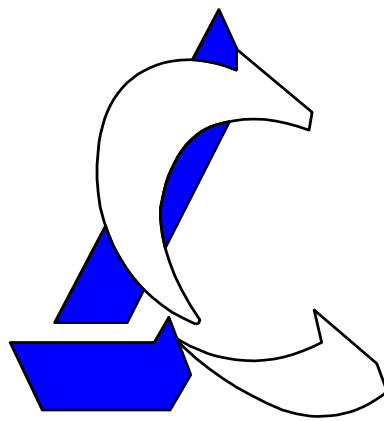


MODBUS MAP

ITR 2.0



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2 INTRODUCTION

The ITR 2.0 unit has a Modbus server accessible by both Modbus TCP and Modbus RTU. Not all the Modbus map is accessible by both methods, see the data of each address block in the following sections for their access options.

The Modbus TCP server is always active, while the Modbus RTU server uses the RS-485 port of the equipment and needs to be activated in the configuration options.

Medida de red :: Acceso Modbus RTU

 No active el acceso a las lecturas del ITR a través del puerto RS485 mediante Modbus RTU si está utilizando este puerto para comunicarse con los inversores. Se producirán resultados inesperados.

Acceso Modbus RTU

Dirección Modbus (1-247)

Velocidad (bps)

Paridad / Bits de parada

Menú

- Hardware
- Relé de seguridad
- Tabla de inversores
- Control
- Modbus RTU**
- Contador compañía
- Modo Maestro/Esclavo
- Fecha y hora
- Ethernet

It is possible to configure the Modbus RTU access address, as well as the baud rate, parity and stop bits of the serial communication.

Note that if the RS-485 bus is being used for communication with the inverters, access to the Modbus RTU server should not be enabled, as communication errors will occur.

The rms voltage, current and power values accessible on the Modbus map correspond to measurements made directly by the ITR 2.0 with its voltage and current inputs.

If only one of the two available current channels is used, it will usually measure the energy exchange at the grid connection point, so these values are the ones that will always be available.

If the two current measurement channels are used, then the values corresponding to the system consumption and PV production will also be available.

In the 10-minute energy records, all values will be available even if only one current measurement channel is used, since the energy produced by the inverters is obtained from the inverters via the communication bus.

3 GRID CONNECTION MEASUREMENTS

The following addresses provide the rms values of voltages, currents and powers at the grid connection point, as well as the active and reactive energy totalizing meters.

It is accessible via Modbus RTU and via Modbus TCP.

Home	Final	Size	R/W	Functions	Name	Type	Units	Description
19000	19001	2	R	3	V_R	float32	V	Voltage phase R
19002	19003	2	R	3	V_S	float32	V	Voltage phase S
19004	19005	2	R	3	V_T	float32	V	Voltage phase T
19006	19007	2	R	3	V_RS	float32	V	Voltage between phases RS
19008	19009	2	R	3	V_ST	float32	V	Voltage between phases ST
19010	19011	2	R	3	V_TR	float32	V	Voltage between phases TR
19012	19013	2	R	3	I_R	float32	A	Current phase R
19014	19015	2	R	3	I_S	float32	A	Current phase S
19016	19017	2	R	3	I_T	float32	A	Current phase T
19018	19019	2	R	3	P_RST	float32	W	Three-phase active power
19020	19021	2	R	3	P_R	float32	W	Active power phase R
19022	19023	2	R	3	P_S	float32	W	Active power phase S
19024	19025	2	R	3	P_T	float32	W	Active power phase T
19026	19027	2	R	3	Q_RST	float32	Var	Three-phase reactive power
19028	19029	2	R	3	PF_RST	float32	--	Three-phase power factor
19030	19031	2	R	3	S_RST	float32	VA	Three-phase apparent power
19032	19035	4	R	3	Tot_P	UInt64	Wh	Active energy totalizer
19036	19039	4	R	3	Tot_Q	UInt64	Varh	Reactive energy totalizer
19040	19043	4	R	3	Tot_P+	UInt64	Wh	Active energy consumption totalizer
19044	19047	4	R	3	Tot_Q+	UInt64	Varh	Positive reactive power totalizer
19048	19051	4	R	3	Tot_P-	UInt64	Wh	Totalized active energy discharged
19052	19055	4	R	3	Tot_Q-	UInt64	Varh	Negative reactive power totalizer

4 STATUS AND INSTANTANEOUS VALUES

The following addresses provide the rms values of voltages, currents and powers at the grid connection point, the consumption of the installation and the photovoltaic generation (if available through the measurements performed by the ITR 2.0). Also some values of the equipment operation such as the percentage of regulation applied to the inverters and the status of the digital outputs.

It is only accessible via Modbus TCP.

Home	Final	Size	R/W	Functions	Name	Type	Units	Description	Values
0x2000	0x2001	2	R	3	Pred_RST	float32	W	P(RST) Power consumed	---
0x2002	0x2003	2	R	3	Pgen_RST	float32	W	P(RST) Generated	---
0x2004	0x2005	2	R	3	Pcon_RST	float32	W	P(RST) Consumption loads	---
0x2006	0x2007	2	R	3	Pred_R	float32	W	P(R) Consumed from mains	---
0x2008	0x2009	2	R	3	Pgen_R	float32	W	P(R) Generated	---
0x200A	0x200B	2	R	3	Pcon_R	float32	W	P(R) Consumption loads	---
0x200C	0x200D	2	R	3	Pred_S	float32	W	P(S) Consumed from mains	---
0x200E	0x200F	2	R	3	Pgen_S	float32	W	P(S) Generated	---
0x2010	0x2011	2	R	3	Pcon_S	float32	W	P(S) Consumption loads	---
0x2012	0x2013	2	R	3	Pred_T	float32	W	P(T) Consumed from mains	---
0x2014	0x2015	2	R	3	Pgen_T	float32	W	P(T) Generated	---
0x2016	0x2017	2	R	3	Pcon_T	float32	W	P(T) Consumption loads	---
0x2018	0x2019	2	R	3	Qred_RST	float32	Var	Q(RST) Net consumption	L (>0)
0x201A	0x201B	2	R	3	Qgen_RST	float32	Var	Q(RST) Generated	L (>0)
0x201C	0x201D	2	R	3	Qcon_RST	float32	Var	Q(RST) Load consumption	L (>0)
0x201E	0x201F	2	R	3	Qred_R	float32	Var	Q(R) Consumed from mains	L (>0)
0x2020	0x2021	2	R	3	Qgen_R	float32	Var	Q(R) Generated	L (>0)
0x2022	0x2023	2	R	3	Qcon_R	float32	Var	Q(R) Load consumption	L (>0)
0x2024	0x2025	2	R	3	Qred_S	float32	Var	Q(S) Consumed from mains	L (>0)
0x2026	0x2027	2	R	3	Qgen_S	float32	Var	Q(S) Generated	L (>0)
0x2028	0x2029	2	R	3	Qcon_S	float32	Var	Q(S) Load consumption	L (>0)
0x202A	0x202B	2	R	3	Qred_T	float32	Var	Q(T) Consumed from mains	L (>0)
0x202C	0x202D	2	R	3	Qgen_T	float32	Var	Q(T) Generated	L (>0)
0x202E	0x202F	2	R	3	Qcon_T	float32	Var	Q(T) Load consumption	L (>0)
0x2030	0x2031	2	R	3	Ired_R	float32	A	I(R) RMS network current	> 0
0x2032	0x2033	2	R	3	Igen_R	float32	A	I(R) Effective generating current	> 0
0x2034	0x2035	2	R	3	Icon_R	float32	A	I(R) RMS current consumption	> 0

Home	Final	Size	R/W	Functions	Name	Type	Units	Description	Values
0x2036	0x2037	2	R	3	Ired_S	float32	A	I(S) RMS grid current	> 0
0x2038	0x2039	2	R	3	Igen_S	float32	A	I(S) Effective generating current	> 0
0x203A	0x203B	2	R	3	Icon_S	float32	A	I(S) RMS current consumption	> 0
0x203C	0x203D	2	R	3	Ired_T	float32	A	I(T) RMS network current	> 0
0x203E	0x203F	2	R	3	Igen_T	float32	A	I(T) RMS generation current	> 0
0x2040	0x2041	2	R	3	Icon_T	float32	A	I(T) RMS current consumption	> 0
0x2042	0x2043	2	R	3	V_R	float32	V	V(R) RMS voltage phase R	> 0
0x2044	0x2045	2	R	3	V_S	float32	V	V(S) RMS voltage phase S	> 0
0x2046	0x2047	2	R	3	V_T	float32	V	V(T) RMS voltage phase T	> 0
0x2048	0x2049	2	R	3	Pexc_R	float32	W	P(R) Excess available	>= 0
0x204A	0x204B	2	R	3	Pexc_S	float32	W	P(S) Excess available	>= 0
0x204C	0x204D	2	R	3	Pexc_T	float32	W	P(T) Excess available	>= 0
0x204E	0x204F	2	R	3	Pexc_RST	float32	W	P(RST) Excess available	>= 0
0x2050	0x2051	2	R	3	Regul_R	float32	%	(R) Regulatory Percentage	0-100
0x2052	0x2053	2	R	3	Regul_S	float32	%	(S) Percentage of Regulation	0-100
0x2054	0x2055	2	R	3	Regul_T	float32	%	(T) Regulatory Percentage	0-100
0x2056	0x2057	2	R	3	Regul_RST	float32	%	(RST) Percentage of Regulation	0-100
0x2058	0x2059	2	R	3	Pload_R	float32	W	P(R) Variable desired load	>= 0
0x205A	0x205B	2	R	3	Pload_S	float32	W	P(S) Variable desired load	>= 0
0x205C	0x205D	2	R	3	Pload_T	float32	W	P(T) Variable desired load	>= 0
0x205E	0x205F	2	R	3	Pload_RST	float32	W	P(RST) Variable desired load	>= 0
0x2060	0x2060	1	R	3	Out_state	uint16	---	Status of digital outputs	

5 10-MINUTE ENERGY LOGS

The accumulated energy registers every 10 minutes are stored in the uSD card of the unit, and the Modbus map allows access to a single register at each moment. To do this it will be necessary to write in the first 3 addresses the date and time of the register we want to access.

The rest of the addresses could then be read, the first of them (0x1003) indicating if the register is already available, if it is still being accessed or if it has not been found (since the uSD has to be accessed the process is not instantaneous). The write and read sequence must be performed on the same TCP connection.

It is accessible only via Modbus TCP.

Home	Final	Size	R/W	Functions	Name	Type	Units	Description	Values
0x1000	0x1002	3	RW	3 6 16	Date	bcd12		Date and time in BCD of the record to be retrieved. yy yy mm dd hh mm	
0x1003	0x1003	1	R	3	State	uint16		0: accessing record 1: registration available 2: record not found	0 - 2
0x1004	0x1006	3	R	3	F_Reg	bcd12		Date and time in BCD of the 10-minute interval read. yy yy mm dd hh mm	
0x1007	0x1008	2	R	3	redR+	float32	kWh	Energy consumed from the grid in phase R	> 0
0x1009	0x100A	2	R	3	redR-	float32	kWh	Energy exported to the grid in phase R	> 0
0x100B	0x100C	2	R	3	redS+	float32	kWh	Energy consumed from the grid in phase S	> 0
0x100D	0x100E	2	R	3	redS-	float32	kWh	Energy exported to the grid in phase S	> 0
0x100F	0x1010	2	R	3	redT+	float32	kWh	Energy consumed from the grid in phase T	> 0
0x1011	0x1012	2	R	3	redT-	float32	kWh	Energy exported to the grid in phase T	> 0
0x1013	0x1014	2	R	3	redRST+ network	float32	kWh	Energy consumed from the grid in the R+S+T phases	> 0
0x1015	0x1016	2	R	3	redRST-	float32	kWh	Energy exported to the grid in the R+S+T phases	> 0

Home	Final	Size	R/W	Functions	Name	Type	Units	Description	Values
0x1017	0x1018	2	R	3	redQ1	float32	kVarh	Reactive energy consumed from the grid in quadrant Q1	> 0
0x1019	0x101A	2	R	3	redQ2	float32	kVarh	Reactive energy consumed from the grid in quadrant Q2	> 0
0x101B	0x101C	2	R	3	redQ3	float32	kVarh	Reactive energy consumed from the grid in quadrant Q3	> 0
0x101D	0x101E	2	R	3	redQ4	float32	kVarh	Reactive energy consumed from the grid in quadrant Q4	> 0
0x101F	0x1020	2	R	3	conR	float32	kWh	Total consumption of the installation in phase R	> 0
0x1021	0x1022	2	R	3	conS	float32	kWh	Total consumption of the plant in phase S	> 0
0x1023	0x1024	2	R	3	conT	float32	kWh	Total consumption of the plant in phase T	> 0
0x1025	0x1026	2	R	3	conRST	float32	kWh	Total consumption of the plant in phases R+S+T	> 0
0x1027	0x1028	2	R	3	invRST	float32	kWh	Total energy produced by the inverters (Read from the inverters)	> 0

For example, to request the 10-minute historical record starting on 12/18/2015 at 20:00 the following write should be performed at addresses 0x1000 to 0x1002:

MODBUS PDU: 0x10 0x10 0x00 0x00 0x03 0x06 0x20 0x15 0x12 0x18 0x20 0x00

6 SUNSPEC

A Modbus map following the SunSpec specification is also implemented starting from address 40000. This map is accessible only via Modbus RTU.

The map contains the following information models:

ID = 1 Common model with device information.

ID = 213 Three-phase star meter with float data type.

The readings of this meter correspond to the measurements taken by the ITR 2.0 at the grid connection point.