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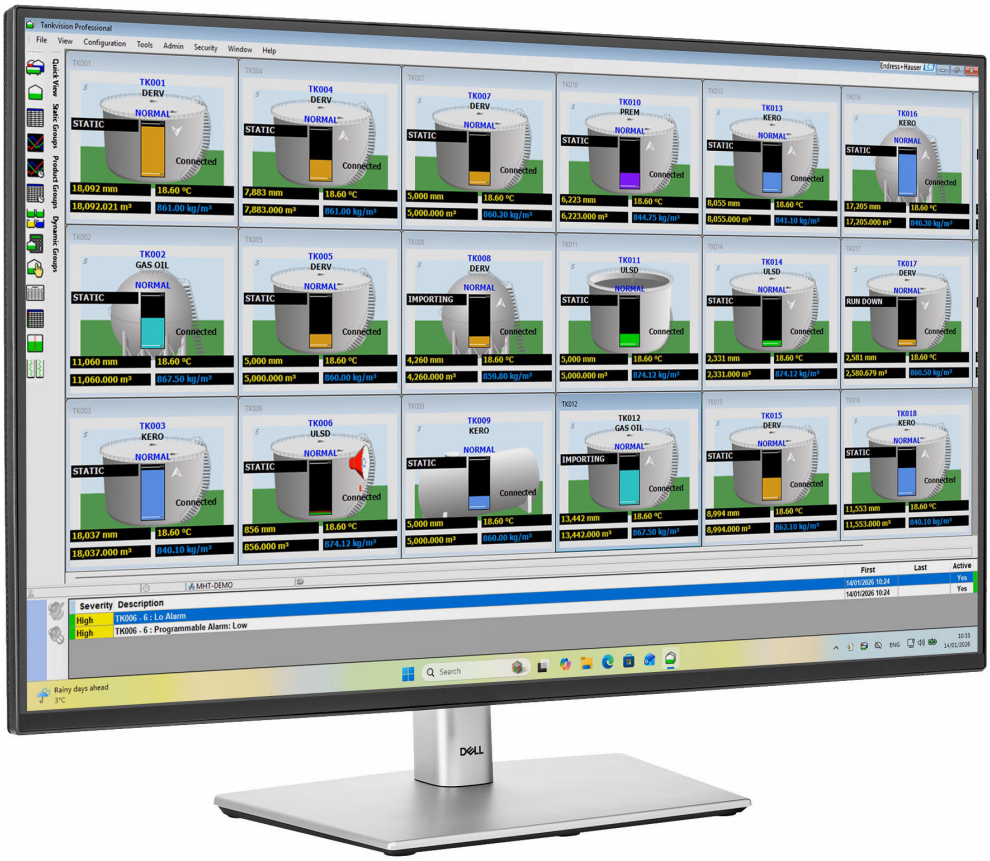
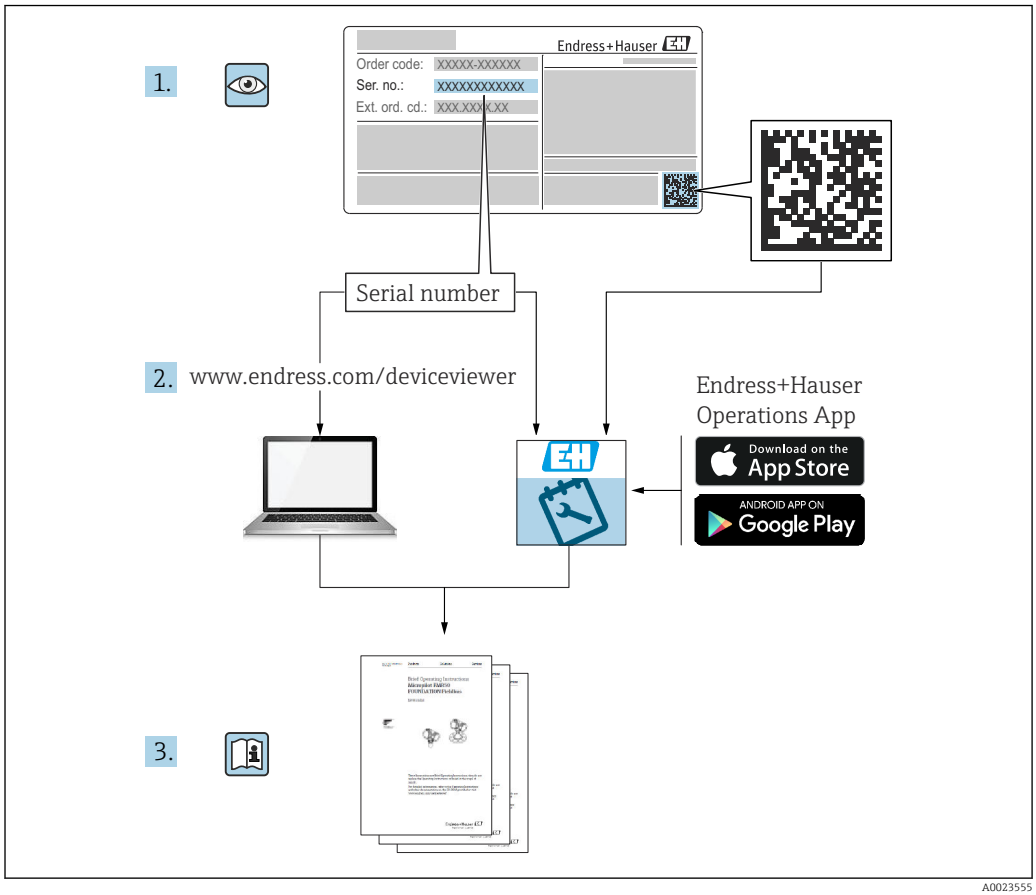
Valid as of version
18.0.2

Operating Instructions
Tankvision Professional NXA85
Tankvision Multi Scan NXA83B

Tank Gauging
SNMP Configuration and Use



Endress+Hauser
People for Process Automation



- Make sure the document is stored in a safe place such that it is always available when working on or with the device
- Avoid danger to individuals or the facility: read the "Basic safety instructions" section carefully, as well as all other safety instructions in the document that are specific to working procedures

The manufacturer reserves the right to modify technical data without prior notice. The Endress+Hauser sales organization will supply you with current information and updates to these instructions.

Table of contents

1 About this document

1.1 Document function

These Operating Instructions contain information that is useful for configuration and operation.

1.2 Target audience

Beside basic PC operating knowledge no special training is needed to perform the Tankvision Professional System operations. Nevertheless it is recommended receiving a training on the system by Endress+Hauser. Furthermore during operation time of the Tankvision Multi Scan system all servicing personnel in need of detailed knowledge about the system capabilities.

1.3 Symbols

1.3.1 Safety symbols

DANGER
This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.

WARNING
This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in serious or fatal injury.

CAUTION
This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in minor or medium injury.

NOTICE
This symbol alerts you to a potentially harmful situation. Failure to avoid this situation can result in damage to the product or something in its vicinity.

1.3.2 Symbols for certain types of information

Tip
Indicates additional information

Reference to documentation

▶
Notice or individual step to be observed

1., 2., 3.
Series of steps

Result of a step

1.3.3 Symbols in graphics

1, 2, 3, ...
Item numbers

1., 2., 3.
Series of steps

A, B, C, ...
Views

1.4 List of abbreviations

- MIB
  Management Information Base
- OID
  Object Identifier
- OT
  Operational Technologies
- SNMP
  Simple Network Management Protocol
- UDP
  User Datagram Protocol

1.5 Documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- *Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from the nameplate
- *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate.

The following document types are available in the Downloads area of the Endress+Hauser website (www.endress.com/downloads), depending on the device version:

Document type	Purpose and content of the document
Technical Information (TI)	**Planning aid for your device** The document contains all the technical data on the device and provides an overview of the accessories and other products that can be ordered for the device.
Brief Operating Instructions (KA)	**Guide that takes you quickly to the 1st measured value** The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning.
Operating Instructions (BA)	**Your reference document** The Operating Instructions contain all the information that is required in various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.
Description of Device Parameters (GP)	**Reference for your parameters** The document provides a detailed explanation of each individual parameter. The description is aimed at those who work with the device over the entire life cycle and perform specific configurations.
Safety instructions (XA)	Depending on the approval, safety instructions for electrical equipment in hazardous areas are also supplied with the device. These are an integral part of the Operating Instructions. The nameplate indicates which Safety Instructions (XA) apply to the device.
Supplementary device-dependent documentation (SD/FY)	Always comply strictly with the instructions in the relevant supplementary documentation. The supplementary documentation is a constituent part of the device documentation.

1.6 Change history

BA02605G/01.26
- Valid for software version: 18.0.2
- Changes to the previous version:
  Initial version

1.7 Registered trademarks

Microsoft®, Windows® and Edge®
Microsoft®, Windows®, Edge® and the Microsoft logo are registered trademarks of the Microsoft Corporation.

1.7.1 Legal notice concerning trademarks

All company/product names and/or all company logos may be trade names, trademarks and/or registered trademarks of Endress+Hauser, its affiliates or of their respective owners with which they are associated.

2 Basic safety instructions

2.1 Requirements for the personnel

The personnel for installation, commissioning, diagnostics and maintenance must fulfill the following requirements:

- Trained, qualified specialists must have a relevant qualification for this specific function and task.
- Are authorized by the plant owner/operator.
- Are familiar with federal/national regulations.
- Before starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- Follow instructions and comply with basic conditions.

The operating personnel must fulfill the following requirements:

- Are instructed and authorized according to the requirements of the task by the facility's owner-operator.
- Follow the instructions in this manual.

2.2 Intended use

2.2.1 Intended use of SNMP

Simple **N**etwork **M**anagement **P**rotocol is an Internet-standard protocol for collecting and organizing information about devices connected to IP networks. The first implementations were for managing hardware on which the Internet is built, such as switches and routers. Increasingly operational technologies (OT) on the factory floor and in process engineering are being given IP network interfaces which means that Information Technology solutions and techniques can be applied to operational technologies problems. The tank farm automation products provide SNMP interfaces to allow external monitoring systems to provide insight into the state of the systems.

It is possible to use an SNMP Manager to monitor the performance of Tankvision Professional and Multi Scan products over an IP network connection. Tankvision Professional and Multi Scan supports versions v2c and v3.

In order to do this the Tankvision Professional and Multi Scan SNMP Agents need to be configured to communicate with the Host.

2.2.2 Intended use of Tankvision Professional NXA85 software

Tankvision Professional is specifically designed for operators of bulk storage facilities, marketing terminals, refineries and pipelines. It is designed to handle all the data acquisition, supervisory control and monitoring required in a single fully integrated solution.

Tankvision Professional integrates all major types of tank measurement instruments into one system.

All measured and calculated tank parameters are accessible to your tank farm and terminal operators as well as to connected host systems.

Multi-user operation is provided by the inbuilt Web Server offering the opportunity to access data at any connected location (local/remote) e.g. for administrative and accounting purposes.

2.2.3 Intended use of Tankvision Multi Scan NXA83B

By using Tankvision Multi Scan to monitor the tank level and stored volume of valuable liquids remotely, owners or operators of tank farms or terminals for petroleum products and chemicals (liquids) can visualize the volume of the stored medium in real time. The data can be used to plan the inventory and distribution. The data can also be used to manage tank farm operations like pumping or transferring products. Tankvision has its unique concept using network technology. Without using proprietary software, the users can visualize and manage their valuable liquids stored in the tanks by a web browser. Tankvision Multi Scan is a flexible and cost effective solution due to its scalable architecture. The application coverage goes from small depots with only a few tanks up to refineries.

2.3 IT security

The manufacturer warranty is valid only if the product is installed and used as described in the Operating Instructions. The product is equipped with security mechanisms to protect it against any inadvertent changes to the settings.

IT security measures, which provide additional protection for the product and associated data transfer, must be implemented by the operators themselves in line with their security standards.

3 Incoming acceptance and product identification

3.1 Incoming acceptance

On receipt of the delivery:

1. Check the packaging for damage.
   ↳ Report all damage immediately to the manufacturer.
   Do not install damaged components.
2. Check the scope of delivery using the delivery note.
3. Compare the data on the nameplate with the order specifications on the delivery note.
4. Check the technical documentation and all other necessary documents, e.g. certificates, to ensure they are complete.

If one of the conditions is not satisfied, contact the manufacturer.

3.2 Product identification

The following options are available for identification of the software:

- Nameplate specifications
- Order code with breakdown of the software features on the delivery note
- Enter serial numbers from nameplates in *Device Viewer* (www.endress.com/deviceviewer): All information about the software is displayed.

For an overview of the technical documentation provided, enter the serial number from the nameplate in the *Device Viewer* (www.endress.com/deviceviewer).

3.2.1 Nameplate

The information that is required by law and is relevant to the product is shown on the nameplate, e.g.:
- Manufacturer identification
- Product name
- Order code
- Extended order code
- Serial number
- Barcode

3.2.2 Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany

Place of manufacture: See nameplate.

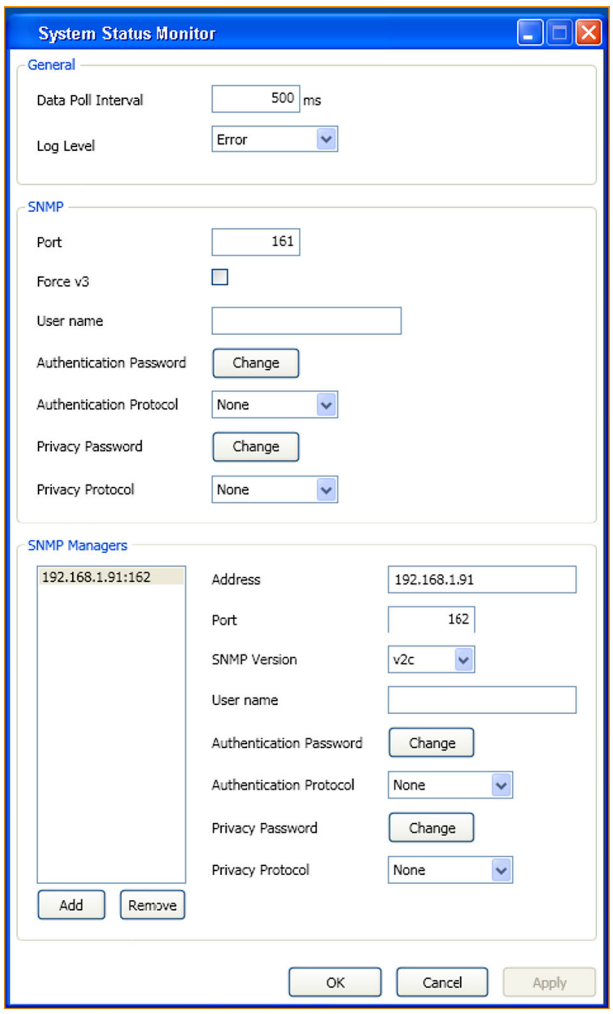
3.2.3 Order code and product version

To find out the version of your software, enter the order code indicated on the nameplate in the search screen at the following address:
www.products.endress.com/order-ident

4 Accessing the Configuration Screens

The System Status Monitor configuration screens are the same for both Tankvision Professional and Multi Scan.

Both are configured in the same way, the only difference between the two products is how the screens are accessed.

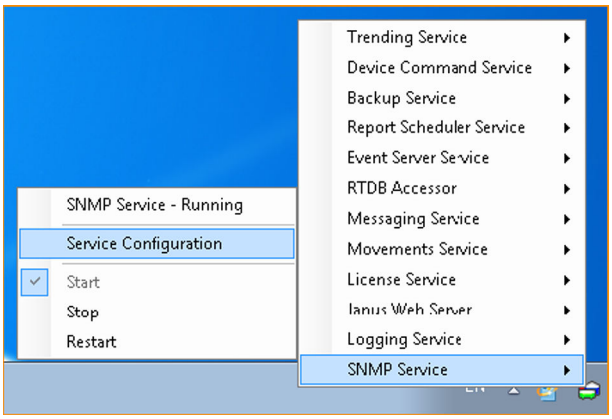


1 Configuration Screen

4.1 Tankvision Professional

The configuration screen is accessed from the system tray.

- Right click the Service Manager icon and select **SNMP Service** → **Service Configuration**.

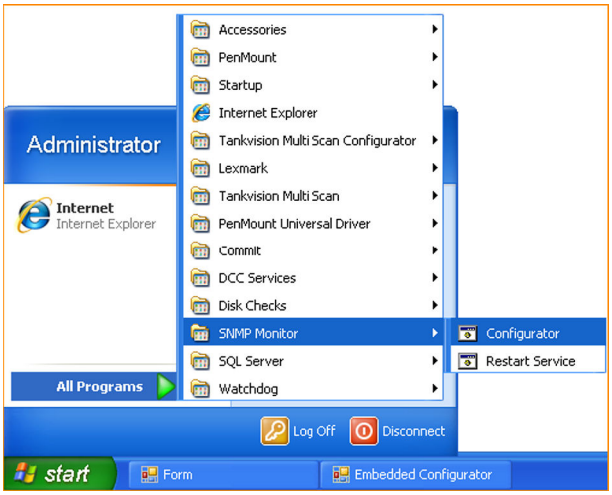


2 *Tankvision Professional*

4.2 Multi Scan

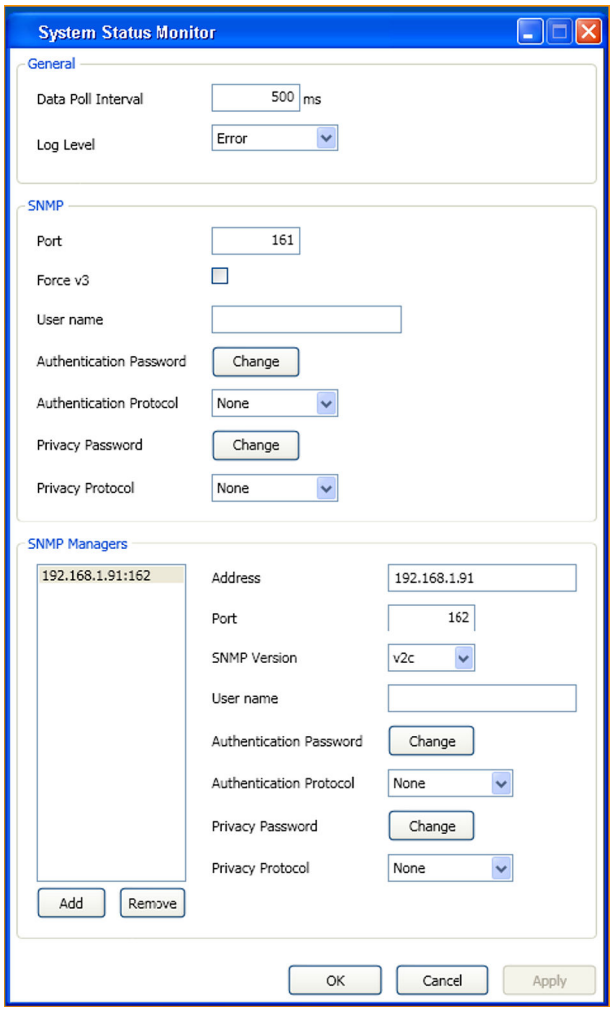
The configuration screen is accessed from the Start menu.

- Select **Start** → **SNMP Monitor** → **Configurator**.



3 *Multi Scan*

5 Configuration



4 *Configuration Screen*

There are 3 sections to the configuration screen, each with a set of parameters that will need to be configured.

General
General database control parameters.

SNMP
This section is used to configure the connection parameters used by the SNMP Agent service to allow the SNMP Manager to request and set Variables.

SNMP Managers
This section is used to configure the connection parameters used to send Traps and Informs to SNMP managers monitoring the system.

5.1 General

Data Poll Interval
The frequency with which the SNMP Service polls the Real Time Database, defaults to 500 ms. It is not normally necessary to alter this.

Log Level
This determines the severity of events which are required to be recorded in the Windows Event log. There are 3 options:
- **Error** - Logs only Error events
- **Warning** - Logs Error and Warning events
- **Information** - Logs Error, Warning and Information events

5.2 SNMP

SNMP Managers use this section to GET (request) Variables from or SET Variables in the SNMP Agent. If using v2c version of SNMP it is only necessary to configure the Port used to communicate with the SNMP Manager. The remainder of the fields are only required for the security settings of SNMP v3.

Port
The Port used to communicate with the SNMP Manager. Defaults to Port 161.

Force v3
If blank the SNMP server will utilise v2c protocol and the contents of the remaining fields in this section will be ignored. If ticked the SNMP manager will utilise v3 protocol and the remaining security fields will require configuration.

User name
A free form text field used to identify the Agent to the Manager.

Authentication Password
Click the **Change** button to set the authentication password.

Authentication Protocol
Select the required protocol from the list. If **None** is selected the SNMP Manager will not require the Authentication Password to communicate with the Agent.

Privacy Password
Click the **Change** button to set the Privacy password.

Privacy Protocol
Select the required protocol from the list. If **None** is selected the SNMP Manager will not require the Privacy Password to communicate with the Agent.

5.3 SNMP Managers

The SNMP service will monitor the tank gauging services on the Tankvision Professional or Multi Scan it is installed on. It will send unsolicited messages (Traps) to configured SNMP Managers when a situation develops that warrants sending one. Up to 2 managers may be configured and the IP address and port number of these are displayed in the box on the Left of this section.

Add a Manager

▶ Click on the **Add** button to add a Manager.

Remove a Manager

1. Select a configured Manager.
2. Click on the **Remove** button to delete that manager.

Address
Enter the IP address of the required SNMP manager.

Port
The Port used to Send Traps to the SNMP Manager. Defaults to Port 162.

SNMP Version
If set to v2c the SNMP server will utilise v2c protocol and the contents of the remaining fields in this section will be ignored. If set to v3 the SNMP manager will utilise v3 protocol and the remaining security fields will require configuration.

User name
A free form text field used to identify the Agent to the Manager.

Authentication Password
Click the **Change** button to set the authentication password.

Authentication Protocol
Select the required protocol from the list. If **None** is selected the SNMP Manager will not require the Authentication Password to communicate with the Agent.

Privacy Password
Click the **Change** button to set the Privacy password.

Privacy Protocol
Select the required protocol from the list. If **None** is selected the SNMP Manager will not require the Privacy Password to communicate with the Agent.

5.4 Saving the changes

When editing of the System Status Monitor settings is complete the changes can be saved by clicking the **Apply** button or alternatively click the **OK** button to save the changes and close the configuration screen. The changes can be abandoned and the configuration screen closed by clicking the **Cancel** button.

6 Guide to monitoring using SNMP

6.1 SNMP Interfaces in Tankvision Professional and Multi Scan

Tank Farm Automation products provide their SNMP data through a service that acts as a SNMP Agent. An SNMP Agent responds to requests from an SNMP Manager. Customers wishing to take advantage of the SNMP interfaces need to provide their own SNMP Manager such as Nagios, OP5 or Icinga and configure it to do so. The configuration of these systems is outside the scope of this document.

6.2 SNMP and Windows

SNMP uses UDP to communicate over IP networks. When configuring firewalls, be aware of the different protocol setting. By default port 161 is used to send requests from a SNMP Manager to a SNMP Agent to ask for data, so the SNMP service on the device needs to be open to receive on this port. Port 162 is used by the agent to send Trap and Inform messages to the SNMP Managers, so these need to be open in the opposite direction.

Windows itself has a SNMP Agent service, which is installed as an optional feature. If your Windows environment has the SNMP Service installed you will need to alter the ports used by the tank farm automation SNMP service to avoid conflict on ports 161 and 162.

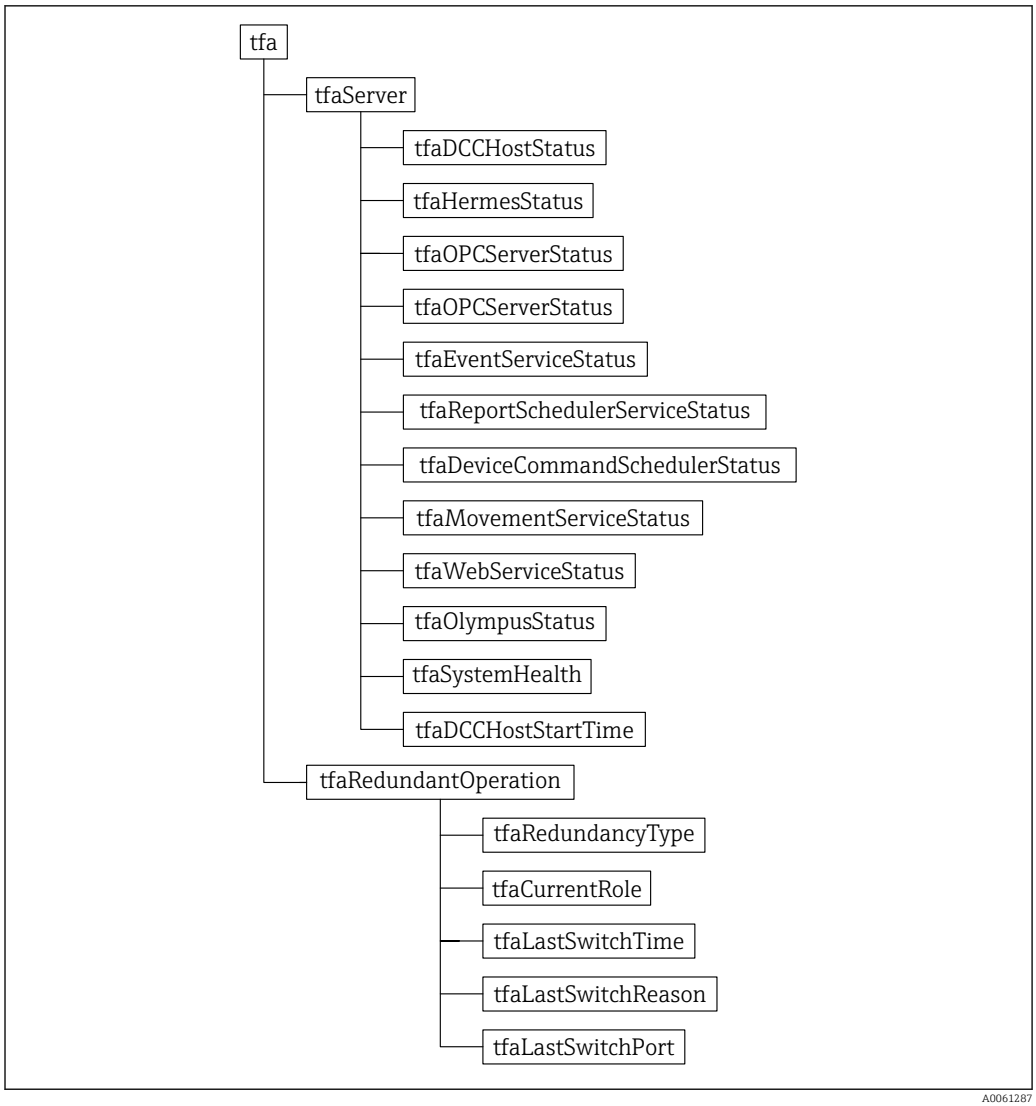
UDP is used for SNMP because the protocol works better over lossy or congested networks than TCP. SNMP is mostly used by network equipment, which if it is in a failure mode would be experiencing substantial packet loss or high volumes of traffic.

6.3 MIB Files

The information provided over SNMP varies with each devices' capabilities and features. SNMP agents detail the information and its meaning in a **M**anagement **I**nformation **B**ase file. The MIB file is written in a computer language called ASN.1, and while being human readable the syntax is quite arcane. Fortunately, there are MIB browser tools, for example ManageEngine MIB Browser Free Tool, which can be used to explore the MIB files' contents without any understanding of ASN.1.

The MIB file names the SNMP variables provided by the interface, describes the type of data in the variable and maps each name to an Object Identifier, or **OID**. The MIBs for Tank Farm Automation are called EH-ROOT-MIB and EH-IMS-MIB. The former contains basic information about the enterprise that published the MIBs, in this case Endress+Hauser, the second contains information specific to the Tank Farm Automation applications. It is usually necessary load both together as the IMS file depends on the ROOT file.

The SNMP variables in a MIB are arranged in a tree-like structure (see figure below), similar to the way folders and files are arranged on a computer disk. The further down the structure you go, the longer the OID for the variable gets. The OID can be represented either textually or numerically, for example, .iso.org.dod.internet.private.enterprises.endress.ims.tfa.tfaServer.tfaSystemInfo.tfaSystemName is equivalent to .1.3.6.1.4.1.23846.1.2.1.14.1.



5 SNMP Variables in MIB

Many SNMP managers require the MIB file to correctly obtain and interpret the SNMP variables from the device. If you require a copy contact your tank farm automation vendor.

7 SNMP Variables

This section describes the variables in the SNMP interface.

The variables are divided by the content meaning into sections:
- Services: Processes implementing the primary features of the tank gauging system (→ 17)
- Redundant Operation: Monitoring and control of redundant systems (→ 18)
- System Info: Basic system information (→ 19)
- OPC: Monitoring of the OPC Server (→ 20)
- Host Ports: Detailed diagnostics on host interfaces (→ 20)
- Slave Ports: Detailed diagnostics on slave interfaces (→ 22)

7.1 tfaServer

The top level of the tfa MIB structure is concerned with the state of the communications services on the tank farm automation server or device. It can be assumed the variables apply to both Multi Scan and Tankvision Professional, unless otherwise noted in the description.

SNMP Variable	Type	OID	Data Type
tfa	node	1.3.6.1.4.1.23846.1.2	
tfaServer	node	1.3.6.1.4.1.23846.1.2.1	
tfaDCCHostStatus	scalar	1.3.6.1.4.1.23846.1.2.1.1	TfaServerStatus
tfaHermesStatus	scalar	1.3.6.1.4.1.23846.1.2.1.2	TfaServerStatus
tfaOPCServerStatus	scalar	1.3.6.1.4.1.23846.1.2.1.3	TfaServerStatus
tfaRTDBServiceStatus	scalar	1.3.6.1.4.1.23846.1.2.1.4	TfaServerStatus
tfaEventServiceStatus	scalar	1.3.6.1.4.1.23846.1.2.1.5	TfaServerStatus
tfaReportSchedulerServiceStatus	scalar	1.3.6.1.4.1.23846.1.2.1.6	TfaServerStatus
tfaDeviceCommandSchedulerStatus	scalar	1.3.6.1.4.1.23846.1.2.1.7	TfaServerStatus
tfaMovementServiceStatus	scalar	1.3.6.1.4.1.23846.1.2.1.8	TfaServerStatus
tfaWebServiceStatus	scalar	1.3.6.1.4.1.23846.1.2.1.9	TfaServerStatus
tfaOlympusStatus	scalar	1.3.6.1.4.1.23846.1.2.1.10	TfaServerStatus
tfaSystemHealth	scalar	1.3.6.1.4.1.23846.1.2.1.11	TruthValue
tfaDCCHostStartTime	scalar	1.3.6.1.4.1.23846.1.2.1.12	DateAndTime

Description:
- tfaOPCServerStatus - Note: this service is not normally running on many systems
- tfaReportSchedulerServiceStatus - Not on Multi Scan
- tfaDeviceCommandSchedulerStatus - Not on Multi Scan
- tfaMovementServiceStatus - Not on Multi Scan
- tfaOlympusStatus - Not on Multi Scan
- tfaSystemHealth - Status indicating if system is to be considered healthy
- tfaDCCHostStartTime - The time at which the DCCHost service on the server was started. If DCCHost has not been started since the system booted the time returned will be 1899-12-31 00:00

7.1.1 TfaServerStatus

TfaServerStatus is an enumerated type, the values returned equate to the following services statuses.

Value	Status
0	Service is in an unknown state
1	Service is stopped
2	Service start is pending
3	Service stop is pending
4	Service is running
5	Service is about to resume running from a paused state
6	Service pause is pending
7	Service is paused

7.1.2 tfaSystemHealth

tfaSystemHealth is an overall assessment of the health of the tank farm automation services, it is intended to be used as a convenient albeit clumsy way of determining whether the tank farm automation system ”is working”. It is not intended as a foolproof method of diagnosing a fault with the system, for that you should look to the individual services. The variable is set to true when at least one port is showing activity and DCCHost, Hermes, RTDB Accessor and Events Server are running.

7.2 tfaRedundantOperation

Variables in this section are only relevant on redundant configurations. The most common use for these variables is to monitor Switch by system redundant configurations in order to determine the route the tank gauging data takes from the field to the operators’ screen.

SNMP Variable	Type	OID	Data Type
tfaRedundantOperation	node	1.3.6.1.4.1.23846.1.2.1.13	
tfaRedundancyType	scalar	1.3.6.1.4.1.23846.1.2.1.13.1	Enumeration
tfaCurrentRole	scalar	1.3.6.1.4.1.23846.1.2.1.13.2	Enumeration
tfaLastSwitchTime	scalar	1.3.6.1.4.1.23846.1.2.1.13.3	DateAndTime
tfaLastSwitchReason	scalar	1.3.6.1.4.1.23846.1.2.1.13.4	Enumeration
tfaLastSwitchPort	scalar	1.3.6.1.4.1.23846.1.2.1.13.5	Integer

Description:
- tfaRedundancyType - The type of redundancy in operation
- tfaCurrentRole - The current role of the device in a redundant configuration
- tfaLastSwitchTime - The time the last switch-over occurred. 1899-12-31 if no switch over has occurred since the system last restarted
- tfaLastSwitchReason - Indication as to why the last switch-over occurred.
- tfaLastSwitchPort - The port implicated in the last switch-over

7.2.1 tfaRedundancyType

A full description of the types of redundancy can be found in the communications manual.

Value	Type of redundancy
0	None. System is not part of a redundant pair.
1	Switch by Interface
2	Switch by Gauge
4	Switch by System

7.2.2 tfaCurrentRole

The redundancy role is only really applicable to ”Switch by System” redundancy types. In all other types the role of both systems will be ”Active”. This variable can be written to in order to command the devices to switch over.

Value	Type of redundancy
0	Unknown
1	Active
2	Passive

In order to achieve the cleanest switchover, send the value ”Passive” to the currently active device. Sending ”Active” to the passive device will work, but will result in the two devices becoming temporarily ”Active” at the same time.

7.2.3 tfaLastSwitchReason

Codes indicating the reason the last switch over occurred.

Value	Type of redundancy
0	None. A switchover has not occurred on this system since it was restarted.
1	Manual. The switchover occurred as the result of a user command
2	Field Port. The loss of communications on the field port indicated in tfaLastSwitchPort caused the switchover
3	Control Port. The redundant cohort triggered the switchover
4	Both Systems Live. Both systems were active and polling the field

7.3 tfaSystemInfo

A group of variables which contain information relating to the system.

SNMP Variable	Type	OID	Data Type
tfaSystemInfo	node	1.3.6.1.4.1.23846.1.2.1.14	
tfaSystemName	scalar	1.3.6.1.4.1.23846.1.2.1.14.1	DisplayString
tfaSystemTime	scalar	1.3.6.1.4.1.23846.1.2.1.14.2	DateAndTime
tfaHardwareId	scalar	1.3.6.1.4.1.23846.1.2.1.14.3	DisplayString
tfaSoftwareVersion	scalar	1.3.6.1.4.1.23846.1.2.1.14.4	DisplayString
tfaWMEnabled	scalar	1.3.6.1.4.1.23846.1.2.1.14.5	TruthValue
tfaWMStatus	scalar	1.3.6.1.4.1.23846.1.2.1.14.6	TruthValue
tfaSystemLicenseID	scalar	1.3.6.1.4.1.23846.1.2.1.14.7	DisplayString

Description:
- tfaSystemName - System name
- tfaSystemTime - Time on system clock
- tfaHardwareId - Not in Tankvision Professional. Type of system hardware
- tfaSoftwareVersion - Software version
- tfaWMEnabled - Not in Tankvision Professional. Indicates device is locked for weights and measures
- tfaWMStatus - Not in Tankvision Professional. Indicates the status of the weights and measures lock
- tfaSystemLicenseID - License identifier

7.4 tfaOPC

Information concerning the tank farm automation OPC server, which provides data to external systems such as DCS and SCADA.

SNMP Variable	Type	OID	Data Type
tfaOPC	node	1.3.6.1.4.1.23846.1.2.1.17	
tfaOPCConnections	scalar	1.3.6.1.4.1.23846.1.2.1.17.1	Integer
tfaOPCLicensedConnections	scalar	1.3.6.1.4.1.23846.1.2.1.17.2	Integer
tfaLastOPCRequest	scalar	1.3.6.1.4.1.23846.1.2.1.17.3	DateAndTime
tfaLastOPCDiagnosticUpdateTime	scalar	1.3.6.1.4.1.23846.1.2.1.17.4	DateAndTime
tfaWMEnabled	scalar	1.3.6.1.4.1.23846.1.2.1.14.5	TruthValue
tfaWMStatus	scalar	1.3.6.1.4.1.23846.1.2.1.14.6	TruthValue
tfaSystemLicenseID	scalar	1.3.6.1.4.1.23846.1.2.1.14.7	DisplayString

Description:
- tfaOPCConnections - The number of current OPC connections
- tfaOPCLicensedConnections - The number of OPC connections paid for on the license
- tfaLastOPCRequest - The time of the last OPC request fulfilled by the OPC server
- tfaLastOPCDiagnosticUpdateTime - The time the OPC status information in the preceding variables was last posted to the SNMP agent

7.5 tfaHostPortTable

The host port table contains a row for each host communications port on the device, where a host communications port might be a physical serial interface or a logical network interface. Ports are indexed according to their number as configured in DCC Configuration. So a network communications port configured as COM71 in DCC Configuration will appear on row 71 in the host port table.

SNMP Variable	Type	OID	Data Type
tfaHostPortTable	table	1.3.6.1.4.1.23846.1.2.1.15	
tfaHostPortEntry	row	1.3.6.1.4.1.23846.1.2.1.15.1	
tfaHostPortNumber	column	1.3.6.1.4.1.23846.1.2.1.15.1.1	Integer
tfaHostPortIsActive	column	1.3.6.1.4.1.23846.1.2.1.15.1.2	TruthValue
tfaHostPortProtocol	column	1.3.6.1.4.1.23846.1.2.1.15.1.3	DisplayString
tfaHostPortParameters	column	1.3.6.1.4.1.23846.1.2.1.15.1.4	DisplayString
tfaConfiguredDevices	column	1.3.6.1.4.1.23846.1.2.1.15.1.5	Integer
tfaPollsCounter	column	1.3.6.1.4.1.23846.1.2.1.15.1.6	Counter32

SNMP Variable	Type	OID	Data Type
tfaValidReplyCounter	column	1.3.6.1.4.1.23846.1.2.1.15.1.7	Counter32
tfaTimeoutCounter	column	1.3.6.1.4.1.23846.1.2.1.15.1.8	Counter32
tfaInvalidReplyCounter	column	1.3.6.1.4.1.23846.1.2.1.15.1.9	Counter32
tfaHostPortLastRequest	column	1.3.6.1.4.1.23846.1.2.1.15.1.10	DateAndTime
tfaHostPortLastResponse	column	1.3.6.1.4.1.23846.1.2.1.15.1.11	DateAndTime
tfaConnectionStatus	column	1.3.6.1.4.1.23846.1.2.1.15.1.12	TruthValue
tfaIsConnected	column	1.3.6.1.4.1.23846.1.2.1.15.1.13	TruthValue
tfaIsCommunicating	column	1.3.6.1.4.1.23846.1.2.1.15.1.14	TruthValue
tfaConnectionType	column	1.3.6.1.4.1.23846.1.2.1.15.1.15	Enumeration
tfaMaxRetries	column	1.3.6.1.4.1.23846.1.2.1.15.1.16	Integer
tfaPollDelayTime	column	1.3.6.1.4.1.23846.1.2.1.15.1.17	Integer
tfaBackgroundScanPeriod	column	1.3.6.1.4.1.23846.1.2.1.15.1.18	Integer
tfaCommsTimeout	column	1.3.6.1.4.1.23846.1.2.1.15.1.19	Integer

Description:
- tfaHostPortNumber - Corresponds to the COM port number
- tfaHostPortIsActive - True is the port is in use
- tfaHostPortProtocol - Name of protocol employed on this port
- tfaHostPortParameters - Protocol specific configuration parameters
- tfaConfiguredDevices - Number of devices on this port
- tfaPollsCounter - Increments with each poll made on the port
- tfaValidReplyCounter - Increments with each valid response received
- tfaTimeoutCounter - Increments when a poll receives no response
- tfaInvalidReplyCounter - Increments when a poll receives an unrecognisable response
- tfaHostPortLastRequest - The date and time the last poll request was made on the port
- tfaHostPortLastResponse - The date and time of the last valid response
- tfaConnectionStatus - True is the port has had a valid response in the last minute
- tfaIsConnected - True if the port has had a valid response to a poll since DCCHost was last restarted
- tfaIsCommunicating - Indicates that a response has been received in the last minute
- tfaConnectionType - The type of connection on the port
- tfaMaxRetries - The type of connection on the port
- tfaPollDelayTime - The number of milliseconds between each poll
- tfaBackgroundScanPeriod - The number of milliseconds between successive background polling cycles
- tfaCommsTimeout - The number of milliseconds the host waits for a response from a poll

7.5.1 tfaConnectionType

Denotes the type of connection the port has been configured for. The type of connection affects the connection and polling strategy employed on the port; by far the most usual connection type is ”Always Poll”.

Value	Connection Type
0	Always Poll
1	Scheduled by interval
2	Scheduled by hour
3	Manual
4	Always listen

Value	Connection Type
5	Always listen or poll
6	Sequential poll group 1
7	Sequential poll group 2
8	Sequential poll group 3
9	Undefined

7.6 tfaSlavePortTable

The slave port table is similar to the host port table in that it contains a row for each slave port on the device. The structure of the fields in each row is different from the host table. Note that OPC "slave" ports are handled separately.

SNMP Variable	Type	OID	Data Type
tfaSlavePortTable	table	1.3.6.1.4.1.23846.1.2.1.16	
tfaSlavePortEntry	row	1.3.6.1.4.1.23846.1.2.1.16.1	
tfaSlavePortNumber	column	1.3.6.1.4.1.23846.1.2.1.16.1.1	Integer
tfaSlavePortIsActive		1.3.6.1.4.1.23846.1.2.1.16.1.2	TruthValue
tfaSlavePortProtocol		1.3.6.1.4.1.23846.1.2.1.16.1.3	DisplayString
tfaSlavePortParameters		1.3.6.1.4.1.23846.1.2.1.16.1.4	DisplayString
tfaRequestCounter		1.3.6.1.4.1.23846.1.2.1.16.1.5	Counter32
tfaResponseCounter		1.3.6.1.4.1.23846.1.2.1.16.1.6	Counter32
tfaInvalidRequestCounter		1.3.6.1.4.1.23846.1.2.1.16.1.7	Counter32
tfaSlavePortLastRequest		1.3.6.1.4.1.23846.1.2.1.16.1.8	DateAndTime
tfaSlavePortLastResponse		1.3.6.1.4.1.23846.1.2.1.16.1.9	DateAndTime
tfaHostIsConnected		1.3.6.1.4.1.23846.1.2.1.16.1.10	TruthValue
tfaHostIsCommunicating		1.3.6.1.4.1.23846.1.2.1.16.1.11	TruthValue

Description:
- tfaSlavePortNumber - Corresponds to the COM port number
- tfaSlavePortIsActive - True if the port is enabled
- tfaSlavePortProtocol - Indicates the protocol employed on the port
- tfaSlavePortParameters - Protocol specific communication parameters
- tfaRequestCounter - Increments with each request received
- tfaResponseCounter - Increments with each valid response sent
- tfaInvalidRequestCounter - Increments when the request cannot be fulfilled
- tfaSlavePortLastRequest - Time of the last request received
- tfaSlavePortLastResponse - Time of the last response sent
- tfaHostIsConnected - True if the port has ever received a valid request since DCC Slave was restarted
- tfaHostIsCommunicating - True if the port has received a valid request in the last minute

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