

Modbus Map: Conext MPPT 60 150 Device

503-0248-01-01
Revision A.4

⚠ 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 Conext MPPT 60 150 Solar Charge Controller. Use this document with the Conext MPPT 60 150 Solar Charge Controller Owner's Guide (975-0400-01-01 Revision E or later).

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.

Document Applicability

The Conext MPPT 60 150 Modbus map applies to the following products, as listed in Table 1.

Table 1 Applicable Products

Product ID	Product Description
865-1030	Conext XW MPPT 60 150
865-1030-1	Conext XW+ MPPT 60 150

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)

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 (975-0283-01-01).

Section 1: Conext MPPT 60 150 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	

Table 3 Configuration and Status Registers

Modbus Address	Name	Type	read/write (r/w)	Units	Scale	Offset	Notes
0x002B	Hardware Serial Number	str20	r				
0x0035	Configuration Status	uint16	r		1.0	0.0	0=Refreshing 1=Done
0x0036	Configuration Refresh Counter	uint32	r		1.0	0.0	
0x0040	Device State	uint16	r		1.0	0.0	See section 2
0x0041	Charger Enabled	uint16	r		1.0	0.0	0=Disabled 1=Enabled
0x0042	Device Present	uint16	r		1.0	0.0	0=Inactive (all data invalid) 1=Active (data valid)
0x0043	Charge Mode Status	uint16	r		1.0	0.0	0=Stand alone 1=Primary 2=Secondary
0x0044	Active Faults Flag	uint16	r		1.0	0.0	0=No Active Faults 1=Has Active Faults
0x0045	Active Warnings Flag	uint16	r		1.0	0.0	0=No Active Warnings 1=Has Active Warnings
0x0046	Fault Bitmap 0	uint16	r		1.0	0.0	See section 3
0x0047	Fault Bitmap 1	uint16	r		1.0	0.0	See section 4
0x0048	Warning Bitmap 0	uint16	r		1.0	0.0	See section 5
0x0049	Charger Status	uint16	r		1.0	0.0	See section 6
0x004A	Configuration Errors	uint32	r		1.0	0.0	
0x004C	Input DC Voltage	uint32	r	V	0.001	0.0	
0x004E	Input DC Current	uint32	r	A	0.001	0.0	
0x0050	Input DC Power	uint32	r	W	1.0	0.0	
0x0056	Battery Temperature	uint16	r	deg C	0.01	-273.0	
0x0058	Output DC Voltage	sint32	r	V	0.001	0.0	
0x005A	Output DC Current	sint32	r	A	0.001	0.0	
0x005C	Output DC Power	uint32	r	W	1.0	0.0	
0x005E	DC Power Output Percentage	uint16	r	%	1.0	0.0	
0x005F	Auxiliary Output Status	uint16	r		1.0	0.0	See section 7
0x0060	Auxiliary Output Voltage	sint32	r	V	0.001	0.0	
0x0064	Auxiliary Output On Reason	uint16	r		1.0	0.0	See section 8
0x0065	Auxiliary Output Off Reason	uint16	r		1.0	0.0	See section 9
0x0066	Energy From PV This Hour	uint32	r	kWh	0.001	0.0	

Table 3 Configuration and Status Registers

Modbus Address	Name	Type	read/write (r/w)	Units	Scale	Offset	Notes
0x0068	PV Input Active This Hour	uint32	r	s	1.0	0.0	
0x006A	Energy From PV Today	uint32	r	kWh	0.001	0.0	
0x006C	PV Input Active Today	uint32	r	s	1.0	0.0	
0x006E	Energy From PV This Week	uint32	r	kWh	0.001	0.0	
0x0070	PV Input Active This Week	uint32	r	s	1.0	0.0	
0x0072	Energy From PV This Month	uint32	r	kWh	0.001	0.0	
0x0074	PV Input Active This Month	uint32	r	s	1.0	0.0	
0x0076	Energy From PV This Year	uint32	r	kWh	0.001	0.0	
0x0078	PV Input Active This Year	uint32	r	s	1.0	0.0	
0x007A	Energy From PV Lifetime	uint32	r	kWh	0.001	0.0	
0x007C	PV Input Active Lifetime	uint32	r	s	1.0	0.0	
0x007E	Energy To Battery This Hour	uint32	r	kWh	0.001	0.0	
0x0080	Battery Charge Active This Hour	uint32	r	s	1.0	0.0	
0x0082	Energy To Battery Today	uint32	r	kWh	0.001	0.0	
0x0084	Battery Charge Active Today	uint32	r	s	1.0	0.0	
0x0086	Energy To Battery This Week	uint32	r	kWh	0.001	0.0	
0x0088	Battery Charge Active This Week	uint32	r	s	1.0	0.0	
0x008A	Energy To Battery This Month	uint32	r	kWh	0.001	0.0	
0x008C	Battery Charge Active This Month	uint32	r	s	1.0	0.0	
0x008E	Energy To Battery This Year	uint32	r	kWh	0.001	0.0	
0x0090	Battery Charge Active This Year	uint32	r	s	1.0	0.0	
0x0092	Energy To Battery Lifetime	uint32	r	kWh	0.001	0.0	
0x0094	Battery Charge Active Lifetime	uint32	r	s	1.0	0.0	

Table 3 Configuration and Status Registers

Modbus Address	Name	Type	read/write (r/w)	Units	Scale	Offset	Notes
0x00A0	MPPT Enable	uint16	rw		1.0	0.0	0=Disable 1=Enable
0x00A2	MPPT Reference Voltage	uint32	rw	V	0.001	0.0	
0x00A5	Battery Type	uint16	rw		1.0	0.0	See section 10
0x00A6	Nominal Battery Voltage	uint32	rw	V	0.001	0.0	See section 11
0x00A8	Battery Bank Capacity	uint16	rw	Ah	1.0	0.0	
0x00A9	Battery Temperature Coefficient	uint16	rw	mV/ deg C	-1.0	0.0	
0x00AA	Force Charger State	uint16	rw		1.0	0.0	1=Bulk 2=Float 3=No Float
0x00AB	Reset	uint16	rw		1.0	0.0	0=Reboot 2=Reset to Factory
0x00AC	Operating Mode	uint16	rw		1.0	0.0	2=Standby 3=Operating
0x00AD	Clear	uint16	rw		1.0	0.0	See section 12
0x00AE	Equalize Voltage Set Point	uint32	rw	V	0.001	0.0	
0x00B0	Bulk/Boost Voltage Set Point	uint32	rw	V	0.001	0.0	
0x00B2	Float Voltage Set Point	uint32	rw	V	0.001	0.0	
0x00B4	Recharge Voltage	uint32	rw	V	0.001	0.0	
0x00B6	Absorption Voltage Set Point	uint32	rw	V	0.001	0.0	
0x00B8	Absorption Time	uint16	rw	min	0.0166 67	0.0	
0x00B9	Charge Cycle	uint16	rw		1.0	0.0	1=3 Stage 2=2 Stage (No Float)
0x00BA	Maximum Charge Rate	uint16	rw	%	1.0	0.0	
0x00BB	Equalize Now	uint16	rw		1.0	0.0	0=Disable 1=Enable
0x00BE	Charge Mode	uint16	rw		1.0	0.0	See section 13
0x00BF	Default Battery Temperature	uint16	rw		1.0	0.0	0=Cold 1=Warm 2=Hot
0x00C0	Identify Enable	uint16	rw		1.0	0.0	0=Disable 1=Enable
0x00C1	Auxiliary Output Active Level	uint16	rw		1.0	0.0	0=Active Low 1=Active High
0x00C2	Auxiliary Output Voltage	uint32	rw	V	0.001	0.0	
0x00C4	Manual Aux	uint16	rw		1.0	0.0	0=Manual Off 1=Manual On 2=Automatic

Table 3 Configuration and Status Registers

Modbus Address	Name	Type	read/write (r/w)	Units	Scale	Offset	Notes
0x00C6	Auxiliary Output Trigger Source	uint16	rw		1.0	0.0	See section 14
0x00C8	Low Battery Voltage Trigger Set	uint32	rw	V	0.001	0.0	
0x00CA	Low Battery Voltage Trigger Set Delay	uint16	rw	s	0.01	0.0	
0x00CC	Low Battery Voltage Trigger Clear	uint32	rw	V	0.001	0.0	
0x00CE	Low Battery Voltage Trigger Clear Delay	uint16	rw	s	0.01	0.0	
0x00D0	High Battery Voltage Trigger Set	uint32	rw	V	0.001	0.0	
0x00D2	High Battery Voltage Trigger Set Delay	uint16	rw	s	0.01	0.0	
0x00D4	High Battery Voltage Trigger Clear	uint32	rw	V	0.001	0.0	
0x00D6	High Battery Voltage Trigger Clear Delay	uint16	rw	s	0.01	0.0	
0x00D8	High Array Voltage Trigger Set	uint32	rw	V	0.001	0.0	
0x00DA	High Array Voltage Trigger Set Delay	uint16	rw	s	0.01	0.0	
0x00DC	High Array Voltage Trigger Clear	uint32	rw	V	0.001	0.0	
0x00DE	High Array Voltage Trigger Clear Delay	uint16	rw	s	0.01	0.0	
0x00E0	Low Battery Temperature Trigger Set	uint32	rw	deg C	0.001	-273.0	
0x00E2	Low Battery Temperature Trigger Set Delay	uint16	rw	s	0.01	0.0	
0x00E4	Low Battery Temperature Trigger Clear	uint32	rw	deg C	0.001	-273.0	
0x00E6	Low Battery Temperature Trigger Clear Delay	uint16	rw	s	0.01	0.0	

Table 3 Configuration and Status Registers

Modbus Address	Name	Type	read/write (r/w)	Units	Scale	Offset	Notes
0x00E8	High Battery Temperature Trigger Set	uint32	rw	deg C	0.001	-273.0	
0x00EA	High Battery Temperature Trigger Set Delay	uint16	rw	s	0.01	0.0	
0x00EC	High Battery Temperature Trigger Clear	uint32	rw	deg C	0.001	-273.0	
0x00EE	High Battery Temperature Trigger Clear Delay	uint16	rw	s	0.01	0.0	
0x00F0	High Heatsink Temperature Trigger Set	uint32	rw	deg C	0.001	-273.0	
0x00F2	High Heatsink Temperature Trigger Set Delay	uint16	rw	s	0.01	0.0	
0x00F4	High Heatsink Temperature Trigger Clear	uint32	rw	deg C	0.001	-273.0	
0x00F6	High Heatsink Temperature Trigger Clear Delay	uint16	rw	s	0.01	0.0	
0x00F8	Refresh Configuration Data	uint16	rw		1.0	0.0	1=Refresh
0x00F9	DC Input Association (PV)	uint16	rw		1.0	0.0	See section 15
0x00FA	DC Output Association (Battery)	uint16	rw		1.0	0.0	See section 16

Section 2: Charge Controller 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: Fault Bitmap 0 Values

Fault Bitmap 0 can report one or more of the following values:

- bit0=F2:Capacitor Over-Temperature
- bit1=F4:Battery Over-Temperature
- bit2=F5:Ambient Over-Temperature
- bit3=F9:DC Over-Voltage
- bit4=F10:Output Under-Voltage Immediate
- bit5=F11:Output Under-Voltage
- bit6=F26:Auxiliary Power Supply
- bit7=F30:Battery Under-Temperature
- bit8=F54:Auxiliary Power Supply
- bit9=F55:Heatsink Over-Temperature
- bit10=F56:Ground Fault
- bit11=F69:Configuration Fault
- bit12=F70:DC Over-Voltage
- bit13=F71:DC Over-current
- bit14=F72:SPS Overload
- bit15=F73:Slow Output Over-Current

Section 4: Fault Bitmap 1 Values

Fault Bitmap 1 can report one or more of the following values:

- bit0=F74:Input Over-Voltage
- bit1=F75:Fan Over-Voltage
- bit2=F76:Fan Over-Current
- bit3=F77:Input Over-Current
- bit4=F78:Output Over-Current
- bit5=F79:Fan Over-Current
- bit6=F80:Fan Under-Voltage
- bit7=F81:Fan Under-Current
- bit8=F82:Network Power Supply Failure

Section 5: Warning Bitmap Values

Warning Bitmap 0 can report one or more of the following values:

- bit0=W11:DC Input Over Voltage Warning

Section 6: Charge Controller Status

Charger Status can report one of the following values:

- 768=Not Charging

- 769=Bulk
- 770=Absorption
- 771=Overcharge
- 772=Equalize
- 773=Float
- 774=No Float
- 775=Constant VI
- 776=Charger Disabled
- 777=Qualifying AC
- 778=Qualifying APS
- 779=Engaging Charger
- 780=Charge Fault
- 781=Charger Suspend
- 782=AC Good
- 783=APS Good
- 784=AC Fault
- 785=Charge
- 786=Absorption Exit Pending
- 787=Ground Fault
- 788=AC Good Pending

Section 7: Auxiliary Output Status

Auxiliary Output Status can report one of the following values:

- 1=Auto On
- 2=Auto Off
- 3=Manual On
- 4=Manual Off

Section 8: Auxiliary Output On Reason

Auxiliary Output On Reason can report one of the following values:

- 0=Not on
- 1=Manual on
- 2=Battery Voltage Low
- 3=Battery Voltage High
- 4=Array Voltage High
- 5=Battery Temp Low
- 6=Battery Temp High
- 7=Heat Sink Temp High
- 8=Fault

Section 9: Auxiliary Output Off Reason

Auxiliary Output Off Reason can report one of the following values:

- 0=Not off
- 1=Manual Off
- 2=No Active Trigger
- 3=Trigger Override
- 4=Fault
- 5=Bulk Exit
- 6=Absorption Exit

Section 10: Supported Battery Types

Configure Battery Type using one of the following values:

- 0=Flooded
- 1=Gel
- 2=AGM
- 3=Custom

Section 11: Nominal Battery Voltage

Configure Nominal Battery Voltage using one of the following values:

- 12000=12V
- 24000=24V
- 36000=36V
- 48000=48V
- 60000=60V

Section 12: Clear Command

The Clear command clears the fault, warning, event, and communication logs. Configure Clear using one of the following values:

- 1=Fault Log
- 2=Active Faults
- 4=Warning Log
- 8=Active Warnings
- 16=State Event Log
- 32=Communication Statistics
- 64=Statistics
- 128=User Statistics
- 255=All

Section 13: Charge Controller Operating Mode

Configure Charge Mode using one of the following values:

- 0=Stand-alone
- 1=Primary
- 2=Secondary
- 3=Echo

Section 14: Auxiliary Output Trigger Source

Configure Auxiliary Output Trigger Source using one of the following values:

- 1=Low Battery Voltage
- 2=High Battery Voltage
- 4=High Array Voltage
- 8=Low Battery Temperature
- 16=High Battery Temperature
- 32=High Heatsink Temperature
- 64=Fault

Section 15: DC Input Association

Configure DC Input Association using one of the following values:

- 21=Solar Array 1
- 22=Solar Array 2
- 23=Solar Array 3
- 24=Solar Array 4
- 25=Solar Array 5
- 26=Solar Array 6
- 27=Solar Array 7
- 28=Solar Array 8
- 29=Solar Array 9
- 30=Solar Array 10
- 31=Solar Array 11
- 32=Solar Array 12
- 33=Solar Array 13
- 34=Solar Array 14
- 35=Solar Array 15
- 36=Solar Array 16

Section 16: DC Output Association

Configure DC Output 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

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