes, <i>Value x 1 (e.g.100 mins = 100)</i>	W
40078	System Control mode.	Unsigned	1= Auto 2= Heat 3= Cool 4= Heat or Cool	W
40079	Digital input 3 mode.	Unsigned	1= Off 2= Occupancy normally open 3= Occupancy normally close 4= NSB normally open 5= NSB normally close	W
40080	Override system occupancy or NSB mode. Depending on the selected DI3 mode (40079), some of these options may not be writable.	Unsigned	1= Locally 2= OFF 3= Occupied 4= Unoccupied 5= Day 6= Night	W
40081	Internal temperature sensor offset correction.	Signed Scale 100	Unit: depends on system unit, Range: $\pm 5^{\circ}\text{C}$ or $\pm 9^{\circ}\text{F}$ <i>Value x 100 (e.g.2°C = 200 or 3°F = 300)</i>	W
40082	External temperature sensor offset correction.	Signed Scale 100	Unit: depends on system unit, Range: $\pm 5^{\circ}\text{C}$ or $\pm 9^{\circ}\text{F}$ <i>Value x 100 (e.g.2°C = 200 or 3°F = 300)</i>	W
40083	Change over analog input signal.	Unsigned	3= Sensor 4= Normally Cool 5= Normally Heat	W
40084	Change over control mode.	Unsigned	1= Local 2= Cool 3= Heat	W
40085	External temperature 0-10V input on analog input.	Unsigned	1= Off 2= 2-10V 3= 0-10V	W
40086	Minimum analog input external temperature reading.	Signed Scale 10	Unit: depends on system unit, Range: -40°C to 0°C or -40°F to 32°F <i>Value x 10 (e.g.-20°C = -200 or -20°F = 200)</i>	W
40087	Maximum analog input external temperature reading.	Signed Scale 10	Unit: depends on system unit, Range: 50°C to 100°C or 122°F to 212°F , <i>Value x 10 (e.g.60°C = 600 or 140°F = 1400)</i>	W
40088	Fan output signal.	Unsigned	1= 1 speed 2= 2 speeds 3= 3 speeds 4= Analog	W

Register Index	Description	Data Type	Range	Writable
40089	Ramp to control analog output 1.	Unsigned	1= Off 2 = Alarm 3= Changeover with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat 8= HumidifyWithFan (with TFLHxx/TDF digital room sensor with humidity only) 9= Reserved 10= Cooling or Heating	W
40090	Minimum voltage for analog output 1 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, Value x 10 (e.g. 3 V = 30)	W
40091	Maximum voltage for analog output 1 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, Value x 10 (e.g. 3 V = 30)	W
40092	Ramp to control analog output 2.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat 8= HumidifyWithFan (with TFLHxx/TDF digital room sensor with humidity only) 9= Reserved 10= Cooling or Heating	W
40093	Minimum voltage for analog output 2 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, Value x 10 (e.g. 3 V = 30)	W
40094	Maximum voltage for analog output 2 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, Value x 10 (e.g. 3 V = 30)	W
40095	Ramp to control analog output 3.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat 8= HumidifyWithFan (with TFLHxx/TDF digital room sensor with humidity only) 9= Reserved 10= Cooling or Heating	W
40096	Minimum voltage for analog output 3 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, Value x 10 (e.g. 3 V = 30)	W
40097	Maximum voltage for analog output 3 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, Value x 10 (e.g. 3 V = 30)	W
40098	Ramp to control analog output 4.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat 8= HumidifyWithFan (with TFLHxx/TDF digital room sensor with humidity only) 9= Fan 10= Cooling or Heating	W
40099	Minimum voltage for analog output 4 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, Value x 10 (e.g. 3 V = 30)	W
40100	Maximum voltage for analog output 4 (volt).	Unsigned Scale 10	Unit: Volt, Range: 0V to 10V, Value x 10 (e.g. 3 V = 30)	W
40101	Timing of floating motor TO1-TO2 in seconds.	Unsigned Scale 1	Unit: seconds, Range: 15 to 250 seconds, Value x 1 (e.g. 20 secs = 20)	W

Register Index	Description	Data Type	Range	Writable
40102	Timing of floating motor TO3-TO4 in seconds.	Unsigned Scale 1	Unit: seconds, Range: 15 to 250 seconds, <i>Value x 1 (e.g. 20 secs = 20)</i>	W
40103	Ramp to control TRIAC output 1.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat	W
40104	Signal output configuration for TRIAC output 1.	Unsigned	1= Pulsing mode 2= On/Off mode 3= Floating mode	W
40105	TRIAC output 1 when set to close.	Unsigned Scale 1	Unit: %, Range: 15 to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40106	TRIAC output 1 when set to open.	Unsigned Scale 1	Unit: %, Range: 0 to TO1closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40107	Ramp to control TRIAC output 2.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat	W
40108	Signal output configuration for TRIAC output 2.	Unsigned	1= Pulsing mode 2= On/Off mode 3= Floating mode	W
40109	TRIAC output 2 when set to close.	Unsigned Scale 1	Unit: %, Range: 15 to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40110	TRIAC output 2 when set to open.	Unsigned Scale 1	Unit: %, Range: 0 to TO2closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40111	Ramp to control TRIAC output 3.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat	W
40112	Signal output configuration for TRIAC output 3.	Unsigned Scale 1	1= Pulsing mode 2= On/Off mode 3= Floating mode	W
40113	TRIAC output 3 when set to close.	Unsigned Scale 1	Unit: %, Range: 15 to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40114	TRIAC output 3 when set to open.	Unsigned Scale 1	Unit: %, Range: 0 to TO3closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40115	Ramp to control TRIAC output 4.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat	W
40116	Signal output configuration for TRIAC output 4.	Unsigned	1= Pulsing mode 2= On/Off mode 3= Floating mode	W
40117	TRIAC output 4 when set to close.	Unsigned Scale 1	Unit: %, Range: 15 to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40118	TRIAC output 4 when set to open.	Unsigned Scale 1	Unit: %, Range: 0 to TO4closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40119	Configuration of DO1 mode.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat 8= HumidifyWithFan (<i>with TFLHxx/TDF digital room sensor with humidity only</i>)	W

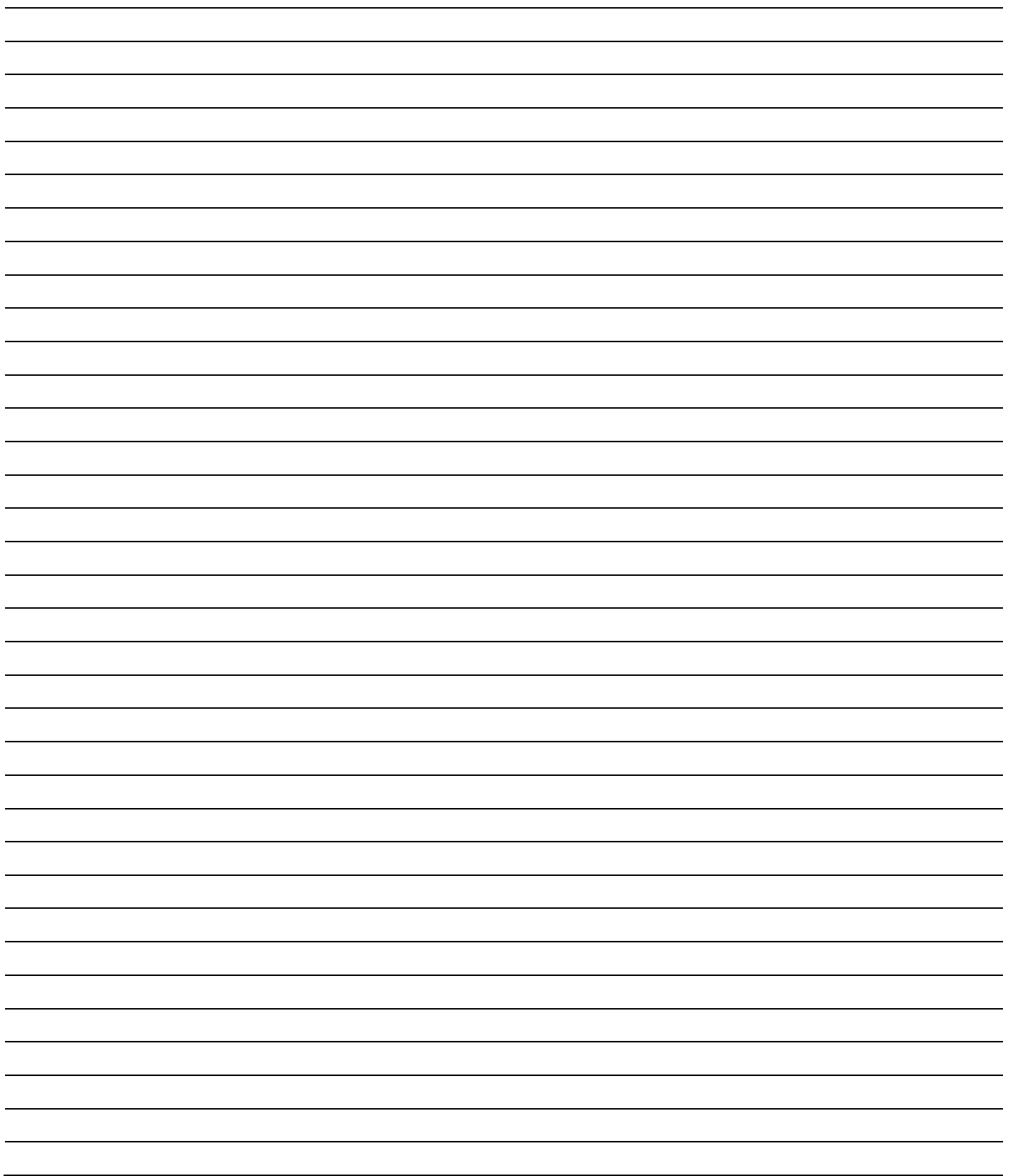
Register Index	Description	Data Type	Range	Writable
40120	Delay before activation of DO1 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 minutes, <i>Value x 1 (e.g. 5 = 5 mins)</i>	W
40121	Close position percentage for contact DO1.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40122	Open position percentage for contact DO1.	Unsigned Scale 1	Unit: %, Range: 0 to DO1closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40123	Configuration of DO2 mode.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat 8= HumidifyWithFan (<i>with TFLHxx/TDF digital room sensor with humidity only</i>)	W
40124	Activation delay for contact DO2 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 minutes, <i>Value x 1 (e.g. 5 = 5 mins)</i>	W
40125	Close position percentage for contact DO2.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40126	Open position percentage for contact DO2.	Unsigned Scale 1	Unit: %, Range: 0 to DO2closepos-4%, <i>Value/1 (e.g. 20% = 20)</i>	W
40127	Configuration of DO3 mode.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat 8= HumidifyWithFan (<i>with TFLHxx/TDF digital room sensor with humidity only</i>)	W
40128	Activation delay for contact DO3 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 minutes, <i>Value x 1 (e.g. 5 = 5 mins)</i>	W
40129	Close position percentage for contact DO3.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40130	Open position percentage for contact DO3.	Unsigned Scale 1	Unit: %, Range: 0 to DO3closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40131	Configuration of DO4 mode.	Unsigned	1= Off 2= Alarm 3= Change Over with fan 4= Cooling with fan 5= Heating with fan 6= Local Reheat with fan 7= Local Reheat 8= HumidifyWithFan (<i>with TFLHxx/TDF digital room sensor with humidity only</i>)	W
40132	Activation delay for contact DO4 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 15 minutes, <i>Value/1 (e.g. 5 = 5 mins)</i>	W
40133	Close position percentage for contact DO4.	Unsigned Scale 1	Unit: %, Range: 15% to 80%, <i>Value x 1 (e.g. 20% = 20)</i>	W
40134	Open position percentage for contact DO4.	Unsigned Scale 1	Unit: %, Range: 0 to DO4closepos-4%, <i>Value x 1 (e.g. 20% = 20)</i>	W

Register Index	Description	Data Type	Range	Writable
40135	Digital input contact of DI1 to DI4.	Bit String	[B3, B5-B15]: Reserved B0: Digital input 1 0 = Normally Open, 1 = Normally Close B1: Digital input 2 0 = Normally Open, 1 = Normally Close B2: Digital input 3 0 = Normally Open, 1 = Normally Close B4: Digital input 4 0 = Normally Open, 1 = Normally Close	W
40136	Configuration of DI1 mode.	Unsigned	1= OFF 2= Override 3= Window 4= Door 5= DirtyFilter 6= FlowSwitch 7= OverHeat	W
40137	Delay before activation of DI1 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 65,535 minutes, <i>Value x 1 (e.g. 5 = 5 mins)</i>	W
40138	Configuration of DI2 mode.	Unsigned	1= OFF 2= Override 3= Window 4= Door 5= DirtyFilter 6= FlowSwitch 7= OverHeat	W
40139	Delay before activation of DI2 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 65,535 minutes, <i>Value x 1 (e.g. 5 = 5 mins)</i>	W
40140	Configuration of DI4 mode.	Unsigned	1= OFF 2= Override 3= Window 4= Door 5= DirtyFilter 6= FlowSwitch 7= OverHeat	W
40141	Delay before activation of DI4 in minutes.	Unsigned Scale 1	Unit: Minutes, Range: 0 to 65,535 minutes, <i>Value x 1 (e.g. 5 = 5 mins)</i>	W
40142	Humidity control mode status. Not available on all models.	Unsigned	1= Auto 2= Dehumidification 3= Humidification 4= Off	W
40143	Humidity setpoint (%RH) in occupancy or day mode. Not available on all models.	Unsigned Scale 10	Unit: %RH, Limited by min/max humidity setpoint, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40144	Dehumidification setpoint (%RH) in unoccupied or night mode. Not available on all models.	Unsigned Scale 10	Unit: %RH, Range: 10% to 65%, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40145	Humidification setpoint (%RH) in unoccupied or night mode. Not available on all models.	Unsigned Scale 10	Unit: %RH, Range: 10% to 65%, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40146	Minimum user setpoint. Not available on all models.	Unsigned Scale 10	Unit: %RH, Range: 10% to max, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40147	Maximum user setpoint. Not available on all models.	Unsigned Scale 10	Unit: %RH, Range: min to 65%, <i>Value x 10 (e.g. 20%RH = 200)</i>	W
40148	Humidity proportional band. Not available on all models.	Unsigned Scale 10	Unit: %RH, Range: 3%RH to 10%RH, <i>Value x 10 (e.g. 4%RH = 40)</i>	W

Register Index	Description	Data Type	Range	Writable
40149	Cfg_HumDeadBand. Not available on all models.	Unsigned Scale 10	Unit: %RH, Range: 0% to 5%, <i>Value x 10 (e.g. 4%RH = 40)</i>	W
40150	External humidity sensor input.	Unsigned	1= Off 2= Analog input 3 3= Analog input 4 4= Analog input 5 5= Analog input 6	W
40151	Humidity deadband. Not available on all models.	Signed Scale 10	Unit: %RH, Range: $\pm 5\%$ RH, <i>Value x 10 (e.g. 2%RH = 20)</i>	W
40152	External humidity sensor offset correction. Not available on all models.	Signed Scale 10	Unit: %RH, Range: $\pm 5\%$ RH, <i>Value x 10 (e.g. 2%RH = 20)</i>	W
40153	Internal CO ₂ sensor reading. Not available on all models.	Unsigned Scale 1	Unit: PPM, Range: 0 to 2000 PPM, <i>Value x 1 (e.g. 20PPM = 20)</i>	RO
40154	Maximum limit of CO ₂ concentration. Not available on all models.	Unsigned Scale 10	Unit: PPM, Range 100 to CO2rangePPM, <i>Value x 10 (e.g. 200PPM = 2000)</i>	W
40155	System status 3.	Unsigned	[B1-B15]: Reserved B0: CO₂ Alarm <i>0 = Off, 1 = On</i>	RO
40156	Maximum range for the CO ₂ sensor. Not available on all models.	Unsigned Scale 50	Unit: PPM, Range 0 to 2000 PPM, <i>Value x 50 (e.g. 20PPM = 1000)</i>	W
40157	External CO ₂ sensor reading. Not available on all models.	Unsigned Scale 1	Unit: PPM, Range 1 to CO2rangePPM, <i>Value x 1 (e.g. 20PPM = 20)</i>	RO
40158	Internal light sensor reading in Luxes. Not available on all models.	Unsigned Scale 1	Unit: Luxes, Range 0 to 16000 Luxes, <i>Value x 1 (e.g. 20Luxes = 20)</i>	RO
40159	Internal PIR sensor reading. Not available on all models.	Unsigned	0 = No Occupancy 1 = Occupancy	RO
40160	Internal VOC sensor reading in ppb. Not available on all models.	Unsigned Scale 1	Unit: ppb, Range 1 to 60000 ppb, <i>Value x 1 (e.g. 20ppb = 20)</i>	RO
40161	Configuration of AI3 mode.	Unsigned	1 = Off 2 = Temperature 3 = CO ₂ 4 = Humidity	W
40162	Configuration of AI4 mode.	Unsigned	1 = Off 2 = Temperature 3 = CO ₂ 4 = Humidity	W
40163	Configuration of AI5 mode.	Unsigned	1 = Off 2 = Temperature 3 = CO ₂ 4 = Humidity	W
40164	Configuration of AI6 mode.	Unsigned	1 = Off 2 = Temperature 3 = CO ₂ 4 = Humidity	W
40165	Configuration of TO1 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO ₂	W
40166	Configuration of TO2 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO ₂	W

Register Index	Description	Data Type	Range	Writable
40167	Configuration of TO3 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W
40168	Configuration of TO4 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W
40169	Configuration of AO1 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W
40170	Configuration of AO2 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W
40171	Configuration of AO3 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W
40172	Configuration of AO4 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W
40173	Configuration of DO1 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W
40174	Configuration of DO2 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W
40175	Configuration of DO3 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W
40176	Configuration of DO4 alarm source.	Unsigned	1 = Alarm Override 2 = Alarm Overheat 3 = Alarm Door 4 = Alarm Window Contact 5 = Alarm FlowSwitch 6 = Alarm CO2	W

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