SAEAUT SNMP OPC Server receives Trap messages

SAEAUT SNMP OPC Server receives Trap messages from SNMP Agents.

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The purpose of the article is to introduce and give useful recommendations how to use the SAEAUT SNMP OPC Server for receiving Trap messages from SNMP Agents.

Introduction

In typical SNMP usage, there are a number of systems to be managed, and one or more systems managing them (see below in the Figure 1). A software component called an agent runs on each managed system and reports information via SNMP to the managing systems. Data contained in the agent database depends on the specific function of the devices. Description of these data is made via standard called MIB (Management Information Bases).

The company SAE–Automation, Ltd. has brought on the market very powerful management system called **SAEAUT SNMP OPC Server** and popularity of this management system is each day increasing.
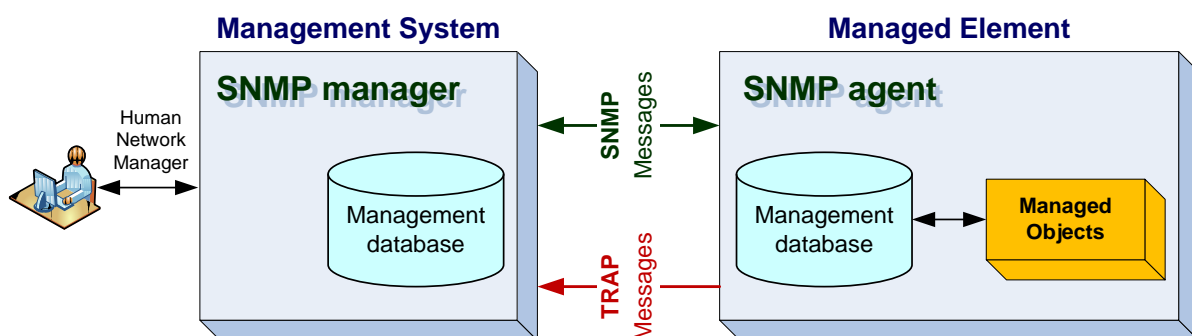

Figure 1: The SNMP communication between SNMP manger and SNMP agents.

Finally, this document should perform as a user guide which will introduce the basic SNMP terms (manager, agent, MIB, Trap, etc.) and show you step-by-step, how to use the **SAEAUT SNMP OPC Server** which acts as SNMP manager for receiving of **Traps** from SNMP agents.

Trap

Trap is asynchronous notification from a SNMP agent to a SNMP manager. Destination addressing for Traps is determined in an application specific manner typically through trap configuration variables in the MIB.

Prerequisites for receiving Traps in the SAEAUT SNMP OPC Server

This section describes requirements which have to be completes in order to receive SNMP Traps. The following two are very important:

- Running SNMP Trap Service in the Windows Services,
- Open the Port number 162 and protocol UDP.

Running SNMP Trap Service in the Windows Services

The base assumption for receiving of Traps in the SAEAUT SNMP OPC Server application is started the SNMP Trap Service.

The SNMP Trap Service receives SNMP Trap messages generated by local or remote SNMP agents and forwards the messages to SNMP management programs running on this computer.

To enable the receiving SNMP Trap messages on your managing system, please do the following:

1. Click on the Windows Start ⇨ Control Panel ⇨ Administrative tools ⇨ Services.
2. Scroll through the right frame to locate SNMP Trap Service. If the SNMP Trap Service is not installed then please install it (see document Installation & Activation of the SNMP Service and SNMP Trap Service). (*The same steps as were already mentioned above in section Windows 2000/XP...)*
3. Right-click on SNMP Trap Service and choose Properties. (see Figure 2, Figure 3)
4. Click on the General tab. (see Figure 3).
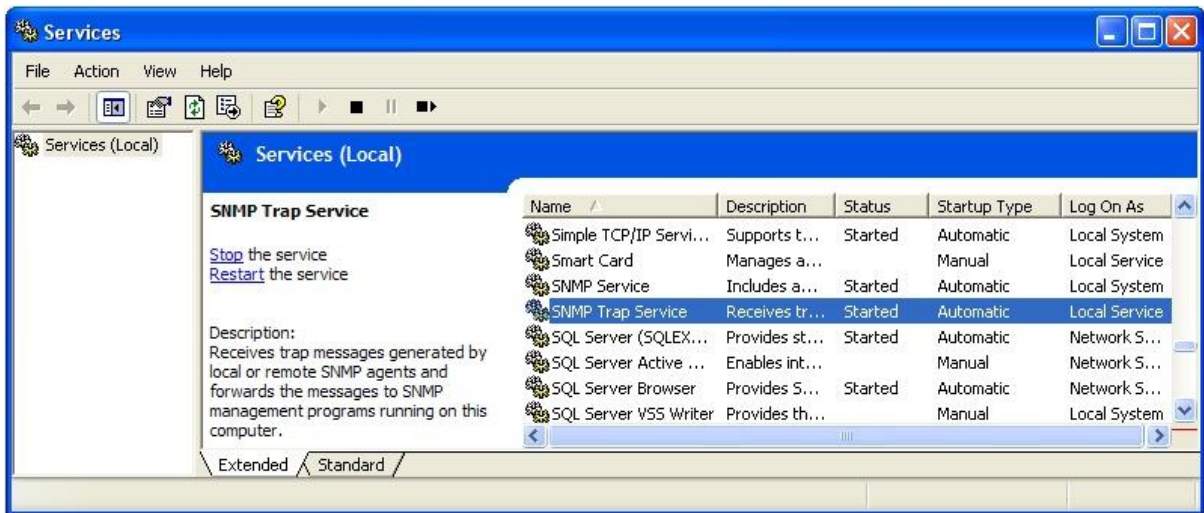5. Click on the Start button if SNMP Trap Service is not started.
6. Click on OK button.
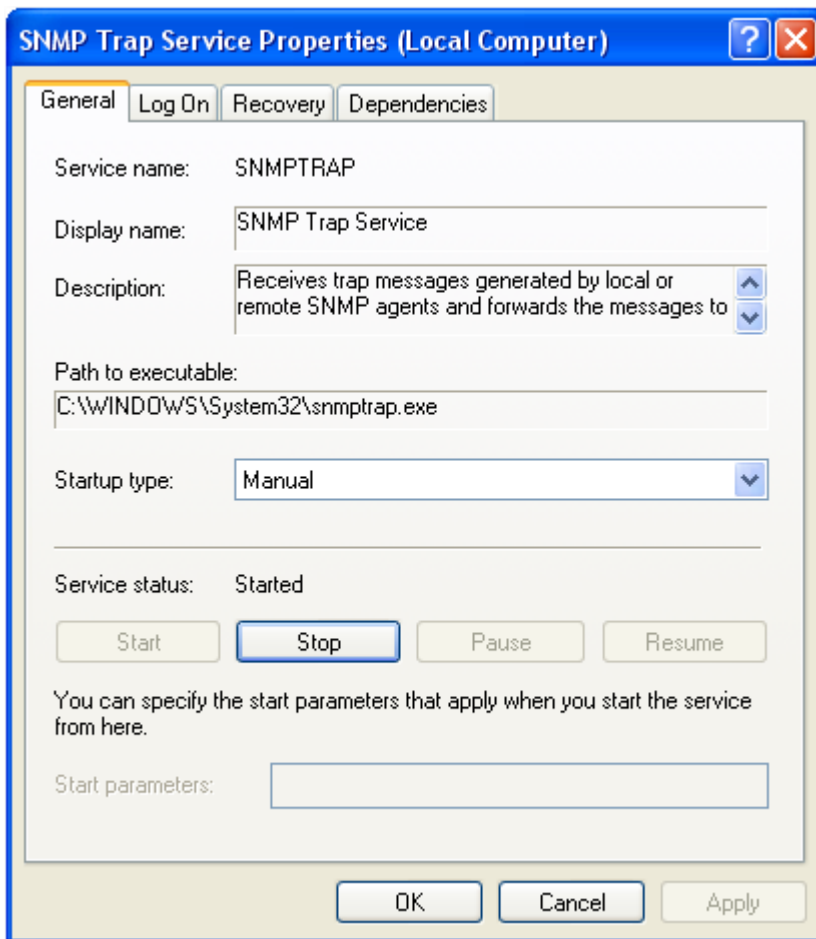
Figure 2: *The SNMP Trap Service.*

Figure 3: *The SNMP Trap Service has to started.*

Open the Port number 162 and protocol UDP

The transferring and receiving of the SNMP Traps is based on the standard UDP protocol and opened Port 162.

It means that it is necessary to open the Port number 162 and protocol UDP for all relevant Firewall systems on personal computer where the SAEAUT SNMP OPC Server is running.
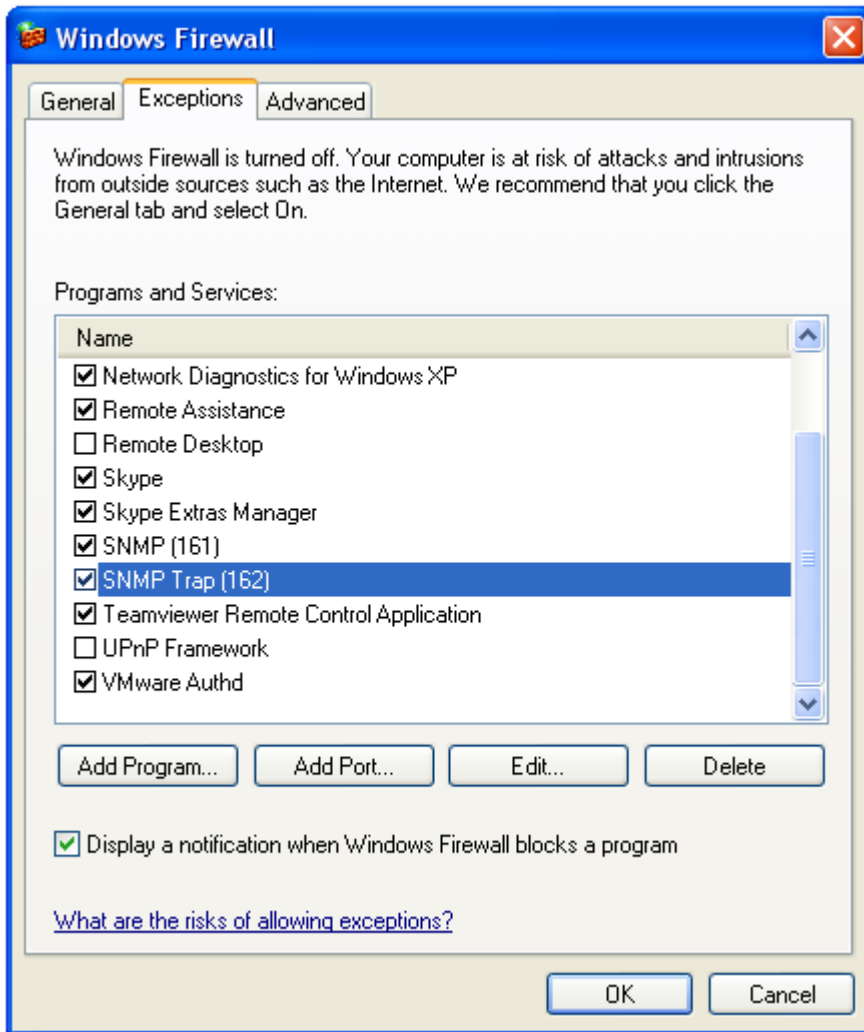

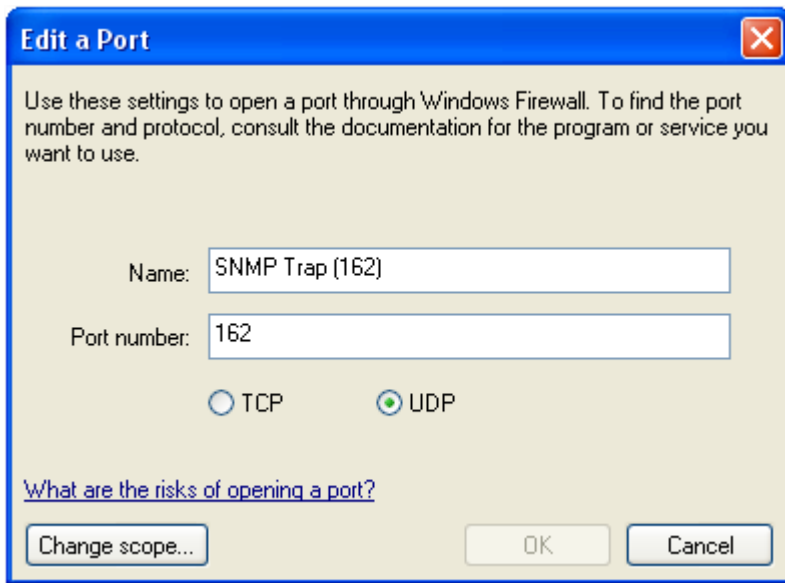**Figure 4**: *Windows Firewall: Exception for SNMP Traps.*

Figure 5: *Windows Firewall: Exception for SNMP Traps.*

Note that:
More about SNMP Service and SNMP Trap Service you can find in document Installation & Activation of the SNMP Service and SNMP Trap Service (please see below the section Downloads).

Receiving of Traps in the SAEAUT SNMP OPC Server

The SAEAUT SNMP OPC Server supports receiving of Traps based on the following versions of SNMP protocol:

- SNMPv1,
- SNMPv2.

The SNMP Trap includes an *OID* identifying the type of trap, a *sysUpTime* and optional *variable bindings*.

The Traps are in the SAEAUT SNMP OPC Server processed through **binding's variables**. The SAEAUT SNMP OPC Server does not match one complete Trap to one OPC item. But it matches individual Trap binding variables with individual OPC items.
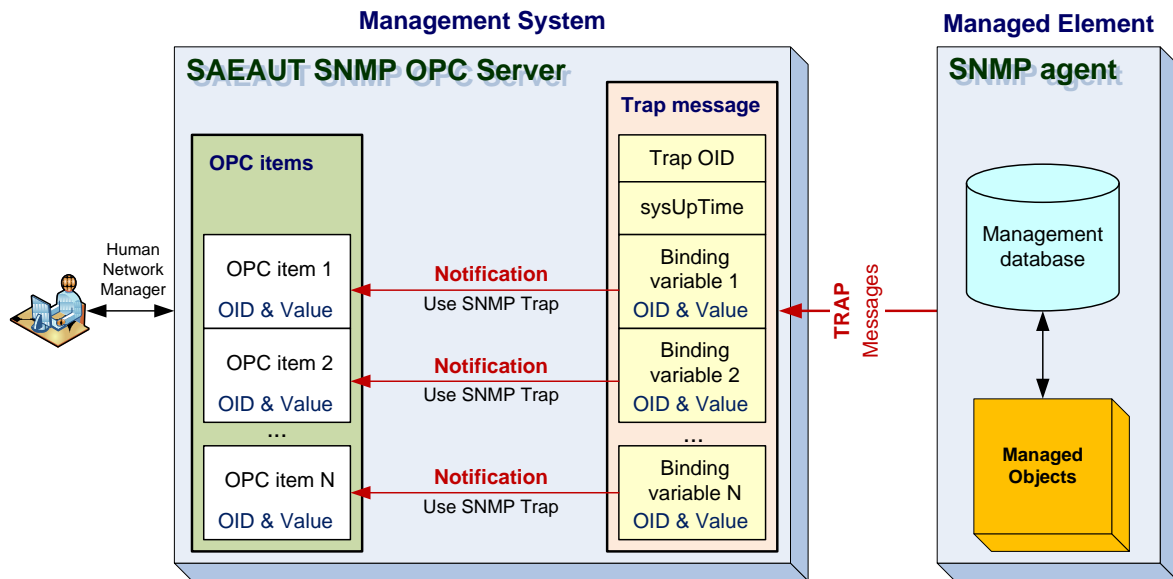
Figure 6: *The binding variables are matched with the OPC items in the SAEAUT SNMP OPC Server.*

It means that if you want to process Traps through the SAEAUT SNMP OPC Server then it is necessary to define OPC items for binding's variables of Trap.

From practice experiences we know that the most frequently using of Traps is related with **UPS** devices. Especially for UPS devices are even implemented various MIB files.
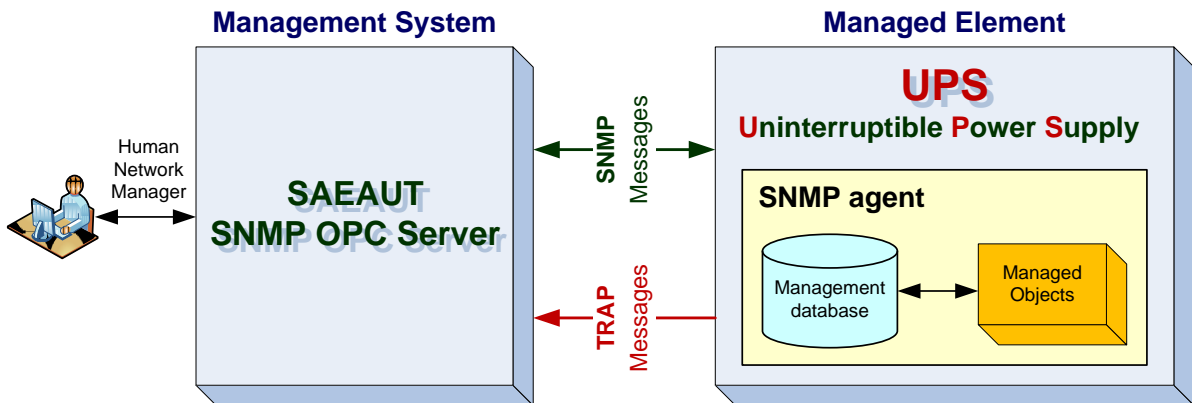

Figure 7: *Example of typical usage of the SAEAUT SNMP OPC Server with the UPS (Uninterruptible Power Supply) devices.*

Example of receiving of a Trap from a UPS through the SAEAUT SNMP OPC Server

The most known MIB file designed and dedicated for UPS devices is the UPS-MIB (RFC1628) file.

The *upsTrapOnBattery* trap (see in the Figure 8) that is defined in the mentioned MIB will be used as example for demonstration of processing of the Traps through the SAEAUT SNMP OPC Server.

Figure 8: The upsTrapOnBattery trap definition in the RFC1628 MIB file.

The UPS-MIB (RFC1628) file includes following three binding variables for the *upsTrapOnBattery* trap (OID .1.3.6.1.2.1.33.2.1) as follows:

upsTrapOnBattery trap (OID .1.3.6.1.2.1.33.2.1)			
Binding variable name	**OID in MIB**	**Object ID in OPC item**	**Syntax**
upsSecondsOnBattery	.1.3.6.1.2.1.33.1.2.2	.1.3.6.1.2.1.33.1.2.2.**0**	Octet String
upsEstimatedMinutesRemaining	.1.3.6.1.2.1.33.1.2.3	.1.3.6.1.2.1.33.1.2.3.**0**	Octet String
upsConfigLowBattTime	.1.3.6.1.2.1.33.1.9.7	.1.3.6.1.2.1.33.1.9.7.**0**	Octet String

Table 1: The upsTrapOnBattery trap definition in the RFC1628 MIB file.

If the OPC items are manual added to configuration file of the SAEAUT SNMP OPC Server and a binding variable OID is not '.0' terminated then it has to be appended there (see Table 1).
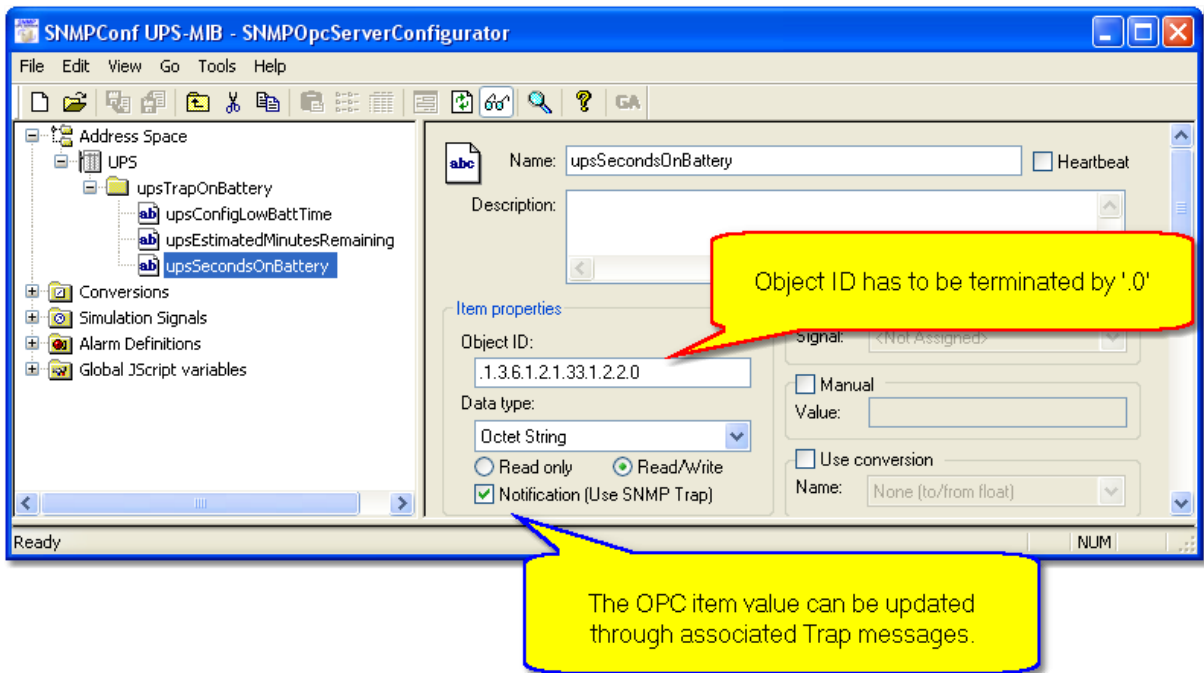
Figure 9: *The upsSecondsOnBattery OPC item definition in the SAEAUT SNMP OPC Server configuration file.*

Monitoring of Traps through the SAEAUT SNMP OPC Server

The current values of the OPC items which are associated with binding variables are available in the Monitor view of the SAEAUT SNMP OPC Server Configurator. The Monitor view feature is very good usable mainly in the phase of creating, tuning and initial testing of a project.
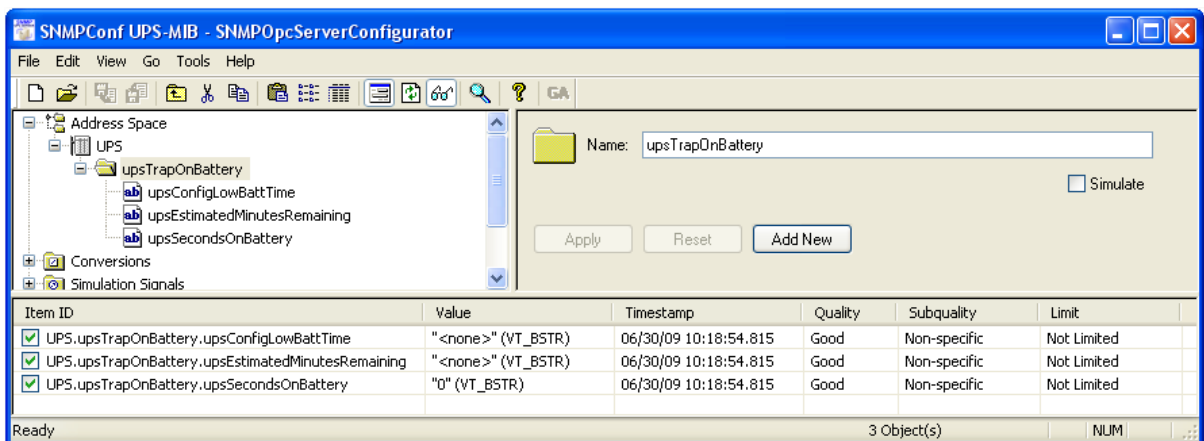

Figure 10: *The current values of the OPC items which are associated with binding variables are available in the Monitor view.*

Downloads

In this section are listed links to important documents which relates with the SAEAUT SNMP OPC Server.

SAEAUT SNMP OPC Server documentation (User's Guide)
http://www.saeautom.sk/download/help/saeaut_snmp_opc_server_en.pdf

Installation & Activation of the SNMP Service and SNMP Trap Service
http://www.saeautom.sk/download/install_snmp_service.pdf

SAEAUT SNMP Agent documentation (User's Guide)
http://www.saeautom.sk/download/help/saeaut_snmp_agent_en.pdf

Elegant solution for the management of computer network
http://www.saeautom.sk/download/snmpopcserver_en.pdf

Monitoring of network infrastructure
http://www.saeautom.sk/download/monitoring_en.pdf

Configuring OPC and DCOM for OPC server and OPC client applications from SAE – Automation, Ltd.
http://www.saeautom.sk/download/dcom_config.pdf

Configuring DCOM for using OPC UA COM Wrapper with OPC servers from SAE – Automation, Ltd.
http://www.saeautom.sk/download/opcuaforsaeproducts.pdf

Internet browser based OPC client
http://www.saeautom.sk/download/opc_explorer.pdf

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