BA01654G/00/EN/04.18
71392424

Valid as of software version:
18.1.1

Operating Instructions
Tankvision Professional NXA85
Tankvision LMS NXA86

System Monitor
(Client/Server Configurations)

Endress+Hauser
People for Process Automation

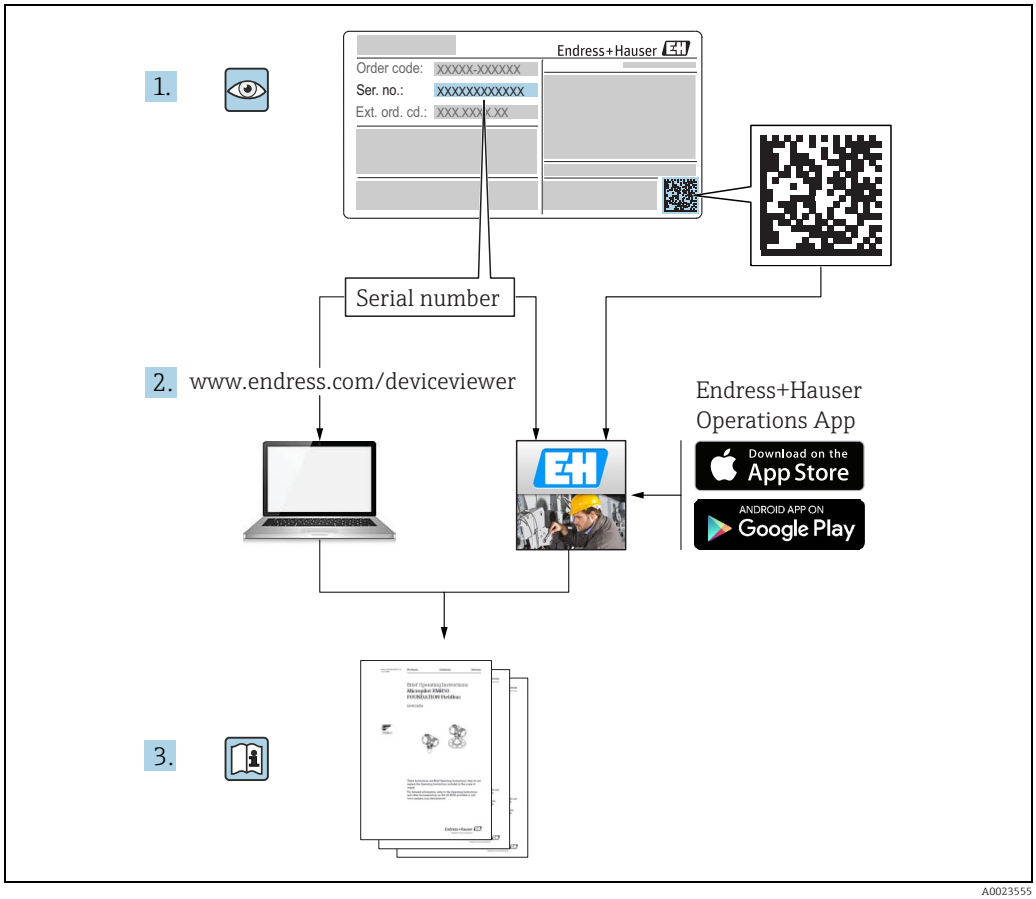

1.
Endress+Hauser
Order code: XXXXX-XXXXXX
Ser. no.: XXXXXXXXXXXX
Ext. ord. cd.: XXX XXX XXX
Serial number
2. www.endress.com/deviceviewer
Endress+Hauser
Operations App
Download on the App Store
ANDROID APP ON Google Play
3.
A0023555

Table of Contents

1 Document information

1.1 Target audience for this manual

This manual should support during the installation of Tankvision Professional NXA85 and LMS NXA86.
It is recommended to receive a training on the system by Endress+Hauser.

1.2 Version history

Document version	Valid for SW version	Changes to the previous version
BA01654G/00/EN/01.16	18.0.2	Initial version
BA01654G/00/EN/02.17	18.0.2	Tankvision LMS added
BA01654G/00/EN/03.17	18.1.1	Unification of the W&M and the non W&M software packages.
BA01654G/00/EN/04.18	18.1.1	Compatibility with Windows 10 and Windows Server 2016

Due to the certification process with weights and measures agencies, the latest software version might only be certified at a later stage. Also some features might be incompatible with the weights and measure regulations and can therefore not be combined.

1.3 Document function

1.3.1 Used symbols

Safety symbols

Symbol	Meaning
DANGER A0011189-EN	**DANGER!** This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
WARNING A0011190-EN	**WARNING!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
CAUTION A0011191-EN	**CAUTION!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
NOTICE A0011192-EN	**NOTICE!** This symbol contains information on procedures and other facts which do not result in personal injury.

Electrical symbols

Symbol	Meaning
A0011197	**Direct current** A terminal to which DC voltage is applied or through which direct current flows.

A0011198	**Alternating current** A terminal to which alternating voltage is applied or through which alternating current flows.
 A0011200	**Ground connection** A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.
 A0011199	**Protective ground connection** A terminal which must be connected to ground prior to establishing any other connections.

Symbols for certain types of information

Symbol	Meaning
 A0011193	**Tip** Indicates additional information.
 A0011195	**Reference to page** Refers to the corresponding page number.
1. , 2. , 3. ...	Series of steps
 A0018373	Result of a sequence of actions

Symbols in graphics

Symbol	Meaning
1, 2, 3 ...	Item numbers
1. , 2. , 3. ...	Series of steps
A, **B**, **C** ...	Views
 A0011187	**Hazardous area** Indicates a hazardous area.
 A0011188	**Indicates a non-hazardous location** Safe area (non-hazardous area)

1.4 Documentation

1.4.1 Operating instructions

Document number	Instrument	Type of Document
BA00390G/00	Tankvision Professional & LMS	System Configuration
BA00391G/00	Tankvision Professional & LMS	Data Communications Controller
BA00392G/00	Tankvision Professional	Installation
BA00393G/00	Tankvision Professional & LMS	Maintenance
BA00394G/00	Tankvision Professional	Movements System Configuration
BA00395G/00	Tankvision Professional	Movements Operation
BA00396G/00	Tankvision Professional	System Operation
BA01293G/00	Tankvision Professional & LMS	OPC Tank Data Server
BA01294G/00	Tankvision Professional & LMS	OPC TG Client Configuration
BA01295G/00	Tankvision Professional	Web Server/Client System Operation
BA01363G/00	Tankvision Professional	Product and Tank Data Synchronization
BA01653G/00	Tankvision Professional	Simple Movements
BA01654G/00	Tankvision Professional & LMS	System Monitor
BA01700G/00	Tankvision LMS	Installation
BA01701G/00	Tankvision LMS	System Operation
BA01702G/00	Tankvision LMS	Rollover Prediction in LNG storage tanks
BA01703G/00	Tankvision LMS	Skin Temperature
BA01704G/00	Tankvision LMS	LNG Stratification Detection

2 Identification

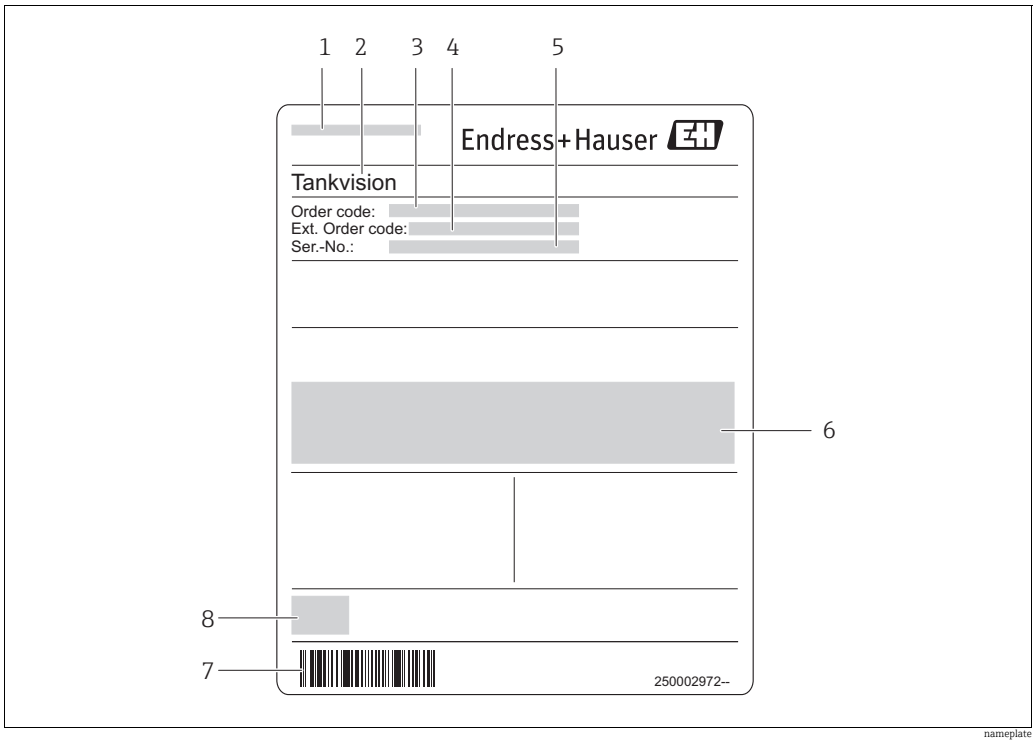
2.1 Product identification

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 W@M 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 nameplates in the W@M Device Viewer (www.endress.com/deviceviewer)

2.2 Nameplate



nameplate

1 Address of manufacturer
2 Device name
3 Order code
4 Extended order code (Ext. ord. cd.)
5 Serial number (Ser. no.)
6 Certificate and approval relevant data
7 Barcode
8 CE mark

2.3 Order code and device 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

2.4 Device documentation

The information required to retrieve the documentation can be found on the nameplate of the device.

Technical documentation can also be downloaded from the Download Area of the Endress+Hauser web site: www.endress.com→ Download. However this technical documentation applies to a particular instrument family and is not assigned to a specific device.

2.4.1 W@M Device Viewer

1. Launch the W@M Device Viewer: www.endress.com/deviceviewer
2. Enter the serial number (Ser. no.) of the device: see nameplate.
   ↳ All the associated documentation is displayed.

2.4.2 Endress+Hauser Operations App

The *Endress+Hauser Operations App* is available both for android smart phones (Google Play Store) and for iPhones and iPads (App Store).

Via the serial number:

1. Launch the *Endress+Hauser Operations App*.
2. Enter the serial number (Ser. no.) of the device: see nameplate.
   ↳ All the associated documentation is displayed.

2.5 Registered trademarks

Microsoft®, Windows® and Internet Explorer®
Registered trademarks of the Microsoft Corporation

Modbus®
Registered trademark of the Modbus-IDA, Hopkinton, MA, USA

Java®
Registered trademark of Sun Microsystems, Inc.

Mozilla® Firefox®
Registered trademark of the Mozilla Foundation

Android® and Google Play® are registered trademarks of Google Inc.

iPhone® and iPad® are trademarks of Apple® Inc., registered in the U.S. and other countries.

3 Basic safety instructions

3.1 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 beginning work, the specialist staff must have read and understood the instructions in the Operating Instructions and supplementary documentation as well as in the certificates
  (depending on the application)
- Following instructions and basic conditions

The operating personnel must fulfill the following requirements:

- Being instructed and authorized according to the requirements of the task by the facility's owner operator
- Following the instructions in these Operating Instructions

3.2 IT security

We only provide a warranty if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

3.3 Designated use

3.3.1 Application

Tankvision Professional NXA85

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.

Tankvision LMS NXA86

Tankvision LMS is a total LNG Tank Storage and Management solution for Peak Shaving, Receiving and Production LNG facilities. The LMS system has been designed to interface to all instruments commonly found on LNG storage tanks, and to collect and present the instrument data through a range of intuitive graphical user interfaces. A typical LNG Tank will have a wide range of measurement instruments to measure Liquid Level, Liquid Density,

Liquid and Vapour Temperature, Liquid and Vapour Pressure, Skin Temperature and much more.

Typically each tank would be fitted with an LTD gauge, two further level gauges configured as a Primary and Secondary, and an Alarm Gauge. The LTD gauge is a servo operated unit mounted on the tank roof. The purpose of the LTD gauge is to take accurate profiles of temperature and density throughout the liquid, and whilst not profiling provide continuous liquid level, temperature and density measurement. The Primary and Secondary gauges can be either servo and or radar operated units also mounted on the tank roof. The purpose of these gauges is to provide continuous liquid level measurement, and average liquid temperature measurement. They provide redundancy on the measurement of level and temperature. The average liquid temperature is derived from a multi point temperature sensor device. The alarm gauge is often a servo or radar based gauge configured to provide volt free contact alarm status to an independent system.

An LMS system can operate in a simple standalone configuration or as a fully redundant system where security and integrity are of paramount importance. The LMS system has a flexible and scalable architecture allowing it to be tailored to a number of different applications easily.

3.4 Workplace safety

For work on and with the device:

- Wear the required personal protective equipment according to federal/national regulations.
- Switch off the supply voltage before connecting the device.

3.5 Operational safety

Risk of injury!

- Operate the device in proper technical condition and fail-safe condition only.
- The operator is responsible for interference-free operation of the device.

Conversions to the device
Unauthorized modifications to the device are not permitted and can lead to unforeseeable dangers

- If, despite this, modifications are required, consult with Endress+Hauser.

Repair
To ensure continued operational safety and reliability,

- Carry out repairs on the device only if they are expressly permitted.
- Observe federal/national regulations pertaining to repair of an electrical device.
- Use original spare parts and accessories from Endress+Hauser only.

3.6 Product safety

The device is designed to meet state-of-the-art safety requirements, has been tested and left thefactory in a condition in which it is safe to operate. The device complies with the applicable standards and regulations as listed in the EC declaration of conformity and thus complies with the statutory requirements of the EG directives. Endress+Hauser confirms the successful testing of the device by affixing to it the CE mark.

4 Introduction

4.1 About System Monitor

The Tank Gauging System Monitor (System Monitor) monitors any servers associated with the client to ensure that they are online. If a server becomes unresponsive the System Monitor is able to alert the user.

NOTICE

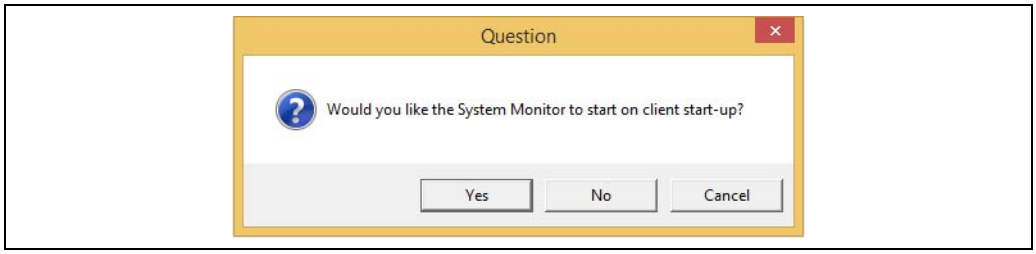
When switching to a single-server configuration the databases on the servers will cease to be synchronised. This may lead to data loss!
Only use the Break Redundancy feature of the System Monitor if you are certain that this is what you want to do.

The System Monitor can be used to break the redundancy of a system, that is, to remove an unresponsive (offline) server from the Tank Gauging System. It is also capable of restoring the redundancy at a later time.

For more information, → 18.

5 Setup

To set up the System Monitor simply run it once. The user is presented with a dialogue box as shown below.



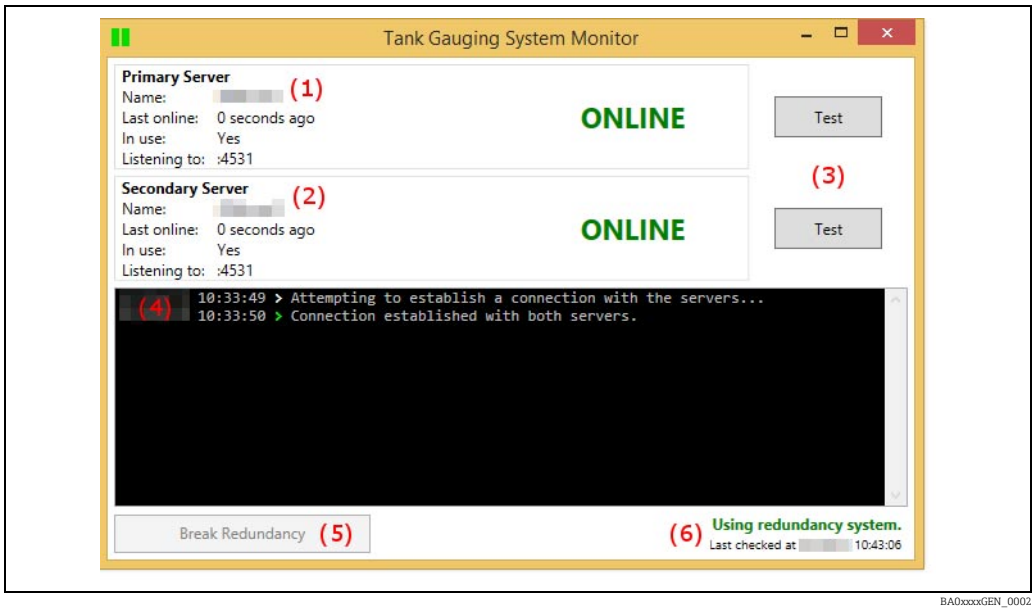
BA0xxxxGEN_0001

Click **Yes** to allow the System Monitor to automatically start up when the client starts. Alternatively, click **No** if you want to start the System Monitor manually. Clicking **Cancel** will not set the System Monitor to start up automatically, but it will ask you again the next time the System Monitor is manually started.

6 Window Overview

6.1 General

The window can be displayed by clicking on the tray icon.



BA0xxxxGEN_0002

The main window and its controls:

1. Primary server information (→ 14).
2. Secondary server information: This contains the same information as 1, but for the secondary server (→ 14).
3. Test buttons: Clicking these manually checks whether the server is online and reports the approximate latency between the servers and the client (→ 15).
4. Log: This box displays any messages produced by the System Monitor while it has been running. Different coloured arrows show different levels of information (→ 15).
5. Break Redundancy/Restore Redundancy button: This button causes the system to break/restore the redundancy and becomes clickable only when necessary (→ 18).
6. General information: Includes a message stating whether the system is using a redundancy or single-server configuration, as well as the time of the last communication attempt to the servers.

Minimising or closing the window will hide it to the tray. To exit the System Monitor, instead right click on the tray icon and select **Exit**. For more information about the tray icon, → 20.

6.2 Server and Information Overview

BA0xxxxGEN_0003

The primary and secondary servers are both online in a redundant configuration.

The server information section of the System Monitor displays the following information about each server:

- **Name**: The name of the server.
- **Last online**: The amount of time since the last successful communication with the server. This displays **0 seconds ago** if the server is online, and **Unknown** if the System Monitor has not been able to communicate with the server since it started, or since a recent configuration change.
- **In use**: Whether the server is part of the system or just being monitored. For example, after switching to a single-server configuration, one server will no longer be in use. The System Monitor will still check to see if it's online so that it can inform the user when it is possible to switch back to a redundancy configuration.
- **Listening to**: The port the server hosts the Events Service on - the port used to check if the server is online.
- **STATUS**: Displays **ONLINE** if the server can be reached by the System Monitor, otherwise displays **OFFLINE**.

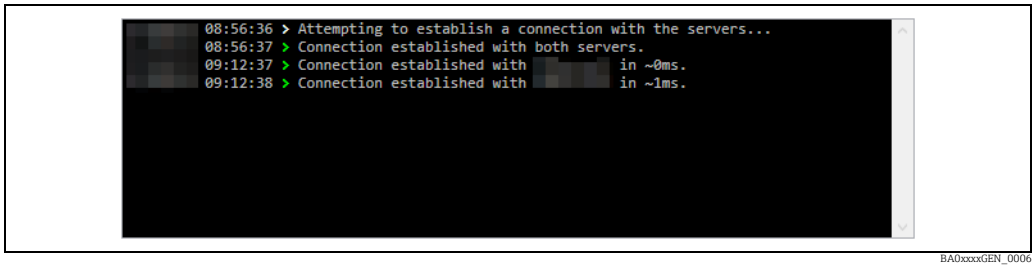
BA0xxxxGEN_0004

A user has switched the configuration to a single-server configuration after the secondary server went offline.

xxxxxx

The secondary server has come back online, but the system is still using a single-server configuration.

6.3 Test Buttons Overview

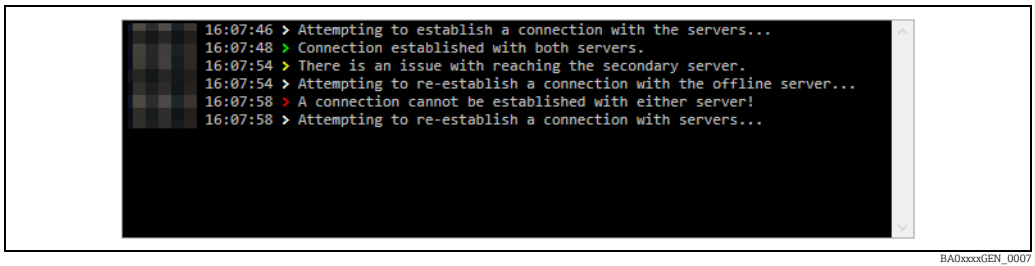


BA0xxxxGEN_0006

The log showing successful connections to the servers.

The test buttons attempt to create a connection with the servers and, if successful, display a success message along with an approximate latency to the log. If it is unable to establish a connection (after 1 second) it displays an error message in the log. For more information about the log, → 15.

6.4 Log Overview



BA0xxxxGEN_0007

The System Monitor's log with some sample messages.

The log section of the System Monitor displays messages created by the System Monitor when an event occurs. Each message is prefixed with the time and date as well as a coloured arrow indicating the severity of the messages.

6.4.1 Timestamp Format

The timestamp takes the format *Day/Month/Year Hour:Minutes:Seconds*.

6.4.2 Message Severity

The arrow icon (>) indicates the severity of the message and can take one of the four following colours:

- Indicates general information.
- Indicates a successful action has occurred.
- Indicates a non-critical issue or warning.
- Indicates a critical issue has occurred.

6.4.3 Examples of logged messages

The following list contains examples of messages that may be logged. The list is neither comprehensive nor applicable to all system configurations.

Message	Severity
–PROGRAM STARTED–	Info
–PROGRAM EXITED–	Info
Attempting to establish a connection with the servers	Info
Unable to write to the log file	Warn
System monitor is shutting down	Warn
Connection established with **server** in **time** ms	Success
Couldn't establish connection to **server**. Gave up after **time** ms	Fail
No changes detected in the last hour	Info
Connection established with both servers	Info
There is an issue with reaching the primary server	Warn
Attempting to re-establish a connection with the offline server	Info
There is an issue with reaching the secondary server	Warn
Attempting to re-establish a connection with the offline server	Info
There is an issue with reaching the server	Fail
Attempting to re-establish a connection with servers	Info
The system configuration file will be backed up	Info
The **server** server will be removed from the system	Warn
Switched configuration to single server solution	Info
Unable to switch configuration to single server solution	Fail
The system will switch servers	Warn
Switching server from **server** to **server**	Info
Primary server switched in configuration	Success
Unable to switch servers	Fail
The system configuration file will be restored	Info
Switched configuration to redundancy solution	Success
Unable to switch configuration to redundancy solution	Fail
The current user will be logged off	Info
Error attempting to log user off	Fail
Service pack will be downloaded	Info
Service pack downloaded to **path**	Success
Error downloading service pack	Fail

6.4.4 Saved Files

The log is saved into a daily file usually located at *C:\ProgramData\Tank Farm Automation\Client\SystemMonitor\logs*. These files are saved as plain text and can be viewed at any time. The timestamp in the log takes the format *YearMonthDay HourMinutesSeconds:Milliseconds*.

7 System Status

The following is a table of icons displaying the various possible statuses of the system:

Status Icon	Meaning	Status Icon	Meaning
	(a) The system is using a redundancy configuration and both servers are online.		(a) The system is using a redundancy configuration and both servers are offline.
	(b) The system is using a redundancy configuration and the secondary server is offline.		(b) The system is using a single-server configuration and the primary server is online.
	(c) The system is using a redundancy configuration and the primary server is offline.		(c) The system is using a single-server configuration and the primary server is offline.

The relevant icon is used as the tooltip of the System Monitor. If the icon contains a green bar then the system is operational - if no green bar is displayed then the client cannot communicate with either server and the system can be considered offline; this can be considered a serious error.

7.1 Balloon Tool Tips

Balloon tool tips appear above the tray icon every time the system status changes. This can be disabled by right clicking the tray icon and selecting **Disable Balloon Tips**. They can be re-enabled by again right clicking the tray icon and selecting **Enable Balloon Tips**

7.2 Update Period

The primary and secondary servers are checked once every second by the System Monitor to ensure they are online. If the server does not respond within 1000 ms (one second) then it is deemed to be offline by the System Monitor and will appear as such in the tray icon and main window.

7.3 User Intervention

If user intervention is recommended, the main window will appear on screen (after ten seconds). The delay is to ensure that the main window does not appear if, for example, a connection to the servers is momentarily lost and then gained just a few seconds later. For more information on updating the configuration, → 18.
User intervention is recommended when:

Using a Redundancy Configuration

- Both servers are offline. No action can be taken using the System Monitor, but a serious error has occurred and should be taken in to account.

Using a Single-Server Configuration

- Both servers are offline. The System Monitor will recommend switching to a redundancy configuration as an attempt to communicate with either server as soon as one becomes available. A serious error has occurred.
- The primary server is offline but the secondary server is online. The client is unable to communicate with the servers as the only server it is pointed at is offline. The System Monitor will recommend switching the configuration to use the secondary, online server.
- Both servers are online. As both servers are online, it is recommended to switch back to a redundancy configuration as this is generally seen as the safer of the two options.

8 Updating the Configuration

If it is possible to update the configuration, the **Break Redundancy/Restore Redundancy** button will be available to click (→ 13). If the user has the correct permissions, the System Monitor will then attempt to modify the configuration of the system.

8.1 Permissions

To modify the configuration, the following must be true:
- The user has Windows administrative access.
- The user has the Security Manager's *System Settings/Redundancy/Reconfigure* permission.
- An audit event can successfully be created.

8.2 Breaking the Redundancy

Just because you can break the redundancy does not mean you should.
The system will work normally in a redundancy configuration even if one server cannot be reached. You should only use this option if you wish to remove a server from the system.

The redundancy can be broken when the system is currently using a redundancy configuration and one of the servers goes offline. Breaking the redundancy will cause the offline server to be completely ignored by the client, instead leaving the client to communicate with the online server in a single-server configuration.

Breaking the redundancy causes the online server to become the primary server. The secondary server will now be greyed out to indicate that it is not in use (→ 14). A server cannot be removed from the system unless it is already offline and the alternative server is online.

NOTICE
When switching to a single-server configuration the databases on the servers will cease to be synchronised. This may lead to data loss!
Only use the Break Redundancy feature of the System Monitor if you are certain that this is what you want to do.

8.3 Restoring the Redundancy

The redundancy can be restored if the system is currently using a single-server configuration and:
- Both monitored servers are online. This will cause the client to communicate with both servers again and the system will be deemed to be using a fully operational redundancy system.
- Both monitored servers are offline. Although neither server can be reached, it is possible to switch to a redundancy system so that as soon as one server becomes available the client will be able to communicate with it.

Restoring the redundancy causes each server to take its initial status (i.e. the server that was originally the primary server will become the primary server if it was not already) and neither server will be greyed out, indicating that both are in use (→ 14). Only the server originally in the redundancy system can be re-added to the system. The System Monitor cannot be used to add new servers to the system.

8.4 Switching Servers

If the system is currently using a single-server configuration and in the rare case that the primary server is offline while the secondary server is now online, it is possible to switch servers so that the client can communicate with the online server. If the user selects the option to Switch Servers the System Monitor will:

1. Restore the redundancy.
2. Immediately and automatically break the redundancy to switch to the working server.

Switching servers causes the online server to become the primary server. The secondary server will still be greyed out to indicate that it is not in use (→ 14).

9 Tray Icon

The tray icon appears in the tray of the client and displays the current status of the system. For available statuses and their definitions, → 17.

9.1 Clicking the Tray Icon

Clicking the tray icon once will display the main window of the System Monitor.

9.2 Right Clicking the Tray Icon

Right clicking the tray icon will bring up the tray icon's context menu.

9.3 Context Menu

The context menu contains the following:

Enable/Disable Tooltips
Enables or disables the tray icon's balloon tool tips respectively. For more information about tooltips, → 17.

Restart Client
Presents a warning box asking the user if they wish to restart the client. Proceeds to restart the client if the user selects yes.

Exit
Closes the System Monitor.

10 Troubleshooting

10.1 Error message in the log: "Unable to write to the log file..."

The System Monitor was unable to create a log file or the log file is in read-only mode. Ensure that all files in the System Monitor's logs folder (usually located at *C:\ProgramData\Tank Farm Automation\Client\SystemMonitor\logs*) can be written to.

10.2 Error message in the log: "Unable to switch configuration to ..."

- The user does not have the required permissions to switch configurations. To switch configurations, users must be a Windows administrator and have the *System Settings/ Redundancy/Reconfigure* permission set by the Security Manager. Or;
- See previous chapter. Or;
- The System Monitor was unable to create a backup of the application.config file. The configuration file will not be modified if a backup cannot be created first. Ensure the backup folder exists (usually found at *C:\ProgramData\Tank Farm Automation\Common\Configuration\backup*) and that the application.config file found in this folder (if it exists) is not in use by any other application (such as a text editor). Or;
- An audit event could not be created. Switching configurations will fail if an audit event cannot be created first.

10.3 Error message window: "Unable to modify system configuration."

See previous chapter.

10.4 Error message window: "Unable to create/delete shortcut" during setup

Ensure the user has Windows administrator privileges when attempting to set the System Monitor to automatically start-up. Delete the SystemMonitor shortcut (if it exists) found in the start-up folder (usually located at *C:\ProgramData\Microsoft\Windows\Start Menu\Programs\StartUp*) and try again.

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www.addresses.endress.com

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