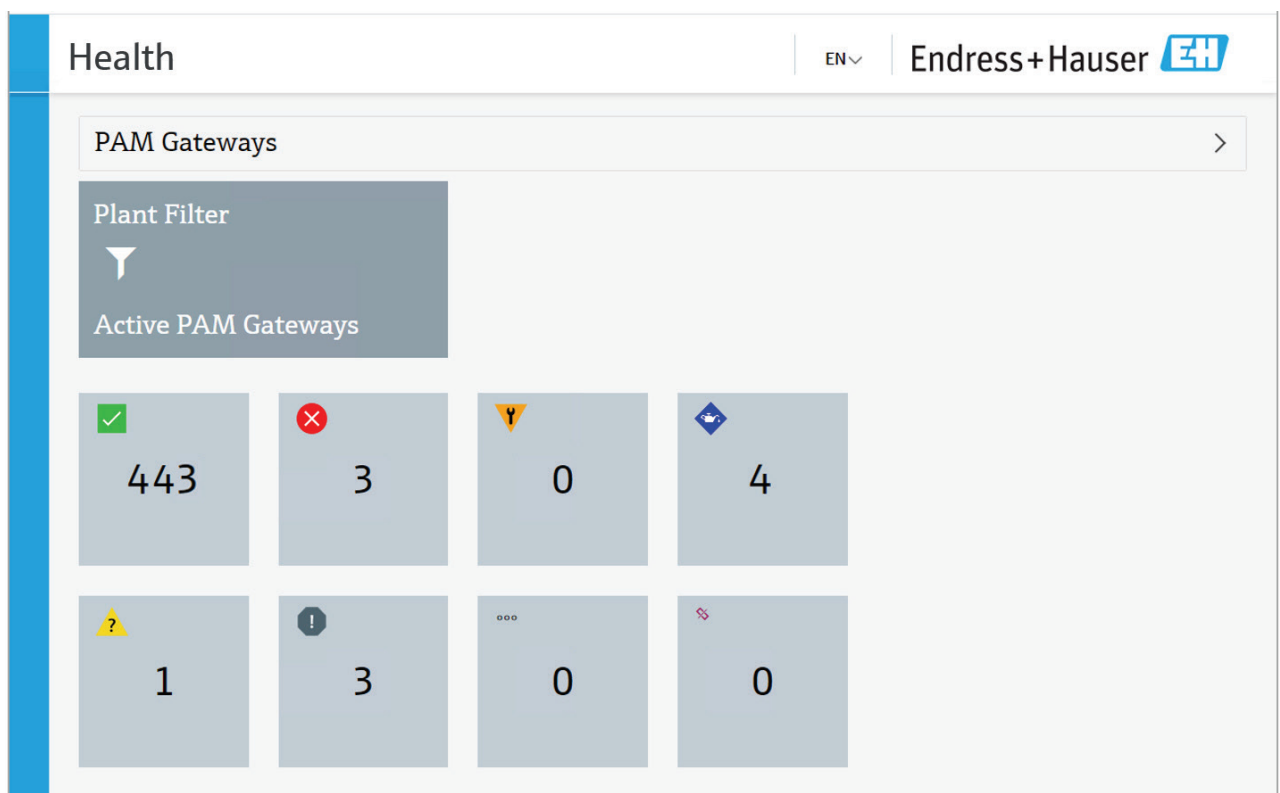


# Technical Information

## Asset Health Monitoring Solution



TI01544S/04/EN/03.23-00  
71622346  
30.06.2023

## Change history

Date	Version	Change	Who
05.09.2019	01.00	First version	DFE
03.12.2019	01.01	Updated connection information for FieldCare, AHM	DFE
19.12.2019	01.02	Updated specific Rockwell requirements, system architecture	DFE
28.02.2020	01.03	Added information on templates for virtual machines	DFE
10.03.2020	01.04	Added information for PROFINET release	DFE
19.03.2020	01.05	Minor changes	DFE
30.06.2023	02.00	New condition monitoring module	PSO

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# 1 General

## 1.1 Objective

This document has been created as a guideline to the specific technical requirements and prerequisites for the installation of a new Asset Health Monitoring Solution. It is intended to help technical responsible persons understand the requirements for hardware, software, operating system and networking.

## 1.2 Definitions, acronyms and abbreviations

AHM	Asset Health Monitor
PAM	Plant Asset Management

## 1.3 Audience

Project manager, e.g. automation engineers and IT administrators

## 1.4 Registered trademarks

### **Rockwell Automation®**

Registered trademark of Rockwell Automation Inc., Milwaukee, Wisconsin, USA

### **EtherNet/IP™**

Trademark of ODVA, Inc., Ann Arbor, Michigan, USA

### **HART®**

Registered trademark of the FieldComm Group, Austin, Texas, USA

### **Windows®**

Registered trademark of the Microsoft Corporation, Redmond, Washington, USA

## 2 Prerequisites

### 2.1 System architecture

#### PAM Client / PAM Mobile Client

- At least **1** PAM Client or PAM Mobile Client is mandatory.
- The maximum total quantity of PAM Clients and PAM Mobile Clients is **10**.

#### Asset Health Monitor server

- **1** Asset Health Monitor server is mandatory.  
Where only 1 PAM Gateway is in use, it is also possible to install the Asset Health Monitor (Health app) on the PAM Gateway. In this case, however, a more powerful server machine is recommended for performance reasons.
- With 2 and more PAM Gateways, a dedicated Asset Health Monitor Server is mandatory.

#### PAM Gateway

- **1** PAM Gateway is mandatory, max. quantity of PAM Gateways is **10**.

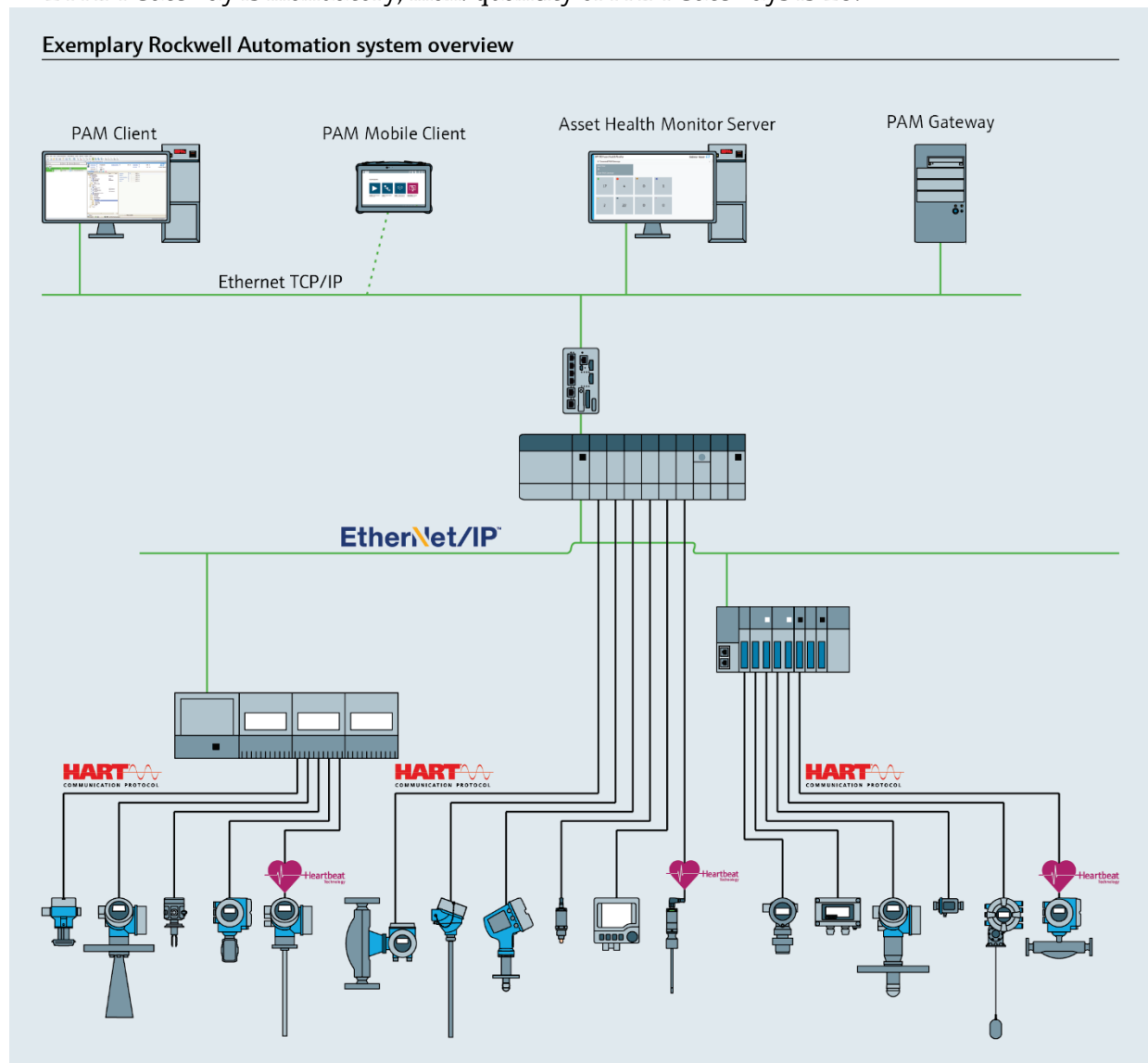


Figure 1: Example of an EtherNet/IP system architecture

## 2.2 Limitations

The Asset Health Monitoring Solution supports HART field devices. There is limited support for EtherNet/IP (only point-to-point connections for device configuration).

Field device protocol	Field device configuration (point-to-point)	Field device configuration (client/gateway)	Asset Health Monitoring (client/gateway)
HART	Yes	Yes	Yes
EtherNet/IP	Yes (PAM Client)	No	No

## **3 Installation options and conditions**

Depending on the customer's requirements, the following installation options are available for the den PAM Client, the Asset Health Monitor and the PAM Gateway.

### **3.1 Remote installation**

The software solution can be installed and set up via remote connection. The customer must provide the servers (physical or virtual machines) with a pre-installed operating system. The customer is also responsible for providing a reliable and fast internet connection (at least 10 Mbit/s, remote desktop or VPN, etc.).

### **3.2 On-site installation**

Endress+Hauser can offer an on-site installation. The customer must provide the servers and the clients (physical or virtual machines) with a pre-installed operating system.

## 4 General requirements

### 4.1 Operating system

The Asset Health Monitoring Solution software runs in Windows. The following Windows versions are supported:

For the PAM Client:

Windows 10 Professional/Enterprise (64-bit)
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For the Asset Health Monitor:

Windows Server 2016 (64-bit) LTSC
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Windows Server 2019 (64-bit) LTSC
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Windows Server 2022 (64-bit) LTSC
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For the PAM Gateway:

Windows Server 2016 (64-bit) LTSC
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Windows Server 2019 (64-bit) LTSC
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Windows Server 2022 (64-bit) LTSC
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Administrator rights are required for the installation and configuration of the entire Asset Health Monitoring Solution.

**Note:**

- Software is installed
- Windows settings are changed



## 5 PAM Client

The PAM Clients have access to the Asset Health Monitor (Health app) and an overview displays the state of health of the connected field devices in the plant. If necessary, it is possible to configure field devices from the PAM Client through the PAM Gateways.

### 5.1 Software prerequisites

The list below shows only the most important software components. Additional software not listed here will be installed during system configuration/commissioning.

#### 5.1.1 FieldCare SFE500

- FieldCare requires .NET Framework 3.5
- FieldCare version 2.17 or higher is necessary

##### 5.1.1.1 SQL database

FieldCare requires an SQL database. As standard, an MS SQL Server 2014 Express instance is installed automatically during the installation of FieldCare.

If necessary, FieldCare can be operated with a more recent MS SQL server. Possible support for other MS SQL server versions must be clarified if necessary. In this case, a suitable prepared SQL instance must be provided before the installation of FieldCare.

#### Note:

- The SQL database must always be on the machine on which the FieldCare is going to be installed (remote SQL databases are not supported).
- After the installation of FieldCare, it is **not possible** to change to a more recent MS SQL server version.

##### 5.1.1.2 FieldCare SFE500 license

The FieldCare license for a PAM Client requires device tags only.

#### 5.1.2 DTM library

Device DTMs must be installed if necessary.

Where necessary in conjunction with Rockwell systems:

Rockwell FactoryTalk Linx for point-to-point device configuration for EtherNet/IP devices.

### 5.2 Hardware prerequisites

Processor	Intel CPU i7/i5, at least 2 GHz or better
RAM	8 GB RAM or more
Hard drive storage	100 GB or more
Connectivity	Ethernet 1 Gbit

The use of virtual machines is possible.

## 5.3 Network requirements

### 5.3.1 Ports used

8303	TCP	Inbound	DTM communication between PAM Gateway and PAM Clients
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### 5.3.2 IP configuration

The PAM Client must be in the same IP range as the Asset Health Monitor server and the PAM Gateways. A fixed IP address is not required.

## 6 PAM Mobile Client

A Field Xpert SMT70 tablet (field device configurator) can be used as a PAM Mobile Client for mobile device configuration and monitoring. The PAM Mobile Client can easily be connected to a PAM Gateway.

See <https://www.endress.com/smt70> for further information.

### 6.1 Network requirements

#### 6.1.1 Ports used

8303	TCP	Inbound	DTM communication between PAM Gateway and PAM Clients
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#### 6.1.2 IP configuration

The PAM Mobile Client must be in the same IP range as the Asset Health Monitor server and the PAM Gateways. A fixed IP address is not required.

## 7 Asset Health Monitor (Health app)

The Asset Health Monitor software (AHM) is a web-based application that collects field device status information from one or more PAM Gateways and displays it on a website.

### 7.1 Software prerequisites

The list below shows only the most important software components. Additional software not listed here will be installed during system configuration/commissioning.

IIS (Internet Information Services) including ASP.NET 4.x
PostgreSQL database (installed during setup)
Compatible browsers: Chrome, Firefox, Safari or Edge

### 7.2 Hardware prerequisites

Processor	CPU Intel® Xeon®, at least 2 GHz or better, with at least 8 cores
RAM	16 GB RAM or more
Hard drive storage	100 GB or more
Connectivity	Ethernet 1 Gbit

The use of virtual machines is possible. The Asset Health Monitor can also be installed on the server on which the PAM Gateway is running (where only 1 PAM Gateway is in use in the project).

### 7.3 Network requirements

The Asset Health Monitor automatically searches for one or more PAM Gateways in the same subnet.

The Asset Health Monitor server, the PAM Gateways and the PAM Clients/PAM Mobile Clients must be in the same IP range.
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#### 7.3.1 Ports used

80	TCP	Inbound	Web server
443	TCP	Inbound	Web server (TLS)

#### 7.3.2 IP configuration

A fixed IP address allocation is required
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## 8 PAM Gateway

The PAM Gateway connects to the field devices and provides a central access point for the PAM Client or PAM Mobile Client.

### 8.1 Software prerequisites

The list below shows only the most important software components. Additional software not listed here will be installed during system configuration/commissioning.

#### 8.1.1 FieldCare SFE500

- FieldCare requires .NET Framework 3.5
- FieldCare version 2.17 or higher is necessary

##### 8.1.1.1 SQL database

FieldCare requires an SQL database. As standard, an MS SQL Server 2014 Express instance is installed automatically during the installation of FieldCare.

If necessary, FieldCare can be operated with a more recent MS SQL server. Possible support for other MS SQL server versions must be clarified if necessary. In this case, a suitable prepared SQL instance must be provided before the installation of FieldCare.

#### Note:

- The SQL database must always be on the machine on which the FieldCare is going to be installed (remote SQL databases are not supported).
- After the installation of FieldCare, it is **not possible** to change to a more recent MS SQL server version.

##### 8.1.1.2 FieldCare SFE500 license

The FieldCare license for the PAM Gateway must also contain condition monitoring tags in addition to the device tags.

#### 8.1.2 DTM library

Only CommDTMs need to be installed, no device DTMs necessary.

#### 8.1.3 FactoryTalk Linx

FactoryTalk Linx is required for connecting to the backplanes of Rockwell systems with HART input cards

### 8.2 Hardware prerequisites

Processor	CPU Intel® Xeon®, at least 2 GHz or better, with at least 8 cores
RAM	16 GB RAM or more
Hard drive storage	100 GB or more
Connectivity	Ethernet 1 GBit

The use of virtual machines is possible.

## 8.3 Network requirements

### 8.3.1 Ports used

8302	TCP	Inbound	DTM communication between PAM Gateway and PAM Clients/PAM Mobile Clients
1433	TCP	Inbound	SQL database access from the AHM server. The port is not needed when the PAM Gateway and the Asset Health Monitor are installed on the same server.
1434	UDP	Inbound	SQL database access from the AHM server. The port is not needed when the PAM Gateway and the Asset Health Monitor are installed on the same server.

### 8.3.2 IP configuration

A fixed IP address allocation is required