Ethernet interface in VAMP 321, configuration instructions v1.2

1 Overview

This document applies to VAMP 321 Arc flash protection main unit.

The document describes how to set up the Ethernet communications and gives some general guidelines of connecting the device to the Ethernet network.

VAMP 321 is the main unit of the Arc Flash protection system. The system usually comprises of VAMP 321 and some I/O units connected to it. Only VAMP 321 main unit is connected to an Ethernet network. There is internal communication between the VAMP 321 and the I/O units, but this should not be mixed with the external Ethernet communications.

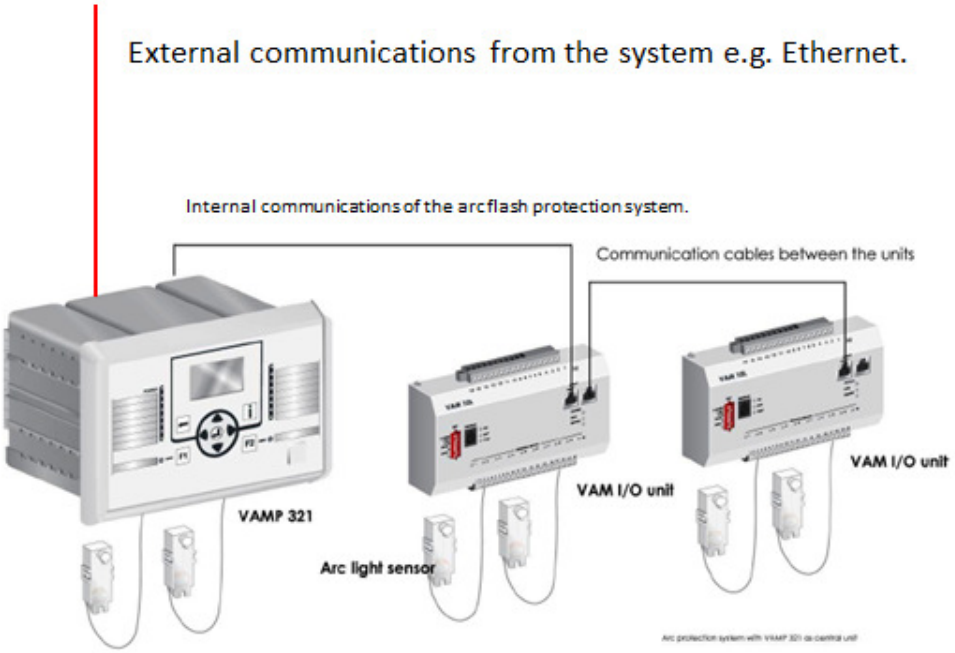

Figure 1.1. VAMP 321 main unit takes care of the external communications of the Arc Flash protection system.

2 Communication interface in VAMP 321

VAMP 321 can be ordered with different types of communication options. The communication option cards are in slots 9 and 10 at the back of the device. The type of the option is defined in the ordering code. The different possibilities are shown in figure 2.1. For example ordering code VAMP 321 ABAAA-AAA**CB**-A1 defines the

communication option card “RS-232 + Ethernet RJ-45” for slot 9 and “RS-232” for slot 10 (see figure 2.2.)

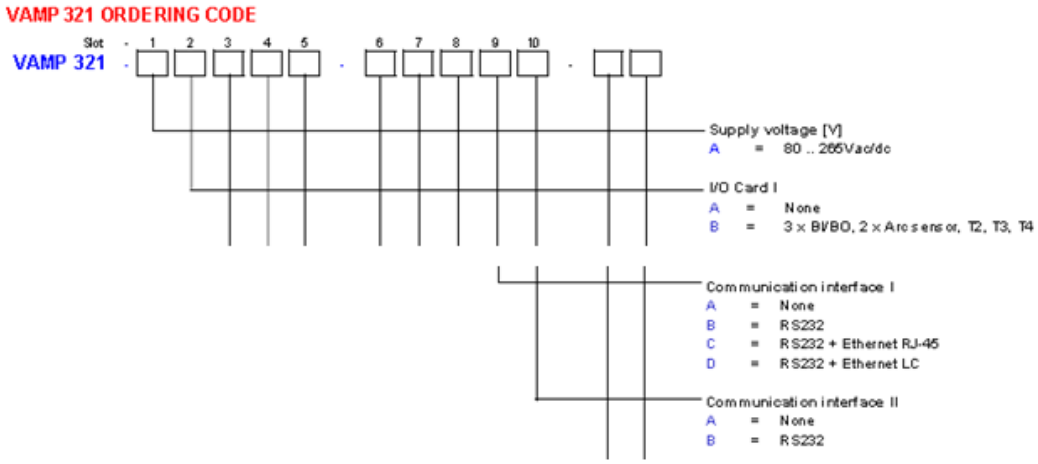

Figure 2.1. Explanation of VAMP 321 ordering code – showing the two digits defining the communication options.

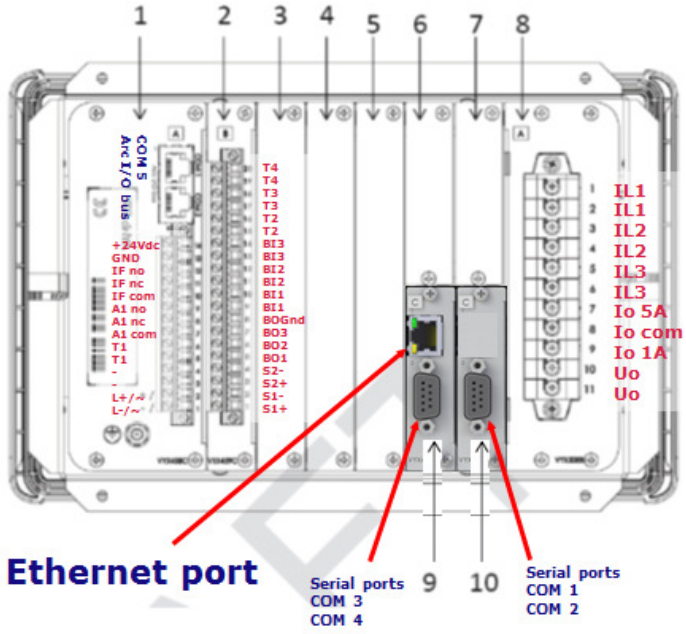

Figure 2.2. Location of the Ethernet port at the back of the device.

3 Configuration

The configuration of the Ethernet port is done with VAMPSET setting tool. VAMPSET can be connected to the relay either via USB interface to the front panel connector or via the Ethernet network. The version of VAMPSET that is needed will vary depending on the

version of the device firmware (for instance, firmware version 10.108 requires VAMPSET version 2.2.85 or higher).

3.1 Setting the main parameters IP Address, TCP port, and Network Mask

The configuration is started by setting the appropriate values for the *IP address (IP address of the VAMP device)*, *NetMask* (Network Mask) and *Gateway* (IP address of the gateway).

Please note that the IP address and network mask must be correctly set in reference to the client system in order to get the communication to work properly. When adding a device to an existing network, please consult with a network administrator to obtain proper IP addresses that you are allowed to use.

Also note that by default the devices do not support DHCP, in contrast to PC's, which are able to obtain different IP addresses each time they are connected to a network. This may cause trouble if the communication is tested in an office network. The use of a separate test network is recommended.

Next, the protocol to be used is activated for one of the two instances of TCP ports. As an example see Figure 3.1, which show settings when ModBusTCP is used.

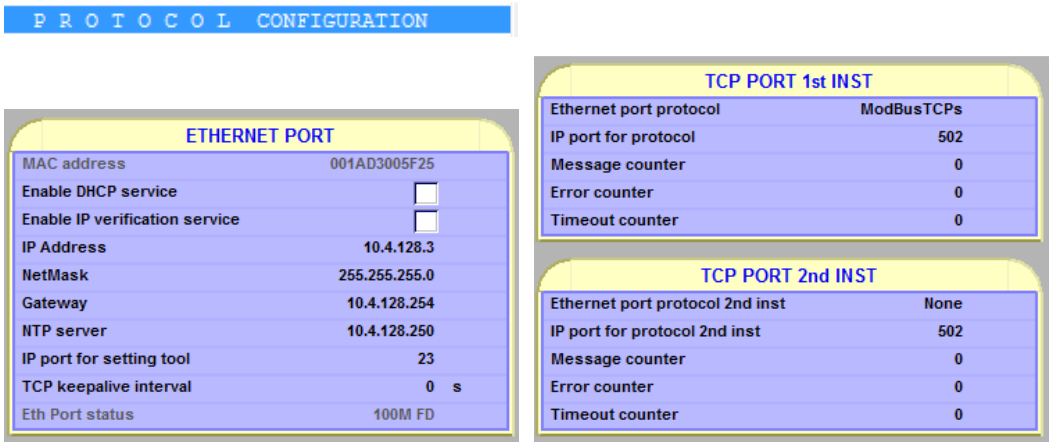

Figure 3.1 Ethernet and TCP port instances configuration menu in VAMPSET.

NOTICE

A change of protocols on any port, serial port or TCP port instance, will require a reboot of the device.

Once the protocol has been activated, the protocol specific parameters will become selectable in VAMPSET (the list to the left in the VAMPSET window). See figure 3.2 for a screenshot of this menu in case ModbusTCP is used.

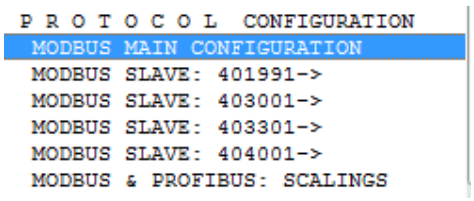

Figure 3.2. Protocol specific parameters for ModbusTCP.

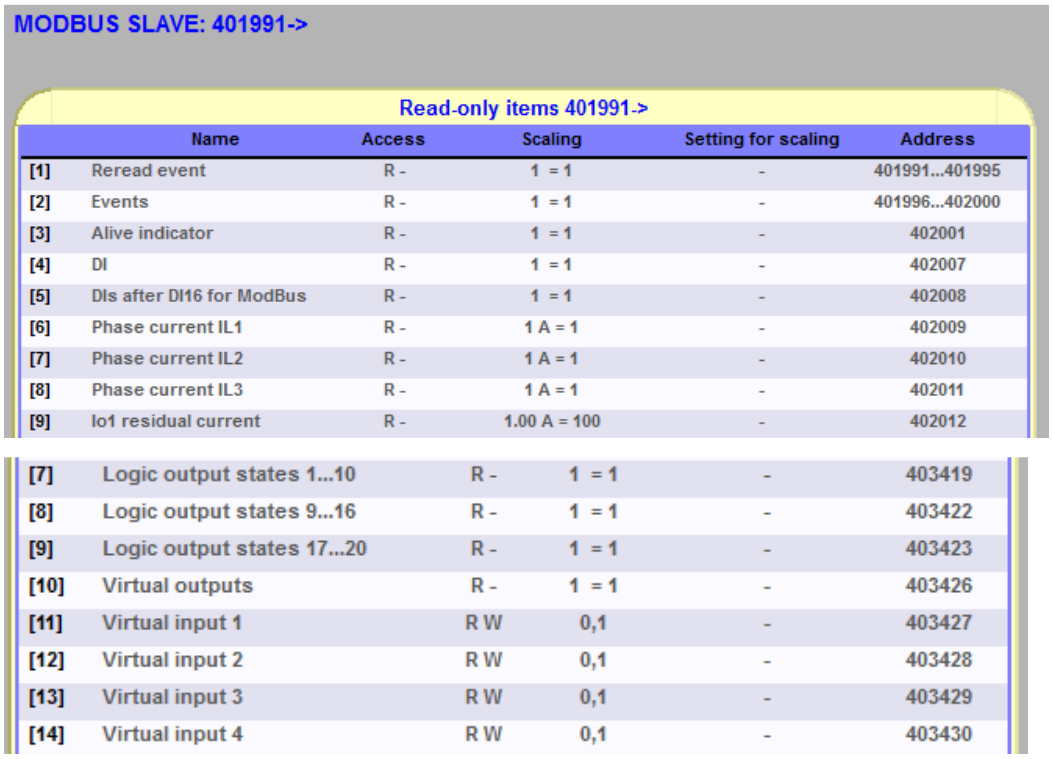

Figure 3.3. Examples of ModbusTCP data mapping shown by VAMPSET.

4 Connection to Ethernet network

The Ethernet network could be described as a network of one or more Ethernet switches, which are connected to each other. The switches are connected to each other either with copper cabling (RJ-45 connectors) or with fiber optic cabling. An example is shown in figure 4.1. VAMP 321 devices are connected to the Ethernet switches of the network.

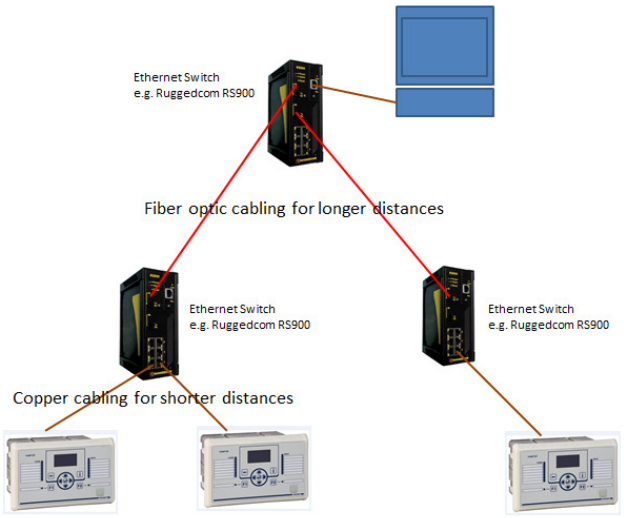

Figure 4.1. An example of an Ethernet network and connection of three VAMP 321 devices to it.

Normally the maximum distance that can be used with copper cabling is 100m and maximum distance with multimode fiber optic cabling is about 1km. With single mode cabling distances up to tens of kilometers can be reached. The maximum distances that can be reached with different type of fiber optic cabling depends on the type of the cable, number of connections on the signal path and type of light transmitters and receivers used in the Ethernet switches. For more information about switches please read e.g. the datasheets of the RS900 switch from Ruggedcom.

5 Testing Ethernet connection with SimpleTester

5.1 Simple Tester overview

Simple Tester is a basic protocol testing tool (for PC) that supports several different protocols, including ModbusTCP. Simple Tester can be used to test reading data from holding registers, writing to holding registers, viewing events and performing clock synchronization from the PC. The user interface of Simple Tester with Modbus selected as protocol is shown and explained in figure 5.1.

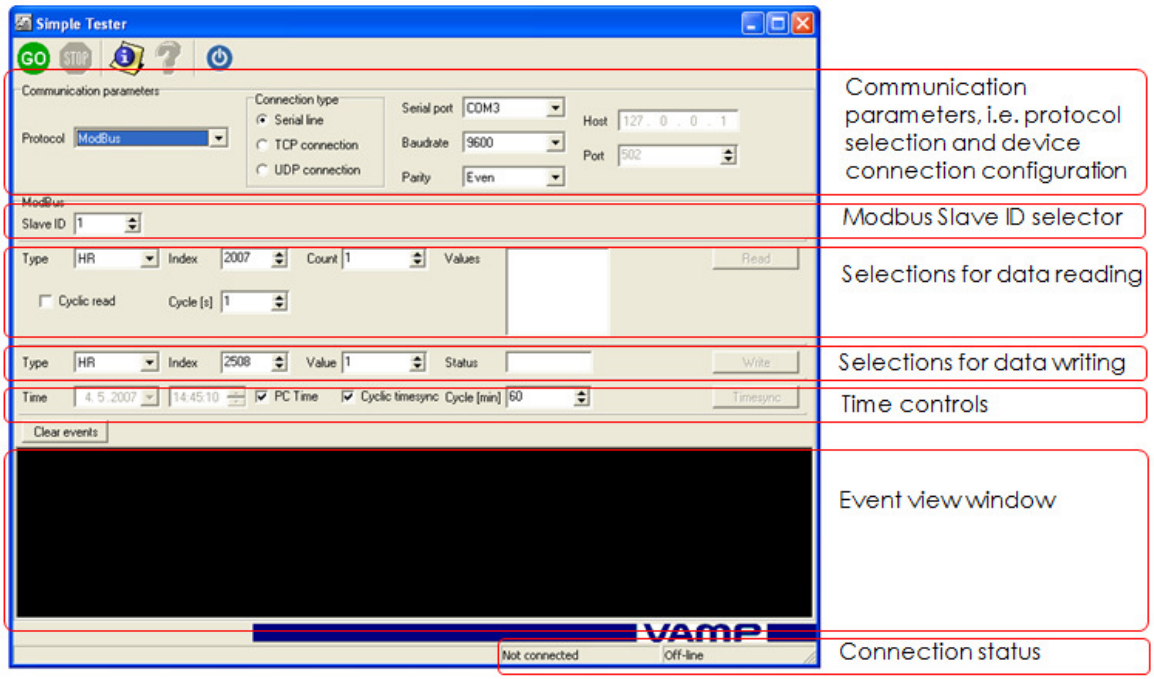

Figure 5.1. The user interface of Simple Tester with ModBus selected as protocol.

5.2 Connecting with Modbus TCP

To connect a device with Modbus TCP, the device Ethernet port and TCP port instances must be configured as described in the previous sections of this document. Also, an Ethernet connection (physical) to the relay from the PC running Simple Tester must be made.

To connect follow these steps:

1. Select “ModBus” in the *Protocol* selector.
2. In the *Connection type* selection, mark *TCP Connection* and set the *Host* to the IP address set on the device.
3. Set the *Port* to the same TCP IP port as configured on the device. (“IP port for protocol”).
4. Set the *Slave ID* in the Modbus Slave ID selector.
5. Press “GO”.
6. A successful connection is indicated by an “OK” in the rightmost connection status indicator furthest down in the Simple Tester window. An example of a successful connection is shown in 5.2.

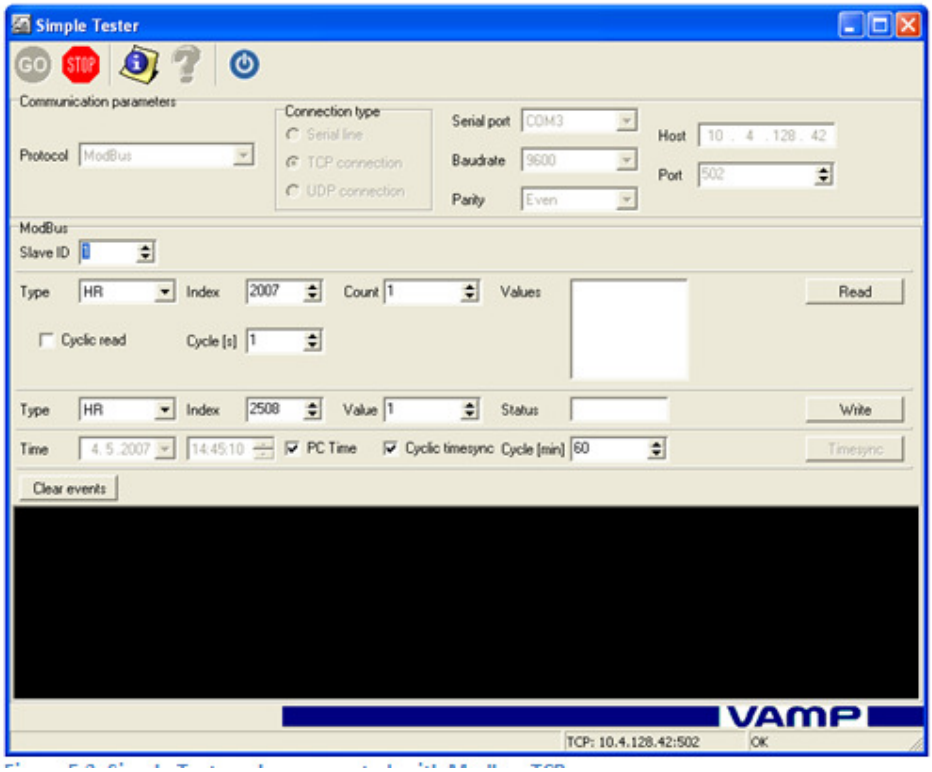

Figure 5.2. Simpe Tester with ModbusTCP connection.

5.3 Reading data

To read data, follow these steps.

1. Set *Type* of data, (HR = Holding register).
2. Select which *Index* to read, to read some data item from a VAMP device (refer to the data mapping provided by VAMPSET).
3. The *Count* value indicates how many consecutive indices are to be read. For instance, setting Index to 2001 and Count to 2 will display the values of Index 2001 and Index 2002 in the *Values*-box.
4. Press the *Read* button to manually initiate a read. Reads can also be done cyclically, by checking the *Cyclic read* box. The length of one cycle can be changed by setting a value in the *Cycles* field (seconds).

Figure 5.1 features an example of reading the Alive Counter (HR 2001) cyclically every three seconds.

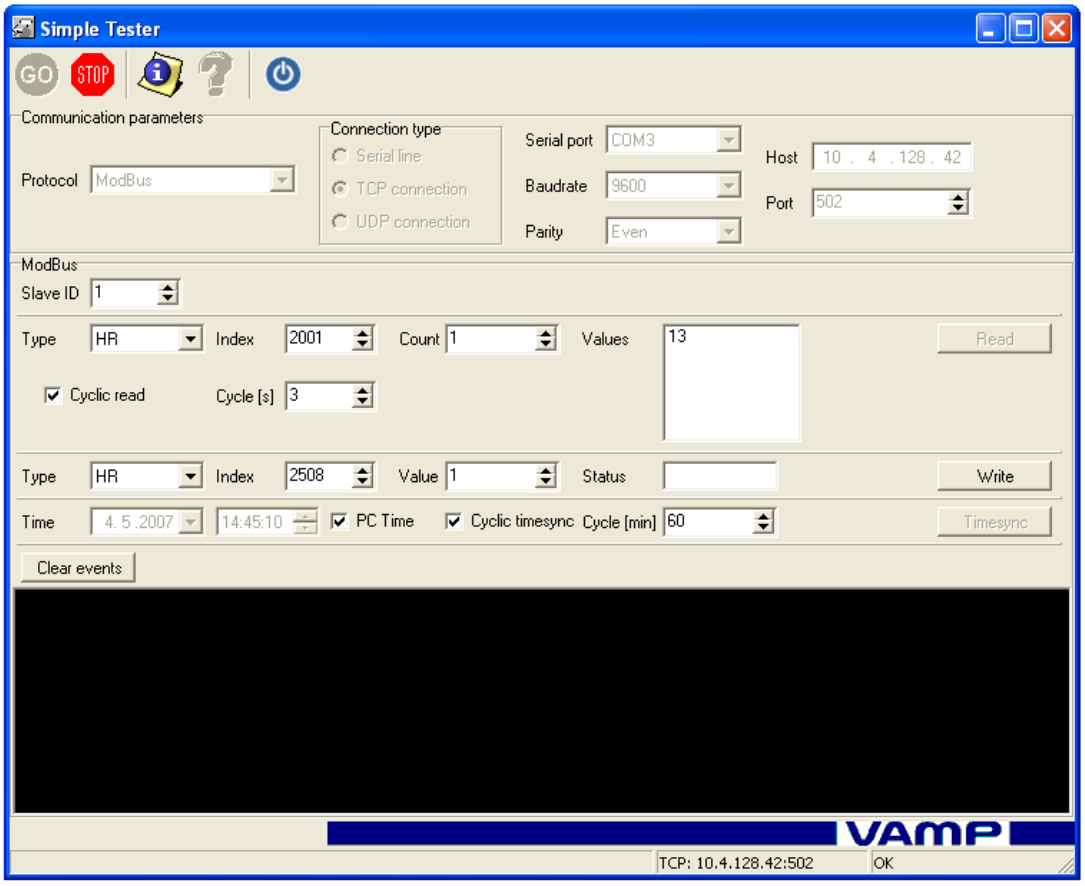

Figure 5.1: Performing a cyclic read on the Alive Counter with Simple Tester.

5.4 Writing data

To write data, follow these steps:

1. Set *Type* of data to be written. (HR = Holding register).
2. Select which *Index* to write to.
3. Set *Value* to be written.
4. Press the *Write* button.
5. The *Status* field will indicate if the operation is successful.

Figure 5.2 features an example of a write of the value 1 to Virtual Input 1 (holding register 3427).

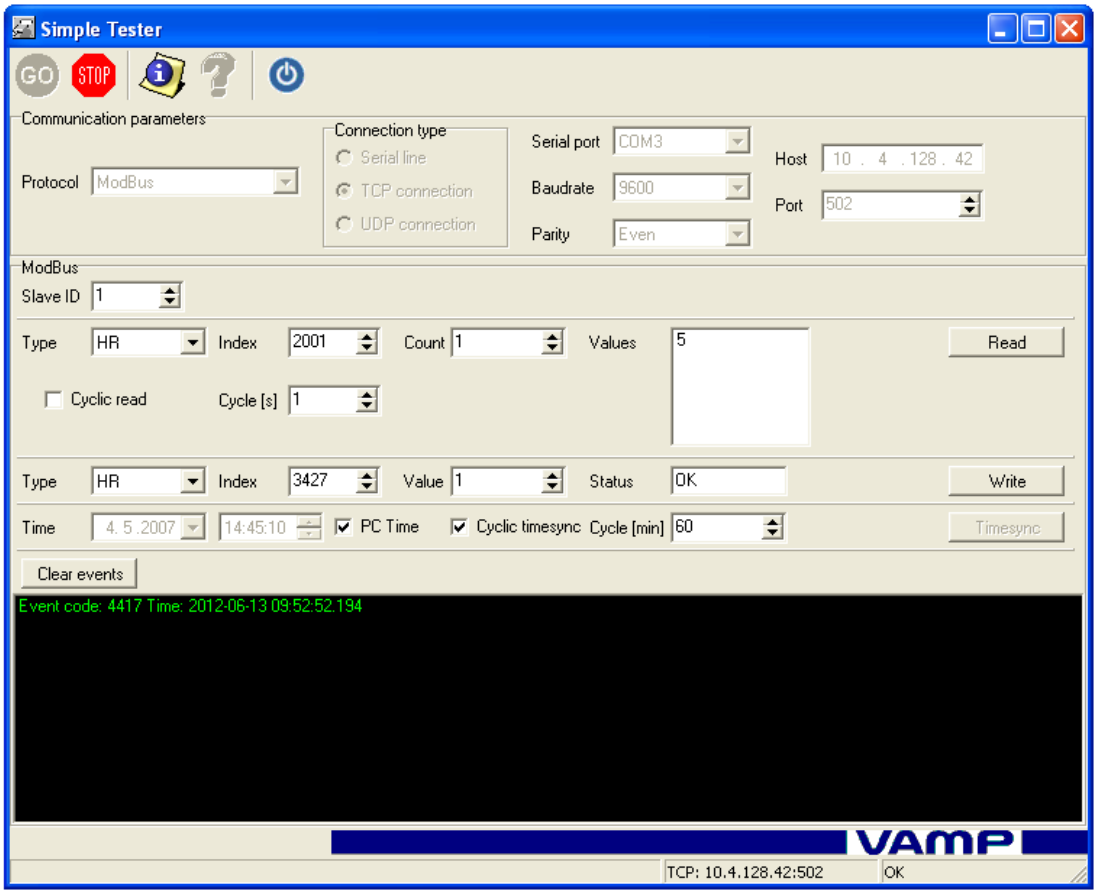

Figure 5.2: Simple Tester after write to Virtual Input 1.

Note that the Event view of Simple Tester now contains an event, corresponding to “Virtual Input 1 ON”. If there are events in the event buffer when connecting Simple Tester, these will be listed in the event view. New events triggered by writes done with Simple Tester will also show up.

Furthermore, a clock synchronisation can be performed with Simple Tester. This is done by setting the desired behaviour in the Time Controls (see figure 5.1). The two leftmost fields are used for setting the time manually, but the time can also be taken from the PC, by checking the *PC Time* checkbox. The clock synchronisation can also be set to be cyclic, by checking the *Cyclic timesync* checkbox. The length of a cycle is set in the rightmost field (minutes).

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