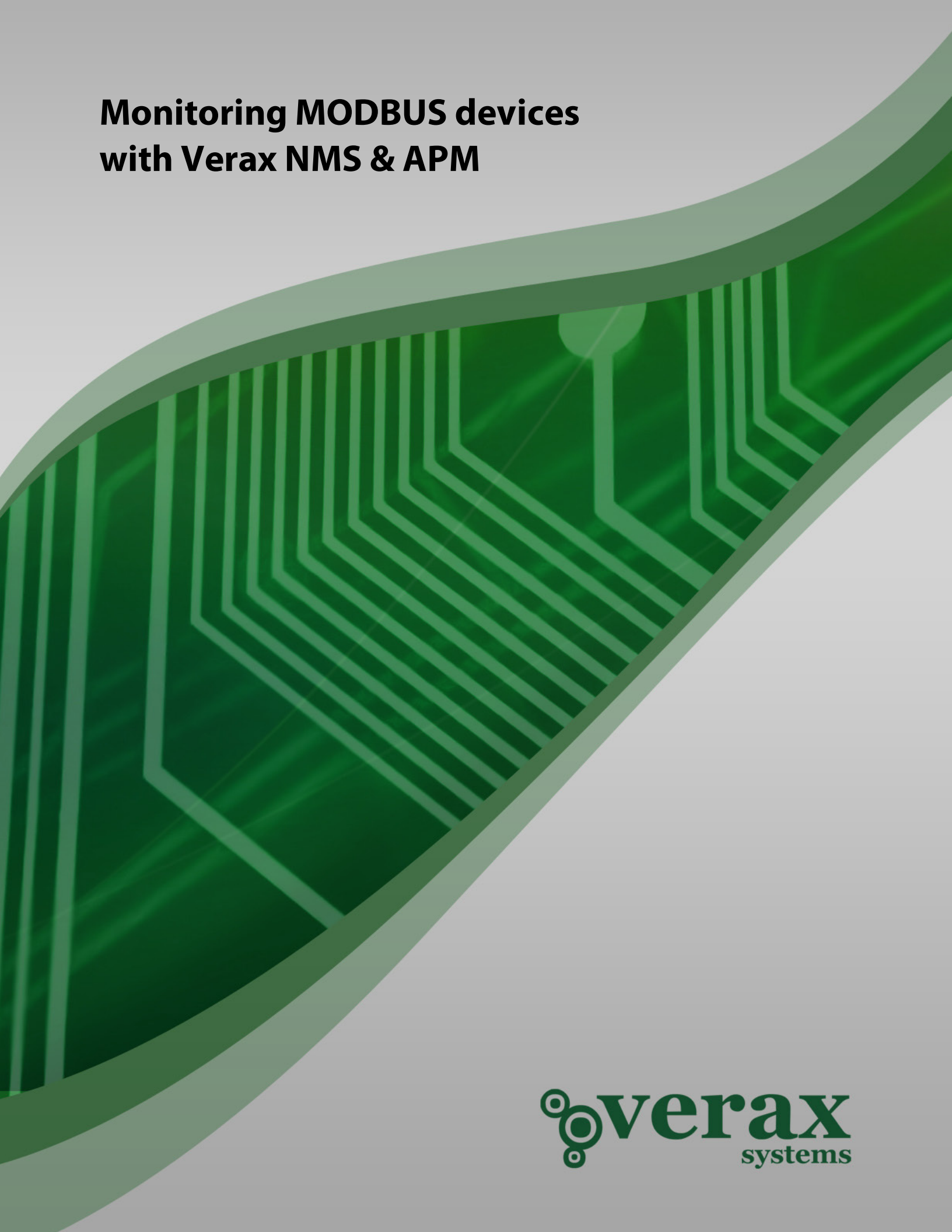
Monitoring MODBUS devices with Verax NMS & APM



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Abstract

This publication provides an overview on how to monitor and manage MODBUS devices with Verax NMS & APM (including the free edition available at http://www.veraxsystems.com/en/downloads - please read terms & conditions for limitations of the free version).

Agenda:

1. Adding MODBUS device to the device inventory.
2. Adding sensors for MODBUS device.
3. Adding performance counters for MODBUS device.
4. Verax NMS & APM MODBUS plugin overview.

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1. Adding MODBUS device to device inventory

Verax NMS & APM allows monitoring industrial devices (e.g. data center's HVAC infrastructure), through industry standard MODBUS protocol, however MODBUS devices **are not the subject of automatic discovery feature** and have to be added manually. Please note, that the device hosting NMS & APM must be able to communicate with MODBUS device via TCP protocol or Serial port.

To add a new MODBUS device, perform the following steps:

1. Navigate to ***Network view*** and select the ***Device list*** tab.
2. Select ***Add*** from the global action menu and click ***Go***.
3. Once the data has been loaded, the edit window appears with all the device attributes ready for input.
4. Provide *Name* and *IP address* for the device.
5. Set Device type to ***Modbus***.

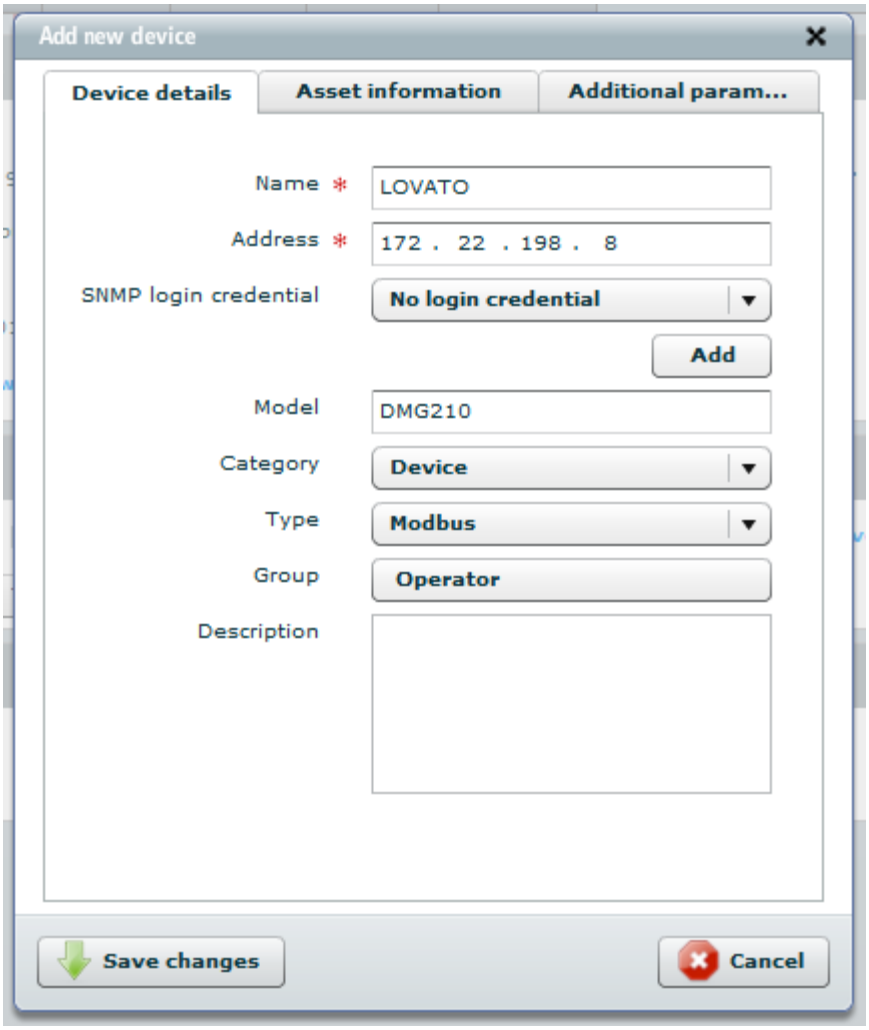

Figure 1: Adding a new MODBUS device

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6. Once the right device type has been selected, the Additional parameters tab appears with additional attributes ready for input.
7. Go to the ***Additional parameters*** tab and specify all additional parameters for connection Modes (ASCII, RTU or TCP). Note that system will utilize only parameters relevant to the selected mode, e.g. in case of ASCII/RTU mode IP address and Port parameters will be ignored, however **it is mandatory to fill all parameters fields**.

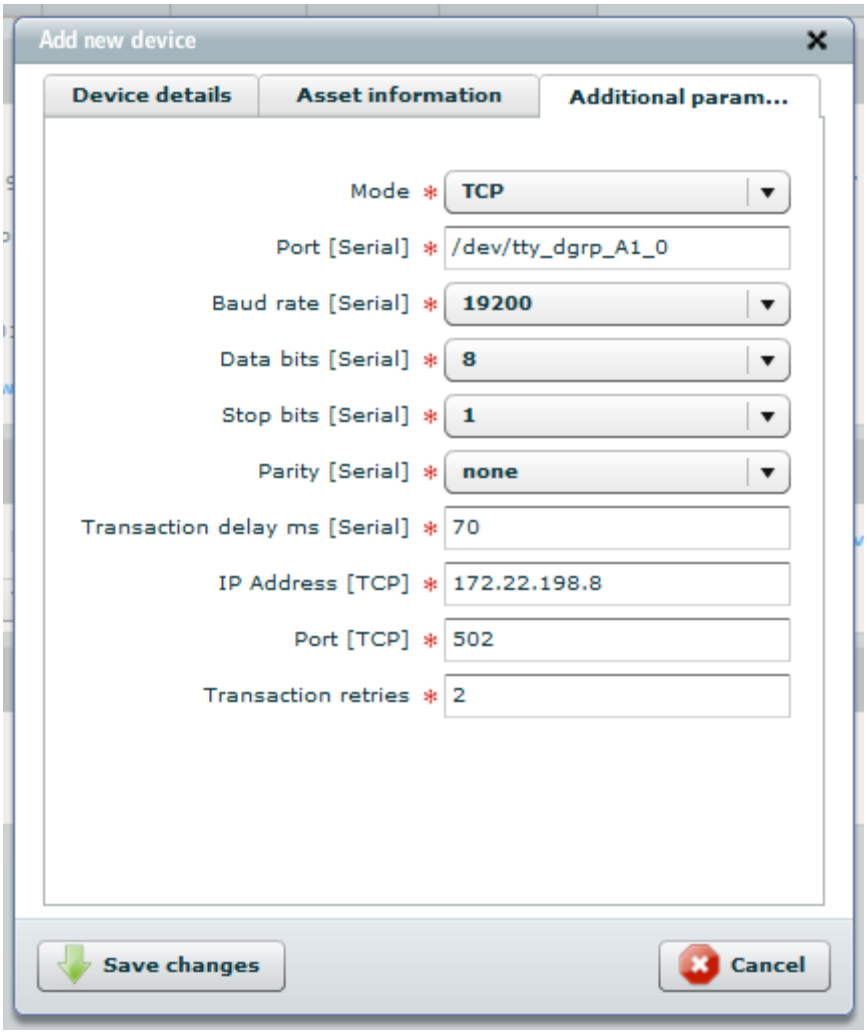

Figure 2: Adding a new MODBUS device

8. Click ***Save changes*** to confirm.
9. A pop-up dialog is displayed asking whether the system should rediscover the device - click ***No*** as MODBUS devices are not subject of automatic discovery.

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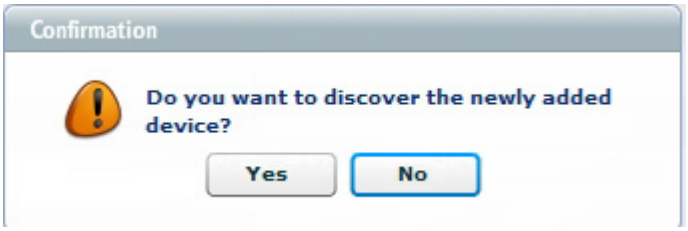

Figure 3: Adding a new MODBUS device

10. The newly added MODBUS device is now visible in the aspect tree within the ***All devices*** node as well as on the device list in ***Network view***.
11. In order to verify the connection, display the device's ***Advanced view***, provide a sample request and click the ***Send*** button.

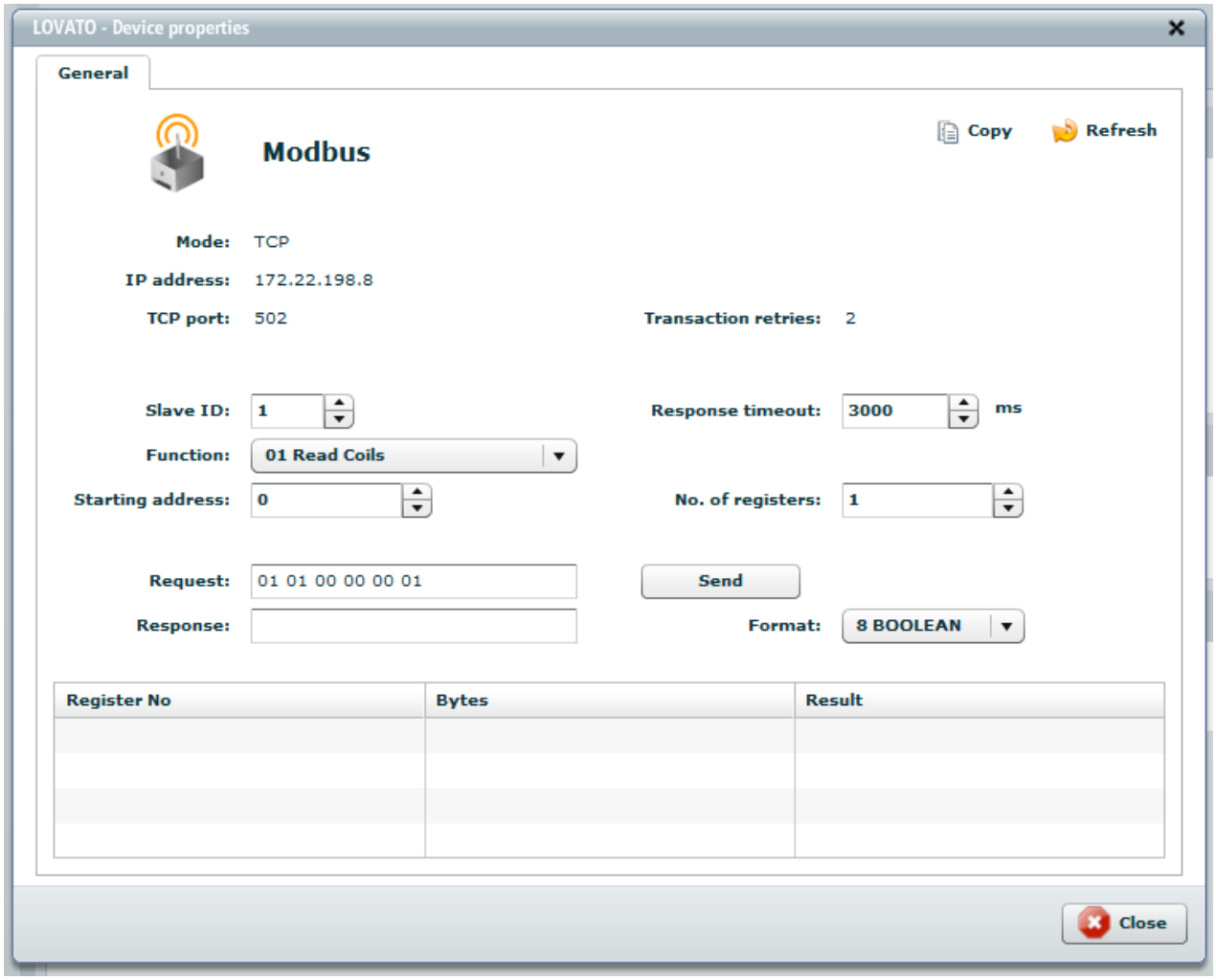

Figure 4: MODBUS device - Advanced view

Note that the device will not be monitored until monitors (sensors and counters) are configured.

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2. Adding sensors for MODBUS device

Sensors are active monitors periodically querying the device services for which they are configured and waiting for their responses. If a query is returned with an expected response, the queried service is considered "available." If a response is not received (timed out), or if the response is not as expected, the queried service is considered "unavailable".

In order to add a sensor for MODBUS device, perform the following steps:

1. Select a device from the aspect tree in Home view. It is also possible to reach the desired device from Network view (choose a device and double click on it).
2. Select ***Monitors*** tab and switch to sensor list by clicking ***Sensor list*** link in the upper-right corner of the view.

3. Sensor list is displayed.
4. Select ***Add*** from the global action menu and click ***Go***.
5. The wizard dialog is displayed (see Figure 5).

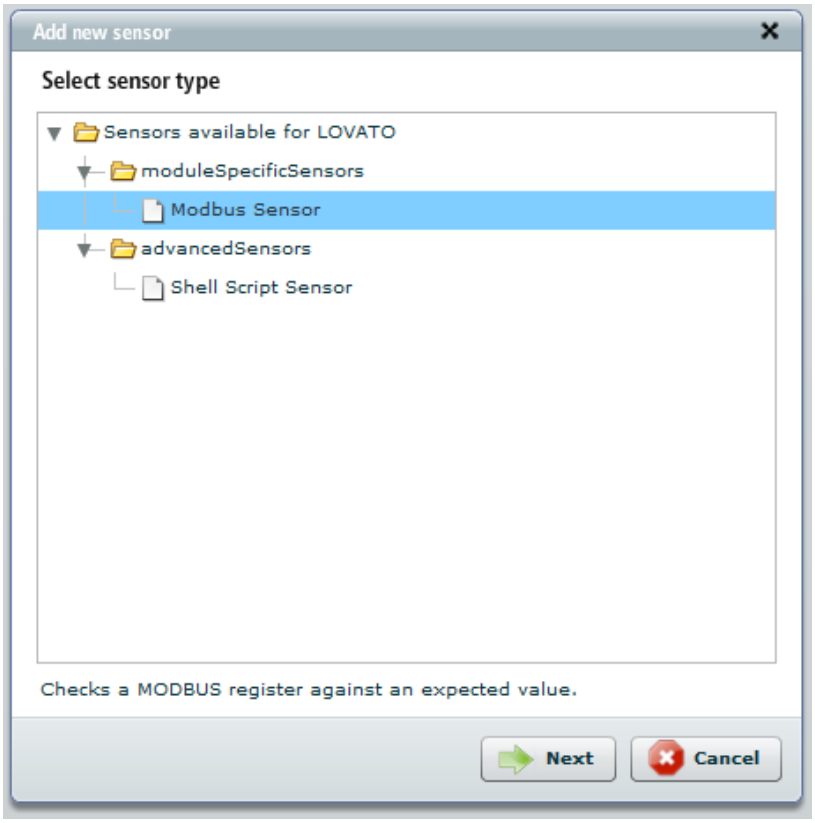

Figure 5: Adding a sensor to MODBUS device

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6. Select the ***Modbus sensor*** and click ***Next***.
7. A dialog shows up with all sensor attributes ready to input.

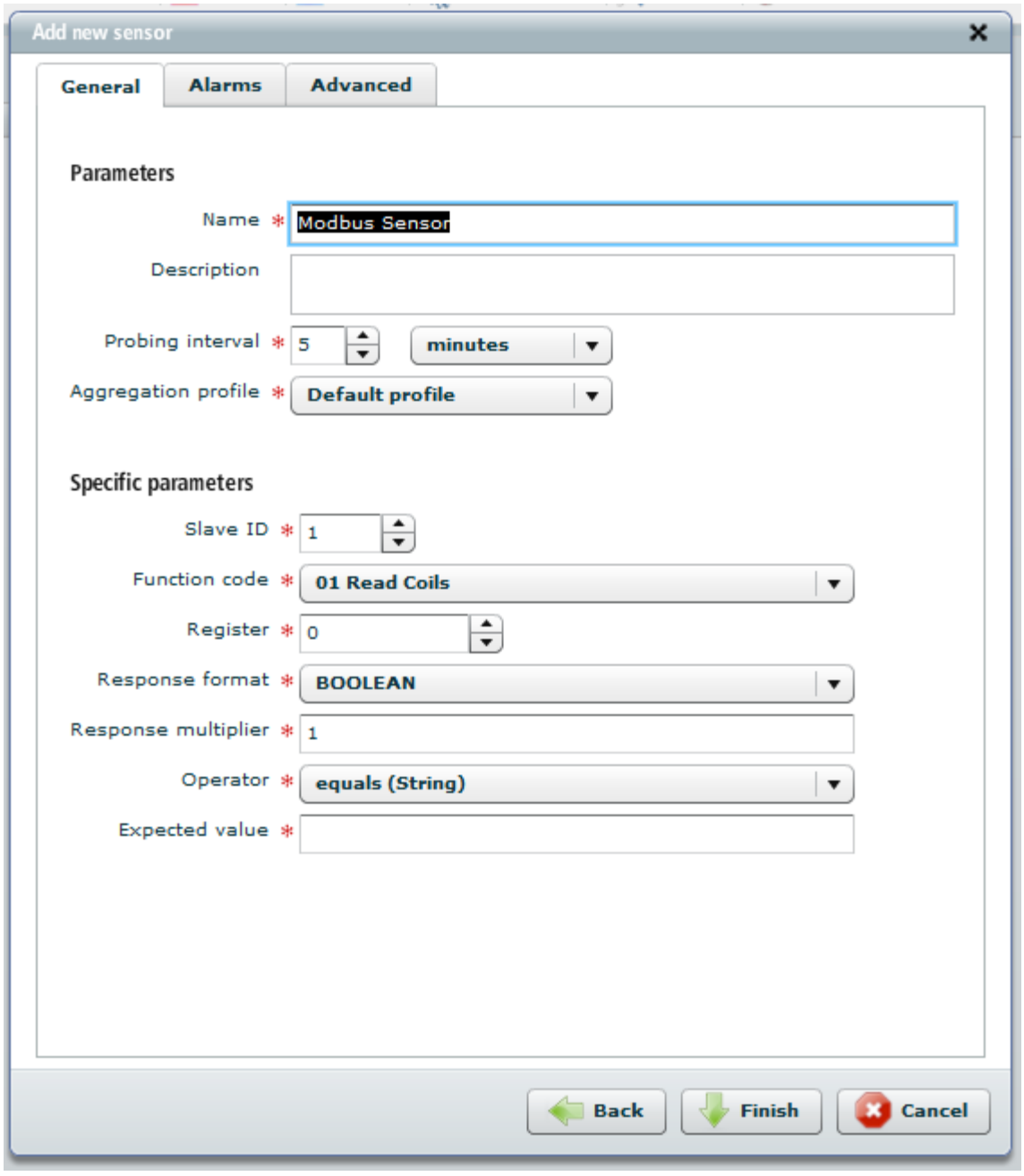

Figure 6: Adding a sensor to MODBUS device

8. Specify sensor parameters and click the ***Finish*** button or ***Cancel*** to discard changes.
9. The new sensor has been created and is now visible in the sensor list.

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3. Adding performance counters for MODBUS device

Performance counters measure system activity and performance (metrics). The application retrieves their current values in predefined intervals. The aim of probing and collecting data is to analyze and convert the data into a performance graph/chart.

In order to add a counter for MODBUS device, perform the following steps:

1. Select a device from the aspect tree in Home view. It is also possible to reach the desired device from Network view (choose a device and double click on it).
2. Select ***Monitors*** tab and switch to counter list by clicking ***Counter list*** link in the upper-right corner of the view.

3. Counter list is displayed.
4. Select ***Add*** from the global action menu and click ***Go***.
5. The wizard dialog is displayed (see Figure 7).

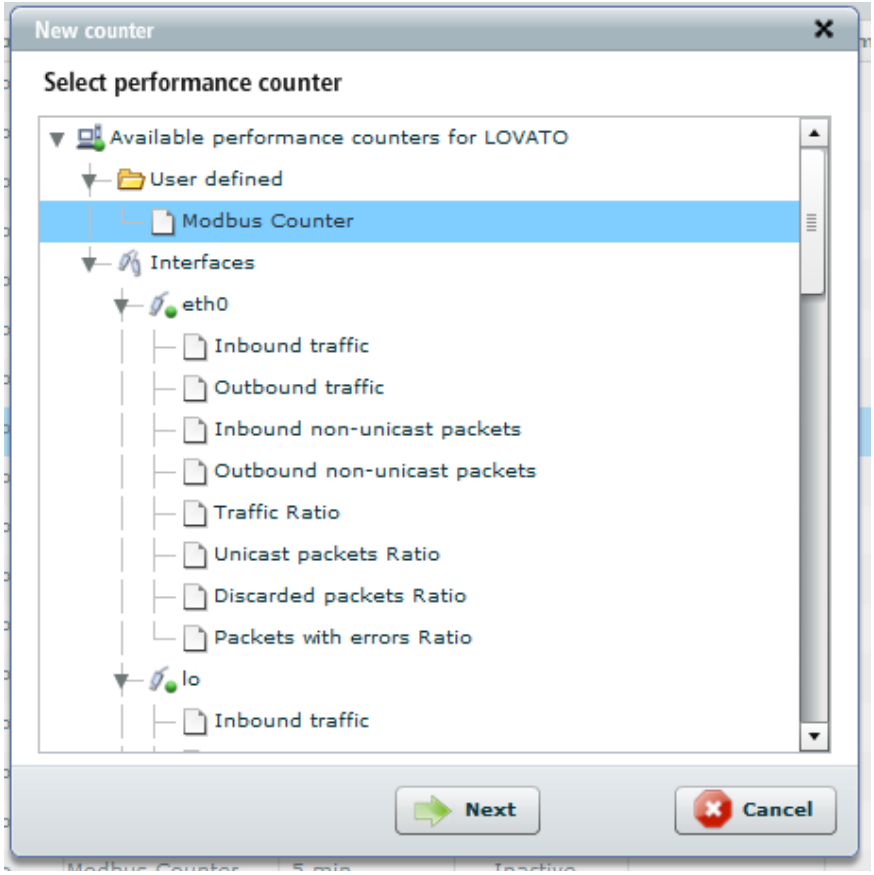

Figure 7: Adding a counter to MODBUS device

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6. Select the ***Modbus counter*** and click ***Next***.
7. A dialog shows up with all counter attributes ready to input.

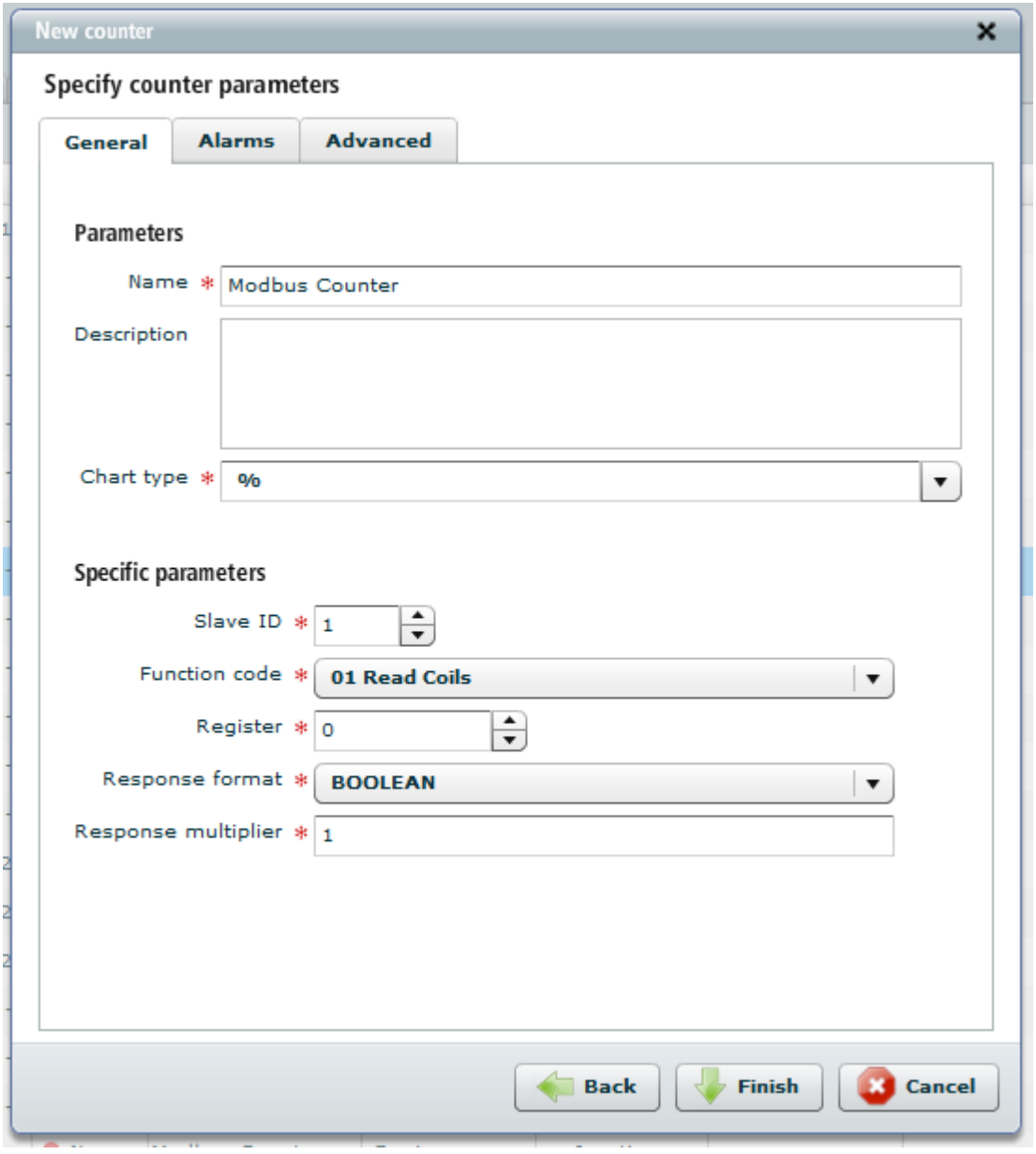

Figure 8: Adding a counter to MODBUS device

8. Specify counter parameters and click the ***Finish*** button or ***Cancel*** to discard changes.
9. The new counter has been created and is now visible in the counter list.

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4. Verax NMS & APM MODBUS plugin overview

Verax NMS & APM MODBUS management plugin allows easy monitoring, alerting, and performance reporting of industrial devices (e.g. data center's HVAC infrastructure), through industry standard MODBUS protocol.

Communications

- Full functionality of a MODBUS master device (connected devices are treated as slaves).
- Support for RTU and ASCII protocols.
- Support for serial and TCP communications.
- Configuration of serial port parameters for MODBUS device: port name, baud rate, data bits, stop bits, parity (odd, even, none).

Functions, registers and arithmetics

- Full support for MODBUS functions: read coils, read discrete inputs, read holding registers and read input register.
- GUI enabling invoking of real-time MODBUS calls (reads registers and parses results) and online register browsing.
- Configurable register value types (unsigned, signed, length, etc.) and multipliers (x100, x0.1).
- Configurable formatting of MODBUS returned values (BOOLEAN8, INT16, UNIT16, LONG32, ULONG32 and FLOAT32)

Sensors, counters and alarms

MODBUS plugin is fully integrated with Verax NMS & APM core and enables:

- Sensors and counters based on results of MODBUS functions calls.
- Ability to generate alarms (fixed and baseline calculated) on sensor supplied values.

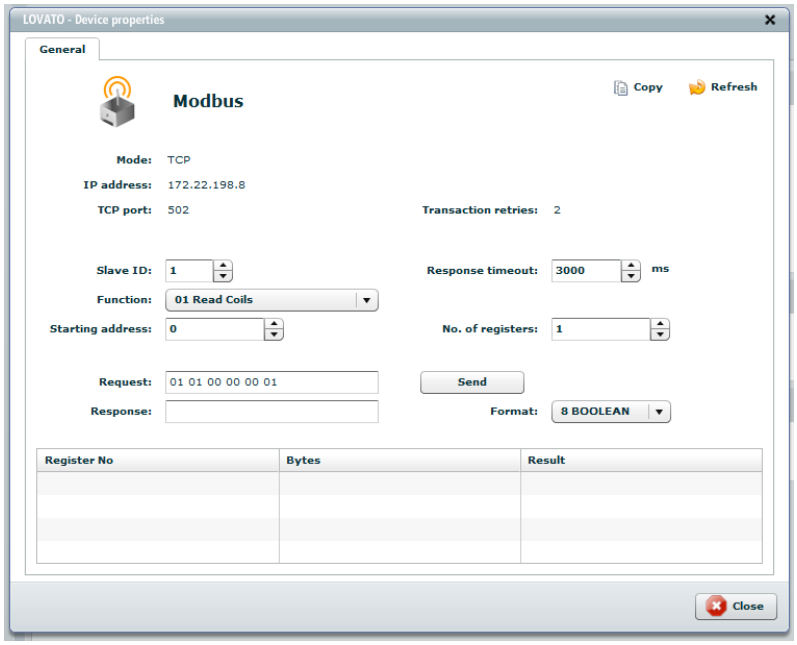

Figure 4: MODBUS device - Advanced view

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