Modbus RTU to IEC104 protocol conversion

Description

This article describes WCC Lite configuration steps to enable Modbus TCP protocol conversion to IEC 104.

First steps

Before you begin, make sure you have completed all physical installation work according to the manufacturer's installation instructions.

Set up your computer and connect Ethernet cable to WCC Lite ETH0 port. Login with default credentials and setup basic required settings (name, network, users, etc.). You can find configuration tutorials in How to articles.

After setup, download configuration template from device (Protocol Hub → Configuration → Template configuration Download)
Or download configuration example from this article Files.

To prepare configuration fill information in both - Devices and Signals sheets:

Configure devices

Add connected ABB meter with Modbus RTU protocol required information:

name	description	device_alias	enable	protocol	id	device	baudrate	databits
From ABB Meter	ABB B21	B21	1	Modbus RTU	1	PORT2	9600	8

stopbits	parity	flowcontrol	scan_rate_ms	serial_delay	retry_count
1	none	none	5000	200	3

Add SCADA working on IEC104 protocol required information:

name	description	device_alias	enable	protocol	bind_address	host	port
To SCADA		iec104	1	IEC 60870-5-104 slave	0.0.0.0	192.168.1.10 192.168.67.192 192.168.71.1	2404

asdu_size	cot_size	ioa_size	rwt	swt	t1	t2	t3	time_sync	message_size	cache_size
2	2	3	8	12	45	30	200	1	249	100

You can find more options and descriptions of the settings in Device configuration article.

Configure signals

Add connected meter measurements information. Use meter manual for information and addresses (**tag_job_todo).**

signal_name	device_alias	signal_alias	enable	multiply	log	job_todo	tag_job_todo	number_type
Voltage	B21	U	1	0.1	1	3;23296;67	3;23296;2	UNSIGNED32
Current	B21	I	1	0.01	1	3;23296;67	3;23308;2	UNSIGNED32
Active power	B21	P	1	0.00001	1	3;23296;67	3;23316;2	SIGNED32
Frequency	B21	F	1	0.01	1	3;23296;67	3;23342;1	UNSIGNED16
Power factor	B21	Cos	1	0.001	1	3;23296;67	3;23354;1	SIGNED16
Active import	B21	E	1	0.01	1	3;20480;4	3;20480;4	UNSIGNED64

job_todo -Request to send according to modbus specification without device address and checksum;

tag_job_todo - a subset of **job_todo** field, exact address of measurement (tag)

Add **IEC104** master signals information:

signal_name	device_alias	signal_alias	source_device_alias	source_signal_alias
Voltage	iec104	tag-iec104-1001	B21	U
Current	iec104	tag-iec104-1002	B21	I

Active power	iec104	tag-iec104-1003	B21	P
Frequency	iec104	tag-iec104-1004	B21	F
Power factor	iec104	tag-iec104-1005	B21	Cos
Active import	iec104	tag-iec104-1006	B21	E

enable	log	units	multiply	gi	common_address	info_address	data_type
1	1	V	1.0	1	1	1001	13
1	1	A	1.0	1	1	1002	13
1	1	kW	1.0	1	1	1003	13
1	1	Hz	1.0	1	1	1004	13
1	1		1.0	1	1	1005	13
1	1	kWh	1.0	1	1	1006	13

Other example with Rail350 meter in video

⚠ The video covers only 1.5 firmware version.

https://www.youtube.com/embed/FdeyXs79Vww

Upload configuration

After all devices and signals are configured it time to check and upload configuration using WCC Excel Utility:

1. Download and run WCC Excel Utility;
2. Select Excel file from your computer and click *Convert*;
3. Check if no events in red color occur. If so, edit Excel file according to event text and repeat Step 2;
4. Enter Host and credentials of WCC Lite and click *Upload configuration.*

Files

1. ABB meter manual Download
2. WCC Excel Utility Download

3. Example of configuration file Download

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