

The two principal functions of Modbus RTU gateway are:

1. Modbus RTU master unit
2. IEC 61850 Server

1 - Modbus RTU master unit

The device is a Modbus RTU master unit, that can poll more modbus RTU slave unit. Using a 485 serial port it connects to the slave unit. More slave unit can be connected to master unit, just that each slave unit has a different slave address. The range of address are 1 to 255.

With the autodiscovery function, the gateway will be programmed to perform queries for each Modbus device connected with the correct parameters.

The correct parameters setting for each device are read into the message of the function 17, which is read during the function of autodiscovery.

2 – IEC 61850 Server

The device it is also a IEC 61850 server that answers at the client request of reading and write. The gateway has a on-line procedure for do a modbus device autodiscovery: the discovery found all modbus device connected and after that create automatically a ICD file..

Rev.	Data / Date	Descrizione / Description	Preparata / Prepared	Approvata / Approved
0	09/12/13	Prima emissione / First issue	S. Isella	A. Miori

CONFIGURE AND START UP THE DEVICE

Firt Step:

Connect to the correct ports of the device the power connector, the Ethernet cable and the serial port connector
Enefer to the homepage.

Then go to the homepage of device web pages and click “General Settings” link.

IEC61850/Modbus RTU Gateway

Firmware Version 1.0.0 Build 1
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When the page is loaded enter in “Network” tab, and set the parameters for connect to the web. Insert a correct NTP server and DNS servers if is necessary.

Settings

Network Serial Login Update System

IP Configuration

Use DHCP:

IP address: 192.168.1.25

Subnet mask: 255.255.255.0

Gateway: 192.168.1.254

User-defined NTP Server

SNTP Server: 195.43.74.3

Time zone: 4

Current time: 2009-12-01 00:14:26

DNS

Name server IP address:

Name server IP address:

For configure the modbus connection open the “Serial” tab and set the right parameters to connect the device with slave units from COM1.



Settings

Network
Serial
Login
Update
System

COM1 Configuration

Baudrate:

Mode:

Parity:

Stop bits:

Request delay (ms):

Poll delay (ms):

Timeout (ms):

Max registers:

Max coils:

Request delay and Max registers are only global parameter. Each device will have its Request delay and its Max registers

Then click the "Devices statistics" link and open "Autodiscovery" tab, choose the range of address to do the discovery and press "Start Autodiscovery" button to start the procedure of autodiscovery. Wait that the procedure finished, a message status at the end will appear,



Devices statistics

Statistics
Autodiscovery

Autodiscovery completed! device found: 2. Now need to reset the device

Autodiscovery

Port:

Start address:

End address:

Start device discovery process

Stop device discovery process

System status

Application status: Running

Then return on "General Settings" page in "System" tab and press "Cold reboot" button for restart the device with the new configuration.



[Home](#)

[Data Monitor](#)

Settings



[Network](#)

[Serial](#)

[Login](#)

[Update](#)

[System](#)

System Maintenance

Perform a cold reboot

Perform a warm reboot

When the device is restarted, open again its web pages and go to "Data monitor". In this page will be show the values for every points of selected device. If all configurations went in the right mode, should see the points value of the slave units.



[Home](#)

[Data Monitor](#)

[Devices statistics](#)

Data Monitor

Show Point

Select ID device: 1 ▾

Index	Name	Value	Type	Quality
0	V L1-N	0	AI	1
1	V L2-N	0	AI	1
2	V L3-N	0	AI	1
3	V L1-L2	0	AI	1
4	V L2-L3	0	AI	1
5	V L3-L1	0	AI	1
6	I L1	0	AI	1
7	I L2	0	AI	1
8	I L3	0	AI	1
9	F	0	AI	1
10	P Sys	0	AI	1
11	Q Sys	0	AI	1
12	S Sys	0	AI	1
13	P.F. Sys	1	AI	1
14	kWh+ Sys	0	AI	1
15	kVArh+ Sys	0	AI	1
16	kWh- Sys	0	AI	1
17	kVArh- Sys	0	AI	1

In order to control the status of each slave units, go to the "devices statistics" page in "statistics" tab.

Devices statistics

Statistics		Autodiscovery					
Id	Tx Packets	Rx Packets	Offlines	Timeouts	Exceptions	Reset Statistics	
1	318	318	0	0	0	<input type="button" value="Reset"/>	
2	105	105	0	0	0	<input type="button" value="Reset"/>	

IEC table point

For each device there are the next LN(logical node)

Logical device

- LLN0 (Logical node zero)

MXXX - Logical Nodes for Metering and Measurement

- MHAI (Harmonics or Interharmonics)
- MMTR (Metering)
- MMXU (Non phase related measurement)
- MSTA (Metering Statistics)

MHAI

IEC name	IEC item	Field 2	Name modbus	Modbus register
ThdPhV	phsA	21	THD V L1	40041
ThdPhV	phsB	22	THD V L2	40043
ThdPhV	phsC	23	THD V L3	40045
ThdA	phsA	24	THD I L1	40047
ThdA	phsB	25	THD I L2	40049
ThdA	phsC	26	THD I L3	40051

MMTR

IEC name	IEC item	Field 2	Name modbus	Modbus register
SupWh		15	kWh + Sys	40029
SupVArh		16	kVArh + Sys	40031
DmdWh		17	kWh – Sys	40033
DmdVArh		18	kVArh - Sys	40035

MMXU

IEC name	IEC item	Field 2	Name modbus	Modbus register
PhV	phsA	1	V L1-N	40001
PhV	phsB	2	V L2-N	40003
PhV	phsC	3	V L3-N	40005
PPV	phsAB	4	V L1-L2	40007
PPV	phsBC	5	V L2-L3	40009
PPV	phsCA	6	V L3-L1	40011
A	phsA	7	I L1	40013
A	phsB	8	I L2	40015
A	phsC	9	I L3	40017
A	Neut	20	I Neutral	40039

Hz		10	F	40019
TotW		11	P Sys	40021
TotVAr		12	Q Sys	40023
TotVA		13	S Sys	40025
TotPF		14	P.F. Sys	40027
W	phsA	28	P L1	40055
W	phsB	29	P L2	40057
W	phsC	30	P L3	40059
VAr	phsA	31	Q L1	40061
VAr	phsB	32	Q L2	40063
VAr	phsC	33	Q L3	40065
VA	phsA	34	S L1	40067
VA	phsB	35	S L2	40069
VA	phsC	36	S L3	40071
PF	phsA	37	P.F. L1	40073
PF	phsB	38	P.F. L2	40075
PF	phsC	39	P.F. L3	40077

MSTA

IEC name	IEC item	Field 2	Name modbus	Modbus register
MaxW		43	P Max Sys	40085
Av W		44	P Avg Sys	40087
Max A	phsA	45	I Max L1	40089
Max A	phsB	46	I Max L2	40091
Max A	phsC	47	I Max L3	40093
Av A	phsA	48	I Avg L1	40095
Av A	phsB	49	I Avg L2	40097
Av A	phsC	50	I Avg L3	40099

ORDER BY REGISTER

IEC name	IEC item	Field 2	Name modbus	Modbus register
PhV	phsA	1	V L1-N	40001
PhV	phsB	2	V L2-N	40003
PhV	phsC	3	V L3-N	40005
PPV	phsAB	4	V L1-L2	40007
PPV	phsBC	5	V L2-L3	40009
PPV	phsCA	6	V L3-L1	40011
A	phsA	7	I L1	40013
A	phsB	8	I L2	40015
A	phsC	9	I L3	40017
Hz		10	F	40019
TotW		11	P Sys	40021
TotVAr		12	Q Sys	40023
TotVA		13	S Sys	40025
TotPF		14	P.F. Sys	40027
SupWh		15	kWh + Sys	40029
SupVArh		16	kVArh + Sys	40031
DmdWh		17	kWh - Sys	40033
DmdVArh		18	kVArh - Sys	40035
		19	Energy multiplier	40037
A	Neut	20	I Neutral	40039
ThdPhV	phsA	21	THD V L1	40041
ThdPhV	phsB	22	THD V L2	40043
ThdPhV	phsC	23	THD V L3	40045
ThdA	phsA	24	THD I L1	40047
ThdA	phsB	25	THD I L2	40049



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USER MANUAL

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ThdA	phsC	26	THD I L3	40051
		27	Cos Phi Sys	40053
W	phsA	28	P L1	40055
W	phsB	29	P L2	40057
W	phsC	30	P L3	40059
VAr	phsA	31	Q L1	40061
VAr	phsB	32	Q L2	40063
VAr	phsC	33	Q L3	40065
VA	phsA	34	S L1	40067
VA	phsB	35	S L2	40069
VA	phsC	36	S L3	40071
PF	phsA	37	P.F. L1	40073
PF	phsB	38	P.F. L2	40075
PF	phsC	39	P.F. L3	40077
		40	Cos Phi L1	40079
		41	Cos Phi L2	40081
		42	Cos Phi L3	40083
MaxW		43	P Max Sys	40085
Av W		44	P Avg Sys	40087
Max A	phsA	45	I Max L1	40089
Max A	phsB	46	I Max L2	40091
Max A	phsC	47	I Max L3	40093
Av A	phsA	48	I Avg L1	40095
Av A	phsB	49	I Avg L2	40097
Av A	phsC	50	I Avg L3	40099
		51	V L-L Sys	40101
		52	V L-N Sys	40103
		53	I Sys	40105
		54	Phases sequence	40107
		55	Temperature	40109