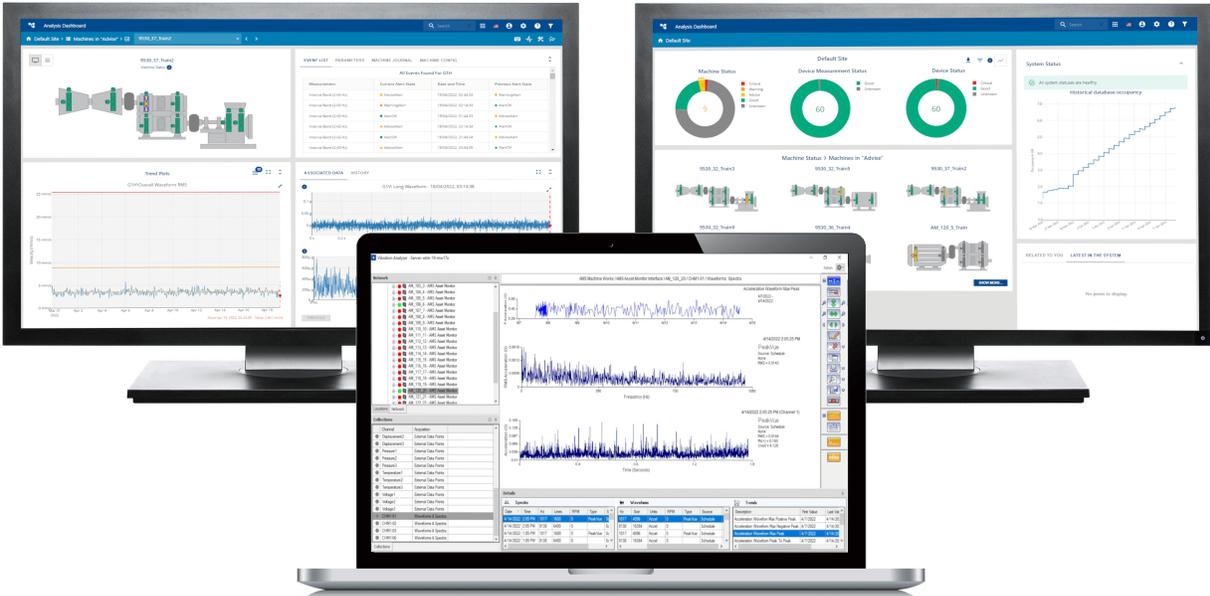


# AMS Machine Works v1.7

## System Guide



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<b>Email</b>	<a href="mailto:Guardian.GSC@Emerson.com">Guardian.GSC@Emerson.com</a>
<b>Web</b>	<a href="http://www.emerson.com/en-us/contact-us">http://www.emerson.com/en-us/contact-us</a>

To search for documentation on AMS Machinery Manager, visit <https://www.emerson.com/en-us/catalog/ams-ams-machinery-manager>.

To view toll free numbers for specific countries, visit <http://www.emerson.com/technicalsupport>.

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# 1 Introduction

AMS Machine Works is Emerson's next generation machinery analysis software which combines state-of-the-art technology and predictive maintenance techniques with comprehensive vibration analysis tools to provide easy and accurate assessment of machinery health in your facility.

AMS Machine Works helps to improve safety and increase profitability by providing a modern software solution capable of predicting faults before they happen and saving you from the costs associated with unplanned downtime.

## What's in this installation

This version of AMS Machine Works comes with a single installer that will provide options to install all the AMS Machine Works web components and interfaces. All of the interfaces are distributable. Some of the web components are also distributable depending on the networking requirements. Refer to this guide for more details.

## Other installation options

AMS Machine Works must be deployed on a separate server from Plantweb Optics. Customers who would like to benefit from the additional features of Plantweb Optics such as Asset View, Plantweb Optics Mobile, CMMS Connectivity, Plantweb Optics Historian and combine multiple data sources should consider licensing AMS Machine Works Data Collector to connect AMS Machine Works to Plantweb Optics. Refer to the Plantweb Optics System Guide for more information.

## About this manual

This guide is intended for system administrators to help plan, install, and set up the software. Emerson recommends that system administrators refer to this document when setting up the system.

## Other relevant documents

- Online Help – provides instructions and reference information for using the software after installation. This is built into the software and accessed by clicking  in the user toolbar
- Release Notes – contains what is new and notes pertaining to the release
- Knowledge Base Articles (KBA) – documents published to address known issues, frequently asked questions, history traces, system requirements, how-to information, and application-specific content

## 1.1 Symbols

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### Note

This symbol marks passages that contain important information.

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**⚠ CAUTION**

This symbol marks operations that can lead to malfunctions or faulty measurements, but will not damage the device.

---

## 2 Installation overview

For an optimum system, follow this recommended installation process for a new system. This is a summary of the installation procedure. Refer to [Installation procedures](#) for the full installation procedure.

---

### Note

Some components must be installed, and some are optional depending on the user's needs and licensing.

---

### 2.1 Preparing for AMS Machine Works installation

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#### Note

The installations have prompts for information about the location of other services. Before you run the installation wizards on each server, you need to have all the information about where the services will be installed.

---

#### Procedure

1. Design and plan your system. See [Planning your system](#).
2. Ensure all of the system requirements are met for all required components. See [System requirements](#).
3. Ensure all security requirements have been met. See [AMS Machine Works security](#).

### 2.2 Installing AMS Machine Works

This is a general overview of the installation process. Refer to [Installation procedures](#) for the full installation procedure.

#### Procedure

1. Install AMS Machine Works standalone installation. Unzip the `Install_1.7.X.X.zip` file on the AMS Machine Works server. Refer to [Installation procedures](#) for the detailed steps.
2. Install AMS Machine Works server certificate on any AMS Machine Works Interface servers and PCs. See [Install certificates](#).

#### **⚠ CAUTION**

If you are performing a distributed installation, install the AMS Machine Works server certificate on the computer before you install components on separate servers. If you do not install the certificate first, the necessary services will not start automatically after installation. The certificate is required for secure communication.

---

3. Extract the installation zip file on each server that requires a separate component to be installed. Run the installation wizard on the server and only select the options to be installed on that server.

4. Register your licenses from the User Manager utility. See [AMS Machine Works Post Installation](#).
5. View **License Summary** from the User Manager.

## 2.3 Register the License

After you install the software and before you log in the first time, you will be prompted to register the software. During the registration process, the software will display a machine fingerprint code that you need to send to Emerson. Emerson will then provide you with a registration file.

## 2.4 Completing AMS Machine Works post-installation steps

Next, complete configuration and set up the system for use. Refer to the sections indicated or the AMS Machine Works 1.7 User Guide and the AMS Machine Works 1.7 Online Help for more information.

### Procedure

1. Configure Active Directory. This is optional, recommended only if you need to connect your user account to Active Directory. See [Configure AMS Machine Works OIDC settings](#).
2. Connect to devices and asset sources in the Asset Explorer utility in the Network tab. Refer to the Online Help for procedures.
3. If you need to connect an OPC UA client, first install OPC UA Server and then launch an OPC Client and select **Connect to OPC Server**. See [Connect to OPC server](#).

You are now ready to start using AMS Machine Works.

## 3 Planning your system

AMS Machine Works is comprised mainly of two components, AMS Machine Works web components and interface components. The components can be installed on the same server or different servers depending on the deployment scenario, network requirements, and setup.

Before you install any of the system components, plan your installation using the system requirements, recommended system deployment scenarios, and the guidelines provided in this chapter.

After designing and planning your system, return to [Step 1](#) of the [Preparing for AMS Machine Works installation](#) topic and continue your installation.

### 3.1 Guidelines for planning your system

#### Procedure

1. Determine the data sources that you want to bring into AMS Machine Works and check if they are compatible. See [Device compatibility](#).  
Depending on the type of data source, install the appropriate interface to bring the right data source into AMS Machine Works. See [Software components](#).
2. Confirm the system will not exceed scalability limitations. See [System scalability](#).
3. Determine your network setup.  
Your network setup affects the deployment of the AMS Machine Works components. See [Deployment diagrams](#).
4. Determine any network architecture restrictions in your network.  
Your network architecture affects what firewall exceptions you need to define. See [Firewall considerations](#).
5. Determine your database requirements.  
The AMS Machine Works database can either reside on a separate SQL server (Standard Installation) or on the AMS Machine Works server (Limited Storage Installation). See [Database deployment](#).
6. Check the [System requirements](#).
7. Check [Internet Information Services \(IIS\)](#) requirements.
8. Plan to integrate security certificate installation with software installation. See [AMS Machine Works Certificate installation checklist](#).
9. Ensure any systems you plan to interface with AMS Machine Works are ready.
  - a) Before interfacing AMS 6500 ATG devices with AMS Machine Works, ensure a supported version of AMS Machine Studio is installed and ensure the devices have been fully configured, including any data you want to bring into AMS Machine Works. Refer to *KBA NK-1900-0985: AMS Machine Works Guide for preparing AMS 6500 ATG systems* for more information.
  - b) Before interfacing Ovation Machinery Health Waveform Recorder (OMHM) with AMS Machine Works, ensure the modules are completely configured in

Ovation Developer Studio including the data you want to bring into AMS Machine Works. You also need to install the Ovation Machinery Health Waveform Recorder on each Interface Server that will be used with Ovation. See *OVDAPS02 Ovation Machinery Health Waveform Recorder User Guide* for instructions to install this software.

- c) Before interfacing Emerson Wireless Gateway devices with AMS Machine Works, ensure the devices are configured for data collection with AMS Device Manager or a Field Communicator such as AMS TREX.
  - d) Before interfacing AMS Asset Monitor devices with AMS Machine Works, access the AMS Asset Monitor Web Interface and ensure that the device has been fully configured, the AMS Machine Works Interface is enabled and that an AMS Machine Works user is created.
10. Determine if you need to read data from AMS Machine Works using an [OPC UA Server](#) client.

## 3.2 How to use the installer

The zip file `Install_1.7.X.X.zip` contains all the installations for the AMS Machine Works v1.7 software distribution. You will need to unzip the file to the root location, such as C, on each server you plan to install any component of AMS Machine Works. Also, do not unzip the file or run the setup from a network folder. On each server, run `setup.exe` and only select the necessary options for install on each server where you perform an installation.

---

### Note

Emerson recommends placing the file on a root location such, as C, to avoid any file paths that are too long during installation, which would cause the installation to fail.

---

After download, you need to unblock the zip file. Right-click the file you downloaded, and select **Properties**. In the **General** tab, click **Unblock**. If the zip file is not unblocked, when you unzip the file and run the installation, you will see an "Unhandled Exception" error and the setup will terminate.

There are several cases in which you can run the installer:

1. Initial installation. Run the installer and select all the components to install on your system. See [Installation procedures](#) for more information.
2. Install and register a new interface. After setting up your system, if you need to add a new interface, you need to register the interface on the AMS Machine Works server. Run the installer, select modify, and select the interface to register. Then install the interface on the AMS Machine Works server, or the AMS Machine Works Interface server, depending on your deployment.
3. Uninstall the software. See [Uninstall AMS Machine Works](#) for more information.

## 3.3 Windows updates

If permitted by your IT department, pause or disable Windows Updates (as well as other automatic updates on your server) for the duration of the installation. This reduces the

number of potential restarts during installation. It is normal to have several restarts during installation. However, if automatic updates are enabled with other applications, especially Windows Updates, there can be over 10 reboots during the installation, depending on the installed programs and the timing of the automatic updates. If it is not possible to pause automatic updates, it can help to first check for updates and apply them before installing AMS Machine Works.

## 3.4 Database deployment

During installation, the system database is configured and the user performing the installation is set up as the SQL database administrator.

By default, the user installing the software is set up as the SQL administrator for the EmersonMW instance. As a best practice, immediately after installation, work with your IT department to add a second SQL administrator for the EmersonMW instance. If there is only one administrator, and that Windows account becomes deactivated, it will not be possible to perform maintenance or make changes to the database instance.

The two database installation choices are described in the sections below, please refer to [Table 3-30](#) for which option is recommended.

### If you plan to use a separate Microsoft SQL Server dedicated to AMS Machine Works

During installation, after selecting **Standard**, the database is deployed on a separate server where a full version of Microsoft SQL Server 2017 or 2019 is already installed and dedicated to AMS Machine Works. A Standard installation requires specific server configuration and database management by a database administrator. Standard installation is the default configuration and represents the recommended network server system. Automatic backup processing is not available for this installation; the database, including backups, should be managed by a database administrator. See [SQL Server Installation](#) for installation instructions.

- The database must be Microsoft SQL Server 2017 or Microsoft SQL Server 2019 and dedicated to AMS Machine Works
- Create the EmersonMW named instance before beginning the AMS Machine Works installation. The user installing should be a system administrator for the EmersonMW named instance
- The EmersonMW named instance needs to be set up for mixed authentication—Windows and SQL accounts
- Enable TCP/IP protocol for EmersonMW SQL Server Network Configuration
- Ensure the SQL Browser service is running and set it to auto-start

### If you plan to use Microsoft SQL Server Express provided with AMS Machine Works

During installation, after selecting **Limited Storage**, the database is deployed on the same server as the software and Microsoft SQL Server 2017 Express is automatically installed during installation. Automatic backup processing is available for this installation. See [page 137](#) for more information.

- Check Windows Programs and Features to verify that Microsoft SQL Server is not currently installed. If it is installed, uninstall it. During a Limited Storage installation,

Microsoft SQL Server 2017 Express is automatically installed and configured, select **Limited Storage** at the database prompt to use this software

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**Note**

There is a 10 GB database limit on Microsoft SQL Server 2017 Express. Scalar data is stored within the database and the analytical data is stored outside the database as filestream (a SQL Server feature that stores data in the file system).

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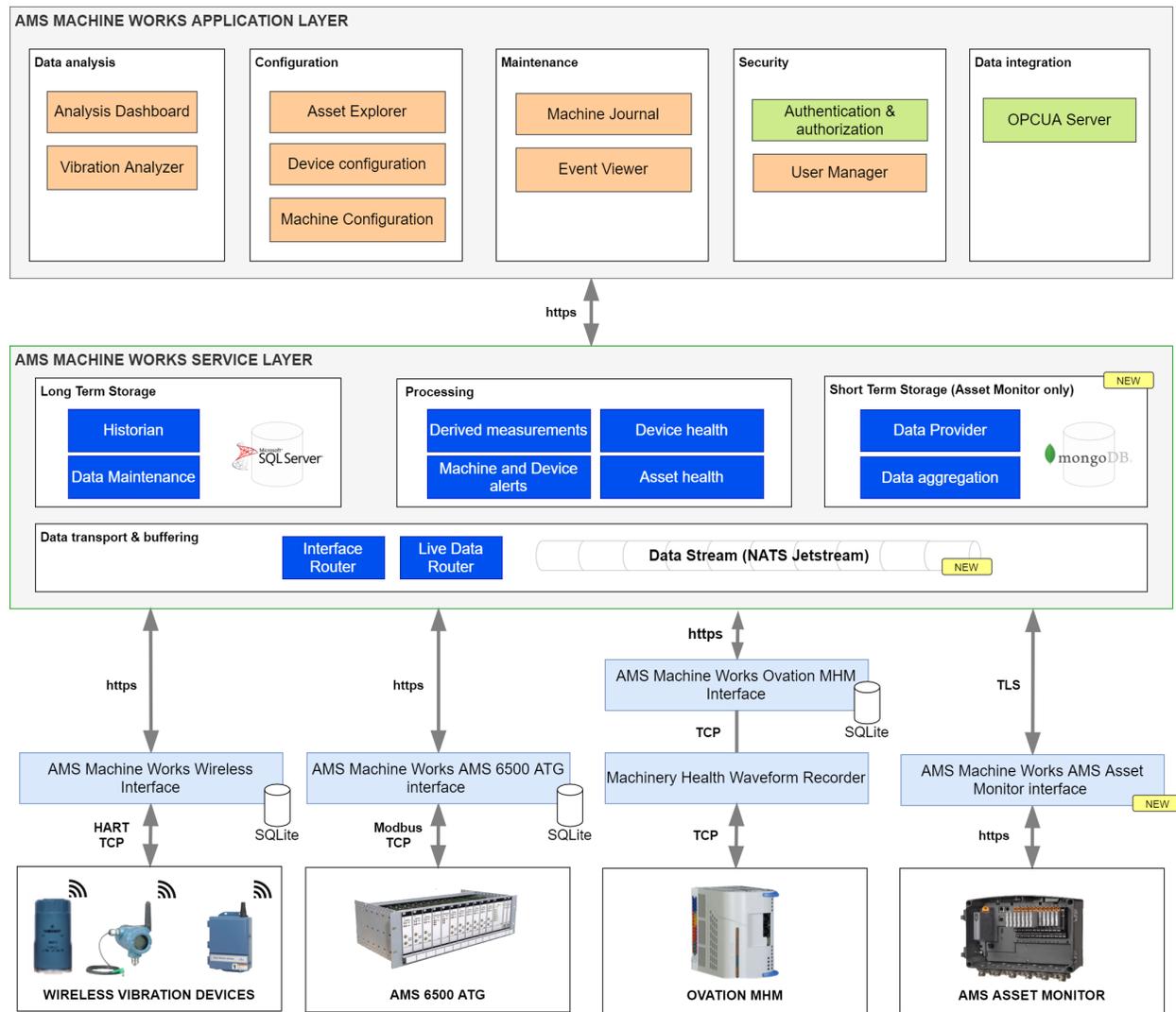
- The EmersonMW named instance is automatically created with the AMS Machine Works installation when there is no existing Microsoft SQL Server installation
- The user installing AMS Machine Works will be a system administrator for the EmersonMW named instance
- The EmersonMW named instance is set up for mixed authentication—Windows and SQL accounts

## 3.5 Internet Information Services (IIS)

- During default installation, IIS is automatically installed and configured to use the Default Site (port 80 and 443)
- If port 80 and 443 are already in use by a previous installation of IIS, you can delete the Default Site (if unused) or configure it to use other ports. See [page 143](#) for instructions
- You can also use non-default ports if your existing system and network requires it. Your network administrator must configure firewall rules to allow traffic to pass through the non-default ports. It is best practice to use ports above 1024 and to use non-restricted ports

## 3.6 System architecture

Figure 3-1: AMS Machine Works Architecture



## 3.7 Software components

AMS Machine Works must be installed on a computer with a server-class operating system.

Client stations access most AMS Machine Works applications from a web browser. However, if detailed machine analysis is required from a client station, the Vibration Analyzer application must be installed.

AMS Machine Works is comprised of many components, described in the tables below. A typical installation involves installing all the core web components in Table 3-1 on one server and installing interface components in Table 3-2, if needed, on another server.

**Table 3-1: AMS Machine Works core software components**

Component	Description
AMS Machine Works Web Services	The AMS Machine Works Web Services provide the essential software components and interfaces to Device Configuration, Machine Configuration, AMS Machine Works Dashboard, and Machine Journal. AMS Machine Works Web Service allows you to create machines in Asset Explorer, perform machine analysis and diagnostics, and maintain case history in AMS Machine Journal. It obtains data from other components, which can be installed on the same server or different servers.
AMS Machine Works Historian	AMS Machine Works Historian is a web service that keeps records of long-term data so you can analyze the trends in vibration data.
AMS Machine Works Interface Router	AMS Machine Works Interface Router is a web service that directs vibration data traffic into the AMS Machine Works Historian.
AMS Machine Works Vibration Analyzer	The Vibration Analyzer is a thick-client web application you can use to perform detailed analysis on vibration data stored in the long-term historian. It can be installed on the AMS Machine Works Server or separately installed on any client computer that will be used for detailed analysis of vibration data.

AMS Machine Works Web services includes all the prerequisite software such as the Microsoft .NET framework, Microsoft Visual C++ Redistributable, and the Embedded Platform Component with AMS Machine Works Web Services.

Though some of the core components are distributable, in most of the cases; all these web components are installed together in one server and they constitute the AMS Machine Works server software.

**Table 3-2: AMS Machine Works interface components (Windows services)**

Component	Description
AMS Machine Works Ovation MHM Interface <sup>1</sup>	AMS Machine Works Ovation MHM Interface is a windows service that interacts with the Ovation Machinery Health Waveform Recorder of an Ovation system to allow you to collect prediction data from Ovation MHM modules. The Ovation MHM Interface is always installed on the same server as the Ovation Machinery Health Waveform Recorder, separately from the AMS Machine Works core services.
AMS Machine Works Wireless Interface <sup>1</sup>	AMS Machine Works Wireless Interface is a windows service that brings data into AMS Machine Works from wireless devices such as the AMS 9420 Wireless Vibration Transmitter and the AMS Wireless Vibration Monitor.
AMS Machine Works AMS 6500 ATG Interface <sup>1</sup>	AMS Machine Works AMS 6500 ATG Interface is a windows service that brings data into AMS Machine Works from an AMS 6500 ATG.
AMS Asset Monitor Interface <sup>1</sup>	AMS Asset Monitor Interface Service allows you to bring data into AMS Machine Works from an AMS Asset Monitor.

<sup>1</sup> If installed on a separate server, the certificate must be exported and installed on the AMS Machine Works server.

These interface software components are distributable. In most cases, they are installed on a separate interface server.

---

**Note**

Emerson recommends installing only the components you are licensed to use to avoid unnecessarily using system resources.

---

## 3.8 Deployment diagrams

In general, there are two broad types of deployments, each with several installation scenarios:

- AMS Machine Works on a Single Server Deployment
- AMS Machine Works on a Distributed Server Deployment

Each of the deployment types can have a combination of AMS Asset Monitor Interface, AMS 6500 ATG Interface and Wireless Interface. The Ovation MHM Interface requires a distributed server deployment and a dedicated AMS Machine Works system. The following interface combinations are supported in AMS Machine Works. Any combinations not listed are not supported.

- AMS 6500 ATG Interface only
- Ovation MHM Interface only
- Wireless Interface only
- AMS Asset Monitor Interface only
- AMS Asset Monitor Interface, AMS 6500 ATG Interface, and Wireless Interface

The deployments are described in the following sections, and are numbered as follows to indicate the types of server deployments:

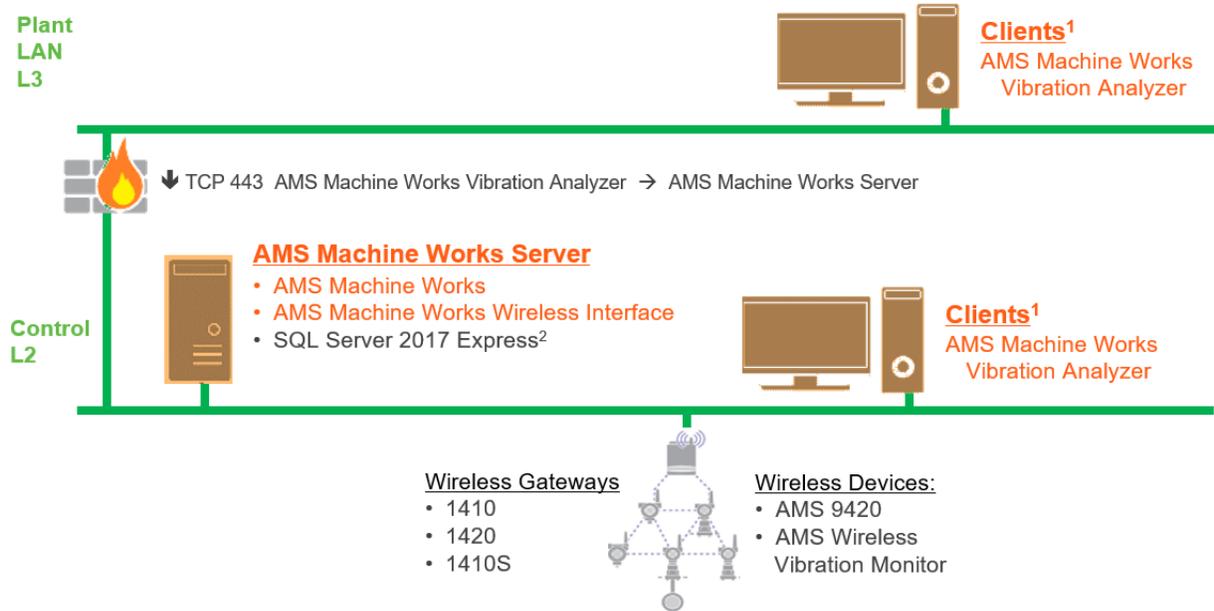
1. Single Server Deployment
2. Distributed Server Deployment
3. Distributed Server Deployment on a 3 level network
4. Cloud Deployment

A letter follows the number when there are multiple options for the type of deployment.

### 3.8.1 1A: AMS Machine Works with wireless devices

This single server deployment shows the AMS Machine Works server with the AMS Machine Works Wireless Interface and is only recommended for temporary proof of concept installations.

Figure 3-2: 1A: AMS Machine Works with wireless devices



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

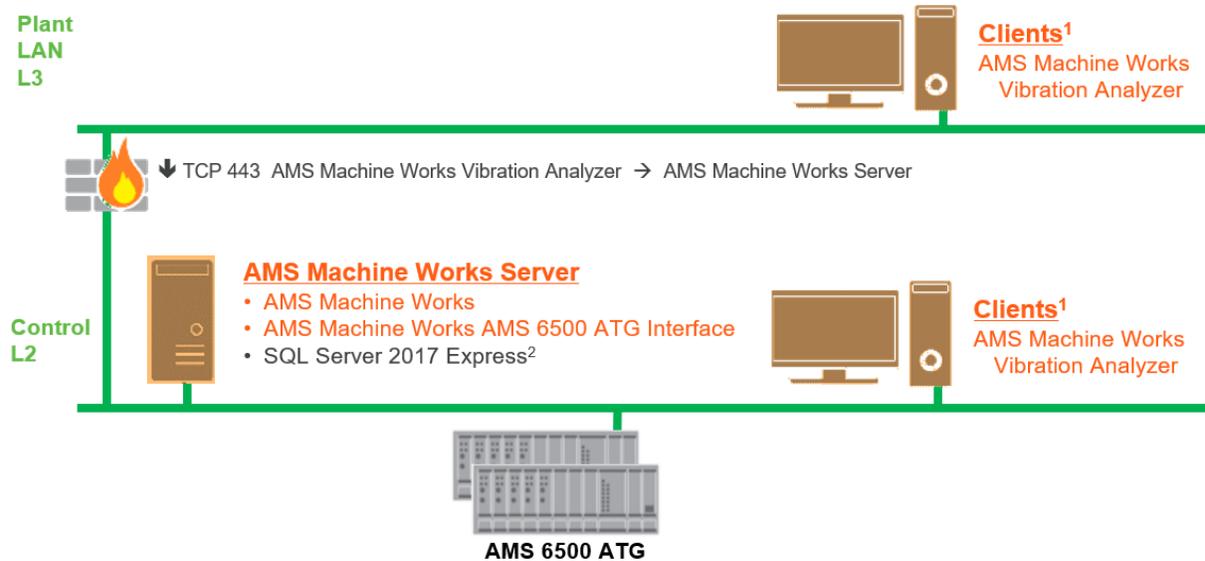
Table 3-3: 1A: AMS Machine Works with wireless devices

Station	Component	Certificate installation notes
<b>AMS Machine Works Server</b>	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router AMS Machine Works Wireless Interface	AMS Machine Works server certificate with private key is automatically generated during software installation. SQL 2017 Express (installed by default when Limited Storage is selected)
<b>Clients</b>	AMS Machine Works Vibration Analyzer Browser applications	AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser. Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
<b>Wireless Gateway</b>	Wireless Gateway	None.

### 3.8.2 1B: AMS Machine Works with AMS 6500 ATG

This single server deployment shows the AMS Machine Works server with the AMS Machine Works AMS 6500 ATG Interface and is only recommended for temporary proof of concept installations.

Figure 3-3: 1B: AMS Machine Works with AMS 6500 ATG



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

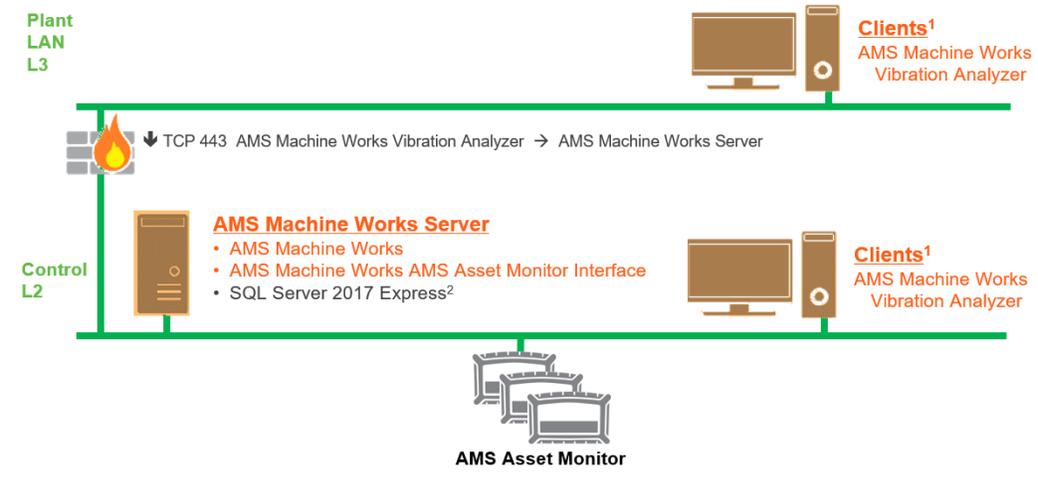
Table 3-4: 1B: AMS Machine Works with AMS 6500 ATG

Station	Component	Installation notes
AMS Machine Works Server	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router AMS Machine Works AMS 6500 ATG Interface	AMS Machine Works server certificate with private key is automatically generated during software installation. SQL 2017 Express (installed by default when Limited Storage is selected)
Clients	AMS Machine Works Vibration Analyzer Browser applications	AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser. Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
AMS 6500 ATG	AMS 6500 ATG	AMS 6500 ATG needs firmware update to take advantage of better performance. Requires non-SIL rated firmware; latest firmware and latest AMS Machine Studio .

### 3.8.3 1C: AMS Machine Works with AMS Asset Monitor

This single server deployment shows the AMS Machine Works server with the AMS Machine Works AMS Asset Monitor Interface and is only recommended for temporary proof of concept installations.

**Figure 3-4: 1C: AMS Machine Works with AMS Asset Monitor**



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

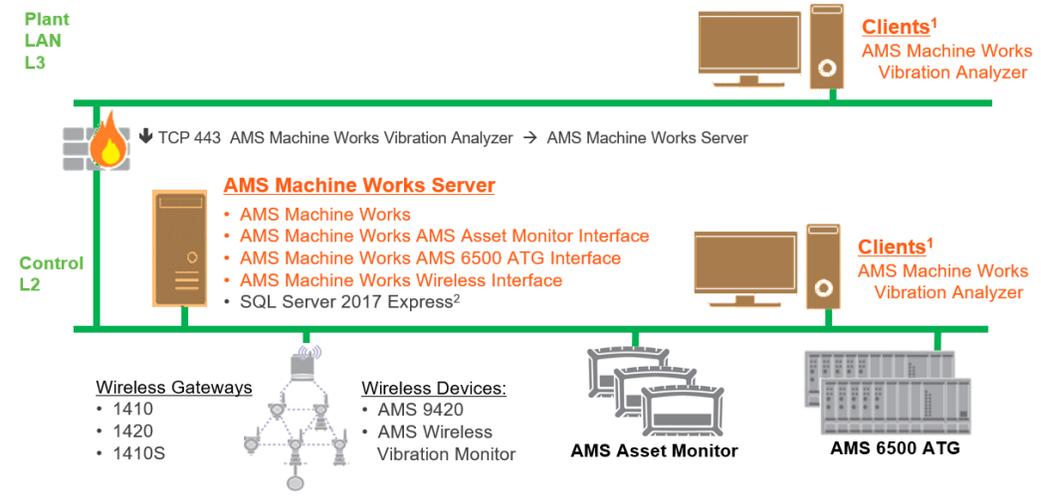
**Table 3-5: 1C: AMS Machine Works with AMS Asset Monitor**

Station	Component	Installation notes
<b>AMS Machine Works Server</b>	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router AMS Machine Works AMS Asset Monitor Interface Service	AMS Machine Works server certificate with private key is automatically generated during software installation. SQL 2017 Express (installed by default when Limited Storage is selected)
<b>Clients</b>	AMS Machine Works Vibration Analyzer Browser applications	AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser. Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
<b>AMS Asset Monitor</b>	AMS Asset Monitor	None.

### 3.8.4 1D: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices

This single server deployment shows the AMS Machine Works server with the AMS Asset Monitor Interface, AMS 6500 ATG interface and Wireless interface, and is only recommended for temporary proof of concept installations.

**Figure 3-5: 1D: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices**



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

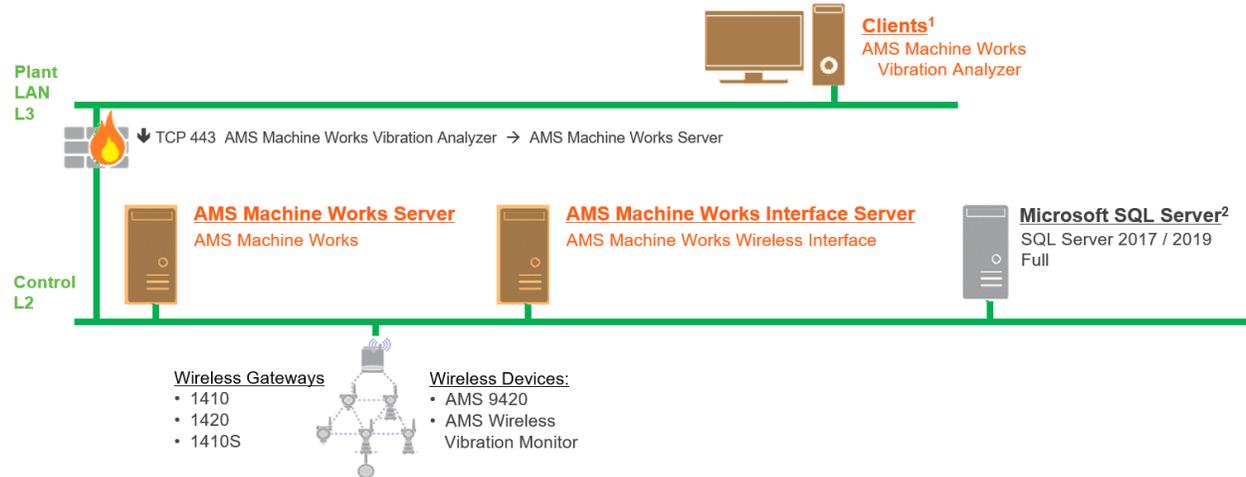
**Table 3-6: 1D: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices**

Station	Component	Certificate installation notes
<b>AMS Machine Works Server</b>	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router AMS Machine Works Wireless Interface AMS Machine Works AMS 6500 ATG Interface AMS Machine Works AMS Asset Monitor Interface	AMS Machine Works server certificate with private key is automatically generated during software installation. SQL 2017 Express (installed by default when Limited Storage is selected)
<b>Clients</b>	AMS Machine Works Vibration Analyzer Browser applications	AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser. Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
<b>AMS 6500 ATG</b>	AMS 6500 ATG	AMS 6500 ATG needs firmware update to take advantage of better performance. Requires non-SIL rated firmware; latest firmware and latest AMS Machine Studio .
<b>AMS Asset Monitor</b>	AMS Asset Monitor	None.
<b>Wireless Gateway</b>	Wireless Gateway	None.

### 3.8.5 2A: AMS Machine Works with wireless devices

This deployment shows the AMS Machine Works server and an AMS Machine Works Interface server dedicated to wireless devices.

**Figure 3-6: 2A: AMS Machine Works with wireless devices**



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

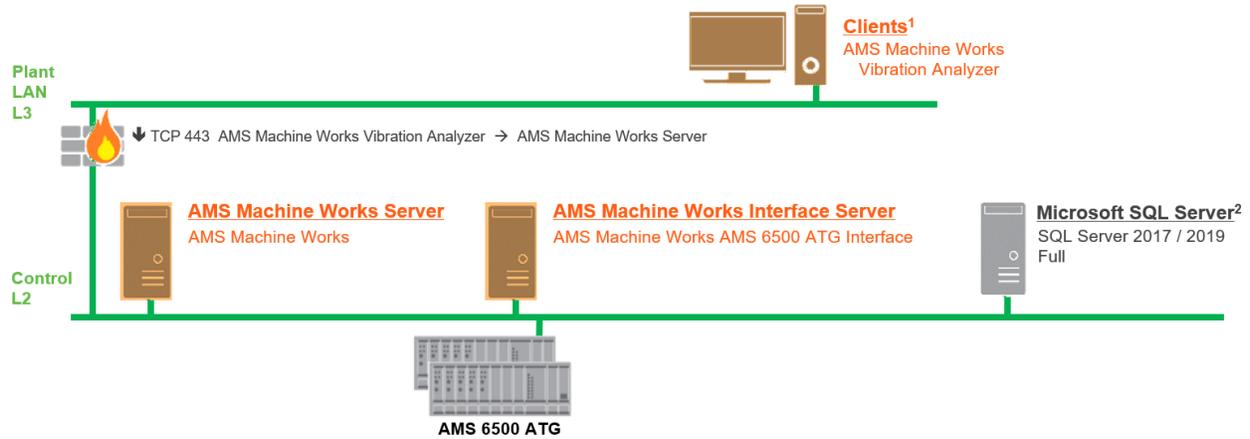
**Table 3-7: 2A: AMS Machine Works with wireless devices**

Station	Component	Certificate installation notes
AMS Machine Works Server	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	<ul style="list-style-type: none"> <li>AMS Machine Works Server certificate with private key is automatically generated during software installation.</li> <li>AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> <li>AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> </ul> SQL 2017 Express (installed by default when Limited Storage is selected)
Clients	AMS Machine Works Vibration Analyzer Browser applications	<ul style="list-style-type: none"> <li>AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.</li> </ul> Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
AMS Machine Works Interface Server	AMS Machine Works Wireless Interface	<ul style="list-style-type: none"> <li>AMS Machine Works Interface certificate with private key is generated during ASI installation.</li> </ul>
Wireless Gateway	Wireless Gateway	None.

### 3.8.6 2B: AMS Machine Works with AMS 6500 ATG

This deployment shows the AMS Machine Works server and an AMS Machine Works Interface server dedicated to AMS 6500 ATG devices.

Figure 3-7: 2B: AMS Machine Works with AMS 6500 ATG



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

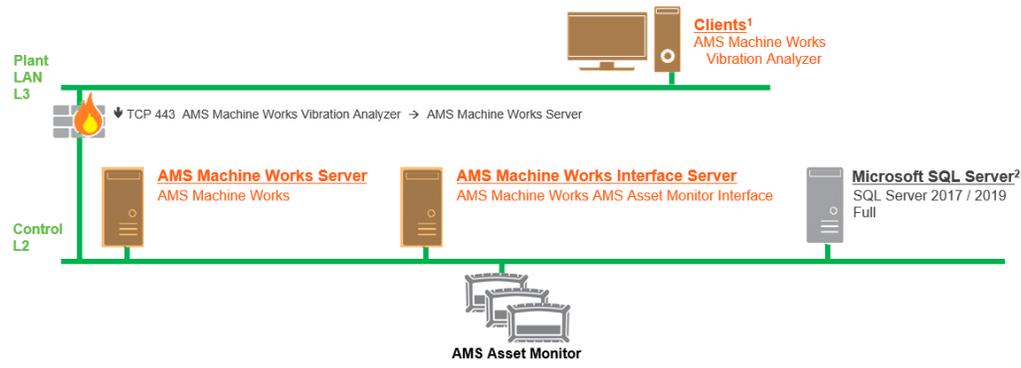
Table 3-8: 2B: AMS Machine Works with AMS 6500 ATG

Station	Component	Certificate installation notes
AMS Machine Works Server	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	<ul style="list-style-type: none"> <li>🔑 AMS Machine Works Server certificate with private key is automatically generated during software installation.</li> <li>🔑 AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> <li>🔑 AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> </ul> SQL 2017 Express (installed by default when Limited Storage is selected)
Clients	AMS Machine Works Vibration Analyzer Browser applications	<ul style="list-style-type: none"> <li>🔑 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.</li> </ul> Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
AMS Machine Works Interface Server	AMS Machine Works AMS 6500 ATG Interface	<ul style="list-style-type: none"> <li>🔑 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.</li> <li>🔑 AMS Machine Works Interface certificate with private key is generated during installation.</li> </ul>
AMS 6500 ATG	AMS 6500 ATG	AMS 6500 ATG needs firmware update to take advantage of better performance. Requires non-SIL rated firmware; latest firmware and latest AMS Machine Studio .

### 3.8.7 2C: AMS Machine Works with AMS Asset Monitor

This deployment shows the AMS Machine Works server and an AMS Machine Works Interface server dedicated to AMS Asset Monitor devices.

**Figure 3-8: 2C: AMS Machine Works with AMS Asset Monitor**



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

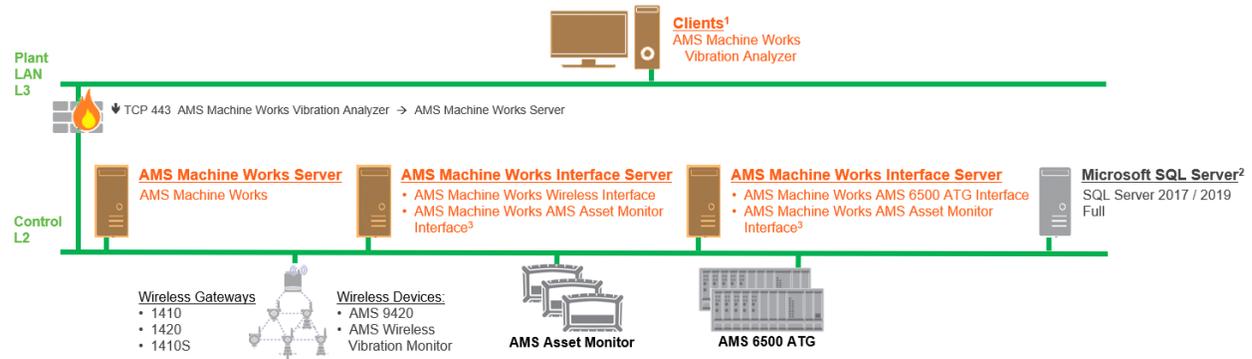
**Table 3-9: 2C: AMS Machine Works with AMS Asset Monitor**

Station	Component	Certificate installation notes
<b>AMS Machine Works Server</b>	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	<ul style="list-style-type: none"> <li> AMS Machine Works Server certificate with private key is automatically generated during software installation.</li> <li> AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> <li> AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> </ul> SQL 2017 Express (installed by default when Limited Storage is selected)
<b>Clients</b>	AMS Machine Works Vibration Analyzer Browser applications	<ul style="list-style-type: none"> <li> AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.</li> </ul> Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
<b>AMS Machine Works Interface Server</b>	AMS Machine Works AMS Asset Monitor Interface	<ul style="list-style-type: none"> <li> AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.</li> <li> AMS Machine Works Interface certificate with private key is generated during installation.</li> </ul>
<b>AMS Asset Monitor</b>	AMS Asset Monitor	None.

### 3.8.8 2D: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices

This deployment shows the AMS Machine Works server and two AMS Machine Works Interface servers with potential combinations of AMS Asset Monitor, AMS 6500 ATG and wireless devices.

**Figure 3-9: 2D: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices**



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server
3. AMS Asset Monitor Interface can be deployed on a server with other Interfaces or on its own, but only one is required

**Table 3-10: 2D: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices**

Station	Component	Certificate installation notes
AMS Machine Works Server	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	<ul style="list-style-type: none"> <li>AMS Machine Works Server certificate with private key is automatically generated during software installation.</li> <li>AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> <li>AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> </ul> SQL 2017 Express (installed by default when Limited Storage is selected)
Clients	AMS Machine Works Vibration Analyzer Browser applications	<ul style="list-style-type: none"> <li>AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.</li> </ul> Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
AMS Machine Works Interface Server	AMS Machine Works AMS 6500 ATG Interface AMS Machine Works AMS Asset Monitor Interface	<ul style="list-style-type: none"> <li>AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.</li> <li>AMS Machine Works Interface certificate with private key is generated during installation.</li> </ul>
AMS Machine Works Interface Server	AMS Machine Works Wireless Interface	<ul style="list-style-type: none"> <li>AMS Machine Works Interface certificate with private key is generated during ASI installation.</li> </ul>

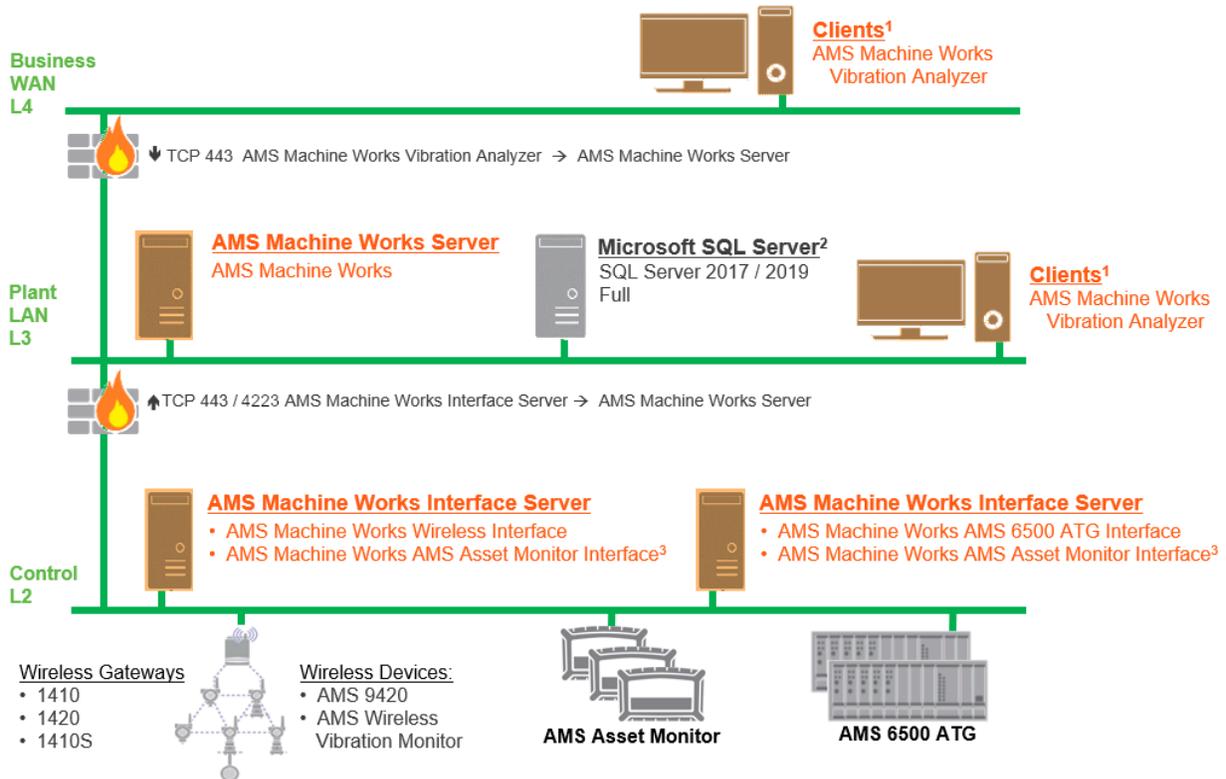
**Table 3-10: 2D: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices (continued)**

<b>Station</b>	<b>Component</b>	<b>Certificate installation notes</b>
<b>AMS 6500 ATG</b>	AMS 6500 ATG	AMS 6500 ATG needs firmware update to take advantage of better performance. Requires non-SIL rated firmware; latest firmware and latest AMS Machine Studio .
<b>AMS Asset Monitor</b>	AMS Asset Monitor	None.
<b>Wireless Gateway</b>	Wireless Gateway	None.

### 3.8.9 3A: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices

This 3 level network deployment shows the AMS Machine Works server and two AMS Machine Works Interface servers, with potential combinations of AMS Asset Monitor, AMS 6500 ATG and wireless devices.

Figure 3-10: 3A: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server
3. AMS Asset Monitor Interface can be deployed on a server with other Interfaces or on its own, but only one is required

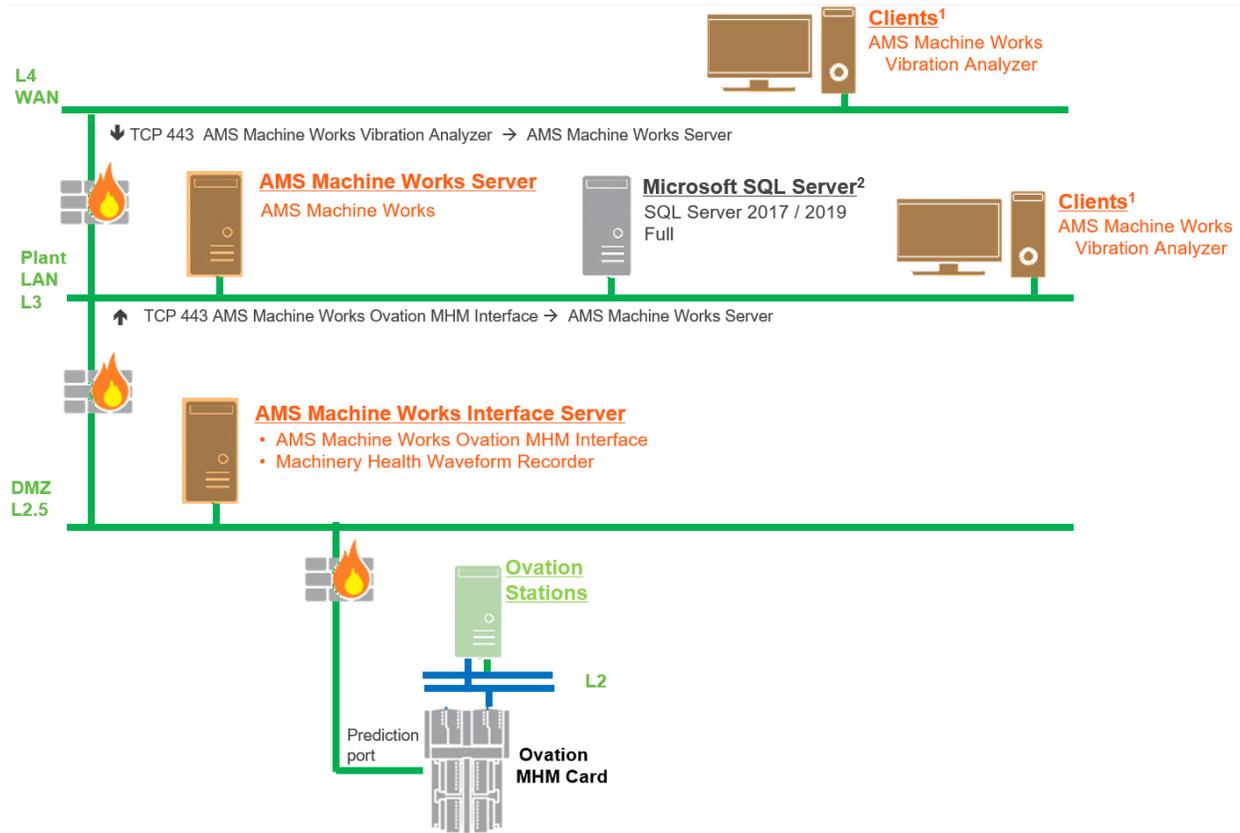
**Table 3-11: 3A: AMS Machine Works with AMS Asset Monitor, AMS 6500 ATG and wireless devices**

Station	Component	Certificate installation notes
<b>AMS Machine Works Server</b>	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	 AMS Machine Works Server certificate with private key is automatically generated during software installation.  AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.  AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file. SQL 2017 Express (installed by default when Limited Storage is selected)
<b>Clients</b>	AMS Machine Works Vibration Analyzer Browser applications	 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser. Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
<b>AMS Machine Works Interface Server</b>	AMS Machine Works AMS 6500 ATG Interface AMS Machine Works AMS Asset Monitor Interface	 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.  AMS Machine Works Interface certificate with private key is generated during installation.
<b>AMS Machine Works Interface Server</b>	AMS Machine Works Wireless Interface	 AMS Machine Works Interface certificate with private key is generated during ASI installation.
<b>AMS 6500 ATG</b>	AMS 6500 ATG	AMS 6500 ATG needs firmware update to take advantage of better performance. Requires non-SIL rated firmware; latest firmware and latest AMS Machine Studio .
<b>AMS Asset Monitor</b>	AMS Asset Monitor	None.
<b>Wireless Gateway</b>	Wireless Gateway	None.

### 3.8.10 3B1: AMS Machine Works with Ovation Machinery Health Monitor

This 3 level network deployment shows the AMS Machine Works server and AMS Machine Works Interface server dedicated to Ovation Machinery Health Monitor devices.

**Figure 3-11: 3B1: AMS Machine Works with Ovation Machinery Health Monitor**



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

**Table 3-12: 3B1: AMS Machine Works with Ovation Machinery Health Module**

Station	Component	Certificate installation notes
AMS Machine Works Server	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	<ul style="list-style-type: none"> <li>AMS Machine Works server certificate with private key is automatically generated during software installation.</li> <li>AMS Machine Works Interface server certificate with private key is generated during installation. Install from a file.</li> <li>AMS Machine Works Interface server certificate with private key is generated during installation. Install from a file.</li> </ul> SQL 2017 Express (installed by default when Limited Storage is selected)

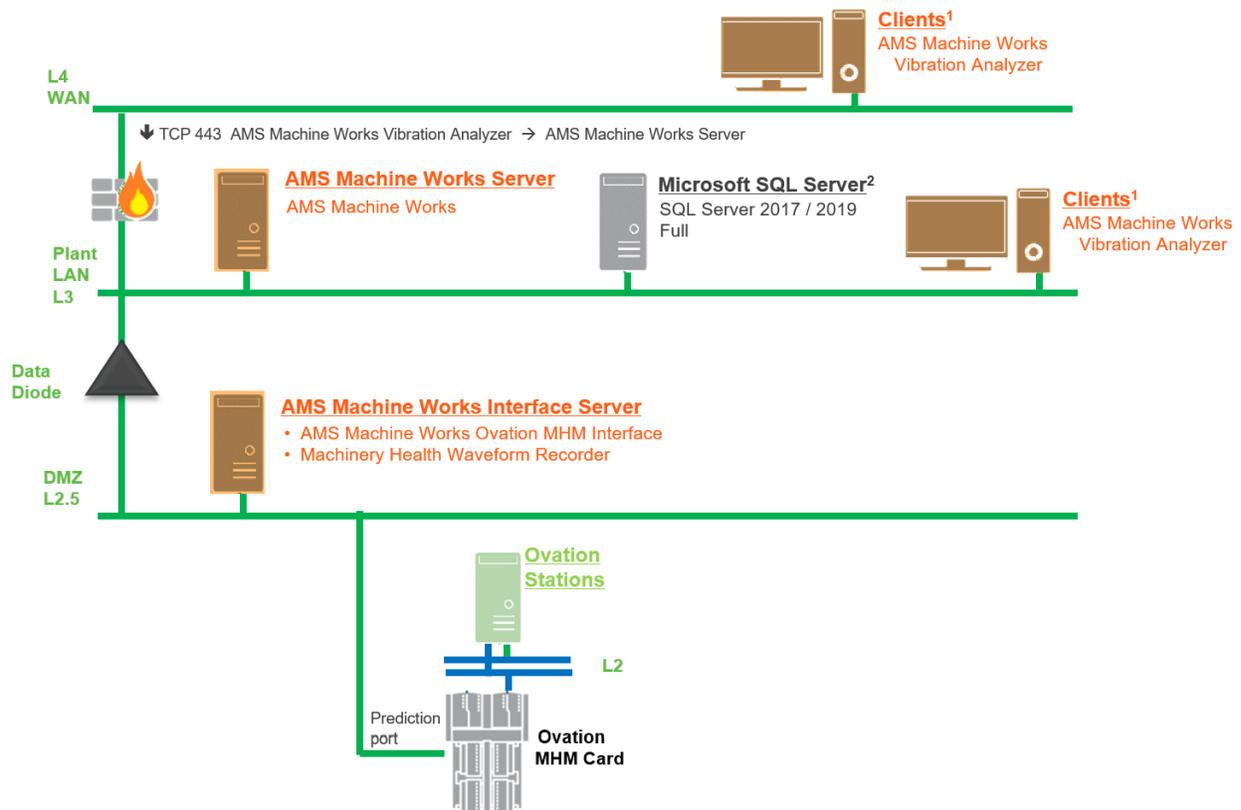
Table 3-12: 3B1: AMS Machine Works with Ovation Machinery Health Module *(continued)*

Station	Component	Certificate installation notes
<b>Clients</b>	AMS Machine Works Vibration Analyzer Browser applications	 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser. Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
<b>AMS Machine Works Interface Server</b>	AMS Machine Works AMS Ovation MHM Interface Ovation Machinery Health Monitor Waveform Recorder	 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.  AMS Machine Works Interface certificate with private key is generated during installation.
<b>Ovation MHM</b>	Ovation MHM	None.

### 3.8.11 3B2: AMS Machine Works with Ovation Machinery Health Monitor and Data Diode

This 3 level network deployment shows the AMS Machine Works server and AMS Machine Works Interface server dedicated to Ovation Machinery Health Monitor devices. A Data Diode allows for unidirectional traffic across network levels from the AMS Machine Works Interface server.

**Figure 3-12: 3B2: AMS Machine Works with Ovation Machinery Health Monitor and Data Diode**



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

**Table 3-13: 3B2: AMS Machine Works with Ovation Machinery Health Module and Data Diode**

Station	Component	Certificate installation notes
AMS Machine Works Server	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	<ul style="list-style-type: none"> <li> AMS Machine Works server certificate with private key is automatically generated during software installation.</li> <li> AMS Machine Works Interface server certificate with private key is generated during installation. Install from a file.</li> <li> AMS Machine Works Interface server certificate with private key is generated during installation. Install from a file.</li> </ul> SQL 2017 Express (installed by default when Limited Storage is selected)

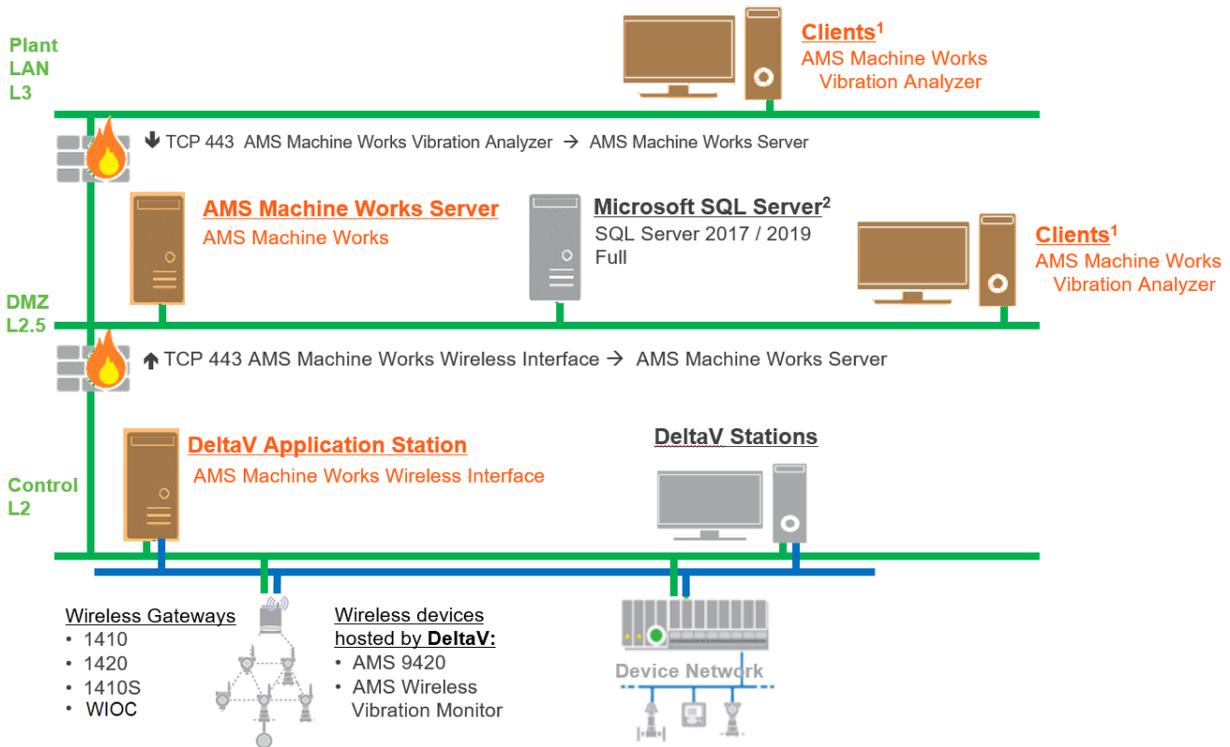
Table 3-13: 3B2: AMS Machine Works with Ovation Machinery Health Module and Data Diode *(continued)*

Station	Component	Certificate installation notes
<b>Clients</b>	AMS Machine Works Vibration Analyzer Browser applications	 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser. Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
<b>AMS Machine Works Interface Server</b>	AMS Machine Works AMS Ovation MHM Interface Ovation Machinery Health Monitor Waveform Recorder	 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.  AMS Machine Works Interface certificate with private key is generated during installation.
<b>Ovation MHM</b>	Ovation MHM	None.

### 3.8.12 3C: AMS Machine Works with wireless devices hosted by DeltaV

This 3 level network deployment shows the AMS Machine Works server on one network level, and an AMS Machine Works Interface server stationed on the same network level as a DeltaV station. AMS Machine Works connects to the wireless gateway to collect data from wireless devices hosted by DeltaV.

Figure 3-13: 3C: AMS Machine Works with wireless devices hosted by DeltaV



1. AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened
2. See [Table 3-30](#) for recommended MS SQL Server

Table 3-14: 3C: AMS Machine Works with wireless devices hosted by DeltaV

Station	Component	Certificate installation notes
AMS Machine Works Server	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router AMS Machine Works Wireless Interface Service	<ul style="list-style-type: none"> <li>AMS Machine Works server certificate with private key is automatically generated during software installation.</li> <li>AMS Machine Works Interface Server certificate with private key is generated during installation.</li> </ul> SQL 2017 Express (installed by default when Limited Storage is selected)

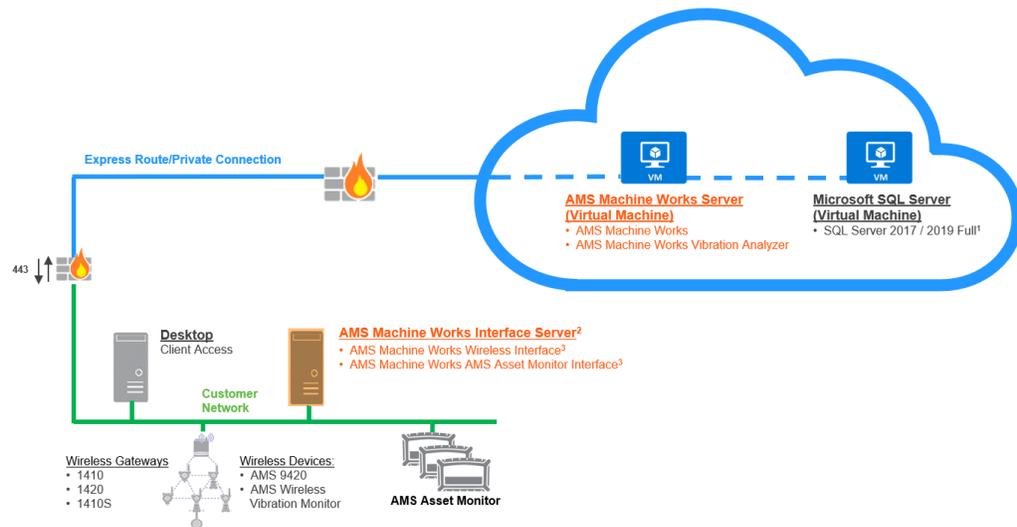
**Table 3-14: 3C: AMS Machine Works with wireless devices hosted by DeltaV (continued)**

Station	Component	Certificate installation notes
<b>Clients</b>	AMS Machine Works Vibration Analyzer Browser applications	 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser. Clients located on a different network level than the server must have port 443 opened between the client and server through any firewalls.
<b>DeltaV Application Station</b>	AMS Machine Works Wireless Interface	 AMS Machine Works Interface Server certificate allows communication to the AMS Machine Works Server. Install from a file. Ensure the application station where the AMS Machine Works Wireless Interface is installed is not used along with any production critical applications such as Batch applications, historian, etc.
<b>DeltaV Station</b>	DeltaV Station	None.

### 3.8.13 4A: Direct connection from AMS Asset Monitor and wireless devices to AMS Machine Works in the cloud

This deployment shows the AMS Machine Works server hosted on a cloud-based virtual machine, and an AMS Machine Works Interface server dedicated to AMS Asset Monitor and wireless devices.

**Figure 3-14: 4A: Direct connection from AMS Asset Monitor and wireless devices to AMS Machine Works in the cloud**



1. See [Table 3-30](#) for recommended MS SQL Server
2. AMS Machine Works Interface Server can also be deployed on a VM in the cloud
3. Wireless / AMS Asset Monitor Interfaces can be deployed on the same server or on their own

**Table 3-15: 4A: Direct connection from AMS Asset Monitor and wireless devices to AMS Machine Works in the cloud**

Station	Component	Certificate installation notes
AMS Machine Works Server	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	<ul style="list-style-type: none"> <li>AMS Machine Works Server certificate with private key is automatically generated during software installation.</li> <li>AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> <li>AMS Machine Works Interface Server certificate with private key is generated during installation. Install from a file.</li> </ul> SQL 2017 Express (installed by default when Limited Storage is selected)

**Table 3-15: 4A: Direct connection from AMS Asset Monitor and wireless devices to AMS Machine Works in the cloud (continued)**

Station	Component	Certificate installation notes
<b>AMS Machine Works Interface Server</b>	AMS Machine Works Wireless Interface AMS Machine Works AMS Asset Monitor Interface	 AMS Machine Works Interface certificate with private key is generated during ASI installation.
<b>AMS Asset Monitor</b>	AMS Asset Monitor	None.
<b>Wireless Gateway</b>	Wireless Gateway	None.

## 3.9 System requirements

After ensuring that all following system requirements are met, return to [Step 2](#) of the [Preparing for AMS Machine Works installation](#) topic and continue your installation.

### AMS Machine Works server

#### Note

Use system specifications marked "recommended" for deployments including AMS 6500 ATGs or a combination of AMS 6500 ATGs and other devices.

<b>Operating system</b>	Windows Server 2019 Standard or Datacenter Windows Server 2016 Standard or Datacenter
<b>CPU architecture</b>	64-bit
<b>Internet Information Services (IIS)</b>	v8.5, v10 (supplied with OS)
<b>Browsers<sup>1</sup></b>	Google Chrome (latest version) Microsoft Edge (latest version)
<b>Processor<sup>2</sup></b>	3.2 GHz, 8-core processor, Intel Xeon-scalable (Gold) or faster (recommended) 2.4 GHz, 4-core processor, Intel Xeon-scalable (Gold) or faster (minimum)
<b>RAM<sup>2</sup></b>	64 GB (recommended) 16 GB (minimum)
<b>Hard drive<sup>3</sup></b>	SSD hard drive (recommended) SAS hard drive (10K RPM) (minimum)
<b>Available disk space</b>	1 TB (recommended) 500 GB (minimum) 100 GB (for wireless-only setup)
<b>Screen resolution</b>	4K UHD (3840 x 2160 pixels) SXGA (1280 x 1024 pixels) (minimum)

<b>Network</b>	2 x 1 GB NIC (use 2 NICs to isolate Level 3 traffic from Level 2 traffic) (recommended) 1 x 1 GB NIC (supported)
----------------	---------------------------------------------------------------------------------------------------------------------

- 1 *Microsoft Internet Explorer is required to be installed on the system, but it is not recommended for using with AMS Machine Works. AMS Machine Works uses Internet Explorer for some cookie functions.*
- 2 *Refer to [Processor and memory specifications per system profile](#) for more details.*
- 3 *Refer to [Hard disk type per system profile](#) for more details.*

### AMS Machine Works Interface server

<b>Operating system</b>	Windows Server 2019 Standard or Datacenter Windows Server 2016 Standard or Datacenter
<b>CPU architecture</b>	64-bit
<b>Internet Information Services (IIS)</b>	v8.5, v10 (supplied with OS)
<b>Processor</b> <sup>1</sup>	2.4 GHz, 4-core processor Intel Xeon-scalable or faster (minimum)
<b>RAM</b> <sup>1</sup>	32 GB (recommended) 16 GB (minimum)
<b>Hard drive</b> <sup>2</sup>	SSD hard drive (recommended) SAS hard drive (10K RPM) (minimum)
<b>Available disk space</b>	250 GB (AMS 6500 ATG or Ovation MHM Interface) 100 GB (Wireless Interface) 10 GB (AMS Asset Monitor Interface)
<b>Network</b>	2 x 1 GB NIC (use 2 NICs to isolate Level 3 traffic from Level 2 traffic) (recommended) 1 x 1 GB NIC (supported)

- 1 *Refer to [Processor and memory specifications per system profile](#) for more details.*
- 2 *Refer to [Hard disk type per system profile](#) for more details.*

### AMS Machine Works Vibration Analyzer client

<b>Operating system</b>	Windows Server 2019 Standard Windows Server 2016 Standard Windows 10 Pro Windows 10 Enterprise
<b>CPU architecture</b>	64-bit
<b>Internet Information Services (IIS)</b>	v8.5, v10 (supplied with OS)
<b>Processor</b>	2.2 GHz, 4-core processor Intel Xeon, Intel Core i5 6th Gen (i5 6400T) or better
<b>RAM</b>	16 GB (recommended) 8 GB (minimum)
<b>Hard drive</b>	SAS hard drive (10K RPM)

<b>Available disk space</b>	100 GB
<b>Screen resolution</b>	4K UHD (3840 x 2160 pixels) SXGA (1280 x 1024 pixels) (minimum)

### Microsoft SQL Server

<b>Operating system</b>	Windows Server 2019 Standard or Datacenter Windows Server 2016 Standard or Datacenter
<b>CPU architecture</b>	64-bit
<b>Internet Information Services (IIS)</b>	v8.5, v10 (supplied with OS)
<b>Microsoft SQL Server<sup>1</sup></b>	MS SQL Server 2019 or 2017 with per core licensing (recommended) MS SQL Server 2017 Express Edition (supported, included by default for Limited Storage installations)
<b>Processor</b>	3.2 GHz, 4-core processor, Intel Xeon-scalable or faster
<b>RAM</b>	32 GB or more
<b>Hard drive</b>	SSD hard drive, separated for OS and Data
<b>Available disk space</b>	Refer to <a href="#">Storage capacity requirements per system profile</a>
<b>Network</b>	2 x 1 GB NIC

<sup>1</sup> For more details on licensing, please visit <https://www.microsoft.com/en-us/sql-server/sql-server-2019-pricing>

### Additional specifications

<b>Ethernet</b>	One or more Ethernet Network Interface Card (NIC) 2 x 1 GB NIC (use 2 NICs to isolate Level 3 traffic from Level 2 traffic) (recommended) 1 x 1 GB NIC (supported)
<b>Internet connectivity</b>	A high-speed internet connection is recommended to download installations, patches, and register software. (Alternatively, you can download the software, patches, and registration file to the server using a storage device.)
<b>Supported virtualization</b>	<ul style="list-style-type: none"> <li>• VMware 6 to 6.7</li> <li>• Hyper-V 2012 or 2016</li> </ul>
<b>Supported antivirus software</b>	<ul style="list-style-type: none"> <li>• Symantec™ Endpoint Protection</li> <li>• McAfee™ Endpoint</li> <li>• Norton™ Security with Backup</li> <li>• CrowdStrike</li> </ul>

### Note

Computers with system components installed must have:

- system clocks synchronized

- date/time in the same format

Communication can be blocked if there are system clock discrepancies. (Many third-party tools are available to synchronize system clocks.) System clocks do not need to be synchronized for PCs with browser-only access.

### Anti-virus exclusion list

To optimize performance, it is recommended to exclude the following applications, files, and extensions in the anti-virus software.

Component	Item	Path (default locations)
AMS Machine Works Web Services and Service Layer (embedded)	Applications (*.exe)	C:\Windows\System32\inetsrv\w3wp.exe C:\Windows\SysWOW64\inetsrv\w3wp.exe
	Program Files	C:\Program Files\Emerson\AMS Machine Works\ C:\EMERSONMW\* C:\Program Files (x86)\Emerson\* C:\inetpub\wwwroot\EmersonCSI\*
	Log files	C:\inetpub\wwwroot\EmersonCSI\Logs\* C:\inetpub\wwwroot\EmersonCSI\WebLogs\*
	Cachecow	C:\Windows\Temp\ARES\Cache\*
MongoDB	Program Files	C:\Program Files\MongoDB\Server\5.0\bin
AMS Asset Monitor Interface	Program Files	C:\Program Files\Emerson\AMS Machine Works\AM_Interface
AMS 6500 ATG Interface	Program Files	C:\Program Files\Emerson\AMS Machine Works\ATG_Interface
AMS Wireless Interface	Program Files	C:\Program Files\Emerson\AMS Machine Works\EWG_Interface
Ovation MHM Interface	Program Files	C:\Program Files\Emerson\AMS Machine Works\OMHM_Interface
SQL	Applications (*.exe)	C:\Program Files\Microsoft SQL Server\MSSQL14.EMERSONMW\MSSQL\Binn\sqlservr.exe
	Program Files	C:\Program Files (x86)\Microsoft SQL Server\* C:\Program Files\Microsoft SQL Server\*
OPC UA	Applications (*.exe)	C:\Program Files (x86)\Emerson\Plantweb Optics OPC UA Server\OPCUA\Emerson.Opc.Ua.Server.exe C:\Program Files (x86)\Emerson\Plantweb Optics OPC UA Server\OPCUA\sqlite3.exe C:\Program Files (x86)\Emerson\Plantweb Optics OPC UA Server\OPCUA\Emerson.OPC.UA.Server.Tool.exe
	Program files	C:\Program Files (x86)\Emerson\Plantweb Optics OPC UA Server\
File extensions	File extensions	bak, bcp, c, cft, chk, cmtx, csv, dll, dri, edb, idx, jrs, ldf, log, mdf, ndf, obj, out, pdb, pol, prc, pre, sch, sql, sqlaudit, sdb, trc, trg, trn, xel, xem, xml

Component	Item	Path (default locations)
Windows	Windows exclusion for Windows Update	C:\Windows\SoftwareDistribution\DataStore\ C:\Windows\System32\GroupPolicy\User\ C:\Windows\System32\GroupPolicy\Machine\*

### 3.9.1 Computer membership deployment

Refer to the following tables for how AMS Machine Works and each component can be deployed in a workgroup or domain setup.

**Table 3-16: AMS Machine Works and Plantweb Optics computer membership**

	AMS Machine Works	Plantweb Optics	Supported
<b>Computer Membership</b>	Workgroup	Workgroup	✓
	Domain	Domain	✓
	Workgroup	Domain	✓
	Domain	Workgroup	✓

**Table 3-17: AMS Machine Works and DeltaV computer membership**

	AMS Machine Works	DeltaV	Supported
<b>Computer Membership</b>	Workgroup	Workgroup	✓
	Domain	Domain	✓
	Workgroup	Domain	✓
	Domain	Workgroup	✓

**Table 3-18: AMS Machine Works and Ovation computer membership**

	AMS Machine Works	Ovation	Supported
<b>Computer Membership</b>	Workgroup	Workgroup	✓
	Domain	Domain	✓
	Workgroup	Domain	✓
	Domain	Workgroup	✓

## 3.10 System scalability

Table 3-19: AMS Machine Works system

Components	AMS Machine Works
<b>Server Specifications</b>	
<b>Assets</b>	500 machine trains
<b>Configured users</b>	25 total users
<b>Concurrent users</b>	15
<b>Concurrent VibApp users</b>	5
<b>Devices<sup>1</sup></b>	
<b>AMS 9420</b>	600 devices maximum per system connected across 50 Emerson Wireless Gateways 500 devices maximum per Interface server
<b>AMS 6500 ATG</b>	50 single rack ATGs maximum per system 25 ATGs maximum per AMS 6500 ATG Interface server Maximum of 2 AMS 6500 ATG Interface servers Up to 1,100 channels on a single AMS Machine Works system
<b>AMS Asset Monitor</b>	300 AMS Asset Monitors maximum per system and per AMS Asset Monitor Interface server
<b>Ovation Interface</b>	100 Ovation MHM Modules maximum per system 20 Ovation MHM modules per one Ovation Interface server / Ovation Machinery Health Waveform Recorder Maximum of 6 Ovation Interface servers / Ovation Machinery Health Waveform Recorders Up to 800 channels on a single AMS Machine Works system
<b>AMS Wireless Vibration Monitor</b>	4000 devices maximum per system connected across 120 Emerson Wireless Gateways 600 devices maximum per Interface server Maximum of 7 Interface servers
<b>Devices per Emerson Wireless Gateway</b>	
<b>AMS 9420</b>	50 devices maximum per 1420 50 devices maximum per 1410B 50 devices maximum per 1410S 50 devices maximum per WIOC
<b>AMS Wireless Vibration Monitor</b>	50 devices maximum per 1420 50 devices maximum per 1410B 140 devices maximum per 1410S 50 devices maximum per WIOC
<b>OPC UA</b>	
<b>Number of Assets</b>	500 Assets
<b>Number of Total Monitored Tags</b>	2,000 Monitored Tags
<b>Number of Clients</b>	2 Clients

<sup>1</sup> Refer to [Supported data storage and update rates](#).

## 3.11 Supported interface combinations

The following interface combinations are supported in AMS Machine Works.

### AMS 6500 ATG Interface only



- 50 single rack ATGs maximum per system
- 25 ATGs maximum per AMS 6500 ATG Interface server
- Maximum of 2 AMS 6500 ATG Interface servers

### Ovation Machinery Health Monitor Interface only



- 100 Ovation MHM modules maximum per system
- 20 Ovation MHM modules maximum per Ovation Interface server / Ovation Machinery Health Waveform Recorder
- Maximum of 6 Ovation MHM Interface servers / Ovation Machinery Health Waveform Recorders

### AMS Machine Works Wireless Interface only



- 500 AMS 9420 Wireless Vibration Transmitters maximum per Wireless Interface server
- 600 AMS Wireless Vibration Monitors maximum per Wireless Interface server
- Supports up to 7 Wireless Interface servers to a maximum of 4000 AMS Wireless Vibration Monitors or 600 AMS 9420s

### AMS Asset Monitor Interface only



- 300 AMS Asset Monitors maximum per system
- 300 AMS Asset Monitors maximum per AMS Asset Monitor Interface server

### AMS Asset Monitor + AMS 6500 ATG + Wireless



Supports a combination of AMS Asset Monitors, AMS 6500 ATG and wireless devices. Consult your Emerson representative about device limits and server requirements for a system with multiple data sources.

## 3.12 System profiles and number of interface servers

When planning your system, consider the number of devices you will add over time, and set up the appropriate number of AMS Machine Works Interface servers. Also, consider the number of measurements each device will take to plan how many vibration tags you need for your system. A vibration tag is a data point that collects spectral and waveform data. All other data is not considered a tag and does not count against the total number of tags required for the system. The maximum number of vibration tags is 12,000. The tables in this section are based on [Supported data storage and update rates](#).

### Note

Consult your Emerson representative about device limits and interface server requirements for a system with a combination of AMS Asset Monitor, AMS 6500 ATG and wireless devices.

### Note

The tables in this section assume a distributed deployment, which requires 2 additional servers for AMS Machine Works and SQL.

**Table 3-20: Interface servers required for AMS 6500 ATG Interface**

System Profile	AMS 6500 ATG	Vibration tags (maximum)	AMS Machine Works Interface Server
Small (S)	<6	110	1
Medium (M)	6-25	550	1
Large (L)	26-40	880	2
Extra Large (XL)	41-50	1,100	2

### Note

- One AMS Machine Works AMS 6500 ATG Interface server can support up to 25 AMS 6500 ATG systems
- A Single Rack AMS 6500 ATG is considered as one AMS 6500 ATG device with up to a total of 11 cards (A6500-UM and/or A6500-TP)
- One A6500-UM card channel constitutes one vibration tag, including installed spare cards
- Each combined measurement location requires an additional vibration tag
- Maximum AMS 6500 ATGs supported in AMS Machine Works is 50

**Table 3-21: Interface servers required for Ovation MHM Interface**

System Profile	Ovation MHM Modules	Vibration tags (maximum)	AMS Machine Works Interface Server
Small (S)	<21	160	1
Medium (M)	21-40	320	2
Large (L)	41-60	480	3

**Table 3-21: Interface servers required for Ovation MHM Interface (continued)**

System Profile	Ovation MHM Modules	Vibration tags (maximum)	AMS Machine Works Interface Server
Extra Large (XL)	61-80	640	4
	81-100	800	5

**Note**

- One AMS Machine Works Ovation MHM Interface can support up to 20 Ovation MHM Modules
- One Ovation MHM module has a maximum of 8 channels
- One Ovation MHM channel constitutes one vibration tag
- Each combined measurement location requires an additional vibration tag
- Maximum Ovation MHM Modules supported in AMS Machine Works is 100

**Table 3-22: Interface servers required for AMS Asset Monitor interface**

System Profile	AMS Asset Monitor	Vibration tags (maximum)	AMS Machine Works Interface Server
Small (S)	0-80	960	1
Medium (M)	81-160	1,920	1
Large (L)	161-300	3,600	1

**Note**

- One AMS Machine Works AMS Asset Monitor Interface can support up to 300 AMS Asset Monitors
- One AMS Asset Monitor has a maximum of 12 vibration CHARMS
- One vibration CHARM constitutes one vibration tag, including installed spare CHARMS
- Maximum AMS Asset Monitors supported in AMS Machine Works is 300

**Table 3-23: Interface servers required for Wireless Interface with AMS Wireless Vibration Monitor**

System Profile	AMS Wireless Vibration Monitor	Vibration tags (maximum)	AMS Machine Works Interface Server
Small (S)	0-600	1,800	1
Medium (M)	601-1,200	3,600	2
Large (L)	1,201-1,800	5,400	3
Extra Large (XL)	1,801-2,400	7,200	4
	2,401-3,000	9,000	5
	3,001-3,600	10,800	6
	3,601-4,000	12,000	7

**Note**

- One AMS Machine Works Wireless Interface server can accommodate up to 600 connected units of AMS Vibration Monitor
- One AMS Wireless Vibration Monitor constitutes three vibration tags, one per axis
- Maximum AMS Wireless Vibration Monitors supported in AMS Machine Works is 4000

**Table 3-24: Interface servers required for Wireless Interface with AMS 9420**

System Profile	AMS 9420	Vibration tags (maximum)	AMS Machine Works Interface Server
Small (S)	0-500	1,000	1
Medium (M)	501-600	1,200	2

**Note**

- One AMS Machine Works Wireless Interface server can accommodate up to 500 connected units of AMS 9420
- One AMS 9420 constitutes a maximum of two vibration tags, one per sensor
- Maximum AMS 9420s supported in AMS Machine Works is 600

## 3.13 Processor and memory specifications per system profile

Depending on the size of your system, you need to ensure the servers have adequate processor and memory resources for the size of your system. Refer to the tables for resources, after selecting the number of servers described in [System profiles and number of interface servers](#). If the system will include AMS Asset Monitor and another device type, then the specifications should reflect the higher value of [Table 3-25](#) and [Table 3-26](#).

**Table 3-25: Processor specifications for system profiles with AMS 6500 ATG and Wireless**

System Profile	AMS Machine Works Server			AMS Machine Works Interface Server		
	Processor	Cores	RAM (minimum)	Processors	Core	RAM (minimum)
Small (S)	2.4 GHz	4	16 GB	2.4 GHz	8	16 GB
Medium (M)	3.2 GHz	8	32 GB	2.4 GHz	8	16 GB
Large (L)	3.2 GHz	8	32 GB	2.4 GHz	8	16 GB
Extra Large (XL)	3.2 GHz	8	32 GB 64 GB <sup>1</sup>	2.4 GHz	8	16 GB

<sup>1</sup> Recommended

**Table 3-26: Processor specifications for system profiles with AMS Asset Monitor**

System Profile	AMS Machine Works Server			AMS Machine Works Interface Server		
	Processor	Cores	RAM (minimum)	Processors	Core	RAM (minimum)
<b>Small (S)</b>	2.4 GHz	6	16 GB	2.4 GHz	4	16 GB
<b>Medium (M)</b>	3.2 GHz	8	32 GB	2.4 GHz	4	16 GB
<b>Large (L)</b>	3.2 GHz	8	32 GB	2.4 GHz	4	16 GB

**Table 3-27: Processor specifications for system profiles with Ovation Machinery Health Module**

System Profile	AMS Machine Works Server			AMS Machine Works Interface Server		
	Processor	Cores	Memory (minimum)	Processor	Cores	Memory (minimum)
<b>Small (S)</b>	2.4 GHz	4	16 GB	2.4 GHz	4	16 GB
<b>Medium (M)</b>	3.2 GHz	8	32 GB	2.4 GHz	4	16 GB
<b>Large (L)</b>	3.2 GHz	8	32 GB	2.4 GHz	4	16 GB
<b>Extra Large (XL)</b>	3.2 GHz	8	32 GB	2.4 GHz	4	16 GB

## 3.14 Hard disk type per system profile

The type of hard disk, either magnetic or solid state drive is recommended based on your system profile. While the amount of data you can store is limited by disk size, the write speed is a very important factor for system performance. All systems are recommended to use a solid-state drive with mixed use and write optimized settings for improved performance.

**Table 3-28: Hard disk for Wireless systems with AMS 9420 and AMS Wireless Vibration Monitor**

System Profile	Magnetic Drive SAS (10K RPM)	Solid-State Drive Mixed Use / Write Optimized
<b>Small (S)</b>	Acceptable	Recommended
<b>Medium (M)</b>	Acceptable	Recommended
<b>Large (L)</b>	Not Recommended	Recommended
<b>Extra Large (XL)</b>	Not Recommended	Recommended

**Table 3-29: Hard disk for Online systems with AMS Asset Monitor, AMS 6500 ATG or Ovation Machinery Health Monitor**

System Profile	Magnetic Drive SAS (10K RPM)	Solid State Drive Mixed Use / Write Optimized
Small (S)	Acceptable	Recommended
Medium (M)	Not Recommended	Recommended
Large (L)	Not Recommended	Recommended
Extra Large (XL)	Not Recommended	Recommended

## 3.15 Storage capacity requirements per system profile

There are two types of storage for AMS Machine Works data, short term and long term. The Short Term Historian for data coming from the AMS Asset Monitor Interface is stored in MongoDB, a highly scalable, document-oriented database program. The Short Term Historian for data coming from all other interfaces is stored in SQLite, a lightweight, file based relational database management system (RDBMS) widely used for storing embedded databases. The Long Term Historian is stored in Microsoft SQL Server, a robust RDBMS that must be purchased separately. SQL Server utilizes Filestream technology which allows it to store unstructured data, such as waveforms, documents and images, on the file system instead of storing them in the database. With Filestream enabled, scalars and pointers to the file stream data location (for unstructured data) are the only data types that are stored in SQL Server database. This implementation expands the storage capability of SQL Server.

The Short Term Historian for data coming from the AMS Asset Monitor Interface always resides on the AMS Machine Works Server.

The Short Term Historian for data coming from all other interfaces resides on the same server where the AMS Machine Works Interface is installed.

The Long Term Historian resides wherever the SQL Server is installed.

When selecting Limited Storage during installation, the Long Term Historian is stored in a free version of Microsoft SQL Server Express with a 10 GB database and resides on the same server as the AMS Machine Works Server. The system will start deleting data on a First-In First-Out (FIFO) basis when nearing the 10 GB SQL Server Express database storage limit.

**Table 3-30: Microsoft SQL Server Recommendations**

System Profile	MS SQL Server 2017 Express (Limited Storage Install)	MS SQL Server 2017 / 2019 Full (Standard Install)
Small (S)	Only acceptable for PoC	Recommended
Medium (M)	Not Recommended	Recommended
Large (L)	Not Recommended	Recommended
Extra Large (XL)	Not Recommended	Recommended

**Table 3-31: Long term storage capacity requirements for Wireless systems with AMS 9420 and AMS Wireless Vibration Monitor**

System Profile	AMS 9420	AMS Wireless Vibration Monitor	Long Term Historian storage <sup>1</sup>		
			1-3 Years	3-5 Years	5-10 Years
<b>Small (S)</b>	0-500	0-600	500 GB	850 GB	1.6 TB
<b>Medium (M)</b>	501-600	601-1,200	1.0 TB	1.7 TB	3.5 TB
<b>Large (L)</b>	-	1,201-1,800	2.0 TB	3.4 TB	7.0 TB
<b>Extra Large (XL)</b>	-	1,801-4000	4.0 TB	6.8 TB	14.0 TB

<sup>1</sup> The Long Term Historian resides wherever the SQL Server is installed.

**Table 3-32: Long term storage capacity requirements for Online systems with AMS Asset Monitor, AMS 6500 ATG or Ovation Machinery Health Monitor**

System Profile	AMS 6500 ATG	Ovation MHM	AMS Asset Monitor	Long Term Historian storage <sup>1</sup>		
				1-3 Years	3-5 Years	5-10 Years
<b>Small (S)</b>	<6	<11	<81	1.0 TB	2.5 TB	5.0 TB
<b>Medium (M)</b>	6-25	11-20	81-160	2.5 TB	4.0 TB	7.5 TB
<b>Large (L)</b>	26-40	21-30	161-300	4.0 TB	6.4 TB	12.0 TB
<b>Extra Large (XL)</b>	41-50	31-55	N/A	5.0 TB	8.0 TB	15.0 TB

<sup>1</sup> The Long Term Historian resides wherever the SQL Server is installed.

## 4 AMS Machine Works security

After verifying all of the security and communication requirements below are met, return to [Step 3](#) of the [Preparing for AMS Machine Works installation](#) topic and continue your installation.

### 4.1 Firewall considerations

AMS Machine Works components that use web communication require firewall exceptions for a user-defined port. Port 443 is used by default.

Before installing the AMS Machine Works components, ensure you have the firewall exceptions set in place for each computer that will have AMS Machine Works components that communicate to web clients. See [Deployment diagrams](#) to help you plan what servers need the firewall exceptions. You need to know the DNS names and IP addresses of the computers and the ports that need to be open between them. There are also other ports required for AMS Machine Works communication. Your IT department will determine what, if any, intermediary firewall also needs the exceptions.

#### 4.1.1 Ports

These ports must be available and need to be open through firewalls.

Below are the ports and firewall configurations that need to be configured for Microsoft SQL Server, AMS Machine Works, and Interface servers for a Standard database server deployment.

##### Note

Outbound rules apply only when the firewall is configured to block outbound connections, which is not a default setting but could be for your organization. Please consult with your IT security specialist.

**Table 4-1: Ports and firewall rules on SQL Server**

Item	Direction	Notes
Distributed Transaction Coordinator (RPC)	Inbound from AMS Machine Works server	Predefined firewall in server
Distributed Transaction Coordinator (RPC-EPMAP)	Inbound from AMS Machine Works server	Predefined firewall in server
Distributed Transaction Coordinator (TCP-In)	Inbound from AMS Machine Works server	Predefined firewall in server
Distributed Transaction Coordinator (TCP-Out)	Outbound to AMS Machine Works server	Predefined firewall in server
TCP 1433 (default, configurable)	Inbound from AMS Machine Works server	Manual port rule required. Suggested name: SQL
UDP 1434	Inbound from AMS Machine Works server	Manual port rule required. Suggested name: SQL browser

**Table 4-1: Ports and firewall rules on SQL Server (continued)**

Item	Direction	Notes
TCP 139	Inbound from AMS Machine Works server	Manual port rule required. Suggested name: SQL server
TCP 445	Inbound from AMS Machine Works server	Manual port rule required. Suggested name: SQL filestream

**Table 4-2: Ports and firewall rules on the AMS Machine Works server**

Item	Direction	Notes
Distributed Transaction Coordinator (RPC)	Inbound from SQL server	Predefined firewall in server
Distributed Transaction Coordinator (RPC-EPMAP)	Inbound from SQL server	Predefined firewall in server
Distributed Transaction Coordinator (TCP-In)	Inbound from SQL server	Predefined firewall in server
Distributed Transaction Coordinator (TCP-Out)	Outbound to SQL server	Predefined firewall in server
TCP 1433 (default, configurable)	Outbound to SQL server	Manual port rule required. Suggested name: SQL
UDP 1434	Outbound to SQL server	Manual port rule required. Suggested name: SQL browser
World Wide Web Services (HTTPS Traffic-In)	Inbound from clients and Interface servers	Predefined firewall in server
World Wide Web Services (HTTP Traffic-In)	Inbound from clients and Interface servers	Predefined firewall in server
TCP 139	Outbound to SQL server	Manual port rule required. Suggested name: SQL server
TCP 445	Outbound to SQL server	Manual port rule required. Suggested name: SQL filestream
TCP 4840	Outbound to OPC client	Manual port rule required. Suggested name: OPC
TCP 4223	Inbound from AMS Asset Monitor Interface server	Manual port rule required. Suggested name: Asset Monitor Interface

**Table 4-3: Ports and firewall rules on Interface servers**

Item	Direction	Notes
TCP 443	Outbound to AMS Machine Works server and AMS Asset Monitor	Manual port rule required. Suggested name: HTTPS Applies to all Interface servers

**Table 4-3: Ports and firewall rules on Interface servers (continued)**

Item	Direction	Notes
TCP 80	Outbound to AMS Machine Works server	Manual port rule required. Suggested name: HTTP Applies to ATG, OMHM, and Wireless Interface servers
TCP 4223	Outbound to AMS Machine Works server	Manual port rule required. Suggested name: Asset Monitor Interface Applies only to Asset Monitor Interface
TCP 5094 (default, configurable)	Outbound to Emerson Wireless Gateway	Manual port rule required. Suggested name: HART IP Applies only to Wireless Interface
TCP 5095 (default, configurable)	Outbound to Emerson Wireless Gateway	Manual port rule required. Suggested name: HART IP Secure Applies only to Wireless Interface
TCP 502	Outbound to AMS 6500 ATG	Manual port rule required. Suggested name: ATG modbus Applies only to ATG Interface
TCP 4841	Outbound to AMS 6500 ATG	Manual port rule required. Suggested name: ATG service Applies only to ATG Interface
7252	Outbound to Ovation Waveform Recorder	Manual port rule required. Suggested name: MHWR Applies only to Ovation Waveform Recorder

**Table 4-4: Ports and firewall rules on client workstations**

Item	Direction	Notes
TCP 443	Outbound to AMS Machine Works server	Predefined firewall in Server
TCP 80	Outbound to AMS Machine Works server	Predefined firewall in Server

## 4.2 SSL/TLS certificates

Secure Sockets Layer (SSL)/Transport Layer Security (TLS) is required for all web communications. The following sections describe which components require certificates, examples of deployments with certificates, and basic instructions to export and import certificates.

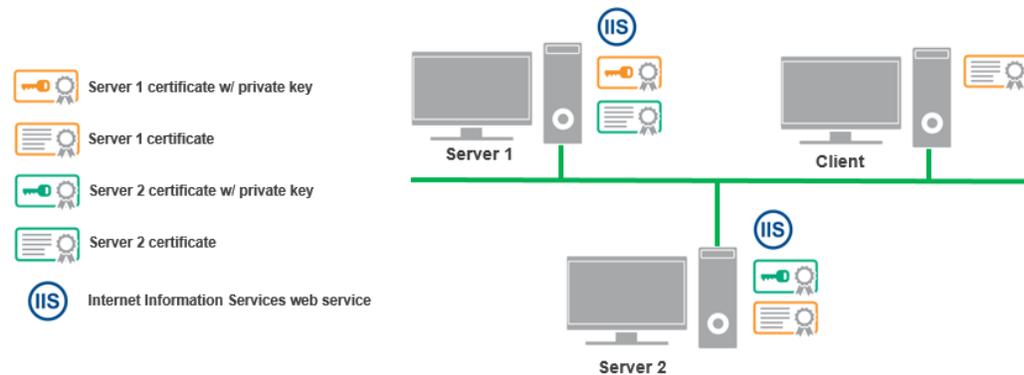
---

**Note**

Emerson recommends working with qualified IT personnel to ensure your installation complies with your plant's network security policy and industry best practices.

SSL/TLS allows applications to establish a secure communication between web servers and web browsers. Figure 4-1 shows an example relationship between web servers and browsers using SSL/TLS certificates. Each server is identified by a private key. If the client has the public key, it can connect securely to the server. In the example, the servers can communicate with each other. The client is only allowed to connect to Server 1. It does not have a certificate for Server 2.

---

**Figure 4-1: Example web servers and browsers using SSL/TLS certificates**

---

**Note**

SSL/TLS requires TCP port 443. AMS Asset Monitor requires TCP port 4222.

During the AMS Machine Works installation, certificates are automatically generated and installed for components that use web applications. The certificate is unique to the server. The **private key** certificate must be kept safe on the server. **Never export (or share) the private key certificate.** Only share the **public key** with any computers in your network that need to connect to the server.

## 4.2.1 System components with certificates

Each computer communicating with a web-based component of AMS Machine Works needs to exchange public key certificates. [Table 4-6](#) shows which components of AMS Machine Works have certificates. Each server where web components are installed will have a server certificate created with the name AMS Machine Works v1.7 plus the name of the server.

**Table 4-6: System components with certificates**

Component	Certificate
AMS Machine Works Server	AMS Machine Works 1.7 <servername>
AMS Machine Works Interface Server	AMS Machine Works 1.7 <servername>

**Table 4-7: Certificates deployment**

Component	Certificate generated upon installation	Where to import the certificate
AMS Machine Works Server	AMS Machine Works 1.7 <servername>	Each AMS Machine Works Interface server, before installing the interface AMS Machine Works client
Emerson Wireless Interface	AMS Machine Works 1.7 <servername>	AMS Machine Works Interface server, after installation
AMS 6500 ATG Interface	AMS Machine Works 1.7 <servername>	AMS Machine Works Interface server, after installation
AMS Asset Monitor Interface	AMS Machine Works 1.7 <servername>	AMS Machine Works Interface server, after installation
Emerson Ovation MHM Interface	AMS Machine Works 1.7 <servername>	AMS Machine Works Interface server, after installation

Interface Web Applications must have certificates to communicate with each relevant part of the system. For example, the AMS Machine Works client computer requires the AMS Machine Works server certificate to use the Asset Explorer utility. The client normally does not need the Interface Server certificate, except when a new asset source is added. In the Asset Explorer utility, when you add a new asset source, the utility contacts the interface to get information about the asset source. If you try adding an asset source, and the relevant interface certificate is not installed, an error message lets you know there is a problem connecting to the interface.

See [Deployment diagrams](#) for diagrams that show where the certificates must be installed based on the type of deployment.

## 4.2.2 AMS Machine Works Certificate installation checklist

The following tasks show the recommended order of installation on each computer in the system, with emphasis on certificate export and how it relates to installation tasks. This shows all the components, assuming each station is a separate computer, such as a four-level deployment. Also, see [Deployment diagrams](#) for diagrams that show where the certificates must be installed based on the type of deployment.

---

### Note

You cannot reuse a certificate from a previous installation. Perform the certificate export and installation tasks after any install, reinstall, or upgrade.

---

### Procedure

1. On the AMS Machine Works Server, install at least the following components :
  - AMS Machine Works Web Services
  - AMS Machine Works Historian
  - AMS Machine Works Interface Router
  - Help
  - Export AMS Machine Works Server certificate
2. If using an AMS Machine Works Interface Server, for one or more interfaces, install the interfaces you need:
  - Install AMS Machine Works Server certificate using a browser
  - AMS Machine Works Wireless Interface
  - AMS Machine Works AMS 6500 ATG Interface
  - AMS Machine Works AMS Asset Monitor Interface
  - AMS Machine Works Ovation MHM Interface

## 4.2.3 Install the AMS Machine Works server certificate on clients and servers

You need to install the AMS Machine Works server public key certificate before you can securely use the utilities. You can export the certificate from the server and install it on each client from a file. However, Google Chrome allows you to easily install the public key certificate when you try to log on for the first time.

### Prerequisites

- Google Chrome, Microsoft Edge, or Internet Explorer can be used for installing certificates from a browser
- On a client PC, log in using an account with administrator privilege

- Port 443 must be open between the client and the server

### Procedure

1. In Google Chrome, enter the URL of one of the applications, such as the AMS Machine Works Dashboard.

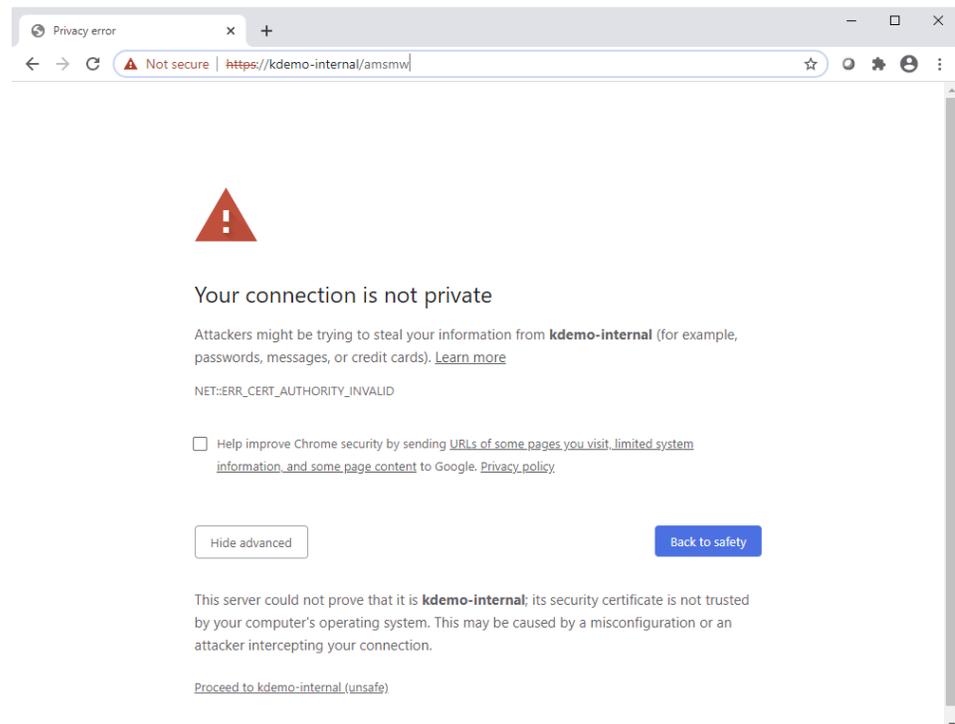
### Example

http://[server]/AMSMW

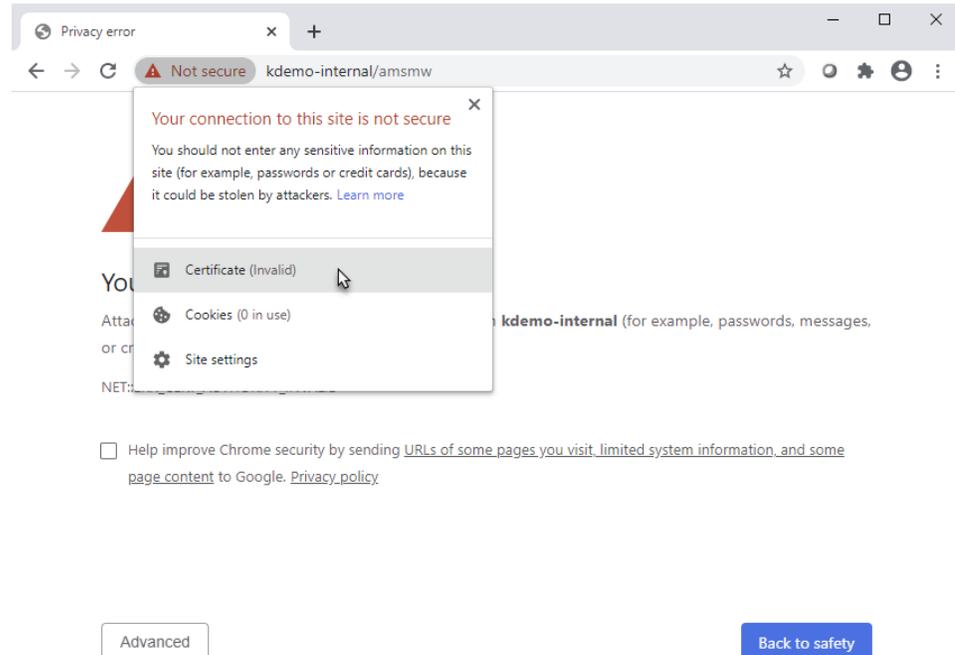
The URL automatically redirects to use secure HTTPS. The browser displays a warning in the address bar and a message such as "Your connection is not private," or "This site is not secure."

2. To continue using the site, you can expand **Advanced** , and click **Proceed to [server] (unsafe)**.

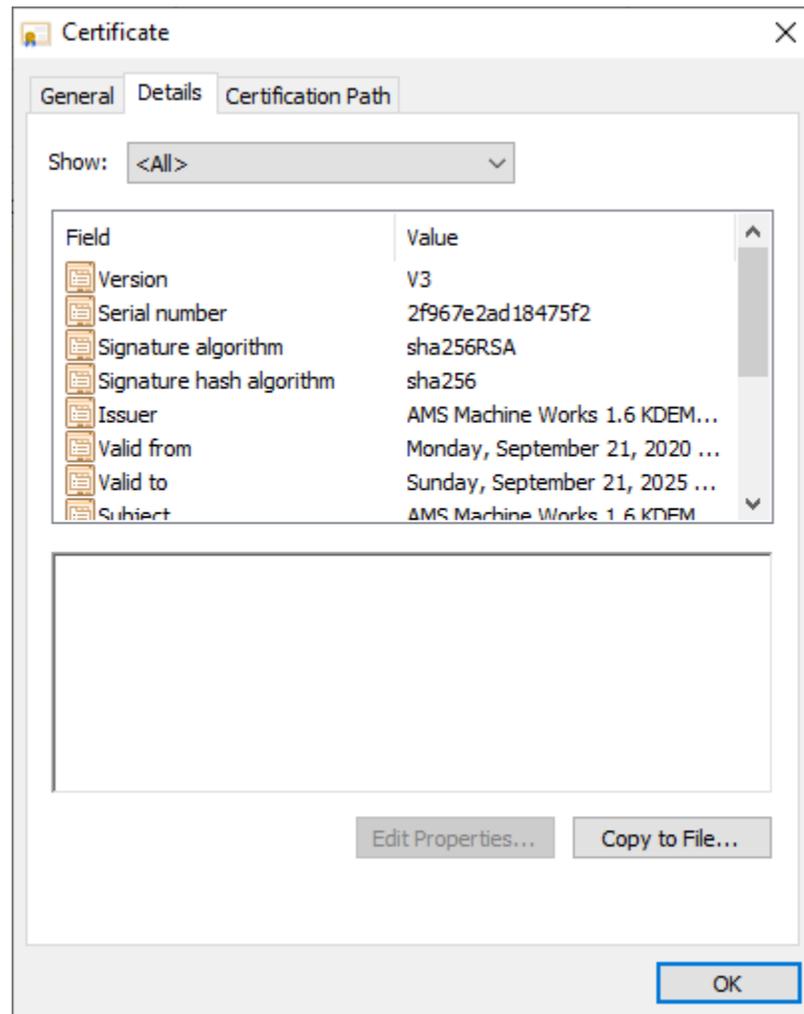
The message may be different depending on your browser version. Select the option to continue to the website.



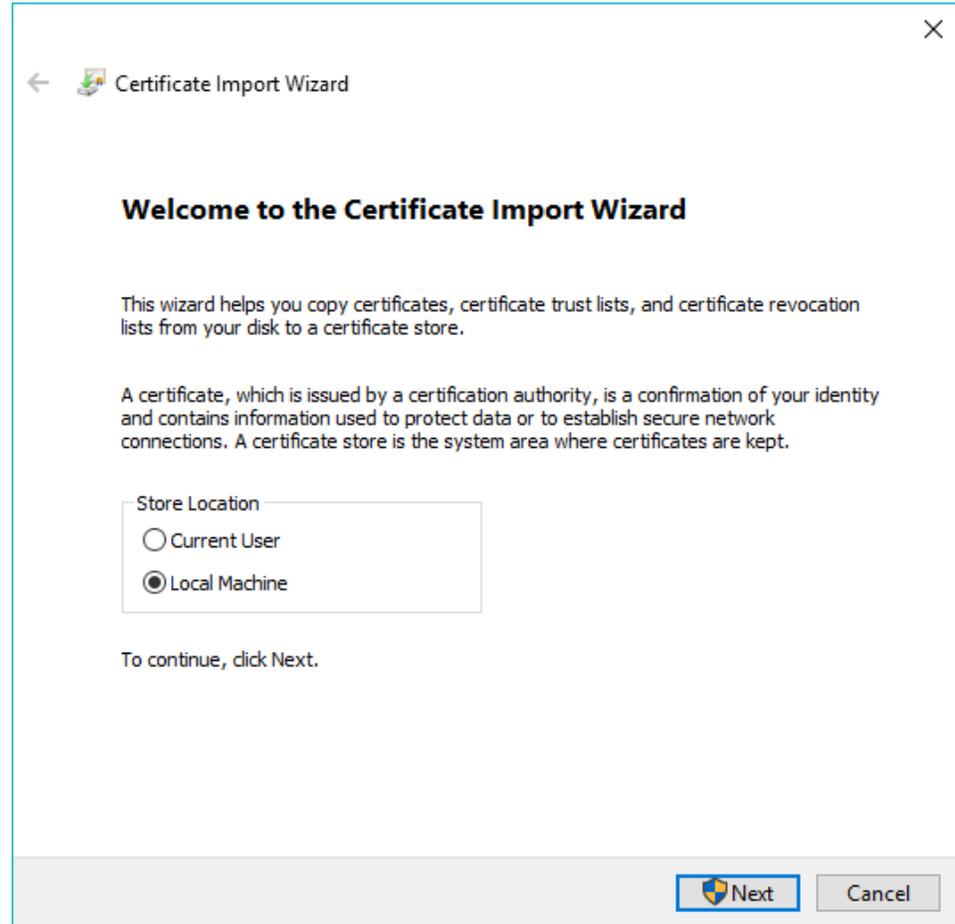
3. To install the certificate, click the **Not secure** message in the address bar, then click **Certificate** below the warning message.



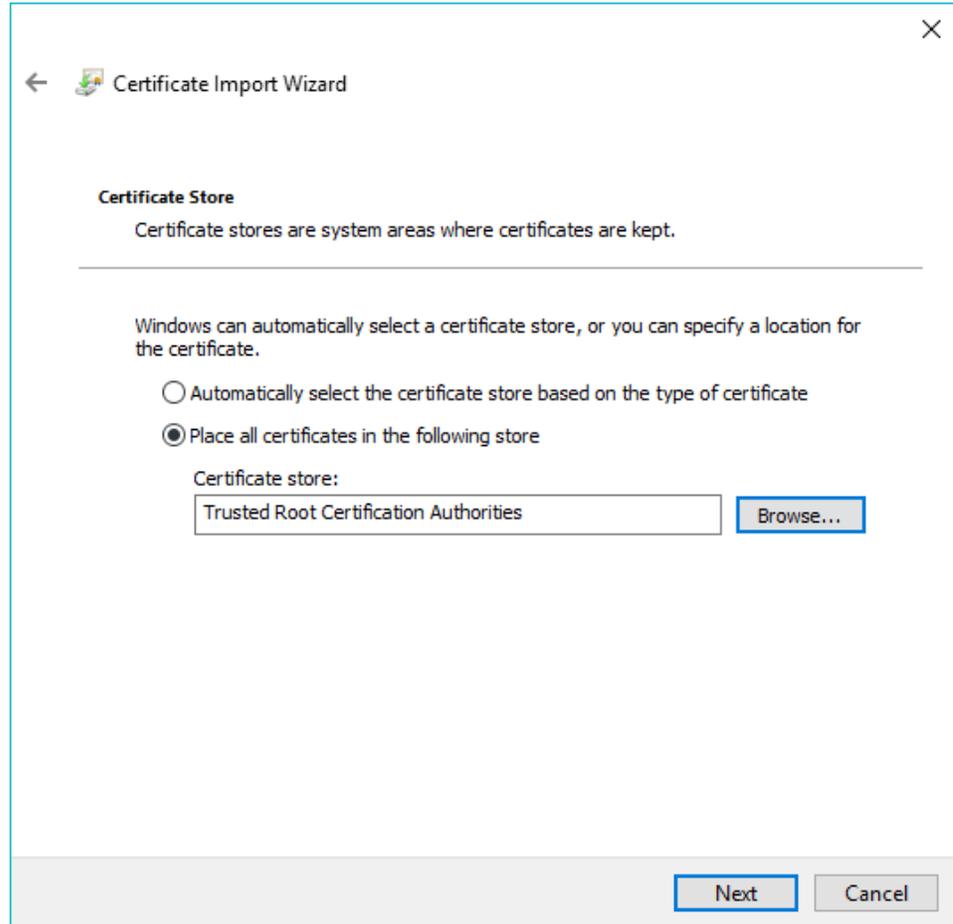
4. In the **Certificate** dialog, select the **Details** tab, and click **Copy to file**.



5. Save the certificate to your desktop.
6. On your desktop, double click the certificate.  
The **Certificate Import Wizard** displays.
7. In the **Certificate Import Wizard**, select **Local Machine**.



8. For **Certificate Store**, select **Place all certificates in the following store**, click **Browse**, and select **Trusted Root Certification Authorities**.



9. Complete the steps in the wizard.
10. Close the **Certificate** dialog.  
The **Sign in** page still shows the certificate error in the address bar.
11. Restart the browser and launch the same application. The certificate error no longer appears.

## 4.2.4 Install certificates

If you install an AMS Machine Works Interface on a server other than the AMS Machine Works server, you need to install the AMS Machine Works server certificate on the server where you plan to install the interface, before installing the interface, so the software can communicate with the server. After any installation, any user launching a client needs to install the AMS Machine Works server certificate from the browser. Perform these steps to complete SSL certification. For more information about certificates and general procedures, refer to [SSL/TLS certificates](#).

## Procedure

1. To install the AMS Machine Works Server certificates on an AMS Machine Works Interface Server or on a client PC, browse to the AMS Machine Works server and complete these steps:

The certificate from the AMS Machine Works Server is required on any computer you use to access the utilities by web browser, or on any server that has web services that communicate using web services.

- a) Launch Google Chrome.
- b) Enter **https://<MachineWorks\_Server\_Name>/Assetexplorer**.
- c) Click **Advanced**.
- d) Click **Proceed to <server\_name> (unsafe)**.
- e) The **Your connection is not private** screen displays.
- f) On the next screen, click **Not secure** next to the URL.
- g) A drop-down box is displayed with the message "Your connection to this site is not secure." Click **Certificate (invalid)**.
- h) On the **Certificate** screen, click on the **Details** tab. Click **Copy to File**.
- i) The **Certificate Export Wizard** displays. Click **Next** through the screens and accept the default values.
- j) In the **File to Export** window, click **Browse** and save the certificate to your PC's desktop using **MachineWorksServer\_Cert** as the file name.
- k) Click **Next**.
- l) Click **Finish**.
- m) Browse to the Desktop folder on your PC.
- n) Locate the **MachineWorksServer\_Cert** file. Right-click on this file and click **Install Certificate**.
- o) The **Certificate Import Wizard** displays. Select **Local Machine**. Click **Next**.
- p) Click **Place all certificates in the following store** and click **Browse**.
- q) Select **Trusted Root Certification Authorities**. Click **OK**. Click **Finish**.
- r) Exit Google Chrome and restart it.
- s) Press F12. Right-click the refresh button in Chrome.
- t) Click **Empty Cache and Hard Reload**. Exit the Chrome browser.
- u) From Windows Explorer, browse to **C:\Windows\Temp\ARES\Cache**.
- v) Delete all folders and files in the **C:\Windows\Temp\ARES\Cache** folder.
- w) To ensure that the Interface will use the certificate, reboot the server after completing these steps.

2. If you install any AMS Machine Works components on separate servers, the installed component's certificate must be exported and then installed on the computer with which it communicates. Follow the procedures in [SSL/TLS certificates](#).

After completing these procedures, return to [Completing AMS Machine Works post-installation steps](#) topic and continue your installation.

## 4.2.5 Export the public key certificate for an AMS Machine Works Interface Server

If you have AMS Machine Works Interfaces installed on computers other than the AMS Machine Works server, you need to export the interface's public key certificate from that station and install it on the AMS Machine Works server and any client computers that will be accessing information provided through the interface.

If you have multiple interfaces installed on a server, export the certificate of the interface that was installed first. In some cases, you may need to export both certificates.

---

### Note

The following instructions use the `certlm.msc` utility and are included as a guide. You can also use the `certmgr.msc` utility with the Certificates snap-in. Refer to Microsoft's documentation for more information.

---

### Prerequisites

- On the station, log in using an account with administrator privileges
- Install the AMS Machine Works server certificate on the Station. To confirm, launch an AMS Machine Works utility and sign in without seeing a certificate error

### Procedure

1. From the command prompt, type `MMC.exe` to launch Microsoft Management Console (MMC).

Refer to Microsoft's documentation for more information.

---

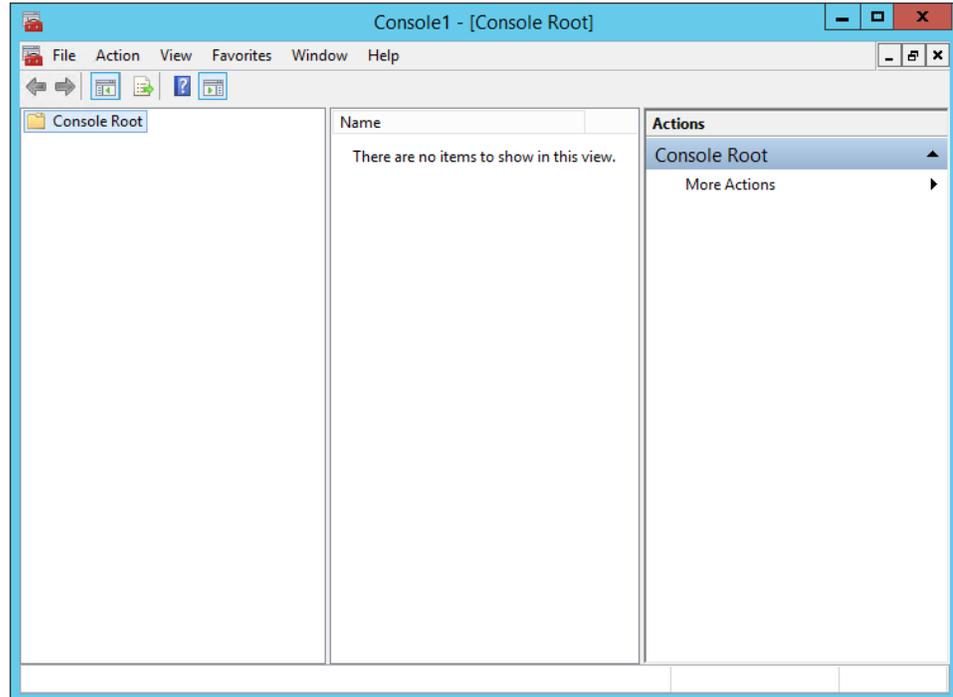
### Note

You can type `certlm.msc` to launch Microsoft Management Console (MMC) and display the local machine level certificates. If you have `certlm.msc`, launch it and skip to [Step 8](#).

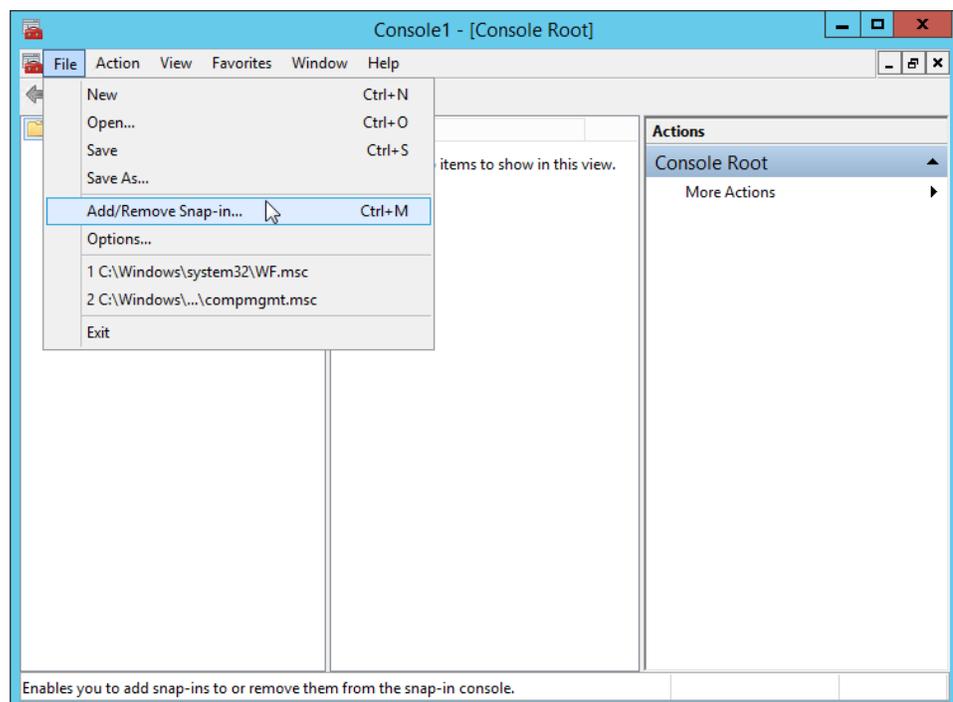
---

2. In the MMC console, add the **Certificates Snap-in**.

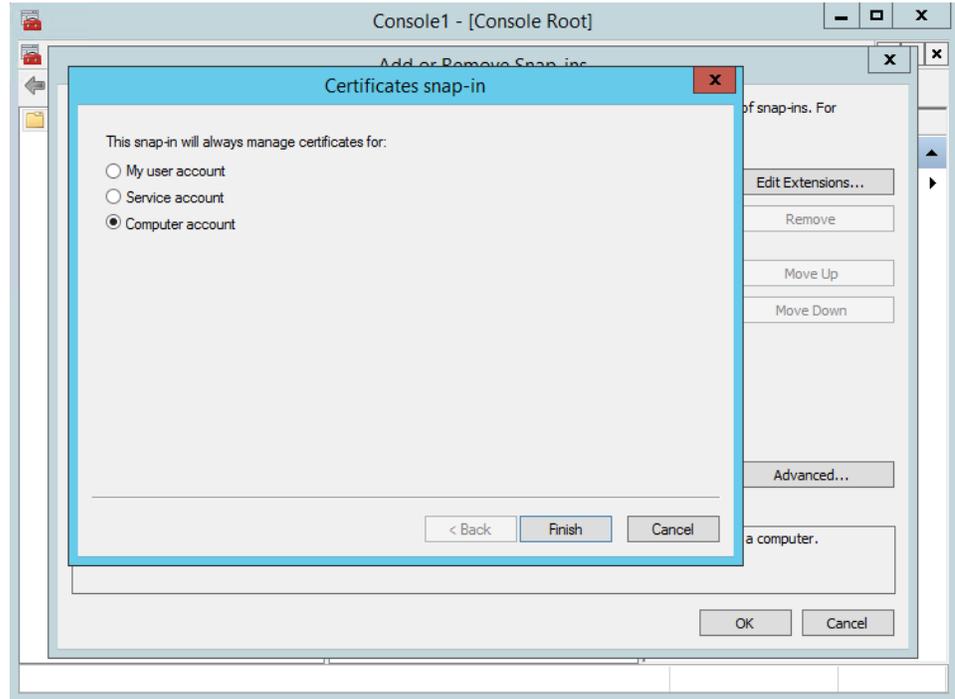
If **Console Root** already contains the Certificates Snap-in, the **Console Root** node already contains **Certificates**. Skip to [Step 8](#).



3. To add the Certificates Snap-in, select **File** → **Add/Remove Snap-in**.

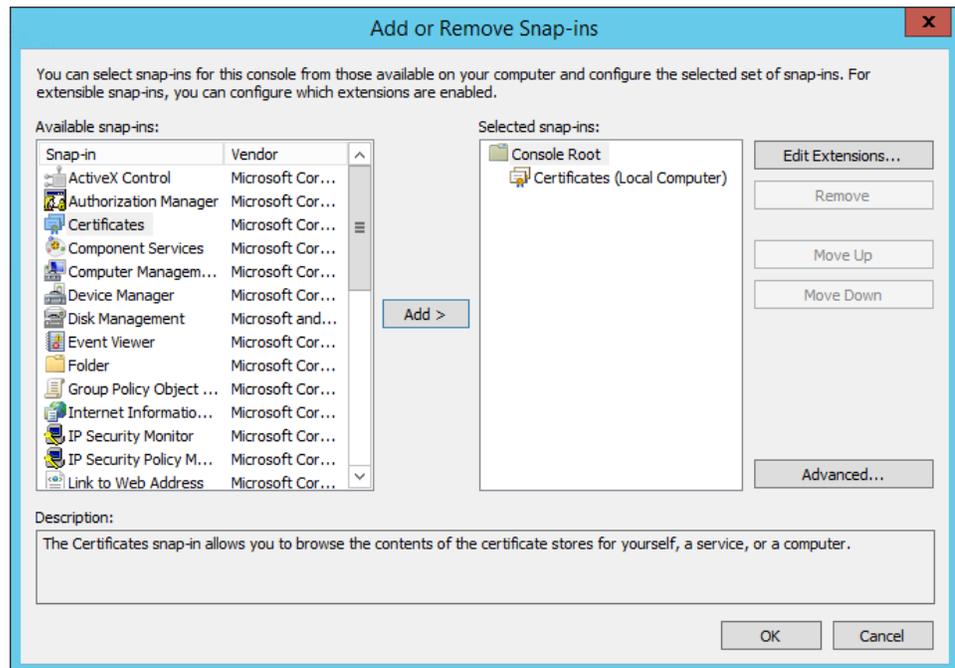


4. In the **Add or Remove Snap-ins** window, double-click **Certificates**, and click **Add**.
5. Select **Computer Account** and click **Finish**.



6. Select **Local computer** and click **Finish**.

In the **Add or Remove Snap-ins** dialog, the **Selected snap-ins** list contains **Certificates (Local Computer)**.



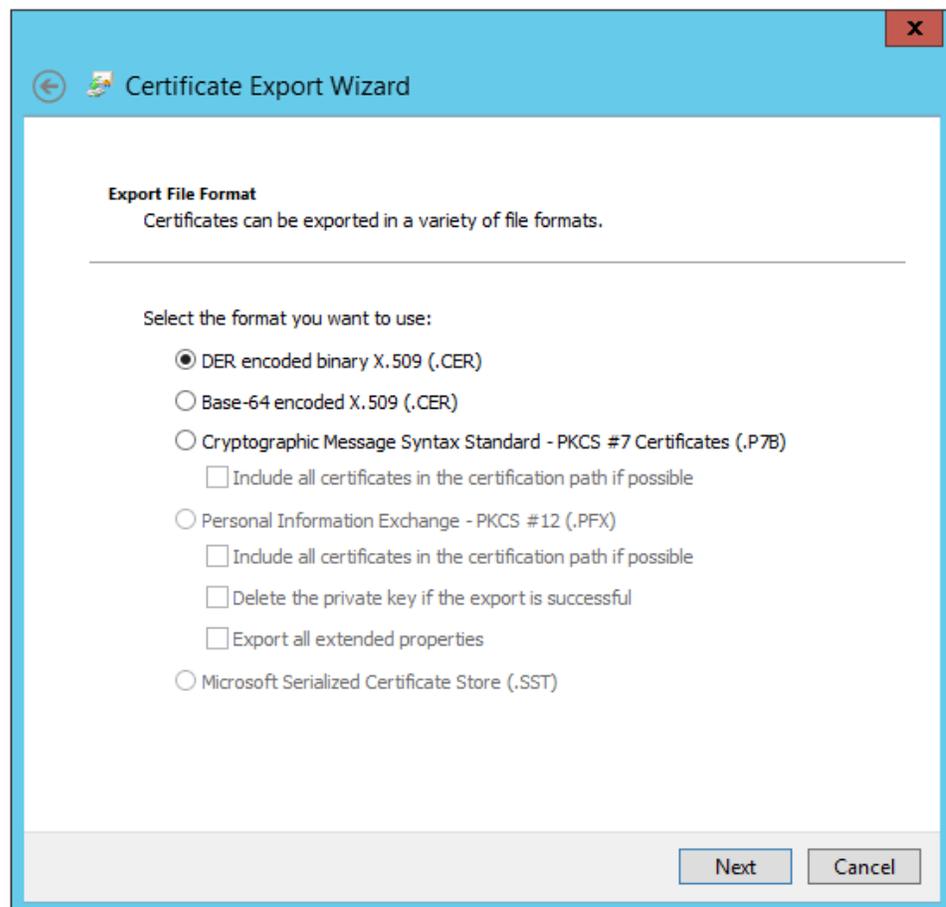
7. Click **OK** to exit the wizard.

8. In the MMC console, expand the nodes to **Certificates (Local Computer)** → **Personal** → **Certificates**.
9. Right-click the certificate to export and select **All Tasks** → **Personal** → **Export**. The Certificate Export Wizard opens.
10. Select **No, do not export the private key (default)**.

### ⚠ CAUTION

Do not export the private key file.

11. In **Export File Format**, select the default format **DER encoded binary X.509 (.CER)**, and click **Next**. (You can use another format if required.)



12. In **File to export**, specify the name and location of the file to be created, and click **Save**.
  - Browse to a secure location where you want to export the certificate as a file
  - Enter a file name that identifies the component and the server name

---

**Note**

Unique filenames can help if you need to export and install certificates for multiple servers.

---

13. Click **Next**, then click **Finish** to complete the export.

Copy the file to a secure location or device that you can access from the target server.

## 4.2.6 Install an AMS Machine Works Interface Server certificate on clients and servers

Installing the AMS Machine Works Interface Server certificate is a manual process. The system administrator needs to export the certificate first, saving it to a file, and securely transfer the certificate to the client or server where it can be installed using the Windows Certificate Import Wizard.

---

**Note**

The AMS Machine Works Interfaces can be installed on the AMS Machine Works Interface server in any order. However, the first interface installed will have the certificate that you need to export and install on the AMS Machine Works server and the AMS Machine Works client.

---

The following are some examples of where you will need to install the certificate that is manually exported from an AMS Machine Works Interface server:

- On the AMS Machine Works server, install the certificate exported from the AMS Machine Works Interface server
- On the client computer where you are using the Asset Explorer utility, install the certificates from AMS Machine Works server and AMS Machine Works Interface server if you need to add a new asset source from that interface

**Prerequisites**

- Install the AMS Machine Works server certificate on the AMS Machine Works Interface server. To confirm, launch an AMS Machine Works utility and sign in without seeing a certificate error
- Export the public key certificate for an AMS Machine Works Interface server
- Log in using an account with administrator privileges

**Procedure**

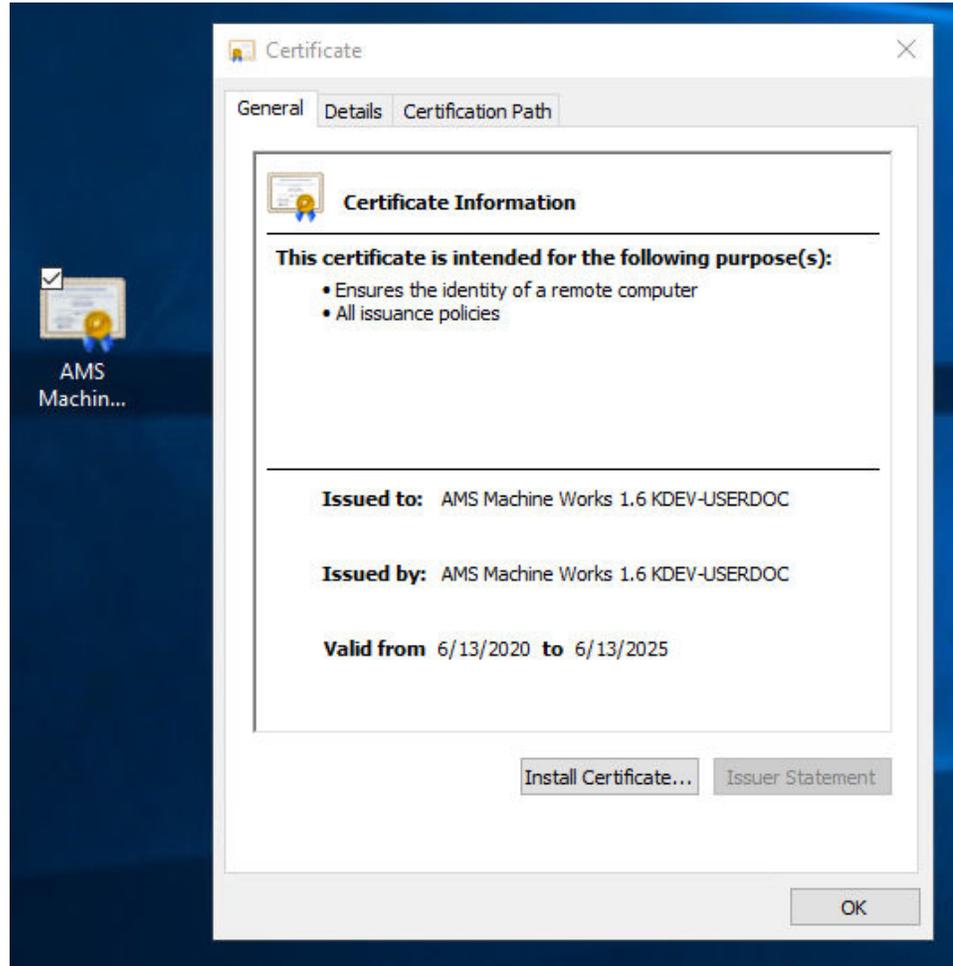
1. Copy the certificate file to the target server. For example, copy it to the desktop.
2. Double-click the certificate.  
The **Certificate** properties dialog opens.

---

**Note**

The example shows the certificate from the AMS Machine Works server. The AMS Machine Works Interface server certificate will have a different name in **Issued To** and **Issued By** that identifies the AMS Machine Works Interface server.

---



3. Click **Install Certificate**.  
The Certificate Import Wizard opens.
4. Select **Local Machine** and click **Next**.
5. Specify the **Trusted Root Certification Authorities** store.
6. Click **Finish**.  
The certificate is installed.

## 4.3 Additional security considerations

### Responsibilities and permissions

The User Manager utility allows for assigning responsibilities and permissions according to job functions. This strategy ensures that appropriate persons in the plant see relevant equipment and health changes.

Responsibilities restrict the user's view in the Asset Explorer utility according to the locations assigned to that user. Permissions assigned to the user would either enable or prevent the user from performing tasks related to assets and plant management.

### **User accounts**

The User Manager utility controls user account security. Consider setting account lockouts, password complexity requirements, and session length before adding users in AMS Machine Works.

## 5 Installation procedures

The installation procedures present the most common installation scenarios for installing AMS Machine Works v1.7. If a scenario you are looking for is not listed in this section, work with your Emerson representative to review the deployment scenario and verify if it is supported.

- **Distributed deployment:** Standard installation with SQL on a separate server. AMS Machine Works web components are installed on a different server than AMS Machine Works Interfaces. See [Install AMS Machine Works: Distributed deployment](#)
- **Single server deployment:** Limited Storage installation with SQL Express, AMS Machine Works web components and AMS Machine Works Interfaces installed on a single server. Only recommended for a temporary proof of concept. See [Install AMS Machine Works: Single server deployment](#)

If upgrading from AMS Machine Works v1.6, please go to chapter [Upgrades and updates](#).

### 5.1 Server Installation Pre-Check

#### Procedure

##### 1. Server names:

The server names for the AMS Machine Works Server and any associated Interface Server must meet the following criteria;

- It must be at least 1 character, but not more than 14
- It cannot contain any of the following characters:
  - backslash \
  - slash mark /
  - colon :
  - asterisk \*
  - question mark ?
  - quotation mark "
  - less than sign <
  - greater than sign >
  - vertical bar |
  - underscores \_
  - comma ,
  - tilde ~
  - semicolon ;
  - exclamation mark !
  - at sign @

- number sign #
- dollar sign \$
- percent %
- caret ^
- ampersand &
- apostrophe '
- period .
- parentheses ( )
- braces { }
- white space ( **blank** )

2. **Check Server Time:**

Make sure time and time-zones are correct before proceeding (If you have multiple servers make sure they all match time and time-zones).

3. **Administrator Account:**

Make sure that the user account being used for installation is an Administrator on all servers associated with AMS Machine Works (AMS Machine Works, SQL, Interface Servers, etc.). To check the user open Computer Management, go to Local Users and Groups, then under Groups double click Administrators. Verify the user you are using for installation is a member of this group.

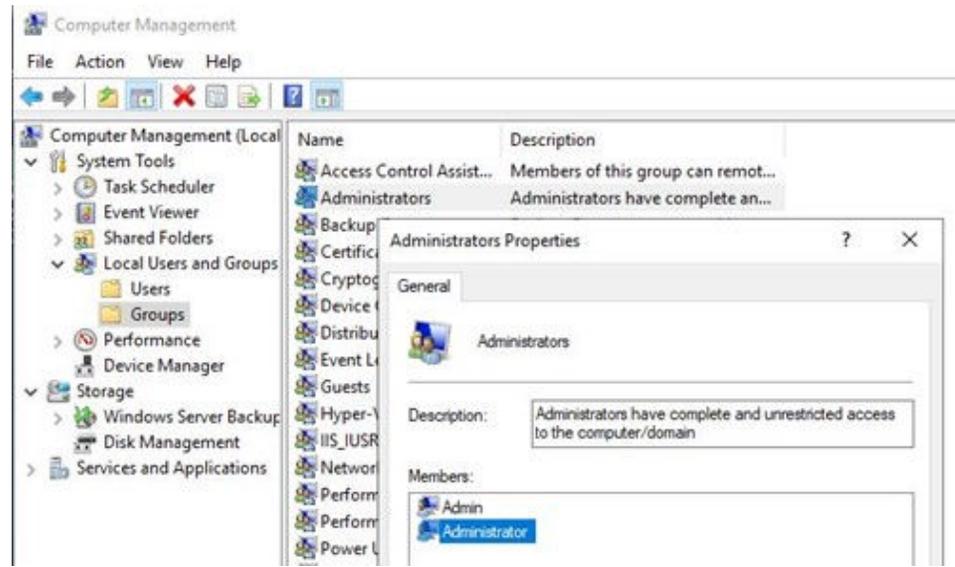
---

**Note**

The user could also be added to a Domain Group which is part of the Administrators Group. If you are unsure you can check with the Network Administrator, but typically if you do not get any errors or warnings getting to this point you are probably an Administrator.

---

Figure 5-1: Administrator Properties



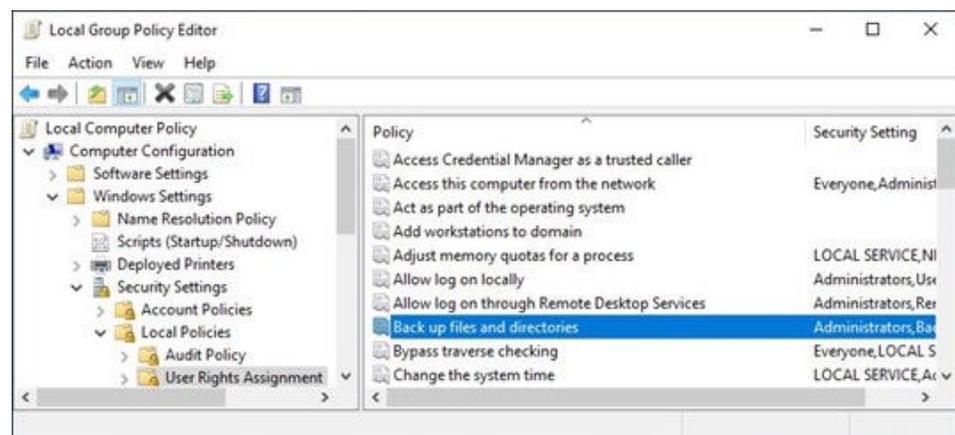
#### 4. Group Policies:

Make sure the user you are installing with has these Group Policy permissions, if not, assign the following rights.

- a. Debug programs
- b. Backup files and directories
- c. Manage auditing and security logs

These can be found under **Local Computer Policy** → **Computer Configuration** → **Windows Settings**→**Security Settings**→ **Local Policies**→ **User Rights Assignment** through the Group Policy Editor.

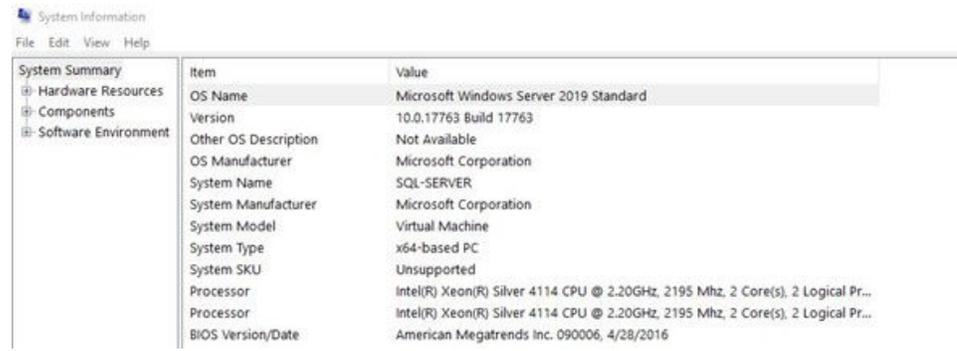
Figure 5-2: Local Group Policy Editor



#### 5. Hardware Details:

Open System Information and confirm the number of Processors and Cores, if you have multiple processors the cores will be added together (this is used during the SQL Server Installation). You can also verify the System RAM.

**Figure 5-3: System summary under System Information**

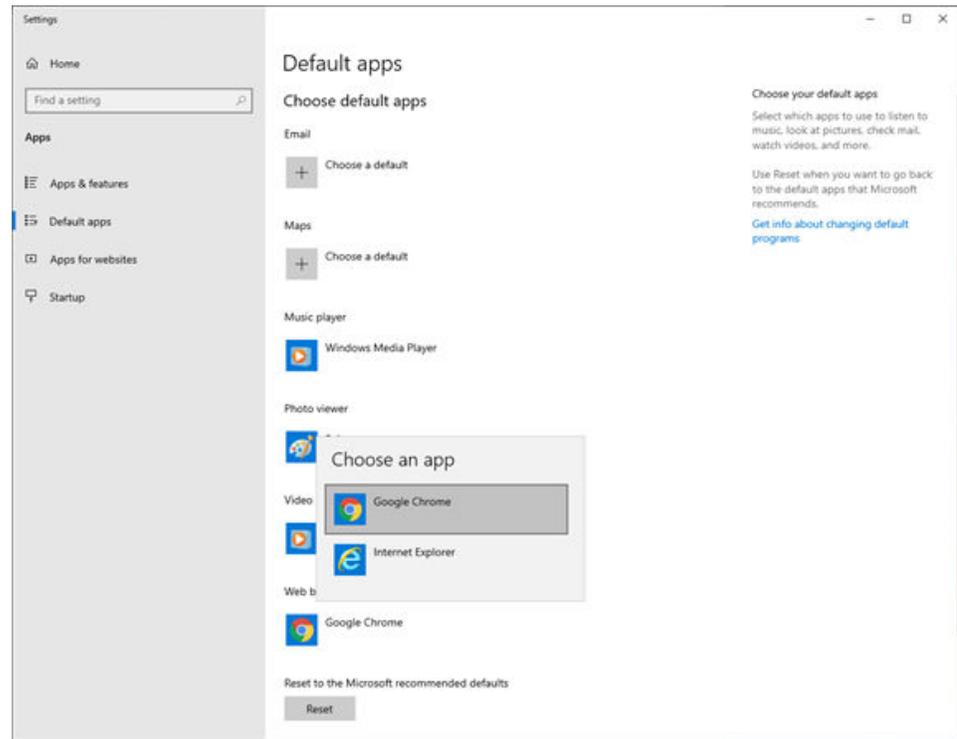


Item	Value
OS Name	Microsoft Windows Server 2019 Standard
Version	10.0.17763 Build 17763
Other OS Description	Not Available
OS Manufacturer	Microsoft Corporation
System Name	SQL-SERVER
System Manufacturer	Microsoft Corporation
System Model	Virtual Machine
System Type	x64-based PC
System SKU	Unsupported
Processor	Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz, 2195 Mhz, 2 Core(s), 2 Logical Pr...
Processor	Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz, 2195 Mhz, 2 Core(s), 2 Logical Pr...
BIOS Version/Date	American Megatrends Inc. 090006, 4/28/2016

**6. Default Browser:**

Setup Chrome as your default Browser. Open Default Apps, select Web browser and select Google Chrome.

**Figure 5-4: Choose a default browser in System Settings**



## 5.2 Install AMS Machine Works

Complete the installation, selecting the following required AMS Machine Works web service components:

- Web Services
- Interface Router
- Historian

Install the AMS Machine Works Interfaces on separate servers. Only the AMS Asset Monitor Interface can be installed on a server with the AMS 6500 ATG Interface or the Wireless Interface. For a temporary proof of concept, all the applicable interfaces can be installed along with the AMS Machine Works web components in a single server:

- AMS 6500 ATG Interface
- Wireless Interface
- Ovation MHM Interface
- AMS Asset Monitor Interface

During installation you will be prompted to register the interfaces.

---

### Note

Use the zip file `Install_1.7.X.X.zip` which includes all the installation files.

Once the zip file is downloaded, you need to unblock it. Right-click the file you downloaded and select **Properties**. In the **General** tab, click **Unblock**. If the zip file is not unblocked prior to unzipping the file; running the installation will result in an 'Unhandled Exception' error and the setup will terminate.

---

### Note

The installer shows the specific order in which these items need to be installed. Please follow that order exactly to ensure a successful installation. Before you begin, please write down the locations where you will install these services.

After completing these procedures, return to [Installing AMS Machine Works](#) and continue your installation.

## 5.3 Install AMS Machine Works: Distributed deployment

This installation section shows the distributed deployment scenario of installing all web components on the AMS Machine Works Server, SQL on a separate server, and an interface on the AMS Machine Works Interface Server. This installation is an example of the deployment scenario shown in [2B: AMS Machine Works with AMS 6500 ATG](#).

---

### Note

If installing an Ovation MHM Interface, a dedicated AMS Machine Works system is required.

---

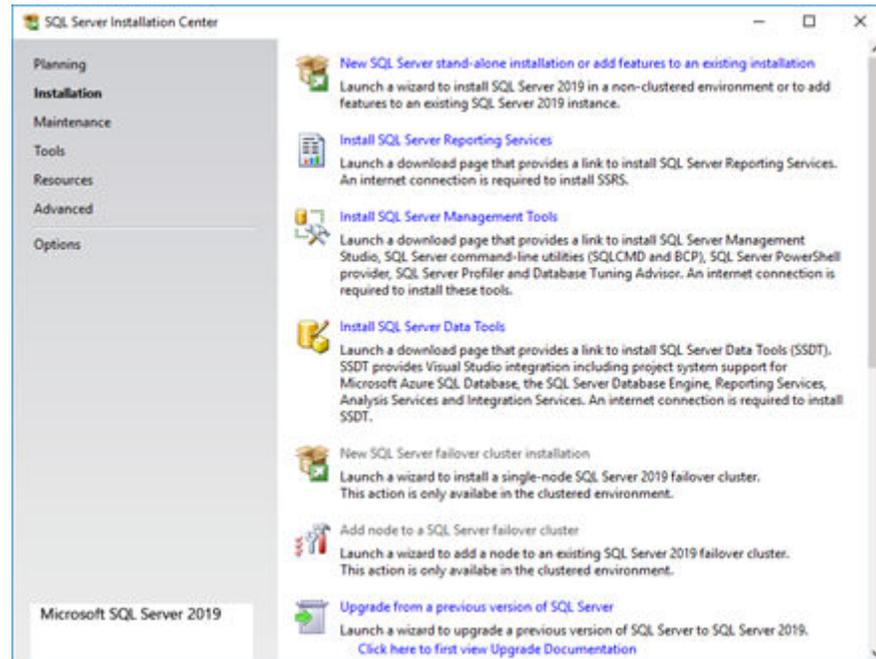
## 5.3.1 SQL Server Installation

This procedure provides instructions for a new installation of SQL Server. If this is an upgrade from AMS Machine Works v1.6, please skip this section and proceed directly to [AMS Machine Works Standard Installation](#). For installation of the AMS Machine Works Interface software go to [Install interfaces on AMS Machine Works Interface Server](#)

### Procedure

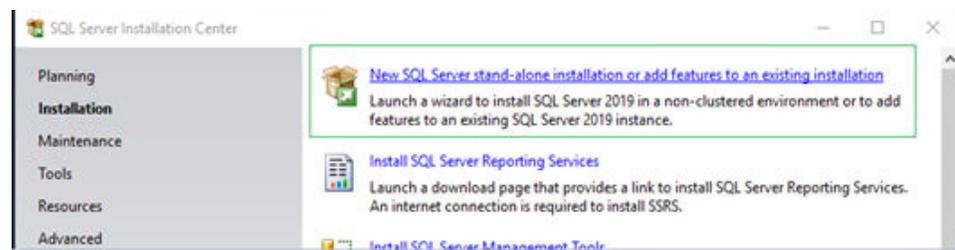
1. Start a NEW SQL Server stand-alone installation from your installer disc/image
2. If you are using an ISO you might have to right click the ISO file and select mount, this will mount the image and create a drive using the next available drive letter. Right-click the Setup. Exe Run as an Administrator
3. Select Installation on the left:

Figure 5-5: SQL Server Installation Center left



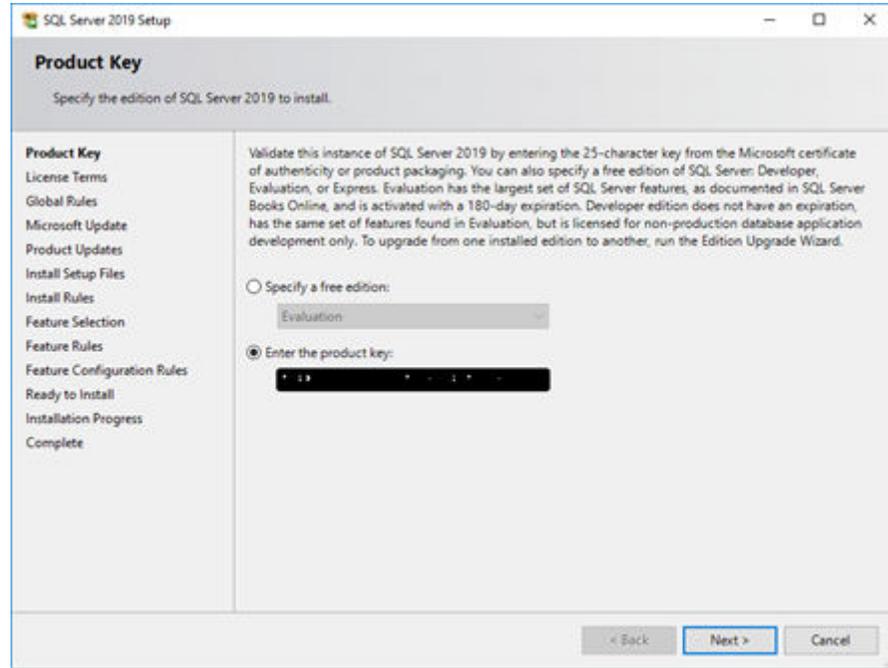
4. Click New SQL stand-alone Installation... on the right

Figure 5-6: SQL Server Installation Center right



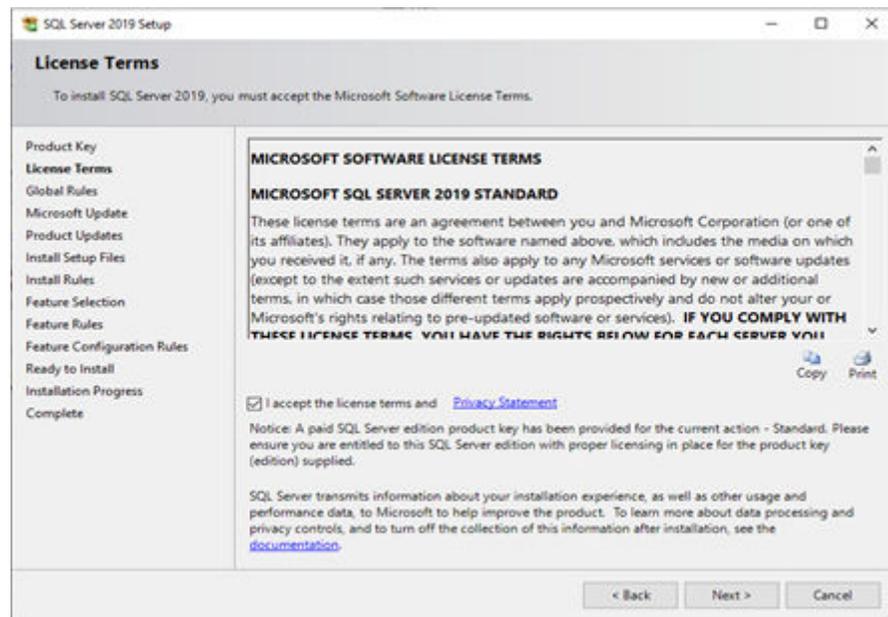
5. Input your product key as needed and click Next.

Figure 5-7: Product Key step



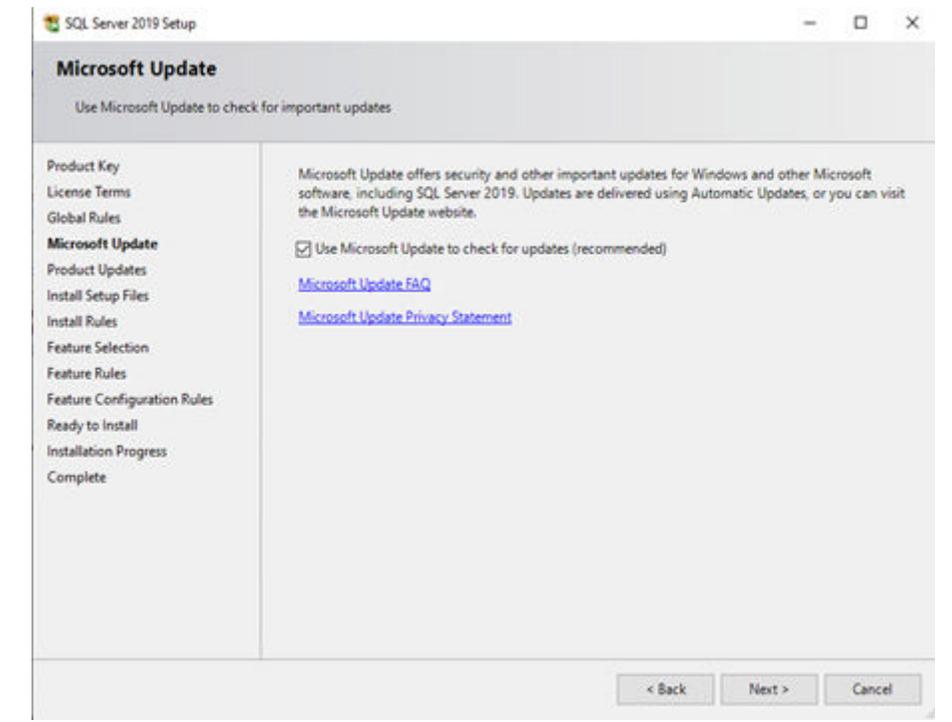
6. Accept the license and click Next.

Figure 5-8: License Terms step



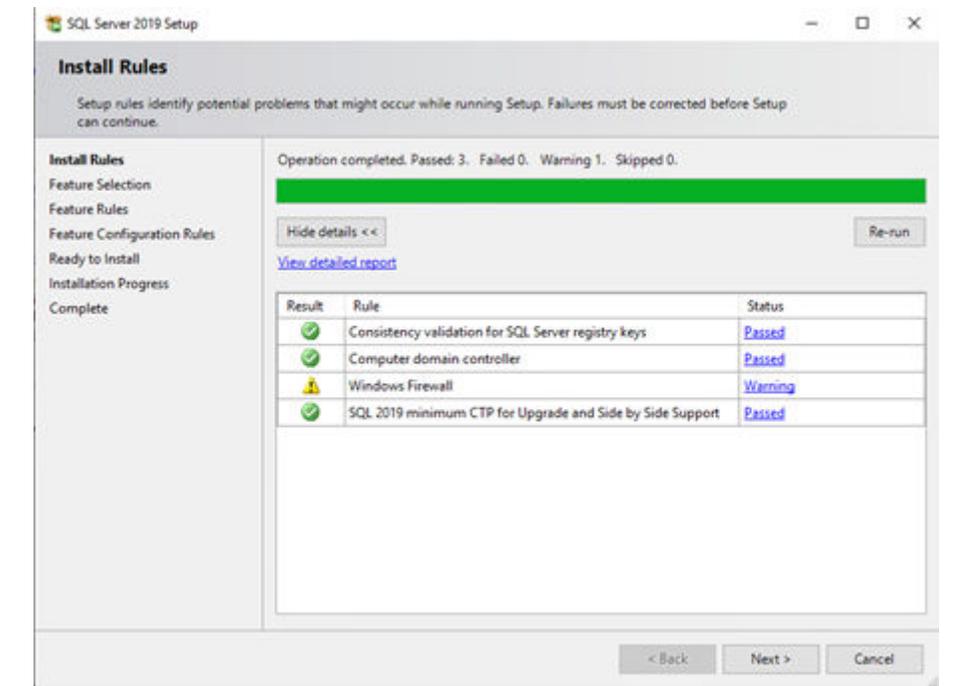
7. Use Microsoft Update as recommended and click Next.

Figure 5-9: Microsoft update step



8. Install Rules: Click Next to proceed if everything is passed. You might get a warning about Windows Firewall – we will set the required rules in further steps.

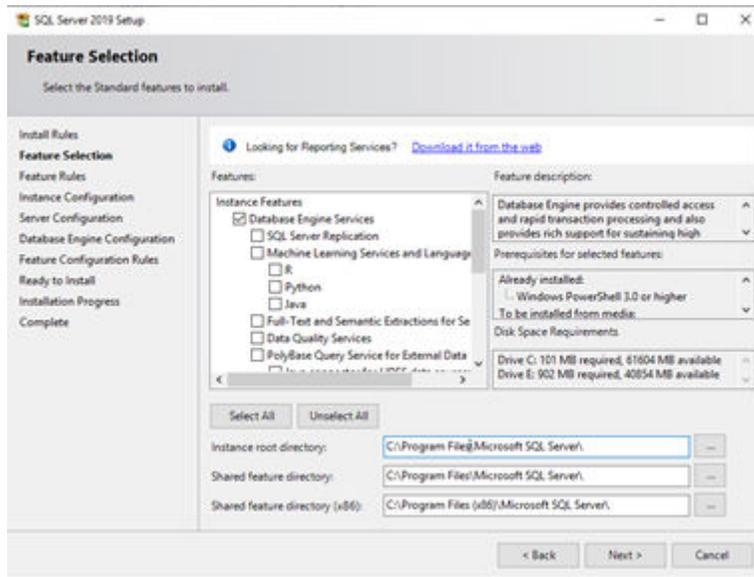
Figure 5-10: Install Rules step



## 9. Feature Selection

- a. Only the basic SQL component is required – Database Engine Services
- b. (optional step) **SQL Server Replication** can be chosen if you wish to perform such operations in the future but is not necessary.
- c. The directories shown on this screen relate to SQL binaries, not data itself. It is recommended to keep them in the default directories on the system disk, so **C:** in most cases.

Figure 5-11: Feature Selection step

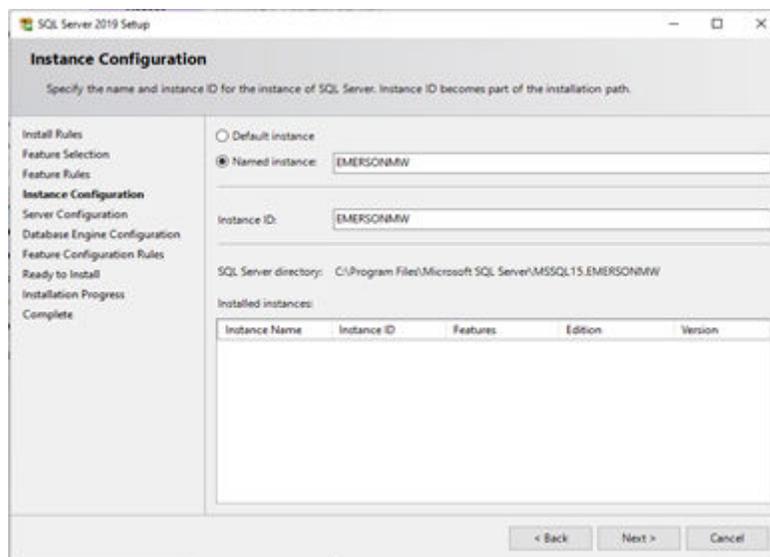


10. Instance Configuration
  - a. Choose Named instance and input EMERSONMW.
  - b. Click on the Instance ID box to confirm it updates to EMERSONMW.

**Note**

Any other Instance Name will not work for AMS Machine Works

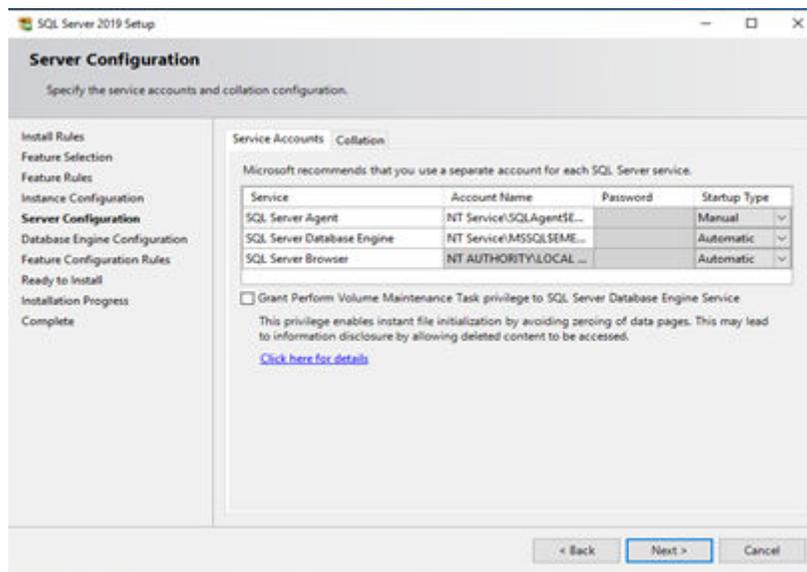
Figure 5-12: Instance Configuration step



11. Server Configuration

- a. (optional step) You can tick the “**Grant Perform Volume...**” checkbox for instant file initialization, which may improve performance, but pose a security threat for the non-zeroed out files.
- b. Click Next.

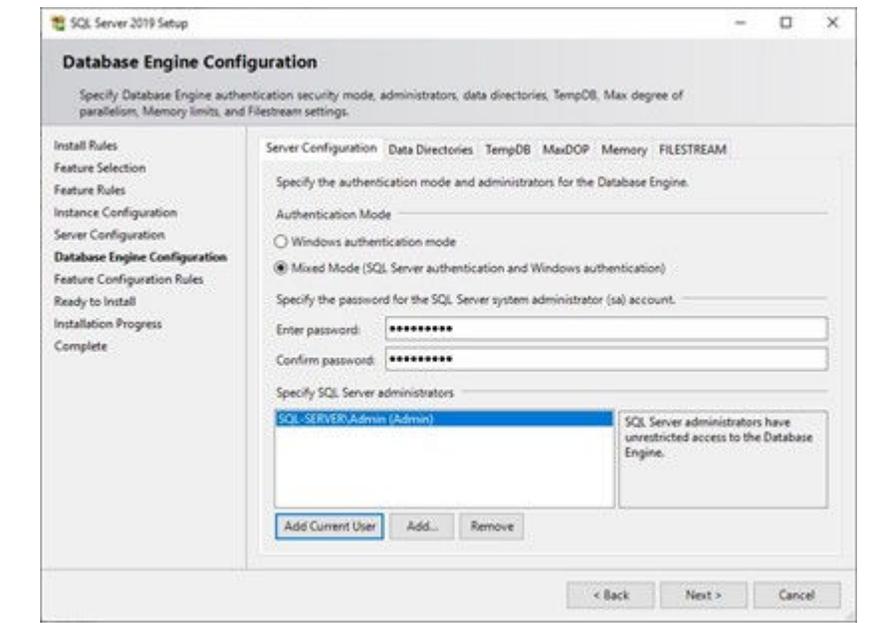
**Figure 5-13: Server Configuration step**



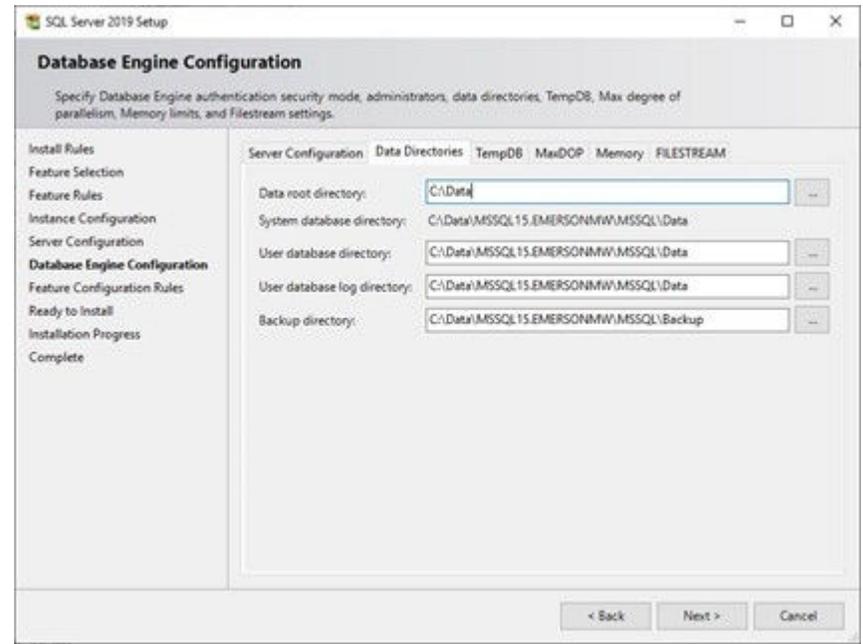
## 12. Database Engine Configuration

- a. Server Configuration tab: Choose Mixed Mode authentication, input chosen system administration (sa) password, and click Add Current User to add logged admin account.
- b. Add any additional administrators that might be needed, including for the person who will be performing the AMS Machine Works installation. Proceed to the Data Directories tab.

Figure 5-14: Database Engine Configuration - Server Configuration tab

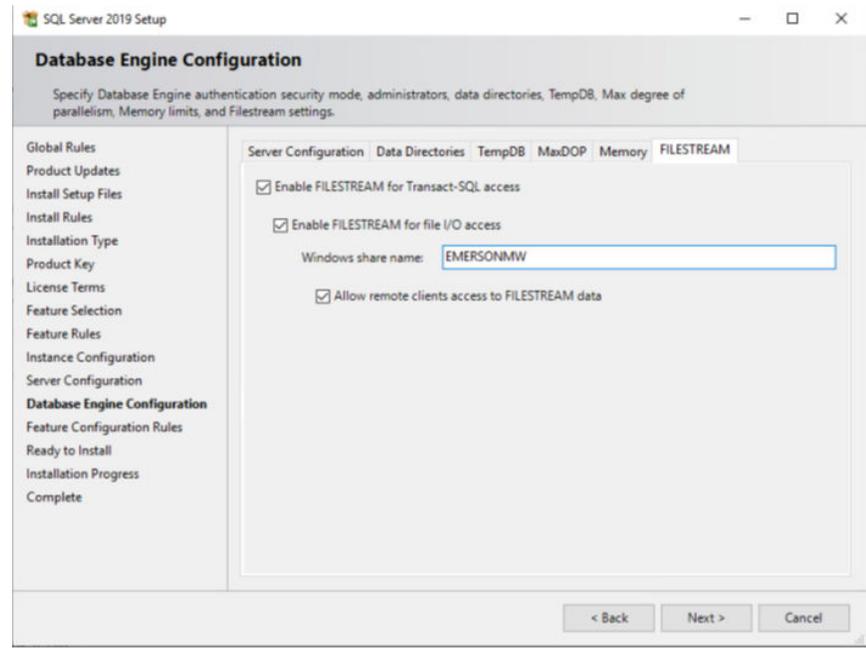


- c. Data Directories tab: Use the Data root directory box to direct data to a different location. It is recommended to keep the data on a different disk than system. Notice the System database, User database, User database log, and Backup directories will update together with Data root. Proceed through the remaining tabs. Take note of the User database directory, as it will be used in future steps.

**Figure 5-15: Database Engine Configuration - Data Directories tab**

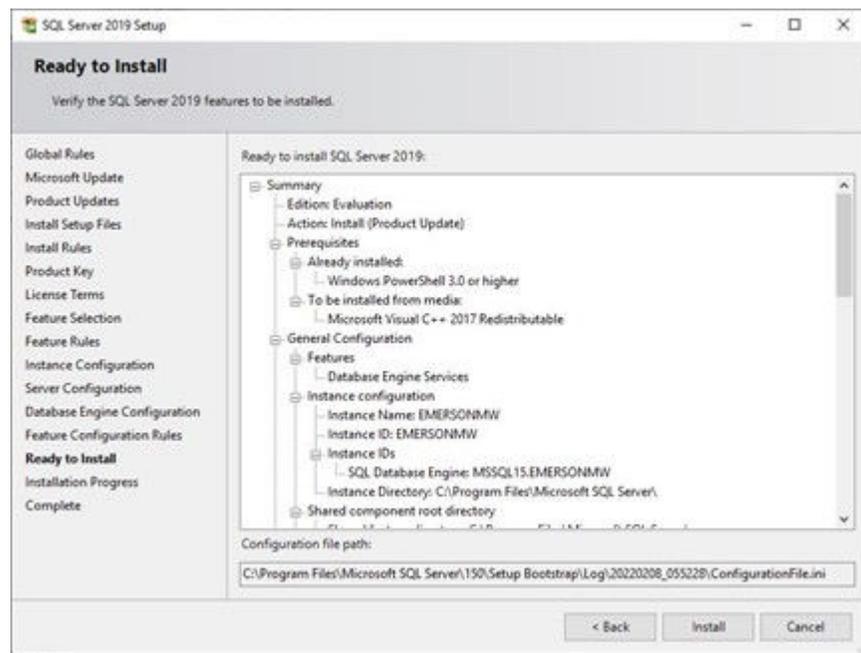
- d. TempDB tab: Make sure 'Number of files' value equals to the number of Processor Cores (up to 8), as well as that Data and Log directories here reflect the changes from Data Directories tab.
- e. MaxDOP tab: Don't change this information.
- f. Memory tab: Leave as Default.
- g. FILESTREAM tab: Check all checkboxes on the tab – **Enable FILESTREAM for Transact-SQL access, Enable FILESTREAM for file I/O access, Allow remote clients access to FILESTREAM data.** Click Next.

Figure 5-16: Database Engine Configuration - FILESTREAM tab



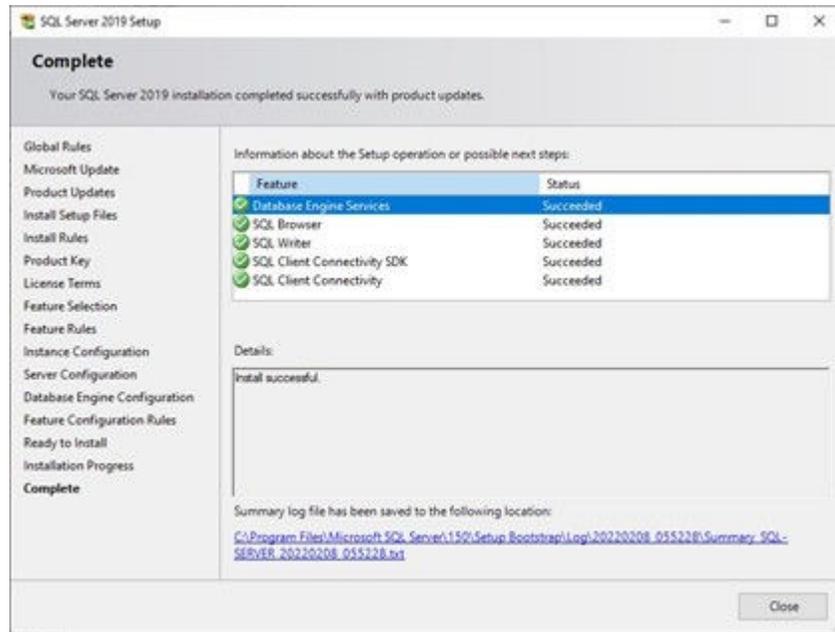
13. Review the summary and Click Install.

Figure 5-17: Ready to install summary



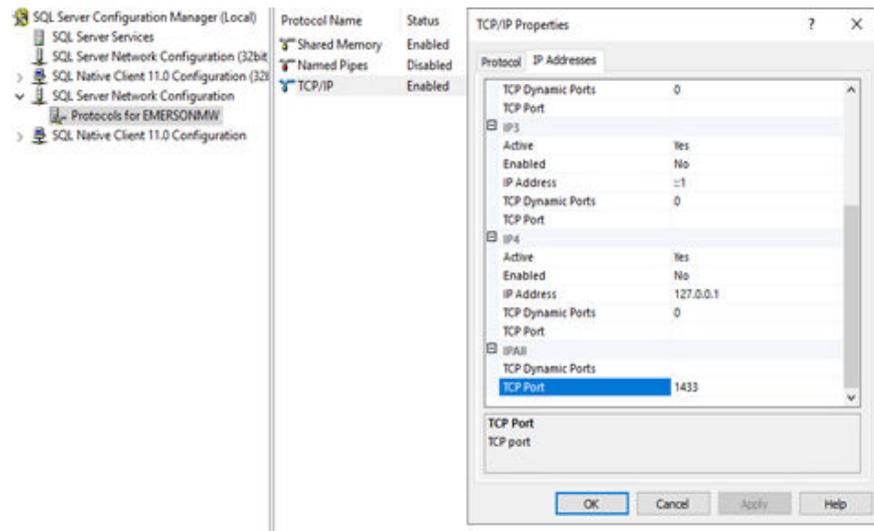
14. After installation is complete, click Close and reboot the machine if prompted.

Figure 5-18: Installation complete



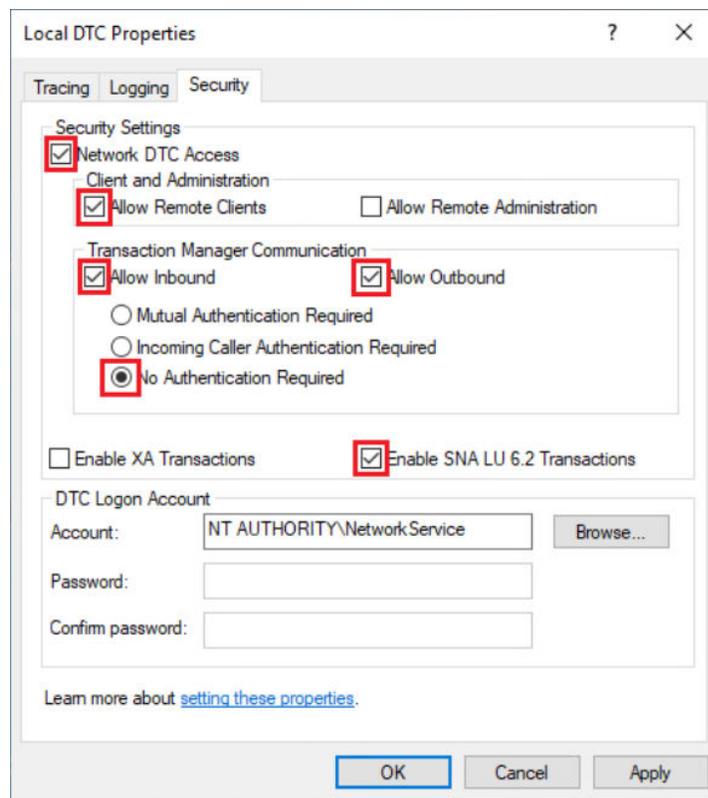
15. O. Go to **Start -> Microsoft SQL Server \*version\* -> SQL Server Configuration Manager -> SQL Server Network Configuration -> Protocols for EMERSONMW**. Make sure **TCP/IP** is enabled and right-click and open its **Properties**.
  - a. In the **IP Addresses** tab, under **IPALL**, set to a static port by changing the **TCP Port** (preferred is 1433) and make note of it – it affects firewall rules that are required to set. Delete the **TCP Dynamic Ports**. Click **Apply** and close this window.

Figure 5-19: TCP/IP Properties window



16. Open Component Services and browse to **Component Services -> Computers -> My Computer -> Distributed Transaction Coordinator -> Local DTC**. Right click and select **Properties**.
  - a. i. In the Security tab, enable the following checkboxes:
    - Network DTC Access
    - Allow Remote Clients
    - Allow Inbound
    - Allow Outbound
    - No Authentication Required
    - Enable SNA LU 6.2 Transactions
  - b. Verify the DTC Logon Account is NT AUTHORITY\Network Service
  - c. Apply the changes and close the windows.

**Figure 5-20: Local DTC Properties**



17. Open Windows Defender Firewall with Advanced Security, and set the following rules:

Figure 5-21: Windows Firewall with Advanced Security

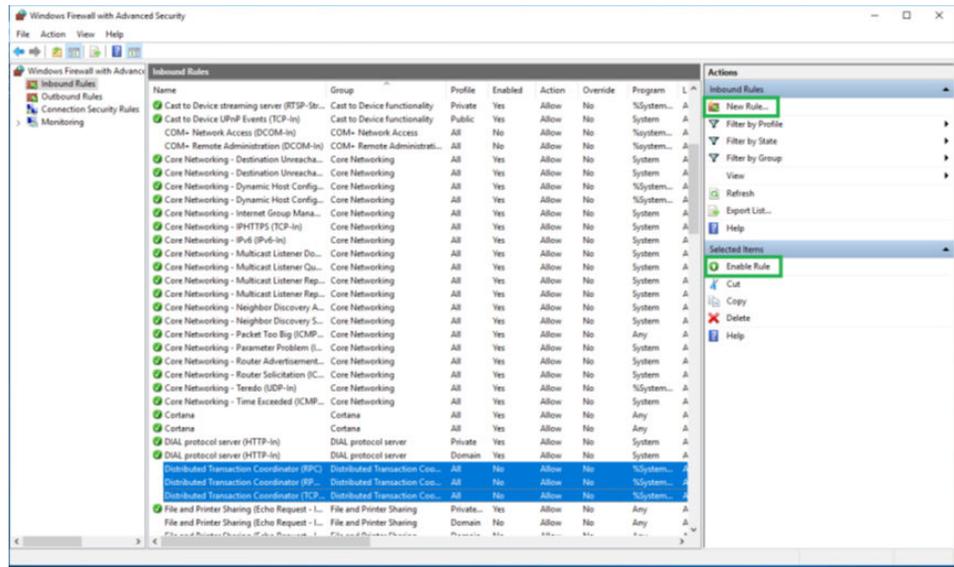


Table 5-1: Inbound Rules

Inbound Rules	Notes
Distributed Transaction Coordinator (RPC)	Predefined firewall rule to be enabled on the list
Distributed Transaction Coordinator (RPC-EPMAP)	Predefined firewall rule to be enabled on the list
Distributed Transaction Coordinator (TCP-In)	Predefined firewall rule to be enabled on the list
UDP Port 1434	Port rule required to add. Suggested name: SQL Browser
TCP Port 1433 (or the port chosen in 1.L.i)	Port rule required to add. Suggested name: SQL

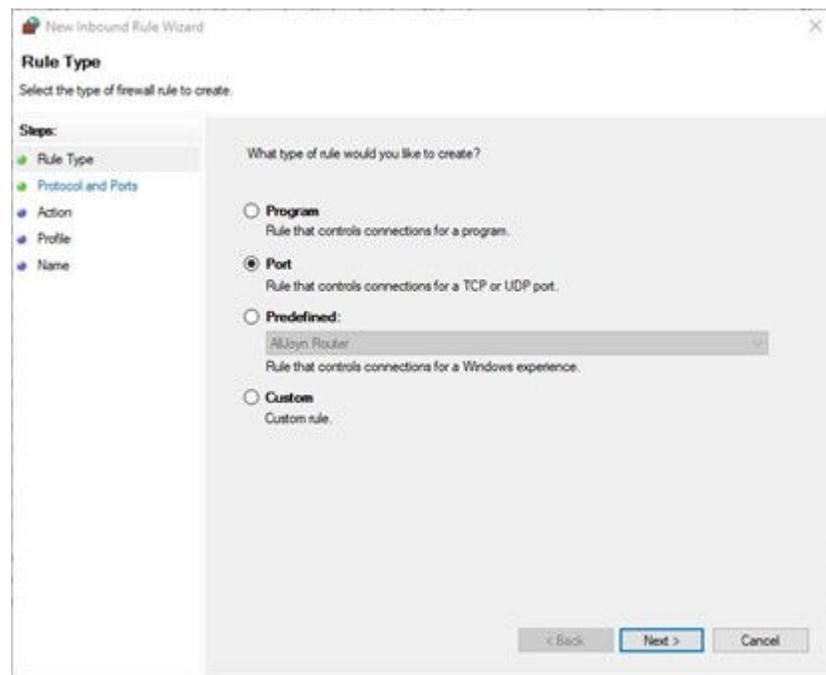
Table 5-2: Outbound Rules

Outbound Rules	Notes
Distributed Transaction Coordinator (TCP-Out)	Predefined firewall rule to be enabled on the list
UDP Port 1434	Port rule required to add. Suggested name: SQL Browser
TCP Port 1433 (or the port chosen in 1.L.i)	Port rule required to add. Suggested name: SQL

- a. Enable a Predefined Firewall rule.

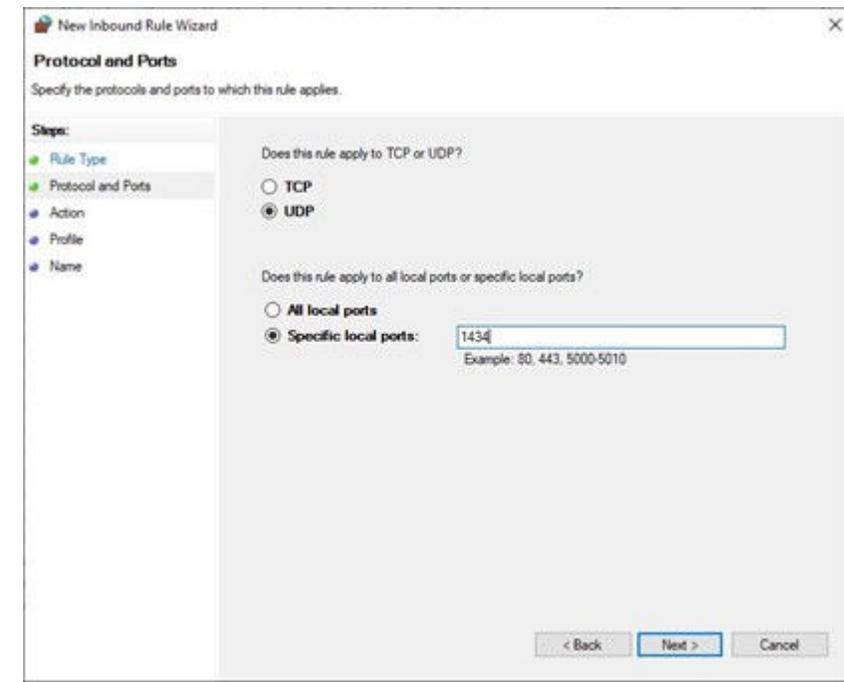
- b. Scroll through the rules for Inbound and Outbound Rules and scroll until you find the items indicated as predefined firewall rules from the tables above. Click Enable Rule on the right for each of them.
- c. Add a new Firewall rule.
- d. Select Inbound or Outbound Rules depending on which rule you are adding and click New Rule on the right. under directory:
- e. Select Port type and click Next.

**Figure 5-22: New Inbound Rule Wizard - port type**



- f. Select protocol type and port number for the rule you're adding. Be careful to set correct protocol (TCP or UDP) for the port number you're adding and click Next.

Figure 5-23: New Inbound Rule Wizard - protocol type

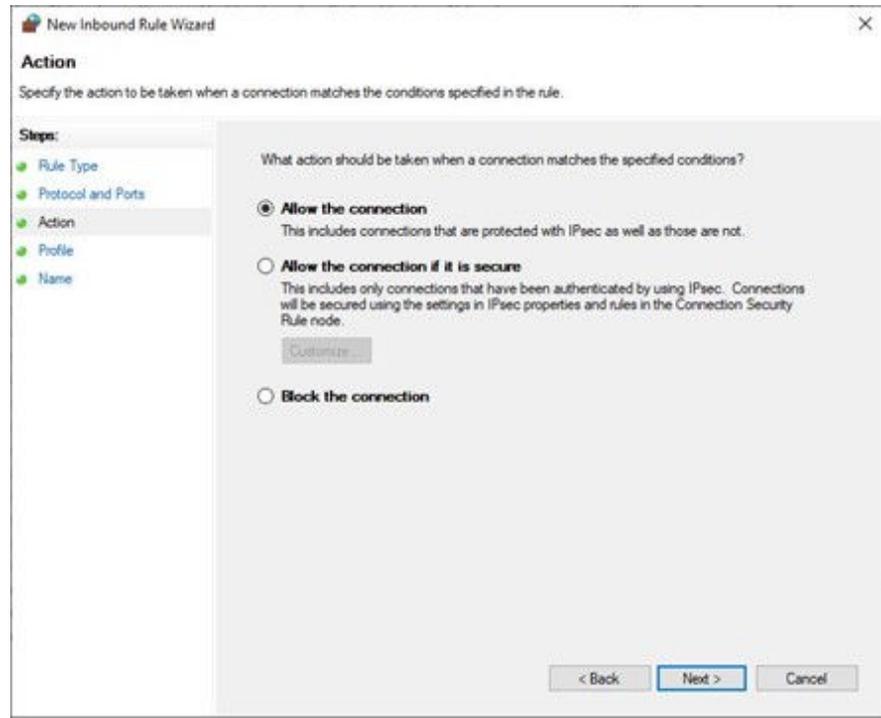


- g. Select Allow the connection and click Next.

**Note**

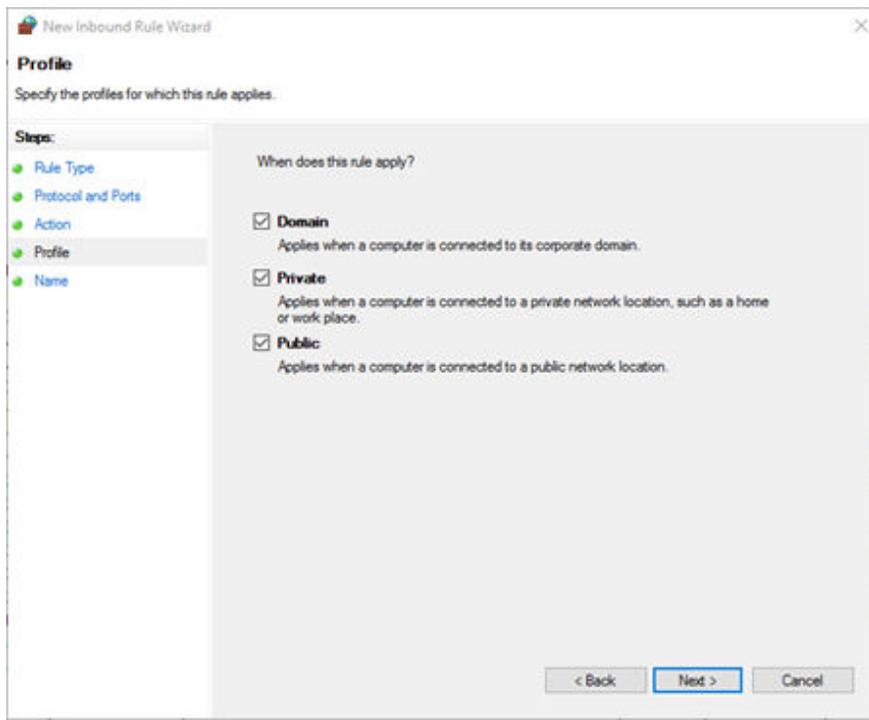
This action will be the default for setting Inbound Rules but needs to be manually selected when setting Outbound Rules.

Figure 5-24: New Inbound Rule Wizard - Action



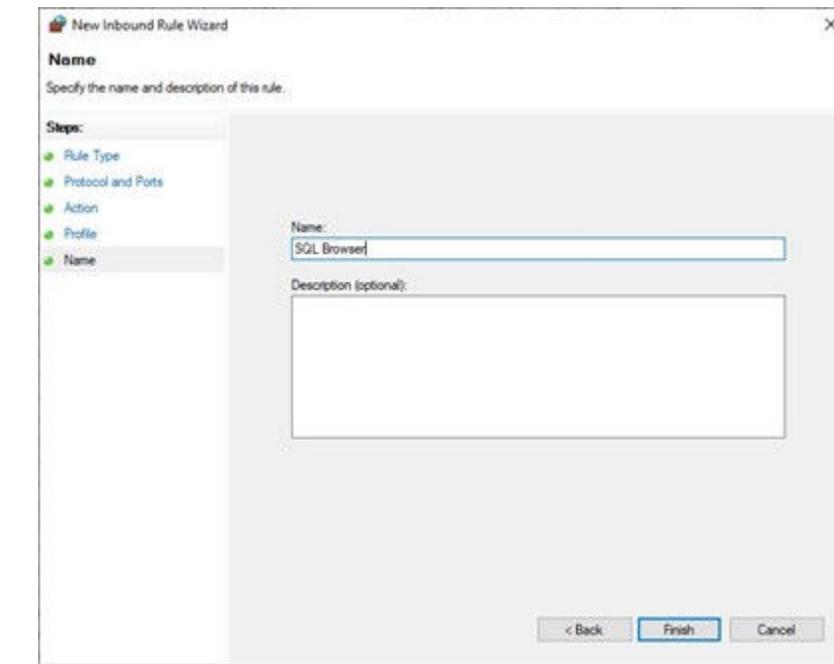
- h. Check or uncheck the network type(s) that this rule will apply to according to your planned network infrastructure and click Next.

Figure 5-25: New Inbound Rule Wizard - Profile



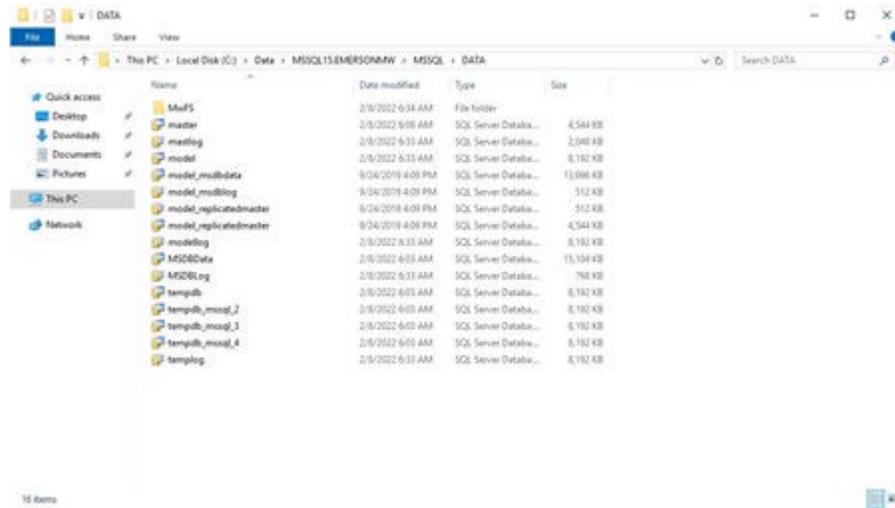
- i. Name the rule the suggested names from the Table above and click Finish.

Figure 5-26: New Inbound Rule Wizard - Name



- j. Add all the Rules mentioning ports in the above tables for Inbound and Outbound Rules.
18. Manually create a New Folder named **MwFS\* User database directory\* \MwFS**  
User database directory was shown during the installation [Figure 5-15](#). Example: **C:\Data\MSSQL15.EMERSONMW\MSSQL\DATA\MwFS**

**Figure 5-27: User database directory - example**



The number after MSSQL may vary depending of the MSSQL Server version used (15 in the example corresponds to SQL Server 2019).

19. Reboot the machine to ensure all the changes were applied.

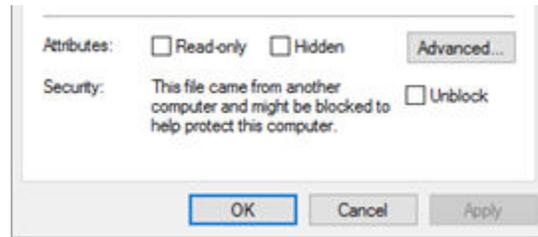
## 5.3.2 AMS Machine Works Standard Installation

This procedure provides instructions for installing the AMS Machine Works software. For installation of the AMS Machine Works Interface software go to [Install interfaces on AMS Machine Works Interface Server](#).

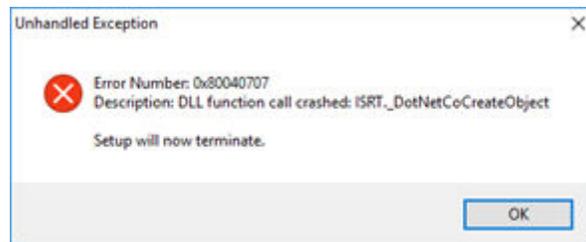
### Procedure

1. Pre-setup for Standard installation of AMS Machine Works v1.7, which must be completed before starting the installation.
  - a. Enable the same firewall rules on the AMS Machine Works server following the same setup steps used when setting up the SQL server [Figure 5-21](#)
  - b. Enable the Local DTC on the AMS Machine Works server in the same manner as you did for the SQL Server installation [Figure 5-20](#)
2. Download the installation files for AMS Machine Works v1.7 and before extracting right-click on the file and select Properties.

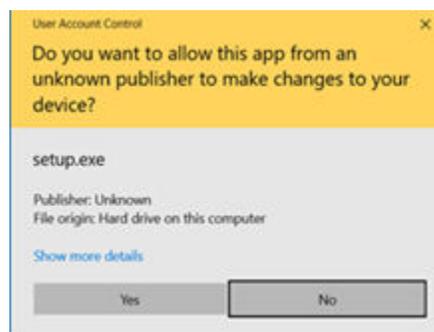
If **Unblock** is shown under Security, be sure to check it and click Apply. Confirm that **Unblock** is unchecked.

**Figure 5-28: File Properties**

If you do not Unblock the files and you will have to delete the extracted folder and re-extract the installation files. This will most likely be the error you see.

**Figure 5-29: Error pop-up**

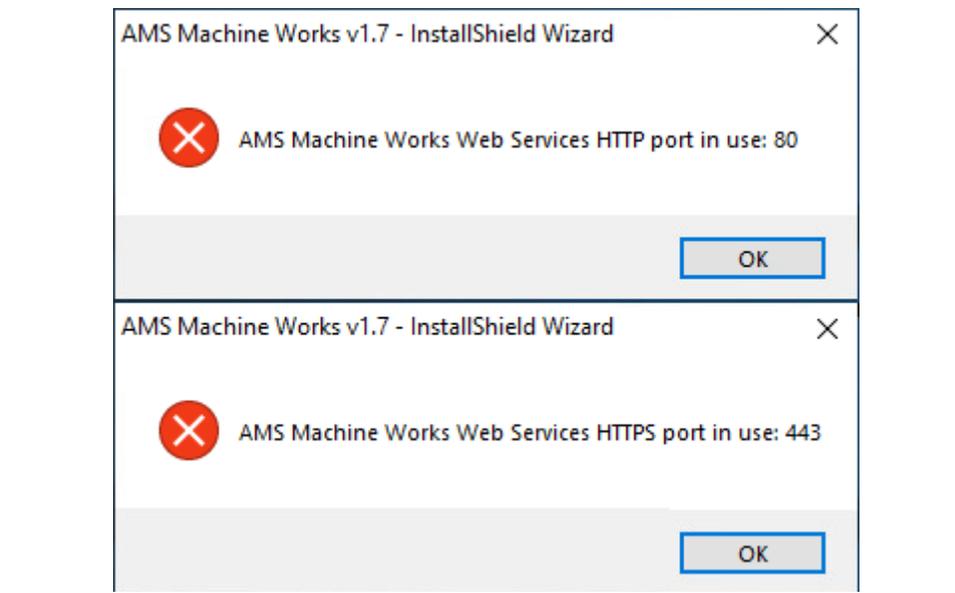
3. Extract the AMS Machine Works v1.7 installation files then right-click on setup.exe and click Run as administrator
4. If you get a window for User Access Control, click Yes to allow this app to install.

**Figure 5-30: User Access Control**

**⚠ CAUTION**

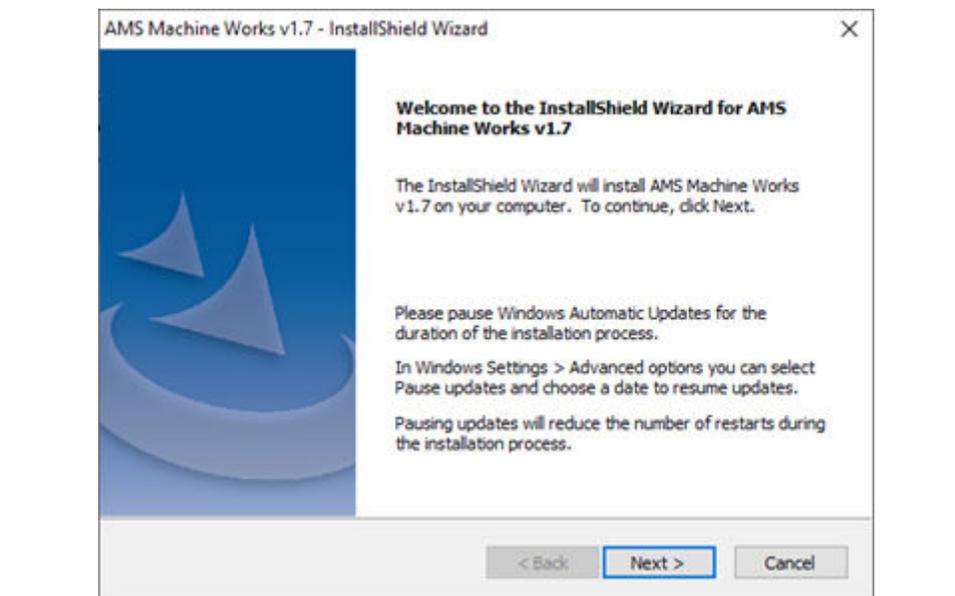
If the following warning pop-ups appears it means that the server does not meet the [System requirements](#) for AMS Machine Works v1.7. It is recommended to stop the installation until all requirements are met.

**Figure 5-31: Warning: AMS Machine Works Web Services ports in use**



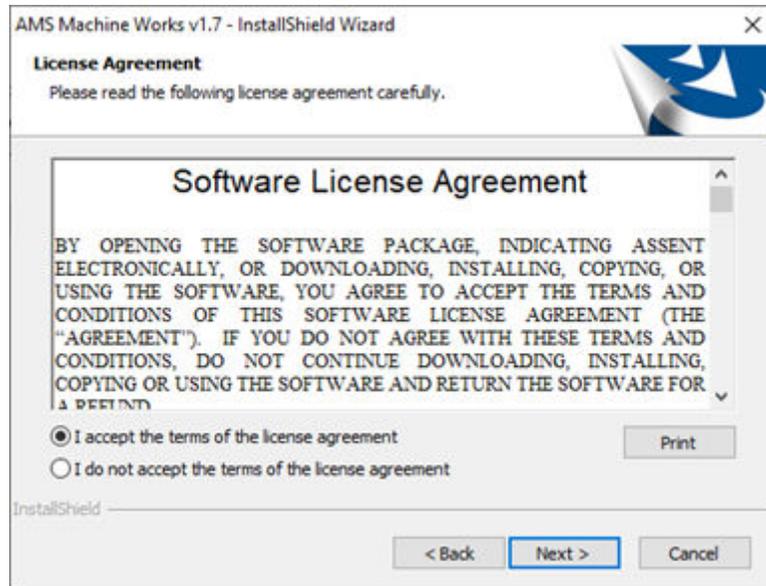
5. AMS Machine Works v1.7 – InstallShield Wizard, click Next to continue.

**Figure 5-32: InstallShield Wizard - first step**



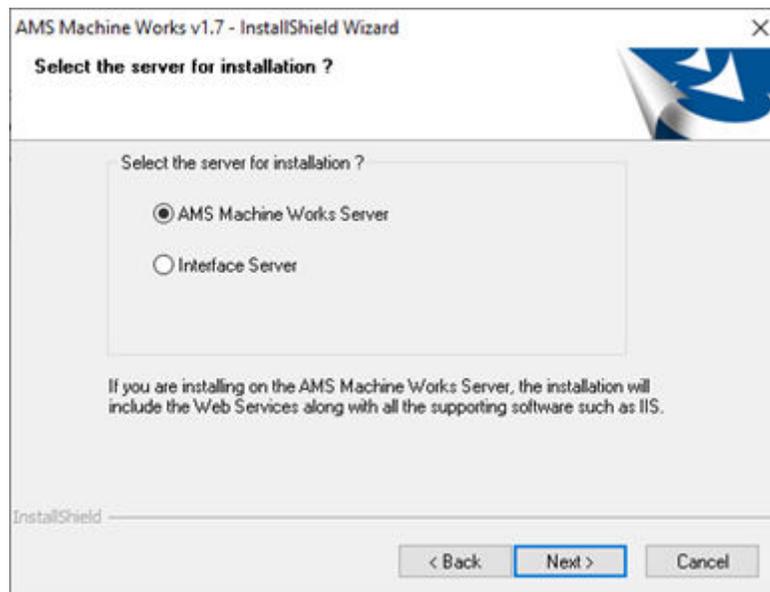
6. Accept the terms of license agreement and click Next

**Figure 5-33: InstallShield Wizard - License Agreement**



7. Select AMS Machine Works Server.

**Figure 5-34: InstallShield Wizard - Select the server for installation**

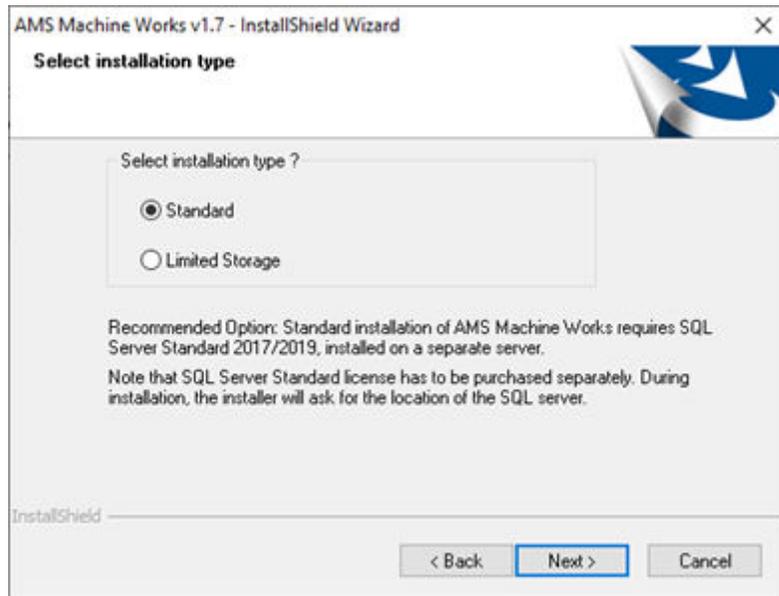


8. Select **Standard** installation type to use the full version of SQL Server (**Tier 2 Installation**), click Next.

**Note**

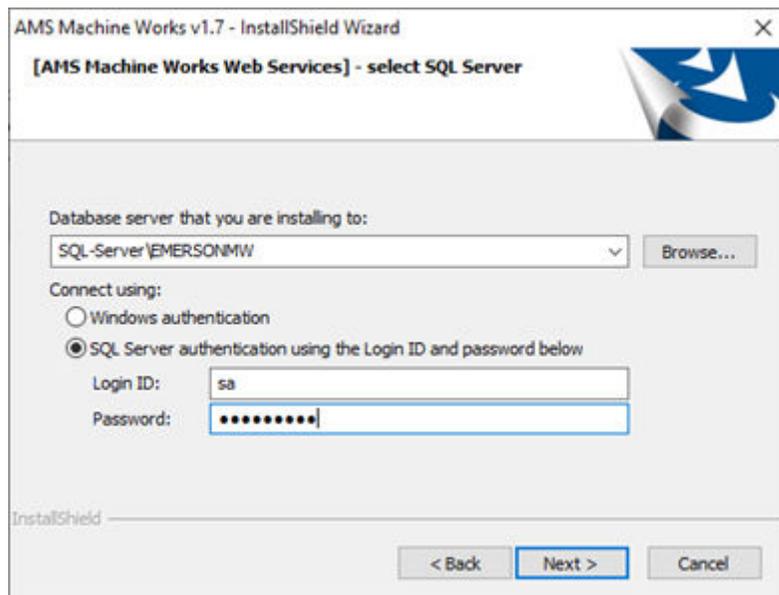
Limited Storage is for SQL Express (**Tier 1 Installation**).

Figure 5-35: InstallShield Wizard - Select installation type



9. Select the SQL Server setup in the previous chapter (if applicable) or your own SQL Server. Define the entire path `SQL-Server\EMERSONMW` and the SQL Server authentication you setup during the SQL Server install [Figure 5-14](#)

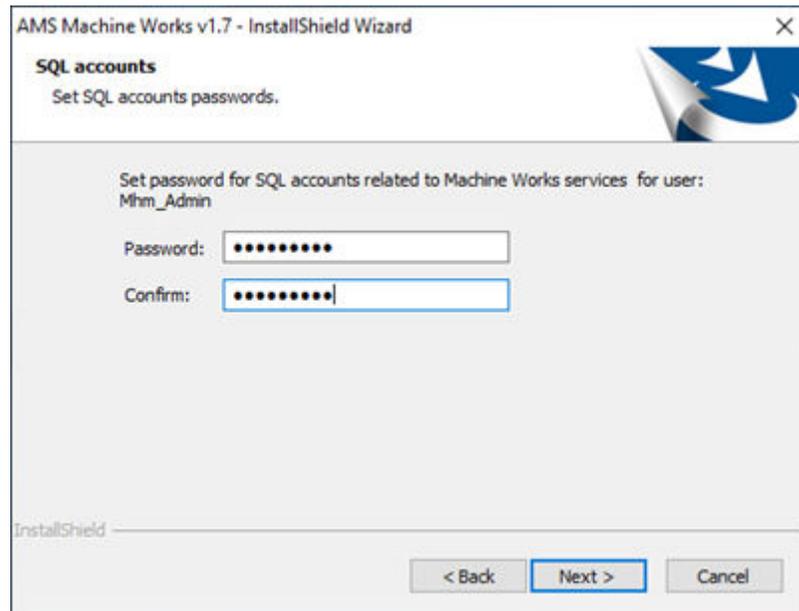
Figure 5-36: InstallShield Wizard - select SQL server



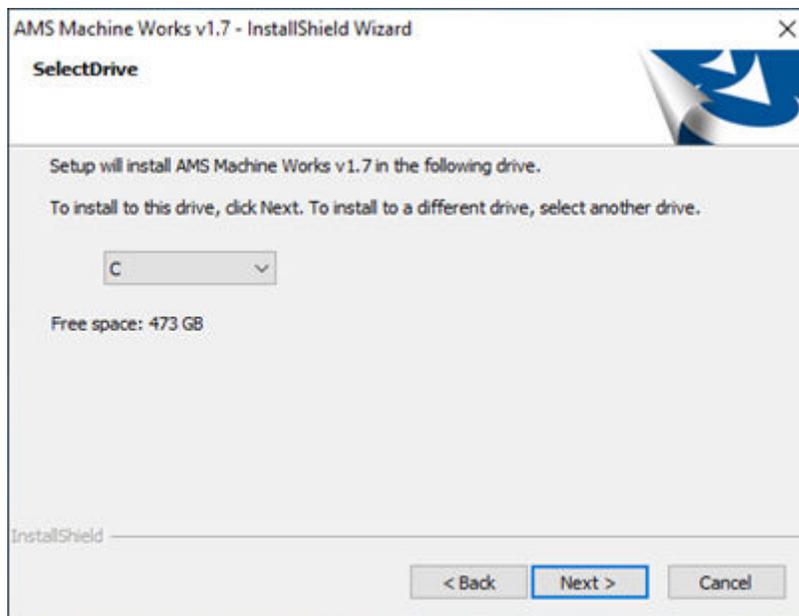
10. You will be stepped through setting up passwords for the MHM accounts. (Mhm\_Admin, Mhm\_Reader, and Mhm\_Writer)

**Note**

If this is an upgrade from AMS Machine Works v1.6, you must reuse the same passwords.

**Figure 5-37: InstallShield Wizard - SQL accounts**

11. Select the Drive letter for the drive you want to install AMS Machine Works software to.

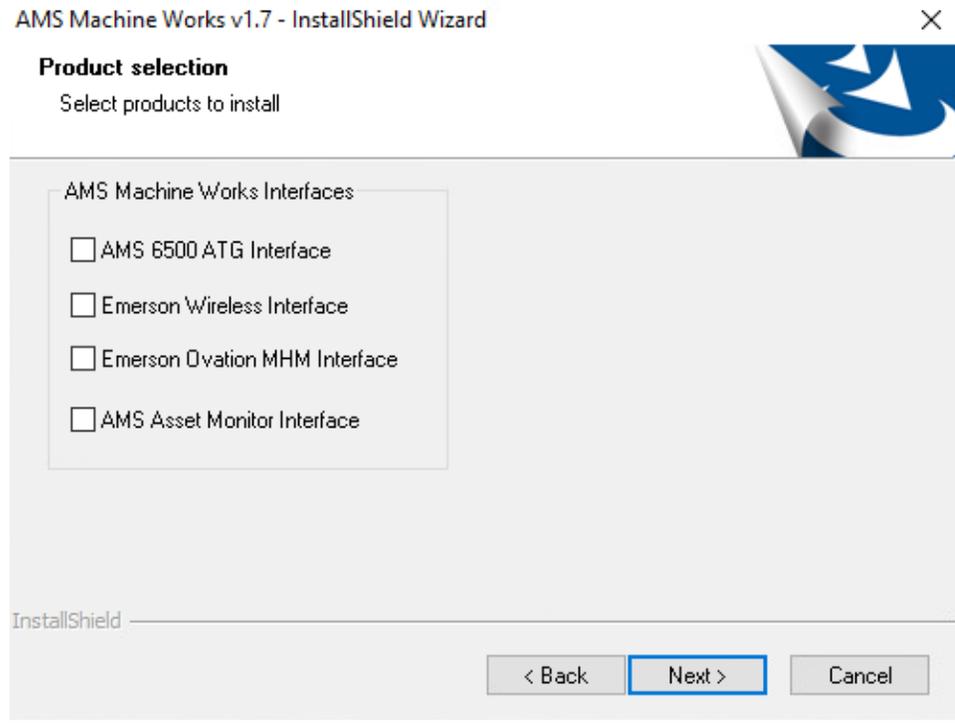
**Figure 5-38: InstallShield Wizard - Select drive**

12. Select the Interfaces for the devices that will be connecting directly to this server.  
Leave the boxes unchecked for a distributed deployment.

**Note**

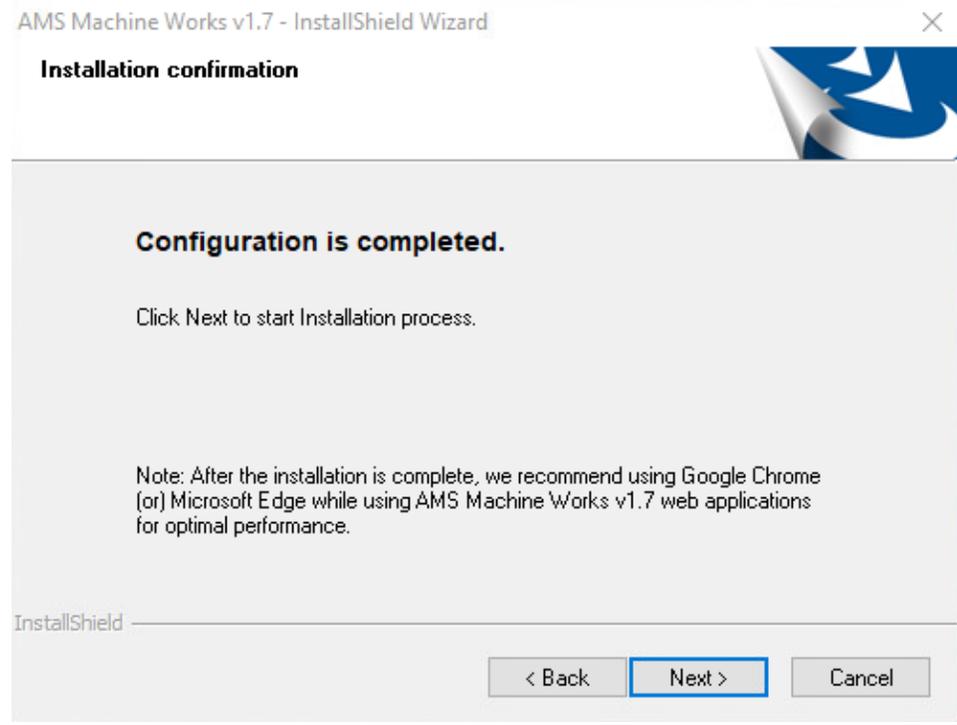
Device Interfaces can be installed on top of AMS Machine Works at after the installation at any time by running the installer again and navigating to this step.

**Figure 5-39: InstallShield Wizard - Product selection**



13. The configuration is completed, click **Next** to start the Installation process.

**Figure 5-40: InstallShield Wizard - Configuration Completed**



14. There will be several reboots during installation. Log back in after the server reboots, and the installation will continue automatically.

**Figure 5-41: AMS Machine Works 1.7 is installing**

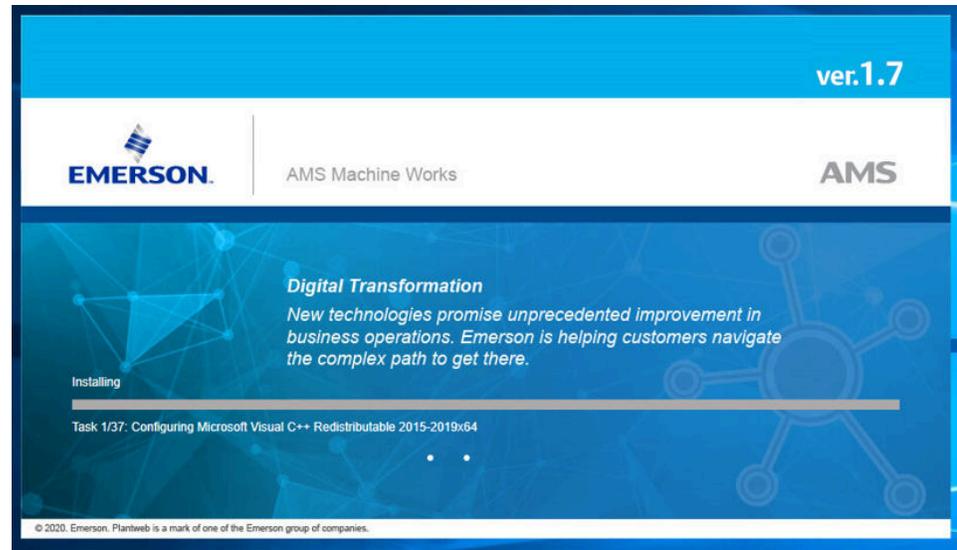
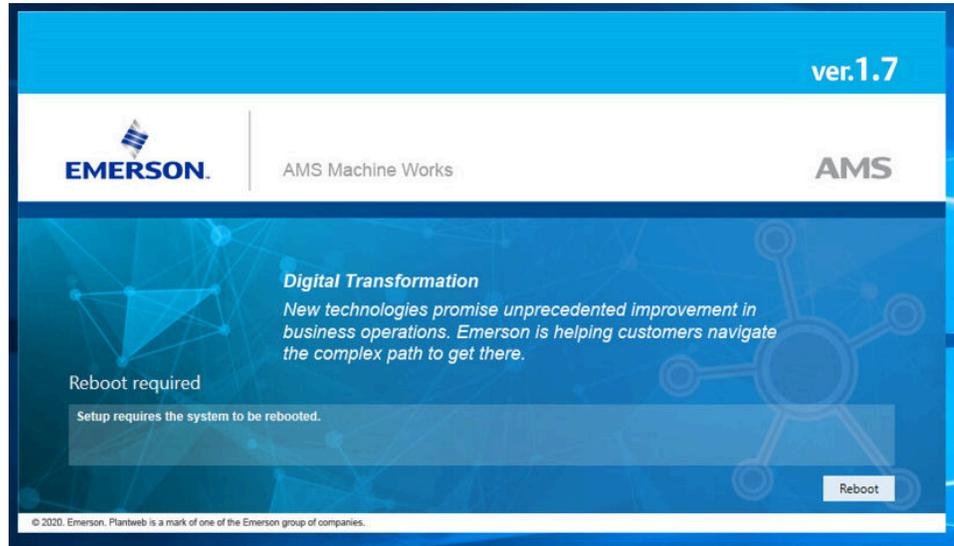
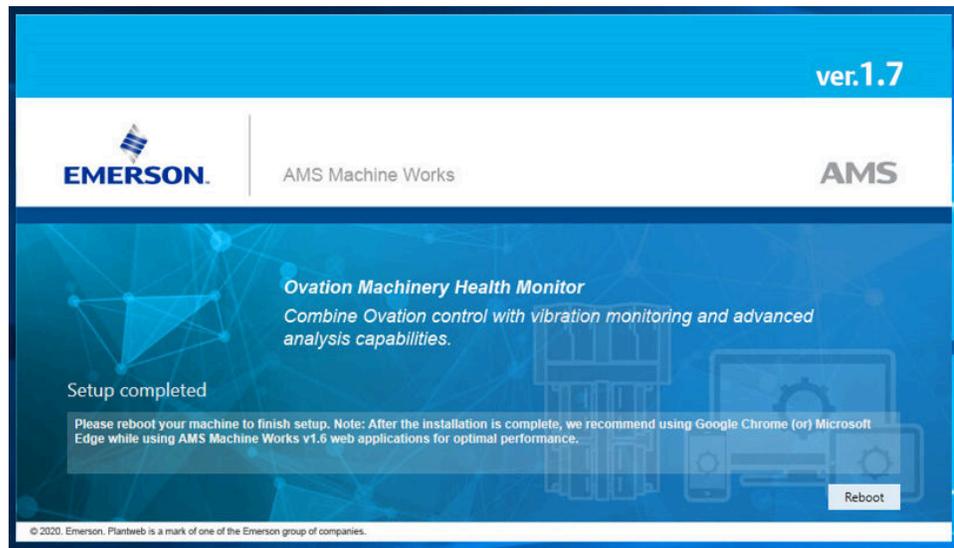


Figure 5-42: A reboot is required



15. When Setup is complete you will be prompted to reboot one last time.

Figure 5-43: Final reboot request



16. The Standard installation is now complete. Please continue to [Install interfaces on AMS Machine Works Interface Server](#).

### 5.3.3 Install interfaces on AMS Machine Works Interface Server

This installation procedure shows the distributed deployment scenario of installing an interface on the AMS Machine Works Interface server. This procedure shows installing the AMS 6500 ATG Interface. However, you can follow this model with other interfaces.

#### Prerequisites

Install components on the AMS Machine Works server. Ensure you select to register the interfaces you are installing in this procedure. See [Install certificates](#).

#### Procedure

1. Extract the `Install_1.7.X.X.zip` file on the server.

---

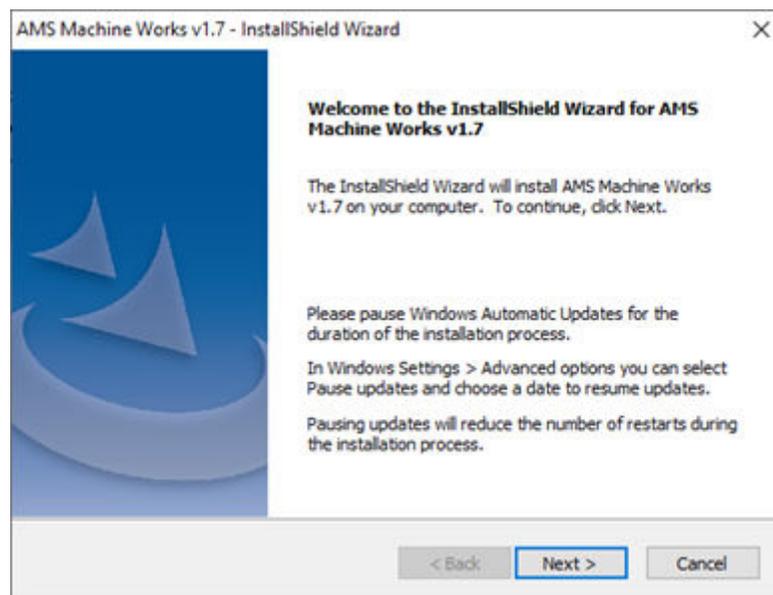
#### Note

Extract the zip file on a root directory. For example, drive C.

---

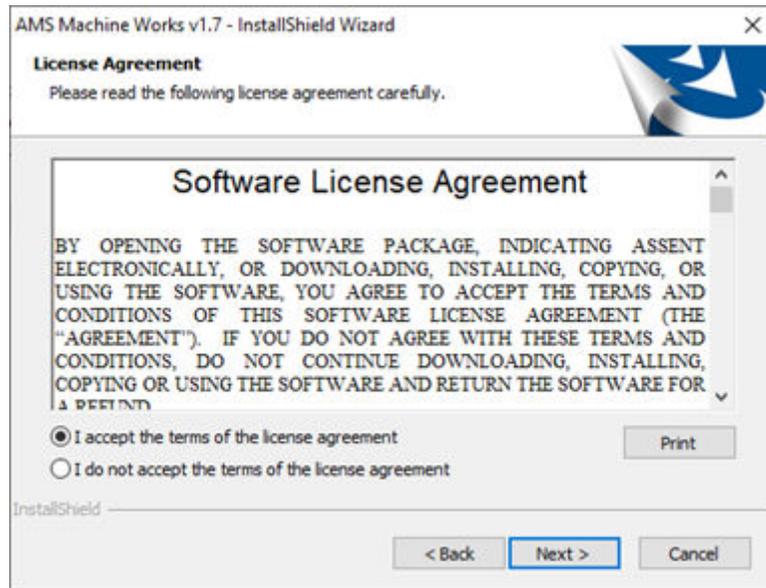
2. Right-click `setup.exe` and select **Run as administrator**.
  3. AMS Machine Works v1.7 – InstallShield Wizard, click **Next** to continue.
- 

**Figure 5-44: InstallShield Wizard - first step**



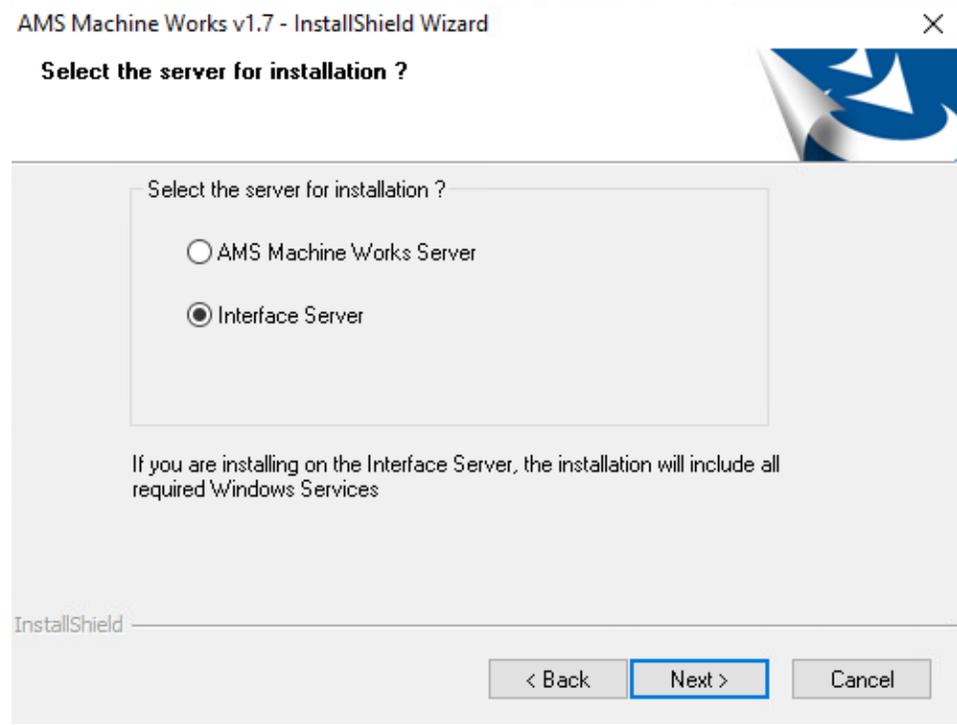
4. Accept the terms of license agreement and click **Next**

Figure 5-45: InstallShield Wizard - License Agreement

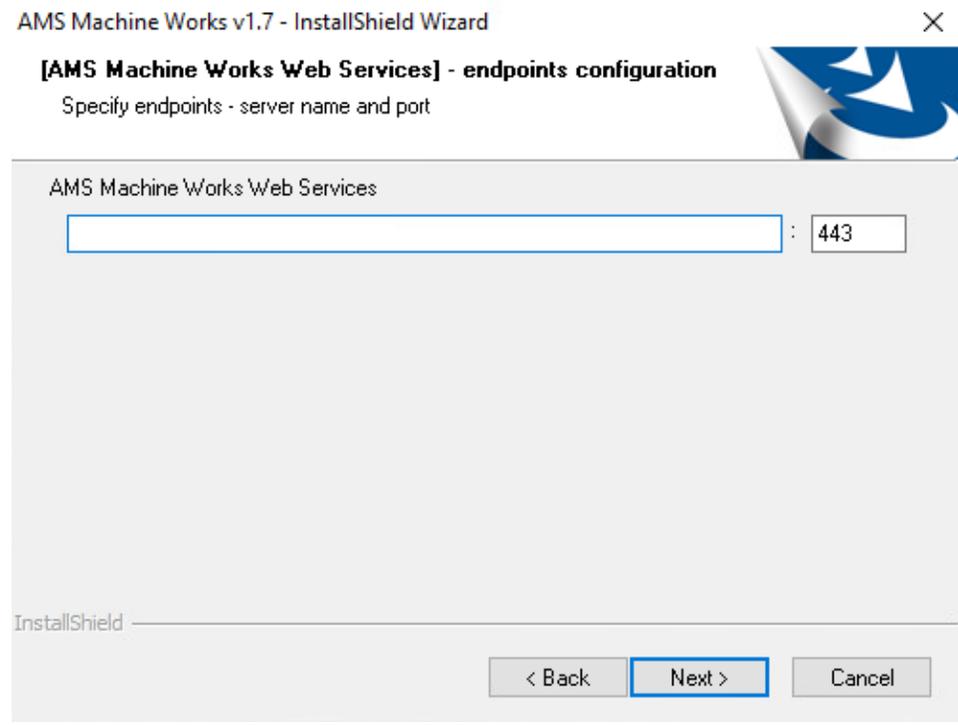


5. Select **Interface Server**.

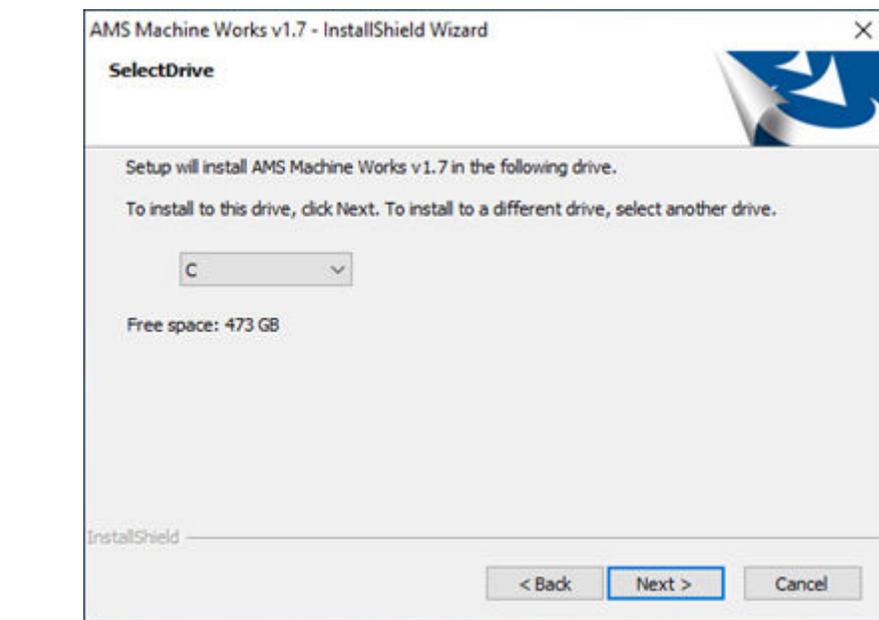
Figure 5-46: InstallShield Wizard - Select the server for installation



6. On the Endpoints Configuration screen, enter the server name of the AMS Machine Works Server and keep the default ports provided (recommended). Click **Next**.

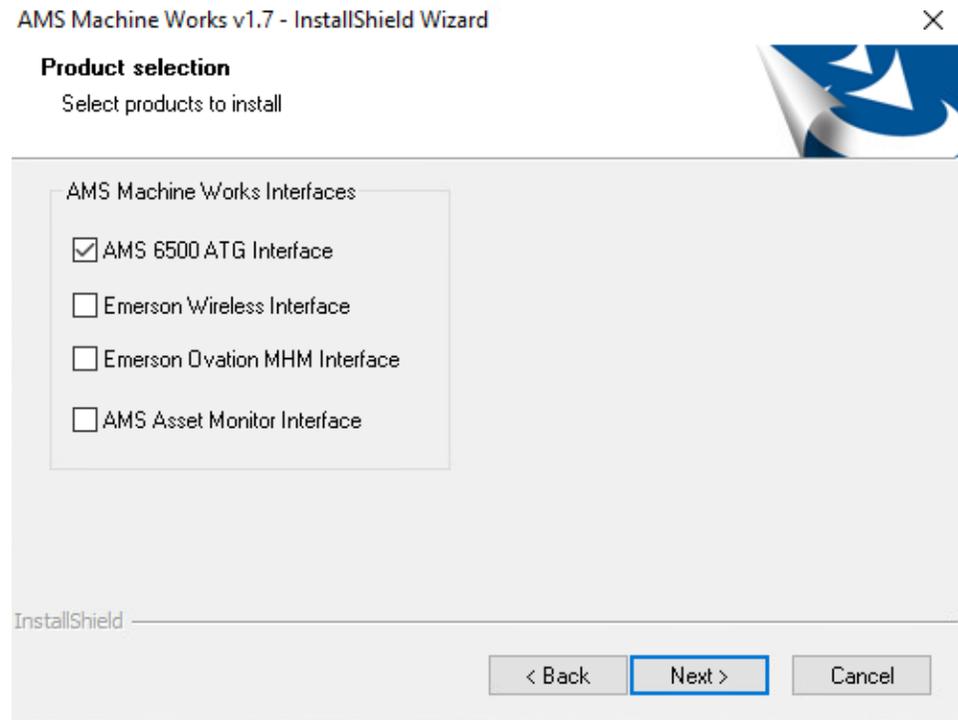
**Figure 5-47: InstallShield Wizard - endpoints configuration**

7. Select the Drive letter for the drive you want to install the software to.

**Figure 5-48: InstallShield Wizard - Select drive**

8. Select the desired Interfaces.

**Figure 5-49: InstallShield Wizard - Product selection**



9. Enter the size for the short-term database that will be used for the 30-day storage of data sent to the AMS Machine Works Analysis Dashboard for each device type connecting directly to this server (AMS 6500 ATG Interface, Wireless Interface, Ovation MHM Interface).

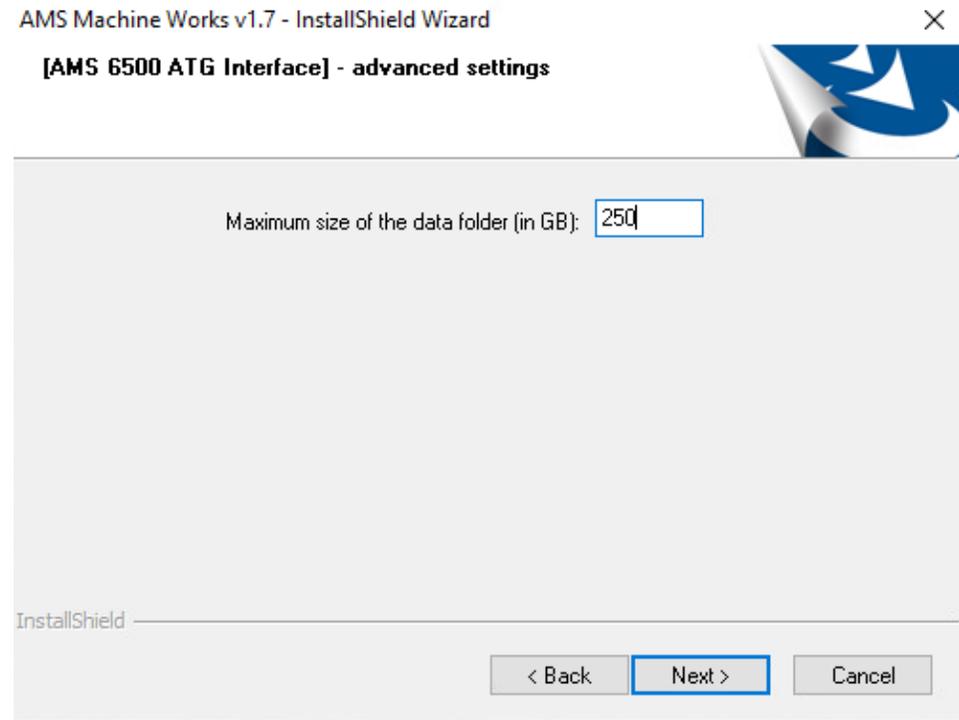
**Note**

Not relevant for AMS Asset Monitor.

**Note**

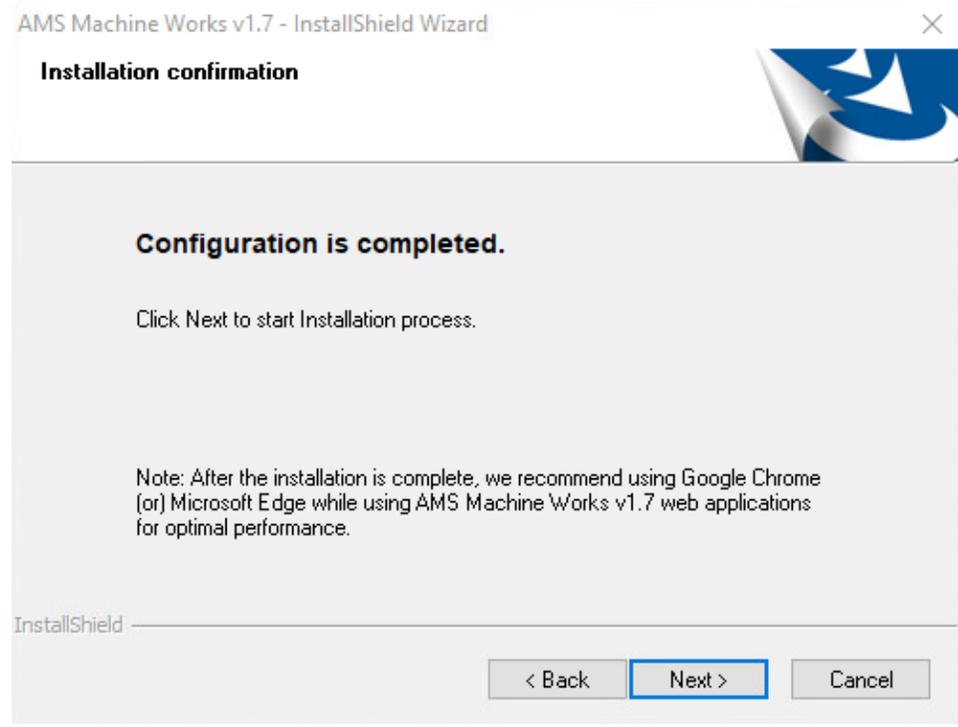
Recommended disk space for each interface can be found in [System requirements](#).

**Figure 5-50: InstallShield Wizard - size of short-term database for AMS 6500 ATG**



10. The configuration is completed, click **Next** to start the Installation process.

**Figure 5-51: InstallShield Wizard - Configuration Completed**



11. There will be several reboots during installation. Log back in after the server reboots, and the installation will continue automatically.

**Figure 5-52: AMS Machine Works 1.7 is installing**

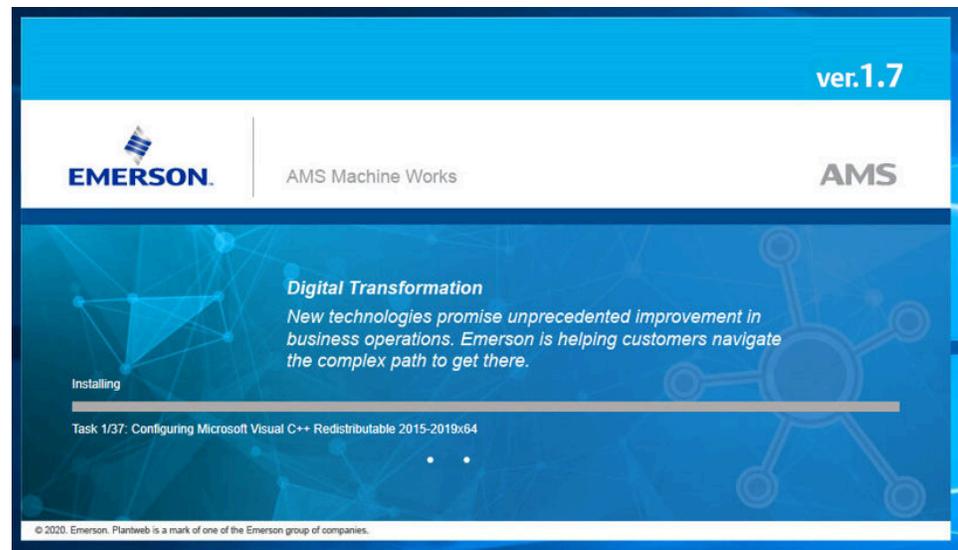
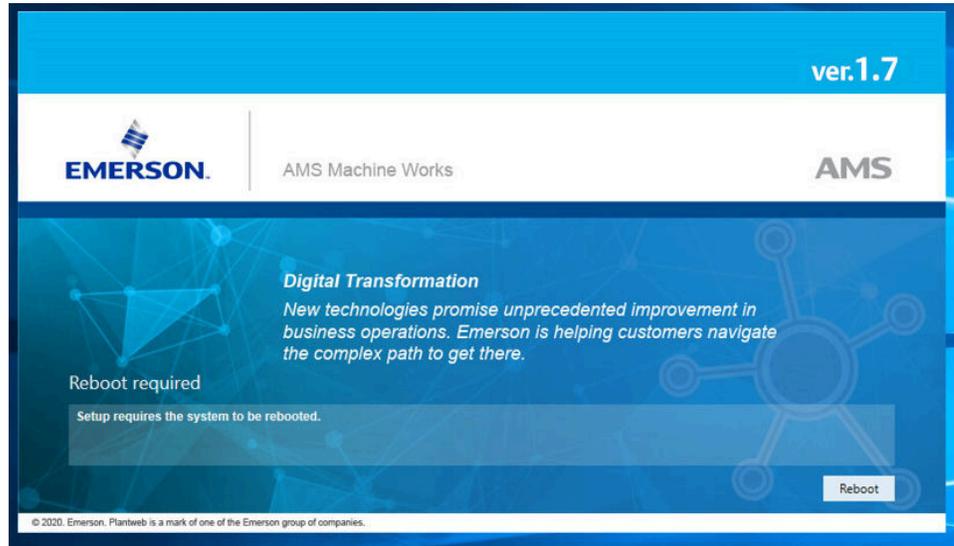
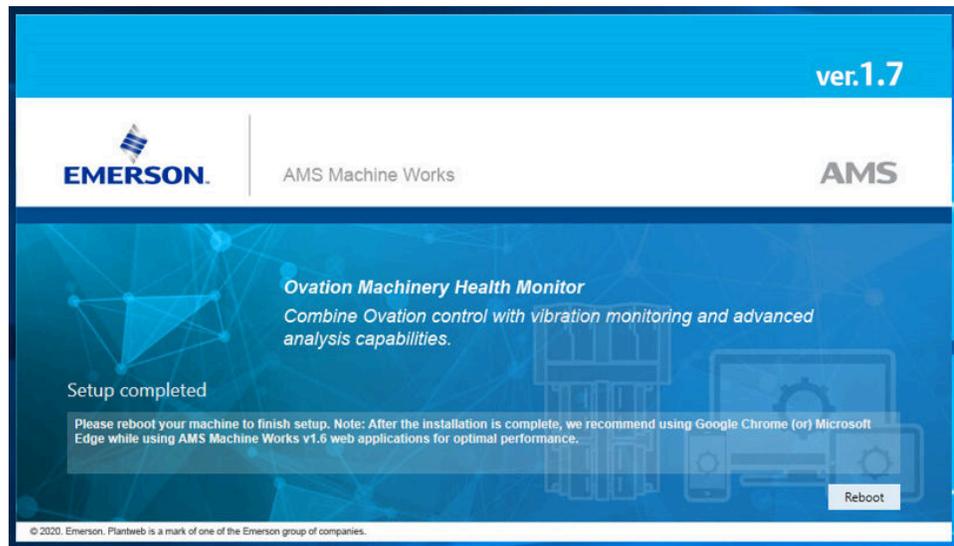


Figure 5-53: A reboot is required



12. When setup is complete you will be prompted to reboot one last time.

Figure 5-54: Final reboot request



13. Export the certificate from the AMS Machine Works server and install it on the AMS Machine Works Interface server. See [Export the public key certificate for an AMS Machine Works Interface Server](#) and [Install an AMS Machine Works Interface Server certificate on clients and servers](#).

The installation is now complete. Please continue to [AMS Machine Works Post Installation](#) to register your software.

## 5.4 Install AMS Machine Works: Single server deployment

This installation section shows the single server deployment scenario of installing all web components and selected interfaces on the AMS Machine Works server. This installation is an example of the deployment scenario shown in [1B: AMS Machine Works with AMS 6500 ATG](#). Single server deployment is only recommended for temporary proof of concept installations. Use [Install AMS Machine Works: Distributed deployment](#) for permanent installations.

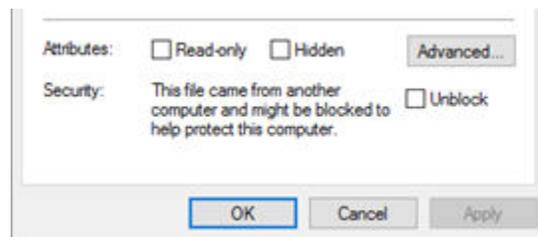
### 5.4.1 AMS Machine Works Limited Storage Installation

This procedure provides instructions for installing all the necessary AMS Machine Works web components, the AMS 6500 ATG Interface and SQL Express on a single server. However, you can follow this model with other interfaces.

#### Procedure

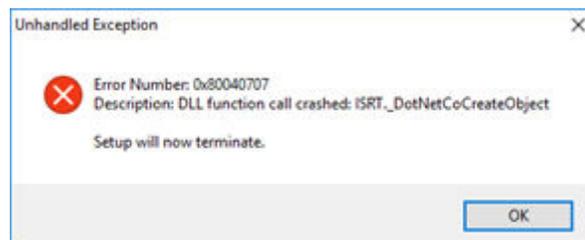
1. Log into the server with an Administrator account.
2. Download the Installation files for AMS Machine Works 1.7 and before extracting right-click on the file and select Properties.  
If **Unblock** is shown under Security, be sure to check it and click Apply. Confirm that **Unblock** is unchecked.

Figure 5-55: File Properties



If you do not Unblock the files and you will have to delete the extracted folder and re-extract the installation files. This will most likely be the error you see.

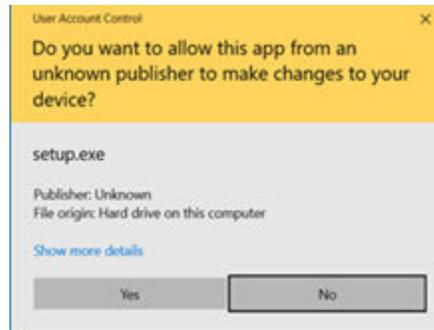
Figure 5-56: Error pop-up



3. Extract the AMS Machine Works v1.7 installation files then right-click on setup.exe and click Run as administrator

4. If you get a window for User Access Control, click Yes to allow this app to install.

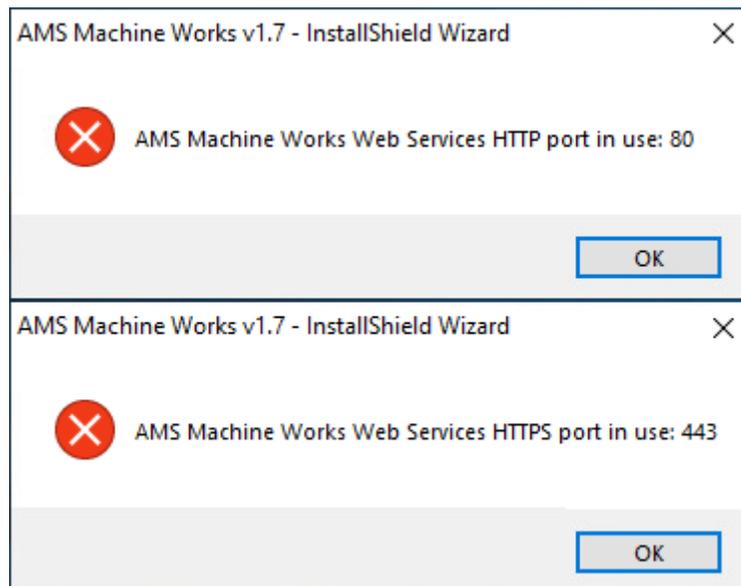
**Figure 5-57: User Access Control**



**⚠ CAUTION**

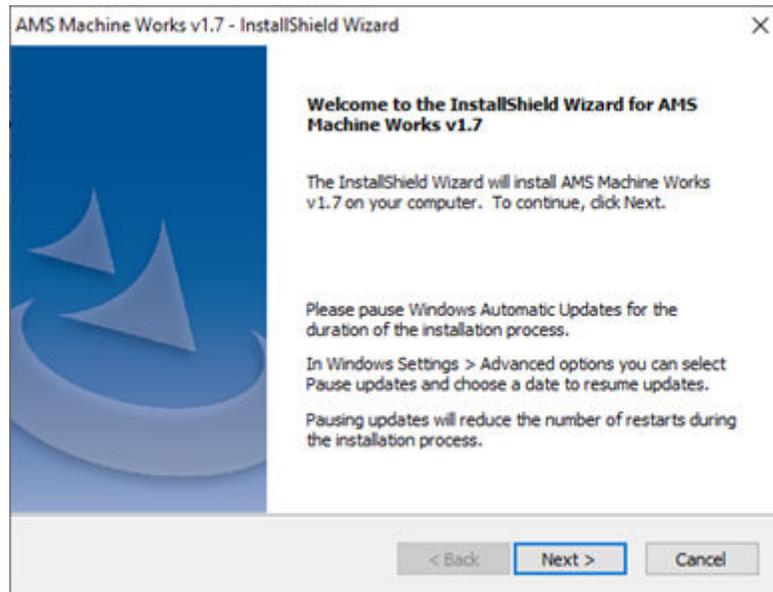
If the following warning pop-ups appears it means that the server does not meet the [System requirements](#) for AMS Machine Works v1.7. It is recommended to stop the installation until all requirements are met.

**Figure 5-58: Warning: AMS Machine Works Web Services ports in use**



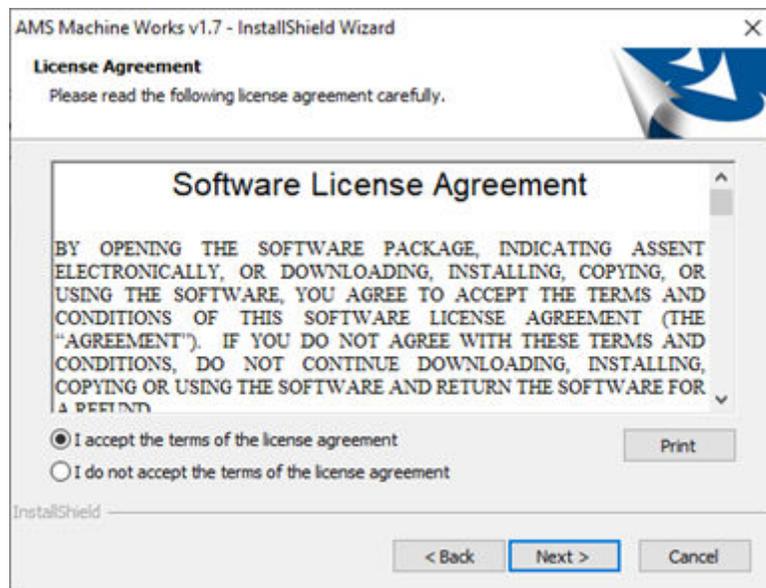
5. AMS Machine Works v1.7 – InstallShield Wizard, click Next to continue.

Figure 5-59: InstallShield Wizard - first step



6. Accept the terms of license agreement and click Next

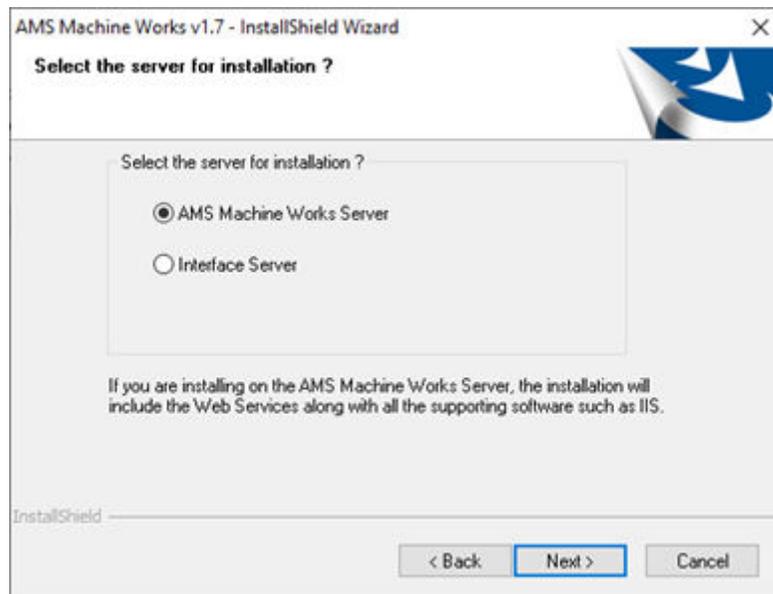
Figure 5-60: InstallShield Wizard - License Agreement



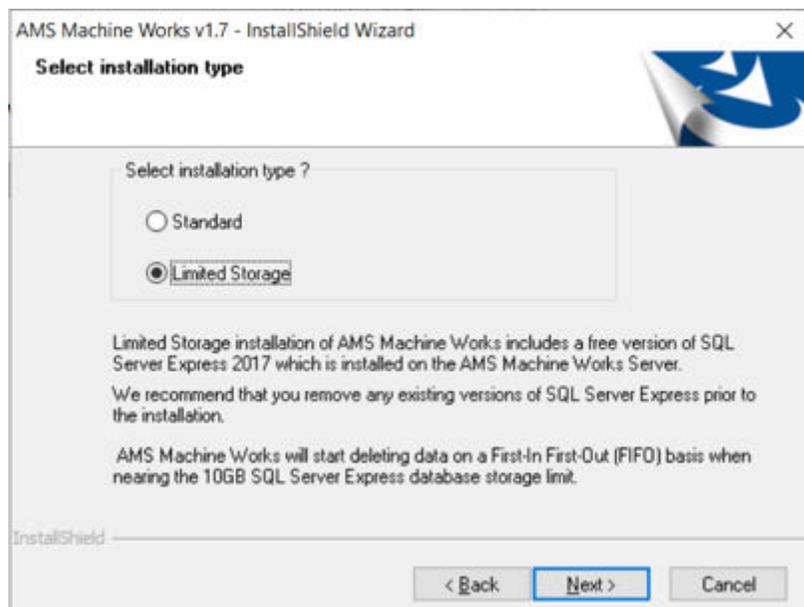
7. Select AMS Machine Works Server for a new installation.

**Note**

If you are adding an AMS Machine Works Interface to an existing installation, select **Interface Server**.

**Figure 5-61: InstallShield Wizard - Select the server for installation**

8. Select **Limited Storage** installation type to use SQL Express on this machine. (Database size is limited to 10GB before data is overwritten).

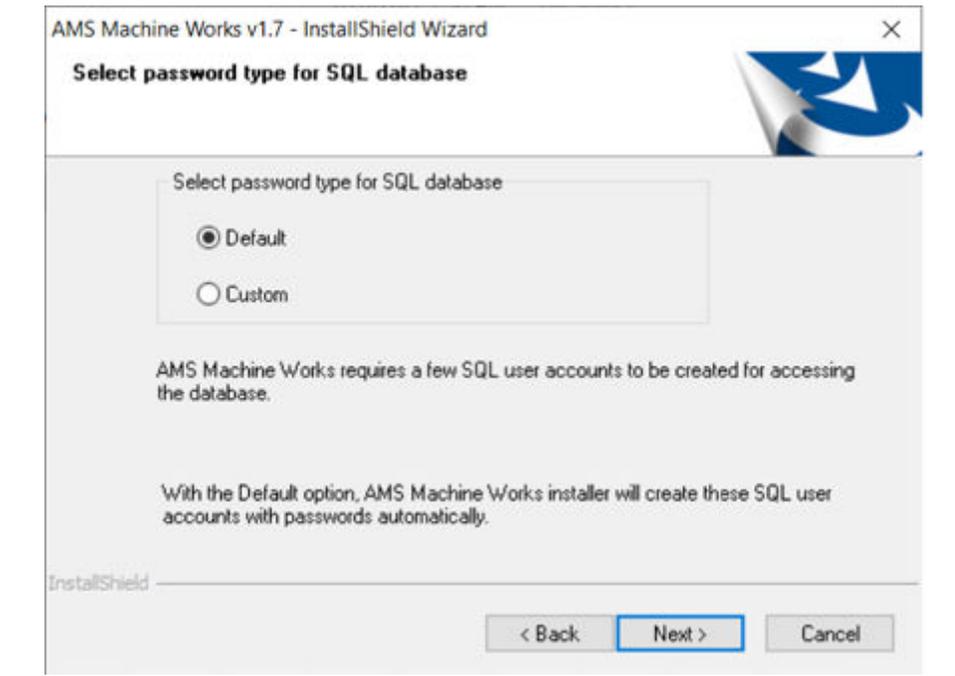
**Figure 5-62: InstallShield Wizard - Select installation type**

9. Select **Default** to allow the installation software to create passwords to access the SQL database for you.  
If you want to define the passwords for MHM accounts in SQL go to the next step.

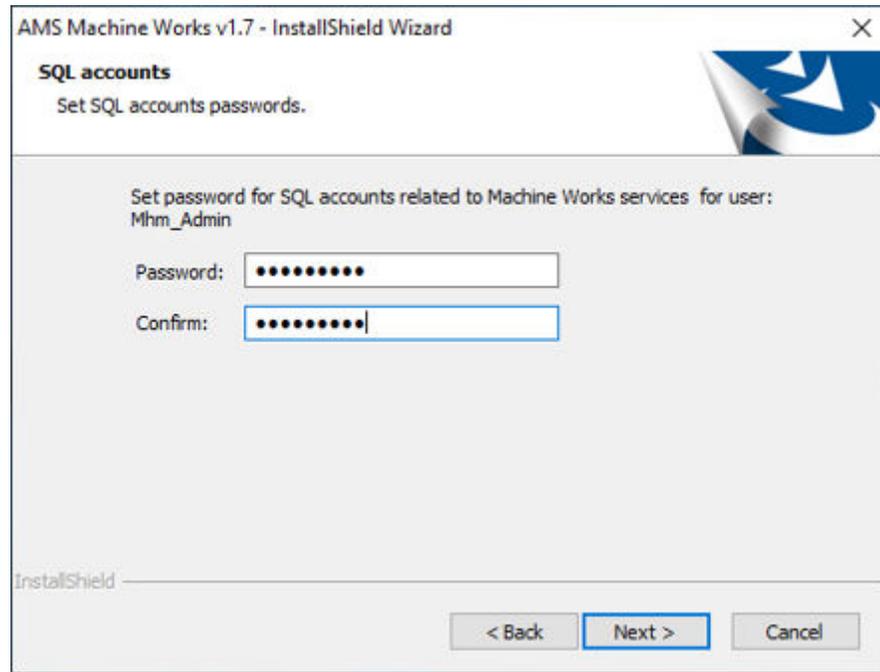
**Note**

If this is an upgrade from AMS Machine Works v1.6, you must select the same password type and if applicable, reuse the same custom passwords.

**Figure 5-63: InstallShield Wizard - Select password type for SQL database**

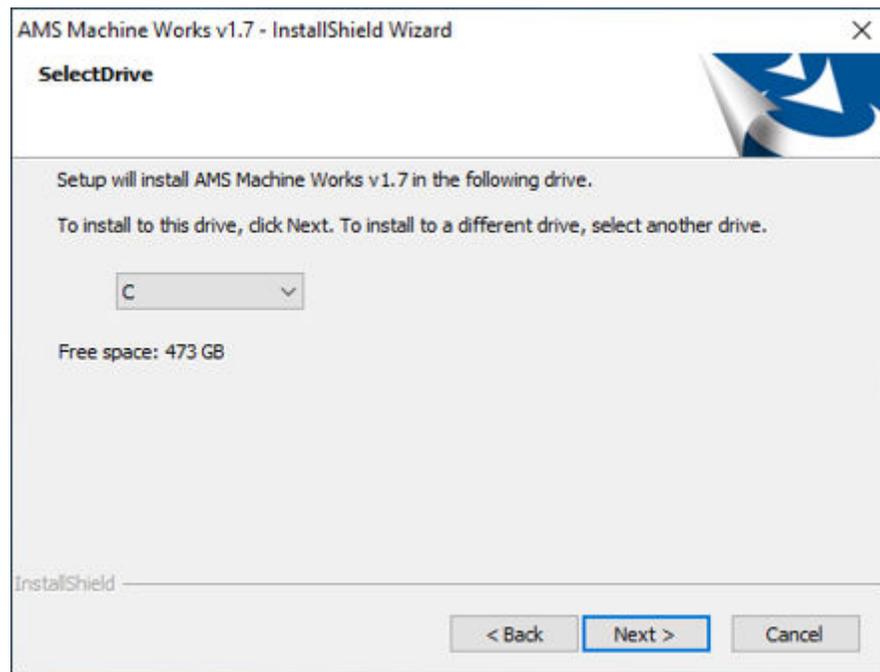


10. Select **Custom** if you would like to create your passwords for the MHM accounts in SQL.  
You will be stepped through setting up Passwords for the MHM accounts (Mhm\_Admin, Mhm\_Reader, and Mhm\_Writer)

**Figure 5-64: InstallShield Wizard - Set SQL account passwords**

The screenshot shows a window titled "AMS Machine Works v1.7 - InstallShield Wizard". The main heading is "SQL accounts" with the instruction "Set SQL accounts passwords." Below this, it says "Set password for SQL accounts related to Machine Works services for user: Mhm\_Admin". There are two input fields: "Password:" and "Confirm:", both containing masked characters (dots). At the bottom, there are three buttons: "< Back", "Next >" (highlighted with a blue border), and "Cancel".

11. Select the Drive letter for the location you want to install AMS Machine Works.

**Figure 5-65: InstallShield Wizard - Select drive**

The screenshot shows a window titled "AMS Machine Works v1.7 - InstallShield Wizard". The main heading is "SelectDrive". Below this, it says "Setup will install AMS Machine Works v1.7 in the following drive." and "To install to this drive, click Next. To install to a different drive, select another drive." There is a dropdown menu showing "C" with a downward arrow. Below the dropdown, it says "Free space: 473 GB". At the bottom, there are three buttons: "< Back", "Next >" (highlighted with a blue border), and "Cancel".

12. Select the Interfaces for the devices that will be connecting directly to this server.

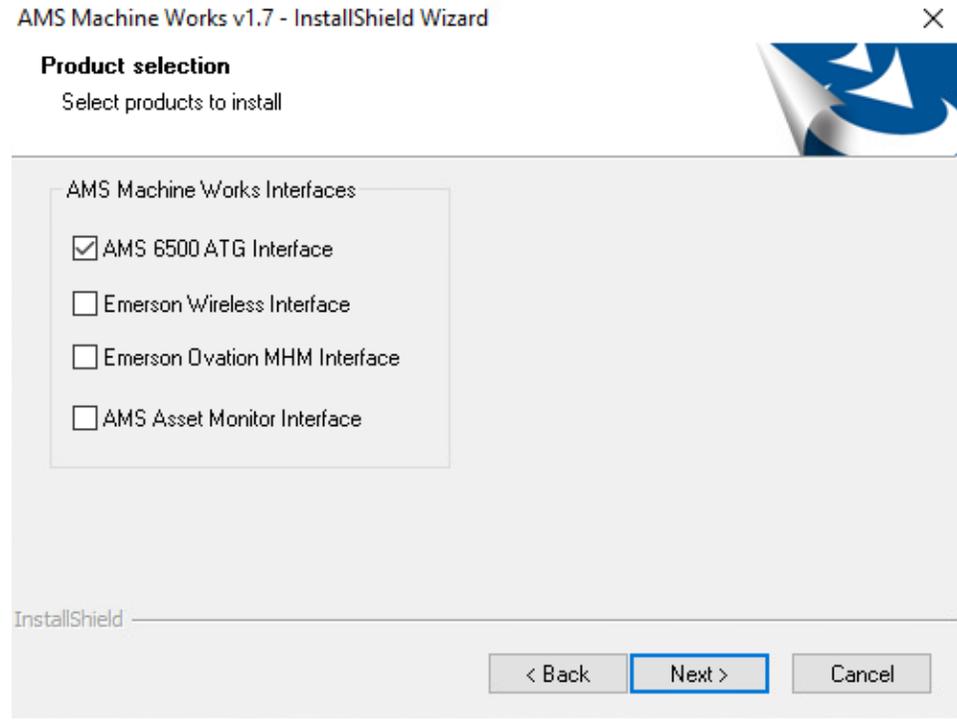
---

**Note**

If you do not install the specific **AMS Machine Works Interface** you will not be able to access those device types.

---

**Figure 5-66: InstallShield Wizard - Product selection**



13. Enter the size for the short-term database that will be used for the 30-day storage of data sent to the AMS Machine Works Analysis Dashboard for each device type connecting directly to this server (AMS 6500 ATG Interface, Wireless Interface, and Ovation MHM Interface).

---

**Note**

Not relevant for AMS Asset Monitor.

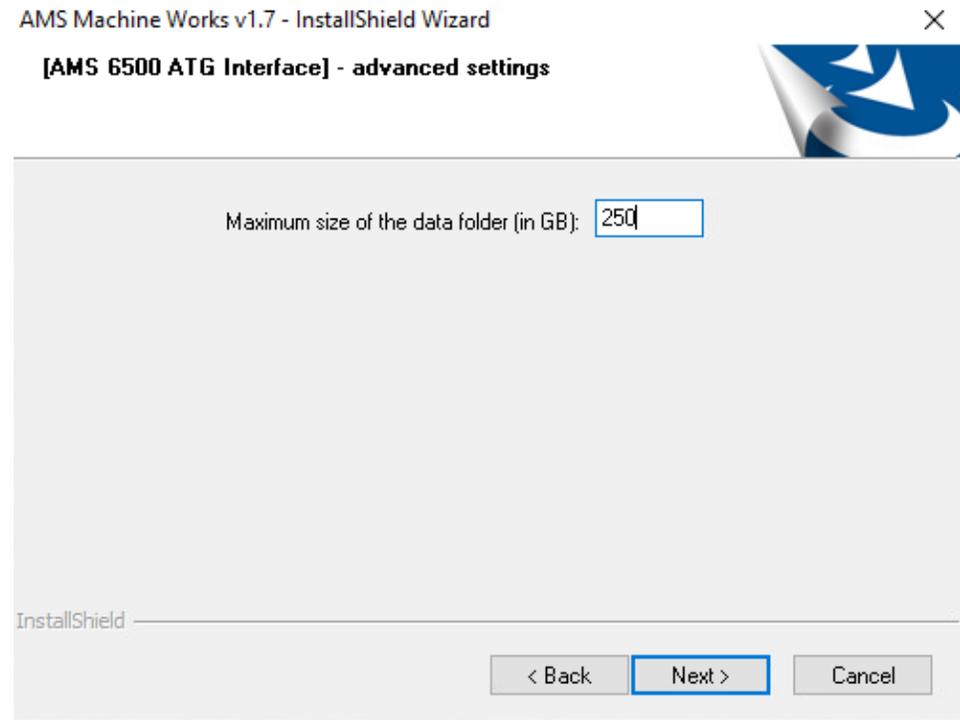
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**Note**

Recommended disk space for each Interface can be found in [System requirements](#).

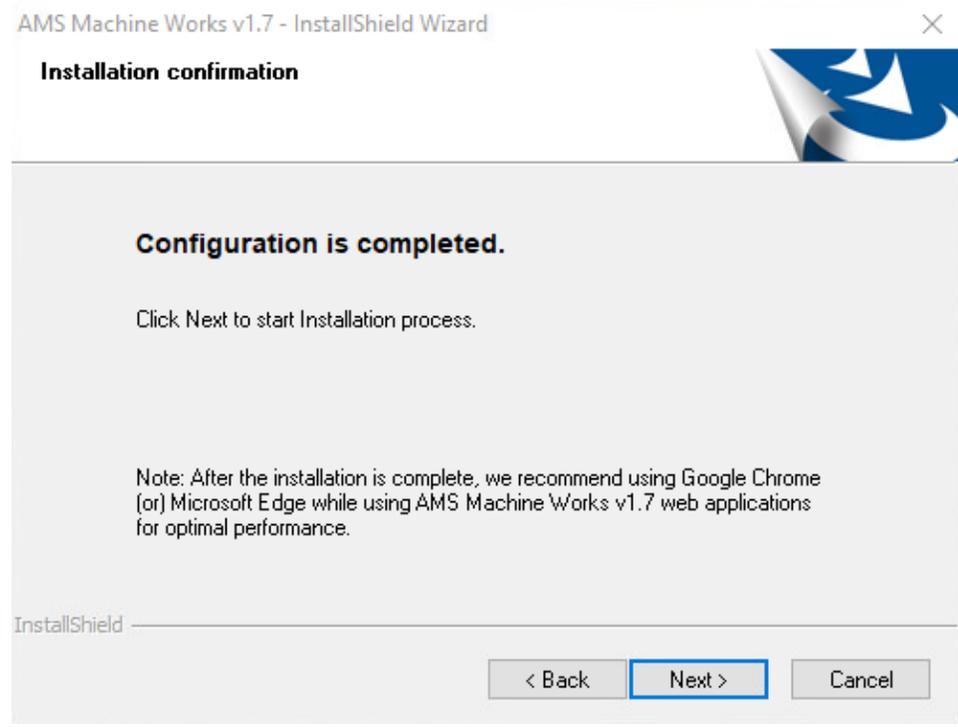
---

**Figure 5-67: InstallShield Wizard - size of short-term database for AMS 6500 ATG**



14. The configuration is completed, click **Next** to start the Installation process.

**Figure 5-68: InstallShield Wizard - Configuration Completed**



15. There will be several reboots during installation. Log back in after the server reboots, and the installation will continue automatically.

**Figure 5-69: AMS Machine Works 1.7 is installing**

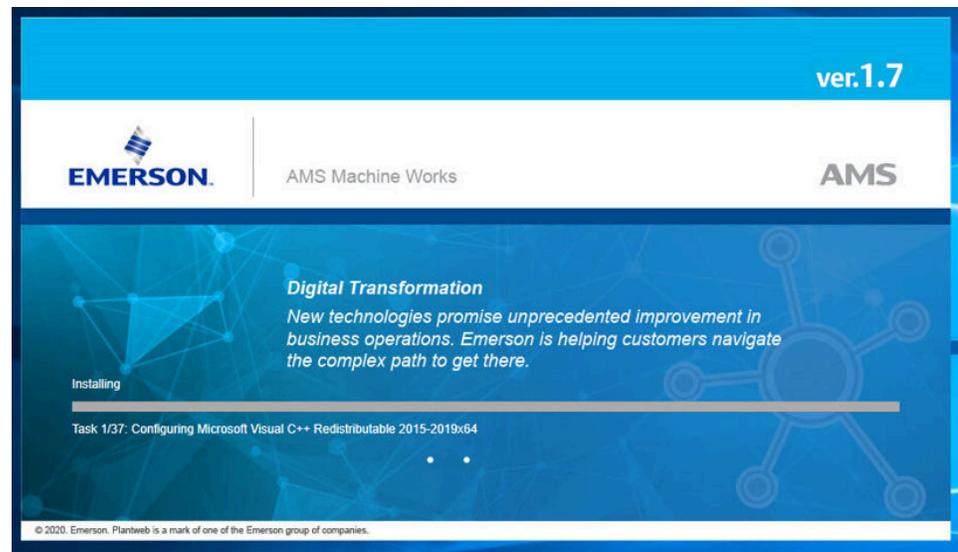
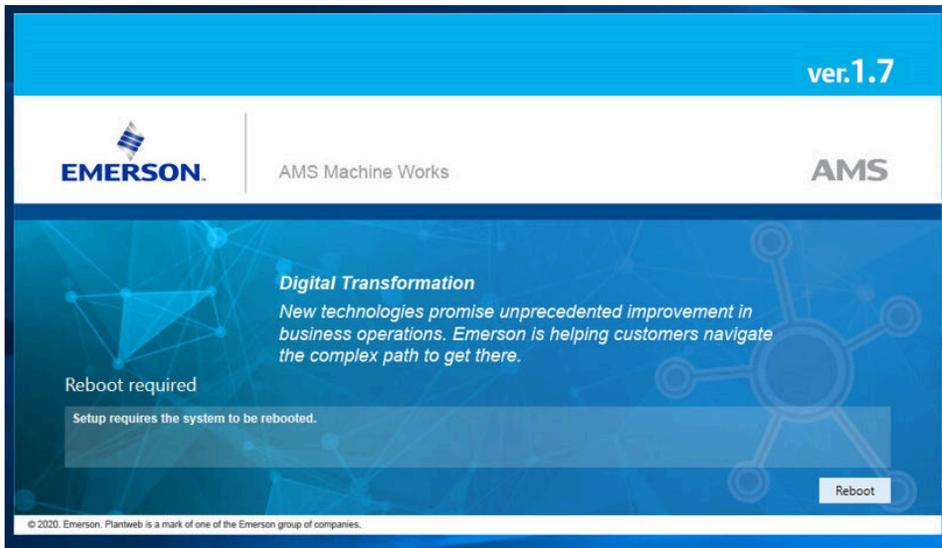
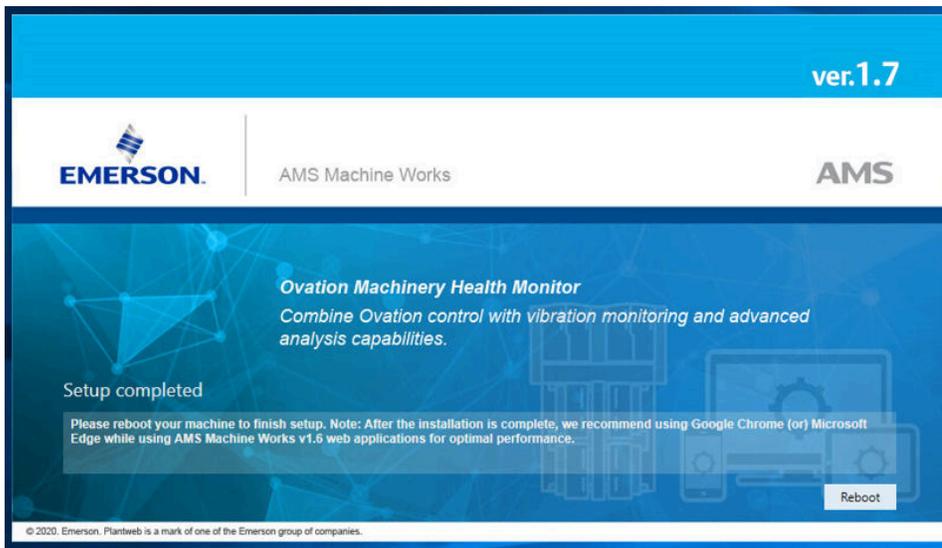


Figure 5-70: A reboot is required



- 16. When setup is complete you will be prompted to reboot one last time.

Figure 5-71: Final reboot request



- 17. The installation is now complete. Please continue to [AMS Machine Works Post Installation](#).

## 5.5 AMS Machine Works Post Installation

### Procedure

1. After the reboot, log in and open Windows Services and check that the service is running for each Interface that you installed.

#### Note

AMS Asset Monitor Interface, AMS 6500 ATG Interface, Ovation MHM Interface, and Wireless Interface have a Delayed Start setting.

Figure 5-72: Windows services

Emerson Alarm Evaluation Service	AMS Alarm Evaluation ...	Running	Automatic	Network Service
Emerson Asset Monitor Interface	AMS Asset Monitor Int...	Running	Automatic	Network Service
Emerson ATG Interface	AMS 6500 ATG Interfac...	Running	Automatic (Delayed Start)	Network Service
Emerson Calculation Service	AMS Calculation Service	Running	Automatic	Network Service
Emerson Data Aggregation Service	AMS Data Aggregation...	Running	Automatic	Network Service
Emerson Knowledge Service	AMS Knowledge Service	Running	Automatic	Network Service
Emerson Ovation MHM Interface	Emerson Ovation MH...	Running	Automatic (Delayed Start)	Network Service
Emerson Pre-Historian Service	AMS Pre-Historian Serv...	Running	Automatic	Network Service
Emerson Pre-EventViewer Service	AMS Pre-EventViewer S...	Running	Automatic	Network Service
Emerson Wireless Interface	Emerson Wireless Interf...	Running	Automatic (Delayed Start)	Network Service

2. Open Asset Explorer via Google Chrome then enter the initial credentials:

Username : **admin**

Password : **Emerson#1**

Figure 5-73: AMS Machine Works login pop-up

AMS Machine Works Account

Username  
admin

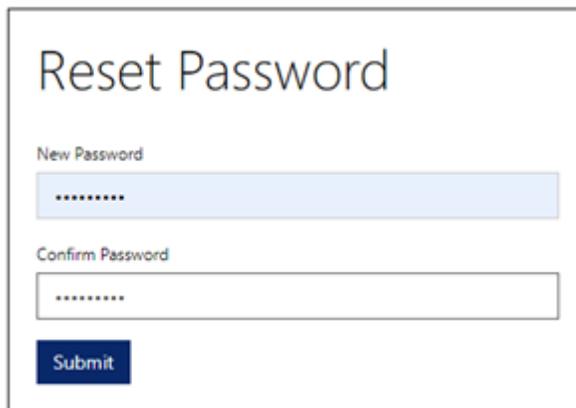
Password  
\*\*\*\*\*

Login

[Forgot your password?](#)

3. After successful login you will have to change the password. You can, however, set the password to remain **Emerson#1**

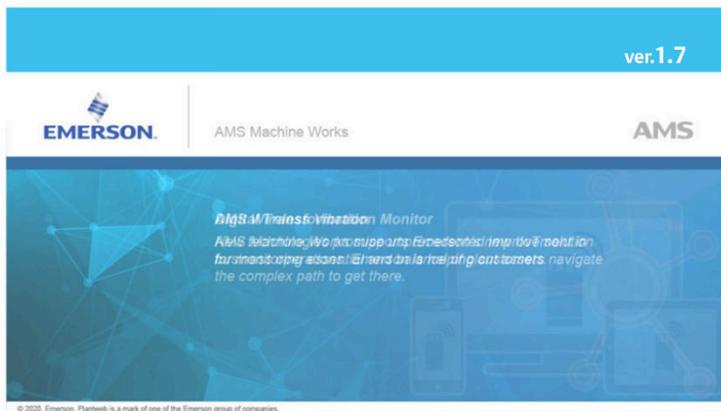
Figure 5-74: AMS Machine Works 1.7 Reset Password pop-up



4. After a password reset, the licensing page appears.
  - a) Click [HERE](#) to install the license.

Figure 5-75: AMS Machine Works License page pop-up

 before you can use the application...



Please contact your local Emerson sales representative for a license. **To install license, click [HERE](#)**

- b) Upload your license file.



2. Open the **General** tab.
3. Under Attributes, select the checkbox for **Unblock**.



4. Click **Apply**, and then click **OK**.

---

**Note**

If the subscription for AMS Machine Works expires, users will be automatically redirected to an unlicensed page and data will no longer be collected, but historical data can still be accessed using Vibration Analyzer.

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## 5.6 Install AMS Machine Works in other scenarios

For all other installation scenarios, please contact your Emerson representative for more information.

## 5.7 Unsupported Installation Scenarios

The following installation scenarios are not supported in AMS Machine Works v1.7:

- **Installing AMS Machine Works v1.7 as a Non-administrator** - The installation always requires administrator privileges.
- **Installing some parts as one user, and the rest as a different user** - The installation has to be completed by one user with administrator privileges.
- **Installing without following the installation procedures as directed by the AMS Machine Works v1.7 System Guide** - The Installation procedures detailed in this System Guide are the only guaranteed method of installing AMS Machine Works v1.7.
- **Installing AMS Machine Works on FIPS enabled machine (FIPS Compliance)** - FIPS is not supported in AMS Machine Works v1.7.
- **Upgrading a demo software version to support interfaces** - A demo software version cannot be upgraded to a full AMS Machine Works v1.7 version. A new installation is required.
- **Installing AMS Machine Works v1.7 with AMS Machinery Manager v6.3 or v6.3.1, or v 5.71** - The aforementioned versions of AMS Machinery Manager are not supported.

- **Install Plantweb Optics v1.6 with AMS Machine Works v1.7 on the same server** - Plantweb Optics and Machine Works have to be installed on separate servers.

## 5.8 Launch AMS Machine Works

After installation and registration, you can launch AMS Machine Works using the desktop shortcut. If you launch the dashboard before you register the software, the dashboard will be blank.

### Prerequisites

- Use Google Chrome for optimal performance. AMS Machine Works web applications use the latest web technologies that are no longer supported in Internet Explorer 11. Also, see [page 143](#) for more information
- Security certificates must be installed. See [page 53](#)

### Procedure

1. Open a web browser.
2. In the web browser address field, enter the URL for the dashboard: For example, `https://[server]/AMSMW`

Where [server] is the computer name of the AMS Machine Works server.<sup>1</sup>

3. If this is the first time you have launched AMS Machine Works from a client computer, install the certificate.  
Install the AMS Machine Works certificate so you can perform actions such as adding asset sources. See [page 53](#).
4. Enter your credentials and log in.  
You either need to use the admin password if you are the administrator, or typical users will be provided a username and password by the administrator for logging into AMS Machine Works.
5. You can launch other applications from the menu. Or, you can access them by typing their address in the web browser address field:

Launch	From this URL	To perform the following
<b>AMS Machine Works Analysis Dashboard</b>	<code>https://[server]:[port number]/AMSMW</code>	<ul style="list-style-type: none"> <li>• Access KPIs on devices, machine alerts and device measurement alerts</li> </ul>
<b>Machine Journal</b>	<code>https://[server]:[port number]/MachineJournal</code>	<ul style="list-style-type: none"> <li>• Add cases, posts, and journal entries of machine issues for diagnosis</li> </ul>
<b>Vibration Analyzer</b>	<code>https://[server]:[port number]/VibApp</code>	<ul style="list-style-type: none"> <li>• Analyze vibration data from machines and devices</li> </ul>

<sup>1</sup> If a port number is required, also include the port number, for example, `https://MachineWorksServer:443/AMSMW`.

Launch	From this URL	To perform the following
User Manager	https://[server]:[port number]/UserManager	<ul style="list-style-type: none"> <li>Set up users</li> <li>Control and monitor access to the software</li> </ul>
Asset Explorer	https://[server]:[port number]/AssetExplorer	<ul style="list-style-type: none"> <li>Set up your site</li> <li>Access and manage assets in your plant</li> </ul>
Event Viewer	https://[server]:[port number]/EventViewer	<ul style="list-style-type: none"> <li>View events generated in the software</li> </ul>

Where [server] is the computer name or IP address of the AMS Machine Works server and [port number] is the port number assigned to the web site.

For example, to launch the Asset Explorer utility from the server named MachineWorksServer and port number of 8080, enter https://MachineWorksServer:8080/AssetExplorer.

## 5.9 Configure Active Directory for AMS Machine Works

Before configuring Active Directory, ensure that Active Directory has been installed and that Active Directory Domain Services and Active Directory Federation Services have been set up. Then, complete the following steps to configure Active Directory Federation Services to add AMS Machine Works as an authorized client.

### Procedure

1. Open **Server Manager**.
2. Click **Tools** at the top right of the screen.
3. Click **AD FS Management** in the list on the right side of the screen. The **AD FS** screen displays.
4. Right click **Application Groups** on the left side of the screen.
5. Click **Add Application Group**. The **Add Application Group Wizard** screen displays.
6. In the **Name** field, enter an Application Group name of your choosing. Click **Server Application**. Click **Next**. The **Server application** screen displays.
7. On the **Server application** screen, copy the contents of the system-generated **Client identifier** field into Notepad for use during the [Configure AMS Machine Works OIDC settings](#) procedure.
8. Under **Redirect URI**, add the following information:  
For the URI shown below, replace <HOSTNAME> with the hostname of the server where AMS Machine Works is installed, and <CALLBACK> with a user defined value.

---

**Note**

Copy the <CALLBACK> into Notepad for use during the configuration procedure. See [Configure AMS Machine Works OIDC settings](#).

---

```
https://<HOSTNAME>/opticsidsrv/<CALLBACK>
```

For example, if your <HOSTNAME> is win-82phv0vjau3 and your <CALLBACK> is adfs, the URI would look like this:

```
https://win-82phv0vjau3/opticsidsrv/adfs
```

9. On the **Configure Application Credentials** screen, click the **Generate a shared secret** checkbox. The **Secret** field populates. Click **Copy to clipboard**. Click **Next**. The **Summary** screen displays.
10. Copy the new secret into Notepad for use during the Configure AMS Machine Works procedure. See [Configure AMS Machine Works OIDC settings](#).
11. Click **Next**.
12. Continue clicking **Next** until you reach the last screen, then click **Close**.
13. The **Application Groups** screen displays showing the new Application Group.

After completing these procedures, return to [Step 1](#) of the [Completing AMS Machine Works post-installation steps](#) topic and continue your installation.

## 5.10 Configure AMS Machine Works OIDC settings

Before configuring AMS Machine Works, ensure that Active Directory has been configured. See [Configure Active Directory for AMS Machine Works](#). Then, complete the following steps.

### Procedure

1. Log in to AMS Machine Works and open **User Manager**.
2. Click the **Settings** tab.
3. Click **OIDC Settings** on the ribbon, the **OpenID Connect Settings** screen displays.
4. On the left side of the **OpenID Connect Settings** screen, click **New OpenID Connect Provider** and enter the following values:
  - a) **Claim Type**: Enter `http://schemas.xmlsoap.org/ws/2005/05/identify/claims/upn` in the **Claim Type** field.
  - b) **Display Name**: User defined. For example, **ADFS**.
  - c) **Scheme Name**: User defined. For example, **adfs**. The **Scheme Name** must be unique and cannot be the same name as another OpenID Connect Provider in AMS Machine Works.
  - d) **Authority**: Use this format for this field, `https://<YOUR ACTIVE DIRECTORY SERVER>/adfs/`.
  - e) **Callback path**: Enter the saved <CALLBACK> that you pasted into Notepad during the Configure Active Directory procedure. This is the last node of the

- URI address that you created. See [Configure Active Directory for AMS Machine Works](#). For example, `/adfs`.
- f) **Client ID:** Enter the saved **Client ID** that you pasted into Notepad during the Configure Active Directory procedure. See [Configure Active Directory for AMS Machine Works](#).
  - g) **Enable Client Secret:** Click this checkbox.
  - h) **Client Secret:** Enter the displayed result that you pasted into Notepad during the Configure Active Directory procedure. See [Configure Active Directory for AMS Machine Works](#).
5. Restart AMS Machine Works to display the changes in the login page. On the AMS Machine Works server, either restart the server or enter `iisreset` in a command prompt.
  6. Login to AMS Machine Works and open User Manager. Open the list of users and select the one you want to be linked with Active Directory.
  7. Click **Edit Logins** in the ribbon. The **Edit Logins** screen displays.
  8. On the **Edit Logins** screen, in the **OpenID Connect Provider** field, select the OpenID Connect Provider that was created earlier in this procedure. For example, ADFS. For the **Claim Value**, enter the user's UPN (the credentials used to log in to Active Directory, usually the user's email address). Click **OK**.
  9. Sign out of AMS Machine Works.
  10. Log back in to AMS Machine Works by clicking a button under **External Account**. The External Account button will show the display name of the OpenID Connect Provider that was entered earlier. The AMS Machine Works sign in screen displays. The configuration is complete.

After completing these procedures, return to [Step 1](#) of the [Completing AMS Machine Works post-installation steps](#) topic and continue your installation.

## 5.11 Install the AMS Machine Works Vibration Analyzer

The AMS Machine Works Vibration Analyzer lets you analyze vibration data collected in AMS Machine Works from connected devices. This is a Windows application that can be installed on client computers and also on the AMS Machine Works server.

---

### Note

If you install AMS Machine Works Vibration Analyzer on the server, an extra step is required to authenticate and launch. You must add the server name to the browser's list of trusted sites. Refer to your browser's documentation to add a trusted site.

---

### Prerequisites

- Turn off automatic Windows updates during installation or upgrade. Pausing updates will reduce the number of restarts during the installation process. In **Windows Settings**, select **Advanced**, and choose to pause updates and select a date to resume updates

### Procedure

1. Open a browser, type **https://[server]:[port number]/VibApp**.

Where [server] is the computer name of the server where AMS Machine Works is installed and [port number], if required, is the port number assigned.

---

#### Note

Enter the server name set during installation of AMS Machine Works.

---

2. On the Vibration Analyzer installation page, click **Install**.
3. Run the application.

---

4. **Note**

If you are prompted to upgrade the installation, this indicates that you have already installed the application.

---

When prompted, enter the name of the AMS Machine Works server and click **Next**.

---

#### Note

Use the same server name as the AMS Machine Works configuration, and when installing or upgrading components. For example, when you choose the **Use Server Name** option in the Server and Port Binding Configuration screen during the installation, you must enter the name of the AMS Machine Works server.

Failure to use the same configuration as AMS Machine Works when installing or upgrading components may cause the installation to fail and you will need to uninstall and reinstall the software to configure the same server setting.

---

5. Click **Next**.
6. Click **Install**.
7. Click **Finish** when done.

## 6 Uninstall AMS Machine Works

Steps for uninstalling AMS Machine Works

### Prerequisites

If applicable, uninstall the following components before uninstalling AMS Machine Works:

1. Plantweb Optics OPC UA Server Registration
2. Plantweb Optics OPC UA Server

### Procedure

Uninstall the following components (if applicable) in the order they are listed according to your installed version of AMS Machine Works. From the Control Panel, select **Add or Remove Programs**, select the component, and click **Uninstall**.

#### For AMS Machine Works v1.6.2:

1. AMS Machine Works Vibration Analyzer
2. AMS Machine Works Help
3. AMS Machine Works ATG Interface
4. AMS Machine Works EWG Interface
5. AMS Machine Works OMHM Interface
6. AMS Machine Works Interface Router
7. AMS Machine Works Historian
8. AMS Machine Works Web Services
9. Plantweb Optics Web Services

#### For AMS Machine Works v1.7:

1. AMS Machine Works Vibration Analyzer
2. AMS Machine Works Help
3. AMS Machine Works ATG Interface
4. AMS Machine Works Wireless Interface
5. AMS Machine Works Ovation MHM Interface
6. AMS Machine Works Asset Monitor Interface
7. AMS Machine Works Alarm Evaluation Service
8. AMS Machine Works Calculation Service
9. AMS Machine Works Data Agregation Service
10. AMS Machine Works Data Shovel Service
11. AMS Machine Works Knowledge Service

12. AMS Machine Works Pre-Historian
13. AMS Machine Works Pre-EventViewer
14. AMS Machine Works Snapshot Generator Service
15. AMS Machine Works Platform Integration Service
16. AMS Machine Works Interface Router
17. AMS Machine Works Historian
18. AMS Machine Works Web Services
19. AMS Machine Works MongoDB
20. AMS Machine Works Nats (Stop nats-server in Services first)
21. Plantweb Optics Web Services

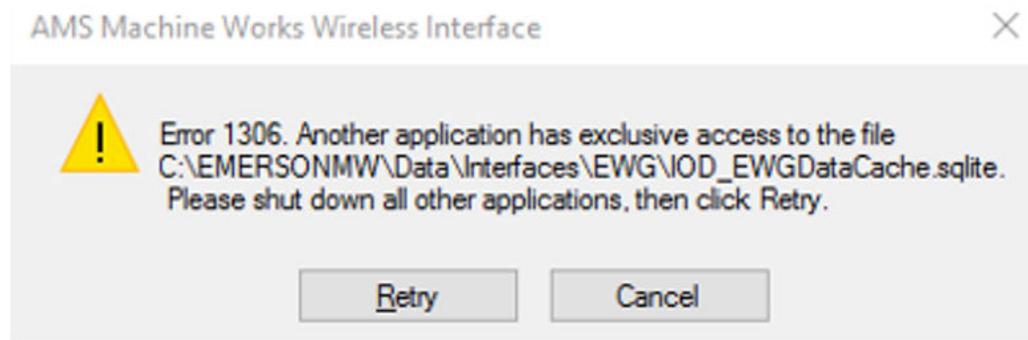
---

**Note**

If a service is still running you may experience the following error. Simply retry after a minute.

---

**Figure 6-1: Error displayed if a service is still running**

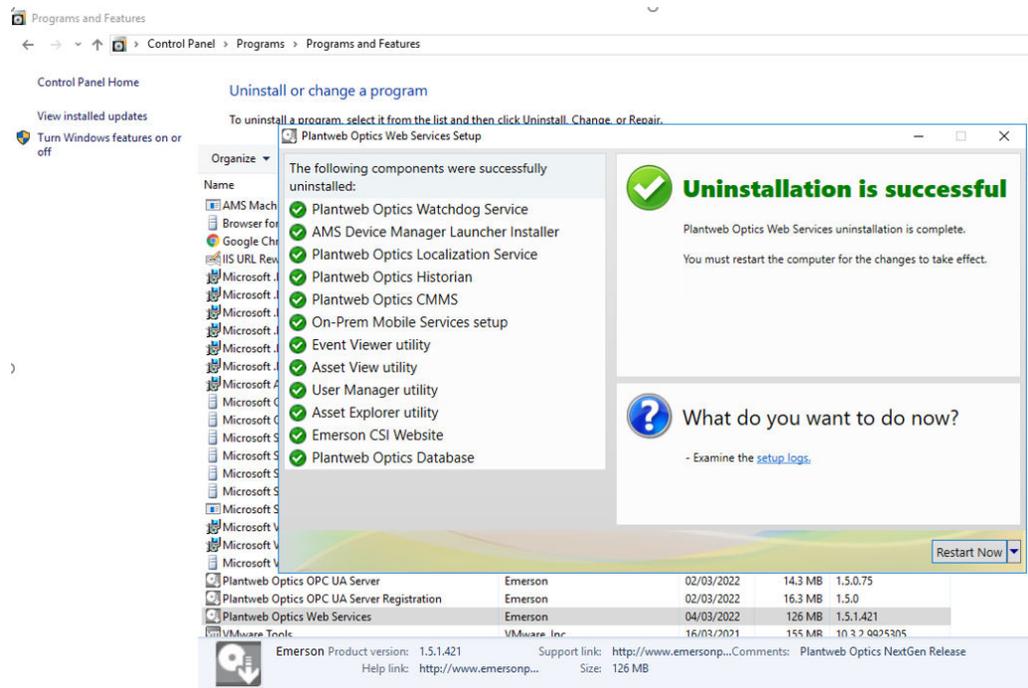


---

**Note**

After uninstalling AMS Machine Works Interface Router you may be prompted to reboot your machine. This is repeated in several steps but you only need one final reboot so it is safe to select No and reboot later, after all components are uninstalled.

---

**Figure 6-2: Plantweb Optics web services setup**

### Post-uninstallation clean-up

Depending on your Machine and setup, some files may remain on the machine after an uninstallation process. The following additional steps are recommended for a total clean-up of any leftover files. Do not follow this guide further if you are updating from AMS Machine Works v1.6.2.

### ⚠ CAUTION

Before deleting any Emerson folders, please ensure that you are not using any other Emerson products on the same Machine.

### Procedure

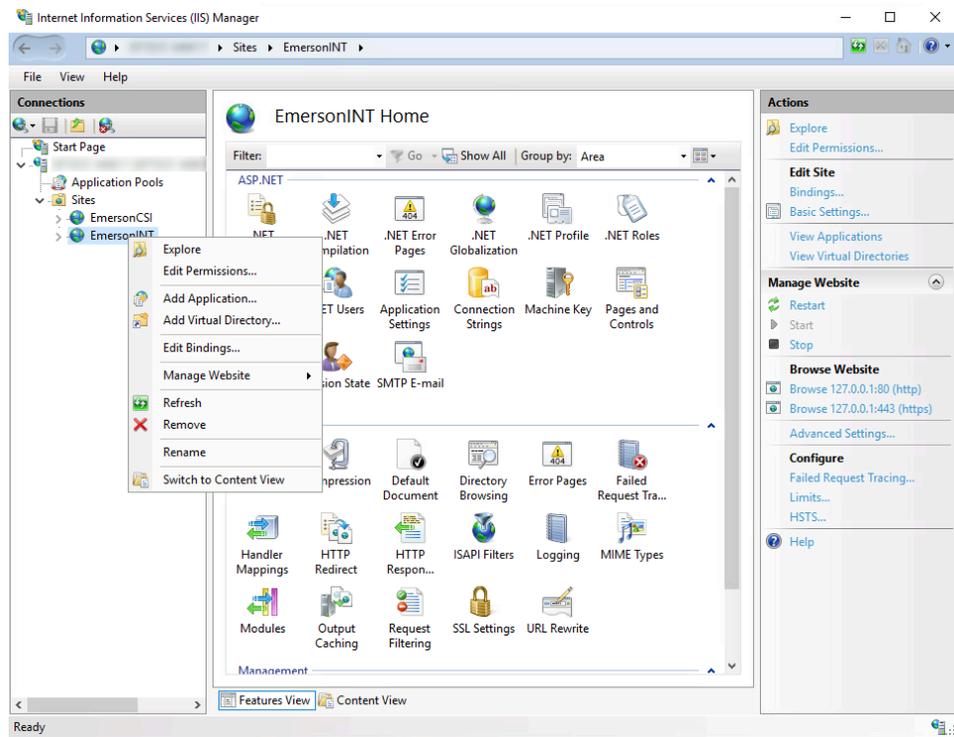
1. Delete the **Emerson** folder in Program Files  
Go to both C:\Program Files directory and C:\Program Files (x86) directory and delete the **Emerson** folder in each.
2. Delete the **Emerson** folder in ProgramData  
Go to C:\ProgramData and delete the **Emerson** folder.

### Note

ProgramData is a hidden folder. You need to enable **Show hidden files, folders, and drives** in Windows Folder Options.

3. Ensure that no Emerson IIS sites are present in the **Internet Information Services (IIS) Manager**

Figure 6-3: Internet Information Services (IIS) Manager



In the Windows search bar type **ISS** and run the suggested **Internet Information Services (IIS) Manager**. On the left side navigation panel click on your PC name and open the **Sites** folder. If **EmersonCSI** and **EmersonINT** are present, right-click on each and choose **Explore**. A folder will open for each that we will work on in the next step. Right-click on both **EmersonCSI** and **EmersonINT** again and choose **Remove**.

4. Delete everything in the two folders opened in the previous step.
- AMS Machine Works and all related leftover files have been removed from the machine.

# 7 Upgrades and updates

This procedure only applies to updates from AMS Machine Works v1.6.2 to v1.7. If you have a version of AMS Machine Works prior to v1.6.2 installed, before attempting an upgrade, please refer to the AMS Machine Works v1.6 System Guide for a detailed guide on updating to v1.6 and to the Release Notes of v1.6.1 and v1.6.2 respectively. Once updated to v1.6.2 use this AMS Machine Works v1.7 System Guide to update to v1.7.

---

## Note

Before upgrading to v1.7, please ensure that you do not have any collections schedules that only include derived measurements (found only under the "Other" filter). Store and Publish functionality will not be available for these collections after upgrading. To keep the collections full functionality, please add a waveform to them while still under v1.6.2.

---

## 7.1 AMS Machine Works v1.6.2 to v1.7 Upgrade

This section covers the upgrade procedure to update an existing AMS Machine Works v1.6.2 system to v1.7. This setup assumes that v1.6.2 is already installed and is running and collecting data.

The upgrade procedure uninstalls current v1.6.2 software, reinstalls the AMS Machine Works software, restores the short-term DB and re-uses the existing DB in the SQL server.

### Procedure

#### Pre-Requisites

1. Inform Users to log out

---

#### Note

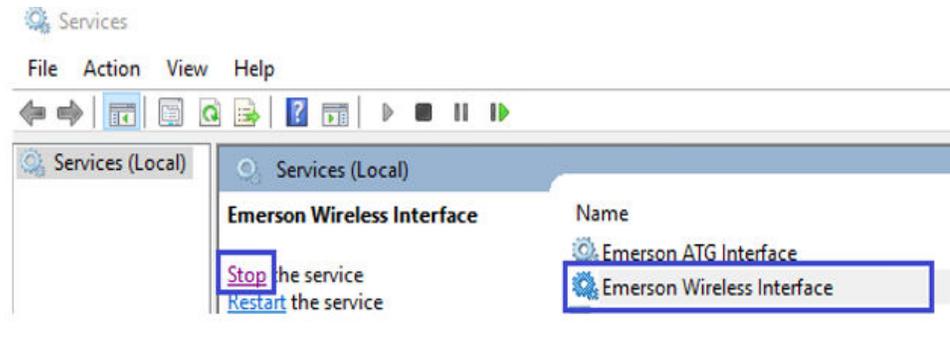
This process will take several hours.

---

- Data collection will stop during this time
  - Do not perform field activities such as adding/removing a device to a gateway
  - Inform users to stop using AMS Machine Works v1.6 for the time of the upgrade
  - Log out of the web application and close the browser from client systems, SQL servers, Interface servers and the AMS Machine Works server
  - Log out and close the Vibration Analyzer (thick client) from client systems and other systems (if installed and used)
2. Stop all interface services
    - Login to the Interface server where AMS Machine Works Interfaces are installed
    - Stop all Interface services
    - Go to **Start** -> **Services** and navigate the list to elements named **Emerson \*interface type\* Interface** select it and click **Stop**. Repeat for each installed Interface. e.g.
      - Emerson Wireless Interface
      - Emerson ATG Interface

— Emerson Ovation MHM Interface

**Figure 7-1: Emerson interfaces stopped in Windows Services**



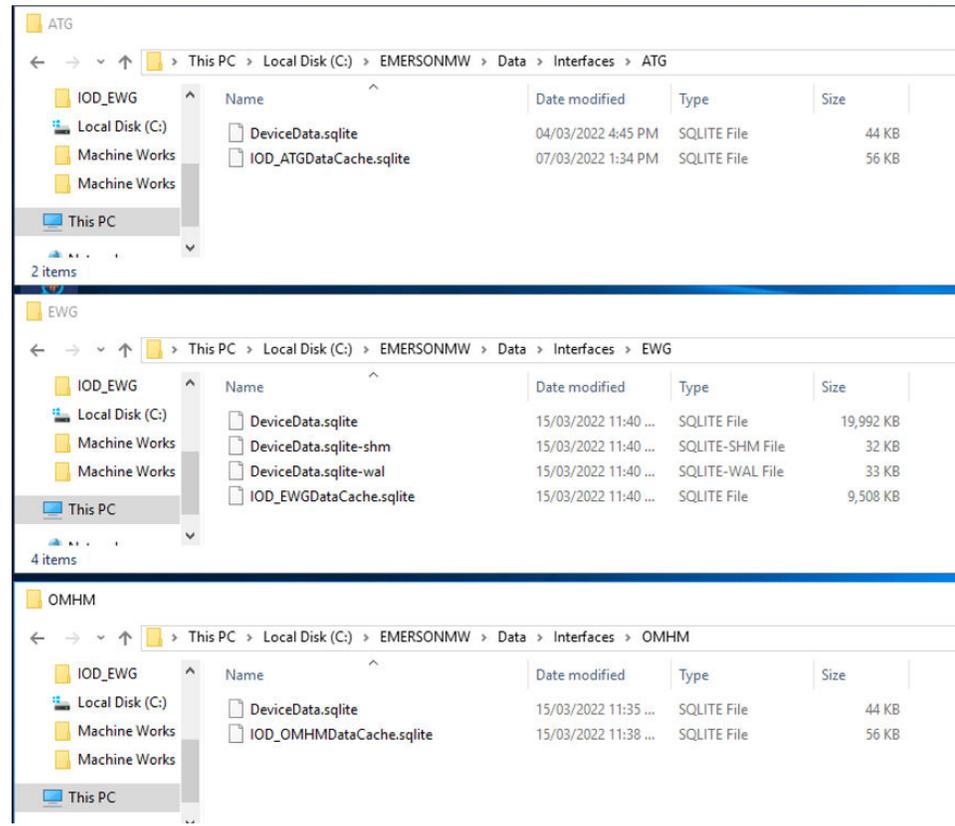
3. Backup SQLite files (Short term DB)

Create a backup of all the SQLite Files from the Interfaces folder

Go to \EmersonMW\Data\Interfaces\ and backup all the files in the following folders

- **ATG** for AMS 6500 ATG
- **EWG** for Wireless
- **OMHM** for Ovation MHM

Figure 7-2: AMS Machine Works Interfaces SQLite files

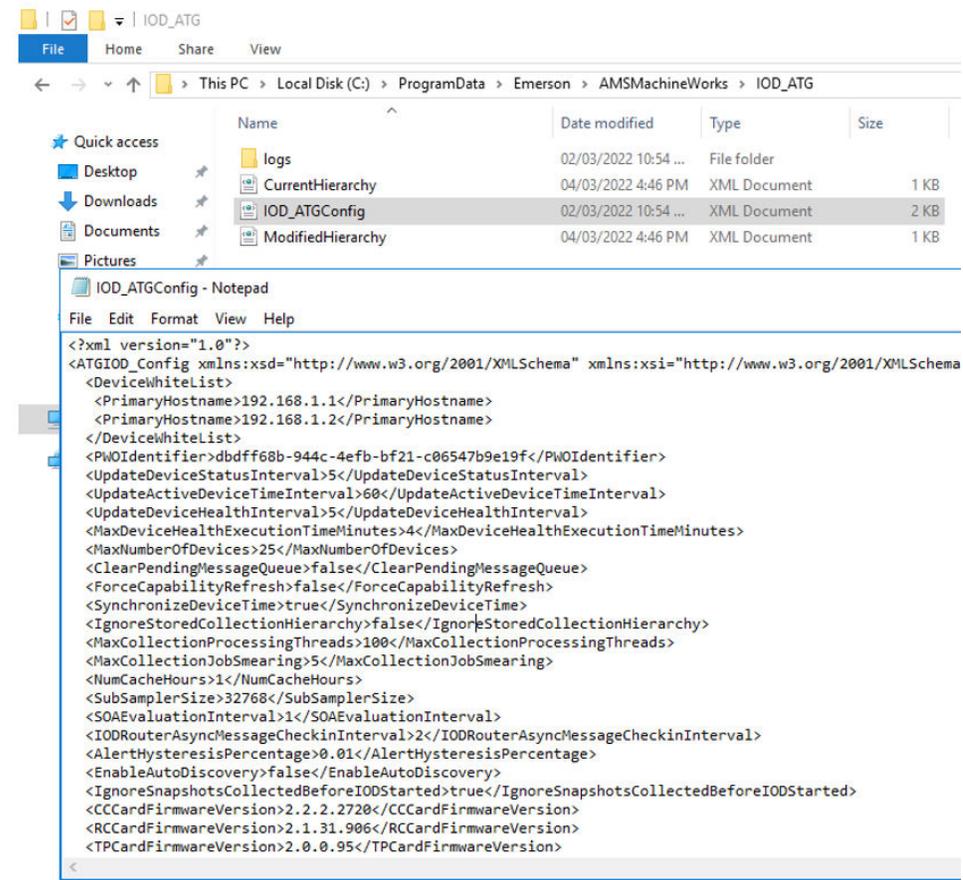


#### 4. Backup ATG Interface Config/Whitelist Files

Create a backup of the ATG Interface configuration and whitelist files if applicable

- Go to `\ProgramData\Emerson\AMSMachineWorks\IOD_ATG` and copy all the files listed below `IOD_ATGConfig.xml` and save it
- Take note of the whitelist entries and Alert Hysteresis values

Figure 7-3: IOD\_ATGConfig.xml opened with Notepad

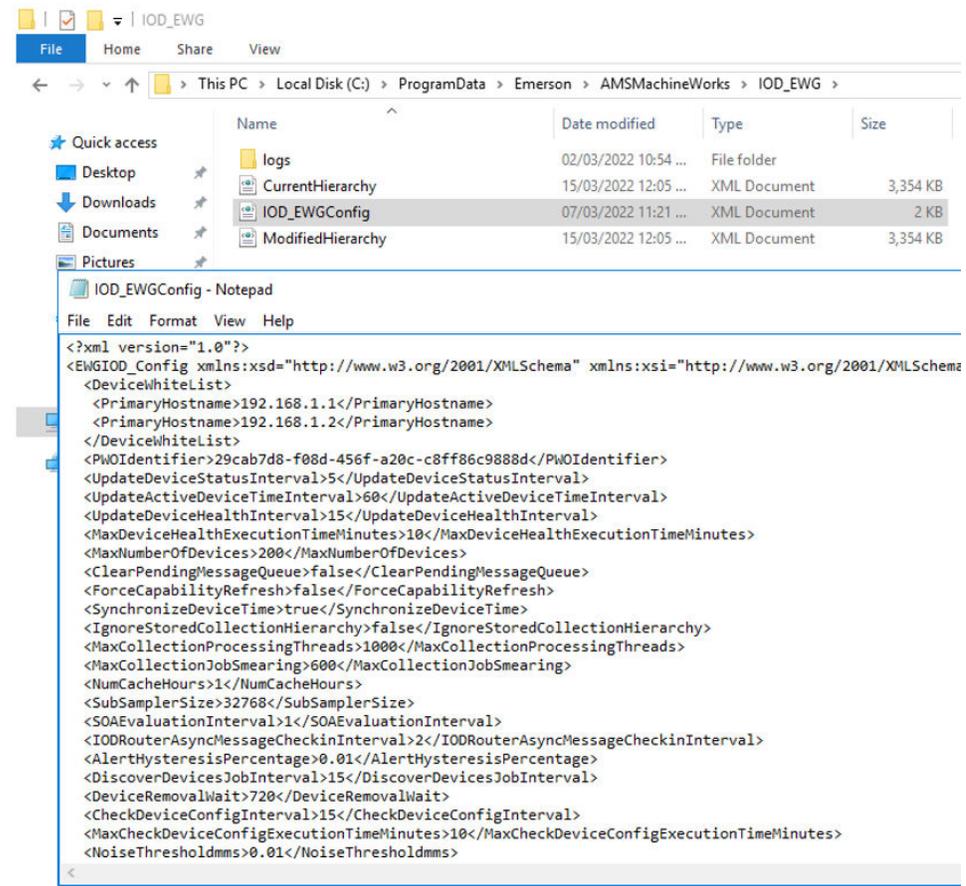


##### 5. Backup EWG Interface Config/Whitelist Files

Create a backup of the EWG Interface configuration and whitelist files if applicable

- Go to \ProgramData\Emerson\AMSMachineWorks\IOD\_EWG and copy all the files listed below **IOD\_EWGConfig.xml** and save it
- Take note of the whitelist entries and Alert Hysteresis values

Figure 7-4: IOD\_EWGConfig.xml opened with Notepad

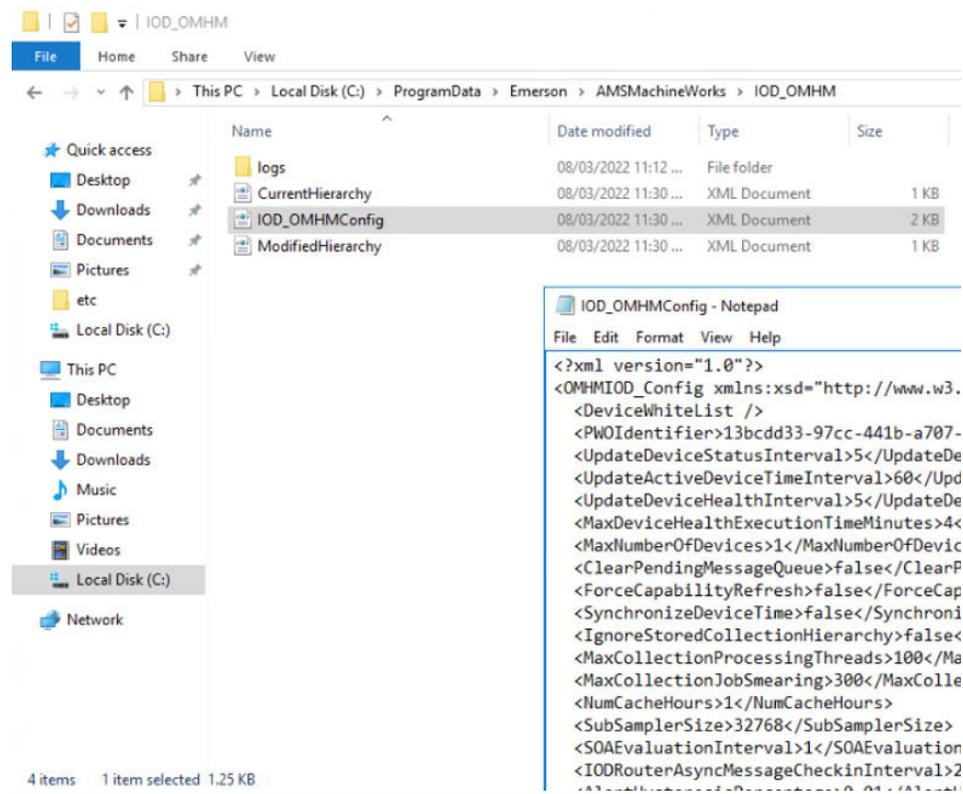


## 6. Backup the OMHM Interface Config files

Create a backup of the OMHM Interface configuration if applicable

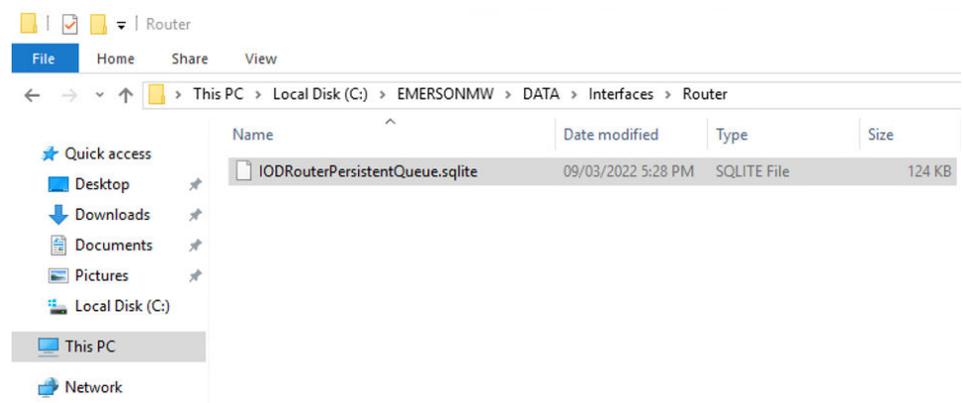
- Go to \ProgramData\Emerson\AMSMachineWorks\IOD\_OMHM and copy all the files listed below IOD\_OMHMConfig.xml and save it
- Take note of the whitelist entries and Alert Hysteresis values

Figure 7-5: IOD\_OMHMConfig.xml opened with Notepad



7. Backup the OMHM Interface Whitelist Files  
Create a backup of the IOD Router Persistent Queue if applicable
  - Go to EmersonMW\Data\Interfaces\Router and copy all the files listed below IODRouterPersistentQueue.sqlite and save it

Figure 7-6: IODRouterPersistentQueue.sqlite file location



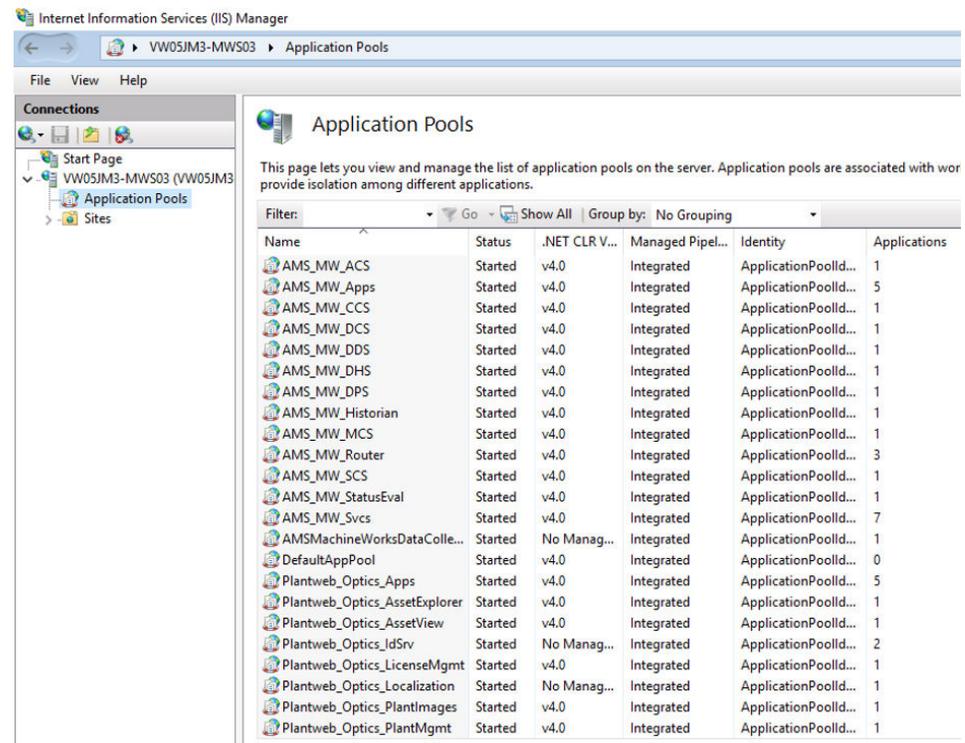
## Reinstallation of AMS Machine Works

8. Uninstall AMS Machine Works v1.6.2. For a detailed step-by-step guide go to [Uninstall AMS Machine Works](#). Do not follow the Post-uninstallation steps.
9. Install AMS Machine Works v1.7. Go to either [Install AMS Machine Works: Distributed deployment](#) or [Install AMS Machine Works: Single server deployment](#) and then proceed to the next step in this chapter.

### Post Install

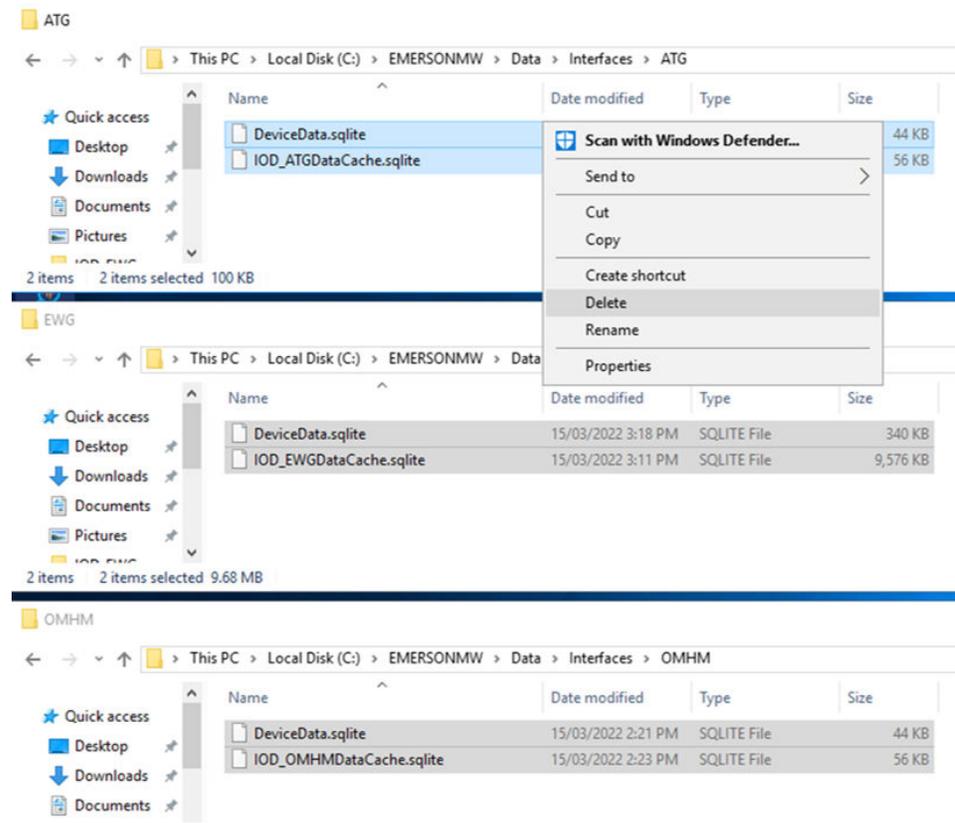
10. Check IIS (web) services are running
  - Once the installation is completed successfully, all IIS (web) services should be running automatically
  - Go to IIS Manager to confirm the following IIS (web) services (as applicable) are running properly
  - If the AMS Machine Works Data Collector service was running with v1.6.2, it should continue to run with v1.7 after the update

**Figure 7-7: AMS Machine Works application pools in IIS Manager**



11. Paste SQLite files back in their respective folders
  - Stop the windows services for the applicable interfaces (ATG, EWG & OMHM)
  - Go to Drive\EmersonMW\Data\Interfaces\ ATG, EWG & OMHM; delete the newly created files and paste all the files previously backed up in step 3

Figure 7-8: AMS Machine Works Interfaces SQLite files to delete and replace



12. Paste Configuration Whitelist (ATG) files back in the respective folder
  - Go to Drive\ProgramData\Emerson\AMSMachineWorks\IOD\_ATG and paste the device whitelist section from the backup
  - Be careful with typographical errors
  - Note: This step may not be applicable in some cases
13. Paste Configuration Whitelist (EWG) files back in the respective folder
  - Go to Drive\ProgramData\Emerson\AMSMachineWorks\IOD\_EWG and paste the device whitelist section from the backup
  - Be careful with typographical errors
  - Note: This step may not be applicable in some cases
14. Paste Configuration Whitelist (OMHM)
  - Go to Drive\ProgramData\Emerson\AMSMachineWorks\IOD\_OMHM and paste the device whitelist section from the backup
  - Be careful with typographical errors
  - Note: This step may not be applicable in some cases

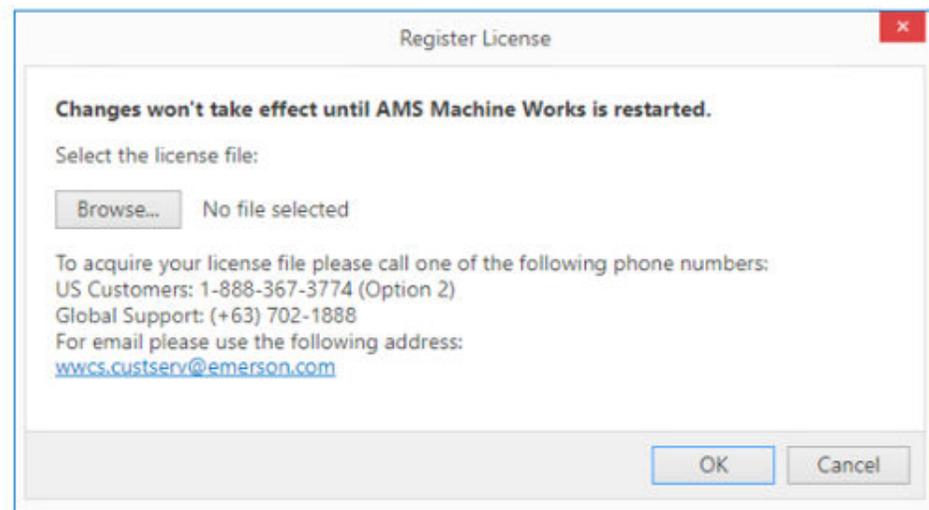
15. Restart all Interface services  
Go to Services and re-start all interface services

**Figure 7-9: Restart all Emerson services in the Services manager**

Processes Performance Users Details Services			
Name	PID	Description	Status
Emerson ATG Interface	13444	Emerson ATG Interface	Running
Emerson Ovation MHM Interface	15812	Emerson Ovation MHM Interface	Running
Emerson Wireless Interface	13564	Emerson Wireless Interface	Running

16. Clear Chrome browser history and cache  
Open the Chrome Browser, go to **settings**, search for **cache** and clear everything listed in Picture (History, cookies, cache etc)
17. Open AMS Machine Works 1.7 and install the license when prompted

**Figure 7-10: AMS Machine Works register license pop-up**



- Go to AMS Machine Works Server and copy the AMS Machine Works server certificate and install it in the Interface Server
  - Install AMS Machine Works certificates with all the client systems (vibapp)
18. Download and install Vibration Analyzer  
Go to `https://<hostname>/vibapp` and download the installer
  19. Install Vibration Analyzer  
Run VibAppSetup.exe and use the Server name for both webservice and historian
- The upgrade is complete and AMS Machine Works v1.7 is ready to be used.

# 8 Databases

The software installations deploy databases into the SQL Server instance, EMERSONMW. The sections below describe the database tables and data file locations per installation.

Each database consists of several files that are created on disk in the default data directory. The location can be specified during installation. The default folder is C:\EmersonMW\Data.

During AMS Machine Works installation, a database named MhmDb is deployed into the SQL Server instance named EMERSONMW. This database contains all the AMS Machine Works data.

**Table 8-1: Databases**

Module	Database
AMS Machine Works	MHMDb
	<b>Note</b> Depending on your configuration, you may have an AMS Machine Works database on multiple servers.
Embedded Platform Component	EventDb
	FrameworkDb
	ImageDb
	MessageDb
	OnPremMobileServicesDb
	CMMSDb
	OpticsHistorianDb

The recovery model can be set up differently on each database. The backup schedule for each database can be customized. However, Emerson recommends that each database is backed up with the same frequency. For instance, if a full backup is performed on each database every night, do not back up each database on a different night.

## 8.1 Backup and restore

### Back ups

The AMS Machine Works Standard and Limited Storage installations allow for two different backup strategies.

In a Limited Storage installation, automatic backup processing is available. See [page 137](#) for more information.

A Standard installation requires maintenance by a database administrator. Backups are expected to be performed by the database administrator. Please contact your database administrator or IT department for proper backup procedures as they relate to your overall backup strategy.

### Restore

If you need to restore any of the databases, contact your IT department to guide you on the proper restore procedure.

### ⚠ CAUTION

All Plantweb Optics Service Layer (embedded) databases and the AMS Machine Works database must be backed up simultaneously and restored simultaneously to keep them synchronized.

## 8.2 Automatic backup for Limited Storage installations

Automatic backups are available for Limited Storage installations. During installation, the **Include Automated SQL Maintenance** option is selected by default when Limited Storage installation is selected. The automatic backups are triggered by scheduled tasks.

The scheduled tasks:

- are set for 2:00 AM (by default)
- run under the native "System" account

The scheduled tasks do the following for each database:

1. Sets the databases to the simple recovery model
2. Processes a database backup
3. Shrinks the database log files

Backups are located by default under C:\EMERSONMW\DATA\Backups. The two most recent backups are saved in folders named Last and Prev.

### Note

Automatic backups are only available with new installations. If you upgrade from the previous version, this feature is not available.

## 9 OPC UA Server

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### Note

Refer to KBA NK-2100-0126 for detailed instructions on how to install and configure the OPC UA / UA Expert for AMS Machine Works.

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### 9.1 Manage certificates in an OPC UA client

To connect an OPC UA client to the AMS Machine Works OPC UA Server, the certificates of the server and the client must first be added as trusted certificates of each other.

#### Procedure

1. From the OPC UA Server, add the OPC UA client certificate as a trusted certificate.
  - a) On the AMS Machine Works server, navigate to the directory where you installed the OPC UA Server. The default path is C:\Program Files (x86)\Emerson\Plantweb Optics OPC UA Server\OPCUA.
  - b) Double-click `Emerson.OPC.UA.Server.Tool.exe`.
  - c) If prompted, select **Yes** to allow the application to make changes to your device.
  - d) Select **Manage Certificate Store**.
  - e) Select **Trust a certificate**.
  - f) Enter the file name of the certificate.
2. From the OPC UA client, add the OPC UA Server (AMS Machine Works server) certificate as a trusted certificate.

### 9.2 Connect to OPC server

Follow these instructions to run the OPC Client (UaExpert) system and connect to the OPC Server.

#### Procedure

1. From your Desktop, run the **UaExpert OPC Client**.
2. Add the OPC Server by clicking on the + sign.
3. Click on **<Double click to Add Server>**.
4. Before clicking **OK**, choose if you prefer to connect via username and password or by providing the OPC UA Client's Certificate. See [Connect an OPC UA client](#). Click **OK**.
5. Using the Server Hierarchy (on the left side of the screen), right-click on AMS Machine Works and click **Connect**.

## 9.3 Connect an OPC UA client

Building the plant hierarchy can take several minutes after installing the software and after rebooting the computer. Allow several minutes after installing or rebooting before attempting to connect OPC UA clients to the OPC UA Server.

The OPC UA Server has security features that protect your connection and your data. You may configure these settings after installation and setup.

### Prerequisites

- Click the LICENSES tab in User Manager to confirm the OPC UA Server license is enabled
- The OPC UA client certificate must be a trusted certificate of the OPC UA server (AMS Machine Works server)

### Procedure

1. From your OPC UA Client, supply the connection information of the OPC UA server. The OPC UA URL is **opc.tcp://[server]:4840**, where [server] is the computer name of the OPC UA server (AMS Machine Works server).
2. **Security Settings**—From your OPC UA client, select the security policy and message security mode that applies to your network. The OPC UA server supports these security settings:
  - a) Security Policy
    - Basic128Rsa15
    - Basic256
    - Basic256Sha256
  - b) Message Security Mode
    - Sign
    - Sign and Encrypt
3. **Authentication Settings**—An OPC UA client may be able to connect to the OPC UA server via a predetermined username and password, or through certificate validation. To enable an OPC UA client to connect to the server via username and password, an Administrator must add the user to the Plantweb Optics OPC UA Users Windows Group.

## 9.4 View or change security settings on an OPC UA Server

The Plantweb Optics OPC UA Server has security features that protect your connection and your data. You may configure these settings after installation and setup.

### Prerequisites

The OPC UA client certificate must be a trusted certificate of the OPC UA server.

### Procedure

1. Security Settings—From your OPC UA client, select the security policy and message security mode that applies to your network. The Plantweb Optics OPC UA server supports these security settings:
  - a. Security Policy
    - Basic128Rsa15
    - Basic256
    - Basic256Sha256Basic256Sha256
  - b. Message Security Mode
    - Sign
    - Sign and Encrypt
2. Authentication Settings—An OPC UA client may be able to connect to the OPC UA server anonymously, via a predetermined username and password, or through certificate validation. To enable an OPC UA client to connect to the server via username and password, an Administrator must add the user to the **Plantweb Optics OPC UA Users Windows Group**.

## 9.5 Hierarchy filtering

This feature lets you filter nodes if you want to monitor specific nodes only. Filtering trims down the hierarchy on the address space and speeds up loading time for clients connecting with an OPC UA client. Filtering is done on the computer where the OPC UA Server is installed.

### Procedure

1. From the Windows search bar, enter Services.
2. Open the Windows Services desktop application.
3. From the list of services, select **Plantweb Optics OPC UA Server**.
4. Right-click **Plantweb Optics OPC UA Server**, and then click **Stop**.
5. Configure the hierarchy elements you want to be read through OPC UA:
  - a) Go to the directory where you installed the OPC UA Server. The default path is `C:\Program Files (x86)\Emerson\Plantweb Optics OPC UA Server \OPCUA`.
  - b) Double-click `Emerson.OPC.UA.Server.Tool.exe`.
  - c) If prompted, select **Yes** to allow the application to make changes to your device.
  - d) Select **Configure Node Filter**.
  - e) Enter the path of the node that you want to monitor.

**Note**

When copying the path of the target node, exclude **Default Enterprise**.

6. Navigate back to **Services**.
7. Right-click **OPC UA Server**, and then click **Start**.

## 9.6 OPC tag information and tree structure

The names of the OPC tags are usually dependent on the configuration of a system. Virtually all data acquired by Plantweb Optics is available through OPC.

In your OPC UA session, or within your OPC application, you can use an OPC browser to identify the data from an AMS 9420 sensor 1, overall. For example:

**Default Enterprise → Default Site → AMS Machine Works Wireless Interface → Gateway 10.4.255.254 → Cooling Tower Mtr/Gearbox → Sensor 1 - Overall**

In AMS Machine Works, the OPC tag names are created using the server name followed by each branch of the tree, then the individual parameter name; each separated by a period. Depending on the OPC browser, the parameters may or may not be listed alphabetically.

At the top level of the OPC hierarchy tree (the server name), these tags are available:

**Table 9-1: OPC data tree structure**

OPC path	Description
Server	Default Server name.
Server.Enterprise	Default Enterprise name.
Server.Enterprise.Site	Default Site name.
Server.Enterprise.Site.Location	Name of locations added to the site. A location can contain locations, assets, and devices.
Server.Enterprise.Site.Location.[Location   Asset   Device]	Name of a location, asset, or device.
Server.Enterprise.Site.Location.Asset	Name of an asset. An asset can contain assets, machines, and devices.
Server.Enterprise.Site.Location.Machine	A machine is a specific asset type that can contain other machines and devices.
Server.Enterprise.Site.Location.[Asset.Machine.]Device	A device contains data about the device and its measurement points.

The hardware portion of the OPC hierarchy tree is listed by Units.

**Table 9-2: Device information**

OPC path	Description	Data type
Server.Enterprise.Site.Location.Asset.Device.Unitname.Status	Status of the individual hardware device (Up, Down, Acknowledged)	String

**Table 9-2: Device information (continued)**

OPC path	Description	Data type
Server.Enterprise.Site.Location. Asset.Device. Unitname.IsOnline	Status of the individual hardware device (On/Off)	Boolean

**Table 9-3: Channel/Sensor information**

OPC path	Description
Server.Device. AI01.Description	The hardware device name; for example, Sensor -1 on an AMS 9420.

# 10 Troubleshooting

This section presents troubleshooting tips. Please also refer to Knowledge Base Articles for additional troubleshooting tips.

## 10.1 AMS Machine Works Analysis Dashboard troubleshooting

**Table 10-1: Launching the AMS Machine Works Analysis Dashboard troubleshooting**

Error	Background	Solution
When launching the AMS Machine Works Analysis Dashboard ( <a href="https://&lt;servername&gt;/amsmw">https://&lt;servername&gt;/amsmw</a> ) with Internet Explorer, the error appears: "Critical failure; Object doesn't support property or method 'fetch'."	This error is encountered in Internet Explorer.	Use Google Chrome with AMS Machine Works Analysis Dashboard. Launch Google Chrome and type the address <a href="https://&lt;servername&gt;/amsmw">https://&lt;servername&gt;/amsmw</a> where <servername> is the name of your AMS Machine Works Server.

## 10.2 Installation troubleshooting

**Table 10-2: Installation troubleshooting**

Error	Background	Solution
The required port to install the software is used by another application	Port 80 and port 443 are required and used by the software. If these ports are not available or used by another application, open up the ports or redirect the website using these ports.	<ol style="list-style-type: none"> <li>1. Launch IIS Manager.</li> <li>2. On the Connections pane, expand <b>PC name</b> → <b>Sites</b>.</li> <li>3. Click <b>Default Web Site</b>.</li> <li>4. On the Actions pane, click <b>Bindings</b>.</li> <li>5. On the Site Bindings page, select port 80 or port 443 and click <b>Edit</b>.</li> <li>6. On the Edit Site Binding page, enter another port number, and click <b>OK</b>.</li> </ol>
Plantweb Optics Service Layer (embedded) installation failure	Plantweb Optics Service Layer (embedded) installation may fail for several reasons.	See the installation logs for additional information on the cause of the installation failure. Installation logs are in <b>C:\ProgramData\Emerson\AMS Machine Works\</b> .
No error given.	A probable cause of installation failure is the total length of the installation path.	It should not exceed 260 characters. Shorten or change the installation path.

**Table 10-2: Installation troubleshooting (continued)**

Error	Background	Solution
No error given.	The server name may have invalid characters.	You may need to change your computer name before installing the software. Special characters (<>;: " * + = \   ? , _ !), accented characters, and other multibyte characters in a computer name can cause problems and interfere with a successful installation. A valid computer name can have numbers 0-9, uppercase and lowercase letters A-Z, and the hyphen (-). Computer names cannot have only numbers, nor can they contain spaces.
No error given	Server names provided in installation prompts do not match across installations.	Use the same server name as the AMS Machine Works configuration, and when installing or upgrading components. For example, when you choose the <b>Use Server Name</b> option in the Server and Port Binding Configuration screen during the installation, you must enter the name of the AMS Machine Works server. Failure to use the same configuration as AMS Machine Works when installing or upgrading components may cause the installation to fail and you will need to uninstall and reinstall the software to configure the same server setting.
No error given	Windows Update service is not running.	Ensure the Windows Update service is running.  <b>Note</b> Windows Update service is different from automatic updates. If you turn off automatic updates, make sure the Windows Update service is not unintentionally turned off.
This installation cannot be run by directly launching the MSI package. You must run setup.exe	The incorrect setup file was launched.	When the installer has both <b>setup.exe</b> and <b>setup.msi</b> included, always run <b>setup.exe</b> rather than <b>setup.msi</b> to install and its components. Running <b>setup.exe</b> checks that the system has necessary prerequisite software, for proper installation to continue.
		If you chose to have the database on a separate server from where the software is installed, you must enable TCP/IP and the SQL Server (EMERSONMW) and SQL Server Browser services have to be running on the database server. <b>To enable TCP/IP:</b> <ol style="list-style-type: none"><li>1. Launch SQL Server Configuration Manager.</li><li>2. On the left pane, expand the <b>SQL Server Network Configuration</b> node.</li><li>3. Select the <b>Protocols for EmersonMW</b>.</li><li>4. On the right pane, right-click <b>TCP/IP</b> and select <b>Enable</b>.</li></ol> <b>To enable the services:</b> <ol style="list-style-type: none"><li>1. Launch SQL Server Configuration Manager.</li><li>2. On the left pane, select <b>SQL Server Services</b>.</li><li>3. On the right pane, right-click <b>SQL Server (EMERSONMW)</b> and select <b>Start</b>.</li><li>4. Right-click <b>SQL Server Browser</b> and select <b>Start</b>.</li></ol>

**Table 10-2: Installation troubleshooting (continued)**

Error	Background	Solution
No error given	The installation is being performed on a computer where the system is already installed or has been uninstalled.	Software installation will fail if there are database files from a previous installation in the EmersonMW\Data folder. You need to remove the database files from a previous installation. See Knowledge Base Article NK-1600-0344 for a complete list of database files to be removed.
Error when installing SQL Server 2017	<p><b>Note</b> During default installation, Microsoft SQL Server 2017 Express is automatically installed and configured for AMS Machine Works. There is no need to install SQL Server 2017 if there is no SQL Server currently installed on the AMS Machine Works server.</p> <p>If you will manually install Microsoft SQL Server 2017 for use with a Tier-2 installation, make sure the account running the SQL Server setup has rights to back up files and directories, rights to manage auditing and the security log, and the right to debug programs.</p>	<ol style="list-style-type: none"> <li>1. Launch Control Panel.</li> <li>2. Go to <b>Administrative Tools</b> → <b>Local Security Policy</b>.</li> <li>3. Navigate to <b>Local Policies</b> → <b>User Rights Assignment</b>.</li> <li>4. Double-click the <b>Back up files and directories</b> policy.</li> <li>5. Check to see if the user account running the SQL Server setup is listed. If it is not, click <b>Add User or Group</b> to add it, and click <b>OK</b> to close the dialogs.</li> <li>6. Double-click the <b>Debug programs</b> policy.</li> <li>7. Check to see if the user account running the SQL Server setup is listed. If it is not, click <b>Add User or Group</b> to add it, and click <b>OK</b> to close the dialogs.</li> <li>8. Double-click the <b>Manage auditing and security log</b> policy.</li> <li>9. Check to see if the user account running the SQL Server setup is listed. If it is not, click <b>Add User or Group</b> to add it, and click <b>OK</b> to close the dialogs.</li> </ol>
Error that ribbon bar is not updated after an interface registration install has been processed successfully.	This results from the software's cache not being updated.	Reboot the server to correct the problem.
Error when installing AMS Machine Works Web Services	Prior to installing AMS Machine Works Web Services, FileStream must be enabled.	See <a href="#">AMS Machine Works Standard Installation</a> for instructions.

## 10.3 Launching utilities troubleshooting

Table 10-3: Launching utilities

Error	Background	Solution
Cannot launch utilities in Internet Explorer	If Enhanced Security Configuration is enabled in Internet Explorer, the server URL must be added to the list of trusted sites.	In Internet Explorer: <ol style="list-style-type: none"> <li>1. Click <b>Tools</b> → <b>Internet Options</b>.</li> <li>2. Select the <b>Security</b> tab and click <b>Trusted sites</b>.</li> <li>3. Click <b>Sites</b>.</li> <li>4. In the <b>Add this website to the zone</b> field, enter <code>https://[server]</code>, where [server] is the computer name or IP address of the AMS Machine Works server.</li> <li>5. Click <b>Add</b>.</li> </ol>

## 10.4 OPC UA Server Troubleshooting

Table 10-4: OPC UA server troubleshooting

Error	Background	Solution
Data and hierarchy in the OPC UA client are not in sync with data and hierarchy in Asset Explorer.	Building the plant hierarchy in the OPC UA client can take several minutes after installation or reboot of the AMS Machine Works server.	Allow several minutes after installation or reboot of AMS Machine Works server before attempting to connect OPC UA clients. If several minutes have passed and data in OPC UA client is still not in sync with data in the software, do the following: <ol style="list-style-type: none"> <li>1. On the AMS Machine Works server, in Windows Services, locate the <b>Plantweb Optics OPC UA Server</b> service.</li> <li>2. Stop and then restart the service.</li> </ol>

## 10.5 SSL and certificates troubleshooting

Table 10-5: SSL and certificates

Error	Background	Solution
Cannot add a Wireless Gateway, AMS 6500 ATG, Ovation Machinery Health Waveform Recorder, or other asset source to Asset Explorer.	A certificate must be installed on the computer where the browser resides. Often, this is the AMS Machine Works server, but it is not required to be.	Check to ensure that the certificate that is installed is the same as the certificate that is bound to the EmersonCSI website.

## 10.6 Vibration Analyzer troubleshooting

Table 10-6: Vibration Analyzer troubleshooting

Error	Background	Solution
Error when printing Image Summary Reports	When Windows update KB3098779 is present on your installation, it results in error when printing Image Summary Reports.	Uninstall Windows update KB3098779. <ol style="list-style-type: none"> <li>1. In Windows, open <b>Control Panel</b>.</li> <li>2. Click <b>Programs</b> → <b>Programs and Features</b> → <b>View installed updates</b>.</li> <li>3. Select <b>KB3098779</b> and click <b>Uninstall</b>.</li> <li>4. Click <b>Yes</b>.</li> </ol>

## 10.7 How to use the installation log files

If you are investigating installation issues with product support, zip and send the content of two folders:

- C:\ProgramData\Emerson\AMS Machine Works\
- C:\ProgramData\Emerson\\_ADMLogs

### Note

Refer to KBA NK-2100-0075 for a downloadable utility that will automatically find and zip the aforementioned log files.

More details about logs:

C:\ProgramData\Emerson\AMS Machine Works\Logs\

MWS.1 log – main log for installation. This file has some general information, but it does not contain specific informative messages.

Sub folders named with the date of install contain .json files with any error messages describing issues with prerequisite installation steps.

MsiSilent folder contains files like ISLOG-ATG, ISLOG-CoreWebServices.

This is very informative in case of any problem during MSI installation:

Look for messages like this at the end of the log file :

```
MSI (s) (A0:80) [09:43:20:534]: Product: AMS Machine Works Web Services -- Installation operation completed successfully.
```

```
MSI (s) (A0:80) [09:43:20:535]: Windows Installer installed the product. Product Name: AMS Machine Works Web Services. Product Version: 1.6.0. Product Language: 1033. Manufacturer: Emerson. Installation success or error status: 0.
```

-----

Folders named per component such as, CoreWebServices, Historian, Router:

The `CallSetupHelper` file has log messages for each component's installation.

Look for messages like this at the end of the log file :

```
4-24-2020 09:44:58;Executing [C:\TEMP\dev_Installer_dev1.6.0.32\dep\_Support  
\SetupHelper\SetupHelper.exe]: "CreateCertificate" -Name "AMSMW16"
```

```
4-24-2020 09:44:58;Executed (0) [C:\TEMP\dev_Installer_dev1.6.0.32\dep\_Support  
\SetupHelper\SetupHelper.exe]: "CreateCertificate" -Name "AMSMW16"
```

Executed (0) means success for each step, if there is a different number (-1) it means a failure.

When installation is completed, all files are moved into a folder named `Archive-x`.

Under `C:\ProgramData\Emerson\_ADMLogs` there are logs for the Plantweb Optics Service Layer (embedded) installation.

In each folder, the `SimpleLog.log` file contains information about each installation.

## 10.8 How to send log files to Emerson Support

Customers encountering any user-facing errors should take a screenshot of the error messages, whether it be during installation, or an unexpected error when using AMS Machine Works.

The Log Export Tool is a program that allows you to get more detailed information from your application logs.

**Table 10-7:**

Software	Download Link
Log Export Tool	<a href="https://gsuds.emerson.com/pickup/psg/MHM/KBAFiles/NK-2200-0264/AMS">https://gsuds.emerson.com/pickup/psg/MHM/KBAFiles/NK-2200-0264/AMS</a>

The Log Export Tool has 3 applications:

1. **MWExportLogs.exe** exports all the log files automatically to a folder
2. **MWIncreaseLogging.exe** increases logging levels for further troubleshooting automatically
3. **MWNormalizeLogging.exe** decreases logging levels after troubleshooting automatically

This logging process will capture the following:

1. AMS Machine Works Installation Files (including platform component)
2. System Event Logs
3. IIS Services Logs applicable to AMS Machine Works

### Log Export Tool Use

Run **MWExportLogs.exe** if you want to copy only logs (Specify how old the archived log files should be). If additional information is required about the customer's AMS Machine Works System

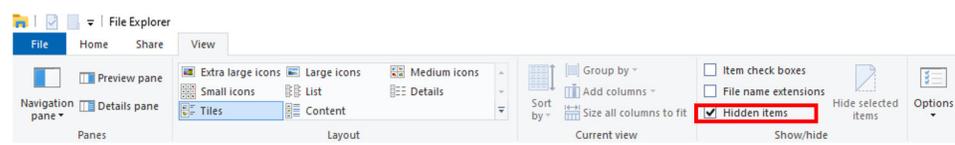
- Run the **MWIncreaseLogging.exe** and allow some system runtime prior to running **MWExportLogs.exe**
- Afterwards, use the **MWNormalizeLogging.exe** to get the logging state of the system back to normal

Should the Log Export Tool fail to run on a given system, proceed with the next procedures indicated in this chapter to capture the needed log files for review.

### Installer Logs: When the installer fails

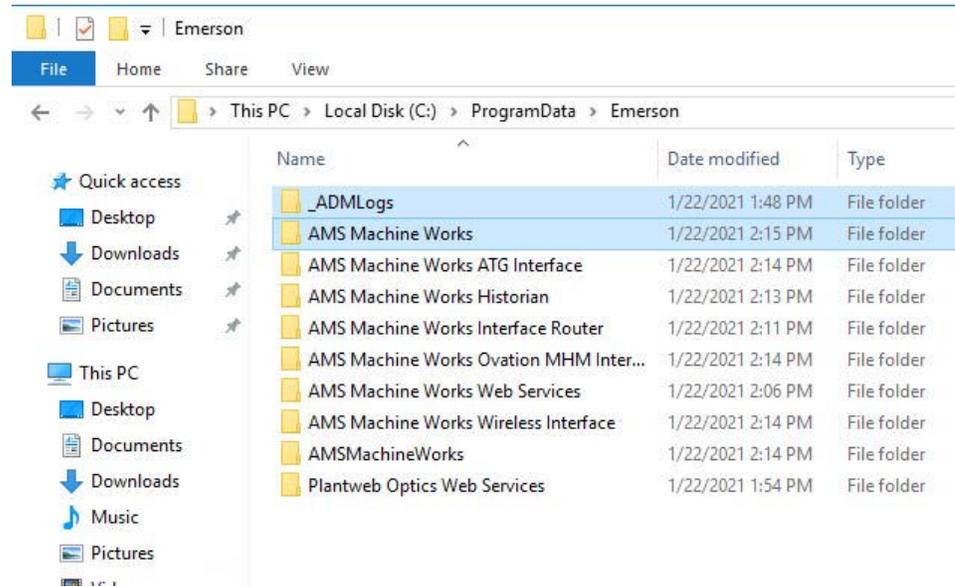
1. Access the AMS Machine Works Server
2. Open File Explorer
3. Select View and check **Show Hidden Items**

**Figure 10-1: Show Hidden Items**



4. Open to C:\ProgramData\Emerson
5. Select the \_ADMLogs and AMS Machine Works folders and zip

**Figure 10-2: Install log files location**



### Web Services Logs for Troubleshooting

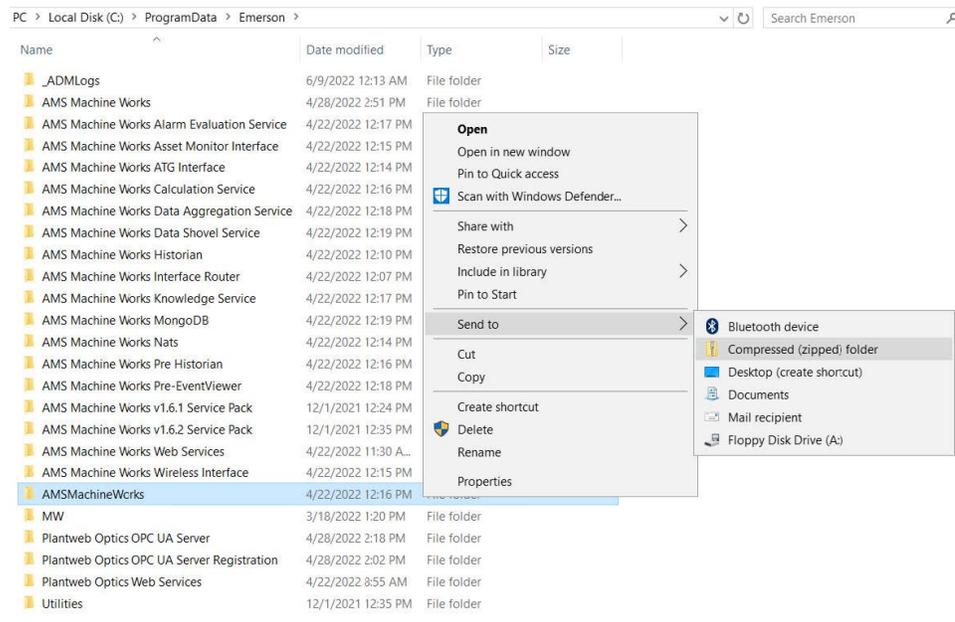
1. The interface logs can be found in the Interface Server

2. Go to the following locations where the Interfaces (ATG, Wireless, or OMHM) is installed
3. Usually the needed log file is located in C:\ProgramData\Emerson\AMSMachineWrks folder

**Note**

the folder name does not have spaces: AMSMachineWrks and is all in one word.

**Figure 10-3: Interface Server logs location**

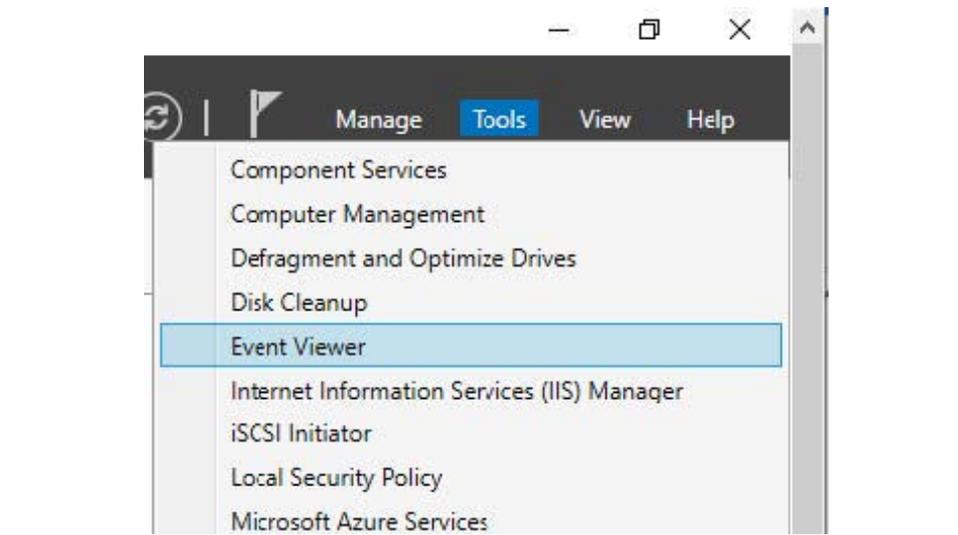


4. Zip the folder

**Windows Server Logs**

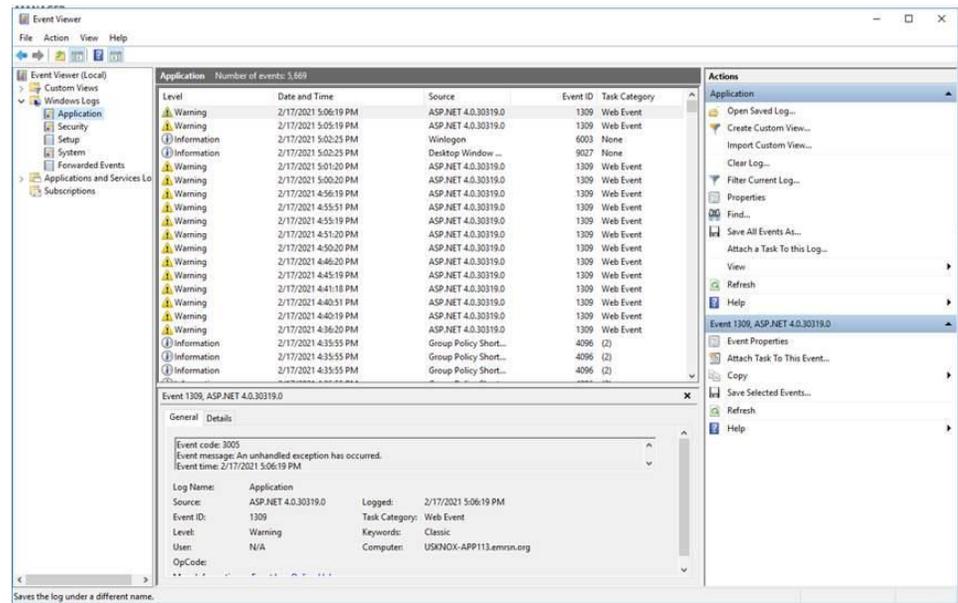
1. Open Server Manager
2. Go to Event Viewer

Figure 10-4: Event Viewer from Server Manager



3. From the Event Viewer, expand the **Windows Logs** and click **Application**. From the right side of the pane, under **Actions**, select **Save All Events As** and input **Applications.evtx**
4. Also, from the Event Viewer Windows logs, click **System**. From the right side of the pane, under **Actions**, select **Save All Events as** and input **System.evtx**

Figure 10-5: Event Viewer



### **Sending the Install and Troubleshooting Logs to Emerson Product Support**

Emerson Product Support will provide a link of a SharePoint location where the log files can be uploaded.

### **Contact Information**

Services are delivered through our global services network. To contact your Emerson local service provider, click [Contact Us](#). To contact the Global Service Center, click [Technical Support](#).

# A Filestream configuration for all system profiles

In addition to following best practices for Microsoft SQL systems recommended by Microsoft, Emerson recommends two additional configuration procedures for system performance. Perform these steps on the server where AMS Machine Works is installed.

## Procedure

1. Using the Windows `fsutil` utility, turn off short file names on computer systems using FILESTREAM. Short file names take significantly longer to create.

- a) Open a Windows CMD prompt as administrator.
- b) To see current configuration, run the following command:

```
C:\Windows\System32\fsutil.exe 8dot3name query <volume>
```

Where <volume> refers to a disk name where the database resides. The following example uses the C drive.

```
C:\WINDOWS\system32>fsutil.exe 8dot3name query c:
The volume state is: 0 (8dot3 name creation is
enabled).
The registry state is: 2 (Per volume setting - the
default).
Based on the above settings, 8dot3 name creation is
enabled on c:
```

- c) Disable the short filename feature globally for the entire system, run the following command:

```
C:\WINDOWS\system32>fsutil.exe 8dot3name set 1
The registry state is now: 1 (Disable 8dot3 name
creation on all volumes).
```

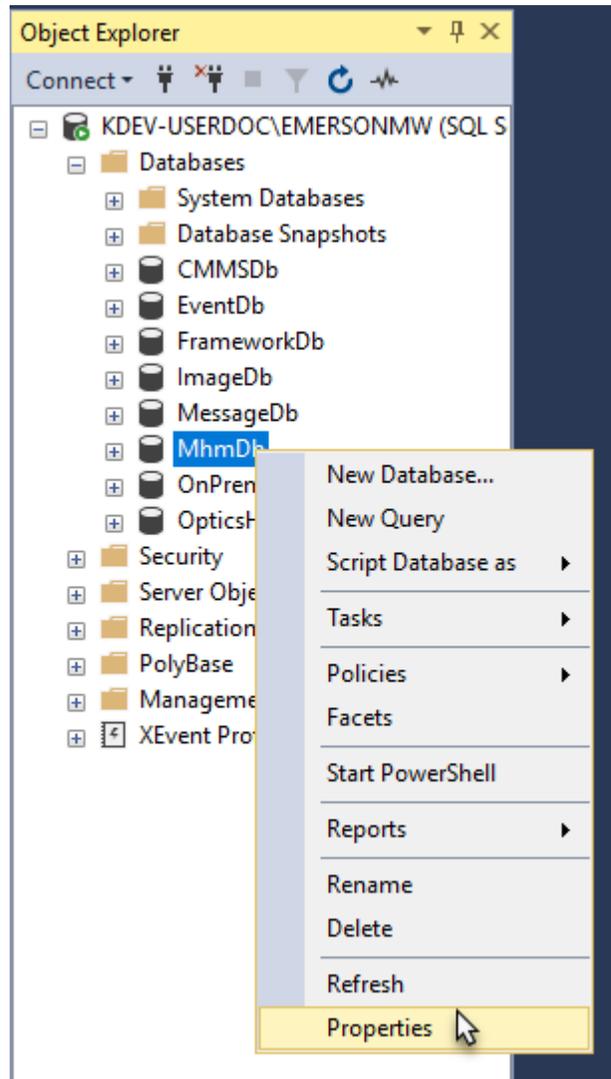
2. Set the system to use multiple filestream containers.

By default, AMS Machine Works installer creates a single container for Filestream use during the installation process. This is acceptable for small systems. However, Emerson recommends three containers for small systems, seven for medium systems, and ten for large systems. Adding containers helps the system to reduce the number of file streams per container and improve system performance. Additional containers can be created manually in the SQL Server Management Studio (SSMS).

This software is provided in the installation zip file in the following subfolder: `\dep\_Support\PWO\bin\_Support\SQL2017Exp\SSMS`

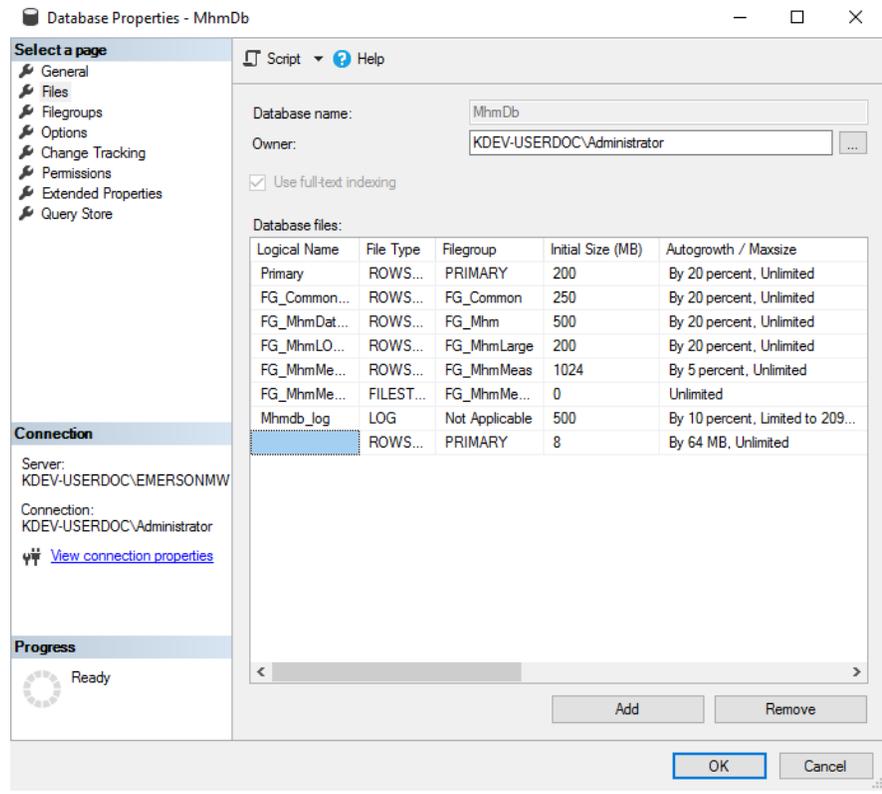
- a) In SQL Server Management Studio, expand **Databases**, right-click **MhmDb** and select **Properties**.

Figure A-1: Select properties for MhmDb



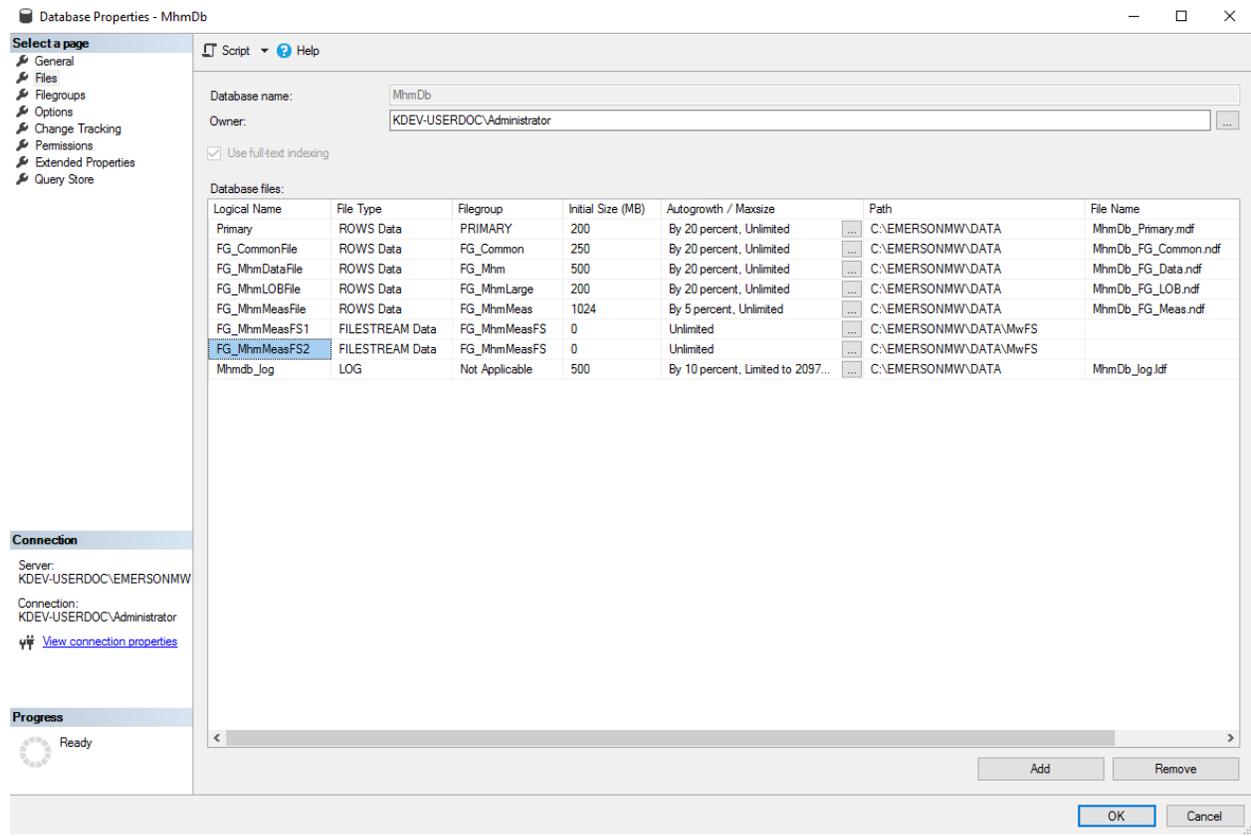
b) In the **Database Properties** dialog, select the **Files** page and click **Add**.

Figure A-2: File properties with new row added



- c) Enter a name (for example, `FG_MhmMeasFS2`), set **File Type** to **FILESTREAM Data**, and set **Path** to the MwFS directory (for example, `C:\EMERSONMW\DATA\MwFS`, which should be the same setting used by the FILESTREAM file created by the installer).

Figure A-3: Update the properties of the new row



**Tip**  
Verify the properties are the same as the files entry named FG\_MhmMeasFS1.

Repeat this process as needed to add enough rows for your expected system size.

## B Internet Information Services (IIS) reference

### Note

When components are installed on separate servers, the EmersonCSI base website references the DefaultAppPool application pool.

**Table B-1: IIS Module AMS Machine Works**

Application Pool	Site
AMS_MW_Apps	\MwDataMaintenance
AMS_MW_Apps	\VibApp
AMS_MW_Apps	\MWUI
AMS_MW_Apps	\MachineJournal
AMS_MW_Historian	\Historian
AMS_MW_Router	\IODRouter
AMS_MW_Router	\LiveDataRouter
AMS_MW_Router	\ZR
AMS_MW_StatusEval	\StatusEval
AMS_MW_Svcs	\AMSMW
AMS_MW_Svcs	\CaseHistory
AMS_MW_Svcs	\DataProvider
AMS_MW_Svcs	\HostServices
AMS_MW_Svcs	\MWASI
AMS_MW_Svcs	\MWLicense
AMS_MW_Svcs	\VibAnalysis
AMS_MW_Svcs	\SystemStatus
AMS_MW_DCS	\DCS
AMS_MW_DPS	\DPS
AMS_MW_CCS	\CCS
AMS_MW_MCS	\MCS
AMS_MW_DDS	\DDS
AMS_MW_ACS	\ACS
AMS_MW_DHS	\DHS
AMS_MW_SCS	\SCS

**Table B-2: IIS Module Plantweb Optics Service Layer (embedded)**

<b>Application Pool</b>	<b>Site</b>
Plantweb_Optics_AssetExplorer	\AssetExplorer
Plantweb_Optics_AssetView	\AssetView
Plantweb_Optics_Apps	\DM
Plantweb_Optics_Apps	\EventViewer
Plantweb_Optics_Apps	\OnPremAssetView
Plantweb_Optics_Apps	\UserManager
Plantweb_Optics_IdSrv	\OpticsIdSrv
Plantweb_Optics_IdSrv	\OnPremMobileServices
Plantweb_Optics_LicenseMgmt	\LicenseMgmt
Plantweb_Optics_Localization	\Localization
Plantweb_Optics_PlantImages	\PlantImages
Plantweb_Optics_PlantMgmt	\PlantMgmt
Plantweb_Optics_Security	\Security
Plantweb_Optics_Svcs	\Actions
Plantweb_Optics_Svcs	\CMMS
Plantweb_Optics_Svcs	\Help
Plantweb_Optics_Svcs	\KPIservices
Plantweb_Optics_Svcs	\MobileServices
Plantweb_Optics_Svcs	\Notifications
Plantweb_Optics_Svcs	\OpticsHistorian
Plantweb_Optics_Svcs	\PlantEvents
Plantweb_Optics_Svcs	\PlantMessages
Plantweb_Optics_Svcs	\PlantStatus
Plantweb_Optics_Svcs	\PluginInfo
Plantweb_Optics_Svcs	\Reference
Plantweb_Optics_Svcs	\Resources
Plantweb_Optics_Svcs	\RuntimeDataServices
Plantweb_Optics_Svcs	\Settings

## C Windows services

The following Windows services are installed on a computer depending on which AMS Machine Works component is installed on the computer.

Component	Windows service name
AMS Machine Works Web Services	ARESWatchdogService Plantweb Optics OPC UA Server
AMS Machine Works Web Services installed with Tier-1 Database setup	SQL Server (EMERSONMW) SQL Server Agent (EMERSONMW) SQL Server Browser SQL Server CEIP service (EMERSONMW) SQL Server VSS Writer
AMS Machine Works ATG Interface	Emerson ATG Interface
Emerson Ovation MHM Interface	Emerson Ovation MHM Interface
AMS Machine Works Wireless Interface	Emerson Wireless Interface
AMS Machine Works Web Services	Plantweb Optics OPC UA Server
AMS Machine Works Alarm Evaluation Service	Emerson Alarm Evaluation Service
AMS Machine Works Asset Monitor Interface	Emerson Asset Monitor Interface
AMS Machine Works Calculation Service	Emerson Calculation Service
AMS Machine Works Data Aggregation Service	Emerson Data Aggregation Service
AMS Machine Works Data Shovel Service	Emerson Data Shovel Service
AMS Machine Works Help	Emerson Help
AMS Machine Works Historian	Emerson Historian
AMS Machine Works Interface Router	Emerson Interface Router
AMS Machine Works Knowledge Service	Emerson Knowledge Service
AMS Machine Works MongoDB	Emerson MongoDB
AMS Machine Works Nats	Emerson Nats
AMS Machine Works Pre Historian	Emerson Pre Historian
AMS Machine Works Pre-EventViewer	Emerson Pre-EventViewer

# D Device compatibility

## AMS Asset Monitor

AMS Machine Works supports the AMS Asset Monitor v2.1 and latest firmware. Firmware versions below v2.1 are not supported by AMS Machine Works. If the device was added with incorrect firmware, we recommend that the device be deleted from AMS Machine Works, and added after the firmware is updated to v2.1 or greater.

## AMS Wireless Vibration Monitor

AMS Machine Works supports the AMS Wireless Vibration Monitor Hardware Rev 3 and latest firmware.

## AMS 9420 Wireless Vibration Transmitter

The following versions of the AMS 9420 are supported.

Revision	Latest version	Older versions
HART/Universal	7	7
Field device	4	3
Software	6	3 and above
Hardware	5	1, 5
DD (Device Descriptor)	7, 8	1

You can view the revision information from a Field Communicator or from AMS Device Manager. See the AMS 9420 Reference Manual for more information.

## Emerson Wireless Gateway

Emerson Wireless Interface supports the following Emerson Wireless Gateway versions:

Rosemount 1420 Smart Wireless Gateway hardware versions 3.0 and 4.0 and firmware versions 3.9.xx, 4.x.xx, or latest are supported.

Rosemount 1410 Smart Wireless Gateway hardware version 4.0 and firmware versions 4.6.64 or latest are supported.

## AMS 6500 ATG

AMS Machine Works supports AMS 6500 ATG when configured using the latest version of AMS Machine Studio and the latest corresponding compatible versions of firmware. The following AMS 6500 ATG firmware versions are supported:

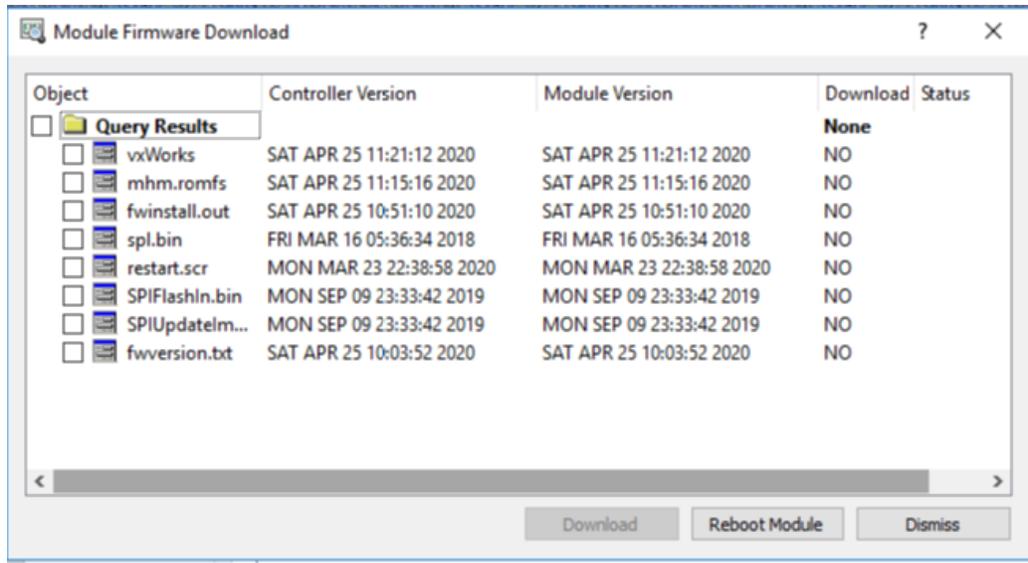
AMS 6500 ATG	AMS Machine Works
A6500-UM	A6500-UM: 2.3.0.155 HW revision: Rev.07 and latest
A6500-CC	A6500-CC: 2.2.2.2720 HW revision: Rev.07 and latest
A6500-RC	A6500-RC: 2.80.78.8660 HW revision: Rev.08 and latest

AMS 6500 ATG	AMS Machine Works
A6500-TP	A6500-TP: 2.0.0.95 HW revision: Rev.06 and latest
AMS Machine Studio	2.81.46 and latest

**Ovation MHM**

Have the PWS team verify the Ovation Feature Pack 1 has been installed on the Ovation Database Server. This is required for the Ovation MHM modules. You will also need to go to Controller Diagnostics and check the module firmware, make sure the dates are as shown below.

**Figure D-1: Module Firmware Download window in Controller Diagnostics**



# E OPC UA Software compatibility

All OPC UA clients are supported and the following software versions have been tested.

**Table E-1: Tested OPC UA Software**

Item	Tested versions
OPC UA Clients	OPC UA Expert v1.4.4 or latest
	Integration Objects
	Prosys

# F Co-deployment and Co-existence

The table lists the co-deployment / co-existence of the different products you may be using. Emerson recommends not co-deploying AMS Machine Works on the same computer with these applications.

**Table F-1: Co-deployment and co-existence with selected software**

Legend: ✓ Supported - X Not Supported - N/A Not Applicable

AMS Machine Works Application Components	Plantweb Optics	AMS Machinery Manager	AMS Device Manager	DeltaV	Ovation	Plantweb Insight
AMS Machine Works Server	✓ <i>Will not coexist in the same server</i>	X	X	X	✓ Approved Architecture only	N/A
AMS Machine Works Wireless Interface	✓ <i>Will not coexist in the same server</i>	X	X	✓ Installed on Application Station	N/A	N/A
AMS Machine Works Ovation MHM Interface	✓ <i>Will not coexist in the same server</i>	X	X	N/A	✓ Approved Architecture only (with Ovation Machinery Health Waveform Recorder)	N/A
AMS Machine Works AMS 6500 ATG Interface	✓ <i>Will not coexist in the same server</i>	X	X	X	N/A	N/A
AMS Machine Works AMS Asset Monitor Interface	✓ <i>Will not coexist in the same server</i>	X	X	X	N/A	N/A

## G Supported data storage and update rates

### G.1 AMS Asset Monitor data storage and update rates

Table G-1: AMS Asset Monitor data storage and update rates

Data Type	Short Term Historian (configured in AMS Asset Monitor)			Long Term Historian (configured in AMS Machine Works)		
	Min <sup>1</sup>	Default	Max	Min	Default	Max
Scalars	60 sec	1800 sec	3600 sec	30 min	1 hour	24 hours
Waveform / Spectrum	1 hour	1 week	1 month	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>

<sup>1</sup> Minimum rates are only recommended for a single AMS Asset Monitor at a time

<sup>2</sup> Waveforms are stored in the Long Term Historian at the same rate as the Short Term Historian

### G.2 Ovation Machinery Health Monitor module data storage and update rates

Table G-2: Ovation Machinery Health Monitor module data storage and update rates

Data Type	Ovation Machinery Health Monitor Modules		
	1	5	10
Scalars	1 sec ( up to 255 scalars)	1 min 1 sec ( with up to 255 scalars)	1 min 1 sec
High-Resolution Data	30 min (All per channel)	30 min (All per channel)	30m (All per channel)

### G.3 AMS 6500 ATG data storage and update rates

Table G-3: AMS 6500 ATG data storage and update rates, per channel

Data Type	Number of AMS 6500 ATG systems			
	1	5	10	25
Device Native Trend (Primary)	1 sec	1 sec	1 sec	1 min
Device Native Trend (Secondary)	1 sec	5 sec	5 sec	1 min

**Table G-3: AMS 6500 ATG data storage and update rates, per channel (continued)**

Data Type	Number of AMS 6500 ATG systems			
	1	5	10	25
<b>Short Waveform / Spectrum (Low-Res)</b>	10 sec	10 sec	10 sec	5 min
<b>Long Waveform / Spectrum (High-Res)</b>	30 min	30 min	30 min	1 hour

## G.4 Wireless data storage and update rates

These are the AMS Wireless Vibration Monitor data performance and scalability limitations.

AMS Wireless Vibration Monitor scalability for limitations

- Maximum 4,000 devices per system and 600 devices per Wireless Interface server

AMS Wireless Vibration Monitor collection rates for performance and scalability<sup>2</sup>

- Device Variables: 4,000 devices @ 60 min
- Diagnostic Thumbnails: 4,000 devices @ 4 hours
- Spectra: 4,000 devices @ 1 per day
- Waveforms: 4,000 devices every 30 days

Number of devices at fastest rates: maximum of 200 devices

- Device Variables: 1 min<sup>3</sup>
- Diagnostic Thumbnails: 1 hour
- Spectra: 8 hours
- Waveforms: Every day

AMS Wireless Vibration Monitor default collection rates<sup>2</sup>

- Device Variables: 1 hour
- Diagnostic Thumbnails: Disabled
- Spectra: Disabled
- Waveforms: Disabled

## G.5 AMS 9420 data storage and update rates

These are the AMS 9420 data performance and scalability limitations.

AMS 9420 scalability for limitations

- Maximum 600 devices per system and 500 devices per Wireless Interface server

AMS 9420 collection rates for performance and scalability<sup>4</sup>

- Burst Variables: 600 devices @ 60 min
- Device Variables: 600 devices @ 1 per day
- Energy Bands: 600 devices @ 1 per day
- Thumbnails: 600 devices @ 1 per day

<sup>2</sup> Applies to all the applicable measurements across all channels per device. For example, for spectra, it will be all available spectra (X,Y, Z) per channel.

<sup>3</sup> Not recommended. Depending on the network, there may be some gaps in data collection. Use this setting temporarily when absolutely required.

<sup>4</sup> Applies to all the applicable measurements across all channels per device.

- Waveform and Spectra: 600 devices @ 1 per 15 days

Number of devices at fastest rates: maximum of 60 devices

- Burst Variables: 1 min<sup>5</sup>
- Device Variables: 8 hours
- Energy Bands: 8 hours
- Thumbnails: 8 hours
- Waveforms and Spectra: Every day

---

<sup>5</sup> Not recommended. Depending on the network, there may be some gaps in data collection. Use this setting temporarily when absolutely required.

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