


# IEC 104 Slave Simulator for SCADA System

## Initial Setup

All you need to do to set up is to be connected to a network from which the SCADA is reachable.

 Standard settings in the Vinci software are for an RJ-45 cable, but it is configurable using the [Hardware](#) tab.

When you're connected to the network it's time to open The Vinci Software and start configuring the simulated device parameters. Since The Vinci Expert will simulate the Slave (Server) when the software is started just select the IEC 60870-5-104 protocol and select Slave mode.

New

Protocol: IEC 60870-5-104

Mode: Slave (Server)


Start

**Fig. 1. Selecting Protocol and Mode.**

Go to the settings tab once the software opens. Now it's time to configure your device according to your SCADA settings. The defaults that are here are usually the defaults in most cases, but make sure to double-check. Also make sure to enter the IP and Port of the SCADA system they are located at the top of the window to the right of the green start button.

THE VINCI PROTOCOL ANALYZER

File Tags Options Hardware Help

 Protocol: IEC 60870-5-104 Mode: Slave (Server) START IP: 127.0.0.1 Port: 2404

Extra: Interface info Ping Sockets

Settings Console Statistic

Structure

COT size in bytes: 2

ASDU size in bytes: 2

IOA size in bytes: 3

Parameters

☒ Send End of ini. on start up

☒ Auto ack. U-Frame

☒ Auto ack. control commands

☒ Auto ack. system commands

Timeouts

t0 in seconds: 30

t1 in seconds: 15

t2 in seconds: 10

t3 in seconds: 20

Windows

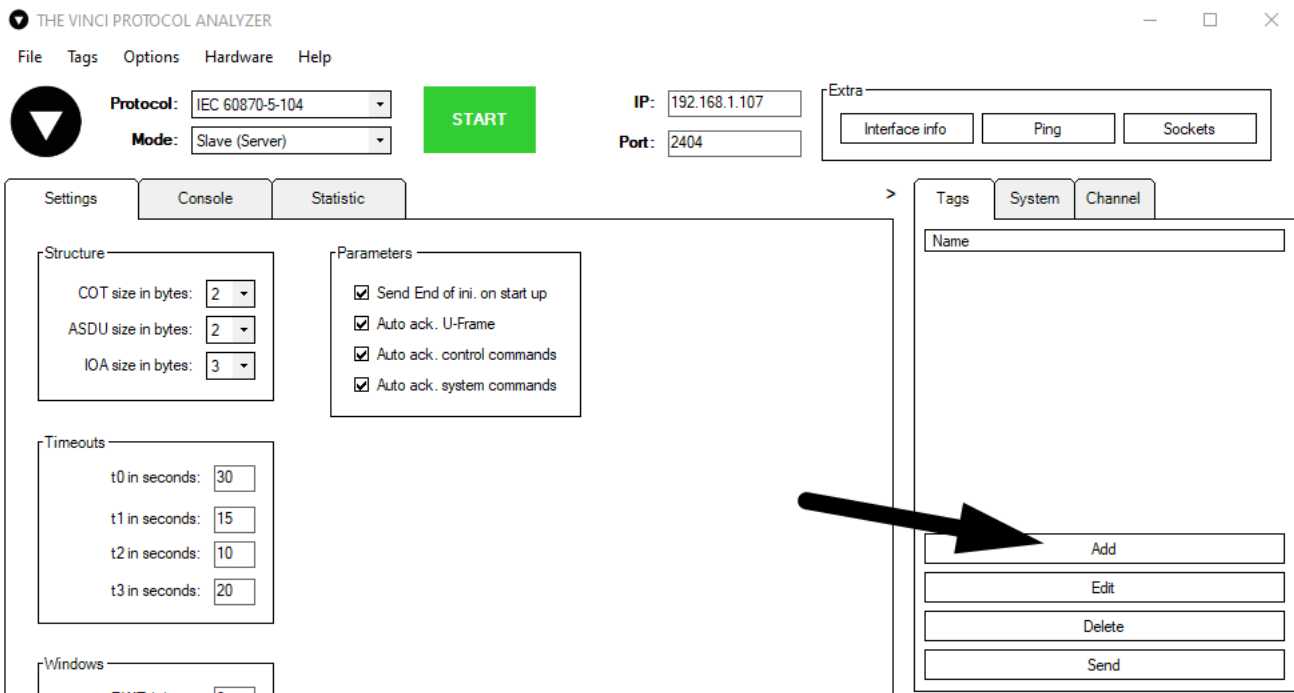
RWT (w) size: 8

SWT (k) size: 12

**Fig. 2. Configuring settings according to SCADA**

## Data Configuration

To begin adding data to send just go to the tags tab on the right side and press the "Add" button.



**Fig. 3. Add Tag**

Now you can configure the data itself. Enter the tag name, select a desired type from the drop down list, type in the ASDU and IOA numbers and then select the value. The value field will change depending on the type selected.

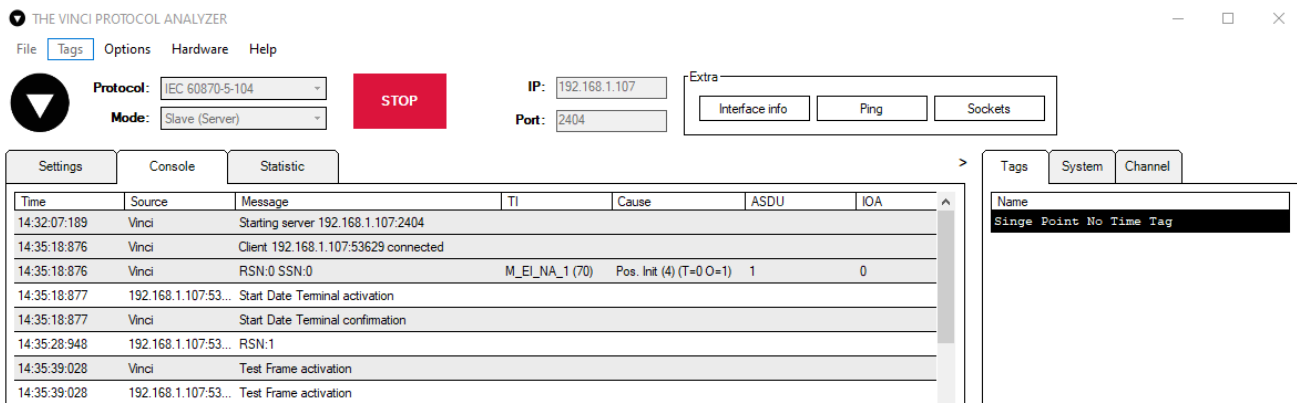
The 'Tag' configuration dialog box is shown. It has a title bar with a play button icon and the text 'Tag'. The dialog contains the following fields and controls:

- Name:** A text input field containing 'Singe Point No Time Tag'.
- Type:** A dropdown menu showing 'M\_SP\_NA\_1 (1)'.
- Asdu:** A text input field containing '1'.
- IoA:** A text input field containing '1'.
- Value:** A dropdown menu showing 'On'.
- Quality:** A group box containing five checkboxes: BL, SB, NT, IV, and OV. All checkboxes are currently unchecked.
- Buttons:** 'Save' and 'Cancel' buttons at the bottom.

**Fig. 4. Tag Menu**

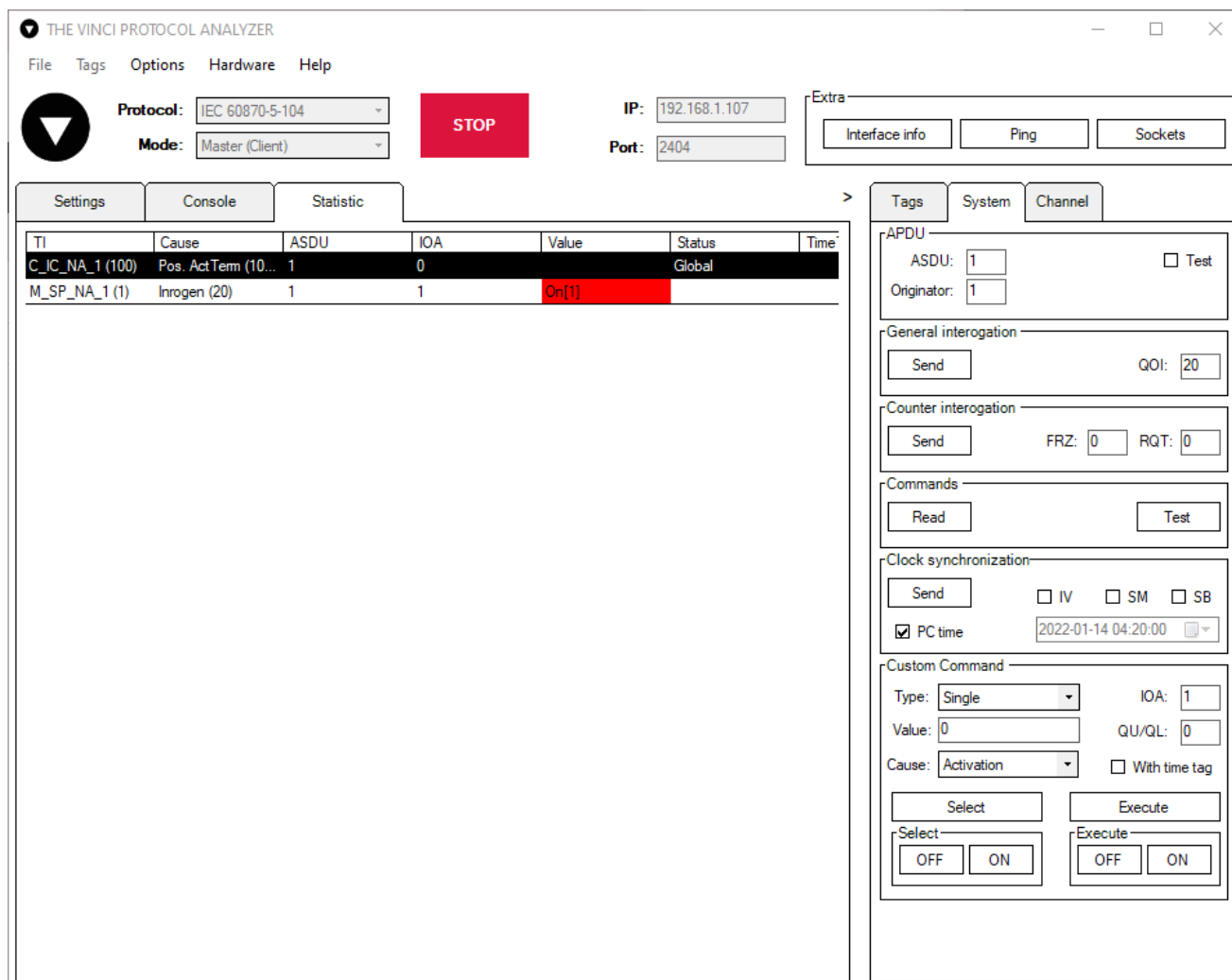
Now you can press the Start button, and The Vinci Software should start establishing communication with the SCADA system. Just like it's depicted in figure 5. You can check the commands that are being sent and recieved in the Console tab.

**i** If you want to add tags you can also do it even when the communication has been started.



**Fig. 5. Connection with SCADA**

For simplicity purposes the SCADA used in this example was another instance of The Vinci Software. As you can see after General Interrogation has been sent the slave sends back the value of the tag that was just added. We can see what the value is if we check the statistics window in The Vinci Software. If the value were to be changed the slave would send the updated value automatically to the SCADA system.



**Fig. 6. SCADA Values**

All that's left to do is to add the other values you desire in the Tags window and the SCADA should be receiving them after it's done

**i** If a new tag is added General Interrogation must be called for it to start sending data.

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