IOMod setup with WCC Lite

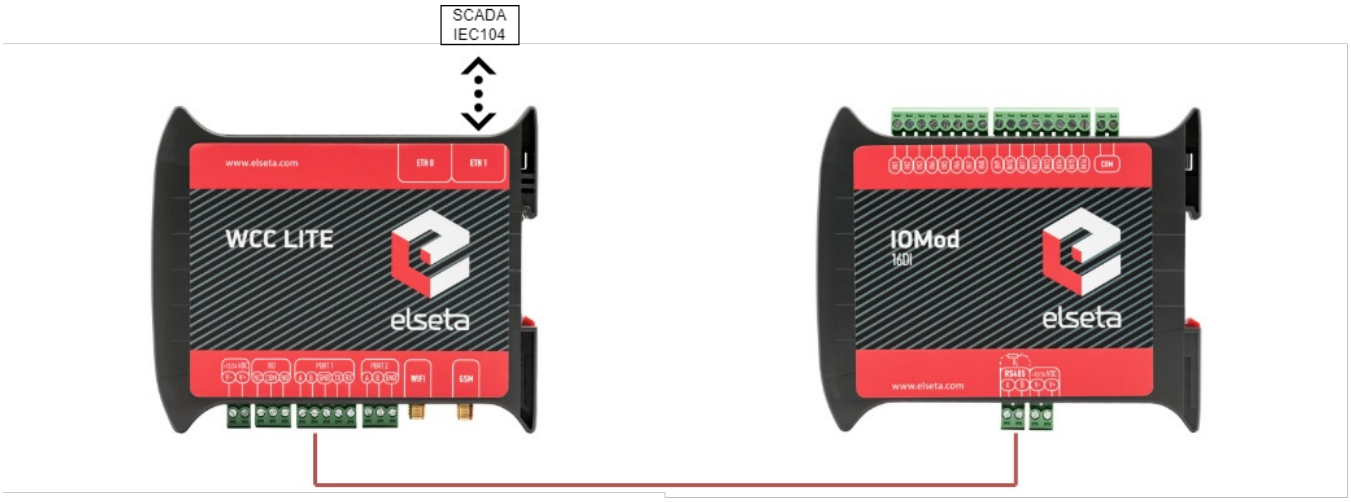
In this chapter you will learn how to connect all kinds of Elseta IOMods to the WCC Lite

- Connecting IOMod 16DI to the WCC Lite
- Connecting two IOMod 16DI

Connecting IOMod 16DI to the WCC Lite

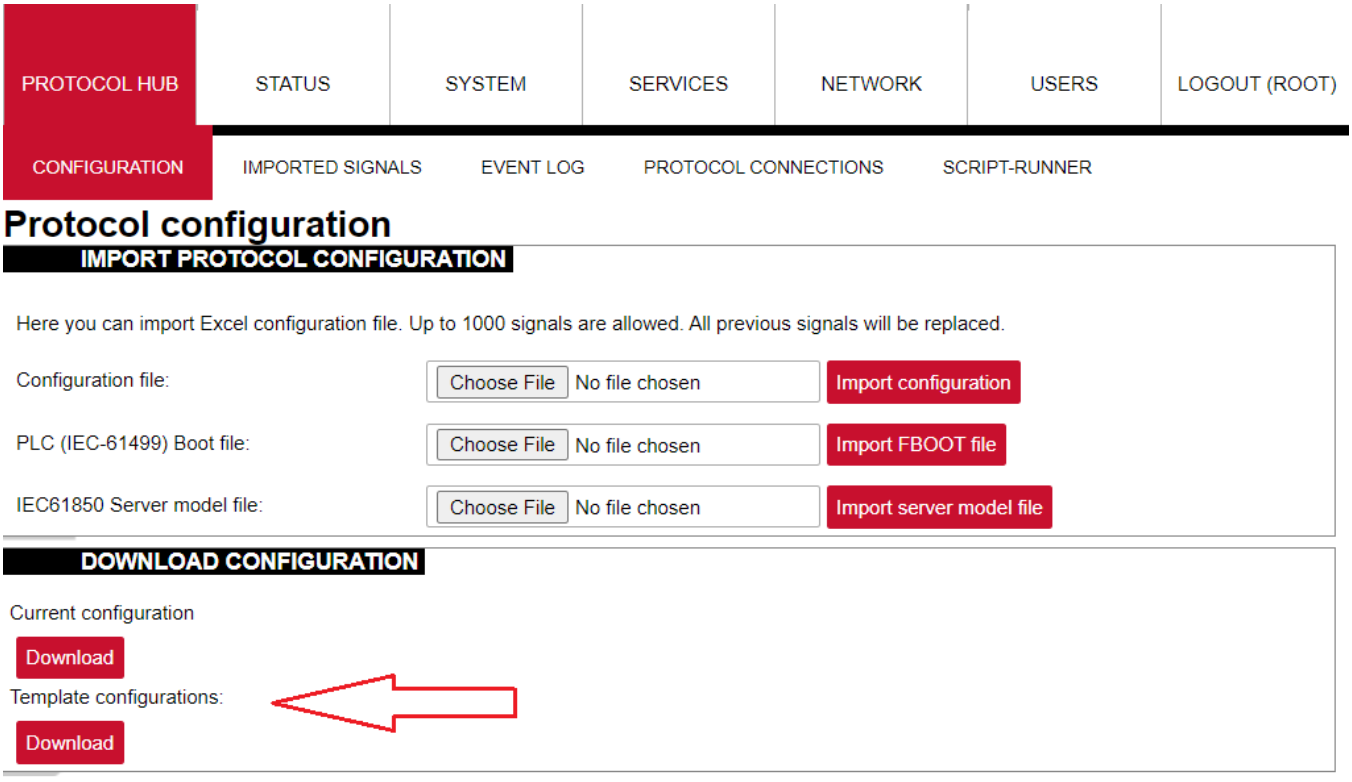
Description

This article describes how to connect and configure IOMod 16DI to the WCC Lite using IEC101, IEC103, and Modbus RTU.



Preparing the configuration

At first you need to make a configuration for the WCC Lite. This can be done using any spreadsheet editing program. Templates for configuration can be found on the WCC Lite web. Protocol Hub --> Configuration. On the bottom of the page there will be a *Download* button for template configurations.



You can download the example configuration for each firmware versions at the bottom of the article or create your own using these links:

- For IEC103
- For IEC101
- For Modbus

You need to configure Devices and Signals sheets before continuing. After downloading template configurations, open phub templates folder. You will see that there's different templates for each IOMod:

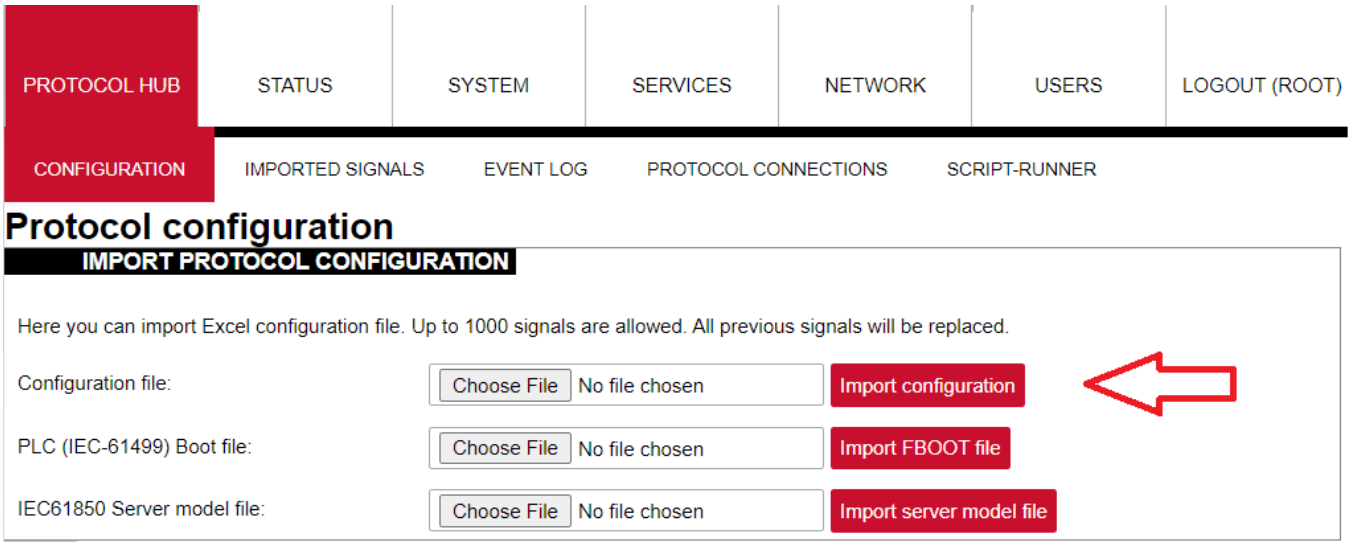
iomod_4CS4VS_IEC103_to_IEC104_...	Microsoft Excel Worksheet	63 KB	No	105 KB	41%	8/23/2022 4:54 PM
iomod_4CS4VS_modbus_RTU_to_IE...	Microsoft Excel Worksheet	68 KB	No	114 KB	41%	8/23/2022 4:56 PM
iomod_4RTD_IEC103_to-IEC104_D...	Microsoft Excel Worksheet	30 KB	No	41 KB	28%	5/18/2022 3:10 PM
iomod_4RTD_Modbus_to_IEC104_D...	Microsoft Excel Worksheet	34 KB	No	45 KB	27%	5/18/2022 3:10 PM
iomod_8AI_IEC103_to_IEC104_DNP...	Microsoft Excel Worksheet	30 KB	No	40 KB	27%	5/18/2022 3:01 PM
iomod_8AI_modbus_RTU_to_IEC10...	Microsoft Excel Worksheet	31 KB	No	41 KB	26%	5/18/2022 3:19 PM
iomod_8DI8DO_IEC103_to_IEC104_...	Microsoft Excel Worksheet	36 KB	No	50 KB	28%	5/18/2022 3:18 PM
iomod_8DI8DO_modbus_RTU_to_IE...	Microsoft Excel Worksheet	39 KB	No	54 KB	29%	5/18/2022 3:39 PM
iomod_16DI_IEC103_to_IEC104_DN...	Microsoft Excel Worksheet	43 KB	No	63 KB	33%	5/18/2022 3:44 PM
iomod_16DI_modbus_RTU_to_IEC1...	Microsoft Excel Worksheet	34 KB	No	45 KB	25%	5/18/2022 3:44 PM

To select correct configuration, check the sticker on the back of IOMod. There you will find which protocol to use according to Factory FW type. For example, if you have IOMod 16DI with IEC103 FW, select configuration iomod_16DI_IEC103_to_IEC104_DNP3_Modbus_SCADA.

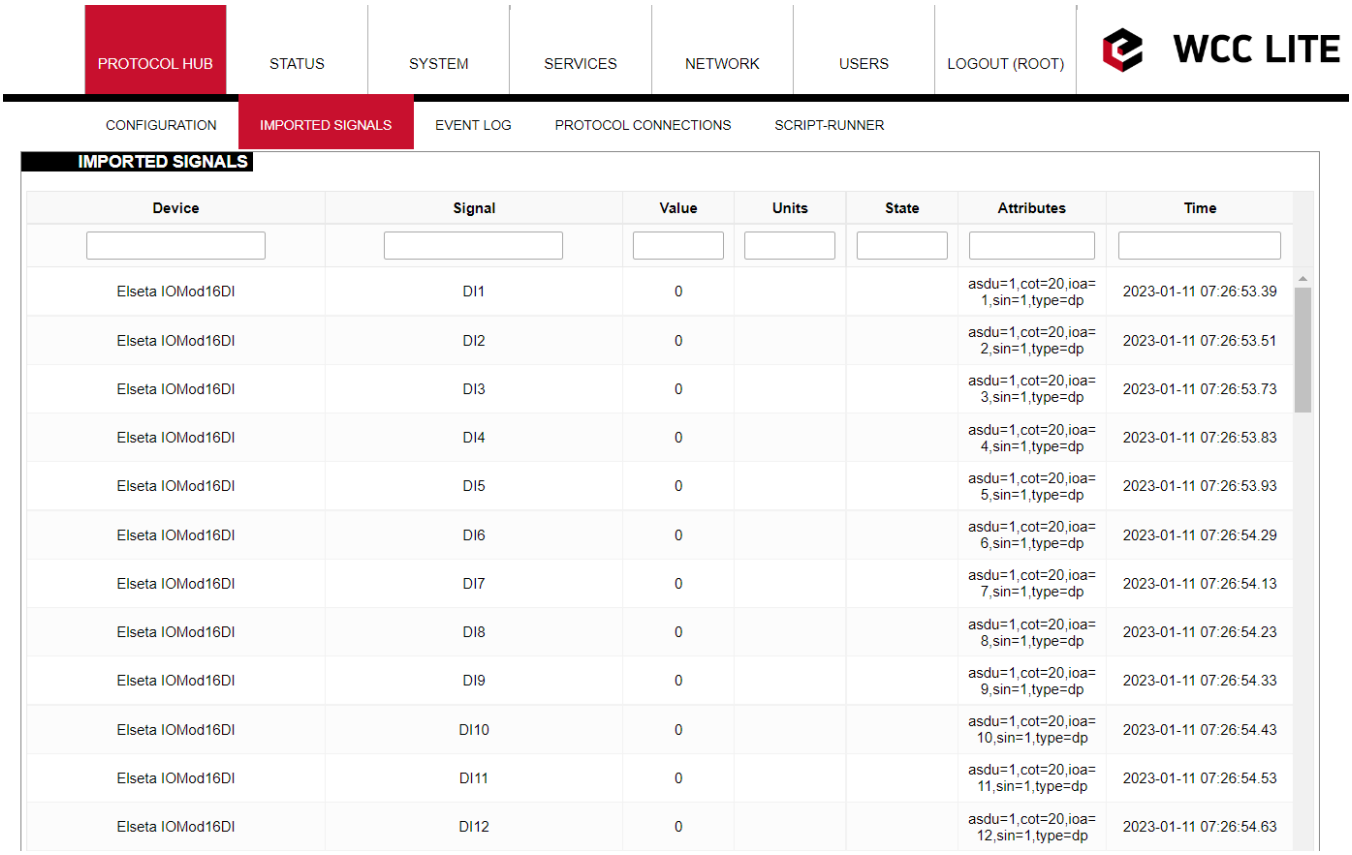
Uploading configuration

Template configurations can work with default settings without any further changes. These template configurations can also be used to configure protocols like Modbus-master and DNP3. Configuration can be modified according to functionality needed. For that you can rely on the examples given in the links above (Preparing the configuration). If you need to specify different IEC104 slave settings, you can do that by changing excel configuration. By changing settings such as *info_address* or *data_type* you can adapt IEC104 slave to work as needed. To test this example you have to specify your computer's IP address in excel configuration for IEC104 slave.

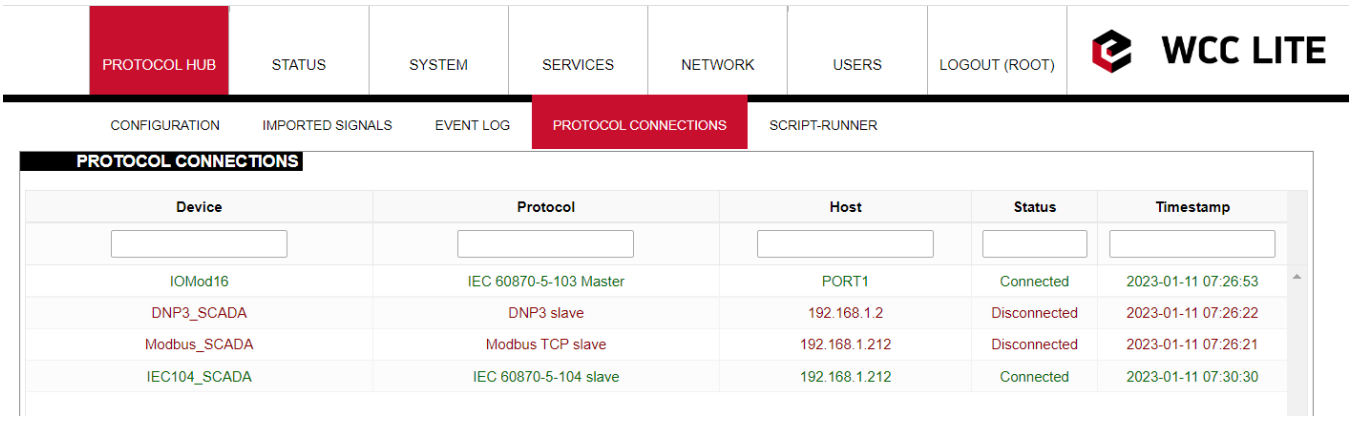
After configuration is ready, upload it to WCC Lite (Configuration --> Choose file --> Import configuration):



After upload is done and no errors were detected, you should see all imported signals (Protocol Hub --> Imported signals):

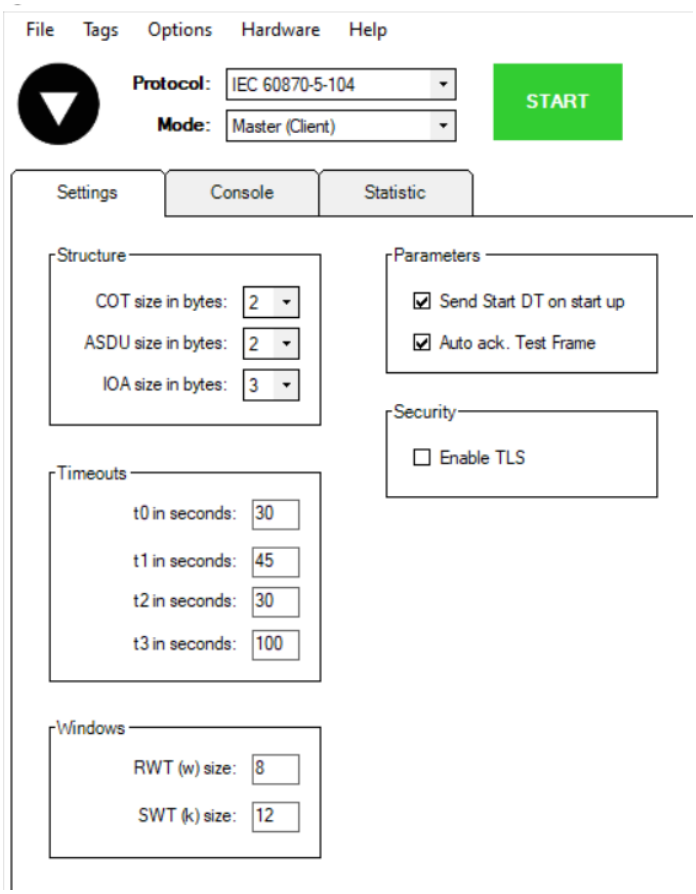


Before doing anything further you should also check for protocol connections if IOMod16DI is connected to WCC Lite via PORT1. Go to Protocol connections where you can see all the connected slave and master protocol devices:



Simulating SCADA via Vinci software

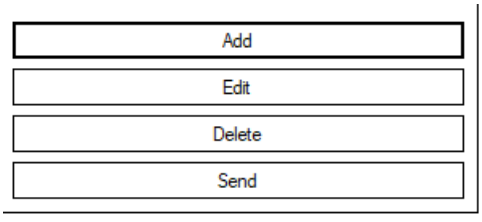
After uploading Excel configuration, you can simulate SCADA using Vinci software. In order to simulate IEC104 slave you need to choose IEC 60870-5-104 protocol and Master(Client) mode and press start. In *Settings* tab, check Structure, Timeouts and Windows values to match Excel configuration.

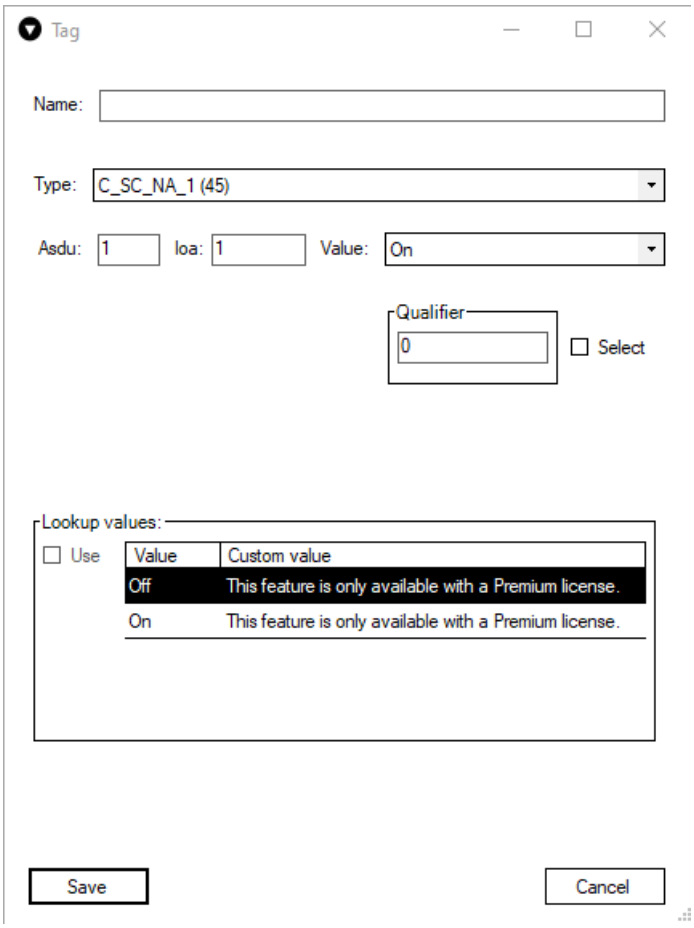


Then set correct IP address and Port at the top of the program page. **Port** for IEC104 should be 2404 and **IP address** should match your WCC Lite IP address (default address is 192.168.1.1 if it's connected to your computer via ethernet cable).

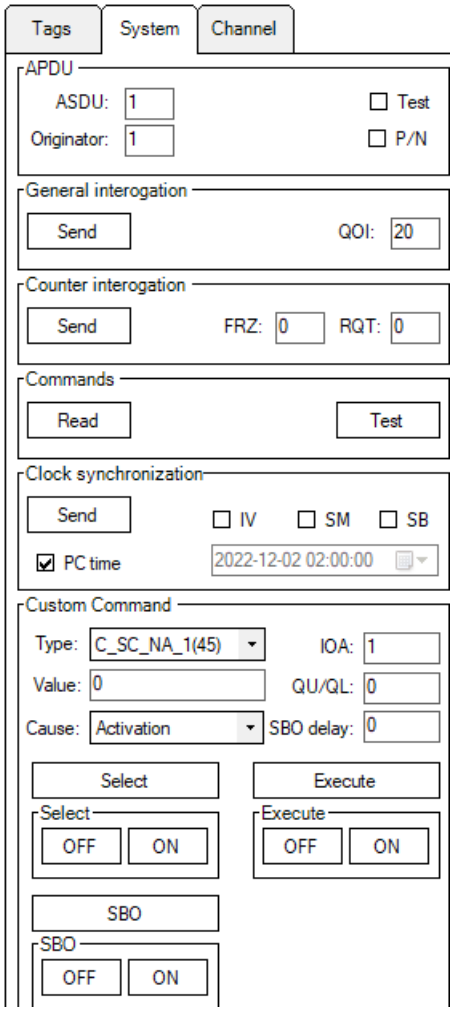
After clicking start, you should check protocol connections tab again to see if IEC104 slave is connected.

On the right side of the page you can find *Tags* and *System* tabs. In *Tags* you can create *jobs* which are specified in you excel configuration *job_todo* and *tag_job_todo.* To do so, click *Add* and choose *Type*. This type should match *data_type* described in excel configuration. If needed change asdu (in Excel configuration –*asdu_address*) and ioa (*info_address)*. Create user friendly name for this job and click save. To execute when needed click *send.*





In *System* tab you can execute commands accordingly by setting*ASDU*, *Type* and *IOA*. To execute commands you need to specify *Value* and *Cause*. To execute these commands you need to click*Execute*.



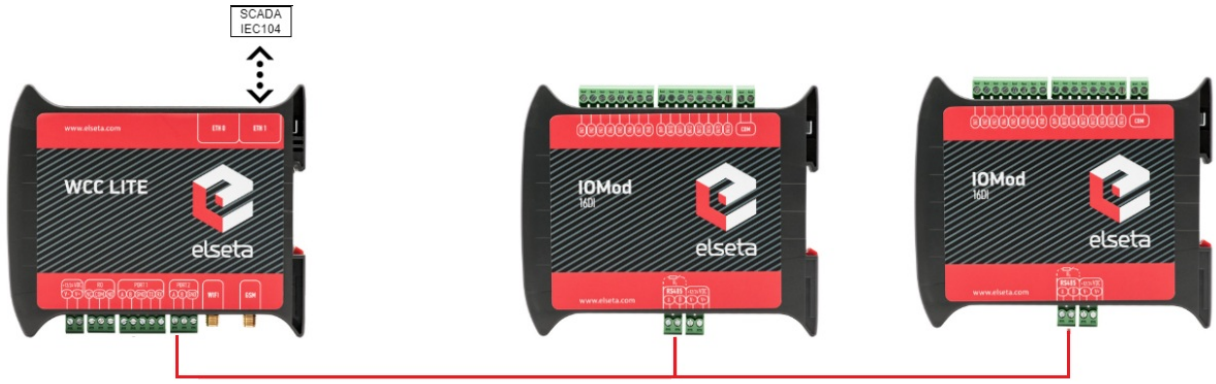
After executing one of the commands you should see results on the web as well as Vinci software window.

IEC104 SCADA system	IEC104 SCADA DI10	0			asdu=1,cot=20,ioa=10,sin=1,type=dp	2022-12-21 11:54:25.32
IEC104 SCADA system	IEC104 SCADA DI11	0			asdu=1,cot=20,ioa=11,sin=1,type=dp	2022-12-21 11:54:25.42
IEC104 SCADA system	IEC104 SCADA DI12	0			asdu=1,cot=20,ioa=12,sin=1,type=dp	2022-12-21 11:54:25.52
IEC104 SCADA system	IEC104 SCADA DI13	0			asdu=1,cot=20,ioa=13,sin=1,type=dp	2022-12-21 11:54:25.62
IEC104 SCADA system	IEC104 SCADA DI14	0			asdu=1,cot=20,ioa=14,sin=1,type=dp	2022-12-21 11:54:25.73
IEC104 SCADA system	IEC104 SCADA DI15	0			asdu=1,cot=20,ioa=15,sin=1,type=dp	2022-12-21 11:54:25.83
IEC104 SCADA system	IEC104 SCADA DI16	1		cmd	asdu=1,cot=6,ioa=16,org=1,qu=0,type=sp	2022-12-21 11:55:57.56

Connecting two IOMod 16DI

Description

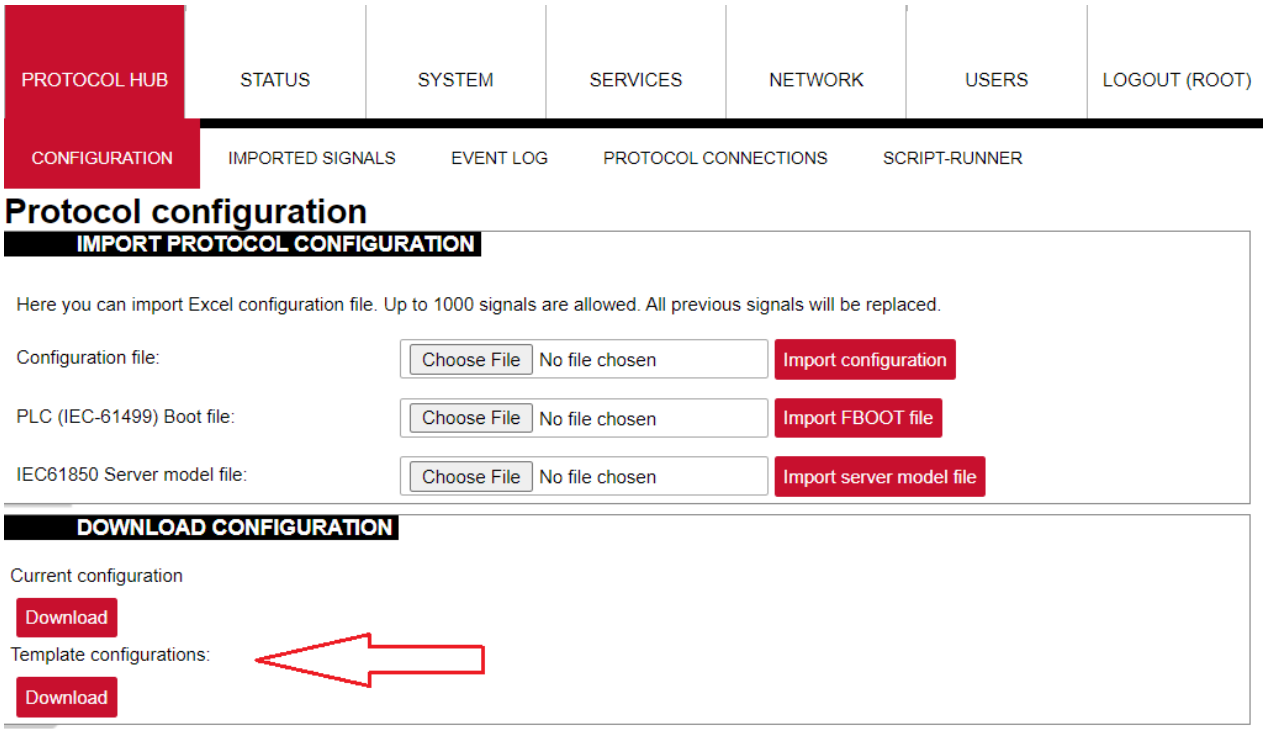
This article describes how to connect and configure two IOMods 16DI to the WCC Lite using IEC103, and Modbus RTU.



Typical connection schematic for two IOMod 16DI

Preparing the configuration

At first you need to make a configuration for the WCC Lite. This can be done using any spreadsheet editing program. Templates for configuration can be found on the WCC Lite web. Protocol Hub --> Configuration. On the bottom of the page there will be a *Download* button for template configurations.



You need to configure Devices and Signals sheets before continuing. These template configurations can also be used to configure protocols like Modbus-master and DNP3. Configuration can be modified according to functionality needed. In this case, *Device* sheet will only have three devices, WCC Lite and two IOMod 16DI. It is important to use only one protocol for each port, otherwise configuration will not work.

name	description	device_alias	id	enable	protocol	device
WCC Lite	WCC Lite	WCC Lite	1	1	modbus rtu	PORT1
IOMOD1	IOMOD1	IOMOD1		1	IEC 60870-5-103 master	PORT2
IOMOD2	IOMOD2	IOMOD2		0	IEC 60870-5-103 master	PORT2

Second step

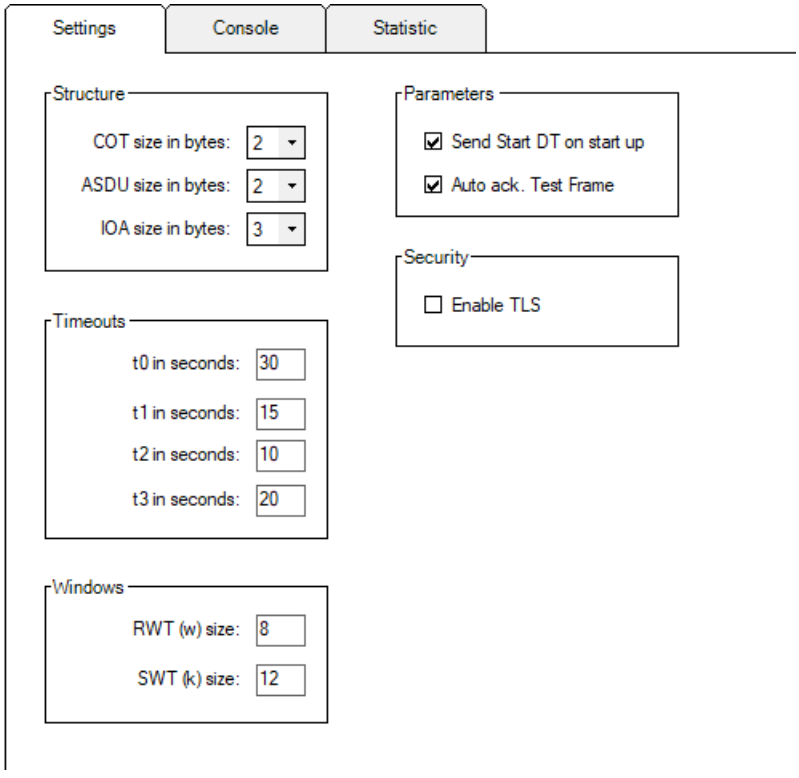
Before connecting IOMods to WCC Lite you need to configure it via mini USB. This can be done following these steps:

- For IEC103
- For IEC101(WIP)
- For Modbus

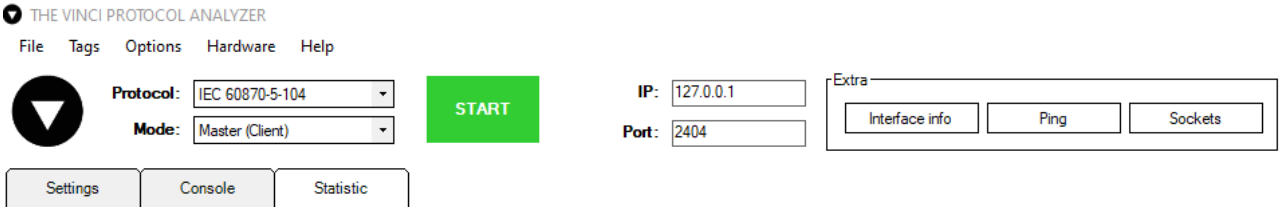
You need to configure it, like it is done in the excel configuration. To do that, fist you need to open PuTTY terminal and change these parameters: *parity, link address, asdu address*. It is important, that *link address* and *asdu address* for both IOMods are different and *parity* should be even. Other parameters such as *baudrate, databits* and *stopbits* should be set to default. Signals sheet should be mapped according to functionality needed.

Connecting IEC104-slave via Vinci

After Excel and USB configurations, you can connect to device using Vinci software. In order to simulate IEC104 slave you need to choose IEC 60870-5-104 protocol and Master(Client) mode and press start. In *Settings* tab, check Structure, Timeouts and Windows values to match Excel configuration.

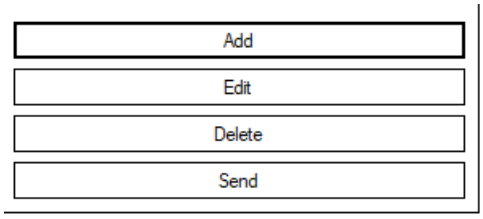


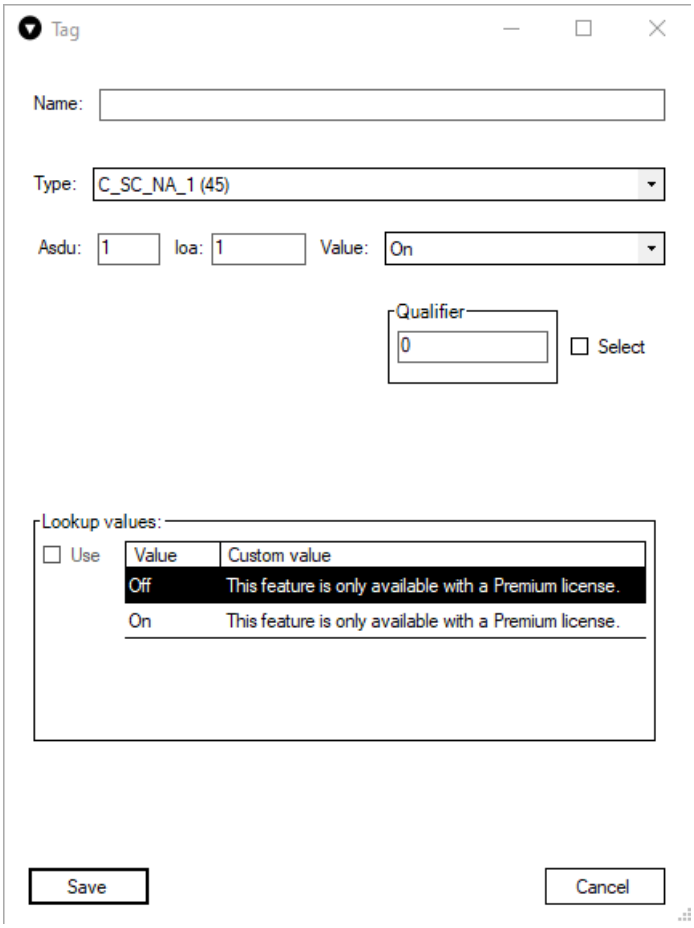
Then set correct IP address and Port at the top of the program page.**Port** for IEC104 should be 2404 and **IP address** should match your WCC Lite IP address.



On the right side of the page you can find *Tags* and *System* tabs. In *Tags* you can create *jobs* which are described in

you excel configuration *job_todo* and *tag_job_todo.* To do so, click *Add* and choose *Type*. This type should match *data_type* described in excel configuration. If needed change asdu (in Excel configuration –*asdu_address*) and ioa (*info_address)*. Create user friendly name for this job and click save. To execute when needed click*send.*





In *System* tab you can execute commands accordingly by setting *ASDU, Type* and *IOA*. To execute commands you need to specify *Value* and *Cause*. Depending on your configuration in order to execute these commands you need to click *Execute* or *Select*. By clicking *Execute,* command will be executed immediately and *Select* will only select given command but will not execute it.