

# AMS Machine Works v1.6

## System Guide



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To search for documentation, visit <http://www.emerson.com>.

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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

AMS Machine Works v1.6 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 v1.6 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 ASI 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 – documents published to address known issues, frequently asked questions, history traces, system requirements, how-to information, and application-specific content.

## 2 What's new

### Key Features

- Hardware Interfaces – AMS Machine Works v1.6 includes support for the AMS Wireless Vibration Monitor, AMS 9420, AMS 6500 ATG, and Ovation™ Machinery Health™ Monitor Module.
- Dashboard – AMS Machine Works v1.6 now includes a dashboard overview for users to quickly evaluate the status of their machines and devices. From the dashboard, users can navigate quickly to areas of interest. Launch the dashboard from a desktop icon from the server or by entering the URL in your browser window <https://servername/AMSMW>, where servername is the name of the server on which AMS Machine Works has been installed.
- Wireless device connections – As of v1.6, simply connect AMS Machine Works to a wireless gateway to collect data from the devices.
  1. Starting with v1.6, AMS Machine Works no longer uses the Emerson Wireless Gateway ASI or AMS Device Manager ASI to connect to wireless vibration devices.
  2. Starting with v1.6, AMS Machine Works does not support the Pass through Method (PTM) to support DeltaV hosted gateways.
  3. Starting with v1.6, AMS Machine Works wireless interface natively supports DeltaV hosted gateways (with the exception of Wireless I/O Controllers (WIOCs)).

### AMS Machine Works available as a standalone installation only

Starting with v1.6, AMS Machine Works is always installed as a standalone product with its own embedded platform component, installed along with it. Due to this reason, AMS Machine Works cannot co-exist on a Plantweb optics server. AMS Machine Works connectivity to Plantweb Optics v1.6 will be enabled separately through AMS Machine Works ASI.

### Connecting to AMS Wireless Vibration Monitor devices

Beginning in version 1.6, AMS Machine Works connects to the new AMS Wireless Vibration Monitor devices through the AMS Machine Works wireless interface.

### Connecting to Ovation systems with the Machinery Health Module

Beginning in version 1.6, AMS Machine Works connects to the Ovation Machinery Health Module in the Ovation System through the Ovation Machinery Health Waveform Recorder (MHWR).

### Connecting to AMS 9420 devices

Beginning in version 1.6, AMS Machine Works uses the wireless interface (native to AMS Machine Works) to connect to AMS 9420 Wireless Vibration Transmitters.

### Connecting to AMS 6500 ATG devices

In version 1.6, AMS Machine Works is updated to support better performance in terms of collection rates with the AMS 6500 ATG.

### Connecting to Emerson Wireless Gateway devices on DeltaV systems

Beginning in version 1.6, AMS Machine Works can connect to wireless devices on Emerson wireless gateways hosted by DeltaV using the native AMS Machine Works wireless Interface. For this scenario, the AMS machine works wireless interface is installed on DeltaV application station that resides in the DeltaV network. The AMS Machine Works wireless interface communicates directly to the Emerson wireless gateway using HART TCP connection. Please note that in AMS Machine Works v1.6, wireless vibration devices hosted on DeltaV WIOCs are not supported and are pending approvals.

### Installation procedure

In AMS Machine Works v1.6, the installation procedure has been simplified with a single integrated installer. The installer collects the configuration information based on the selected install components. Then it installs all of the selected components.

### Short-term historian

Beginning in version 1.6, a short-term historian is introduced for all interfaces to manage the last 30 days of historical data on a first-in first out (FIFO) basis. This data is available to be viewed and analyzed in the AMS Machine Works Dashboard, Machine Diagnostics and Device Diagnostics applications. The data collection rates for the short-term historian are at faster rates when compared to the long term collection rates. In Device Configuration, manage the short-term collection rates using Buffer Settings.

### Long-term historian

Beginning in version 1.6, with the new architecture involving short-term data collection and long-term data collection, the data stored in long-term historian is configurable to store less often compared to the short term data collection. The data stored in the long-term historian can be viewed and analyzed using Vibration Analyzer. In the long-term historian, scalar data is stored inside the database, while the analytical data (thumbnails, waveforms, spectrums, journal posts, images) are stored in Filestream (a SQL Server feature that stores data in the file system). In the case, when the default SQL Server 2017 Express is installed, a data deletion routine is activated when the database reaches a certain limit, cleaning the oldest data to store new data.

### Bulk configuration

AMS Machine Works supports bulk configuration and copy and paste functionality.

The primary intent of bulk configure is for wireless devices. Using this feature, you can bulk configure the device collections configured in Machine Works from one device to multiple devices, as long as the device capabilities match. This feature is available in Device Configuration.

Machine Train configuration can be copied from one machine to several machines using the Copy Train feature. This is available in Machine Configuration.

Note that the devices cannot be configured from Machine Works. For wireless devices, an AMS Trex or AMS Device Manager should be used for configuring the device. For AMS 6500 ATG, Machine Studio should be used for configuring the AMS 6500 ATG.



### Improved system status visibility

From the AMS Machine Works dashboard, the System Status tab helps you view alerts related to the health of your AMS Machine Works server, and see pertinent information about the database storage settings and database size.

### Licensing

AMS Machine Works supports up to 12,000 Vibration Tags on a single AMS Machine Works server.

### Other updates

A new settings menu, accessible from the AMS Machine Works Dashboard, lets the user configure unit preferences for AMS Machine Works data.

Device Configuration now supports the AMS Wireless Vibration Monitor and the Ovation Machinery Health Waveform Recorder.

### AMS Machine Works Server Settings

Vibration Analyzer now supports connecting to different AMS Machine Works Servers. Users can create multiple connection profiles in the Vibration Analyzer settings menu and easily switch server connections using profiles.

### Supported device quantities

**Table 2-1: Supported device quantities**

Device	Supported number
AMS 6500 ATG	Up to 1,100 channels on a single AMS Machine Works system
AMS Wireless Vibration Monitor	Up to 4,000 devices connected across 120 Emerson Wireless Gateways
AMS 9420	Up to 600 devices across 50 Emerson Wireless Gateways
Ovation Machinery Health Monitor	Up to 440 channels or 55 Ovation Machinery Health Monitor Modules on a single AMS Machine Works system

### Supported device, software, and firmware versions

**Table 2-2: Supported device, software, and firmware versions**

Device	Supported number
AMS 6500 ATG	AMS Machine Studio version 2.82.07 Revision 9207 or above, with firmware versions: A6500-UM (2.2.0.155 or above), A6500-CC (2.2.2.2720 or above), A6500-TP (2.0.0.95 or above), A6500-RC (2.1.31.906 or above)
AMS Wireless Vibration Monitor	Hardware Rev 3, with latest firmware
AMS 9420	Hardware Rev 3, with latest firmware

**Table 2-2: Supported device, software, and firmware versions (continued)**

Device	Supported number
Ovation Machinery Health Monitor	Ovation 3.6 FP4 or higher Ovation IOIC Group 3; Local or extended I/O placement; Remote I/O placement when paired with an Ovation remote node interface; Spare I/O slot OMHM 3.6.0 firmware version patch 139 Machinery Health Waveform Recorder U13
Emerson Wireless Gateway	Hardware Rev 3, Firmware ver. 3.9.9 Hardware Rev 4, Firmware ver. 4.7.84

### Supported operating systems

AMS Machine Works v1.6 supports installation on Windows Server 2019, Windows Server 2016, and Windows Server 2012 R2.

### Supported browsers

AMS Machine Works supports use of Google Chrome and Windows Edge browser. Microsoft Internet Explorer is required to be installed on the system, but it is not recommended for using AMS Machine Works.

### Supported Plantweb Optics version

Beginning in version 1.6, AMS Machine Works cannot co-exist with Plantweb Optics on the same server. AMS Machine Works v1.6 can be connected to Plantweb Optics v1.6 using the AMS Machine Works v1.6 ASI data collector.<sup>1</sup> Do not co-deploy AMS Machine Works or any of its components or interfaces on any computer with Plantweb Optics, AMS Machinery Manager, AMS Device Manager, etc.

### Supported upgrade paths

AMS Machine Works v1.5, deployed as a standalone installation, can be upgraded to the AMS Machine Works v1.6 release. Versions prior to 1.5 will need to upgrade to v1.5 before upgrading to v1.6, and perform specific tasks for the upgrade. If you have AMS Machine Works v1.4 or v1.5, before attempting an upgrade, please contact Product Support and refer to the AMS Machine Works upgrade guide, KBA NK-2000-0451.

### Supported languages

AMS Machine Works is available in English.

<sup>1</sup> Connector to be available after the initial release of AMS Machine Works v1.6.

## 3 Installation overview

### Topics:

- [3.1 Preparing for AMS Machine Works installation](#)
- [3.2 Installing AMS Machine Works](#)
- [3.3 Prepare to register the software](#)
- [3.4 Completing AMS Machine Works post-installation steps](#)

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.

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#### Note

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

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### 3.1 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.

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#### 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](#).

### 3.2 Installing AMS Machine Works

This is a simple 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_1.6.X.X.zip` file on the AMS Machine Works server. See [Install AMS Machine Works](#). 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 [Register licenses](#).
5. View **License Summary** from the User Manager.

## 3.3 Prepare to register the software

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.

## 3.4 Completing AMS Machine Works post-installation steps

Next, complete configuration and set up the system for use. Refer to the sections indicated or 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 (UaExpert) and select **Connect to OPC Server**. See [Connect to OPC server](#).

Congratulations, you are now ready to start using AMS Machine Works.

# 4 Planning your system

## Topics:

- [4.1 Guidelines for planning your system](#)
- [4.2 How to use the installer](#)
- [4.3 Windows updates](#)
- [4.4 Database deployment](#)
- [4.5 Internet Information Services \(IIS\)](#)
- [4.6 System architecture](#)
- [4.7 Software components](#)
- [4.8 Deployment diagrams with system profiles](#)
- [4.9 System requirements](#)
- [4.10 System scalability](#)
- [4.11 Supported interface combinations](#)
- [4.12 System profiles and number of servers](#)
- [4.13 Processor and memory specifications per system profile](#)
- [4.14 Hard disk type per system profile](#)
- [4.15 Storage capacity requirements per system profile](#)

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.

## 4.1 Guidelines for planning your system

### Procedure

1. Determine the data sources that you want to bring into AMS Machine Works.  
Depending on the type of data source, install the appropriate interface to bring the right data source into AMS Machine Works. See [page 17](#).
2. Evaluate the systems and assets that you want to integrate into AMS Machine Works.
  - a) Check if these systems are compatible with AMS Machine Works. See [page 138](#).
  - b) Check the number of assets, databases, and parameters in the system. See [page 41](#).

3. Determine your network setup.  
Your network setup affects the deployment of the AMS Machine Works components. See [page 19](#).
4. Determine any network architecture restrictions in your network.  
Your network architecture affects what firewall exceptions you need to define. See [page 48](#).
5. Determine your database requirements.  
The AMS Machine Works database can either reside on the AMS Machine Works server (Tier-1) or on a separate SQL server (Tier-2). See [page 15](#).
6. Check the system requirements and system capacity recommendations. See [page 36](#) and [page 41](#).
7. Check Microsoft Internet Information Services (IIS) requirements. See [page 16](#).
8. Plan to integrate security certificate installation with software installation. See [page 52](#).
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 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 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.
10. Determine if you need to read data from AMS Machine Works using an OPC UA client.

## 4.2 How to use the installer

The zip file `Install_1.6.X.X.zip` contains all the installations for the AMS Machine Works v1.6 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.

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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 "Unhanded 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 [Uninstalling the software](#) for more information.

## 4.3 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 2-3 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.

## 4.4 Database deployment

During installation, the system databases are 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.

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

During installation, when you select Tier 1 for the database, the databases are deployed on the same server as the software and Microsoft SQL Server 2017 Express is automatically installed during installation. Tier-1 is the default configuration and represents the typical network server system. Automatic backup processing is available for this installation. See [page 110](#) 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 default installation, Microsoft SQL Server 2017 Express is automatically installed and configured during installation, select Tier-1 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.

**If you plan to use an existing Microsoft SQL Server:**

During installation, when you select Tier 2 for the database, the databases are deployed on a separate server where Microsoft SQL Server 2017 or 2019 is already installed. A Tier-2 installation requires specific server configuration and database management by a database administrator. Automatic backup processing is not available for this installation; the database, including backups, should be managed by a database administrator. See [page 122](#) for more information.

- The database must be Microsoft SQL Server 2017 or Microsoft SQL Server 2019.
- 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.

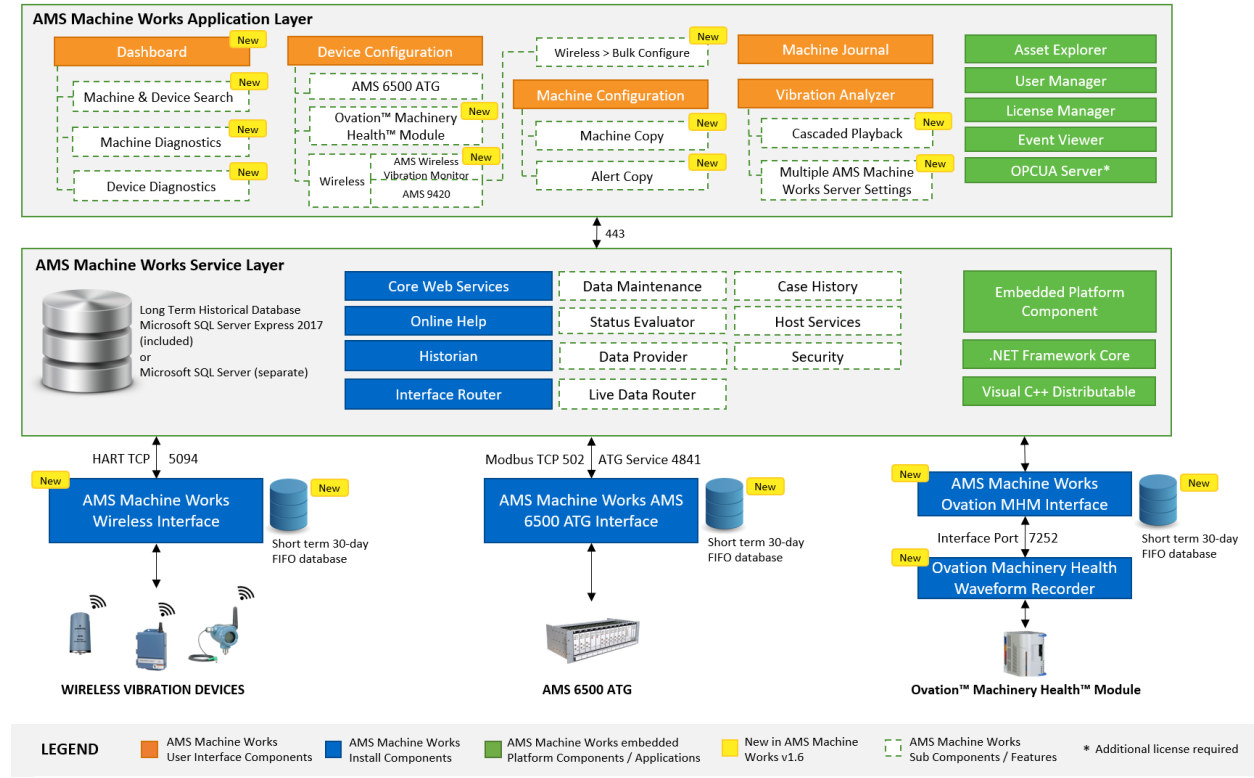
## 4.5 Internet Information Services (IIS)

- 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 115](#) 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.



## 4.6 System architecture

Figure 4-1: AMS Machine Works Architecture



## 4.7 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 4-1](#) on one server and installing interface components in [Table 4-2](#), if needed, on another server.

**Table 4-1: 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 analysis in Machine and device diagnostics, and log work requests 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 <sup>1</sup>	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 <sup>1</sup>	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.

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

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 4-2: 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 Machine Works core services.
AMS Machine Works Wireless Interface	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.

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

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**Important**

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

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## 4.8 Deployment diagrams with system profiles

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 6500 ATG Interface and Emerson Wireless Interface, or the Emerson Ovation MHM Interface. The following interface combinations are supported in AMS Machine Works v1.6. Any combinations not listed are not supported.

- AMS 6500 ATG Interface only
- Ovation MHM Interface only
- AMS Machine Works Wireless Interface only
- AMS 6500 ATG Interface and AMS Machine Works 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. Distributed Server Deployment with hosted gateways

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

## 4.8.1 1A: AMS Machine Works with wireless devices

This single-server deployment shows the AMS Machine Works Server with the AMS Machine Works Wireless Interface. This deployment is recommended for a small system profile. Refer to [Figure 4-2](#) and [Table 4-3](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.

Figure 4-2: 1A: AMS Machine Works with wireless devices

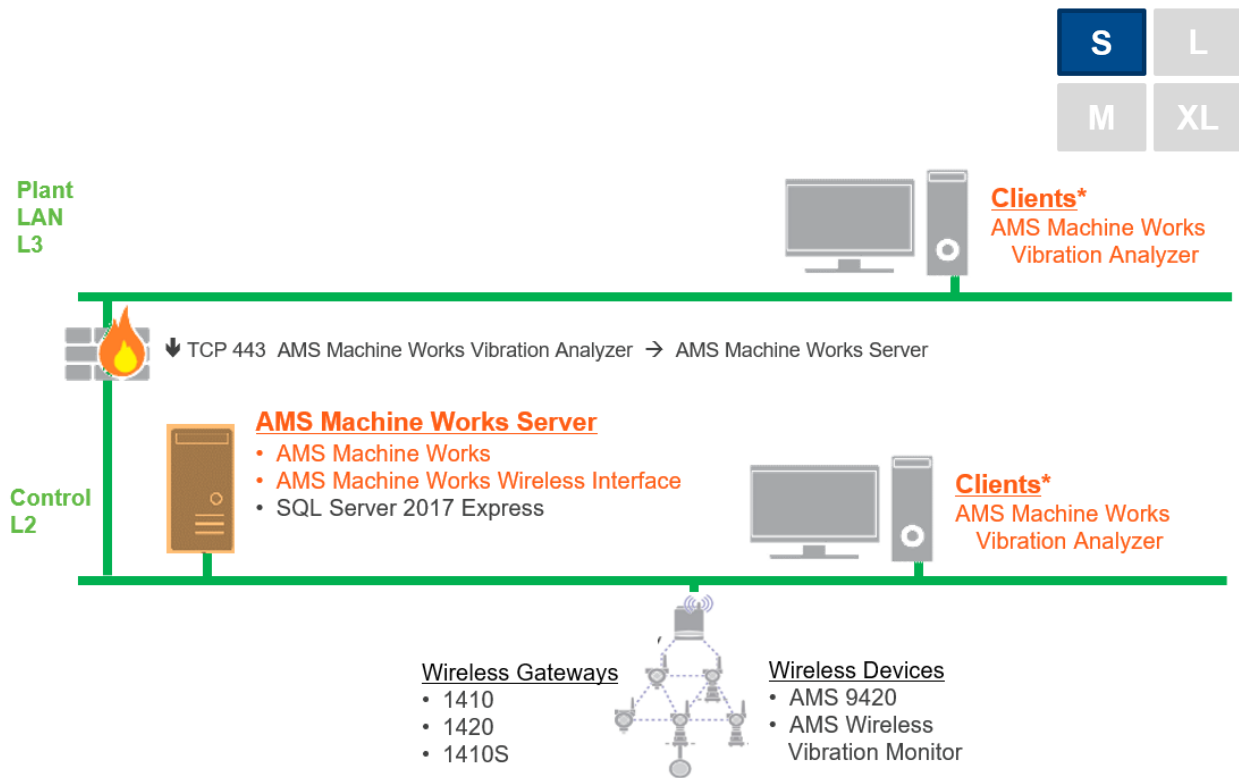


Table 4-3: 1A: AMS Machine Works with wireless devices

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 Tier-1 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.

## 4.8.2 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. This deployment is recommended for a small system profile and can have up to 10 AMS 6500 ATGs. Refer to [Figure 4-3](#) and [Table 4-4](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.

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

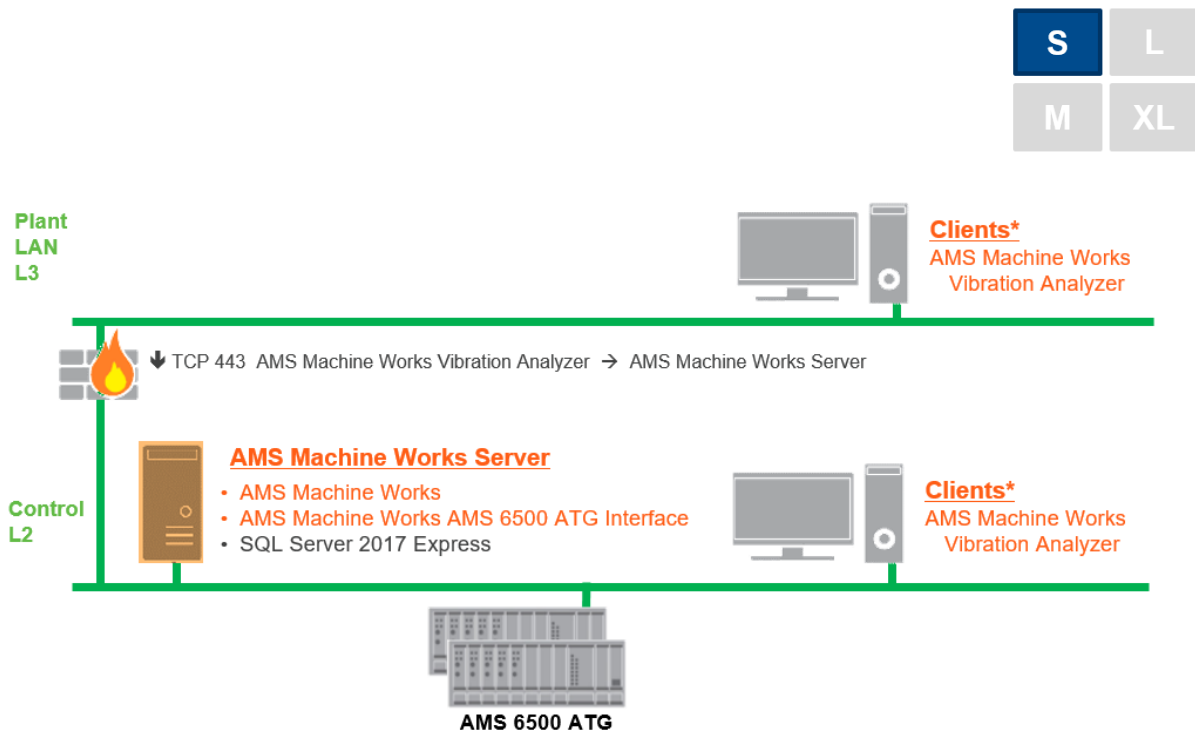


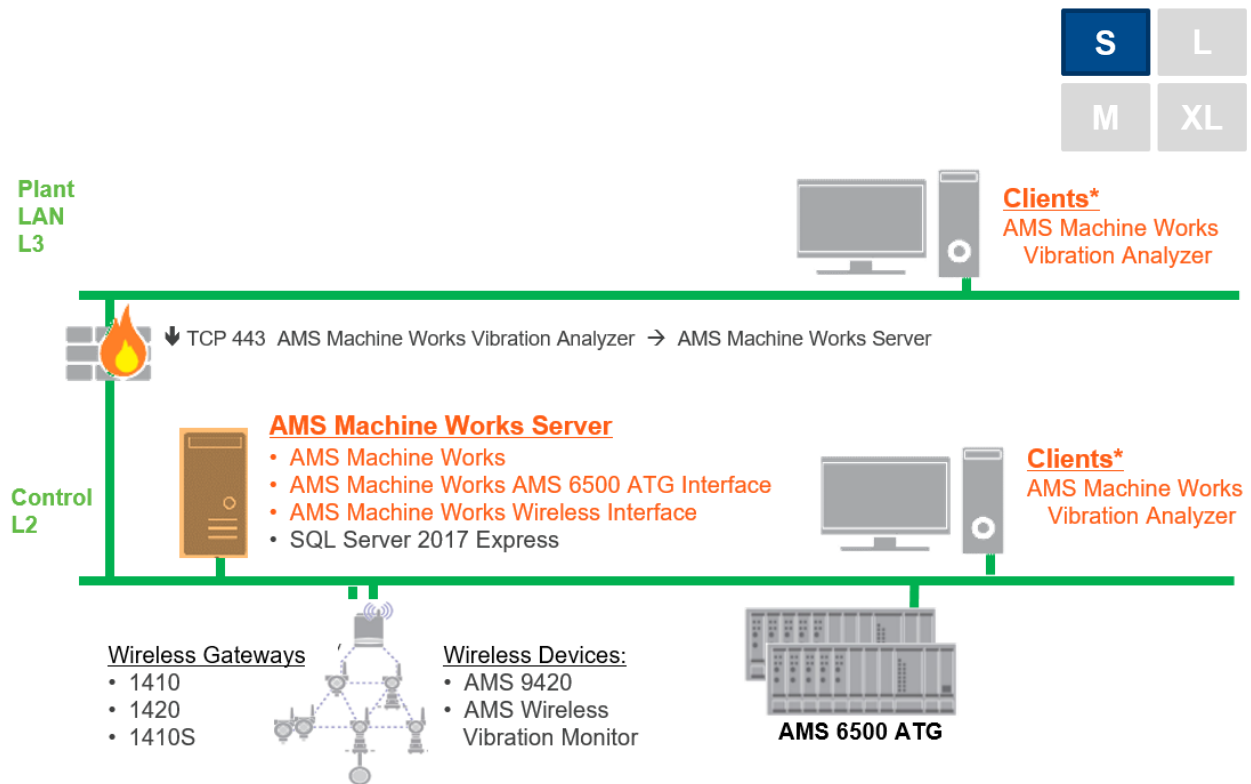
Table 4-4: 1B: AMS Machine Works with AMS 6500 ATG

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 6500 ATG Interface Service	AMS Machine Works server certificate with private key is automatically generated during software installation. SQL 2017 Express (installed by default when Tier-1 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 .

### 4.8.3 1C: AMS Machine Works with AMS 6500 ATG and wireless devices

This deployment shows the AMS Machine Works Server with all software components. Refer to [Figure 4-4](#) and [Table 4-5](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.

**Figure 4-4: 1C AMS Machine Works with AMS 6500 ATG and wireless devices**



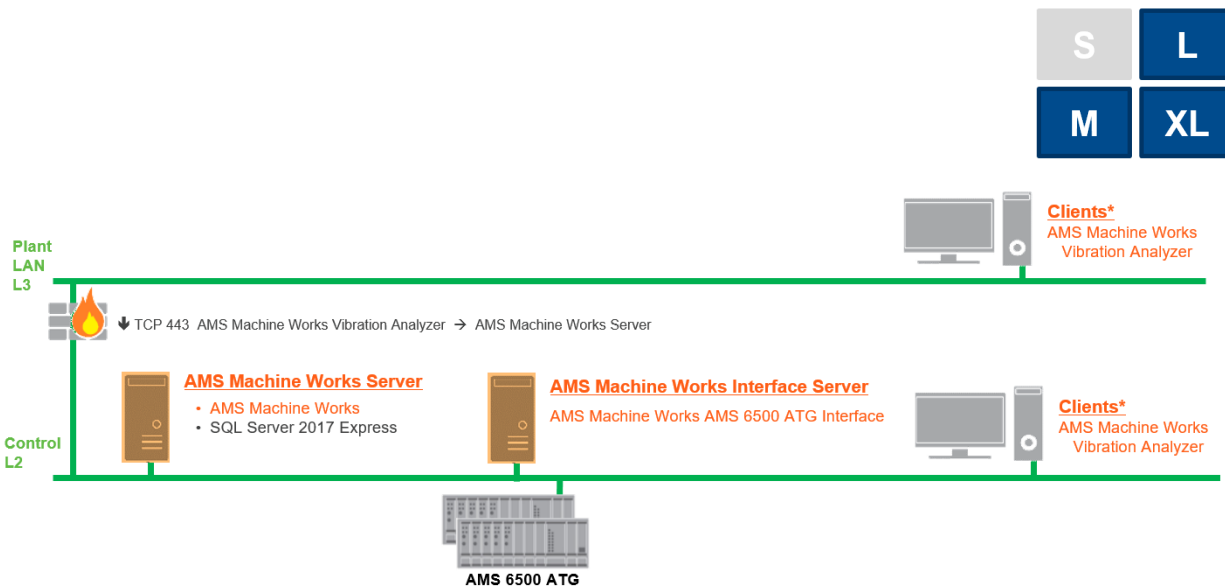
**Table 4-5: 1C: AMS Machine Works with AMS 6500 ATG and wireless devices**

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 Service	AMS Machine Works server certificate with private key is automatically generated during software installation. SQL 2017 Express (installed by default when Tier-1 is selected)
<b>Clients</b>	AMS Machine Works Vibration Analyzer Browser applications	AMS Machine Works server certificate allows communication to . Install from a web browser.
<b>AMS 6500 ATG</b>	AMS 6500 ATG	None.
<b>Wireless Gateway</b>	Wireless Gateway	None.

## 4.8.4 2A: AMS Machine Works v1.6 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. Refer to [Figure 4-5](#) and [Table 4-6](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.

**Figure 4-5: 2A: AMS Machine Works v1.6 with AMS 6500 ATG**



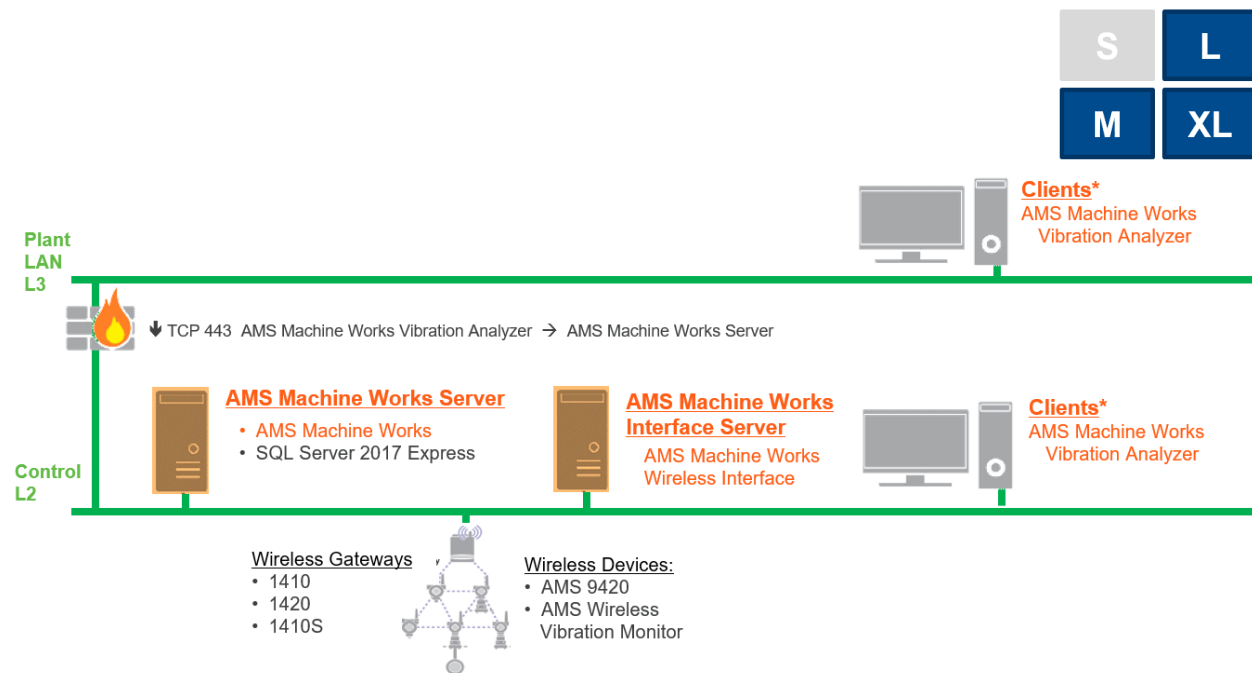
**Table 4-6: 2A: AMS Machine Works v1.6 with AMS 6500 ATG**

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 Tier-1 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.
<b>AMS Machine Works Interface Server</b>	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>
<b>AMS 6500 ATG</b>	AMS 6500 ATG	None.

## 4.8.5 2B: AMS Machine Works with Emerson Wireless Gateway

This deployment shows the AMS Machine Works Server and an AMS Machine Works Interface Server dedicated to wireless devices. Refer to [Figure 4-6](#) and [Table 4-7](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.

**Figure 4-6: 2B: AMS Machine Works with Emerson Wireless Gateway**



**Table 4-7: 2B: AMS Machine Works with Emerson Wireless Gateway**

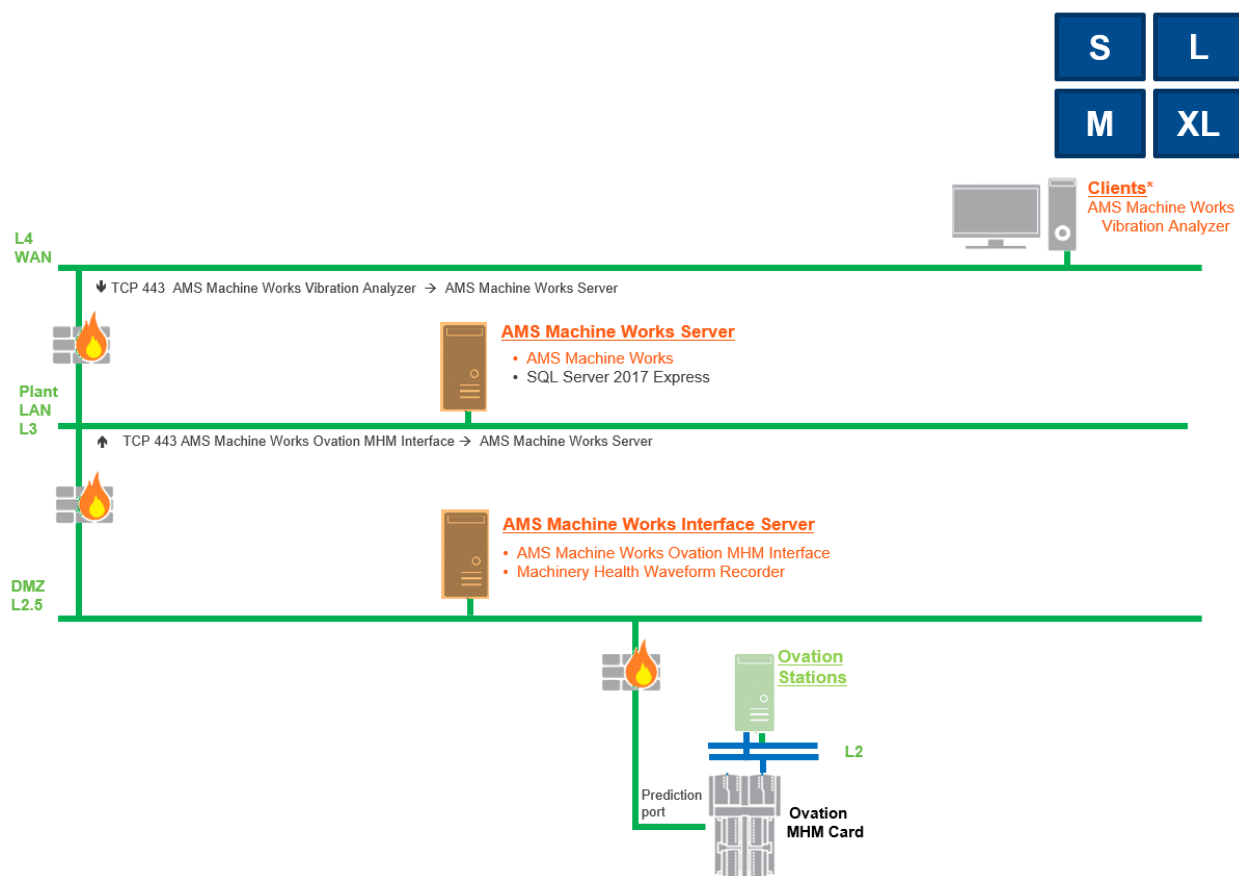
Station	Component	Certificate installation notes
AMS Machine Works Server	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	<ul style="list-style-type: none"> <li> AMS Machine Works Server certificate with private key is automatically generated during software 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 Tier-1 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.
AMS Machine Works Interface Server	AMS Machine Works Wireless Interface	AMS Machine Works Interface certificate with private key is generated during ASI installation.
Wireless Gateway	Wireless Gateway	None.



## 4.8.6 2C1: AMS Machine Works with Ovation Machinery Health Module

This deployment shows the AMS Machine Works Server and an AMS Machine Works Interface Server at the same network level. Refer to [Figure 4-7](#) and [Table 4-8](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.



**Figure 4-7: 2C1: AMS Machine Works with Ovation Machinery Health Module**



**Table 4-8: 2C1: 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 Tier-1 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.

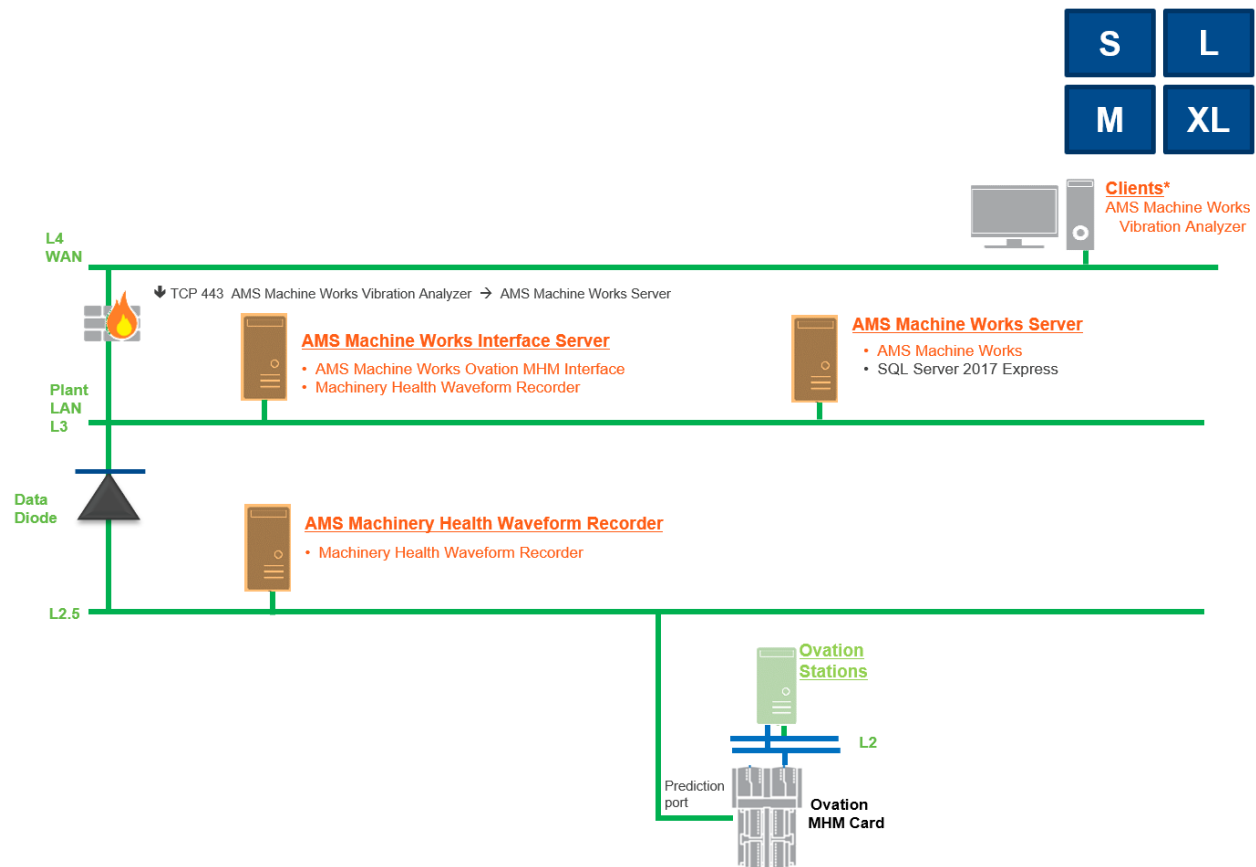
**Table 4-8: 2C1: AMS Machine Works with Ovation Machinery Health Module (continued)**

Station	Component	Certificate installation notes
<b>AMS Machine Works Interface Server</b>	AMS Machine Works AMS Ovation MHM Interface Ovation Machinery Health Module 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>		None.

## 4.8.7 2C2: AMS Machine Works with Ovation Machinery Health Module with Data Diode

This deployment shows the AMS Machine Works Server and an AMS Machine Works Interface Server at the same network level. This deployment shows a Data Diode and note that the Ovation Machinery Health Waveform Recorder installed on an additional server. Refer to [Figure 4-8](#) and [Table 4-9](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.




**Figure 4-8: 2C2: AMS Machine Works with Ovation Machinery Health Module with Data Diode**



**Table 4-9: 2C2: AMS Machine Works with Ovation Machinery Health Module with 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 Tier-1 is selected)

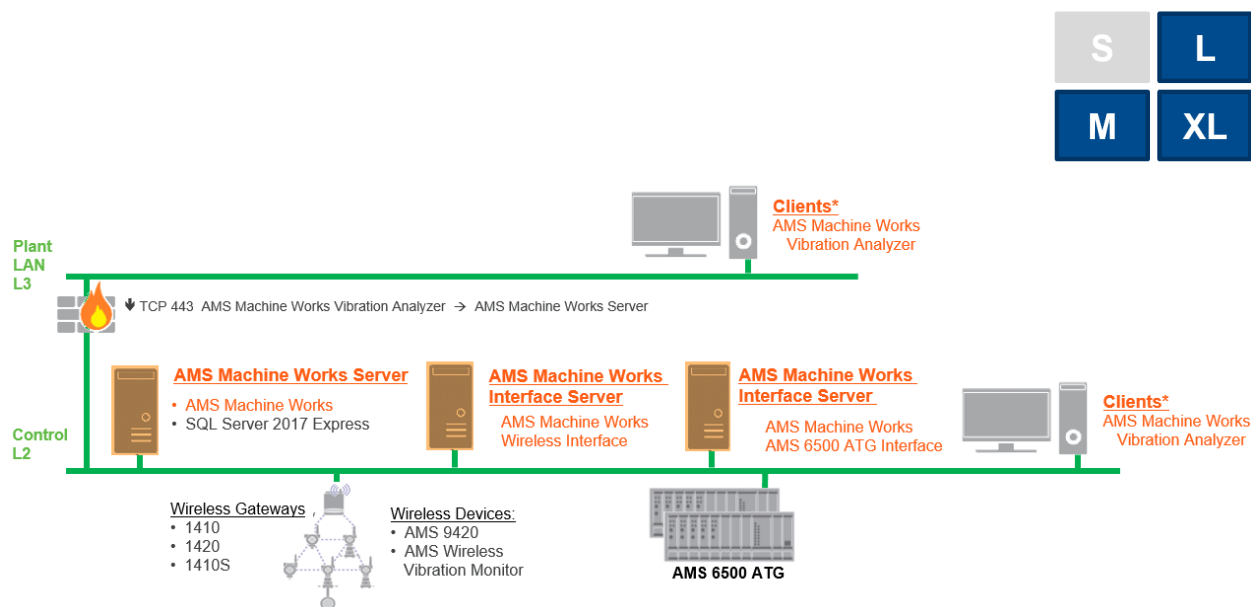
**Table 4-9: 2C2: AMS Machine Works with Ovation Machinery Health Module with Data Diode (continued)**

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.
<b>AMS Machine Works Interface Server</b>	AMS Machine Works AMS Ovation MHM Interface Ovation Machinery Health Module 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>AMS Machinery Health Waveform Recorder</b>	Ovation Machinery Health Module Waveform Recorder	None.
<b>Ovation MHM</b>		None.

## 4.8.8 2D: AMS Machine Works with wireless devices and AMS 6500 ATG

This deployment shows the AMS Machine Works Server and two AMS Machine Works Interface Servers, one each dedicated to either wireless devices or AMS 6500 ATG devices. Refer to [Figure 4-9](#) and [Table 4-10](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.

**Figure 4-9: 2D: AMS Machine Works with wireless devices and AMS 6500 ATG**



**Table 4-10: 2D: AMS Machine Works with wireless devices and 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 Tier-1 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.
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 Machine Works Interface Server	AMS Machine Works Wireless Interface	AMS Machine Works Interface certificate with private key is generated during ASI installation.

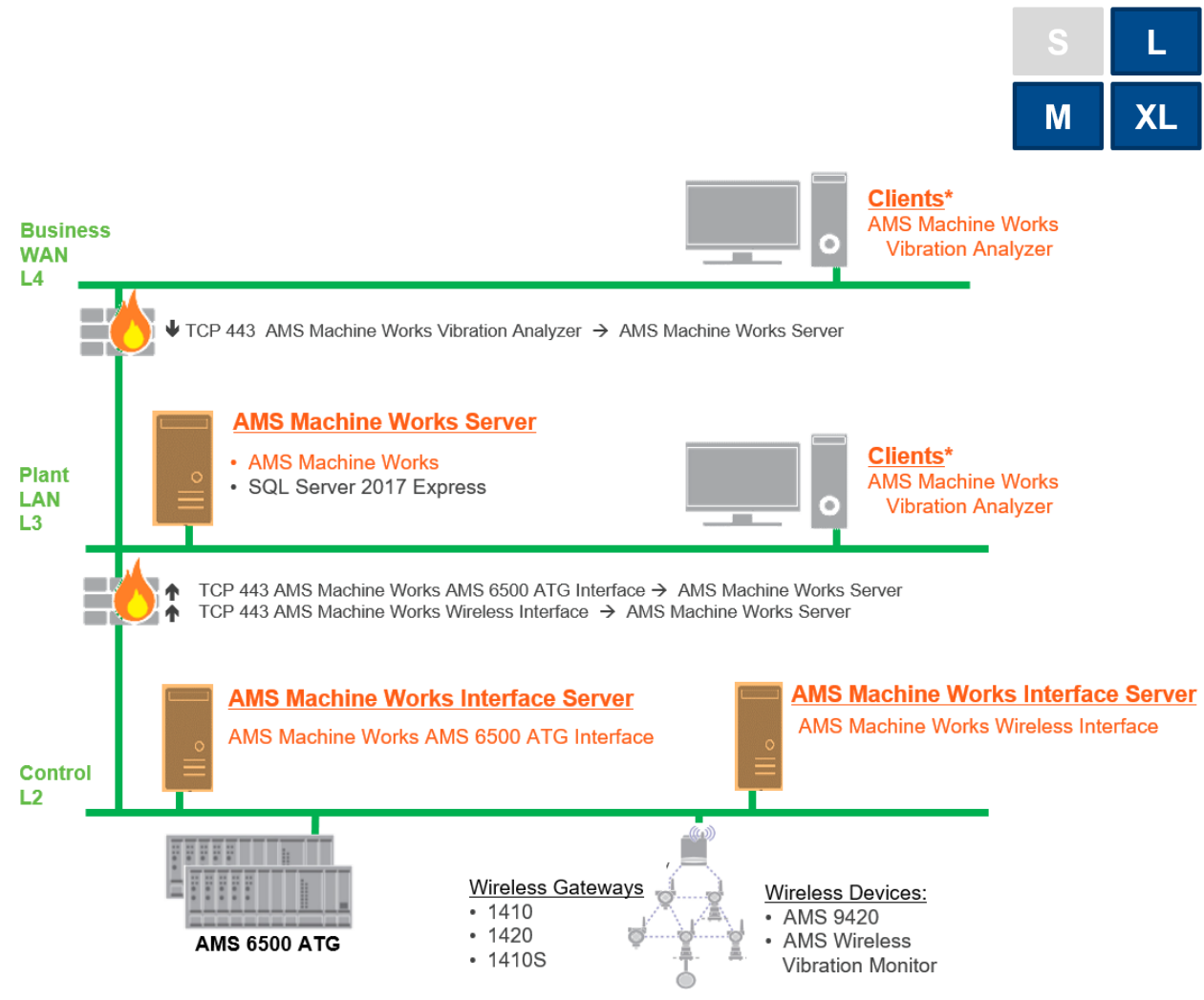
**Table 4-10: 2D: AMS Machine Works with wireless devices and AMS 6500 ATG (continued)**

<b>Station</b>	<b>Component</b>	<b>Certificate installation notes</b>
<b>AMS 6500 ATG</b>	AMS 6500 ATG	None.
<b>Wireless Gateway</b>	Wireless Gateway	None.








## 4.8.9 3A: AMS Machine Works with AMS 6500 ATG, and Emerson Wireless Gateway

This deployment shows the AMS Machine Works Server and two AMS Machine Works Interface Servers, one each dedicated to either wireless devices or AMS 6500 ATG devices. Refer to [Figure 4-10](#) and [Table 4-11](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.

**Figure 4-10: 3A: AMS Machine Works with AMS 6500 ATG, and Emerson Wireless Gateway**



**Table 4-11: 3A: AMS Machine Works with AMS 6500 ATG, and Emerson Wireless Gateway**

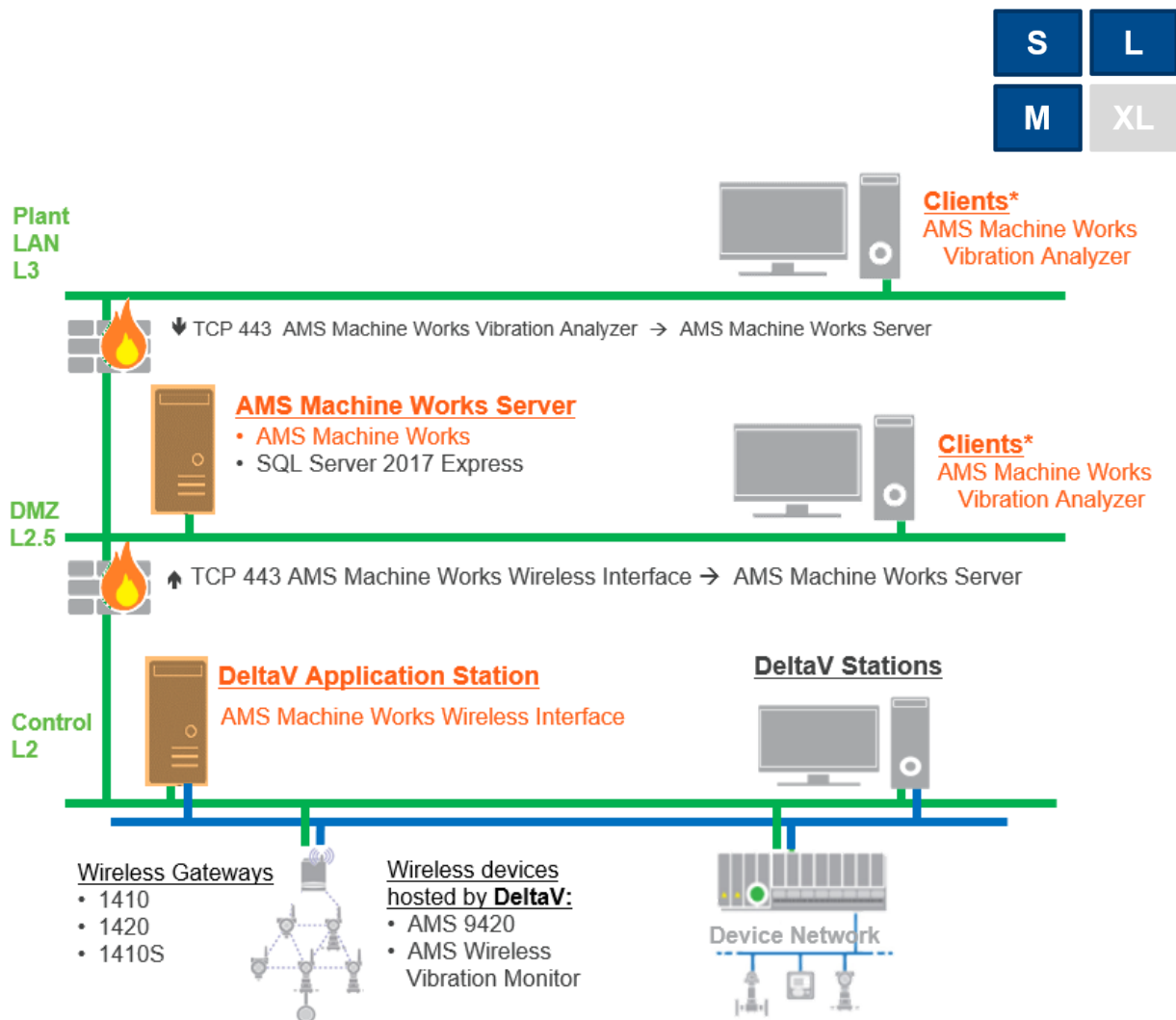
Station	Component	Certificate installation notes
<b>AMS Machine Works Server</b>	AMS Machine Works Web Services AMS Machine Works Historian AMS Machine Works Interface Router	 AMS Machine Works Server certificate with private key is automatically generated during software installation.  AMS Machine Works 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 Tier-1 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.
<b>AMS Machine Works Interface Server</b>	AMS Machine Works AMS 6500 ATG 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	None.
<b>Wireless Gateway</b>	Wireless Gateway	None.







## 4.8.10 4A: AMS Machine Works with Wireless Devices including DeltaV

This 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. Refer to [Figure 4-11](#) and [Table 4-12](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.

Figure 4-11: 4A: AMS Machine Works with Wireless Devices including DeltaV



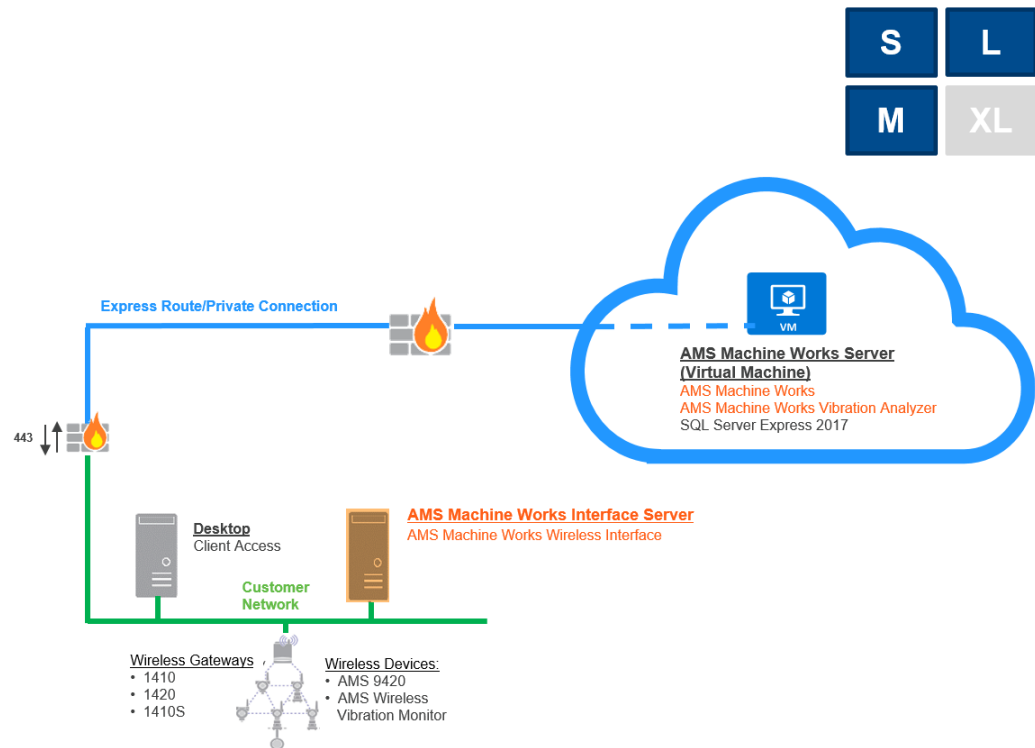
**Table 4-12: 4A: AMS Machine Works with Wireless Devices including DeltaV**

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 Service	 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. SQL 2017 Express (installed by default when Tier-1 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.
<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.

## 4.8.11 5A: AMS Machine Works with cloud-based connection to Emerson Wireless Gateway (Wireless Interface only)

This deployment shows the AMS Machine Works Server deployed to a cloud-based virtual machine, and connected to an AMS Machine Works Interface Server dedicated to wireless devices. Refer to [Figure 4-12](#) and [Table 4-13](#) for details on the system profile and device limitations for this deployment. See [System profiles and number of servers](#) for profile size information.



**Figure 4-12: 5A: AMS Machine Works with cloud-based connection to Emerson Wireless Gateway (Wireless Interface only)**



**Table 4-13: 5A: AMS Machine Works with cloud-based connection to Emerson Wireless Gateway (Wireless Interface only)**

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> <p>SQL 2017 Express (installed by default when Tier-1 is selected)</p>

**Table 4-13: 5A: AMS Machine Works with cloud-based connection to Emerson Wireless Gateway (Wireless Interface only) (continued)**

Station	Component	Certificate installation notes
Clients	AMS Machine Works Vibration Analyzer Browser applications	 AMS Machine Works server certificate allows communication to AMS Machine Works. Install from a web browser.
AMS Machine Works Interface Server	AMS Machine Works Wireless Interface	 AMS Machine Works Interface certificate with private key is generated during ASI installation.
Wireless Gateway	Wireless Gateway	None.

## 4.9 System requirements

After ensuring that all of the 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 requirements

#### 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 Windows Server 2012 R2 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</b>	MS SQL Server 2019 or 2017 (recommended) MS SQL Server 2017 Express Edition (supported, included by default for Tier-1 installations)
<b>Browsers</b>	Google Chrome (latest version) Microsoft Edge (latest version)  <b>Note</b> Microsoft Internet Explorer is required to be installed on the system, but it is not recommended for using AMS Machine Works. AMS Machine Works uses Internet Explorer for some cookie functions.
<b>Processor</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</b>	64 GB (recommended) 32 GB (minimum)

<b>Hard drive</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>	Full HD (1920 x 1080 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)

### AMS Machine Works Interface Server Station

<b>Operating system</b>	Windows Server 2019 Standard or Datacenter Windows Server 2016 Standard or Datacenter Windows Server 2012 R2 Standard or Datacenter
<b>CPU architecture</b>	64-bit
<b>Internet Information Services (IIS)</b>	v8.5, v10 (supplied with OS)
<b>Processor</b>	2.4 GHz, 4-core processor Intel Xeon
<b>RAM</b>	32 GB (recommended) 16 GB (minimum)
<b>Hard drive</b>	SSD hard drive (recommended) SAS hard drive (10K RPM) (minimum)
<b>Available disk space</b>	100 GB (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)

### AMS Machine Works Vibration Analyzer Client Station

<b>Operating system</b>	Windows Server 2019 Standard Windows Server 2016 Standard Windows Server 2012 R2 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)

### Additional specifications

<b>Ethernet</b>	One or more Ethernet Network Interface Card (NIC) 2 x 1 GB NIC (use 2 NICs to isolate Tier 3 traffic from Tier 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> </ul>

### Notes

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\*

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

## 4.9.1 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 4-14: 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 4-15: AMS Machine Works and DeltaV computer membership**

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

**Table 4-15: AMS Machine Works and DeltaV computer membership (continued)**

	AMS Machine Works	DeltaV	Supported
	Workgroup	Domain	✓
	Domain	Workgroup	✓

**Table 4-16: AMS Machine Works and Ovation computer membership**

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



## 4.10 System scalability

Table 4-17: AMS Machine Works system

Components		AMS Machine Works
<b>Server Specifications</b>		<b>One- or Two-server setup recommended hardware</b>
	<b>Assets</b>	500 machine trains
	<b>Configured users</b>	15 total users
	<b>Concurrent users</b>	5
<b>Devices</b>		
	<b>AMS 9420</b>	600 AMS 9420s maximum per system
	<b>AMS 6500 ATG</b>	50 single rack ATGs (maximum) 25 ATGs maximum per AMS 6500 ATG Interface server Maximum of 2 AMS 6500 ATG Interface servers
	<b>Ovation Interface</b>	55 Ovation MHM Modules (maximum) 10 Ovation MHM modules per one Ovation Interface server / Ovation Machinery Health Waveform Recorder. Maximum of 55 Ovation MHM modules. Maximum of 6 Ovation Interface servers / Ovation Machinery Health Waveform Recorders
	<b>AMS Wireless Vibration Monitor</b>	4000 devices maximum per system 600 devices maximum per Interface server Maximum of 7 Interface servers
<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

## 4.11 Supported interface combinations

The following interface combinations are supported in v1.6.

AMS Machine Works Vibration Analyzer clients can be installed on the same network level or 1 network level higher with the required ports opened.

AMS Machine Works includes the following software components: Web Services, Historian, Interface Router, and Embedded Platform Component.

Microsoft SQL Server 2017 Express is installed with AMS Machine Works during installation when the Tier-1 database option is selected.

### 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
- Maximum of 4 Interface servers

### Ovation Machinery Health Monitor Interface only



- 55 Ovation MHM Modules maximum per system
- 10 Ovation MHM modules per one Ovation Interface server / Ovation Machinery Health Waveform Recorder. Maximum of 55 Ovation MHM modules. Maximum of 6 Ovation Interface servers / Ovation Machinery Health Waveform Recorders

### AMS Machine Works Wireless Interface only



- 600 AMS 9420s maximum per system
- 500 AMS 9420s maximum per Interface server
- 4000 AMS Wireless Vibration Monitors maximum per system
- 600 AMS Wireless Vibration Monitors maximum per Interface server
- Maximum of 7 Interface servers

### AMS 6500 ATG Interface and AMS Machine Works Wireless Interface



- Supports a combination of AMS 6500 ATGs and Wireless Interfaces per the limits mentioned above

## 4.12 System profiles and number of 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. Refer to the deployment drawings for an illustration.

**Table 4-18: Servers required for AMS 6500 ATG Interface**

System Profile	AMS 6500 ATG	Vibration tags (maximum)	AMS Machine Works v1.6 Server	AMS Machine Works Interface Server (AMS 6500 ATG)
Small (S)	<6	110	1	0
Medium (M)	6-25	550	1	1
Large (L)	26-40	880	1	2
Extra Large (XL)	41-50	1100	1	2

### Notes

- 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.
- Maximum AMS 6500 ATGs supported in AMS Machine Works v1.6 is 50.

**Table 4-19: Servers required for Emerson Ovation MHM Interface**

System Profile	Ovation MHM Modules	Vibration tags (maximum)	AMS Machine Works v1.6 Server	AMS Machine Works Interface Server (Emerson Ovation MHM Interface)
Small (S)	<11	80	1	1
Medium (M)	11-20	160	1	2
Large (L)	21-30	240	1	3
Extra Large (XL)	31-40	320	1	4
	41-50	400	1	5
	51-55	440	1	6

### Notes

- One AMS Machine Works Ovation MHM Interface can support up to 10 Ovation MHM Modules.
- One Ovation MHM module has a maximum of 8 channels.

- One Ovation MHM channel constitutes one vibration tag.
- Maximum Ovation MHM Modules supported in AMS Machine Works v1.6 is 55.

**Table 4-20: Servers required for Emerson Wireless Interface with AMS Wireless Vibration Monitor**

System Profile	AMS Wireless Vibration Monitor	Vibration tags (maximum)	AMS Machine Works v1.6 Server	AMS Machine Works Interface Server (Emerson Wireless Interface)
Small (S)	0-600	1,800	124	0
Medium (M)	601-1,200	3,600	1	1
Large (L)	1,201-1,800	5,400	1	2
Extra Large (XL)	1,801-2,400	7,200	1	3
	2,401-3,000	9,000	1	4
	3,001-3,600	10,800	1	5
	3,601-4,000	12,000	1	6

**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 v1.6 is 4000.

**Table 4-21: Servers required for Emerson Wireless Interface with AMS 9420**

System Profile	AMS 9420	Vibration tags (maximum)	AMS Machine Works v1.6 Server	AMS Machine Works Interface Server (Emerson Wireless Interface)
Small (S)	0-500	1,000	1	0
Medium (M)	501-600	1,200	1	1

**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 v1.6 is 600.

**Table 4-22: Servers required for AMS 6500 ATG Interface with AMS 6500 ATG and Emerson Wireless Interface, AMS 9420, and AMS Wireless Vibration Monitor**

System Profile	AMS 6500 ATG	AMS 9420	AMS Wireless Vibration Monitor	AMS Machine Works Server	AMS Machine Works Interface Server (Wireless)	AMS Machine Works Interface Server (ATG)
<b>Small (S)</b>	0-5	0-500	or 0-500	1	0	0
<b>Medium (M)</b>	6-25	501-600	or 501-600	1	1	1
<b>Large (L)</b>	26-40	-	601-1,200	1	2	2
<b>Extra Large (XL)</b>	41-50	-	1201-1,800	1	3	2
	-	-	1,801-2,400	1	4	2
	-	-	2,401-3,000	1	5	2
	-	-	3,001-3,600	1	6	2
	-	-	3,601-4,000	1	7	2

**Note**

When a wireless network has a combination of AMS 9420s and AMS Wireless Vibration Monitors, consider an AMS 9420 as equivalent of two AMS Wireless Vibration Monitors on the total network count.

## 4.13 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 servers](#).

**Table 4-23: 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)
<b>Small (S)</b>	2.4 GHz	4	16GB	-	-	-
<b>Medium (M)</b>	3.4 GHz	8	32GB	2.4GHz	8	16GB
<b>Large (L)</b>	3.4 GHz	8	32GB	2.4GHz	8	16GB
<b>Extra Large (XL)</b>	3.4 GHz	8	32GB 64GB <sup>1</sup>	2.4GHz	8	16GB

<sup>1</sup> Recommended

**Table 4-24: 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	16GB	2.4GHz	4	16GB
<b>Medium (M)</b>	3.4 GHz	8	32GB	2.4GHz	4	16GB
<b>Large (L)</b>	3.4 GHz	8	32GB	2.4GHz	4	16GB
<b>Extra Large (XL)</b>	3.4 GHz	8	32GB	2.4GHz	4	16GB

## 4.14 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 4-25: 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 4-26: Hard disk for Online systems with AMS 6500 ATG or Ovation Machinery Health 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>	Not Recommended	Recommended
<b>Large (L)</b>	Not Recommended	Recommended
<b>Extra Large (XL)</b>	Not Recommended	Recommended

## 4.15 Storage capacity requirements per system profile

For a single-server deployment, the amount of hard disk storage available needs to accommodate both the Short-Term Historian and the Long-Term Historian. The short term historian is stored in SQLite, a lightweight, file based RDBMS widely used for storing embedded databases. If your database resides on the same server as the AMS Machine Works Server, and you are using Microsoft SQL Server Express for the long term historian, installed by default when you select Tier-1 during installation, your data storage is limited to 10GB. The long term historian in SQL server utilizes the SQL Server Filestream Technology. Filestream enables SQL Server-based applications to store unstructured data, such as waveforms and spectrum, documents and images, on the file system, instead of storing them in the 10GB database. This implementation expands the storage possibility with Microsoft SQL Server 2017 Express. With filestream enabled, scalars and pointers to the file stream data location (for waveforms and spectra) are the only data types that are stored in SQL server database. The rest (waveforms, spectra, thumbnails, journal post images, etc.) are stored in the file system outside the database.

The Short-Term Historian resides on the same server where the AMS Machine Works interface is installed.

The Long-Term Historian resides on the server where the AMS Machine Works historian is installed.

**Table 4-27: Storage capacity requirements for Wireless systems with AMS 9420 and AMS Wireless Vibration Monitor**

System Profile	AMS 9420	Vibration Monitor	Short Term Historian storage	Long Term Historian storage		
				1-3 Years	3-5 Years	5-10 Years
<b>Small (S)</b>	0-500	0-500	100GB	500 GB	850 GB	1.6 TB
<b>Medium (M)</b>	501-600	501-1000	150GB	1.0 TB	1.7 TB	3.5 TB
<b>Large (L)</b>	-	1001-2000	200GB	2.0 TB	3.4 TB	7.0 TB
<b>Extra Large (XL)</b>	-	2001-4000	250GB	4.0 TB	6.8 TB	14.0 TB

**Table 4-28: Storage capacity requirements for Online systems with AMS 6500 ATG or Ovation Machinery Health Monitor**

System Profile	AMS 6500 ATG	Ovation MHM	Short Term Historian storage	Long Term Historian storage		
				1-3 Years	3-5 Years	5-10 Years
<b>Small (S)</b>	<11	<11	250GB	1.0 TB	2.5 TB	5.0 TB
<b>Medium (M)</b>	11-25	11-20	300GB	2.5 TB	4.0 TB	7.5 TB
<b>Large (L)</b>	26-40	21-30	400GB	4.0 TB	6.4 TB	12.0 TB
<b>Extra Large (XL)</b>	41-50	31-55	500GB	5.0 TB	8.0 TB	15.0 TB

# 5 AMS Machine Works security

## Topics:

- [5.1 Firewall considerations](#)
- [5.2 SSL/TLS certificates](#)
- [5.3 Additional security considerations](#)

After verifying that 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.

## 5.1 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 with system profiles](#) 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. See [Ports \(DRAFT ORIGINAL\)](#) for more information. Your IT department will determine what, if any, intermediary firewall also needs the exceptions.

### 5.1.1 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 server stations for a Tier-2 database server deployment.

**Table 5-1: Ports and firewall rule on SQL Server station**

Item	Direction	Firewall rule
Distributed Transaction Coordinator (RPC)	Inbound	Predefined firewall in Server 2012 R2
Distributed Transaction Coordinator (RPC-EPMAP)	Inbound	Predefined firewall in Server 2012 R2
Distributed Transaction Coordinator (TCP-In)	Inbound	Predefined firewall in Server 2012 R2
EMERSONMW SQL instance TCP port	Inbound / Outbound	SQL
UDP Port 1434	Inbound / Outbound	SQL browser
TCP Port 1433	Inbound / Outbound	SQL



**Table 5-2: Ports and firewall rule on AMS Machine Works and Server stations**

Item	Direction	Firewall rule
EMERSONMW SQL instance TCP port	Inbound / Outbound	SQL
UDP Port 1434	Inbound / Outbound	SQL browser
TCP Port 1433	Inbound / Outbound	SQL

**Table 5-3: Ports used by AMS Machine Works Web Services**

Item	Direction	Notes
TCP 443 (default, configurable)	HTTPS, bidirectional	Configurable
TCP 139	SQL Server	
TCP 445	SQL Server—Filestream	
TCP 135	Remote Procedure Call Microsoft Distributed Transaction Coordinator Microsoft Message Queue	
TCP 1801	Microsoft Message Queue	
TCP 4840	OPC	

**Table 5-4: Ports used by AMS Machine Works**

Item	Direction	Notes
TCP 443 (default, configurable)	Bidirectional	Wireless Interface to AMS Machine Works
TCP 443 (default, configurable)	Outbound	AMS 6500 ATG Interface to AMS Machine Works
TCP 443 (default, configurable)	Inbound	AMS Machine Works Vibration Analyzer
TCP 5094	HART Port default, bidirectional	Wireless Gateway to AMS Machine Works Wireless Interface
Modbus Port 502	Modbus Port default, bidirectional	AMS 6500 ATG to AMS 6500 ATG Interface
Service Port 4841	Service Port default, bidirectional	AMS 6500 ATG to AMS 6500 ATG Interface

**Table 5-5: Ports used with Emerson Wireless Gateway**

Item	Direction	Notes
TCP 443 (default, configurable)	Inbound	Wireless Interface to AMS Machine Works Web Services (Plantweb Optics Service Layer)

**Table 5-5: Ports used with Emerson Wireless Gateway (continued)**

Item	Direction	Notes
TCP 33333	Bidirectional, secure connection	Wireless Gateways to Wireless Interface
TCP 32000	Bidirectional, default connection	Wireless Gateways to Wireless Interface

**Table 5-6: General Ports**

Ports to open between AMS Machine Works Server and Interface Servers; and between AMS Machine Works Server and App Stations

Port	Purpose	Comment	Configurable	Direction
TCP 443	Communication between web services and applications	HTTPS	Yes	Bidirectional

**Table 5-7: I/O Devices**

Ports to open between Interface Servers and applicable I/O Devices

Port	Purpose	Comment	Configurable	Direction
TCP 5094	Wireless (HART IP)		Yes	Bidirectional
TCP 5095	Wireless (Secure HART IP Proxy)	Only needed if using HART Secure	Yes	Bidirectional
502	ATG (Modbus)		Yes	Bidirectional
4841	ATG (Service Port)		Yes	Bidirectional
7253	OMHM (Service Port)	MHWR to OMHM	Yes	Bidirectional

**Table 5-8: Tier 2 SQL**

Ports to open between AMS Machine Works Server and SQL Database Server

Port	Purpose	Comment	Configurable	Direction
UDP 1434	SQL Browser			Bidirectional
TCP 1433	SQL			
TCP 139	SQL Server			
TCP 445	SQL Filestream			

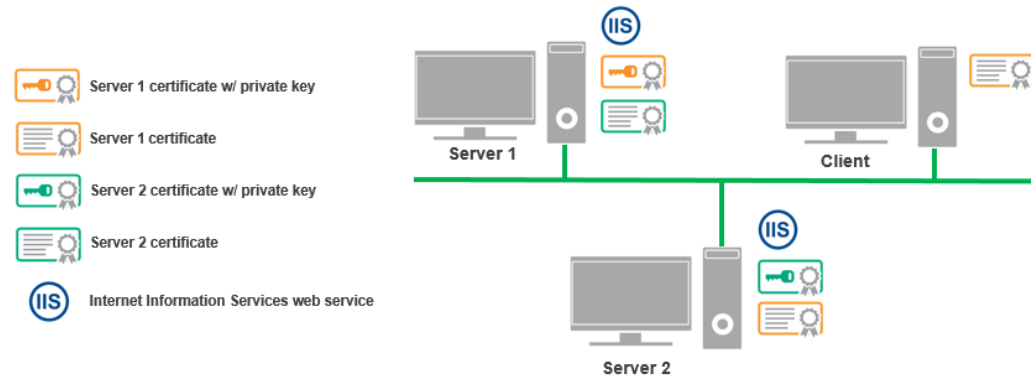
## 5.2 SSL/TLS certificates

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. However, 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 5-1](#) 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 5-1: Example web servers and browsers using SSL/TLS certificates**



**Note**

SSL/TLS requires TCP port 443.

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.

## 5.2.1 System components with certificates

Each computer communicating with a web-based component of AMS Machine Works needs to exchange public key certificates. [Table 5-9](#) 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 1.6 plus the name of the server.

**Table 5-9: System components with certificates**

Component	Certificate
AMS Machine Works Server	AMS Machine Works 1.6 <servername>
AMS Machine Works Interface Server	AMS Machine Works 1.6 <servername>

**Table 5-10: Certificates deployment**

Component	Certificate generated upon installation	Where to import the certificate
AMS Machine Works Server	AMS Machine Works 1.6 <servername>	Each AMS Machine Works Interface server, before installing the interface AMS Machine Works client
Emerson Wireless Interface	AMS Machine Works 1.6 <servername>	AMS Machine Works Interface server, after installation
AMS 6500 ATG Interface	AMS Machine Works 1.6 <servername>	AMS Machine Works Interface server, after installation
Emerson Ovation MHM Interface	AMS Machine Works 1.6 <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 with system profiles](#) for diagrams that show where the certificates must be installed based on the type of deployment.

## 5.2.2 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 with system profiles](#) 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 6500 ATG Interface.
  - Emerson Ovation MHM Interface.
  - Export the Emerson Wireless Interface certificate.

---

**Note**

Note that when you install multiple applications with certificates, the first certificate that is installed on the server needs to be exported and installed on the AMS Machine Works Server and any client computers.

---

3. On the AMS Machine Works Server:
  - Install the AMS Machine Works Wireless Interface certificate.
4. On any computer where users will add an asset source:
  - Install AMS Machine Works Server certificate from a browser.

---

**Note**

If users will not add asset sources from this client PC, only the server certificate needs to be installed. Each time a new interface is installed to the server, it will overwrite the current certificate with the new certificate. All client PCs must then import a new certificate.

---

## 5.2.3 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.

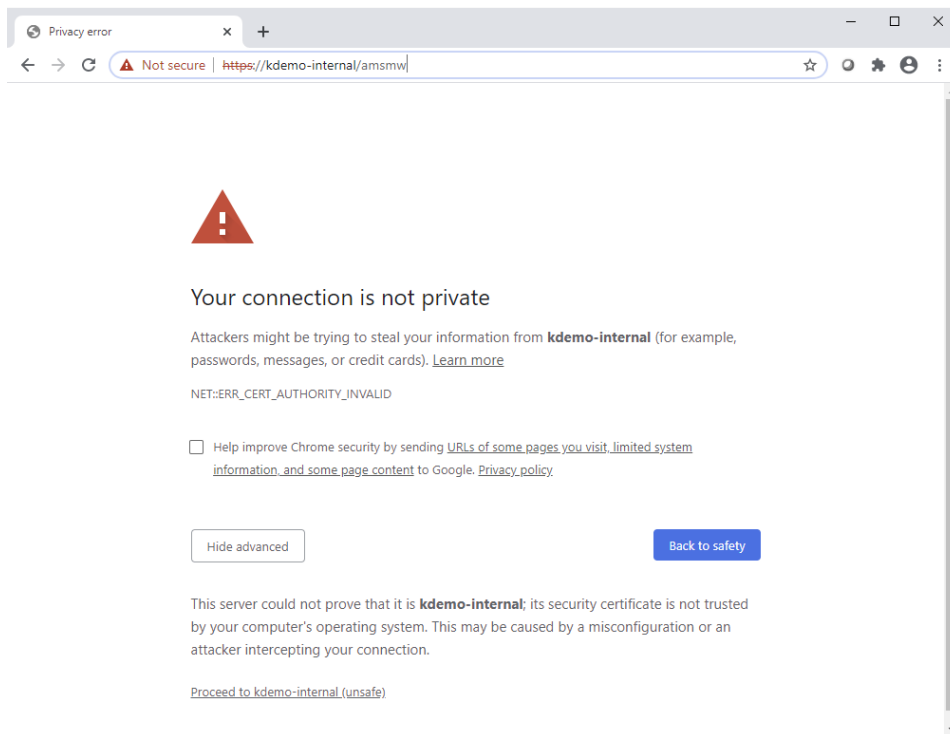
#### Example

`http://[server]/AMSMW`

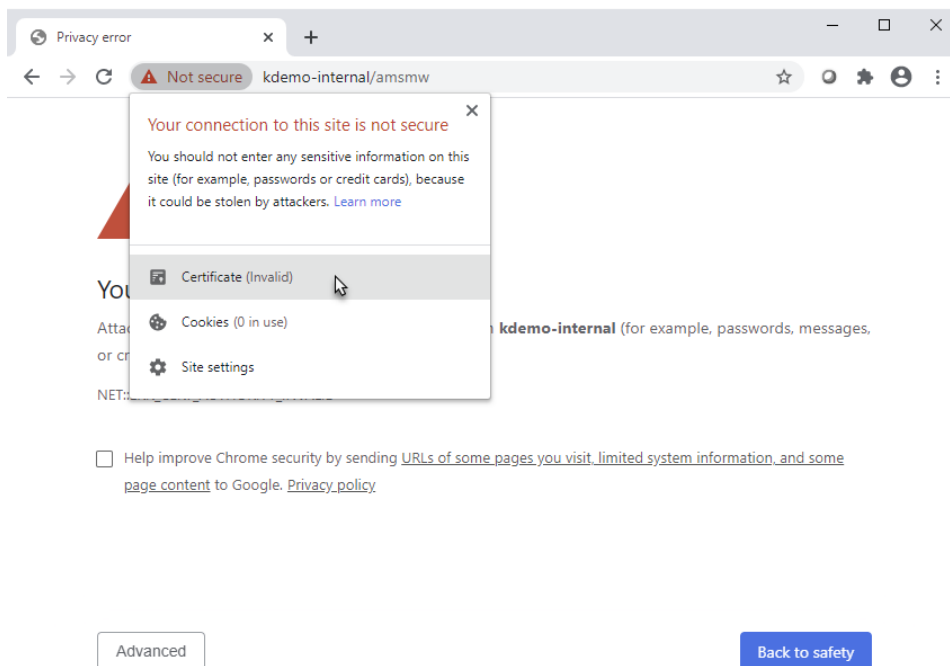
The URL automatically redirects to use secure HTTPS. The browser displays a warning in the address bar and a message such as "Your connection is not private," or "This site is not secure."

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

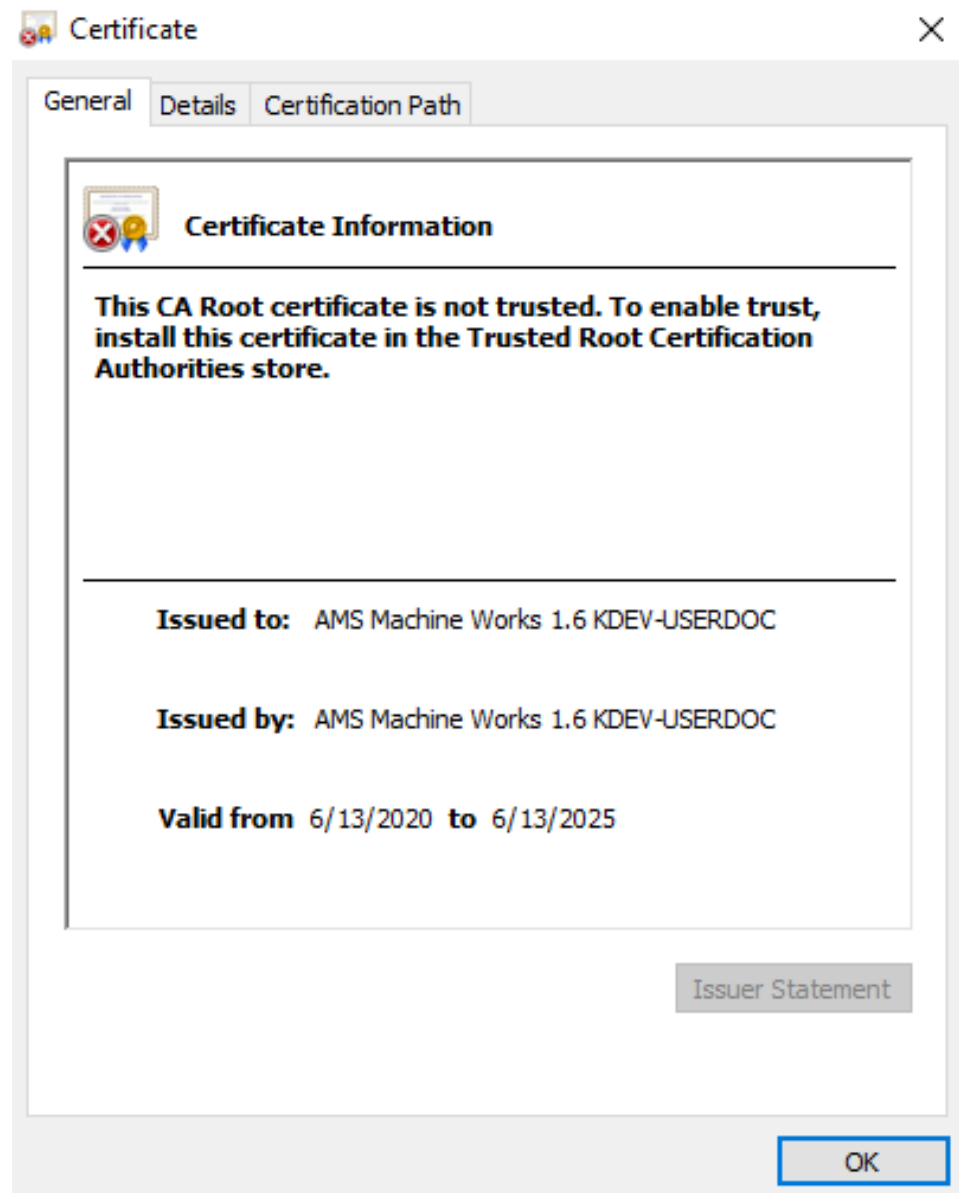
The message may be different depending on your browser version. Select the option to continue to the website.



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

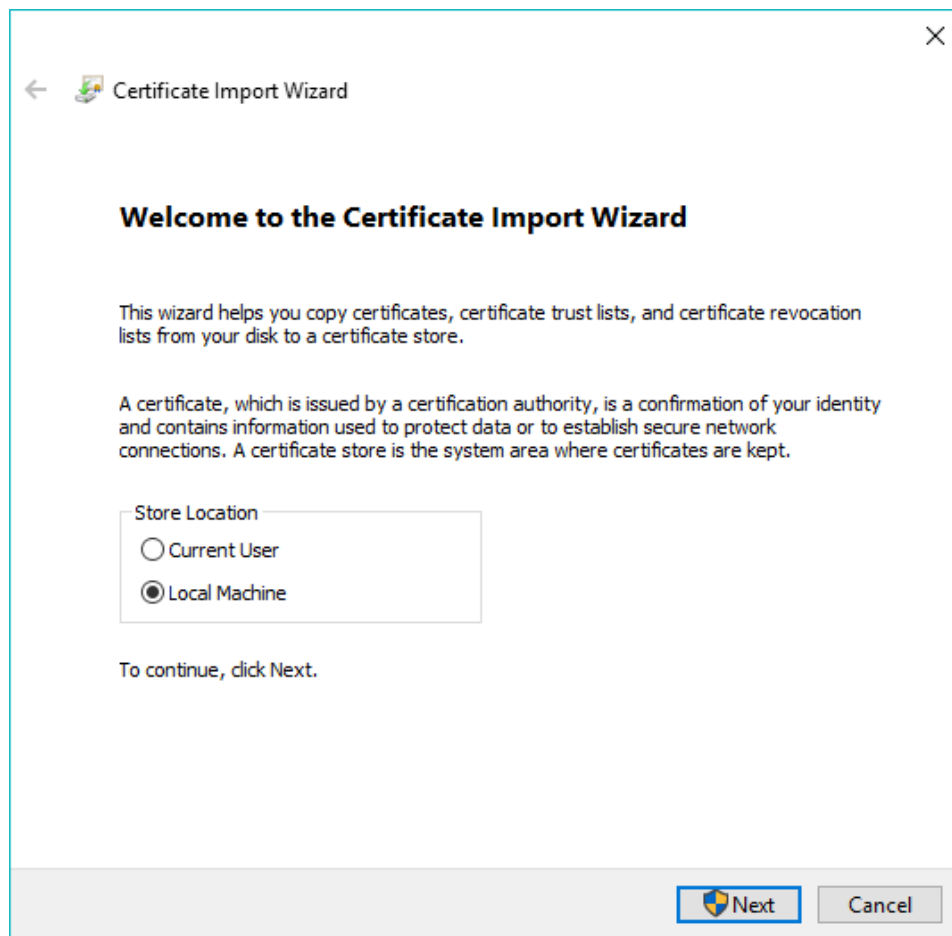


4. In the **Certificate** dialog, select the **Details** tab, and click **Copy to file**.

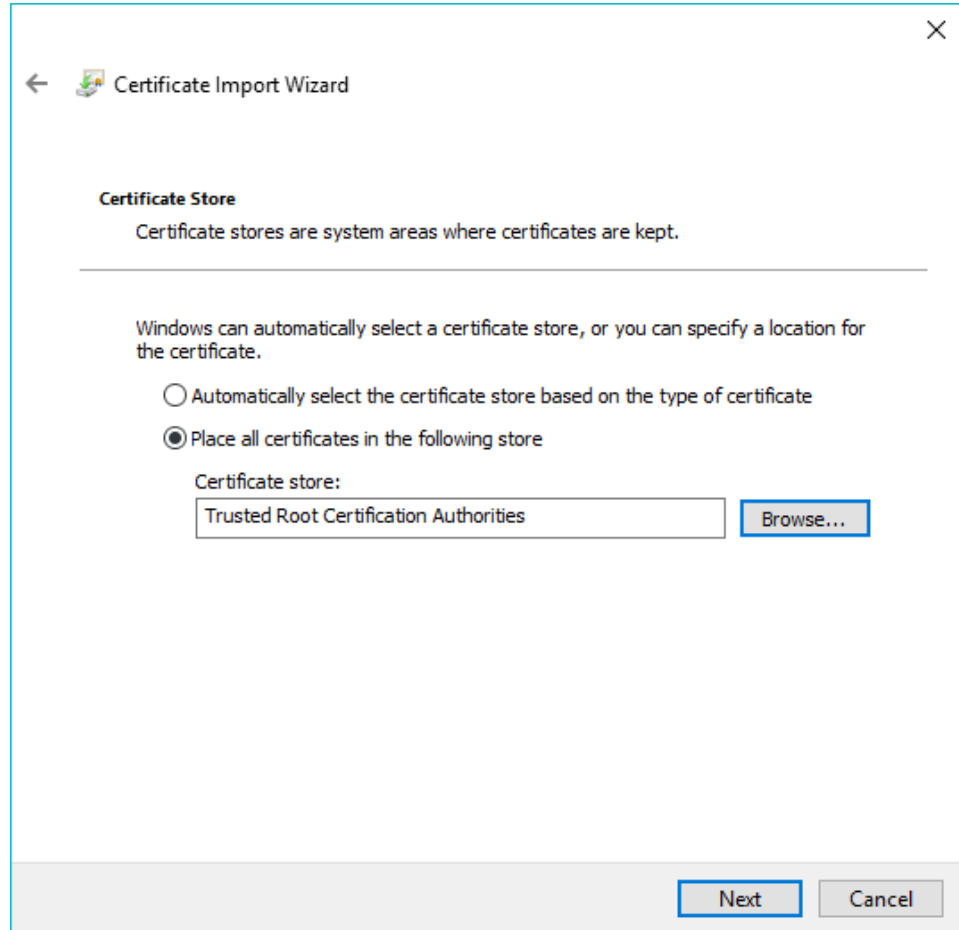


5. Save the certificate to your desktop.
6. On your desktop, double click the certificate.  
The **Certificate Import Wizard** displays.
7. In the **Certificate Import Wizard**, select **Local Machine**.





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.

## 5.2.4 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.

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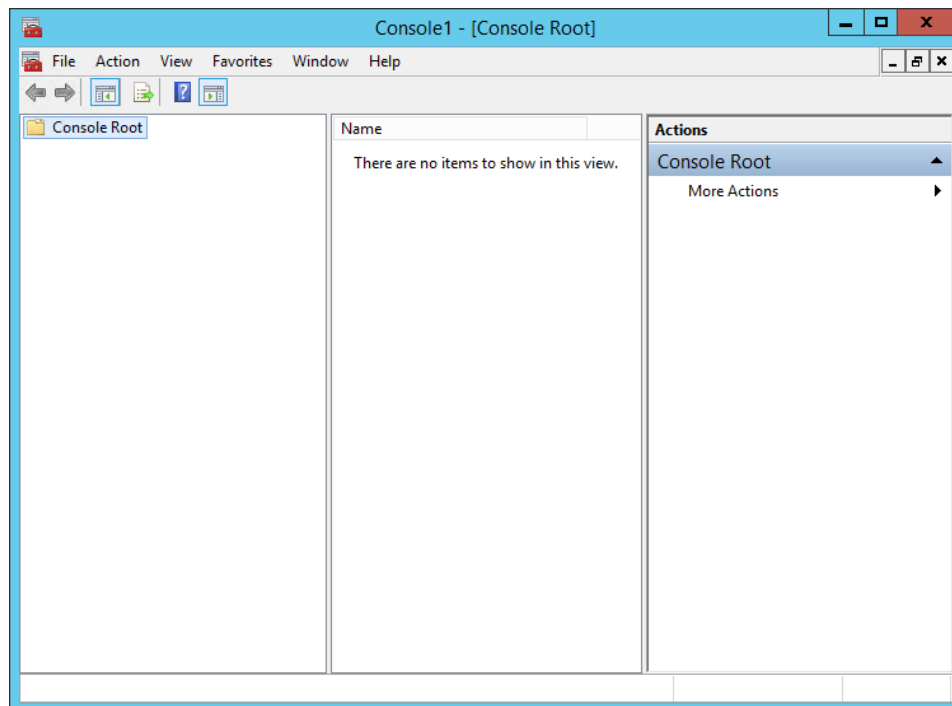
### Note

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](#).

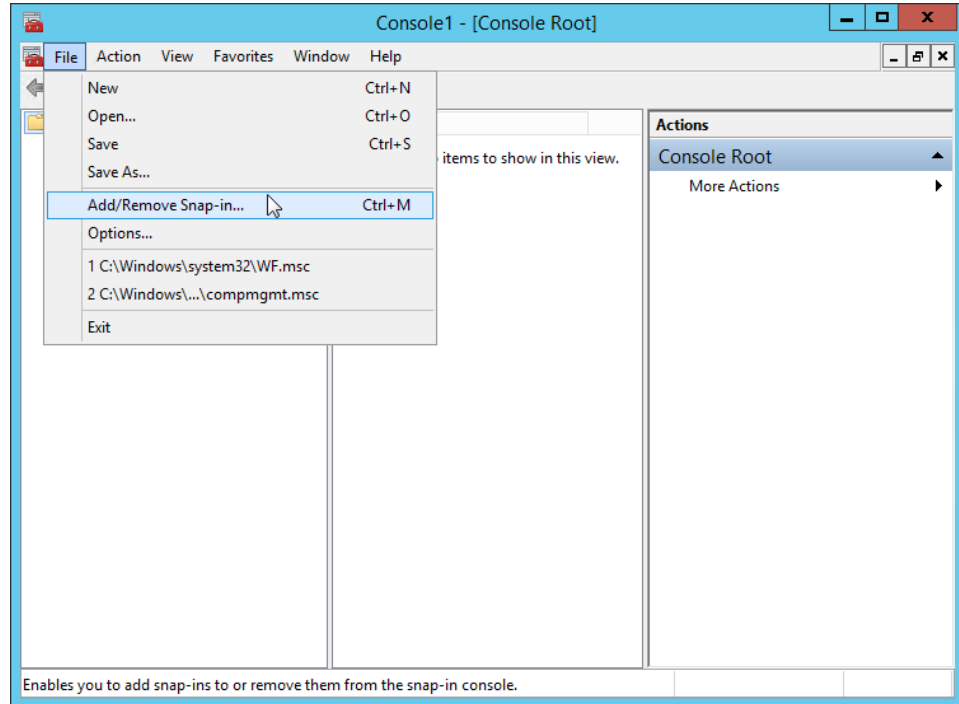
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2. In the MMC console, add the **Certificates Snap-in**.

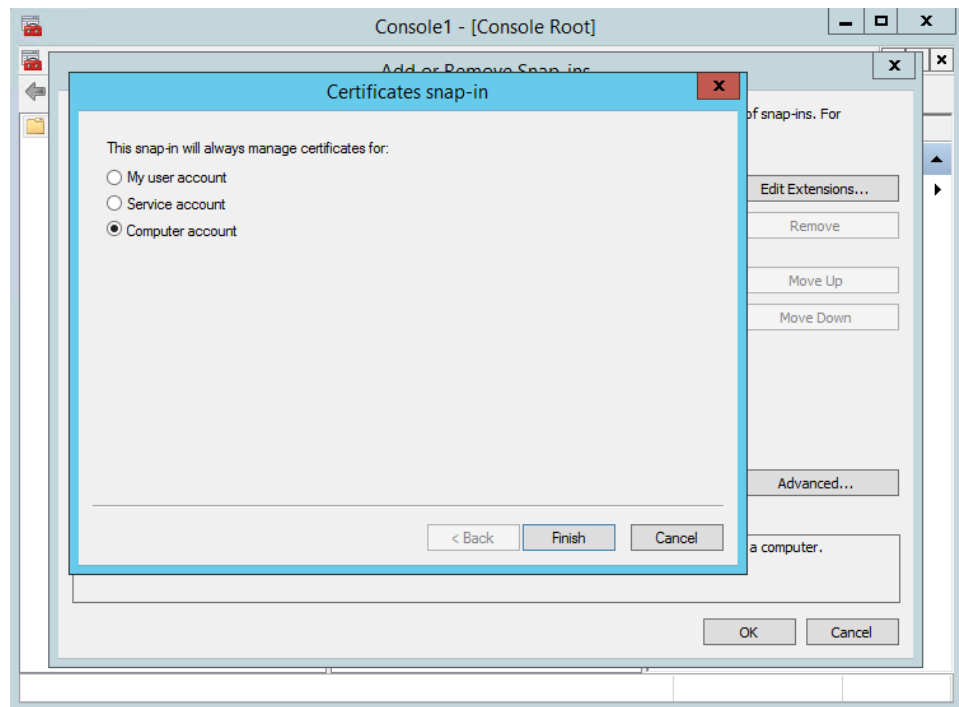
If **Console Root** already contains the Certificates Snap-in, the **Console Root** node already contains **Certificates**. Skip to [Step 8](#).



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

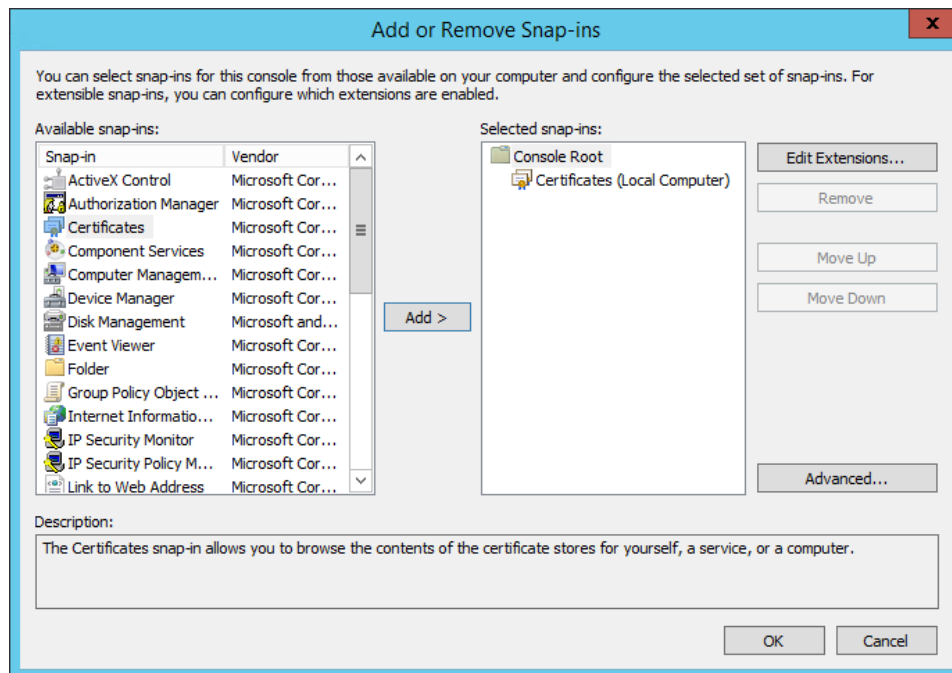


4. In the **Add or Remove Snap-ins** window, double-click **Certificates**, and click **Add**.
5. Select **Computer Account** and click **Finish**.



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

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

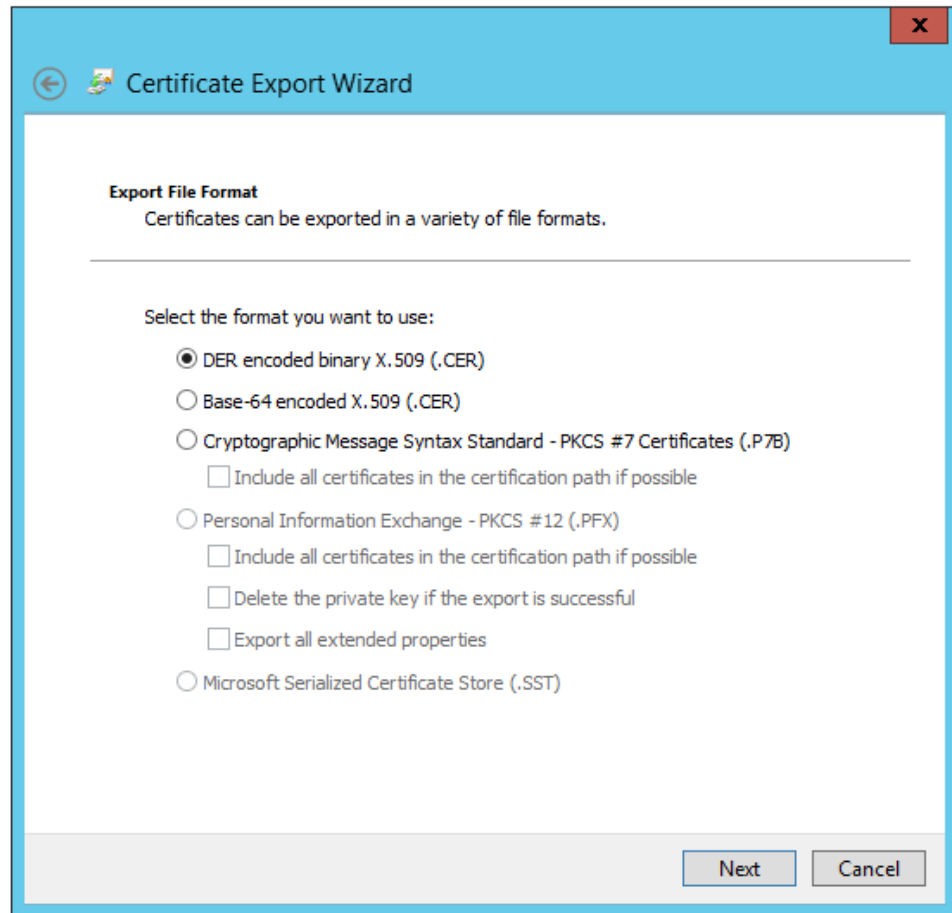


7. Click **OK** to exit the wizard.
8. In the MMC console, expand the nodes to **Certificates (Local Computer)** → **Personal** → **Certificates**.
9. Right-click the certificate to export, and select **All Tasks** → **Personal** → **Export**. The Certificate Export Wizard opens.
10. Select **No, do 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.

## 5.2.5 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

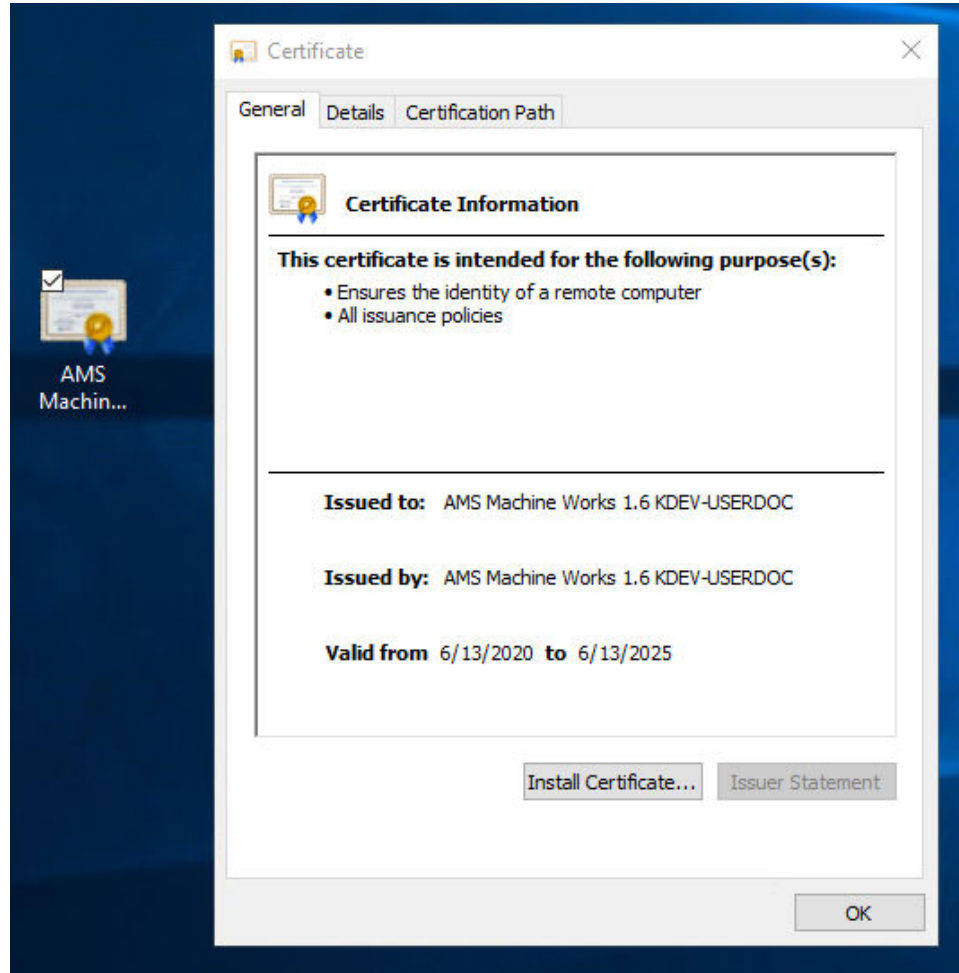
1. Copy the certificate file to the target server. For example, copy it to the desktop.
2. Double-click the certificate.  
The **Certificate** properties dialog opens.

---

### 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.

## 5.3 Additional security considerations

### Responsibilities and permissions

Assign 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.

# 6 Installation procedures

## Topics:

- [6.1 Install AMS Machine Works](#)
- [6.2 Install AMS Machine Works: Single-server deployment](#)
- [6.3 Install AMS Machine Works: Distributed deployment](#)
- [6.4 Install AMS Machine Works in other scenarios](#)
- [6.5 Register licenses](#)
- [6.6 Launch AMS Machine Works](#)
- [6.7 Enable secure communication with an Emerson Wireless Gateway](#)
- [6.8 Configure Active Directory for AMS Machine Works](#)
- [6.9 Configure AMS Machine Works OIDC settings](#)
- [6.10 Install the AMS Machine Works Vibration Analyzer](#)
- [6.11 Install certificates](#)

The installation procedures present the most common installation scenarios for installing AMS Machine Works v1.6. 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.

- Scenario 1: AMS Machine Works Web Components and Interfaces installed on a Single Server – Most suitable for small profile systems
- Scenario 2: AMS Machine Works Web Components installed on an AMS Machine Works Server and the Interfaces installed on a separate and dedicated AMS Machine Works Interface Server – Most suitable for medium to large profile systems
- Scenario 3: Either Scenario 1 or Scenario 2 with Tier-2 Installation (that is separate SQL Server 2017 Standard or Enterprise)
- Scenario 4: AMS Machine Works with Ovation MHM Interface

## 6.1 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 either on the same server or on separate servers based on your site deployment architecture. For a small system, all the applicable interfaces can be installed along with the AMS Machine Works web components:

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

During installation you will be prompted to register the interfaces.

---

**Note**

Use the zip file `Install_1.6.X.X.zip` which includes all the installations

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 not unblocked, when unzip the file and run the installation, you will see 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.

## 6.2 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 [1C: AMS Machine Works with AMS 6500 ATG and wireless devices](#) which has both AMS 6500 ATG and wireless devices. This is recommended for small systems.

### 6.2.1 Install components and interfaces on AMS Machine Works Server

This installation procedure shows the most common installation scenario of installing all the necessary AMS Machine Works web components and the AMS 6500 ATG and Emerson Wireless Interface on one server. However, you can follow this model with only one of the interfaces.

**Procedure**

1. Extract the `Install_1.6.X.X.zip` file on the server.

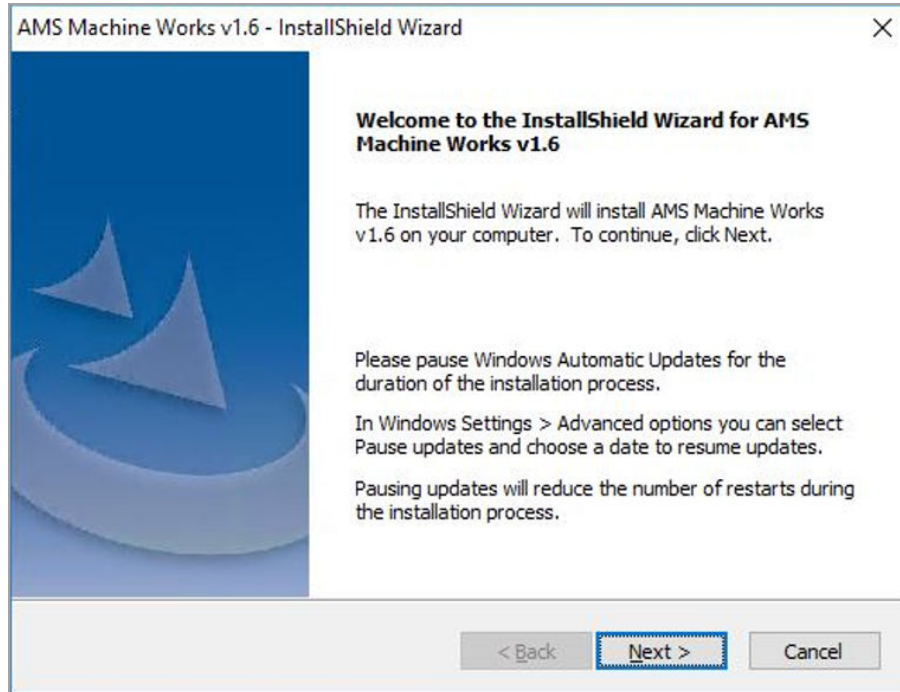
---

**Note**

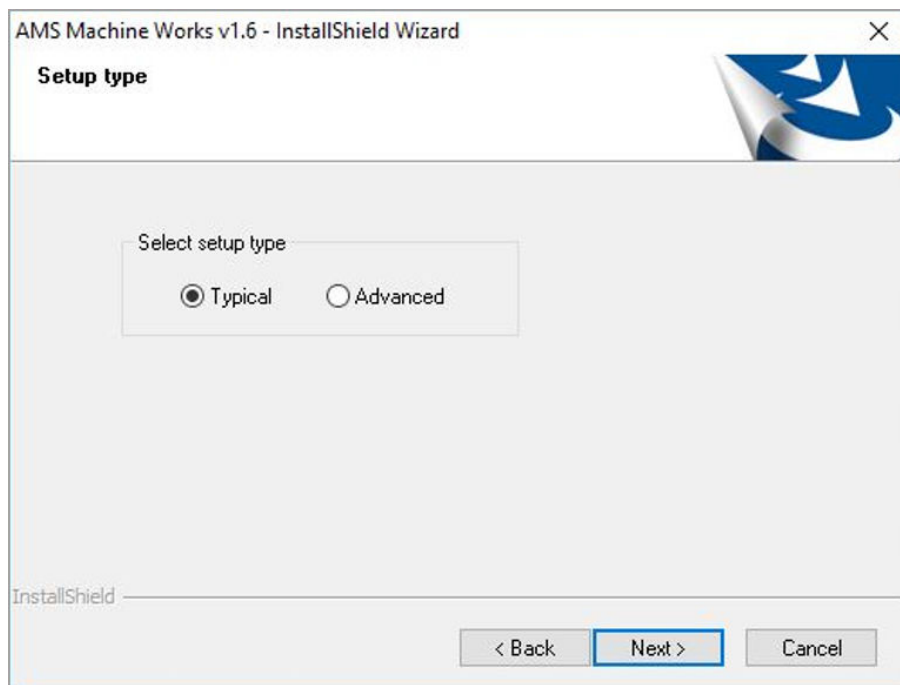
Extract the zip file on a root directory. For example, drive C.

---

2. Right-click **setup.exe** and select **Run as administrator**.
3. At the welcome screen, review the reminder to pause Windows Automatic Updates for the duration of the installation process.



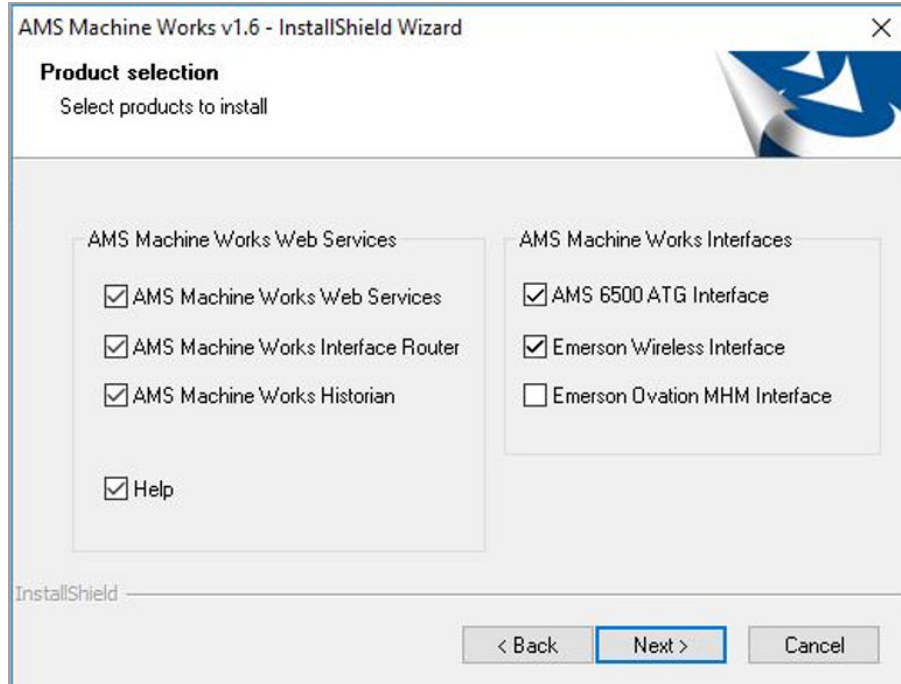
4. At the **Setup type** screen, select **Typical**.



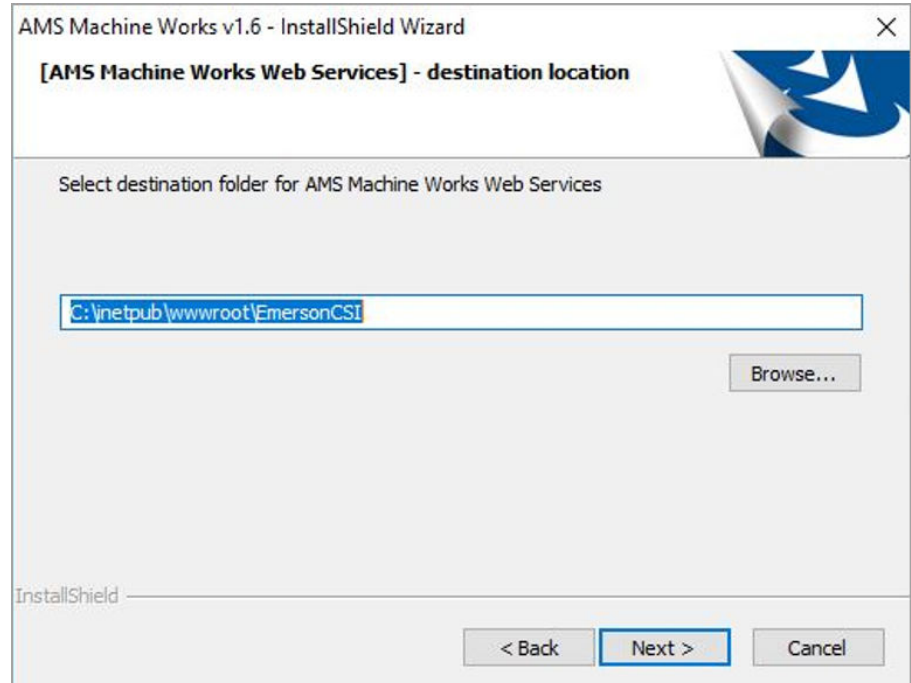
Selecting **Typical** accepts default location for the data folder and the SQL passwords. Selecting **Advanced** lets you supply custom passwords for the SQL accounts.

5. Select to install the AMS Machine Works Web Services and all other services needed, and click **Next**.

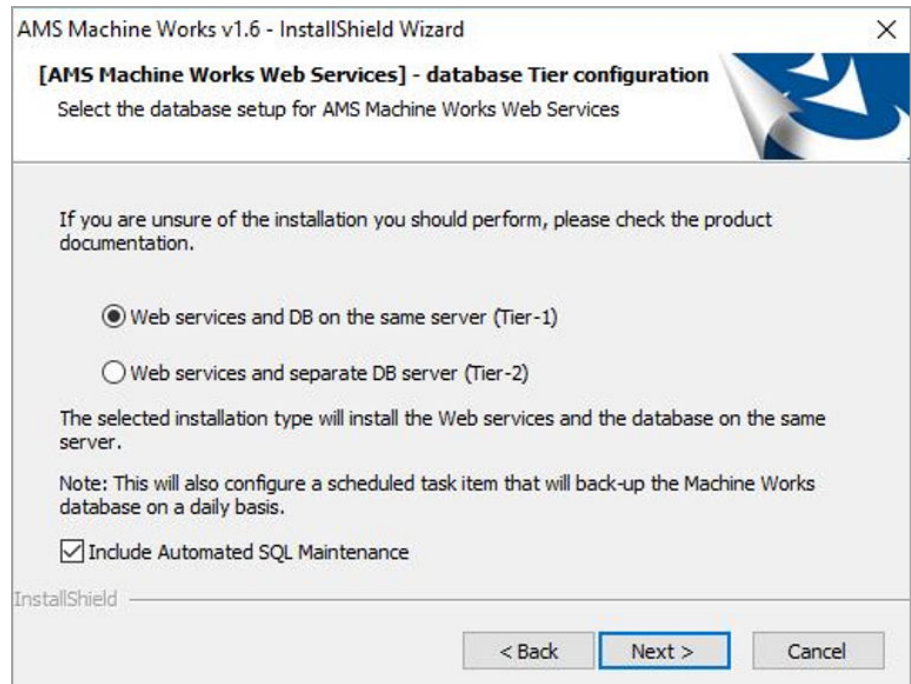
This procedure assumes a setup with AMS 6500 ATG and wireless devices.



6. Read and accept the license agreement. Click **Next**.
7. Select the options for the AMS Machine Works Web Services:
  - a) On the **Destination Location** screen, accept the default location (recommended). Click **Next**.

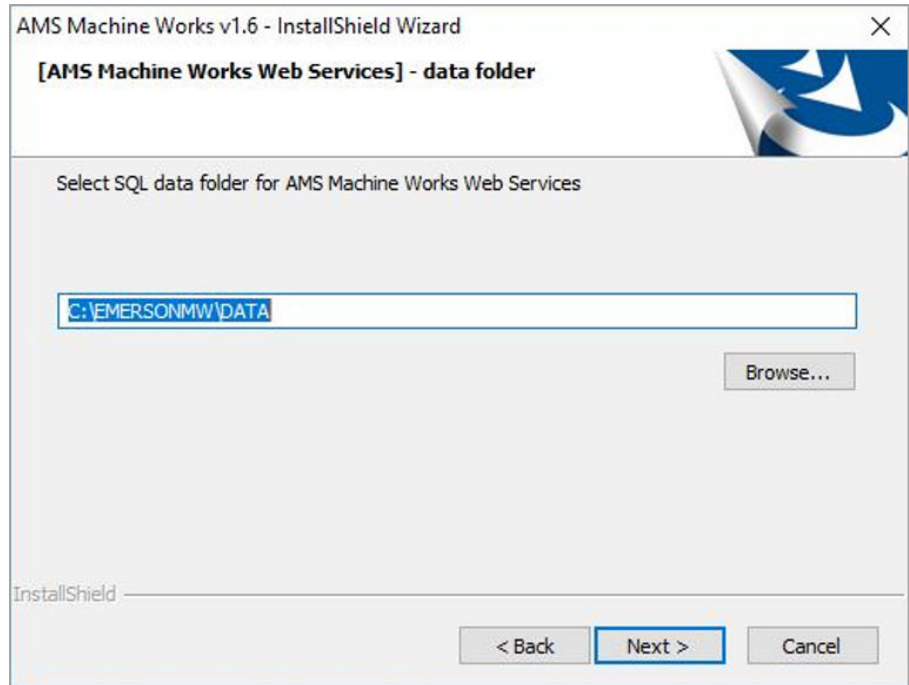


- b) On the **Database Tier selection** screen, select **Web services and DB on the same server (Tier-1)** and click **Next**.

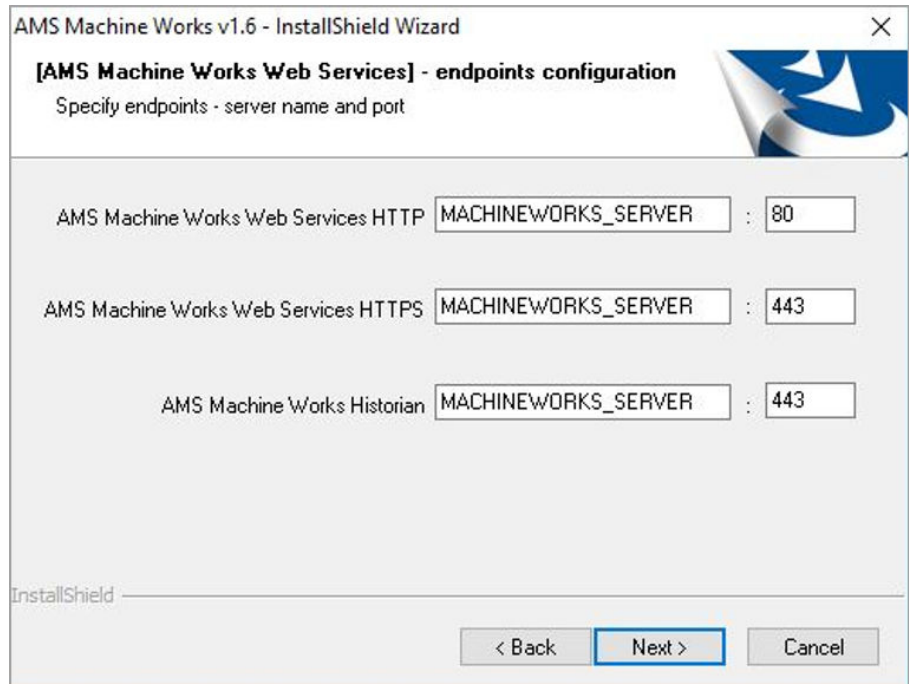


Refer to [Install AMS Machine Works for use with a separate SQL Server](#) if you need to install the database on a separate SQL Server.

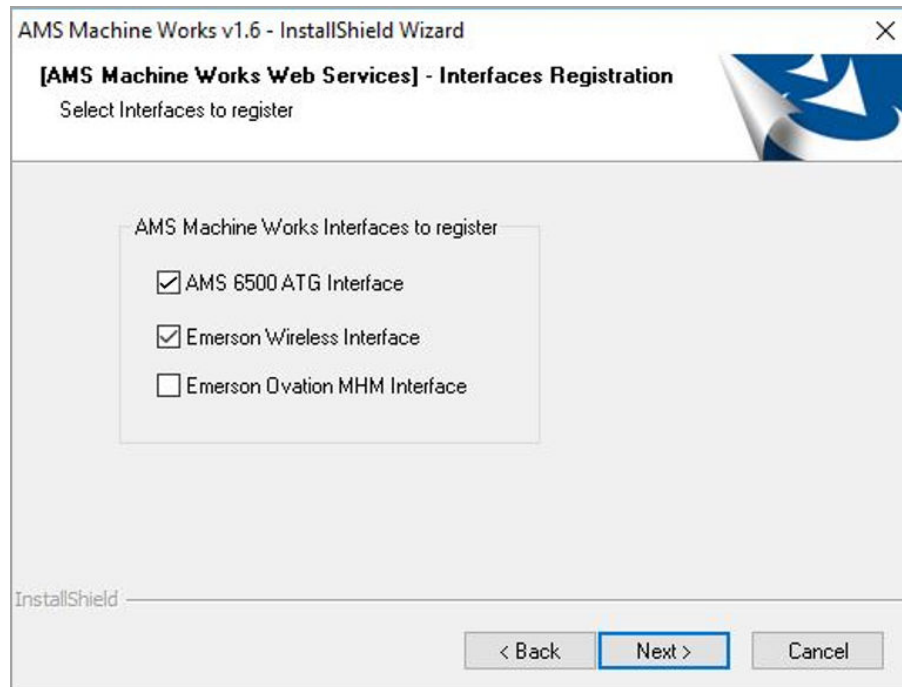
- c) On the **Data Folder** screen, accept the default location (recommended). Click **Next**.



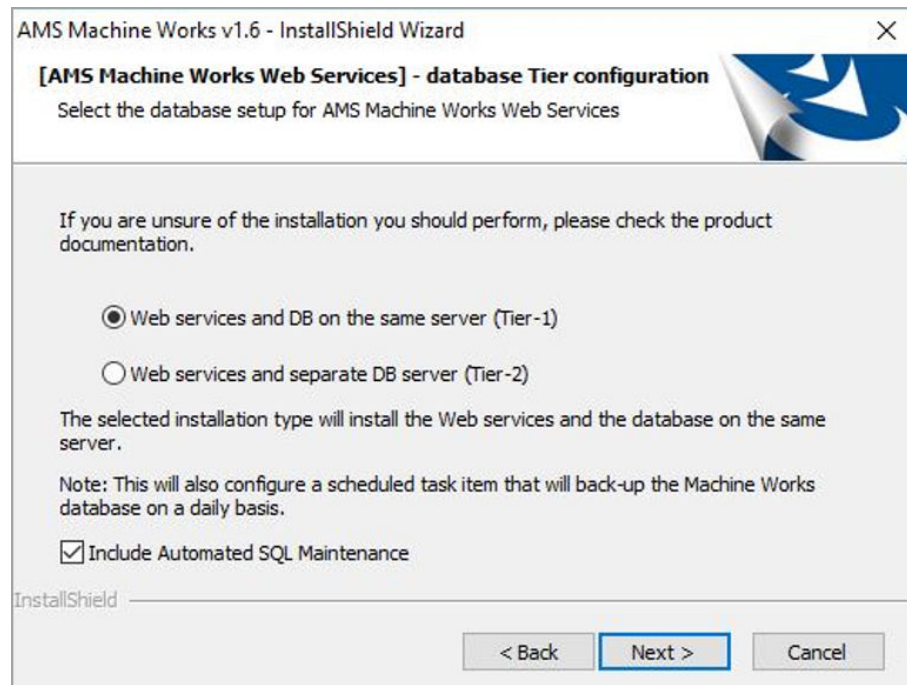
- d) On the **Endpoints Configuration** screen, accept the default server names and ports provided (recommended). Click **Next**.



8. On the **Interfaces Registration** screen, select to register each of the components. Click **Next**.

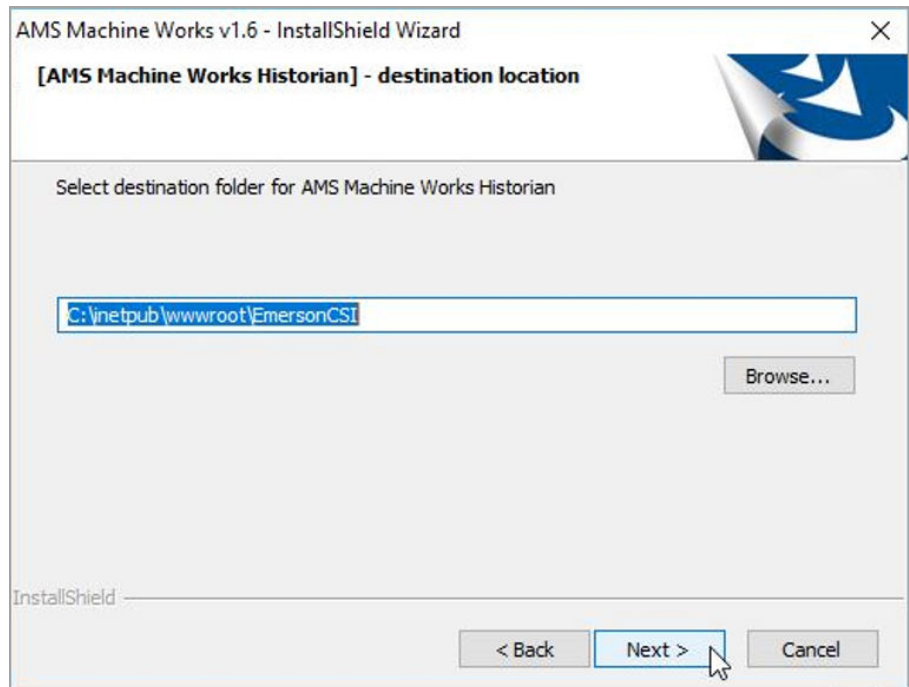


9. Select the options for the AMS Machine Works Historian:
  - a) On the **Database Tier selection** screen, select **Web services and DB on the same server (Tier-1)** and click **Next**.

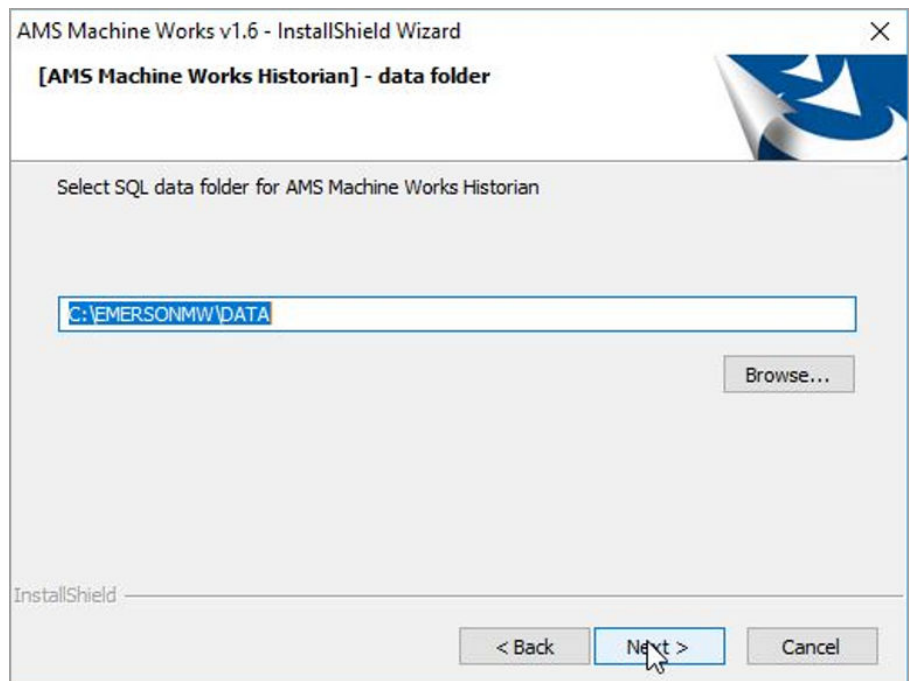




- b) On the **Destination Location** screen, accept the default location (recommended). Click **Next**.



- c) On the **Data Folder** screen, accept the default location (recommended). Click **Next**.



- d) On the **Endpoints Configuration** screen, accept the default server names and ports provided (recommended). Click **Next**.

AMS Machine Works v1.6 - InstallShield Wizard

**[AMS Machine Works Historian] - endpoints configuration**  
Specify endpoints - server name and port

AMS Machine Works Historian MACHINEWORKS\_SERVER : 443

AMS Machine Works Web Services MACHINEWORKS\_SERVER : 443

InstallShield

< Back Next > Cancel

10. Select the options for the AMS Machine Works Interface Router:
- a) On the **Destination Location** screen, accept the default location (recommended). Click **Next**.

AMS Machine Works v1.6 - InstallShield Wizard

**[AMS Machine Works Interface Router] - destination location**

Select destination folder for AMS Machine Works Interface Router

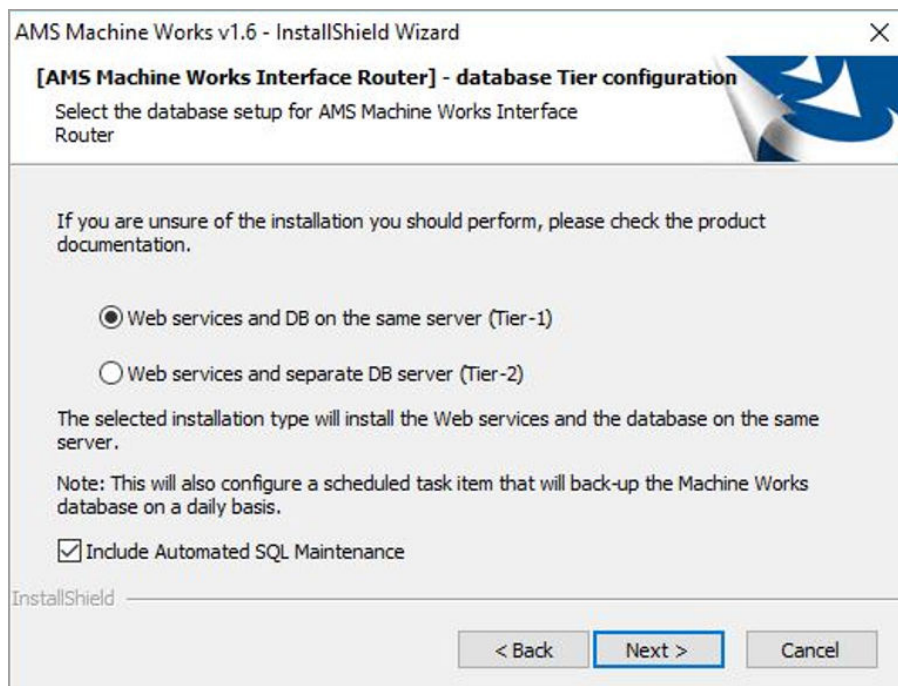
C:\inetpub\wwwroot\EmersonCSI

Browse...

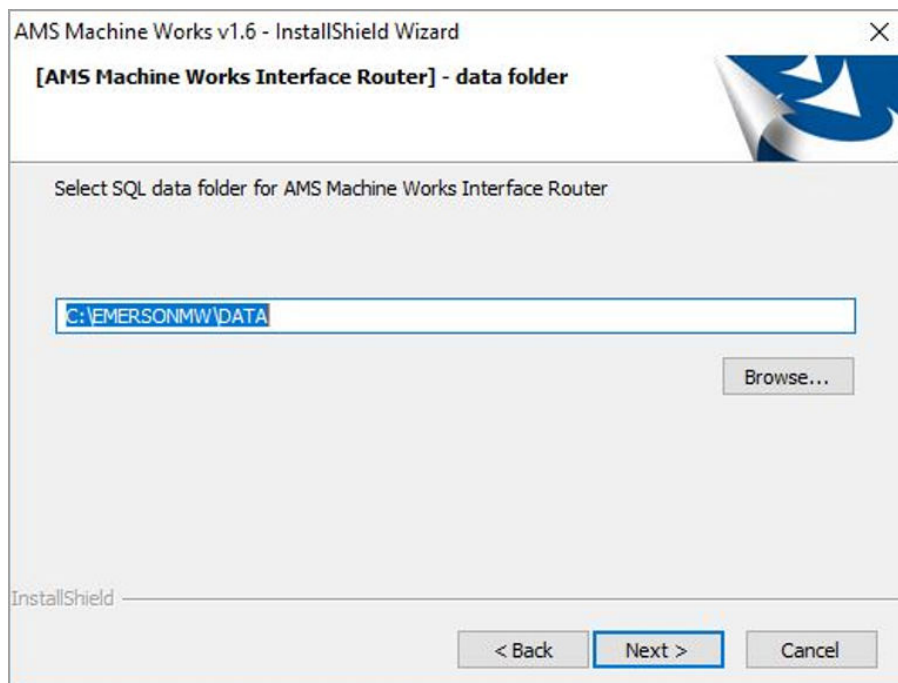
InstallShield

< Back Next > Cancel

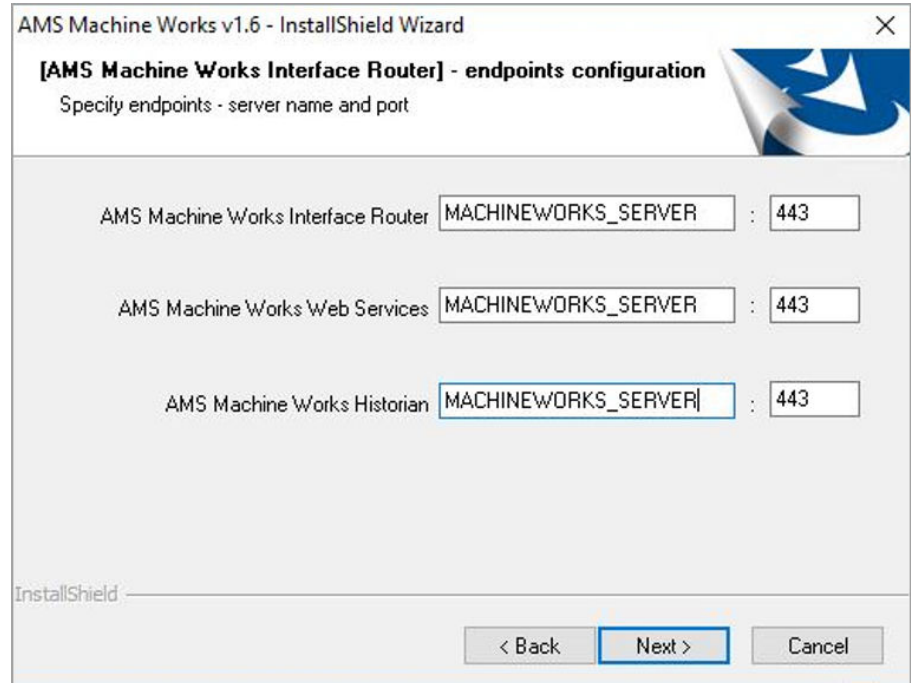
- b) On the **Database Tier selection** screen, select **Web services and DB on the same server (Tier-1)** and click **Next**.



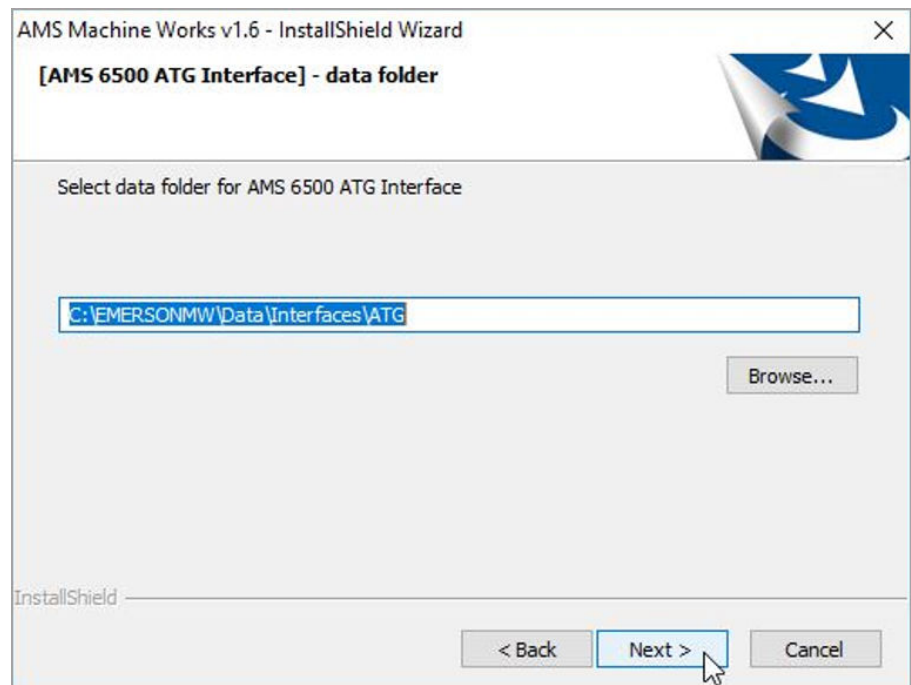
- c) On the **Data Folder** screen, accept the default location (recommended). Click **Next**.



- d) On the **Endpoints Configuration** screen, accept the default server names and ports provided (recommended). Click **Next**.



11. Select the options for the AMS 6500 ATG Interface.
  - a) On the **Destination Location** screen, accept the default location (recommended). Click **Next**.
  - b) On the **Data Folder** screen, accept the default location (recommended). Click **Next**.



- c) On the **Endpoints Configuration** screen, accept the default server names and ports provided (recommended). Click **Next**.

AMS Machine Works v1.6 - InstallShield Wizard

**[AMS 6500 ATG Interface] - endpoints configuration**  
Specify endpoints - server name and port

AMS Machine Works Interface Router  :

InstallShield

< Back **Next >** Cancel

- d) On the **Advanced settings** screen, enter the Maximum size of the data folder (in GB). Click **Next**.

AMS Machine Works v1.6 - InstallShield Wizard

**[AMS 6500 ATG Interface] - advanced settings**

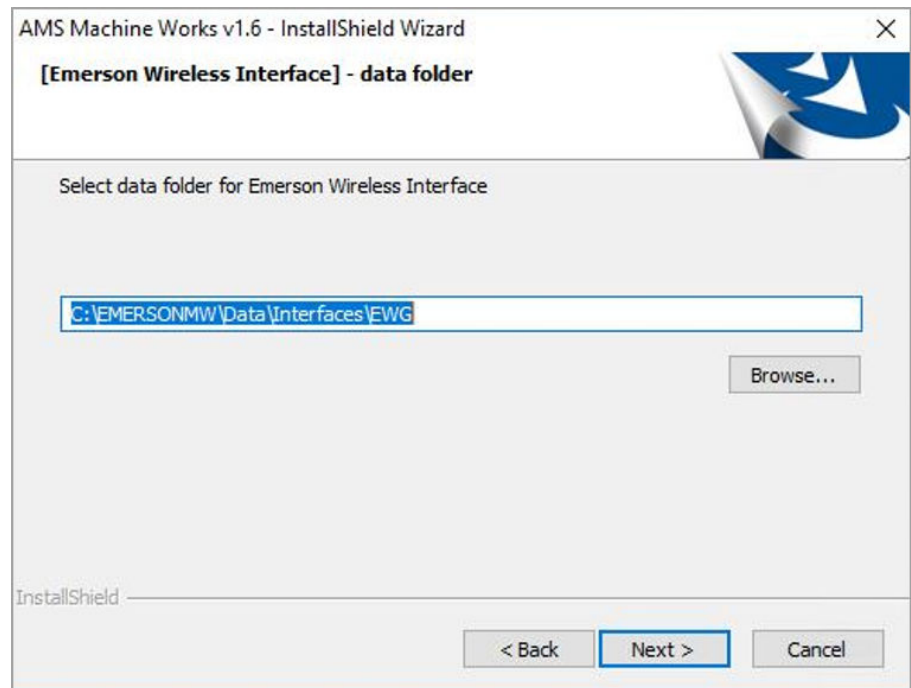
Maximum size of the data folder (in GB):

InstallShield

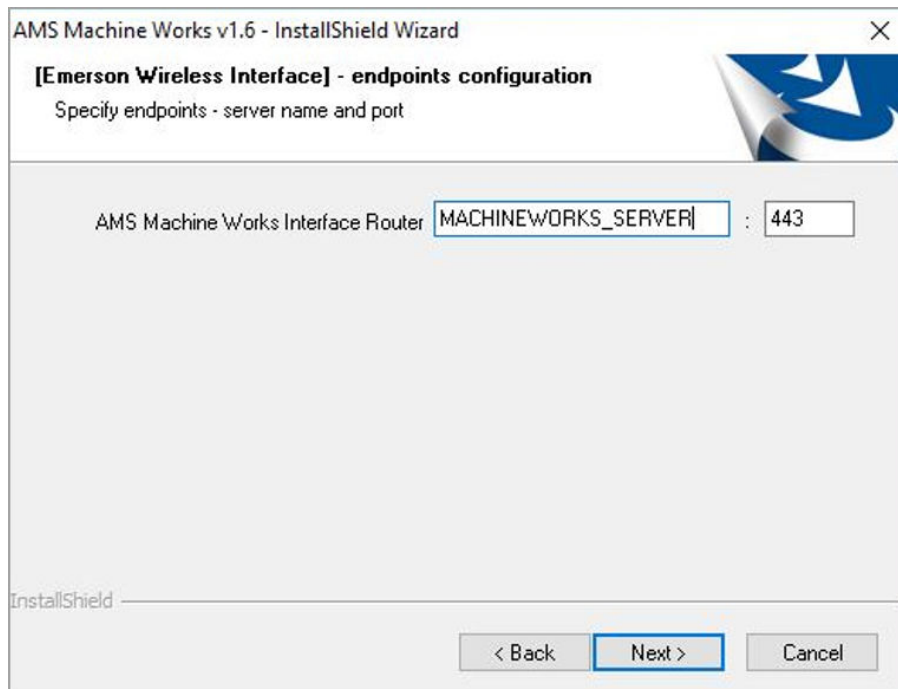
< Back **Next >** Cancel

The default value is 100 GB. However, consider using more space to allow more data to be stored locally.

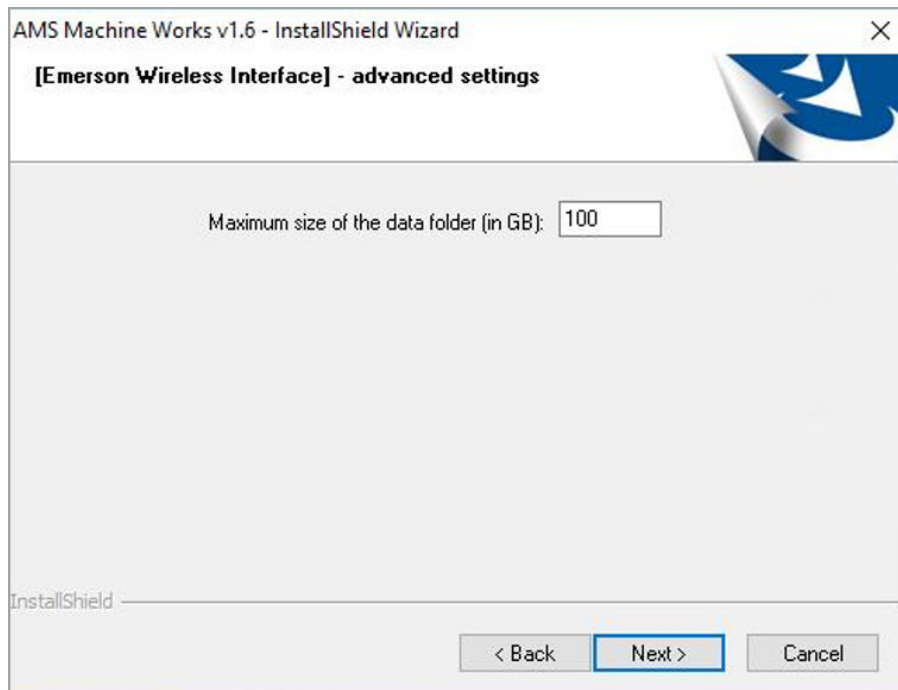
12. Select the options for the Emerson Wireless Interface.
  - a) On the **Destination Location** screen, accept the default location (recommended). Click **Next**.
  - b) On the **Data Folder** screen, accept the default location C:\EMERSONMW\Data\Interfaces\EWG (recommended). Click **Next**.



- c) On the **Endpoints Configuration** screen, accept the default server names and ports provided (recommended). Click **Next**.

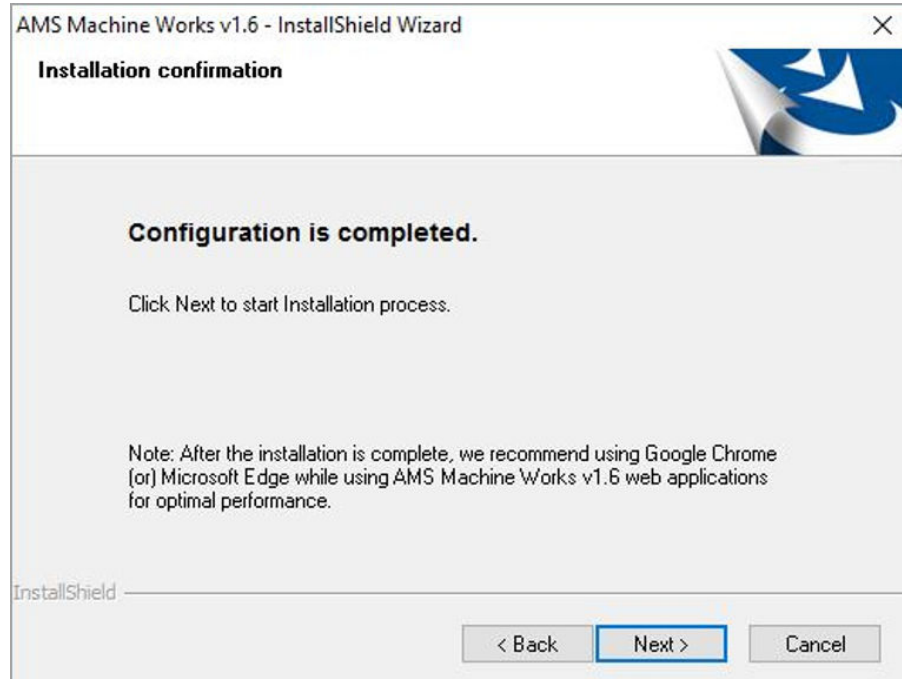


- d) On the **Advanced settings** screen, enter the Maximum size of the data folder (in GB). Click **Next**.



The default value is 100 GB. However, consider using more space to allow more data to be stored locally.

13. At the **Installation confirmation** page, select **Next** to install the software.



14. Reboot the system when prompted. Log in again with the same user and the installation automatically resumes.
15. On the **Setup complete** page, click **Done**.

Next, register the software. See [Register licenses](#).

## 6.3 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, and an interface on the AMS Machine Works Interface Server. This installation is an example of the deployment scenario shown in [2C1: AMS Machine Works with Ovation Machinery Health Module](#) which has the Ovation MHM Interface. This is recommended for medium to large systems.

### 6.3.1 Install components on AMS Machine Works Server

This installation procedure shows the distributed deployment scenario of installing a web components on the AMS Machine Works Server, and registering the Ovation MHM 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.

#### Procedure

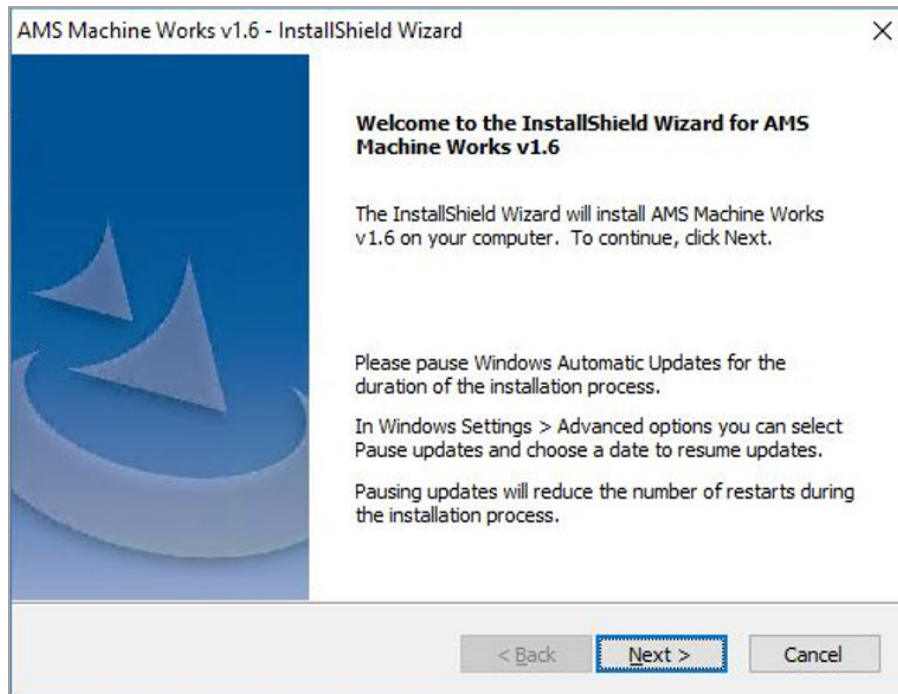
1. Extract the `Install_1.6.X.X.zip` file on the server.



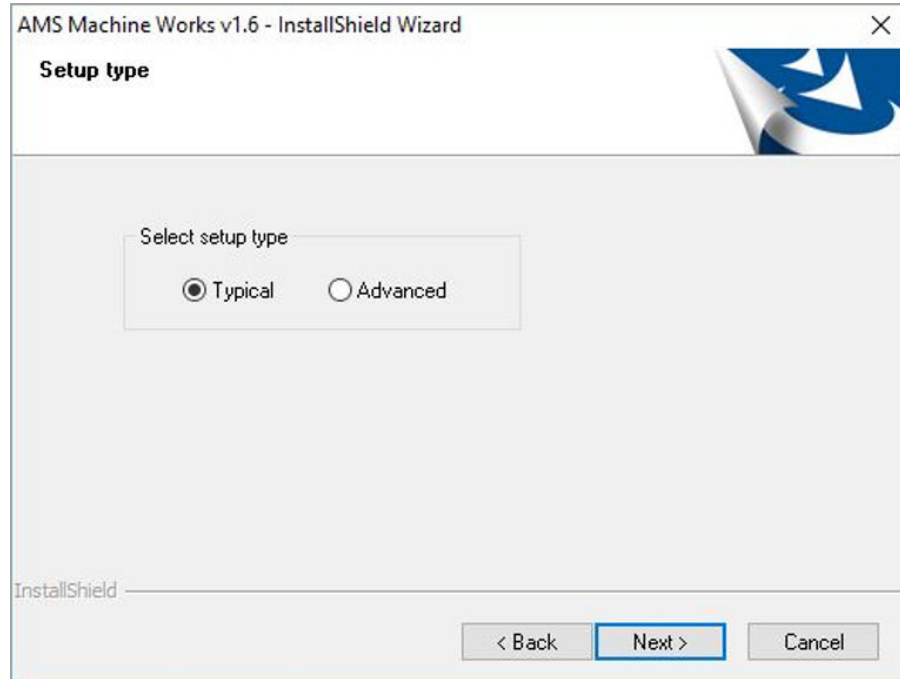
**Note**

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

2. Right-click **setup.exe** and select **Run as administrator**.
3. At the welcome screen, review the reminder to pause Windows Automatic Updates for the duration of the installation process.



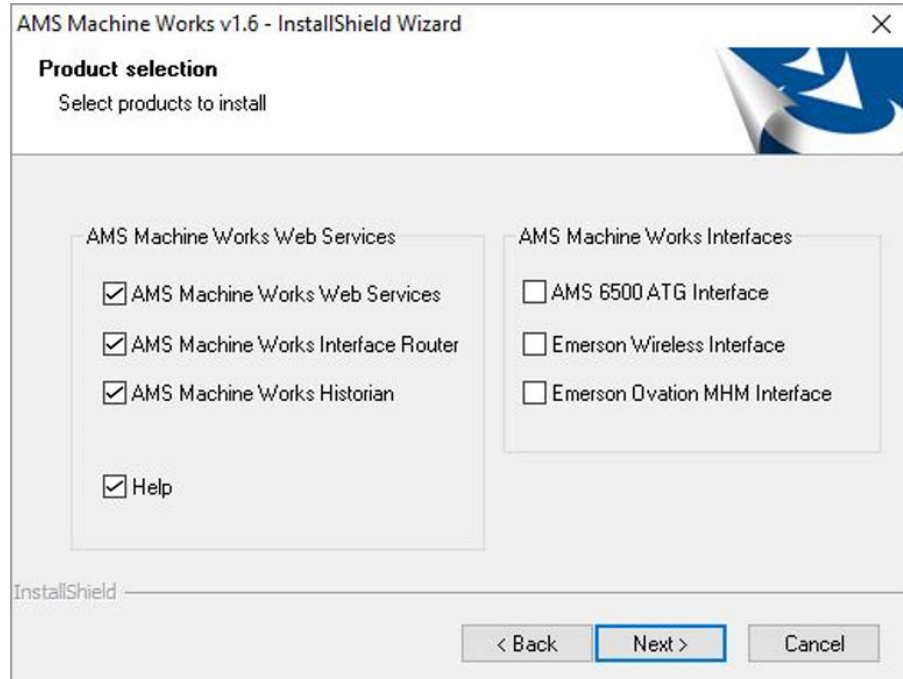
4. At the **Setup type** screen, select **Typical**.



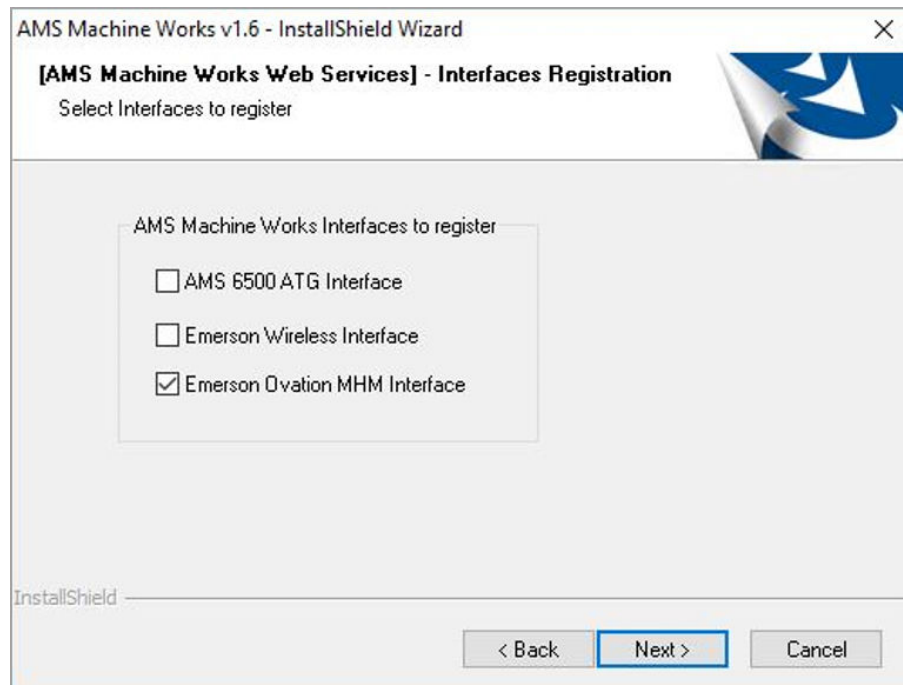
Selecting **Typical** accepts default location for the data folder and the SQL passwords. Selecting **Advanced** lets you supply custom passwords for the SQL accounts.

5. Select to install the AMS Machine Works Web Services and all other services needed, and click **Next**.

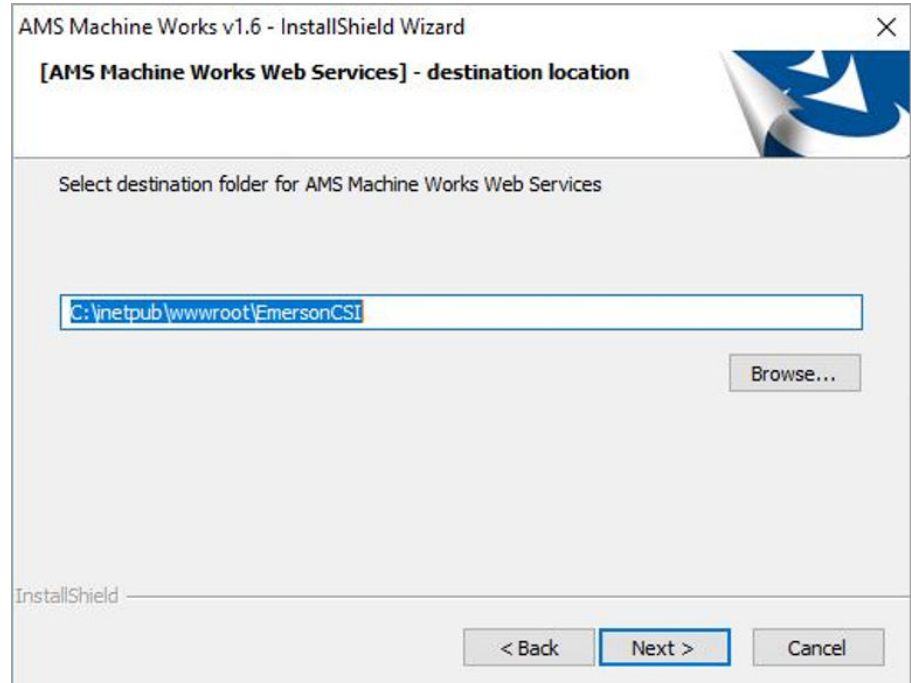
This procedure shows registering only the AMS Machine Works Web Services.



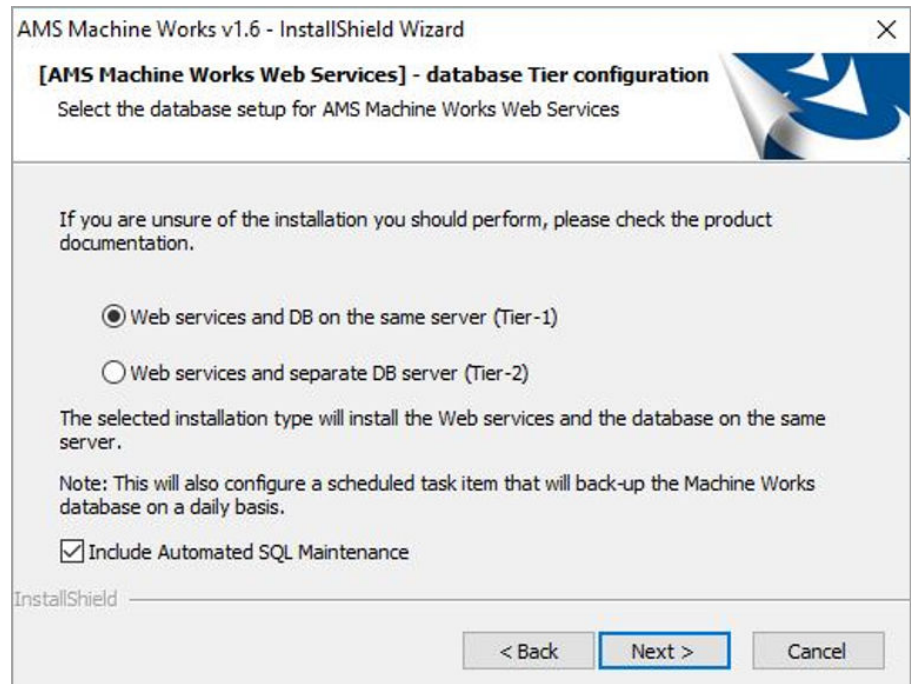
6. Read and accept the license agreement. Click **Next**.
7. On the **Interfaces Registration** screen, select to register the Ovation MHM interface. Click **Next**.



8. Select the options for the AMS Machine Works Web Services:
  - a) On the **Destination Location** screen, accept the default location (recommended). Click **Next**.

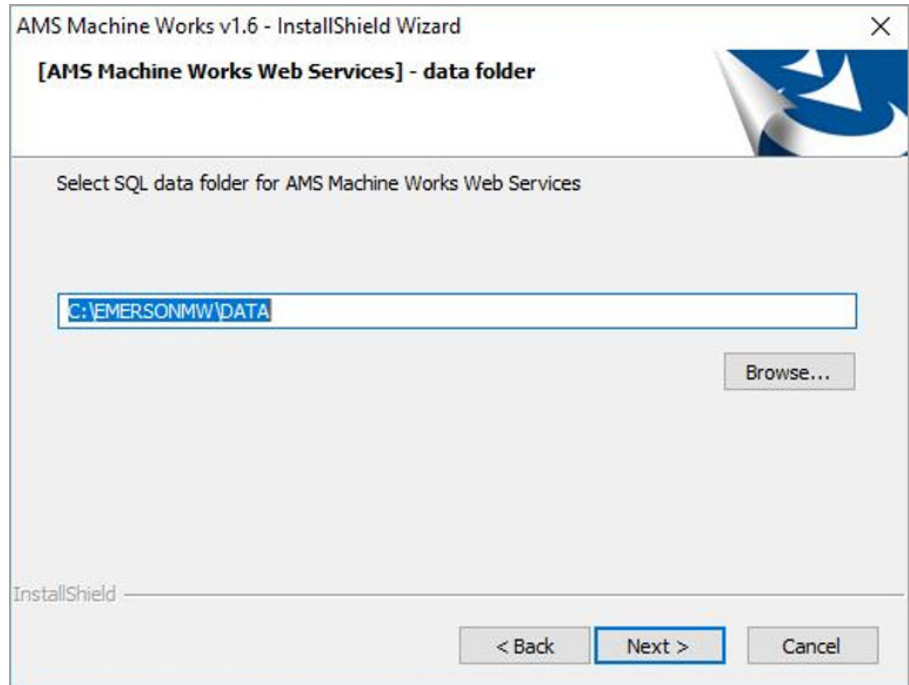


- b) On the **Database Tier selection** screen, select **Web services and DB on the same server (Tier-1)** and click **Next**.

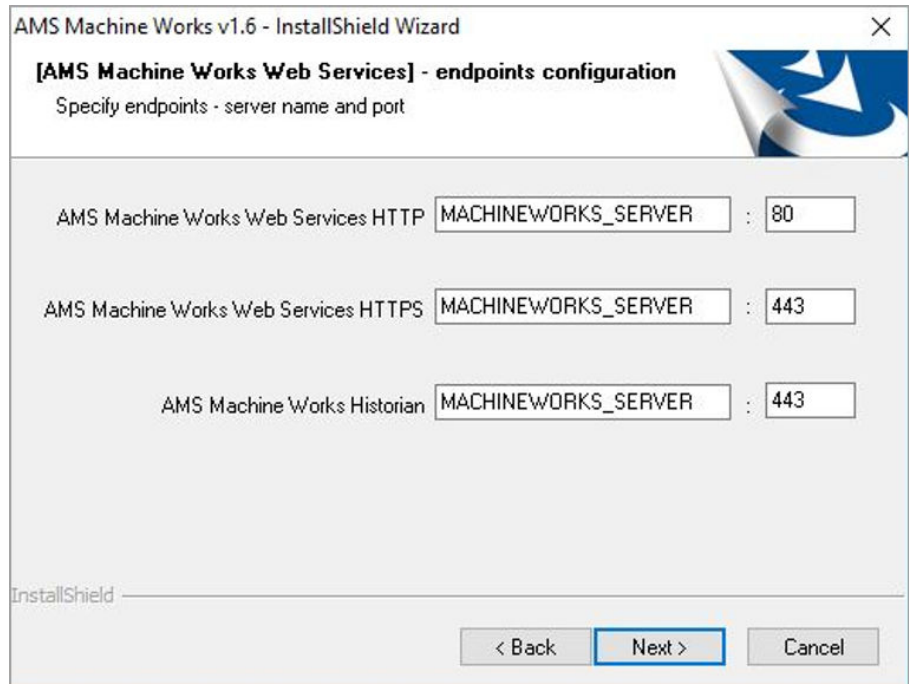


Refer to [Install AMS Machine Works for use with a separate SQL Server](#) if you need to install the database on a separate SQL Server.

- c) On the **Data Folder** screen, accept the default location (recommended). Click **Next**.

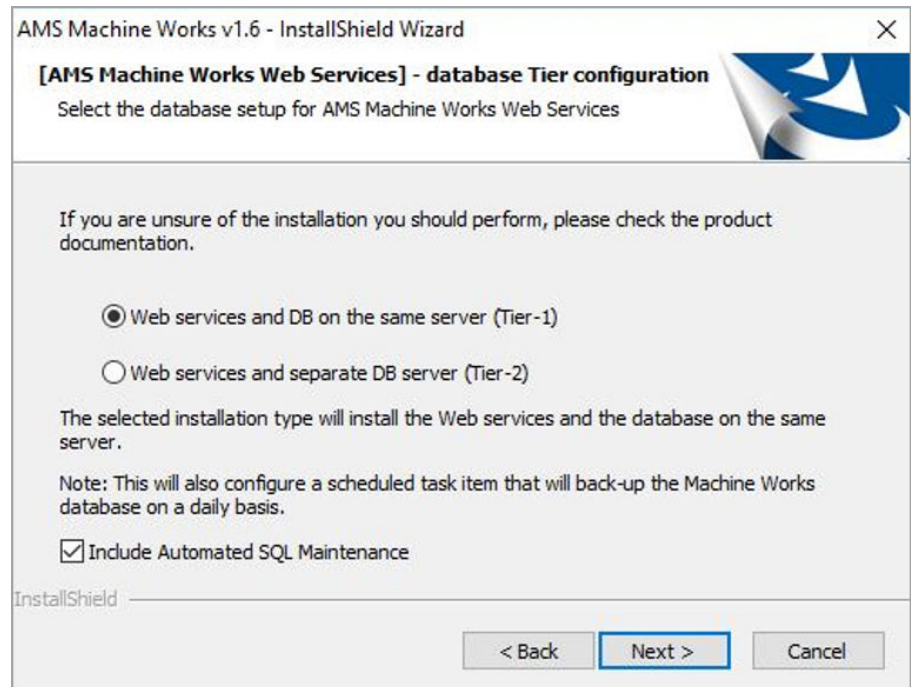


- d) On the **Endpoints Configuration** screen, accept the default server names and ports provided (recommended). Click **Next**.

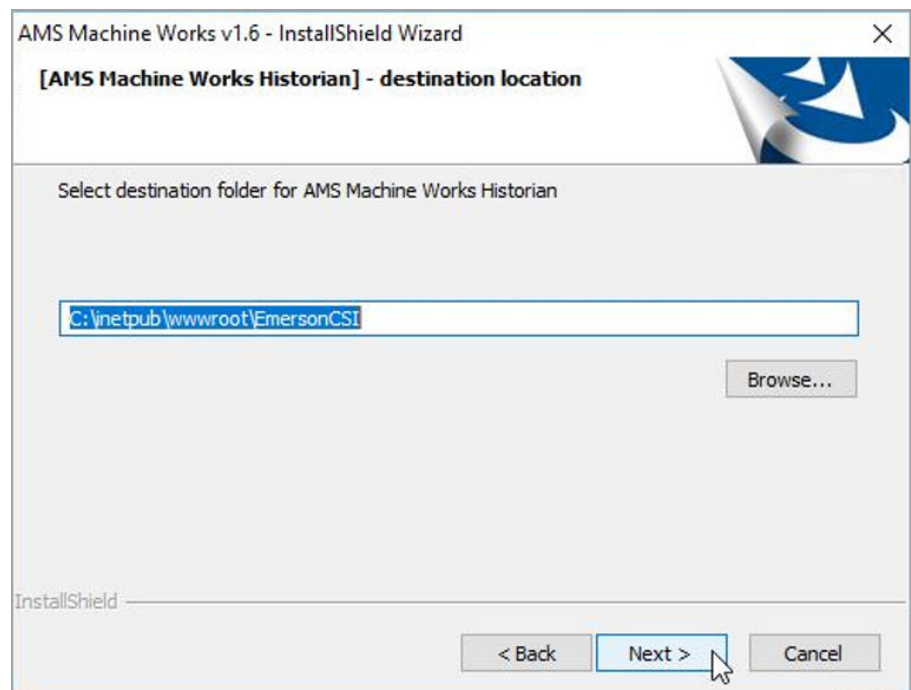


9. Select the options for the AMS Machine Works Historian:

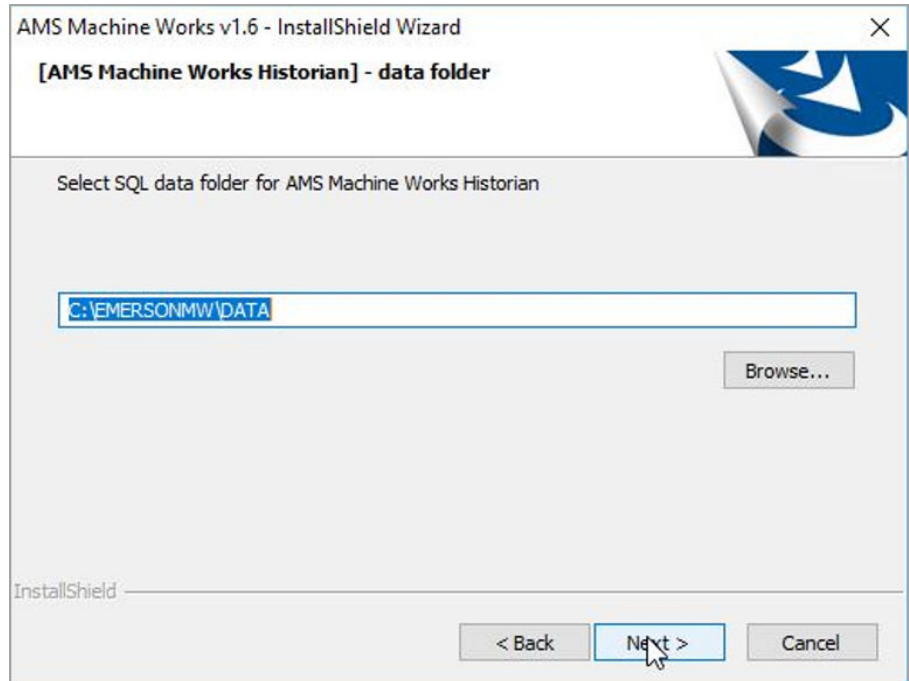
- a) On the **Database Tier selection** screen, select **Web services and DB on the same server (Tier-1)** and click **Next**.



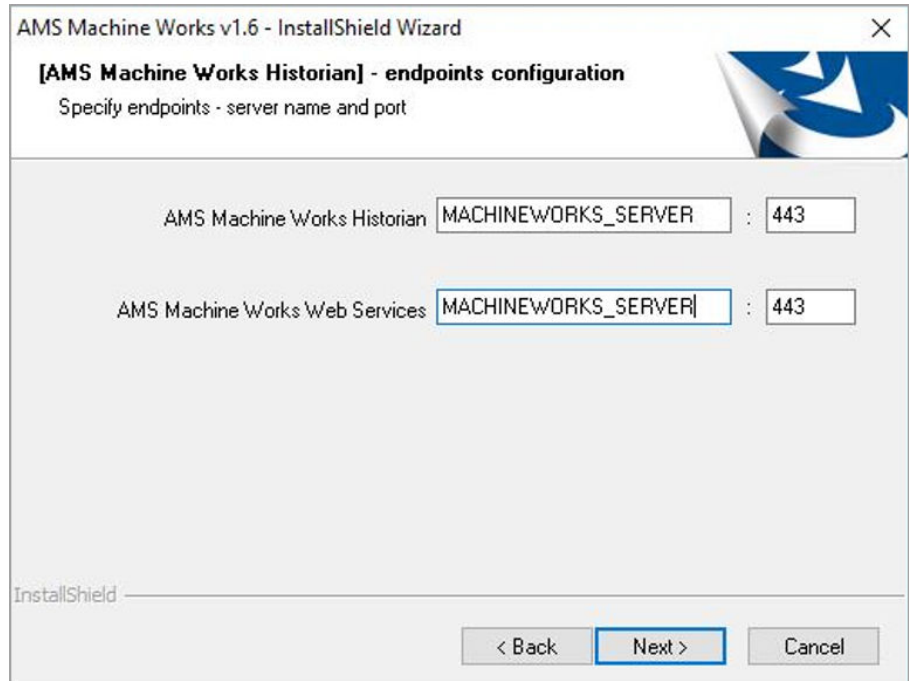
- b) On the **Destination Location** screen, accept the default location (recommended). Click **Next**.



- c) On the **Data Folder** screen, accept the default location (recommended). Click **Next**.

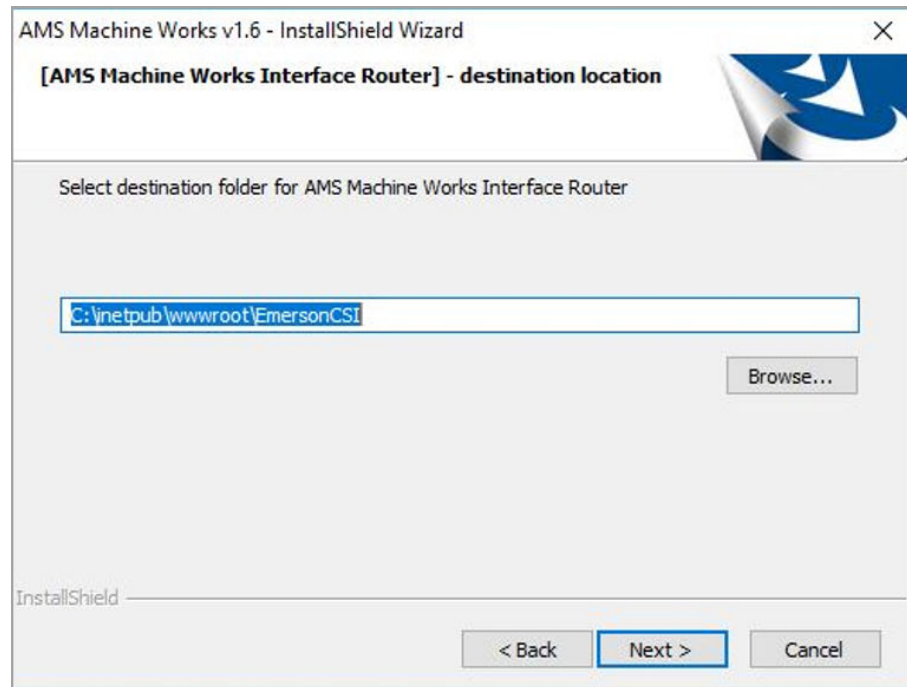


- d) On the **Endpoints Configuration** screen, accept the default server names and ports provided (recommended). Click **Next**.

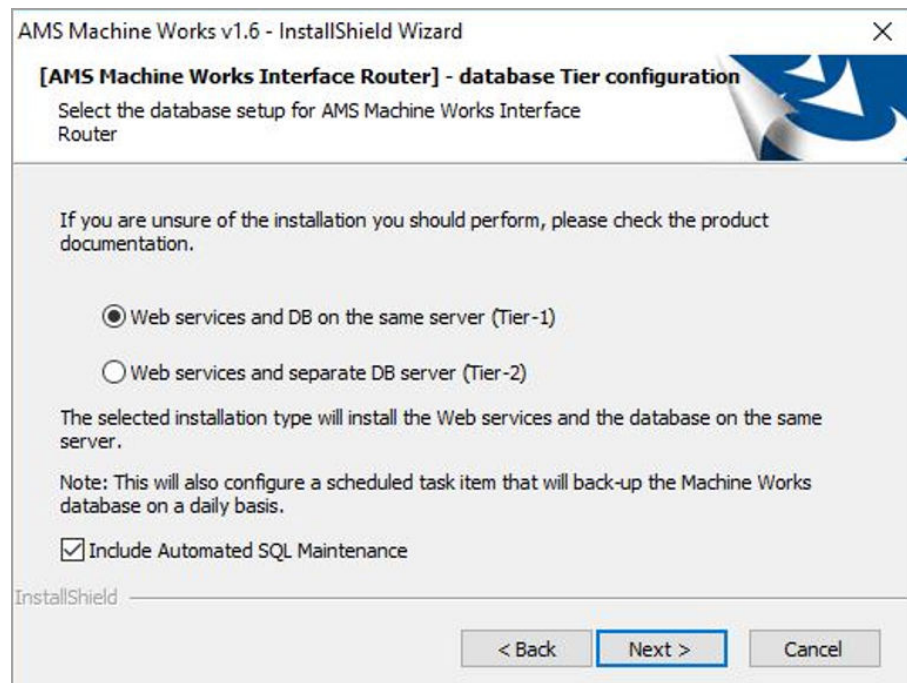


10. Select the options for the AMS Machine Works Interface Router:

- a) On the **Destination Location** screen, accept the default location (recommended). Click **Next**.

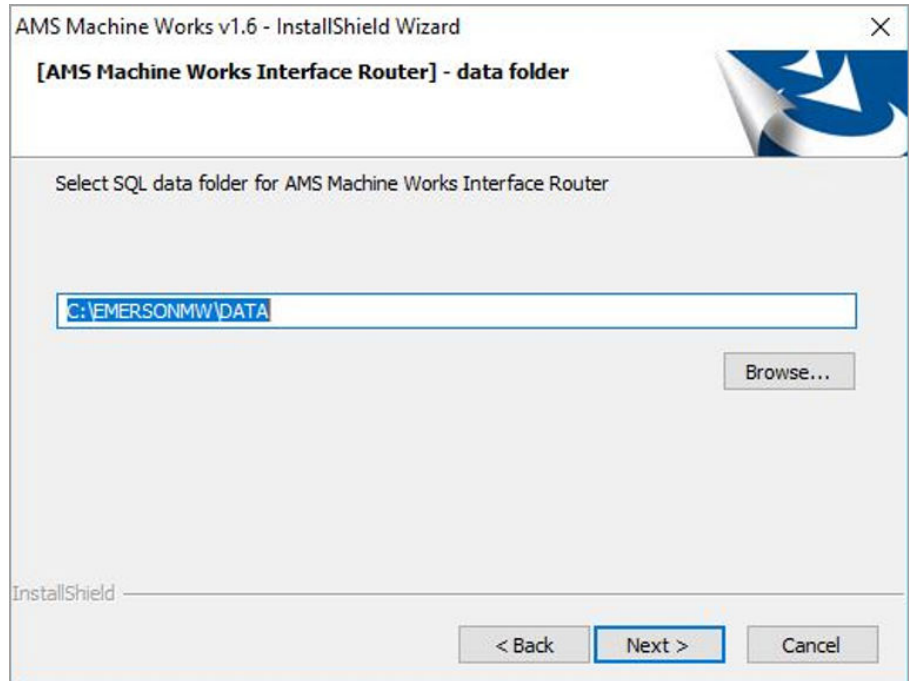


- b) On the **Database Tier selection** screen, select **Web services and DB on the same server (Tier-1)** and click **Next**.

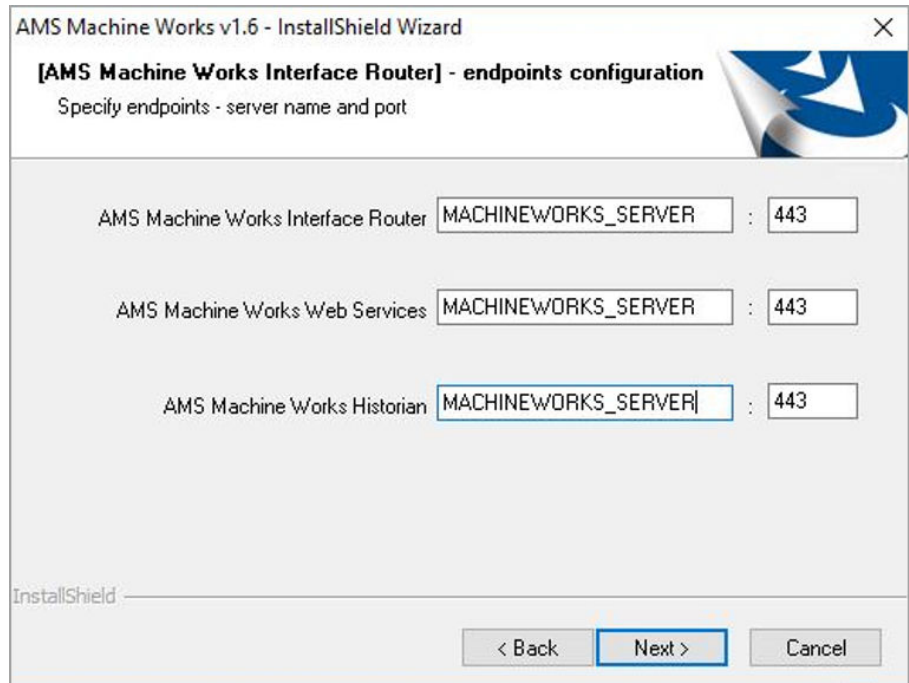




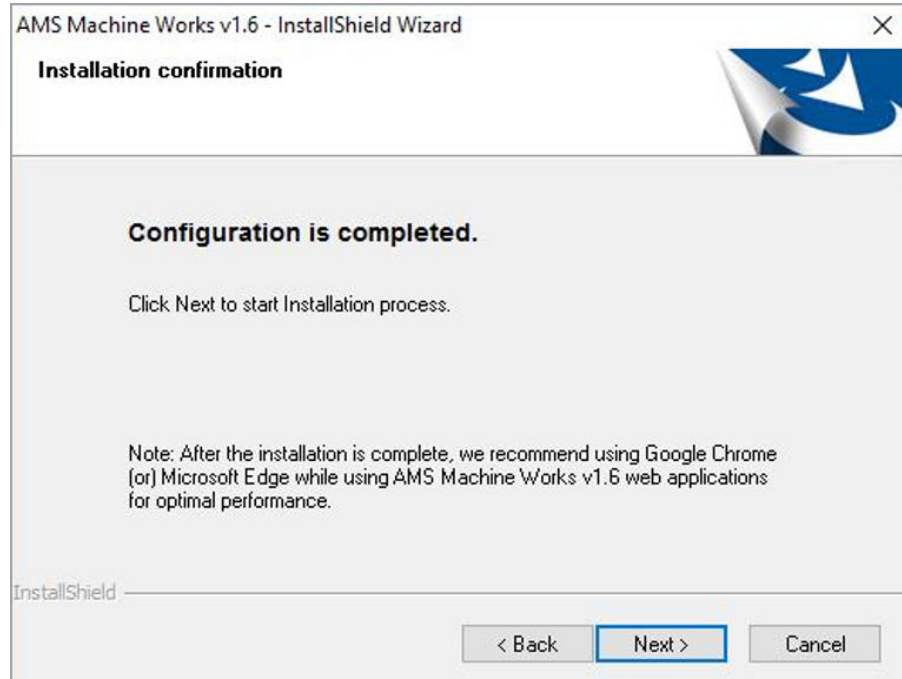
- c) On the **Data Folder** screen, accept the default location (recommended). Click **Next**.



- d) On the **Endpoints Configuration** screen, accept the default server names and ports provided (recommended). Click **Next**.



11. At the **Installation confirmation** page, select **Next** to install the software.



12. Reboot the system when prompted. Log in again with the same user and the installation automatically resumes.
13. On the **Setup complete** page, click **Done**.

Next, install the Ovation MHM Interface on AMS Machine Works Interface Server. See [Install interfaces on AMS Machine Works Interface Server\[other\]](#).

## 6.3.2 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 Ovation MHM 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.

### Procedure

1. Extract the `Install_1.6.X.X.zip` file on the server.

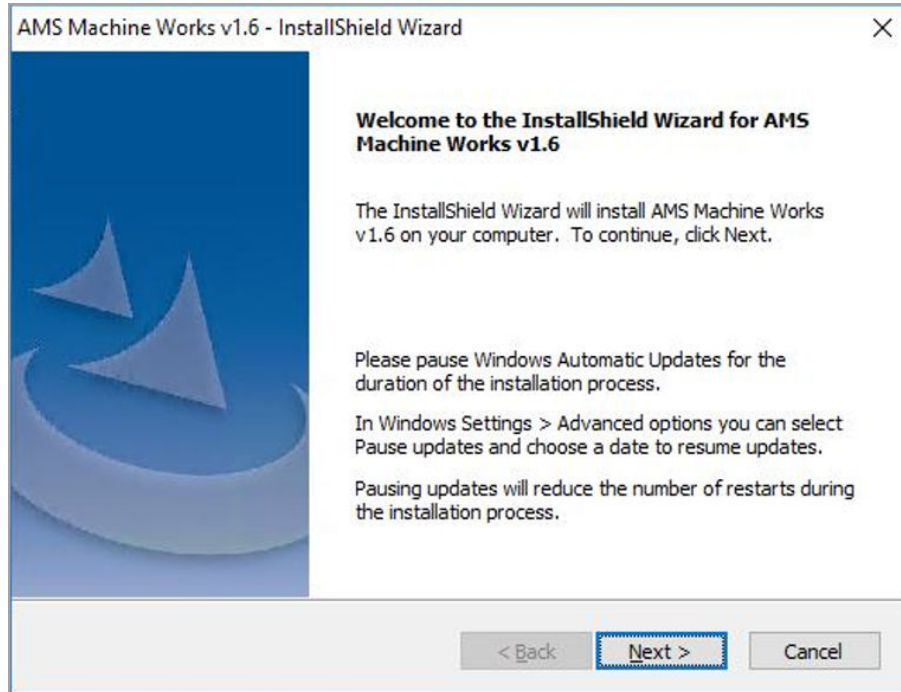
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#### Note

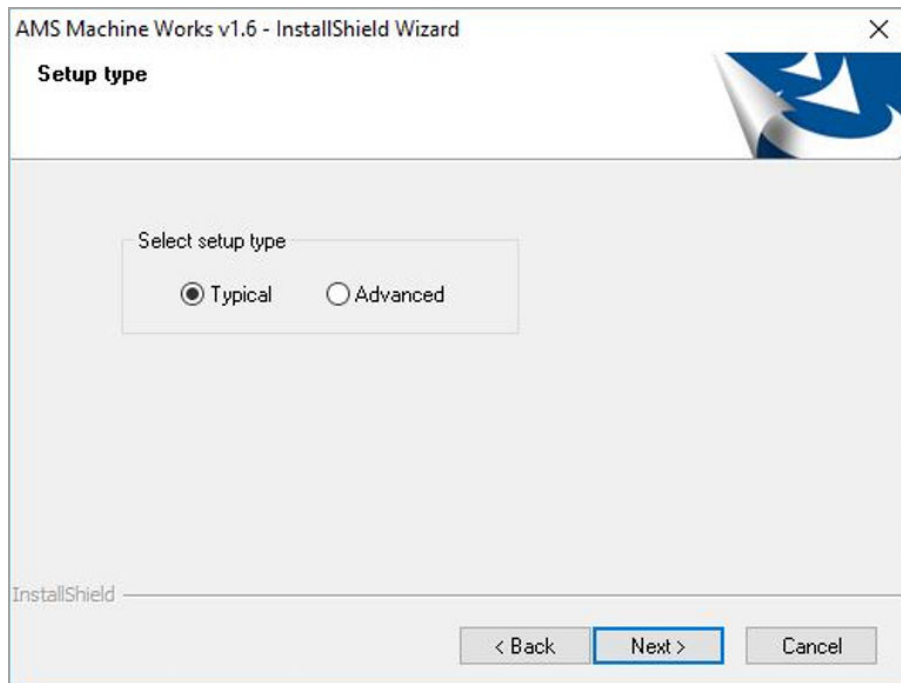
Extract the zip file on a root directory. For example, drive C.

---

2. Right-click `setup.exe` and select **Run as administrator**.
3. At the welcome screen, review the reminder to pause Windows Automatic Updates for the duration of the installation process.

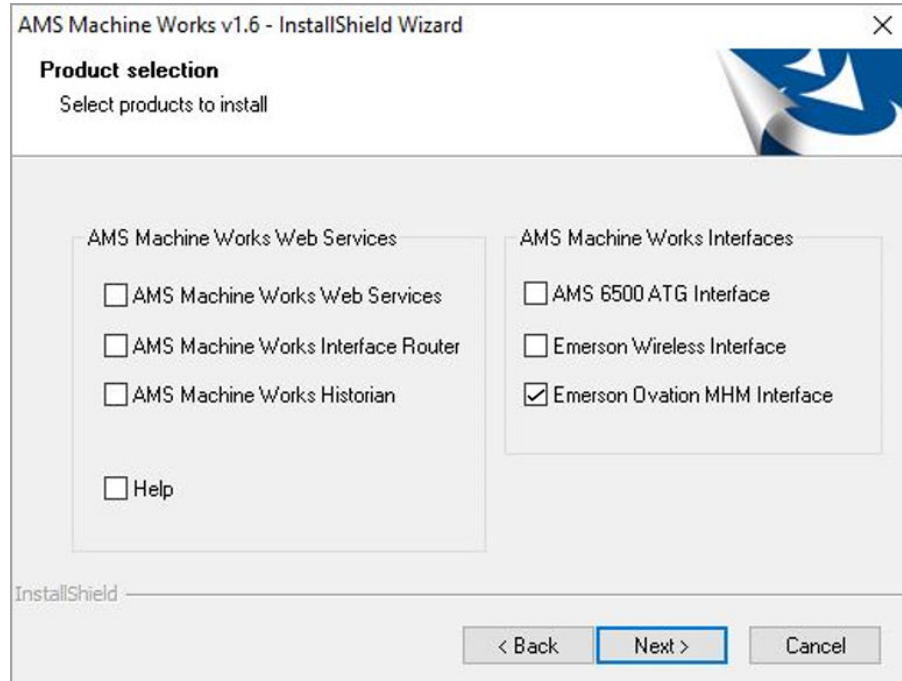


4. At the **Setup type** screen, select **Typical**.

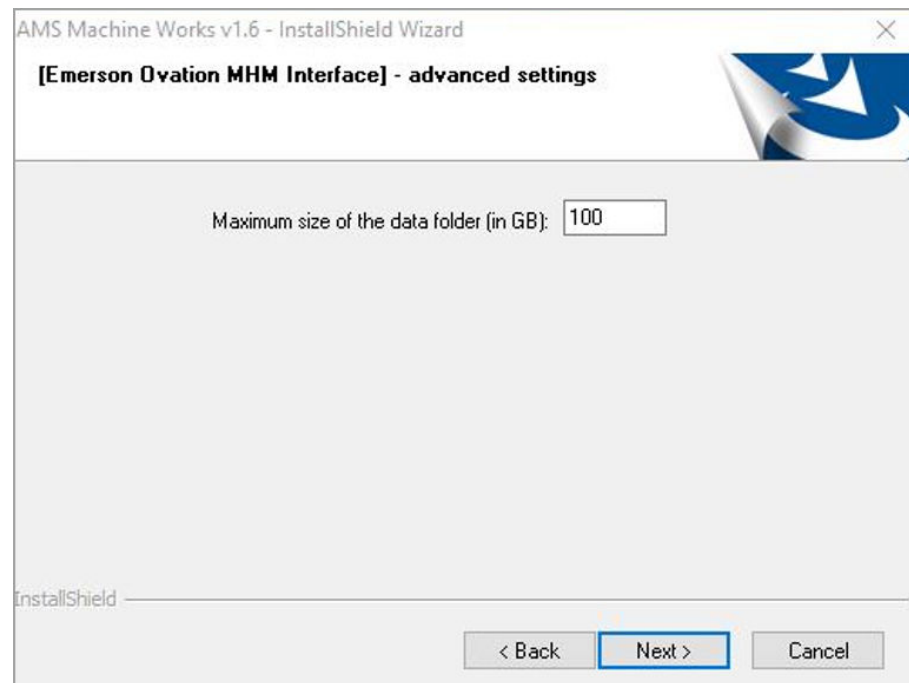


Selecting **Typical** accepts default location for the data folder and the SQL passwords. Selecting **Advanced** lets you supply custom passwords for the SQL accounts.

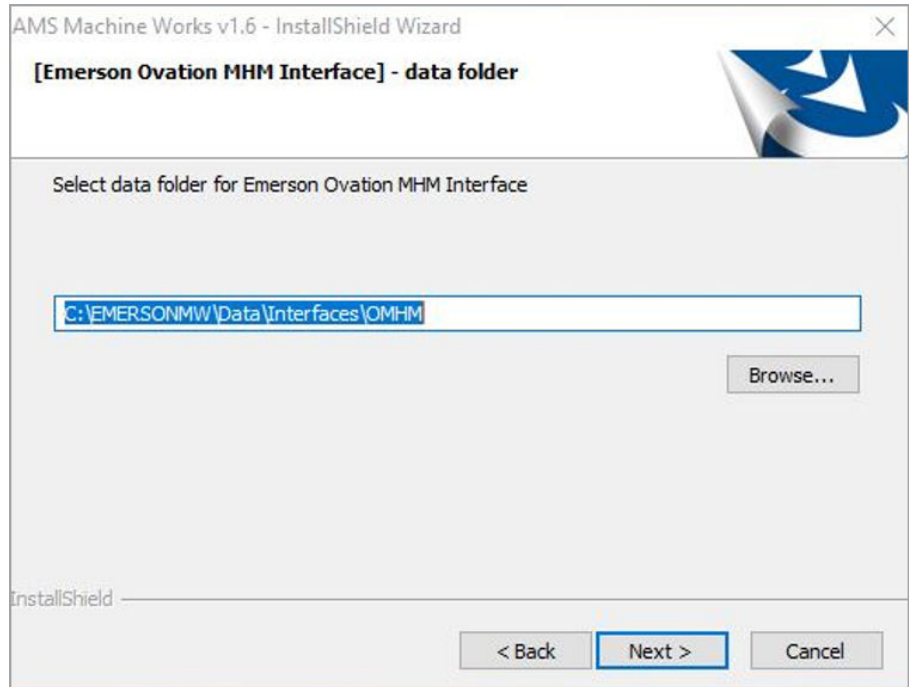
5. Select to install the Ovation MHM Interface, and click **Next**.



6. Read and accept the license agreement. Click **Next**.
7. Select the options for the Ovation MHM Interface:
  - a) On the **Advanced settings** screen, enter the Maximum size of the data folder (in GB). Click **Next**.



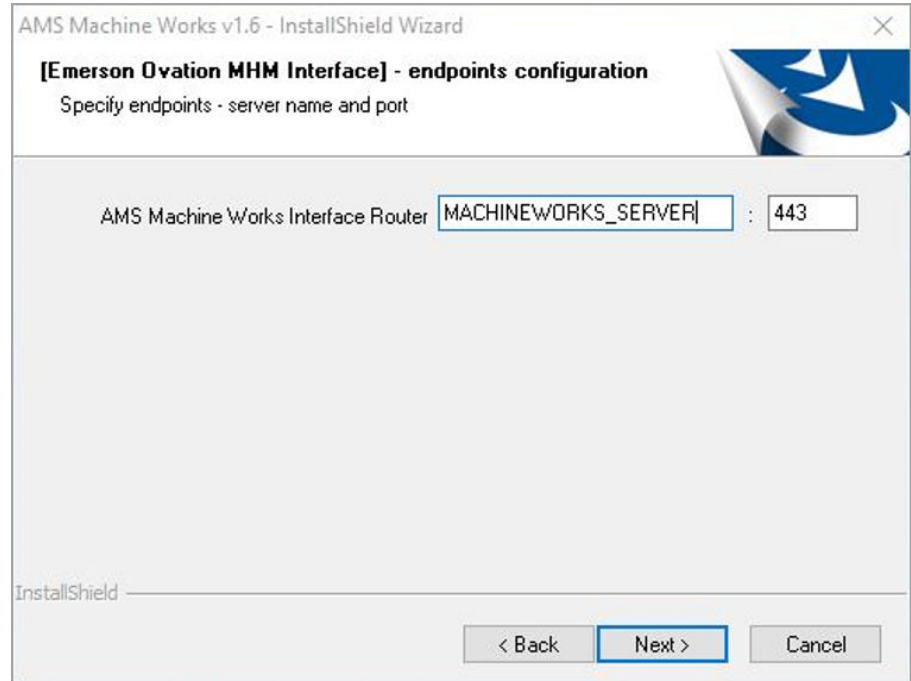
- b) On the **Data Folder** screen, accept the default location (recommended). Click **Next**.



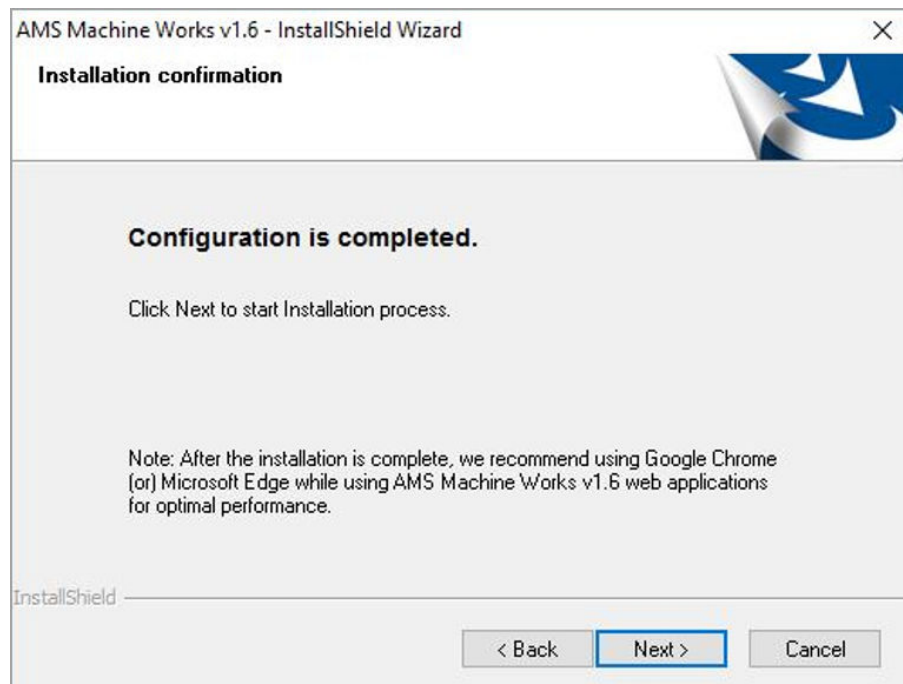
- c) On the **Endpoints Configuration** screen, enter the server name of the AMS Machine Works Server and keep the default ports provided (recommended). Click **Next**.

**⚠ CAUTION**

By default, this setting contains the name of the AMS Machine Works Interface Server. You must change it to the name of the AMS Machine Works Server.



8. At the **Installation confirmation** page, select **Next** to install the software.



9. Reboot the system when prompted. Log in again with the same user and the installation automatically resumes.
10. On the **Setup complete** page, click **Done**.

- Export the certificate from the AMS Machine Works Interface Server and install it on the AMS Machine Works 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](#).
- Register the software. See [Register licenses](#).

## 6.4 Install AMS Machine Works in other scenarios

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

## 6.5 Register licenses

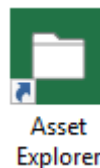
AMS Machine Works must be registered when it is installed. Follow these steps to register the product license.

### Procedure

1. From your browser window, enter this URL: `https://[server]/AssetExplorer`.

Where [server] is the computer name of the AMS Machine Works server. Or, click the Asset Explorer desktop shortcut on the server.

**Figure 6-1: Asset Explorer shortcut**



2. At the bottom of the screen, this message is displayed: **Please contact your local Emerson sales representative for a licensed version of the AMS Machine Works. To install license, click HERE.** Click the **HERE** prompt to register the license. The **Please Upload the License File** window displays.
3. Click **Choose File** and select the License File to activate. License files have a .lic file extension.
4. Click **Activate Product**.
5. After registering the license(s), you can log in and use the software.

## 6.6 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.

**Figure 6-2: Dashboard shortcut**



### 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 115](#) for more information.
- Security certificates must be installed. See [page 54](#).

### 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>2</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 54](#).
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 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>2</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], if required, 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.

Return to [Installing AMS Machine Works](#) and continue your installation.

## 6.7 Enable secure communication with an Emerson Wireless Gateway

If the gateway is configured to use secure communication, follow this procedure to enable connections to the gateway.

Perform these steps on the server hosting the Emerson Wireless Interface only after installing and setting up the proxy using the Emerson Wireless Gateway's Security Setup Utility.

### Prerequisites

Install the latest version of Security Setup Utility (v1.5.7 or later) for the Emerson Wireless 1420 Gateway on the server where the Emerson Wireless Interface is installed.

Use the Security Setup Utility to set up the proxy and exchange the security certificate with the gateway, following setup instructions provided in the [Emerson Wireless Gateway Reference Manual](#). After this configuration is complete, you need to know the Local Port number to use for the connection in AMS Machine Works.

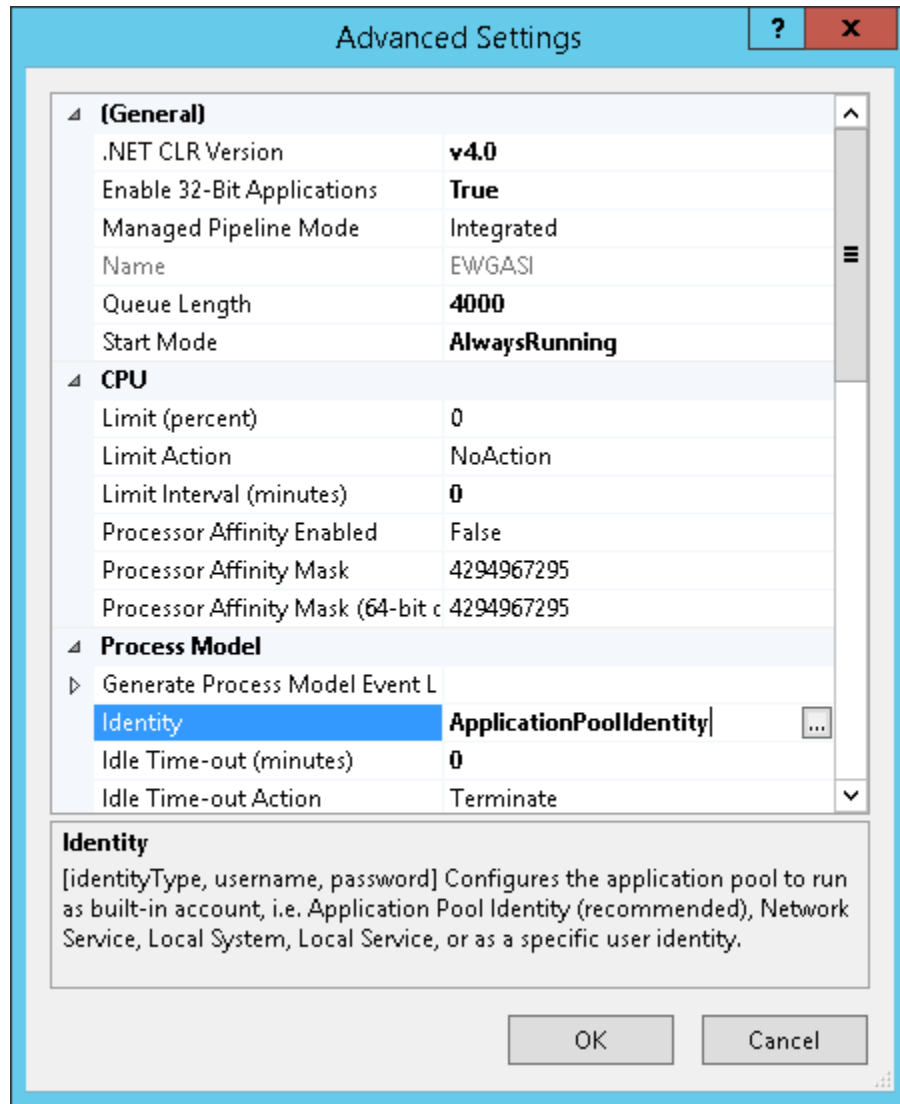
### Procedure

1. Launch IIS Manager and expand the server name.
2. Click **Application Pools** and right-click **EWGASI**.
3. Select **Advanced Settings**.

The **Advanced Settings** dialog is displayed.

4. Under the Process Model tree, select **Identity**, and click .

Figure 6-3: Advanced Settings—Identity



5. From the Application Pool Identity dialog, select **Custom account** and click **Set**.
6. Enter the administrator username and password and click **OK**.  
The software is now set up to run as an administrator.
7. Click **OK** to close the dialogs.
8. From the list of Application Pools, right-click **EWGASI**, and select **Recycle**.
9. Launch the Security Setup Utility and create a new proxy:
  - a) Select **Edit** → **New** → **Add AMS Access Proxy**.
  - b) Right-click the new proxy and select **Properties**.
  - c) Enter the IP address of your Emerson Wireless Gateway.
  - d) Click **OK**.

- e) Select **File** → **Save**.
- f) If you are prompted for authentication, enter the admin password for the target Gateway.
- g) Click **OK**.

## 6.8 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.

## 6.9 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/we/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.

## 6.10 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.

## 6.11 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 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 (WebApi client) 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.

# 7 Uninstall AMS Machine Works

## Prerequisites

Uninstall AMS Machine Works and its components in the following order:

1. AMS Machine Works Vibration Analyzer
2. Plantweb Optics OPC UA Server Registration
3. Plantweb Optics OPC UA Server
4. AMS Machine Works
  - AMS Machine Works Help
  - AMS Machine Works Ovation MHM Interface
  - AMS Machine Works ATG Interface
  - AMS Machine Works Wireless Interface
  - AMS Machine Works Interface Router
  - AMS Machine Works Historian
  - AMS Machine Works Web Services
5. Plantweb Optics Web Services

---

## Note

Steps for uninstalling the software can differ depending on your operating system.

If any of the components are on separate servers, such as in a distributed installation, install the component from the separate server.

## Procedure

1. From the Control Panel, select **Add or Remove Programs**, select the component, and click **Uninstall**.  
The installation wizard launches and uninstalls the component.
2. Restart your computer.



## 8 Upgrades and updates

This system guide is geared to new installations and provides an overview of the upgrade and update process. If you have AMS Machine Works v1.4 or v1.5, before attempting an upgrade, please refer to the AMS Machine Works upgrade guide, available from Product Support KBA NK-2000-0451.

### 8.1 Upgrade AMS Machine Works

This procedure describes the procedure for upgrading AMS Machine Works between major releases. It includes upgrading the software from new installations of version 1.5 released as AMS Machine Works Standalone installation to version 1.6. It does not cover upgrading AMS Machine Works 1.5 installed on a Plantweb Optics installation.

Customers need to upgrade from v1.4 to v1.5; then from v1.5 to v1.6. Do not attempt to upgrade from v1.4 directly to v1.6.

Upgrade is a complex topic and, unless a customer is already standalone, will require some manual steps - you CANNOT just run the installer.

Customers that have both Plantweb Optics and AMS Machine Works need to be very careful to plan and deploy an upgrade. Contact Product Support to obtain any new technical material being developed about this process. Because AMS Machine Works v1.6 is truly standalone, customers with AMS Machine Works deployed with Plantweb Optics, both are on the same server for v1.5/v1.5.1. For an upgrade, the new deployment will require two servers so that AMS Machine Works v1.6 is deployed on a separate server than Plantweb Optics.

#### CAUTION

It is imperative to export the Plantweb Optics Framework DB (EmersonCSI) BEFORE upgrading PWO v1.6. SQL must be installed on the MW destination and then the exported database must be imported to the EmersonMW named instance of SQL on the new AMS Machine Works server. Then AMS Machine Works v1.6 (w/ embedded platform) can be installed, and it will use the imported database. Connectivity to the original Plantweb Optics server is irrevocably lost upon upgrade, and will be supported later, when Plantweb Optics is upgraded to v1.6 and has the AMS Machine Works ASI, which is to be released following Plantweb Optics v1.6.)

## 9 Supported upgrade scenarios

The table shows the supported upgrade path scenario for AMS Machine Works releases as well as its components and complementary products. Before performing an upgrade, determine if you need to migrate your data first. It is not possible to migrate data after the upgrade has been performed.

- If you have Plantweb Optics v1.4 with AMS Machine Works v1.4:  
Do you need to retain historical data post upgrade?
  - If yes, then migrate v1.4 to v1.5 and then migrate v1.5 to v1.6.
  - If no, install AMS Machine Works v1.6.
- If you have Plantweb Optics v1.5 or v1.5.1 with AMS Machine Works v1.5:  
Do you need to retain historical data post upgrade?
  - If yes, then migrate v1.5 to v1.6 and then migrate v1.5 to v1.6.
  - If no, install AMS Machine Works v1.6.
- If you have beta or demo software, upgrade or migration is not supported.

**Table 9-1: Supported AMS Machine Works upgrade scenarios**

AMS Machine Works versions	Upgrade To						
	v1.4 w/ Plantweb Optics v1.4 Managed Release	v1.4 w/ Plantweb Optics 1.4 General Release	v1.5 w/ Plantweb Optics 1.5	v1.5 w/ Plantweb Optics 1.5.1	v.1.5 (standalone )	v1.6 Managed Release	v1.6 General Release
v1.4 w/ Plantweb Optics 1.4 Managed Release	-	✓	✓	✓	N/A	N/A	N/A
v1.4 w/ Plantweb Optics 1.4 General Release	N/A	-	✓	✓	N/A	N/A	N/A
v1.5 w/ Plantweb Optics 1.5	N/A	N/A	-	✓	N/A	N/A	✓
v1.5 w/ Plantweb Optics 1.5.1	N/A	N/A	N/A	-	N/A	N/A	✓
v.1.5 (standalone )	N/A	N/A	N/A	N/A	-	N/A	✓

**Table 9-1: Supported AMS Machine Works upgrade scenarios (continued)**

AMS Machine Works versions	Upgrade To						
	v1.4 w/ Plantweb Optics v1.4 Managed Release	v1.4 w/ Plantweb Optics 1.4 General Release	v1.5 w/ Plantweb Optics 1.5	v1.5 w/ Plantweb Optics 1.5.1	v.1.5 (standalone )	v1.6 Managed Release	v1.6 General Release
<b>v1.6 Managed Release</b>	N/A	N/A	N/A	N/A	N/A	-	✓
<b>v1.6 General Release</b>	N/A	N/A	N/A	N/A	N/A	N/A	-

The table below describes the actions needed for the AMS Machine Works installation in case the complementary product upgraded its version.

**Table 9-2: Actions needed for upgrades of complementary software**

Complementary Products	Upgrade Path	Actions for AMS Machine Works component Install
Plantweb Optics	v.1.5.1 to v.1.6	Starting with AMS Machine Works v1.6, AMS Machine Works v1.6 must reside on a separate server from Plantweb Optics v1.6. AMS Machine Works v1.6 will connect to the Plantweb Optics v1.6 using the AMS Machine Works v1.6 ASI.  For upgrading from Plantweb Optics v1.5 systems with AMS Machine Works v1.5 or v1.5.1 to Machine Works v1.6, please work with your service personnel, since several manual steps are involved.  Upgrade AMS Machine Works v1.5 to v1.6, refer to the KBA NK-2000-0451.
Ovation	v3.6 to v3.7	AMS Machine Works and Ovation Machinery Health Waveform Recorder is independent of the Ovation version and is not affected by an ovation version upgrade from 3.6 to 3.7. However, AMS Machine Works requires a minimum of Ovation 3.6 and above to support Ovation in AMS Machine Works.
DeltaV	v13.3.1 to v14.3.1	No action, as long a DeltaV supports the Emerson Wireless Gateways then AMS Machine Works will support that version. In the first phase of support, AMS Machine Works supports 13.3.1.
Emerson Wireless Gateways	FW versions 3.9.9 to the latest released version FW versions 4.7.84 to the latest released version	In case the Emerson Wireless Gateway is updated, AMS Machine Works should still work.
Microsoft SQL Server	Microsoft SQL Server 2017 (Tier2) to Microsoft SQL Server 2019 (Tier2)	Microsoft SQL upgrade 2017 to 2019 is out of scope of this documentation. However, while untested, upgrading SQL should not affect AMS Machine Works as long as the SQL upgrade is done properly by a qualified SQL administrator. Emerson does not provide support for SQL Server upgrades.

---

**Note**

For more information refer to KBA NK-2000-0451.

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# 10 Databases

## Topics:

- [10.1 Back up and restore](#)
- [10.2 Automatic backup for Tier-1 installations](#)

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 10-1: 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.

## 10.1 Back up and restore

### Back ups

The AMS Machine Works Tier-1 and Tier-2 database options allow for two different backup strategies.

In a Tier-1 installation, automatic backup processing is available. See [page 110](#) for more information.

A Tier-2 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. If you do not have a database administrator or IT department, call Emerson Product Support to provide you with some basic database backup guidance.

### Restore

If you need to restore any of the databases, contact your IT department or call Emerson Product Support to guide you on the proper restore procedure.

### ⚠ CAUTION

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

## 10.2 Automatic backup for Tier-1 installations

Automatic backups are available for Tier-1 installations. During installation, the **Include Automated SQL Maintenance** option is selected by default when Tier-1 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:\EMERSONCSI\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.

# 11 OPC UA Server

## Topics:

- [11.1 Manage certificates in an OPC UA client](#)
- [11.2 Connect an OPC UA client](#)
- [11.3 View or change security settings on an OPC UA Server](#)
- [11.4 Hierarchy filtering](#)
- [11.5 OPC tag information and tree structure](#)

## 11.1 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.

## 11.2 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

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.

## 11.3 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**.

## 11.4 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**.

## 11.5 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 11-1: 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 11-2: 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
Server.Enterprise.Site.Location.Asset.Device.Unitname.IsOnline	Status of the individual hardware device (On/Off)	Boolean

**Table 11-3: Channel/Sensor information**

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

# 12 Troubleshooting

## Topics:

- [12.1 AMS Machine Works Dashboard troubleshooting](#)
- [12.2 Asset Explorer \(Ovation MHM module\) troubleshooting](#)
- [12.3 Installation troubleshooting](#)
- [12.4 Launching utilities troubleshooting](#)
- [12.5 OPC UA Server Troubleshooting](#)
- [12.6 SSL and certificates troubleshooting](#)
- [12.7 Vibration Analyzer troubleshooting](#)
- [12.8 How to use the installation log files](#)

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

## 12.1 AMS Machine Works Dashboard troubleshooting

**Table 12-1: Launching the AMS Machine Works Dashboard troubleshooting**

Error	Background	Solution
When launching the AMS Machine Works Dashboard (https://<servername>/amsmw) 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 Dashboard. Launch Google Chrome and type the address <b>https://&lt;servername&gt;/amsmw</b> where <servername> is the name of your AMS Machine Works Server.

## 12.2 Asset Explorer (Ovation MHM module) troubleshooting

Table 12-2: Ovation MHM module troubleshooting

Error	Background	Solution
Asset Explorer: Monitoring OMHM module fails, no error message given	If you select <b>Monitor</b> from the <b>Home</b> ribbon, for any devices monitored by AMS Machine Works, the monitoring function appears to fail with no error message given. The <b>Assets to Monitor</b> window shows a red message box containing no text.	To monitor devices in AMS Machine Works, use the Dashboard or Vibration Analysis application. The <b>Monitor</b> button in Asset Explorer is not intended for devices monitored with AMS Machine Works. It is a function supplied by the Plantweb Optics Service Layer and is not used in AMS Machine Works.

## 12.3 Installation troubleshooting

Table 12-3: 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.
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.

**Table 12-3: Installation troubleshooting (continued)**

Error	Background	Solution
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>
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.

**Table 12-3: Installation troubleshooting (continued)**

Error	Background	Solution
<p>Error when installing SQL Server 2017</p>	<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>
<p>Error that ribbon bar is not updated after an interface registration install has been processed successfully.</p>	<p>This results from the software's cache not being updated.</p>	<p>Reboot the server to correct the problem.</p>
<p>Error when installing AMS Machine Works Web Services</p>	<p>Prior to installing AMS Machine Works Web Services, FileStream must be enabled.</p>	<p>See <a href="#">Step 4 in Set up a separate SQL server for a Tier-2 installation</a> for instructions.</p>

## 12.4 Launching utilities troubleshooting

Table 12-4: 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>

## 12.5 OPC UA Server Troubleshooting

Table 12-5: 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>

## 12.6 SSL and certificates troubleshooting

Table 12-6: 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.

## 12.7 Vibration Analyzer troubleshooting

Table 12-7: 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>

## 12.8 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

More details about logs:

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

MWS.1log – 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.1 log file contains information about each installation.

# A Requirements for separate SQL server Tier-2 installations

## Topics:

- [A.1 Separate server Tier-2 installation](#)
- [A.2 Set up a separate SQL server for a Tier-2 installation](#)
- [A.3 Set up the AMS Machine Works server before a Tier-2 installation](#)
- [A.4 Tier-2 post-installation setup](#)
- [A.5 Set up the AMS Machine Works Interface Server before installing an interface on a Tier-2 system](#)

## A.1 Separate server Tier-2 installation

A Tier-2 installation installs the system's databases on a separate SQL database server. For a Tier-2 installation, you need to set up the SQL database server and the AMS Machine Works server in a specific order.

1. Set up the separate SQL Server for a Tier-2 installation. See [page 122](#).
2. Set up the AMS Machine Works server before a Tier-2 installation. See [page 125](#).
3. Install AMS Machine Works on the computer you designate as the AMS Machine Works server. During installation, choose a Tier-2 installation and supply information about the database server.

---

### Important

After installation, do not start using the software or install other components until you have completely set up the system for a Tier-2 installation.

---

4. Finish post-installation setup on the AMS Machine Works server. See [page 126](#).
5. Set up the AMS Machine Works Interface Server before installing one of the AMS Machine Works interfaces on a Tier-2 system. See [page 129](#).

---

### Note

This step is only required if you install the interface on a separate server.

---

## A.2 Set up a separate SQL server for a Tier-2 installation

---

### Important

Complete these steps on the separate SQL server before installing AMS Machine Works on the computer you designate as the AMS Machine Works server.

---

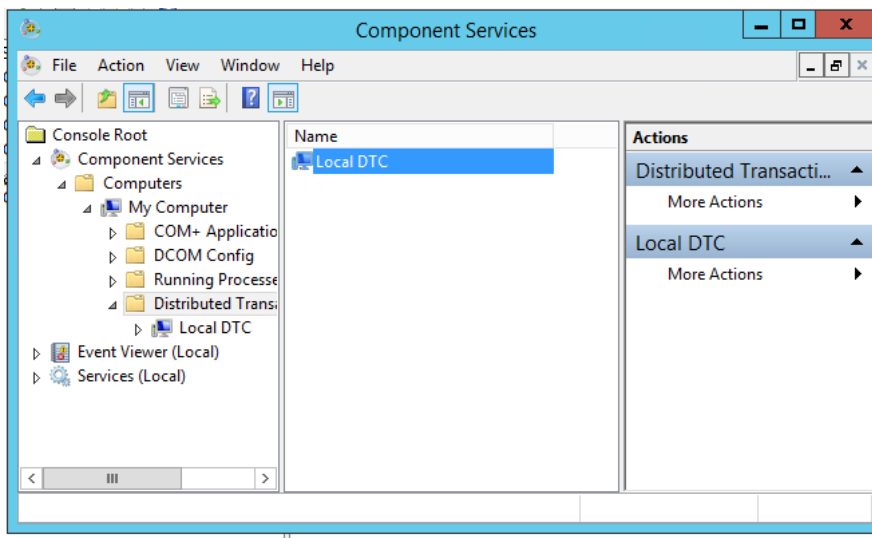
### Prerequisites

AMS Machine Works is NOT yet installed.

### Procedure

1. On the separate SQL server, ensure the server meets the following requirements to host the system's databases.
  - SQL 2017 is the minimum version supported
  - SQL Instance name must be **EMERSONMW**
  - Remote connections must be enabled
  - Mixed authentication (Windows & SQL) must be enabled
  - TCP/IP protocol must be enabled for the **EmersonMW** SQL Server Network Configuration (SQL Server Configuration Manager)
  - SQL Browser must be running and set to auto-start
  - A static port for the **EMERSONMW** SQL Instance must be set.
2. Update settings for Microsoft Distributed Transaction Coordinator (MDTC):
  - a. In **Windows Component Services**, browse to **Component Services** → **Computers** → **My Computer** → **Distributed Transaction Coordinator** → **Local DTC**.

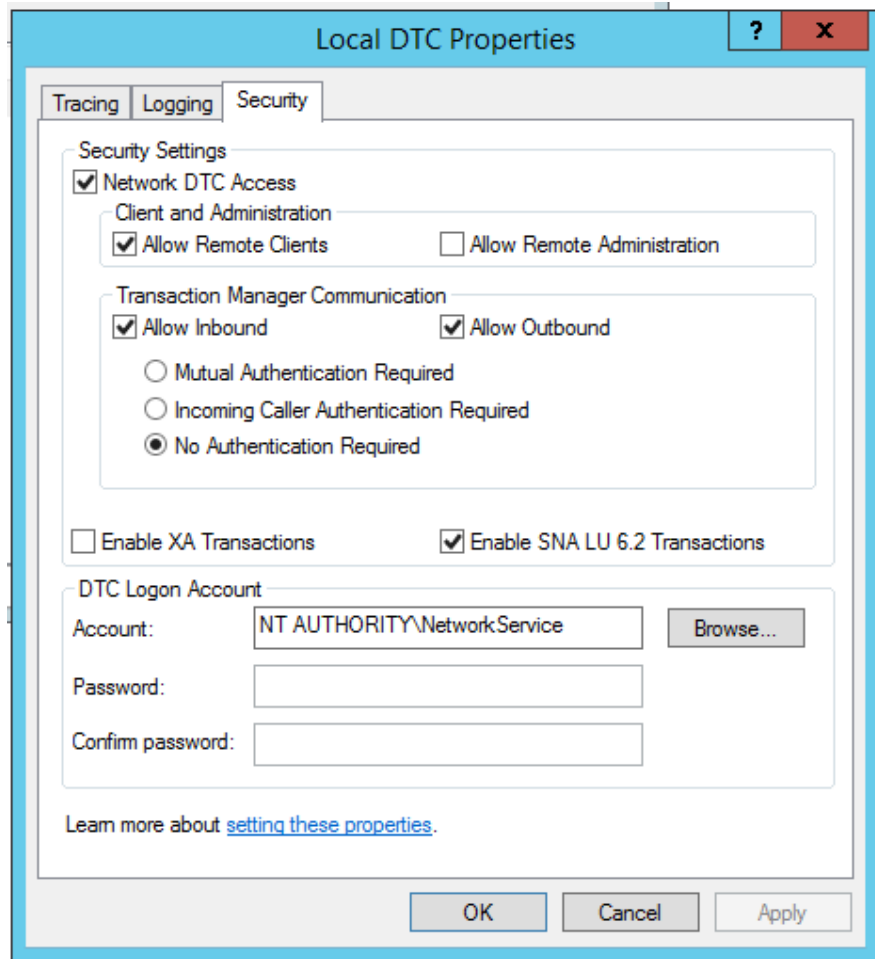
Figure A-1: Windows Component Services expanded to Local DTC



- b. Select **More Actions** → **Properties**.
- c. In the Local DTC Properties dialog, select the Security tab and change the following settings:
  - Check **Network DTC Access**.
  - Check **Allow Remote Clients**.

- Check **Allow Inbound**.
- Check **Allow Outbound**.
- Select **No Authentication Required**.
- Check **Enable SNA LU 6.2 Transactions**.
- The DTC Logon Account should be **NT AUTHORITY\Network Service**.

**Figure A-2: Local DTC Properties dialog with required settings**



3. Set communication ports and firewall rules.

Inbound communication	Firewall rule
Distributed Transaction Coordinator (RPC)	Predefined firewall rule in Server 2012 R2
Distributed Transaction Coordinator (RPC-EPMAP)	Predefined firewall rule in Server 2012 R2
Distributed Transaction Coordinator (TCP-In)	Predefined firewall rule in Server 2012 R2

Inbound communication	Firewall rule
UDP Port 1434	SQL Browser
TCP Port 1433	SQL
<b>EMERSONMW</b> SQL instance TCP port	SQL

Outbound communication	Firewall rule
Distributed Transaction Coordinator (TCP-Out)	Predefined firewall rule in Server 2012 R2
UDP Port 1434	SQL Browser
TCP Port 1433	SQL
<b>EMERSONMW</b> SQL instance TCP port	SQL

4. Filestream should be enabled, as follows:
  - a) On the **Start** menu, navigate to **All Programs**, navigate to **SQL Server 2017**, navigate to **Configuration Tools**, and then click **SQL Server Configuration Manager**.
  - b) In the list of services, right-click **SQL Server Services**, and then click **Open**.
  - c) In the **SQL Server Configuration Manager** snap-in, locate the EmersonMW instance of SQL Server.
  - d) Right-click the instance, and then click **Properties**.
  - e) In the **SQL Server Properties** dialog box, click the **FILESTREAM** tab.
  - f) Select the **Enable FILESTREAM for Transact-SQL access** check box.
  - g) We do not want to read and write FILESTREAM data from Windows. Click **Transact-SQL access enabled**.
  - h) Click **Apply**.
  - i) Create the folder where all of the filestream files will be written.  
By default, this is **C:\EmersonMW\Data\MwFS**. For example, if the other MhmDb files are on **D:\EMERSON\Data**, then create the new folder in **D:\EmersonMW\Data\MwFS**. If you are installing on a licensed SQL Server, then create the MwFS folder under default path for the other database files. This folder must exist prior to the AMS Machine Works installation or it fails.

## A.3 Set up the AMS Machine Works server before a Tier-2 installation

In a Tier-2 installation, when your SQL database is on a separate server, you need to change firewall settings on the AMS Machine Works server before and after installing the software, and before using the software. This section covers the settings you need to change on the AMS Machine Works server before installation.

### Prerequisites

Set up the separate SQL Server for a Tier-2 installation.

### Procedure

On the AMS Machine Works server, enable the ports for SQL communication to and from the server.

Inbound communication	Firewall rule
UDP Port 1434	SQL Browser
TCP Port 1433	SQL
EMERSONMW SQL instance TCP port	SQL

Outbound communication	Firewall rule
UDP Port 1434	SQL Browser
TCP Port 1433	SQL
EMERSONMW SQL instance TCP port	SQL

### Postrequisites

Make sure you have **sa** rights on the EMERSONMW SQL instance or know the credentials of the SQL account that has those rights before proceeding with AMS Machine Works installation.

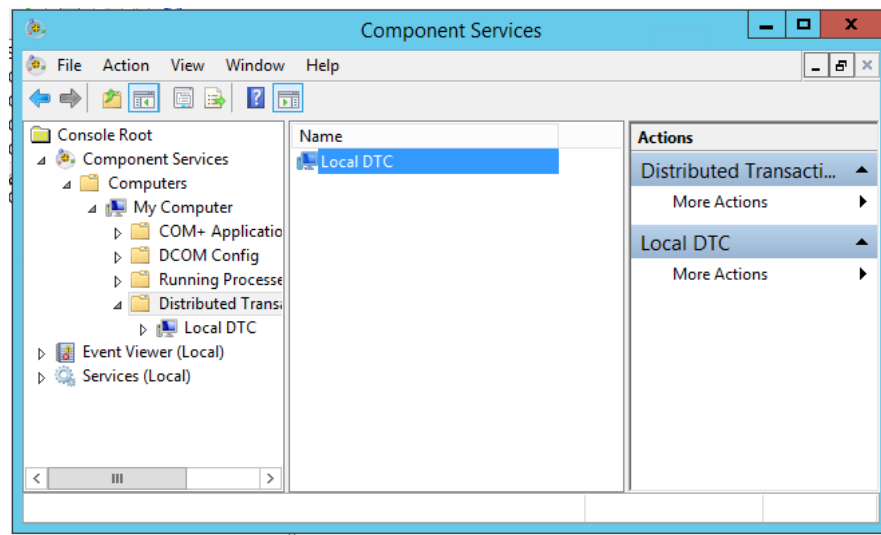
## A.4 Tier-2 post-installation setup

Complete this setup on the AMS Machine Works server after installing the software and before you start using it or installing other components.

### Procedure

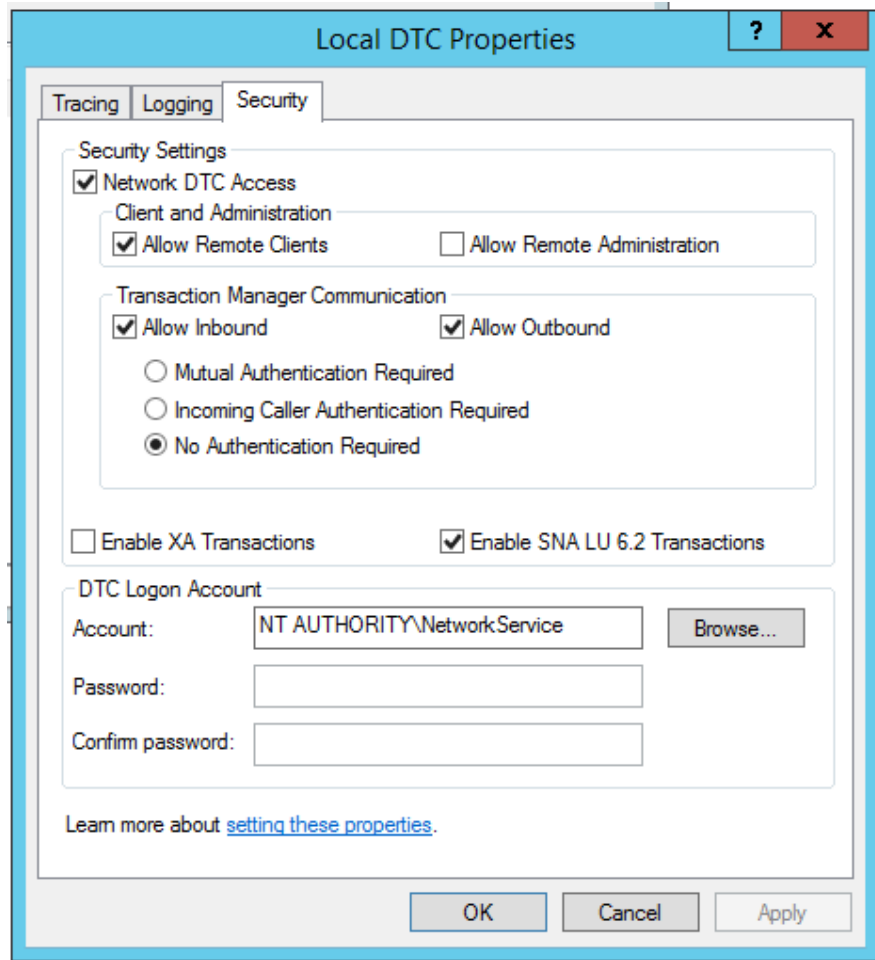
1. Update settings for Microsoft Distributed Transaction Coordinator (MDTC):
  - a. In **Windows Component Services**, browse to **Component Services** → **Computers** → **My Computer** → **Distributed Transaction Coordinator** → **Local DTC**.

**Figure A-3: Windows Component Services expanded to Local DTC**



- b. Select **More Actions** → **Properties**.
- c. In the Local DTC Properties dialog, select the Security tab and change the following settings:
  - Check **Network DTC Access**.
  - Check **Allow Remote Clients**.
  - Check **Allow Inbound**.
  - Check **Allow Outbound**.
  - Select **No Authentication Required**.
  - Check **Enable SNA LU 6.2 Transactions**.
  - The DTC Logon Account should be **NT AUTHORITY\Network Service**.

Figure A-4: Local DTC Properties dialog with required settings



2. Enable the predefined firewall rules to allow SQL communication.

Inbound communication	Firewall rule
Distributed Transaction Coordinator (RPC)	Predefined firewall rule in Server 2012 R2
Distributed Transaction Coordinator (RPC-EPMAP)	Predefined firewall rule in Server 2012 R2
Distributed Transaction Coordinator (TCP-In)	Predefined firewall rule in Server 2012 R2

Outbound communication	Firewall rule
Distributed Transaction Coordinator (TCP-Out)	Predefined firewall rule in Server 2012 R2



**Note**

These predefined rules are available on the AMS Machine Works server after you install the software. If the rules are not present, you may need to re-install AMS Machine Works.

**Postrequisites**

Install other components, as needed.

## A.5 Set up the AMS Machine Works Interface Server before installing an interface on a Tier-2 system

**Note**

This step is only required if you install the interface on a separate server.

This action requires connection to the SQL Server hosting the database that has rights to insert information into Plantweb Optics tables; this is known as "Action Registration." The SQL communications usually require additional access through server and network firewalls. The AMS Machine Works Interface Server only needs these firewall exemptions for Action Registration during installation. If the SQL communication is not available, you will get "Action Registration" failures during the interface installation. The firewall exceptions described here can be restored (removed) after the interface installation is complete.

**Prerequisites**

- This is a Tier-2 installation. The AMS Machine Works server does not host the databases. The databases are hosted on a separate SQL server.
- AMS Machine Works installation is complete.

**Procedure**

- On the target server, and any intervening firewalls, enable the ports for SQL communication to the SQL database server.

Inbound communication	Firewall rule
UDP Port 1434	SQL Browser
TCP Port 1433	SQL
<b>EMERSONMW</b> SQL instance TCP port (static)	SQL

Outbound communication	Firewall rule
UDP Port 1434	SQL Browser
TCP Port 1433	SQL
<b>EMERSONMW</b> SQL instance TCP port (static)	SQL

### **Postrequisites**

- Install the selected interface on the target server.
- You can remove these exceptions on the AMS Machine Works Interface Server after the installation is complete.

## B 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).
```

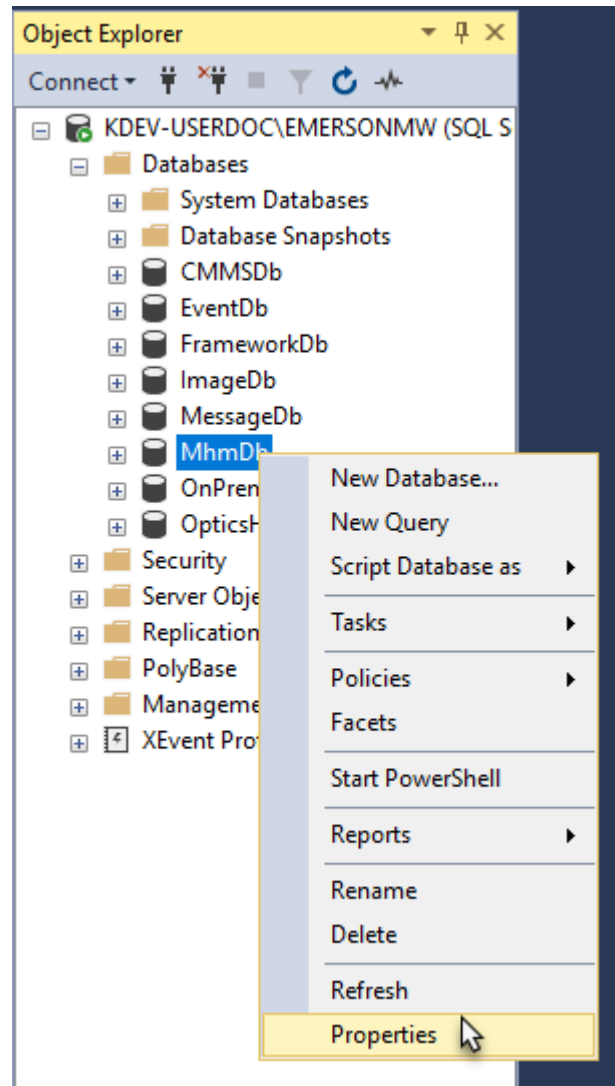
2. Set the system to use multiple filestream containers.

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`

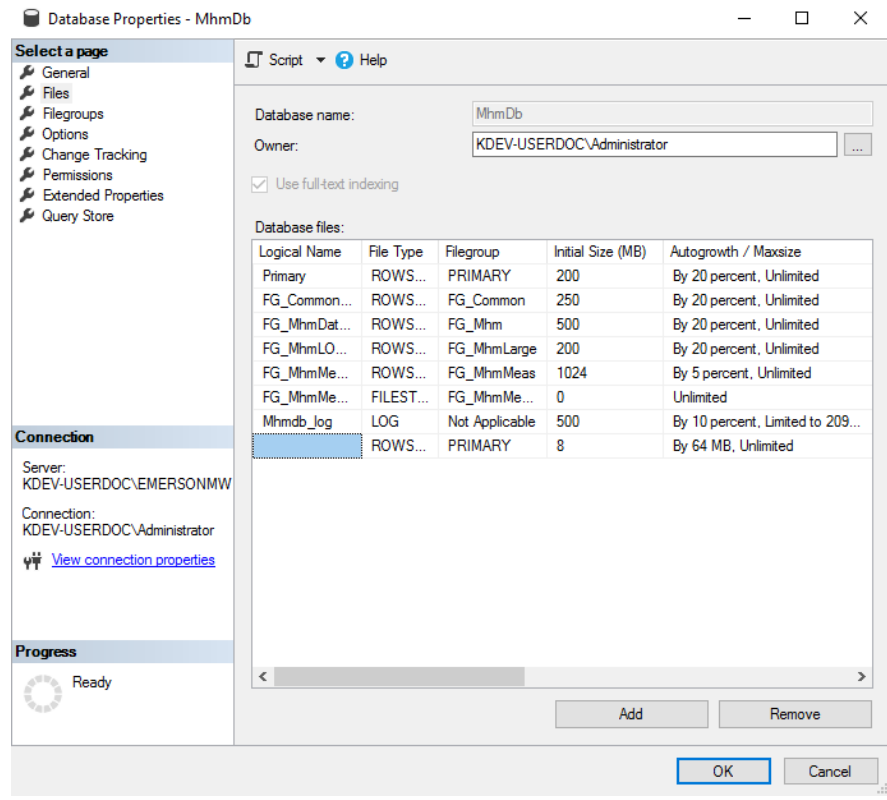
- a) In SQL Server Management Studio, expand **Databases**, right-click **MhmDb** and select **Properties**.

Figure B-1: Select properties for MhmDb



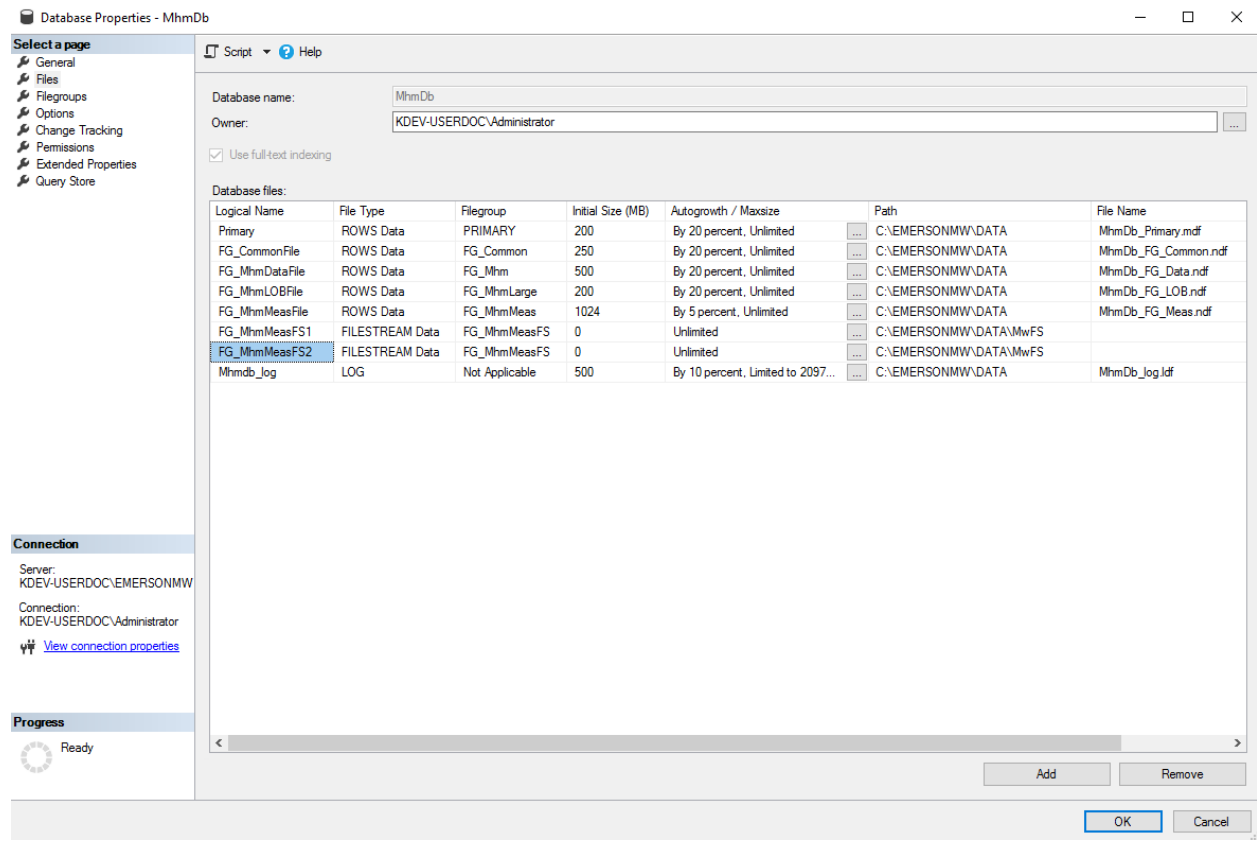
b) In the **Database Properties** dialog, select the **Files** page and click **Add**.

Figure B-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 B-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.

# C Internet Information Services (IIS) reference

## Note

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

**Table C-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

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

Application Pool	Site
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

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

<b>Application Pool</b>	<b>Site</b>
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



## D 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

# E Device compatibility

## AMS Wireless Vibration Monitor

AMS Machine Works v1.6 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 v1.6 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 1.6
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
A6500-TP	A6500-TP: 2.0.0.95 HW revision: Rev.06 and latest
AMS Machine Studio	2.81.46 and latest

# F OPC UA Software compatibility

This appendix shows supported OPC UA software versions for system compatibility.

**Table F-1: OPC UA Software compatibility**

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

## G Co-deployment and Co-existence

The table shows 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 these applications.

**Table G-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	NA?	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

# H Supported data storage and update rates

## Topics:

- H.1 Ovation Machinery Health Monitor module supported data storage and update rates
- H.2 AMS 6500 ATG supported data storage and update rates
- H.3 Wireless data storage and update rates
- H.4 AMS 9420 data storage and update rates

## H.1 Ovation Machinery Health Monitor module supported 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)

## H.2 AMS 6500 ATG supported data storage and update rates

Table H-1: AMS 6500 ATG supported 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
Short Waveform / Spectrum (Low-Res)	10 sec	10 sec	10 sec	5 min
Long Waveform / Spectrum (High-Res)	30 min	30 min	30 min	1 hour

## H.3 Wireless data storage and update rates

These are the performance goals for the wireless data performance and scalability, using the AMS Wireless Vibration Monitor, for example.

AMS Wireless Vibration Monitor scalability for v1.6:

- Wireless Interface: 4,000 devices (with 600 devices per Interface server)

AMS Wireless Vibration Monitor collection rates for performance and scalability<sup>3</sup>

- Device Variables: 4,000 devices @ 60 min
- Device Variables: 3,800 devices @ 60 min and 200 devices collecting at 1 min
- Diagnostic Thumbnails: 4,000 devices @ 4 hours
- Diagnostic Thumbnails: 3,800 devices @ 4 hours and 200 devices collecting at 1 hour
- Spectra: 4,000 devices @ 1 per day
- Spectra: 3,800 devices @ 1 per day with 200 devices collecting at 8 hours
- Waveforms: 4,000 devices every 30 days
- Waveforms: 3,800 devices every 30 days with 200 devices collecting every day

Number of devices at fastest rates: 200 devices

- Device Variables: 1 min
- Diagnostic Thumbnails: 1 hour
- Spectra: 8 hours
- Waveforms: Every day

AMS Wireless Vibration Monitor collection rates default<sup>3</sup>

- Device Variables: Publish rate with warnings below 60 min
- Diagnostic Thumbnails: Every 4 hours
- Spectra: Every 7 days
- Waveforms: Every 30 days

## H.4 AMS 9420 data storage and update rates

These are the performance goals for the wireless data performance and scalability, using the AMS 9420, for example.

AMS 9420 scalability for v1.6:

- Wireless Interface: maximum 600 devices per system

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

- Burst Variables: 600 devices @ 60 min

---

<sup>3</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>4</sup> Applies to all the applicable measurements across all channels per device.

- Burst Variables: 60 devices @ 1 min
  - Device Variables: 600 devices @ 1 per day
  - Device Variables: 60 devices @ 8 hours
  - Energy Bands: 600 devices @ 1 per day
  - Energy Bands: 60 devices @ 8 hours
  - Thumbnails: 600 devices @ 1 per day
  - Thumbnails: 60 devices @ 8 hours
  - Waveform and Spectra: 600 devices @ 1 per 15 days
  - Waveform and Spectra: 60 devices @ 1 per day
- Number of devices at fastest rates: maximum of 60 devices
- Burst Variables: 1 min
  - Device Variables: 8 hours
  - Thumbnails: 8 hours
  - Waveforms and Spectra: Every day

# I AMS Machine Works supported installation scenarios

The following table provides a list of supported and unsupported ways to install AMS Machine Works.

Item	Scenario	Supported
<b>Single-Tier Database Installations (SQL Server Express 2017, installed automatically)</b>		
1	Installation with Tier-1 database selection– AMS Machine Works with Wireless Interface	✓
2	Installation with Tier-1 database selection – AMS Machine Works with Ovation Interface	✓
3	Installation with Tier-1 database selection – AMS Machine Works with ATG interface	✓
4	Installation with Tier-1 database selection– AMS Machine Works with Combination of these interfaces	✓
<b>Multi-Tier Database Installations (SQL Server 2017 or SQL Server 2019, customer installed)</b>		
5	Installation with Tier-2 database selection – AMS Machine Works with SQL Server 2017	✓
6	Installation with Tier-2 database selection – AMS Machine Works with SQL Server 2019	✓
7	Installation with Tier-2 database selection – AMS Machine Works Distributed Install	✓
<b>Multiple Interface Servers</b>		
8	Install multiple AMS 6500 ATG Interface on multiple servers connected to one Interface Router	✓
9	Install multiple Ovation MHM Interface on multiple servers connected to one Interface Router	✓
10	Install Wireless Interface on multiple servers connected to one Interface Router	✓
Other Scenarios		
11	Install AMS Machine Works on a different drive than C:	✓
<b>Operating Systems and Antivirus</b>		
12	Install on Windows Server 2012 R2	✓
13	Install on Windows Server 2016	✓
14	Install on Windows Server 2019	✓
15	Install on Windows 10 (to be used for Demo purposes only)	✓
16	Install on non-English operating system	✓
17	Install on Sales Demo Laptop running on Windows 10	✓



Item	Scenario	Supported
18	Install with Antivirus enabled: - McAfee 10.6.x and above, Symantec 14.2.x and above, or Norton	✓
<b>Installs, Modify and Uninstall</b>		
19	Uninstall AMS Machine Works	✓
20	Modify AMS Machine Works	✓
21	Install Help post-installation if an update of the help system is released.	✓
23	Install OPC UA Server	✓
24	Uninstall AMS Machine Works v1.5 and install AMS Machine Works v1.6	✓ Clean up procedure must be followed. Data will not be migrated in this case.
<b>Other Installation Scenarios</b>		
25	Install with non-default ports (in both distributed and single-server scenarios)	✓
26	Change the buffer size of the interface during installation	✓
27	Install AMS Machine Works on a server with Microsoft Visual C++ redistributable version already installed	✓
28	Ovation MHM Interface with Data Diode Configuration	✓
29	AMS Machine Works upgrade from v1.5 to v1.6	✓
<b>Scenarios not supported</b>		
30	Install as a Non-administrator	Not supported
31	Install some parts as one user and the rest as a different user	Not supported
32	Install AMS Machine Works in FIPS enabled machine (FIPS Compliance)	Not supported
33	Install AMS Machine Works with AMS Machinery Manager v6.3 or v6.3.1, or v 5.71	Not supported
34	Install without following the install order as directed by AMS Machine Works System Guide	Not supported
35	Install Plantweb Optics v1.6 with AMS Machine Works v1.6 on the same server	Not supported
36	Upgrading demo software to support interfaces	Not supported

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