
Modbus Map: Grid Tie (GT) Device

503-0250-01-01
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 Grid Tie devices below. 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 Grid Tie Device Modbus map applies to the following products, as listed in Table 1.

Table 1 Applicable Products

Product ID	Product Description
864-1030	GT2.8AU
864-1030-01	GT5.0AU
878-2801	TX 2800 NA
878-3301	TX 3300 NA
878-3801	TX 3800 NA
878-5001	TX 5000 NA

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]
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 (975-0596-01-01).

Section 1: Grid Tie 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	r				
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				
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	Inverter 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	Active Faults Flag	uint16	r		1.0	0.0	0=No Active Faults 1=Has Active Faults
0x0044	Active Fault Count	uint16	r		1.0	0.0	0=No Active Warnings 1=Has Active Warnings
0x0045	Fault Bitmap 0	uint16	r		1.0	0.0	See section 3
0x0046	Configuration Errors	uint32	r		1.0	0.0	
0x0048	PV Input Voltage	uint32	r	V	0.001	0.0	
0x004A	PV Input Current	uint32	r	A	0.001	0.0	
0x004C	PV Input Power	uint32	r	W	1.0	0.0	
0x004E	Grid AC Voltage	uint32	r	V	0.001	0.0	
0x0050	Grid AC Current	uint32	r	A	0.001	0.0	
0x0052	Grid AC Frequency	uint16	r	Hz	0.01	0.0	
0x0053	Inverter Status	uint16	r		1.0	0.0	See section 4
0x0054	Grid AC Power	uint32	r	W	1.0	0.0	
0x0056	AC Power to Load	uint32	r	W	1.0	0.0	
0x0058	AC Power to Grid	uint32	r	W	1.0	0.0	
0x0060	Energy From PV This Hour	uint32	r	kWh	0.001	0.0	
0x0062	PV Input Active This Hour	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
0x0064	Energy From PV Today	uint32	r	kWh	0.001	0.0	
0x0066	PV Input Active Today	uint32	r	s	1.0	0.0	
0x0068	Energy From PV This Week	uint32	r	kWh	0.001	0.0	
0x006A	PV Input Active Week	uint32	r	s	1.0	0.0	
0x006C	Energy From PV This Month	uint32	r	kWh	0.001	0.0	
0x006E	PV Input Active Month	uint32	r	s	1.0	0.0	
0x0070	Energy From PV This Year	uint32	r	kWh	0.001	0.0	
0x0072	PV Input Active Year	uint32	r	s	1.0	0.0	
0x0074	Energy From PV Lifetime	uint32	r	kWh	0.001	0.0	
0x0076	PV Input Active Lifetime	uint32	r	s	1.0	0.0	
0x0078	Grid Output Energy This Hour	uint32	r	kWh	0.001	0.0	
0x007A	Grid Output Active This Hour	uint32	r	s	1.0	0.0	
0x007C	Grid Output Energy Today	uint32	r	kWh	0.001	0.0	
0x007E	Grid Output Active Today	uint32	r	s	1.0	0.0	
0x0080	Grid Output Energy This Week	uint32	r	kWh	0.001	0.0	
0x0082	Grid Output Active This Week	uint32	r	s	1.0	0.0	
0x0084	Grid Output Energy This Month	uint32	r	kWh	0.001	0.0	
0x0086	Grid Output Active This Month	uint32	r	s	1.0	0.0	
0x0088	Grid Output Energy This Year	uint32	r	kWh	0.001	0.0	
0x008A	Grid Output Active This Year	uint32	r	s	1.0	0.0	
0x008C	Grid Output Energy Lifetime	uint32	r	kWh	0.001	0.0	
0x008E	Grid Output Active Lifetime	uint32	r	s	1.0	0.0	
0x0090	AC To Load Energy 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
0x0092	AC To Load Active This Hour	uint32	r	s	1.0	0.0	
0x0094	AC To Load Energy Today	uint32	r	kWh	0.001	0.0	
0x0096	AC To Load Active Today	uint32	r	s	1.0	0.0	
0x0098	AC To Load Energy This Week	uint32	r	kWh	0.001	0.0	
0x009A	AC To Load Active This Week	uint32	r	s	1.0	0.0	
0x009C	AC To Load Energy This Month	uint32	r	kWh	0.001	0.0	
0x009E	AC To Load Active This Month	uint32	r	s	1.0	0.0	
0x00A0	AC To Load Energy This Year	uint32	r	kWh	0.001	0.0	
0x00A2	AC To Load Active This Year	uint32	r	s	1.0	0.0	
0x00A4	AC To Load Energy Lifetime	uint32	r	kWh	0.001	0.0	
0x00A6	AC To Load Active Lifetime	uint32	r	s	1.0	0.0	
0x00A8	AC To Grid Energy This Hour	uint32	r	kWh	0.001	0.0	
0x00AA	AC To Grid Active This Hour	uint32	r	s	1.0	0.0	
0x00AC	AC To Grid Energy Today	uint32	r	kWh	0.001	0.0	
0x00AE	AC To Grid Active Today	uint32	r	s	1.0	0.0	
0x00B0	AC To Grid Energy This Week	uint32	r	kWh	0.001	0.0	
0x00B2	AC To Grid Active This Week	uint32	r	s	1.0	0.0	
0x00B4	AC To Grid Energy This Month	uint32	r	kWh	0.001	0.0	
0x00B6	AC To Grid Active This Month	uint32	r	s	1.0	0.0	
0x00B8	AC To Grid Energy This Year	uint32	r	kWh	0.001	0.0	
0x00BA	AC To Grid Active This Year	uint32	r	s	1.0	0.0	
0x00BC	AC To Grid Energy Lifetime	uint32	r	kWh	0.001	0.0	
0x00BE	AC To Grid 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
0x00C0	Reset	uint16	rw		1.0	0.0	0=Reboot 2=Reset to Factory
0x00C1	Operating Mode	uint16	rw		1.0	0.0	2=Standby 3=Operating
0x00C2	Clear	uint16	rw		1.0	0.0	See section 5
0x00C3	Identify Enable	uint16	rw		1.0	0.0	0=Disable 1=Enable
0x00C4	Refresh Configuration Data	uint16	rw		1.0	0.0	1=Refresh
0x00C5	DC Input Association	uint16	rw		1.0	0.0	See section 6
0x00C6	AC Output Association	uint16	rw		1.0	0.0	See section 7

Section 2: 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=F8:Neutral Loss
- bit1=F9:DC Over Voltage
- bit2=F11:DC Under Voltage
- bit3=F40:Protection Processor Communication Failure
- bit4=F54:PV Voltage Zero
- bit5=F55:Heat Sink Over Temperature
- bit6=F56:Ground Fault
- bit7=F57:External Shutdown
- bit8=F58:Grid Voltage beyond Limits
- bit9=F59:Grid Frequency beyond Limits
- bit10=F60:Impedance Fault
- bit11=F61:Reconnect Delay
- bit12=F62:DC Bus is more than 440V
- bit13=F63>User Shutdown

Section 4: Inverter Status

Inverter Status can report one of the following values:

- 1024=Invert
- 1025=AC Pass Through
- 1026=APS Only
- 1027=Load Sense
- 1028=Inverter Disabled
- 1029=Load Sense Ready
- 1030=Engaging Inverter
- 1031=Invert Fault
- 1032=Inverter Standby
- 1033=Grid-Tied
- 1034=Grid Support
- 1035=Gen Support
- 1036=Sell-to-Grid
- 1037=Load Shaving
- 1038=Grid Frequency Stabilization

Section 5: 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 6: 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 7: AC Output Association

Configure AC Output Association using one of the following values:

- 1=None
- 35=AC 1
- 36=AC 2
- 37=AC 3
- 38=AC 4
- 39=AC 5
- 40=AC 6
- 41=AC 7
- 42=AC 8
- 43=AC 9
- 44=AC 10
- 67=Grid 1
- 68=Grid 2
- 69=Grid 3
- 70=Grid 4
- 71=Grid 5
- 72=Grid 6
- 73=Grid 7
- 74=Grid 8
- 75=Grid 9
- 76=Grid 10

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