Modbus RTU to IEC104 protocol conversion

Setup

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

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 the Ethernet cable to the WCC Lite ETH0 port. Log in with default credentials and set up basic required settings (name, network, users, etc.). You can find configuration tutorials in How to articles.

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

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

Configuring Devices

Add a connected ABB meter with the 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	192.168.1.10 192.168.71.1	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 the Device configuration article.

Configuring Signals

Add connected meter measurements information. Use the 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;2	3;23296;2	UNSIGNED32
Current	B21	I	1	0.01	1	3;23308;2	3;23308;2	UNSIGNED32
Active power	B21	P	1	0.00001	1	3;23316;2	3;23316;2	SIGNED32
Frequency	B21	F	1	0.01	1	3;23340;1	3;23340;1	UNSIGNED16
Power factor	B21	Cos	1	0.001	1	3;23354;1	3;23354;1	SIGNED16
Active import	B21	E	1	0.01	1	3;20480;4	3;20480;4	FLOAT

ℹ **job_todo** -Request to send according to Modbus specification without device address and checksum;

ℹ **tag_job_todo** - a subset of the **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 examples with the Rail350 meter

⚠ The video covers only 1.5 firmware version.

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

Uploading the Configuration

After configuring all devices and signals, follow these steps to check and upload the configuration using the WCC Excel Utility:

1. Download and run WCC Excel Utility.
2. Select the firmware version from the drop-down menu.
3. Select the Excel file from your computer and click *Convert*.
4. Check if no events in red color occur. If so, edit the Excel file according to the event text and repeat Step 2.
5. Enter the Host and credentials of WCC Lite, click connect and then *Upload configuration.*
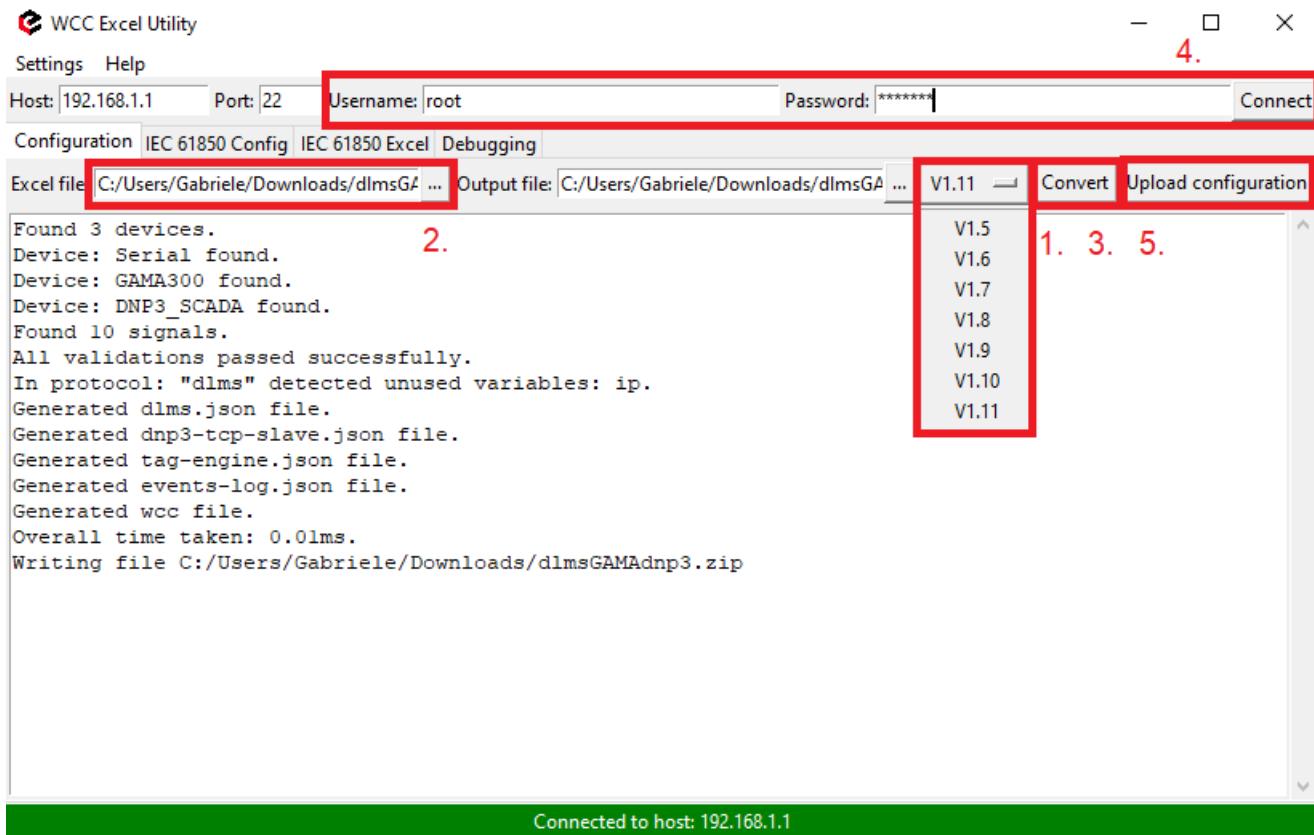
Another method to upload the configuration is via the web interface:

1. Access the WCC Lite interface via your browser. The default IP address is 192.168.1.1. Enter credentials:

2. Upload the Excel configuration:

3. After a successful upload, the configuration will appear under the **DOWNLOAD CONFIGURATION** tab:

DOWNLOAD CONFIGURATION

Current configuration (config-elseta-wcc-Comlynx.xlsx):
Last changed: 2024-11-10 01:44:14

Download

Template configurations:

Download

4. If any errors occur during the upload, follow the error messages, fix them according to Excel utility guidelines.

Files

1. ABB meter manual Download
2. WCC Excel Utility Download
3. Example of configuration file Download