Modbus Map: Conext™ Battery Monitor Device

⚠ WARNING

UNINTENDED OPERATION

The use of this product with Modbus communications requires expertise in the design, operation, and programming of the device. Only qualified persons should program, install, alter, and commission this product.

When writing values to the device, you must ensure other persons are not working with the device.

Failure to follow these instructions can result in death or serious injury, and/or equipment damage.

⚠ WARNING

LOSS OF CONTROL

Do not assign the same address to two Modbus devices. The entire serial bus may behave unexpectedly if the master device cannot communicate with all the slave devices on the bus.

Failure to follow these instructions can result in death or serious injury, and/or equipment damage.

Overview

This document describes the structure of the Modbus register address map, which is used to configure, control, and monitor the Battery Monitor. The information in this document is intended for use only by qualified persons who have a detailed technical understanding of the Modbus protocol.

The Modbus map is divided into rows of Modbus registers. Each row indicates the Modbus register address, its name, data type, access type, units, scale, offset, and applicable notes as required. External Modbus Master devices, such as the Schneider Electric M340 PLC, can read and write the Modbus registers to configure, control, or monitor the device remotely.

Schneider Electric

Document Applicability

The Battery Monitor Device Modbus map applies to the following products, as listed in Table 1.

Table 1 Applicable Products

Product ID	Product Description
865-1080-01	Conext Battery Monitor

Supported Modbus Data Types

Table 2 lists the supported data types.

Table 2 Modbus Data Types

Data Type	Description
uint16	unsigned 16-bit integer [0,65535]
uint32	unsigned 32-bit integer [0,4294967295]
sint32	signed 32-bit integer [-2147483648,2147483647]
str<nn>	packed 8-bit character string, where <nn> is the length of characters in the string. Two characters are packed into each Modbus register.
	Example: str20 = 20-character string (packed into 10 Modbus registers) str16 = 16-character string (packed into 8 Modbus registers)

Converting Data to Units of Measurement

Data from a Modbus register is converted to units of measurement using the following algorithm:

result = [(data @ Modbus Register) * scale] + offset

Example: Read the Battery Temperature

The following example shows a conversion of the battery temperature located at Modbus Address 0x004A.

Modbus Address = 0x004A
Scale = 0.01
Offset = -273.0
Data type = uint16 (one Modbus register)
units: deg C

Reading one Modbus Register from address 0x004A yields 0x7440
Apply the offset and scale as follows:

result = (0x7440 * 0.01) + (-273.0)
      = (29760 * 0.01) + (-273.0)
      = 297.60 + (-273.0)
      = 24.60

The conversion yields a battery temperature of 24.60 degrees Celsius.

Writing Modbus Registers

Modbus does not provide an error response when data written to a Modbus Register is out of range or invalid. To confirm that a Modbus Register is correctly written, you should read it back and compare it with the expected value.

For descriptions of settings and their valid values, refer to the product's user manual (975-0636-01-01).

Section 1: Battery Monitor Device Modbus Map

Table 3 Configuration and Status Registers

Modbus Address	Name	Type	read/ write (r/w)	Units	Scale	Offset	Notes
0x0000	Device Name	str16	rw				
0x000A	FGA Number	str20	r				
0x0014	Unique ID Number	str20	r				
0x001E	Firmware Version	str20	r				
0x0028	Modbus Address	uint16	rw		1.0	0.0	
0x0029	Device Number	uint16	rw		1.0	0.0	
0x002A	System Instance	uint16	rw		1.0	0.0	
0x002B	Hardware Serial Number	str20	r				
0x0040	Device State	uint16	r		1.0	0.0	See section 2
0x0041	Device Present	uint16	r		1.0	0.0	0=Inactive (all data invalid) 1=Active (data valid)
0x0042	Configuration Errors	uint32	r		1.0	0.0	
0x0044	DC Source ID	uint32	r		1.0	0.0	See section 8
0x0046	Battery Voltage	uint32	r	V	0.001	0.0	
0x0048	Battery Current	sint32	r	A	0.001	0.0	
0x004A	Battery Temperature	uint32	r	deg C	0.01	-273.0	
0x004C	Battery State of Charge	uint32	r	%	1.0	0.0	
0x004E	Battery State of Health	uint32	r	%	1.0	0.0	
0x0050	Battery Percent Over Charge	uint32	r	%	1.0	0.0	
0x0052	Battery Midpoint 1 Voltage	uint32	r	V	0.001	0.0	
0x0054	Battery Midpoint 2 Voltage	uint32	r	V	0.001	0.0	
0x0056	Battery Midpoint 3 Voltage	uint32	r	V	0.001	0.0	
0x0058	Battery Capacity Remaining	uint32	r	Ah	1.0	0.0	

Table 3 Configuration and Status Registers

Modbus Address	Name	Type	read/ write (r/w)	Units	Scale	Offset	Notes
0x005A	Battery Capacity Removed	uint32	r	Ah	1.0	0.0	
0x005C	Battery BTS Present	uint32	r		1.0	0.0	See section 4
0x005E	Battery Time To Full	uint32	r	Min	1.0	0.0	
0x0060	Battery Time To Discharge	uint32	r	Min	1.0	0.0	
0x0062	Battery Hours In Float	uint32	r	Hr	0.1	0.0	
0x0064	Battery Last Equalize	uint32	r	Days	1.0	0.0	
0x0066	Battery Average Discharge	sint16	r	Ah	1.0	0.0	
0x0067	Battery Average Discharge Percent	sint16	r	%	0.01	0.0	
0x0068	Battery Deepest Discharge	sint16	r	Ah	1.0	0.0	
0x0069	Battery Deepest Discharge Percent	sint16	r	%	0.01	0.0	
0x006A	Battery Capacity Removed	uint32	r	Ah	1.0	0.0	
0x006C	Battery Capacity Returned	uint32	r	Ah	1.0	0.0	
0x006E	Battery Number of Charge Cycles	uint16	r		1.0	0.0	
0x006F	Battery Number of Synchronizations	uint16	r		1.0	0.0	
0x0070	Battery Number of Discharges	uint16	r		1.0	0.0	
0x0076	Nominal Temperature	uint16	rw	deg C	0.01	-273.0	
0x0077	Temperature unit	uint16	rw		1.0	0.0	0=Imperial 1=Metric
0x0078	Temperature Coefficient	uint16	rw	Ah/ deg C	0.01	0.0	
0x0079	Nominal Discharge Rate	uint16	rw	Hr	1.0	0.0	
0x007A	Self Discharge Rate	uint16	rw	%	0.1	0.0	
0x007B	Shunt Amp Rating	uint16	rw	A	1.0	0.0	See section 5
0x007C	Shunt Voltage Rating	uint16	rw	mV	1.0	0.0	0=50 1=60
0x007D	Charge Efficiency Factor Mode	uint16	rw		1.0	0.0	0=Manual 1=Automatic
0x007E	Backlight mode	uint16	rw	s	1.0	0.0	See section 6

Table 3 Configuration and Status Registers

Modbus Address	Name	Type	read/ write (r/w)	Units	Scale	Offset	Notes
0x007F	Nominal Voltage	uint16	rw	V	1.0	0.0	0=12 1=24 2=48
0x0080	Setup lock	uint16	rw		1.0	0.0	0=Disable 1=Enable
0x0081	Time Remaining Averaging Filter	uint16	rw		1.0	0.0	0=Fastest 1=Faster 2=Fast
0x0082	Default Temperature	uint16	rw	deg C	0.01	-273.0	
0x008A	Charger Float Voltage	uint16	rw	V	0.001	0.0	
0x008B	Charger Float Current	uint16	rw	%	0.1	0.0	
0x008C	Discharge Floor	uint16	rw	%	1.0	0.0	
0x008D	Auto Sync Time	uint16	rw	s	1.0	0.0	See section 7
0x008E	Auto Sync Sensitivity	uint16	rw	%	1.0	0.0	
0x0090	Nominal Voltage Deprecated	uint32	rw	V	0.001	0.0	
0x0092	Battery Capacity	uint16	rw	Ah	1.0	0.0	
0x0093	Peukert Exponent	uint16	rw		0.002	1.0	
0x0094	Charge Efficiency Factor	uint16	rw	%	1.0	0.0	
0x00A0	RS485 Address	uint16	r		1.0	0.0	
0x00A1	RS485 Baud Rate	uint16	r		1.0	0.0	0=9600 1=19200 2=38400 3=57600 4=115200
0x00A2	RS485 Parity	uint16	r		1.0	0.0	0=None 1=Odd 2=Even
0x00A3	RS485 Stop Bits	uint16	r		1.0	0.0	1=1 2=2
0x00A4	Modbus Byte Order	uint16	r		1.0	0.0	0=LSB 1=MSB
0x00AC	Refresh Configuration Data	uint16	rw		1.0	0.0	1=Refresh
0x00AD	Synchronize Enable/Disable	uint16	rw		1.0	0.0	0=Disable 1=Enable
0x00AE	DC Association (Battery)	uint16	rw		1.0	0.0	See section 8
0x00AF	Identify Enable	uint16	rw		1.0	0.0	0=Disable 1=Enable

Section 2: Battery Monitor Operating State

Device State can report one of the following values:

- 0=Hibernate
- 1=Power Save
- 2=Safe Mode
- 3=Operating

- 4=Diagnostic Mode
- 5=Remote Power Off
- 255=Data Not Available

Section 3: DC Input/Output Source Association

Configure DC Input/Output Source Association using one of the following values:

- 3=House Battery Bank 1
- 4=House Battery Bank 2
- 5=House Battery Bank 3
- 6=House Battery Bank 4
- 7=House Battery Bank 5

Section 4: Battery BTS States

The BTS states can report one or more of the following values:

- 0=No
- 1=Yes
- 2=Error
- 3=Unavailable

Section 5: Shunt Ampere Rating

Shunt Ampere Rating can report one or more of the following values:

- 0=10
- 1=11
- 2=12
- 3=13
- 4=14
- 5=15
- 6=16
- 7=17
- 8=18
- 9=19
- 10=20
- 11=21
- 12=22
- 13=23
- 14=24
- 15=25
- 16=30
- 17=35

- 18=40
- 19=45
- 20=50
- 21=55
- 22=60
- 23=65
- 24=70
- 25=75
- 26=80
- 27=85
- 28=90
- 29=95
- 30=100
- 31=110
- 32=120
- 33=130
- 34=140
- 35=150
- 36=160
- 37=170
- 38=180
- 39=190
- 40=200
- 41=210
- 42=220
- 43=230
- 44=240
- 45=250
- 46=300
- 47=350
- 48=400
- 49=450
- 50=500
- 51=550
- 52=600
- 53=650
- 54=700
- 55=750
- 56=800
- 57=850
- 58=900
- 59=950
- 60=1000

- 61=1100
- 62=1200
- 63=1300
- 64=1400
- 65=1500
- 66=1600
- 67=1700
- 68=1800
- 69=1900
- 70=2000
- 71=2100
- 72=2200
- 73=2300
- 74=2400
- 75=2500
- 76=3000
- 77=3500
- 78=4000
- 79=4500
- 80=5000
- 81=5500
- 82=6000
- 83=6500
- 84=7000
- 85=7500
- 86=8000
- 87=8500
- 88=9000

Section 6: Backlight Modes/Durations

The following values are supported:

- 0=Off
- 1=5
- 2=10
- 3=15
- 4=30
- 5=45
- 6=60
- 7=90
- 8=120
- 9=150
- 10=180

- 11=240
- 12=300
- 13=On
- 14=Automatic

Section 7: Auto Syn Time Value

Auto Syn Time can report one or more of the following values:

- 0=5
- 1=10
- 2=15
- 3=30
- 4=45
- 5=60
- 6=90
- 7=120
- 8=150
- 9=180
- 10=240
- 11=300

Section 8: DC Input/Output Association

The following associations are supported:

- 3= House Battery Bank 1
- 4=House Battery Bank 2
- 5=House Battery Bank 3
- 6=House Battery Bank 4
- 7=House Battery Bank 5

Exclusion for Documentation

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