



VEBKO ONLINE HELP

GOOSE Messaging Testing

Category	tester
Section	Goose Messaging Testing
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1 Imported Content

The new power systems, specifically power substations, are designed in such a way that protection and control schemes of IEC 61850 Generic Object-Oriented Substation Event (or GOOSE) are used in them.

GOOSE messaging can be considered as a virtual connection replacing wiring and hardware connection. Hardware systems are physically checked and tested. -While GOOSE systems can be virtually checked.

Improved GOOSE systems development needs enough information about VLAN (Virtual Local-area) networks, MAC address filtering and Logical Nodes. Moreover, it needs Ethernet traffic analysis or switch setting inspection.

Testing devices can play a major role here to make GOOSE messaging testing and inspection easier. In AMT 105 devices, testing can be easily performed using SCD files in relays and network setting.

GOOSE setting can be accessed through hardware configuration window.

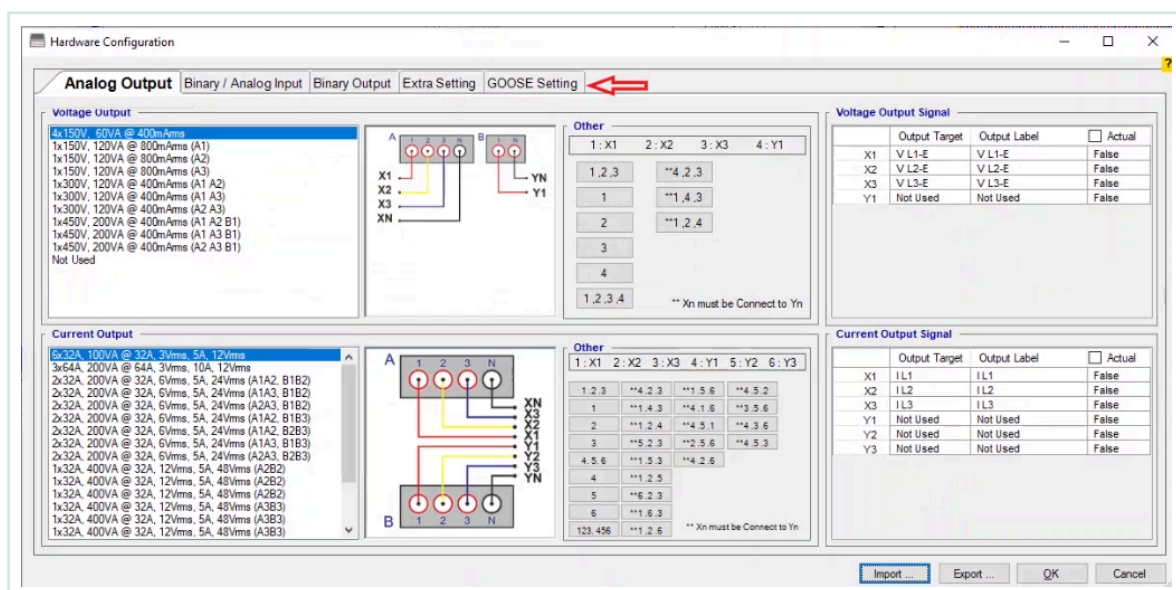


Figure 1

In this window, by selecting Import SCL option, you can import a created GOOSE configuration file.

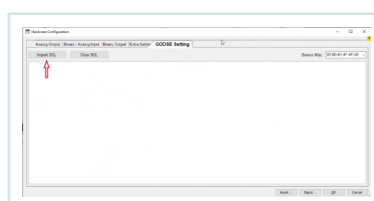


Figure 2

By choosing Clear SCL option entered data can be deleted so you can add another file.

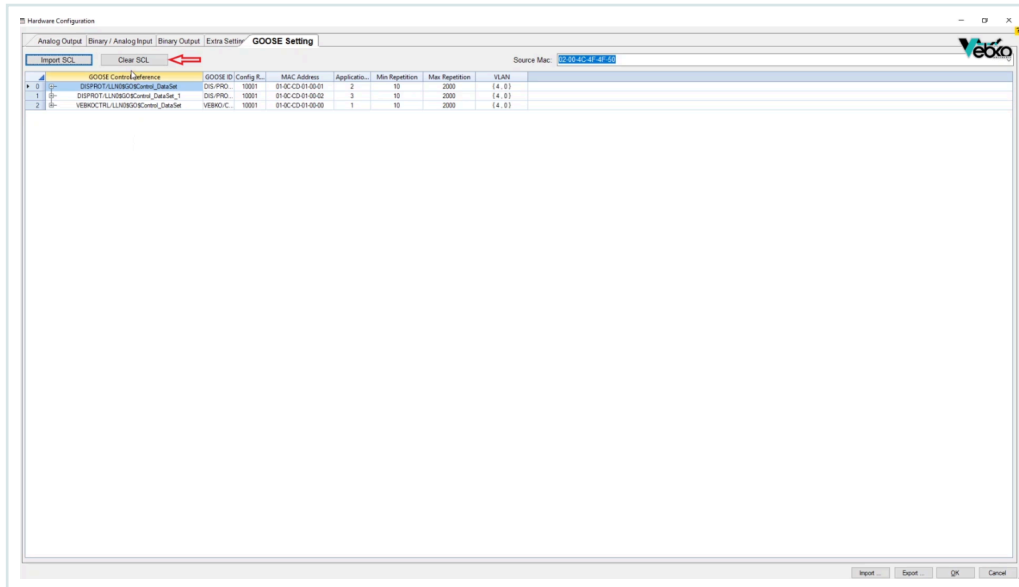


Figure 3

After importing the file, a list of GOOSE reference information, ID, MAC address, etc. are shown. By expanding each directory, you can see a series of GOOSE.

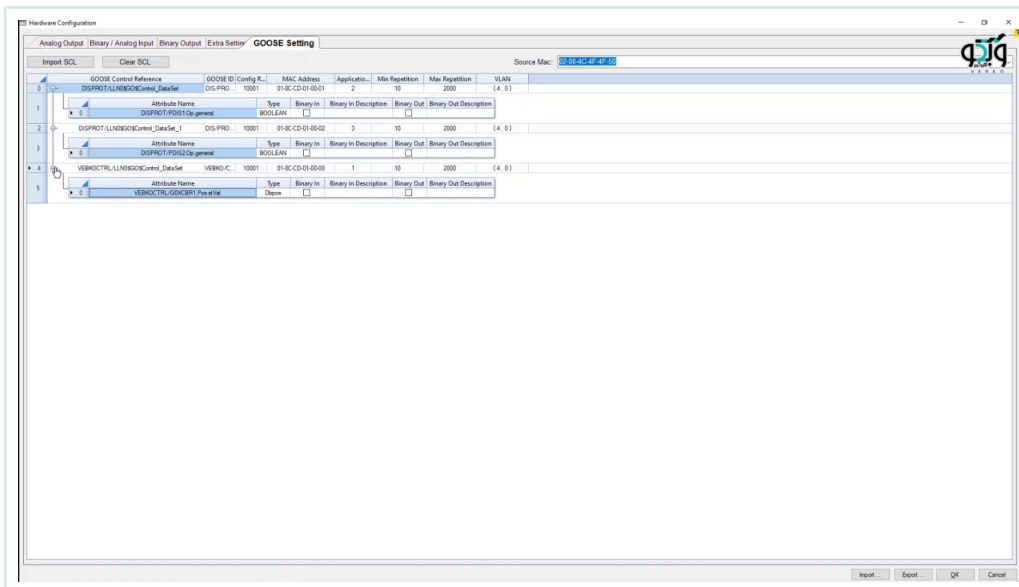


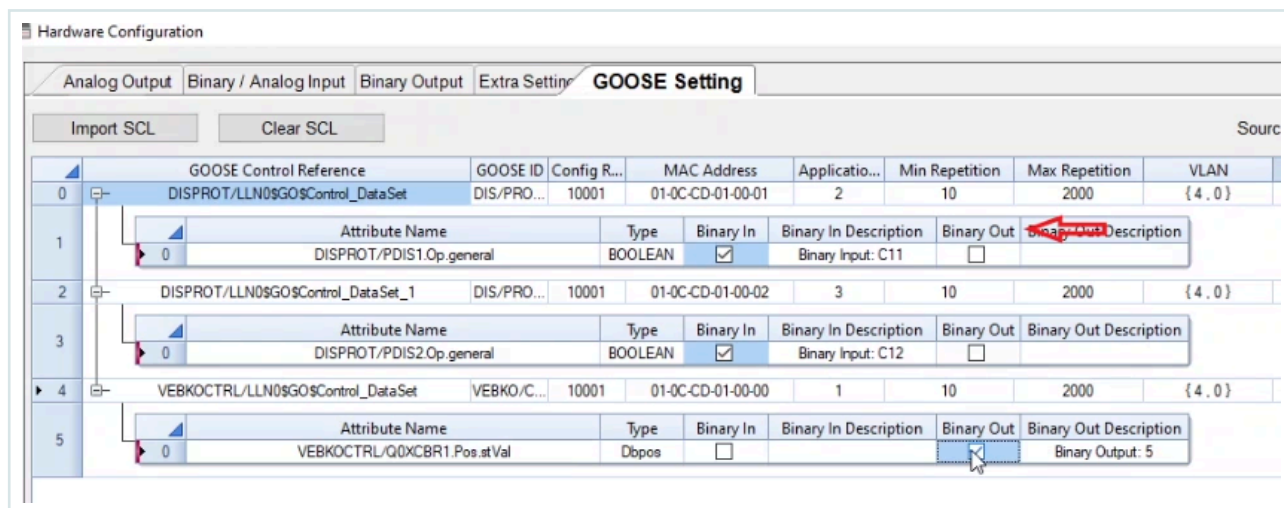
Figure 4

If your selected option is put in relay's output list, while you want it in input list, you can simply choose Binary In option.



Figure 5

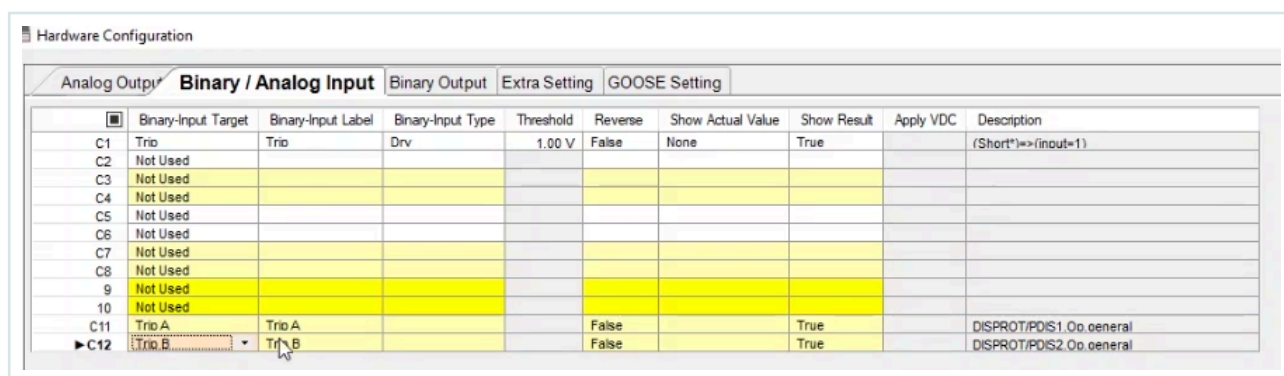
Contrariwise, if the tester is supposed to excite the input of the relay, you can select Binary Out, after choosing the desired option.



GOOSE Control Reference	GOOSE ID	Config R...	MAC Address	Applicatio...	Min Repetition	Max Repetition	VLAN												
DISPROT/LLN0\$GO\$Control_DataSet	DIS/PRO...	10001	01-0C-CD-01-00-01	2	10	2000	{ 4 , 0 }												
<table border="1"> <thead> <tr> <th>Attribute Name</th> <th>Type</th> <th>Binary In</th> <th>Binary In Description</th> <th>Binary Out</th> <th>Binary Out Description</th> </tr> </thead> <tbody> <tr> <td>DISPROT/PDIS1.Op.general</td> <td>BOOLEAN</td> <td>☒</td> <td>Binary Input: C11</td> <td>☐</td> <td></td> </tr> </tbody> </table>								Attribute Name	Type	Binary In	Binary In Description	Binary Out	Binary Out Description	DISPROT/PDIS1.Op.general	BOOLEAN	☒	Binary Input: C11	☐	
Attribute Name	Type	Binary In	Binary In Description	Binary Out	Binary Out Description														
DISPROT/PDIS1.Op.general	BOOLEAN	☒	Binary Input: C11	☐															
DISPROT/LLN0\$GO\$Control_DataSet_1	DIS/PRO...	10001	01-0C-CD-01-00-02	3	10	2000	{ 4 , 0 }												
<table border="1"> <thead> <tr> <th>Attribute Name</th> <th>Type</th> <th>Binary In</th> <th>Binary In Description</th> <th>Binary Out</th> <th>Binary Out Description</th> </tr> </thead> <tbody> <tr> <td>DISPROT/PDIS2.Op.general</td> <td>BOOLEAN</td> <td>☒</td> <td>Binary Input: C12</td> <td>☐</td> <td></td> </tr> </tbody> </table>								Attribute Name	Type	Binary In	Binary In Description	Binary Out	Binary Out Description	DISPROT/PDIS2.Op.general	BOOLEAN	☒	Binary Input: C12	☐	
Attribute Name	Type	Binary In	Binary In Description	Binary Out	Binary Out Description														
DISPROT/PDIS2.Op.general	BOOLEAN	☒	Binary Input: C12	☐															
VEBKCTRL/LLN0\$GO\$Control_DataSet	VEBKO/C...	10001	01-0C-CD-01-00-00	1	10	2000	{ 4 , 0 }												
<table border="1"> <thead> <tr> <th>Attribute Name</th> <th>Type</th> <th>Binary In</th> <th>Binary In Description</th> <th>Binary Out</th> <th>Binary Out Description</th> </tr> </thead> <tbody> <tr> <td>VEBKCTRL/Q0XCBR1.Pos.stVal</td> <td>Dbpos</td> <td>☐</td> <td></td> <td>☐</td> <td>Binary Output: 5</td> </tr> </tbody> </table>								Attribute Name	Type	Binary In	Binary In Description	Binary Out	Binary Out Description	VEBKCTRL/Q0XCBR1.Pos.stVal	Dbpos	☐		☐	Binary Output: 5
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VEBKCTRL/Q0XCBR1.Pos.stVal	Dbpos	☐		☐	Binary Output: 5														

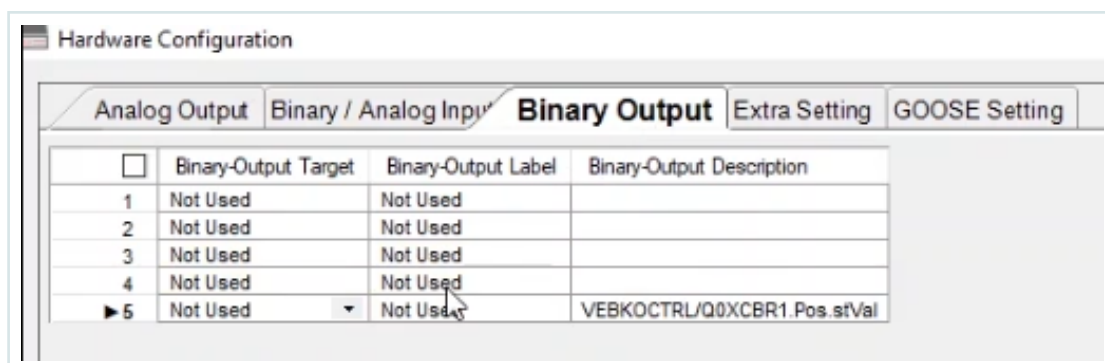
Figure 6

By choosing each option, related virtual Binary Input or Output will appear. After clicking on each binary, you will be directed to that page under Binary/Analog Input or Binary Output tab. Then you will be able to change the desired configurations.



Binary-Input Target	Binary-Input Label	Binary-Input Type	Threshold	Reverse	Show Actual Value	Show Result	Apply VDC	Description
C1	Trip	Drv	1.00 V	False	None	True		(Short*)=>(input=1)
C2	Not Used							
C3	Not Used							
C4	Not Used							
C5	Not Used							
C6	Not Used							
C7	Not Used							
C8	Not Used							
9	Not Used							
10	Not Used							
C11	Trip A			False		True		DISPROT/PDIS1.Op.general
C12	Trip B			False		True		DISPROT/PDIS2.Op.general

Figure 7



Binary-Output Target	Binary-Output Label	Binary-Output Description
1	Not Used	Not Used
2	Not Used	Not Used
3	Not Used	Not Used
4	Not Used	Not Used
5	Not Used	VEBKCTRL/Q0XCBR1.Pos.stVal

Figure 8

Therefore, the created virtual binaries will act like the real binaries of the device and will be considered in the test. Here is an example of the Goose testing for the Siemens 7SA522 relay with the IEC61850 protocol and the RJ45 port with the EN100 card is done.

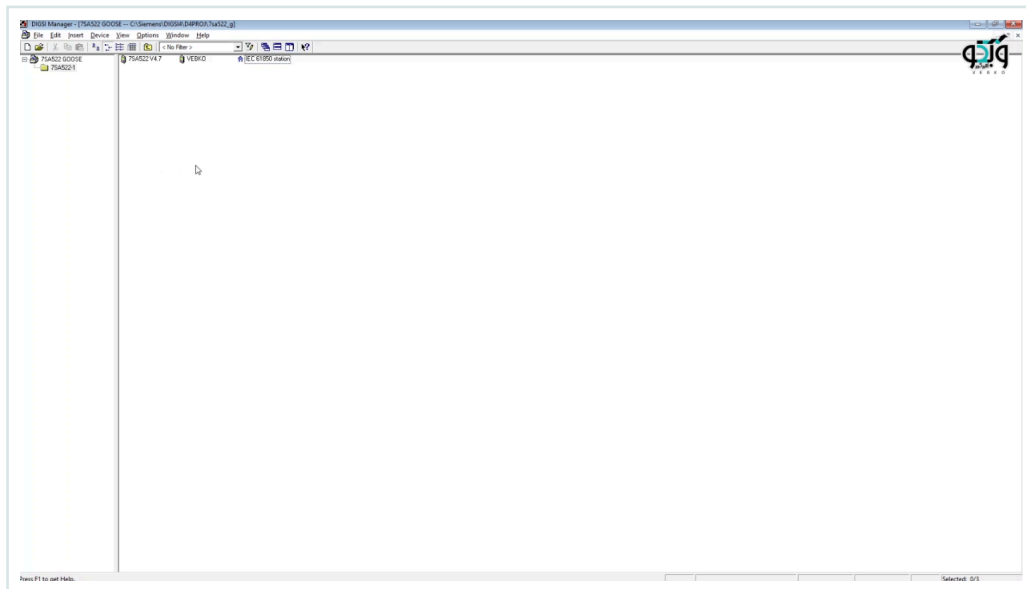


Figure 9

Note that the selected IPs for the laptop network, tester and relay must be in the same range. The IP of the test device here is 192.168.1.57 and the IP of the computer network is set to 192.168.1.2. Now it is time to register an IP for the relay in the same range in Digsy 4 software. Here "192.168.1.4" is set as an example. Keep in mind that by having an MLFB relay, all you need to do is to create an IEC 61850 Station by registering the IP and initializing it. By right-clicking on the relay title and checking the Communication Parameters section, you can make sure that the VD address, Mirror VD, IP address and Subnet Mask are correct. Here in IED name, the title DIS stands for Distance.

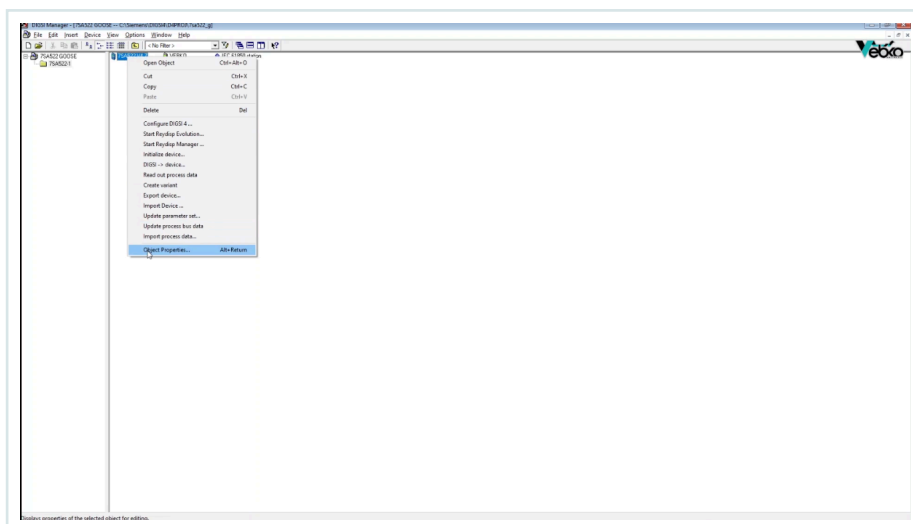


Figure 10

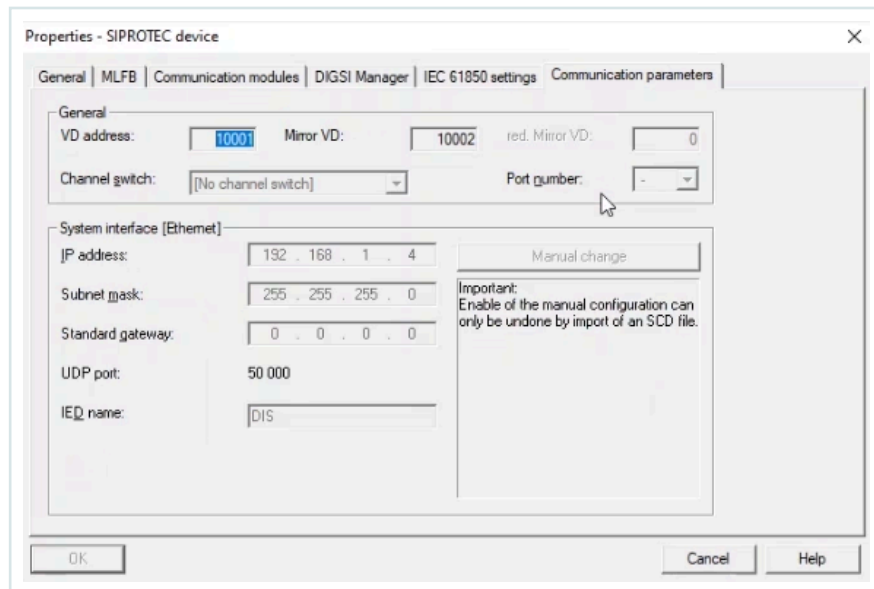


Figure 11

By opening the IEC61850 System Configurator, you can select the desired items from the Source Catalog and Destination Catalog sections and transfer them to the Goose Application section to perform Goose test. In this video, two protection items, Trip Zone 1 and Trip Zone 2, have been selected from the reference section. From the destination section, the Double position breaker item that was previously created in the Masking I / O relay is selected. Now all you need to do is to save the created file with an SCD extension.

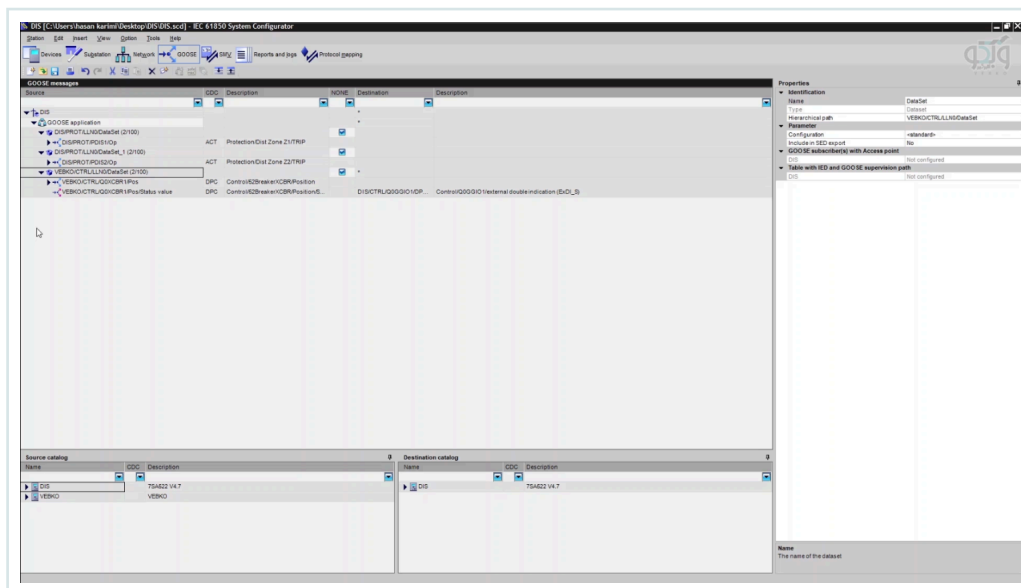


Figure 12

Figure 13

In the next step, open the AMT Sequencer room and Click on Hardware Configuration to go to the Goose Setting section and import the file saved in the previous step. As you can see, there are three items with subcategories in the Goose Control Reference section. By opening the subcategories, the function of zone 1 is set to Binary Input 11 and the function of zone 2 is set to Binary Input 12. In order to change the position of breaker in using a tester, Binary Output 5 is selected. The C1 binary is also wired to be used as a reference for comparing the time between trip zones 1 and 2.

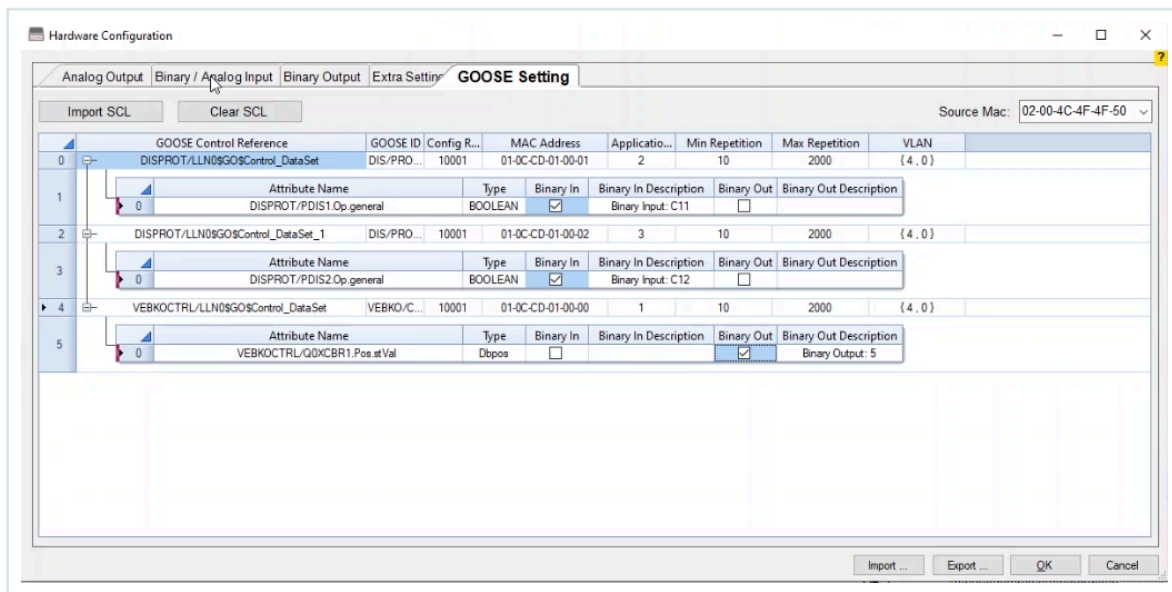


Figure 14

In the next step, you need to set the configurations for Binary Inputs. Here, Trip A and Trip B are selected to record the relay performance against Trip Zones 1 and 2, respectively.

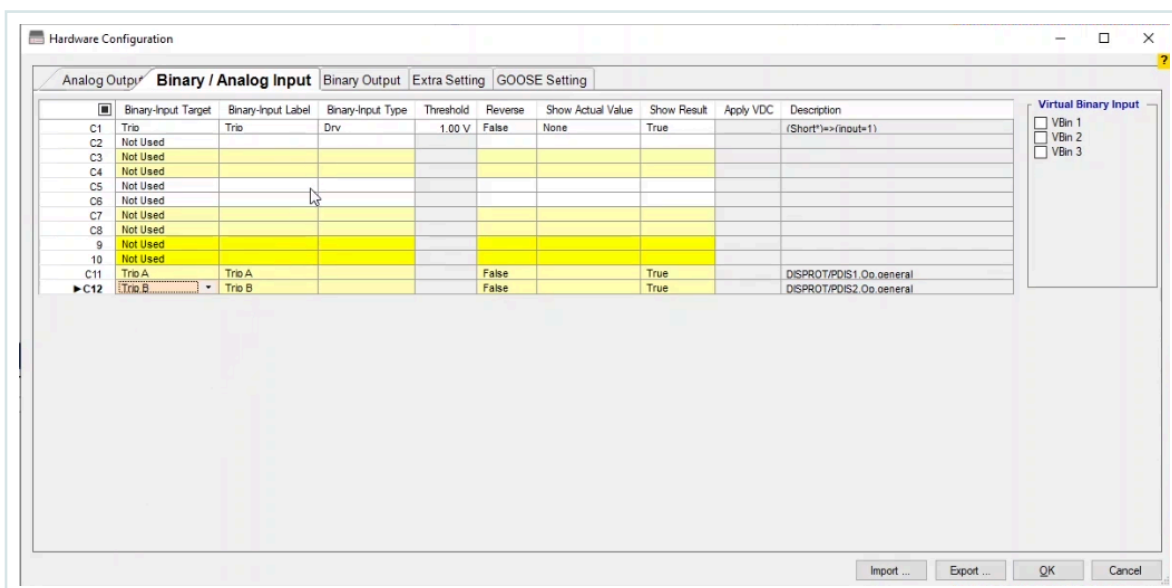


Figure 15

Then, it is time for Binary Output to be configured. Clicking OK will save the settings.

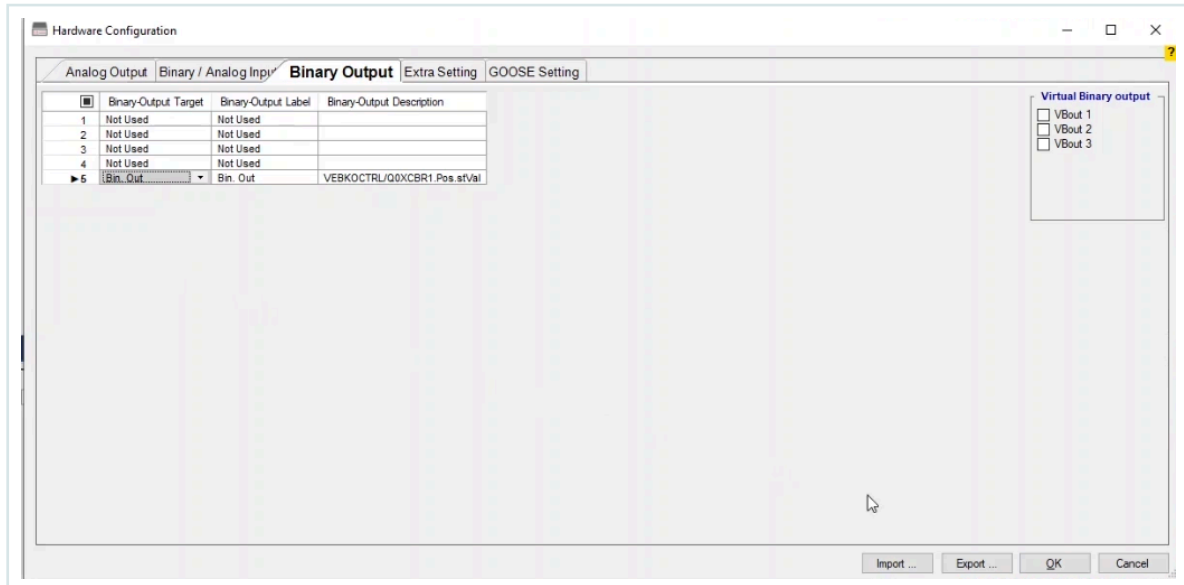


Figure 16

Now it is time to do the test. As you can see, for trips in Zone 1 and Zone 2, in addition to the physically-wired contact C1, the trip is also recorded through contacts C11 and C12. You can also send a “change status” command to the relay, by enabling or disabling Binary Output. There are different ways to check the information transference through Goose. For example, you can use Goose Inspector, IEC Browser or a software like Wireshark.

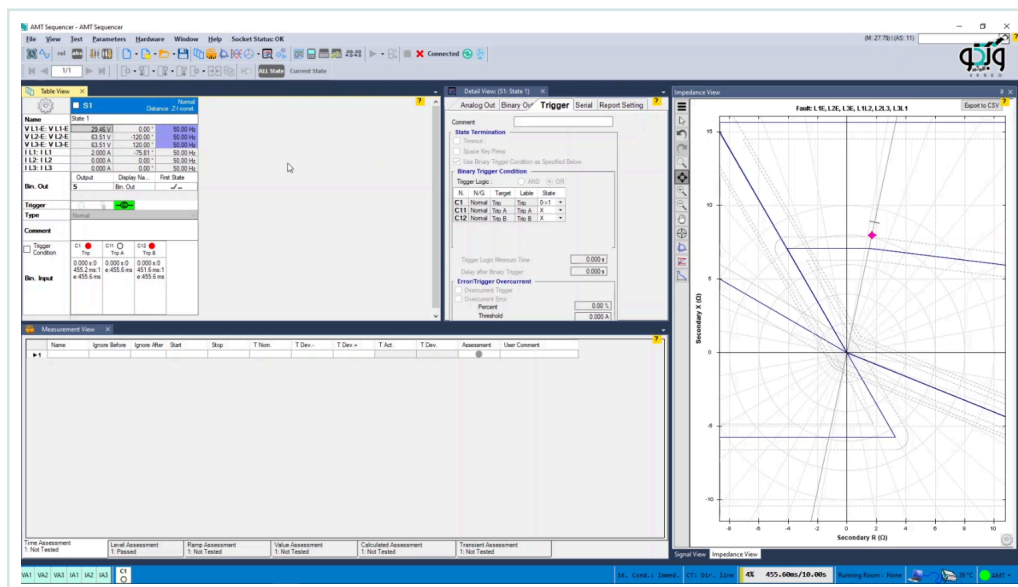


Figure 17

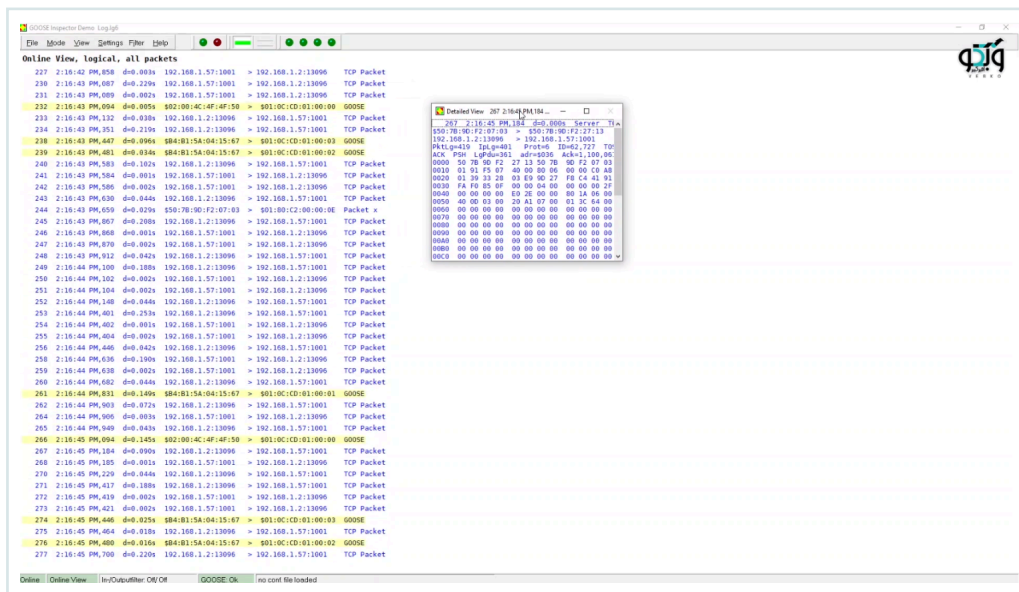


Figure 18

[jg1]Goose_Messaging_testing