System Guide
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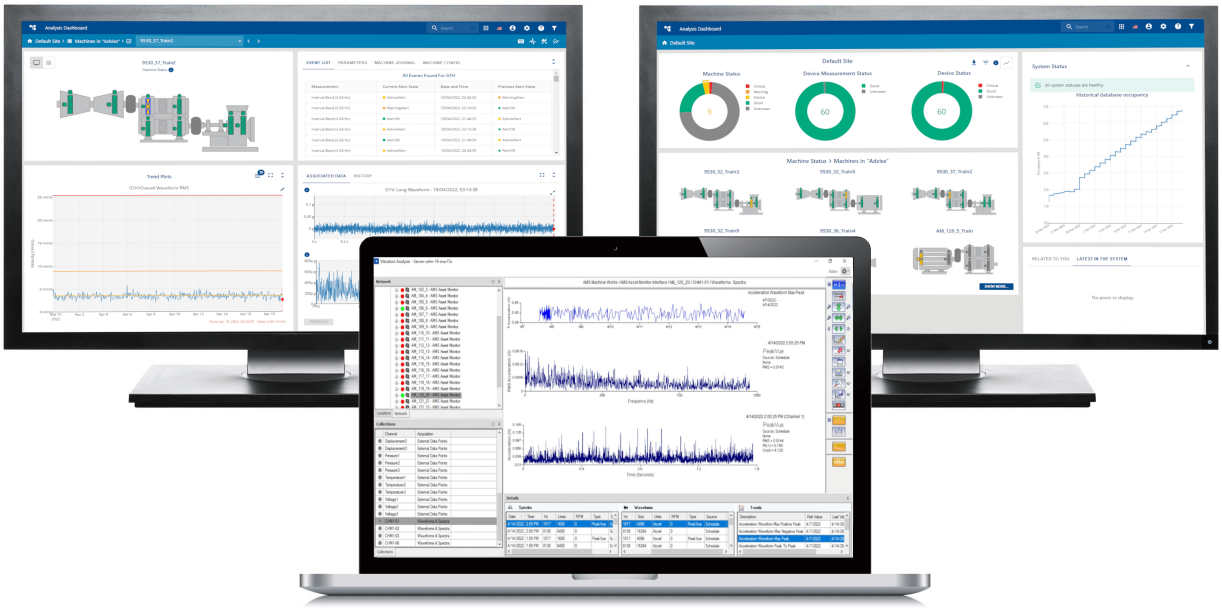
AMS Machine Works v1.7.5

System Guide



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Where to get help

Emerson provides a variety of ways to reach your Product Support team to get the answers you need when you need them:

Phone	Toll free 1 800 833 8314 (U.S. and Canada) +1 512 832 3774 (Latin America) +63 2 8702 1111 (Asia Pacific, Europe, and Middle East)
Email	Guardian.GSC@Emerson.com
Web	http://www.emerson.com/en-us/contact-us

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1 Introduction

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

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

What's in this installation

This version of AMS Machine Works comes with a single installer that will provide options to install all the AMS Machine Works web components and every **Agent**. You can deploy each **Agent** more than once, and distribute them according to your network requirements. Some of the web components are also distributable depending on the networking requirements. The main data storage is handled by MongoDB, which is deployed on the same server as the AMS Machine Works server by default. MongoDB can also be deployed on an external server or on a cloud server. Refer to this guide for more details.

Other installation options

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

About this manual

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

Other relevant documents

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

1.1 Symbols

Note
This symbol marks passages that contain important information.

⚠ CAUTION

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

2 Planning your system

AMS Machine Works is comprised mainly of two components, AMS Machine Works web components and **Agent** 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 Installation* topic and continue your installation.

2.1 Guidelines for planning your system

Procedure

1. Determine the data sources that you want to bring into AMS Machine Works and check if they are compatible. See: Device compatibility.

   Depending on the type of data source, install the appropriate **Agent** to bring the right data source into AMS Machine Works. See Software Components.

2. Confirm the system will not exceed scalability limitations. See: System Scalability.
3. Determine your network setup.

   Your network setup affects the deployment of the AMS Machine Works components. See: Deployment Scenarios.

   a) If you are using a Fully Qualified Domain Name (FQDN), modify your installation as described here: Optional Installation Steps for Using a Fully Qualified Domain Name (FQDN)

4. Determine any network architecture restrictions in your network.

   Your network architecture affects what firewall exceptions you need to define. See: AMS Machine Works Security

5. Determine your database requirements.

   The AMS Machine Works MongoDB database for measurements can be either **Internal** or **External**. The SQL database server can be **Internal SQL** or **External SQL**. See: Database Deployments

6. Check the System Requirements.
7. Check Internet Information Services (IIS) requirements.
8. Plan to integrate security certificate installation with software installation. See: AMS Machine Works Security
9. Ensure any systems you plan to interface with AMS Machine Works are ready.

   a) 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.

b) Before interfacing AMS Asset Monitor devices with AMS Machine Works, access the AMS Asset Monitor Web Interface and ensure that the device has been fully configured, the AMS Machine Works Interface is enabled and that an AMS Machine Works user is created.

10. Determine if you need to read data from AMS Machine Works using an OPC UA Server client.

2.2 Using the installer

The zip file `Installer_1.7.X.X.zip` contains all of the installation materials for the AMS Machine Works v1.7.5 software distribution.

After downloading the `Installer_1.7.X.X.zip` file, you must **Unblock** the zip file. To **Unblock** the zip file, and right-click it, select **Properties**, and in the **General** tab, click **Unblock**.

Note
If the zip file is **Blocked**, an "Unhanded Exception" error will occur and the setup will terminate.

It is recommended to place the `Installer_1.7.X.X.zip` file in a root location, such as C, on each server you plan to install any component of AMS Machine Works, and to unzip to a root location. This will keep file path lengths to a minimum.

Note
The installation can fail if file paths are too long.

On each server, run `setup.exe` from a root location. Only select the options which are strictly necessary for the server you are performing an installation on.

Note
Do not run `setup.exe` from a network folder.

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 **Agent**. — It is a three step process to register a new **Agent** in an existing AMS Machine Works server or AMS Machine Works Agent server installation.
    a. First, run the installer, and enter the AMS Machine Works server name and port.
    b. Next, select the **Agent** to register.
    c. Finally, install the **Agent** on the server. (AMS Machine Works server or AMS Machine Works Agent server, depending on the deployment.)
3. Uninstall the software. — See Uninstall AMS Machine Works for more information.

2.3 Windows updates

If permitted by your IT department, pause or disable Windows Updates (as well as other automatic updates on your server) for the duration of the installation. This reduces the number of potential restarts during installation. It is normal to have several restarts during installation. However, if automatic updates are enabled with other applications, especially Windows Updates, there can be over 10 reboots during the installation, depending on the installed programs and the timing of the automatic updates. If it is not possible to pause automatic updates, it can help to first check for updates and apply them before installing AMS Machine Works.

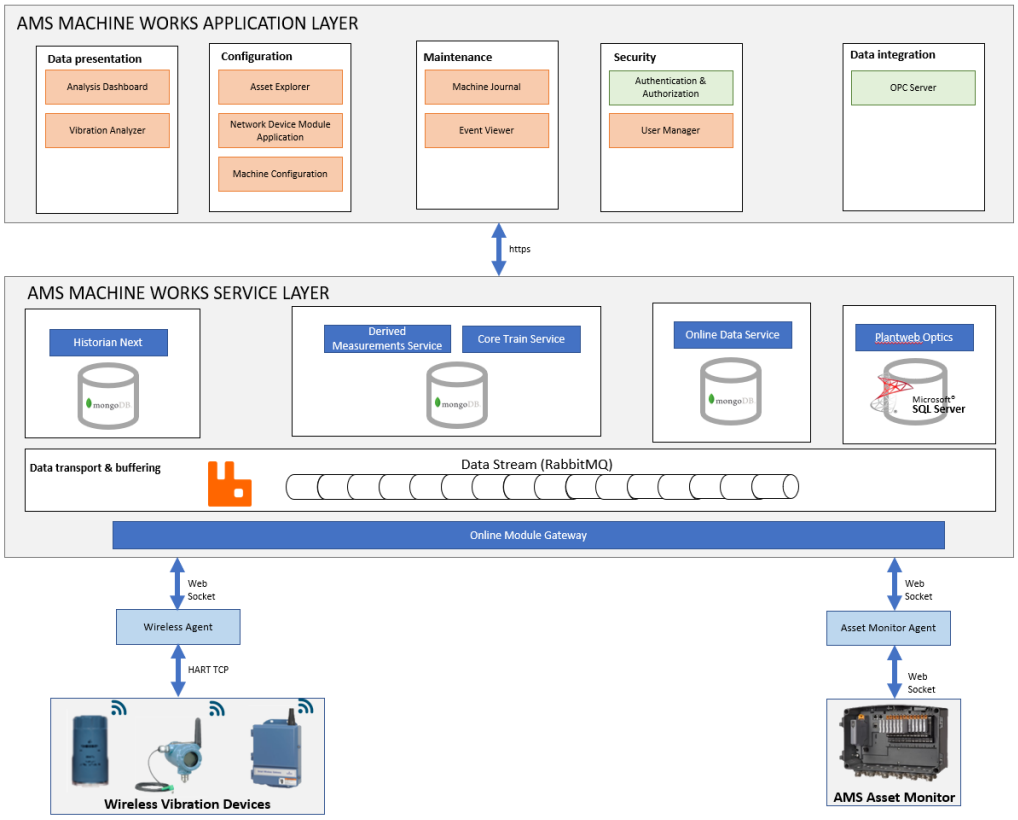
2.4 Internet Information Services (IIS)

- 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 216 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

2.5 AMS Machine Works Architecture

AMS Machine Works has three distinct architecture layers:

Figure 2-1: AMS Machine Works Architecture



A. ***AMS Machine Works Application Layer***— *This layer contains several web applications for data presentation, configuration, maintenance, security, and data integration. Connects to OPC UA Server.*
B. ***AMS Machine Works Service Layer***— *This layer processes the vibration data for health, alerts, aggregation, and calculating derived measurements. Manages machine trains, monitors alerts, and assesses the health of assets.*
C. ***Network Device Module Layer***— *This layer connects to monitoring devices and collects vibration data. Native measurements, device health, and status information data is sent to the Core Module.*

2.6 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 complete installation can be achieved with one server. This involves installing all the core web components listed in Table 2-1 and **Agent** components listed in Table 2-2 on one server. See: Internal — Single Server Scenario

AMS Machine Works supports deployments on complicated network topologies. This involves deploying the components listed in the tables below on different servers. See: External — Distributed Server Scenarios

Table 2-1: 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 Network Device Configuration, Machine Configuration, AMS Machine Works Analysis Dashboard, and Machine Journal. AMS Machine Works Web Service allows you to create machines in Asset Explorer, perform machine analysis and diagnostics, and maintain case history in AMS Machine Journal. It obtains data from other components, which can be installed on the same server or different servers.
AMS Machine Works Vibration Analyzer	The Vibration Analyzer is a thick-client web application you can use to perform detailed analysis on vibration data stored in the long-term historian. It can be installed on the AMS Machine Works Server or separately installed on any client computer that will be used for detailed analysis of vibration data.

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

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

Table 2-2: AMS Machine Works Agent Components

Component	Description
AMS Machine Works Wireless Agent[1]	AMS Machine Works Wireless Agent 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 Asset Monitor Agent[1]	AMS Asset Monitor Agent is a windows service that brings data into AMS Machine Works from an AMS Asset Monitor.

1 *If installed on a separate server, the AMS Machine Works Server certificate must be installed on the AMS Machine Works Agent Server.*

Agent software components are distributable, and can be installed on an external **Agent** server.

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

2.7 Database Deployments

With AMS Machine Works 1.7.5, the database for storing measurement data is MongoDB. The SQL database is now only used for storing AMS Machine Works application configuration information.

The recommended SQL database is Microsoft SQL Server Express, this software meets all of the performance requirements for the configuration database.

You should choose an External MongoDB Server Installation when some or all of the following conditions are met:

- Your previous installation of AMS Machine Works required an External SQL Server.
- Your network administration policies require physical or logical separation of servers.
- Your data retention policies require data storage greater than can easily be supported on the computer acting as your AMS Machine Works server.
- When the 'XL' size of a single server no longer meets your needs. Processor and Memory Specifications

There are three MongoDB database deployment options:

1. Single Server Deployment — The MongoDB database is on the same machine as the AMS Machine Works software. The AMS Machine Works installer handles the MongoDB database configuration. See: MongoDB Single Server Deployment — Internal
2. External Server Deployment — The MongoDB database is on an external server within the same network as the AMS Machine Works server machine. See: MongoDB External Server Deployment
3. Cloud Server Deployment — The MongoDB database, in this case MongoDB Atlas, is on an external server accessed through the internet. See: MongoDB Atlas Cloud Server Deployment

There are two SQL database deployment options:

1. Single Server Deployment — The SQL server is on the same machine as the AMS Machine Works software. The AMS Machine Works installer handles the SQL database configuration. See: Single Server Deployment — Internal SQL
2. External Server Deployment — The SQL server is on an external server within the same network as the AMS Machine Works server machine. See: External Server Deployment — External SQL

Note
AMS Machine Works supports external deployments with complex network topologies. The connection string which is required depends on your network, contact your system administrator for assistance.

2.7.1 MongoDB Database Deployment

MongoDB Single Server Deployment — Internal

An internal MongoDB Database installation is the default configuration. To deploy the database on the same server as the AMS Machine Works software you should proceed with the **Internal** option. A MongoDB 6.0.10 database will be automatically installed and configured. Before you begin the installation process you should verify that a MongoDB is not currently installed.

Note
Installation will fail if a version of the MongoDB database already exists on the machine.

When the MongoDB is created the following actions are completed by the installer:

- A MongoDB 6.0.10 database is created and configured.
- The MongoDB database is configured to use port 27018.
- A MongoDB database administrator user is created.
- A MongoDB database user is created for AMS Machine Works services to use for communicating with the MongoDB database server.

MongoDB External Server Deployment

An external Mongo DB database server deployment requires that a MongoDB database server has previously been fully configured and network access is available. You must choose the **External** option in the installer. External installation requires specific server configuration and database management to be performed by your database administrator.

When you choose to use an external MongoDB deployment these configuration and management steps include:

- Creating a MongoDB database user on the external server machine with the appropriate privileges for AMS Machine Works services to use for communicating with the MongoDB database server. See: External MongoDB Server Installation
- Ensuring network connectivity between the AMS Machine Works server and MongoDB database server.
- Providing a certificate file for the MongoDB database.

Note
Depending on the database configuration, the connection string that must be entered during the software installation process will have different parameters.

MongoDB Atlas Cloud Server Deployment

A MongoDB Atlas cloud server deployment requires that a MongoDB Atlas cloud database server has previously been fully configured and network access is available. You should choose the **External** option in the installer. External installation requires specific server configuration and database management to be performed by your database administrator.

When you choose to use an external MongoDB Atlas cloud deployment these configuration and management steps include:

- Creating a MongoDB database user on the external cloud server machine with the appropriate privileges for AMS Machine Works services to use for communicating with the MongoDB Atlas cloud database server. See: External MongoDB Server Installation
- Ensuring network connectivity between the AMS Machine Works server and the MongoDB Atlas cloud server.
- Adding the IP address of the AMS Machine Works server to the Access List of the MongoDB Atlas cloud server.

Note
Depending on the database configuration, the connection string that must be entered during the software installation process will have different parameters.

2.7.2 SQL Database Deployment

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

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

The two database installation choices are described in the sections below, because SQL is just used for storing configuration data, the **Internal SQL** option is recommended.

Single Server Deployment — Internal SQL

During installation, after selecting **Internal SQL**, a Microsoft SQL Server 2017 Express database is deployed on the same server as the software and is automatically installed during installation. Automatic backup processing is available for this installation.

- Check Windows Programs and Features to verify that Microsoft SQL Server is not currently installed. If it is installed, uninstall it. During an **Internal SQL** installation, Microsoft SQL Server 2017 Express is automatically installed and configured, select **Internal SQL** at the database prompt to use this software

  Note
  There is a 10 GB database limit on Microsoft SQL Server 2017 Express.

- 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

External Server Deployment — External SQL

During installation, after selecting **External SQL**, the database is deployed on a separate server where a full version of Microsoft SQL Server 2017 or 2019 is already installed and dedicated to AMS Machine Works. A **External SQL** 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 External SQL Server Installation for installation instructions.

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

2.8 Deployment Scenarios

Each of the deployment types can have all of the **Agent** types, a single type of **Agent**, or a mix of **Agent** types.

Deployment scenarios involve various locations for each **Agent**:

- **Internal** — Single Server
- **External** — Distributed Deployment

For example with two types of **Agent** there are three combinations:

- **Emerson Wireless Agent**
- **AMS Asset Monitor Agent**
- **Emerson Wireless Agent** + **AMS Asset Monitor Agent**

Deployment scenarios also involve various locations for the two databases **MongoDB** and **SQL**:

- **MongoDB**
  - **Internal** — Single Server
  - **External** — Distributed Deployment
- **SQL**
  - **Internal SQL** — Single Server
  - **External SQL** — Distributed Deployment

In general there are two types of deployments which have many possible installation scenarios depending on your network topology:

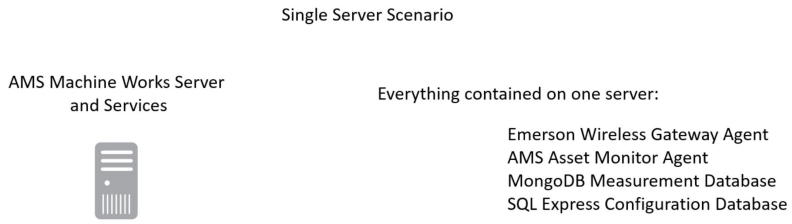
- **Single Server Deployment** — **AMS Machine Works**, **MongoDB**, **SQL**, and the **Agents** can be deployed together on one server. See: Internal — Single Server Scenario

- **Distributed Server Deployments** — **AMS Machine Works** can be deployed on one server and the **MongoDB**, **SQL**, and **Agents** can be located on other servers. See: External — Distributed Server Scenarios

2.8.1 Internal — Single Server Scenario

AMS Machine Works can be completely installed on one server which meets the System Requirements. This includes all the software components, every **Agent**, the **Internal** MongoDB database for storage of measurements, and the **Internal SQL** database for storage of configuration information.

Figure 2-2: AMS Machine Works Single Server Scenario



2.8.2 External — Distributed Server Scenarios

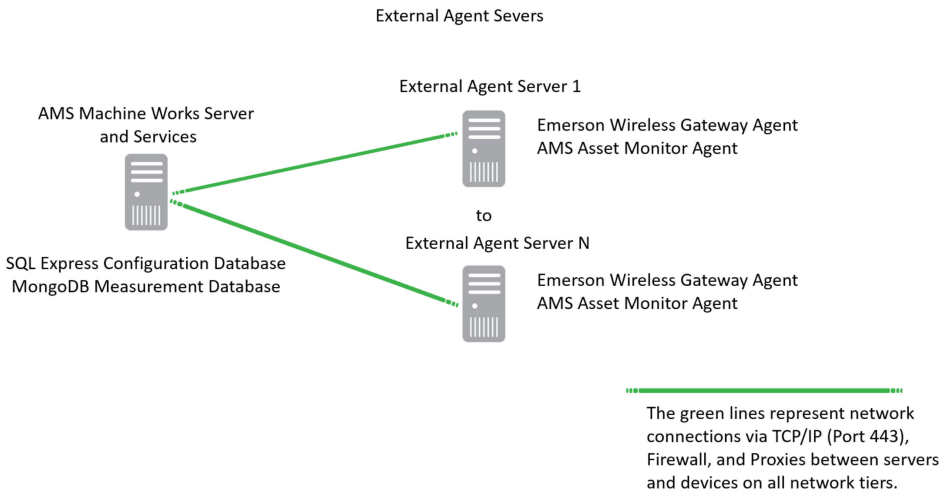
AMS Machine Works is a highly modular system of software and databases. The Software Components and Database Deployments can involve multiple servers and complex network topologies.

External Agents Scenario

With AMS Machine Works every **Agent** which is used to communicate with devices can be on a different server. When you run the AMS Machine Works installer you have an option to install just the **Agent Server**. During the **Agent Server** installation process you can enter the name of the AMS Machine Works server you want to connect to and the port for communications.

AMS Machine Works also supports multiple copies of each type of **Agent**. If your collection of monitoring devices grows, or your network topology changes, you can install an additional **Agent Server** at any time you need.

Figure 2-3: External Agents



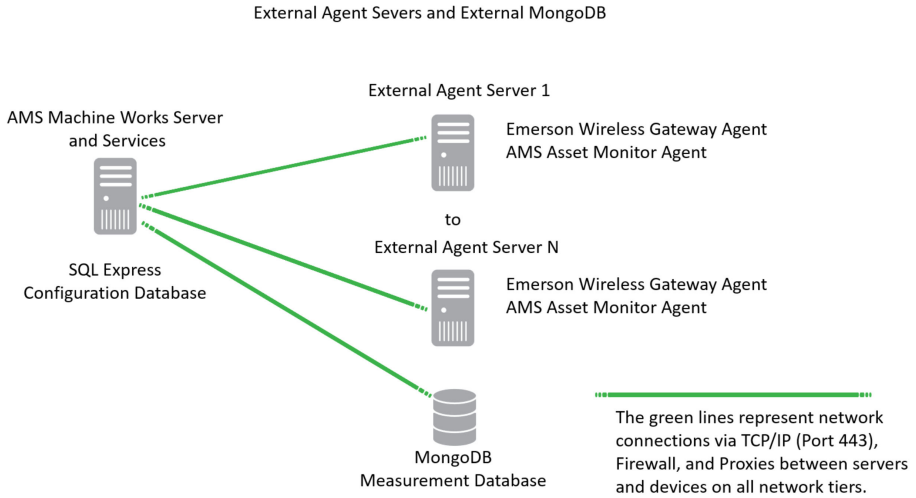
External Agents and MongoDB Scenario

The main data storage for measurements from devices is MongoDB. If there is a requirement to have MongoDB on an **External** server this is possible. During the AMS Machine Works installation process you have a choice between an **Internal** or an **External** MongoDB server installation.

In the previous section we saw a deployment scenario with **External Agents**. The diagram below adds another layer of complexity by adding an **External** MongoDB server. See: External Agents and MongoDB Scenario

Note
An **External** MongoDB database can be installed without **External Agents**.

Figure 2-4: External Agents and MongoDB

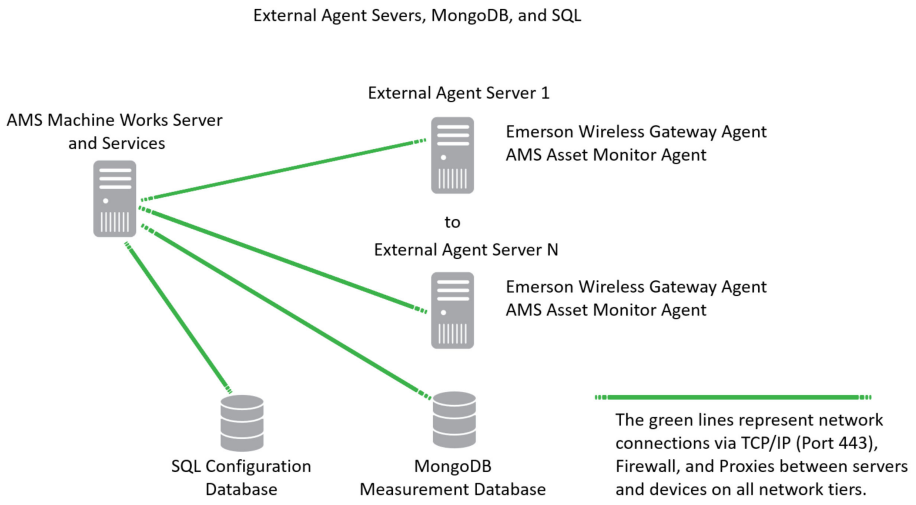


External Agents, MongoDB, and SQL Scenario

AMS Machine Works uses a SQL database to store its configuration data. The default setting is for an **Internal SQL** installation of SQL Express, which is performant enough for this purpose.

AMS Machine Works supports an **External SQL** option for installations which require this. During the AMS Machine Works installation process you have a choice between **Internal SQL** and **External SQL**. This deployment scenario depicts a fully distributed deployment of AMS Machine Works.

Figure 2-5: AMS Machine Works Server with All Other Elements Distributed



2.8.3 Typical Deployment Scenarios

AMS Machine Works is typically installed in complex network environments which are separated by network firewalls, and access between levels is granted via ports, proxy servers, or a combination of both.

The different components of AMS Machine Works can be spread over different network levels according to your needs.

The diagrams presented below represent some of the most commonly used deployment scenarios, but many other deployment scenarios are theoretically possible. See: Other Deployment Scenarios

Figure 2-6: Single Server with Client Access from Plant LAN

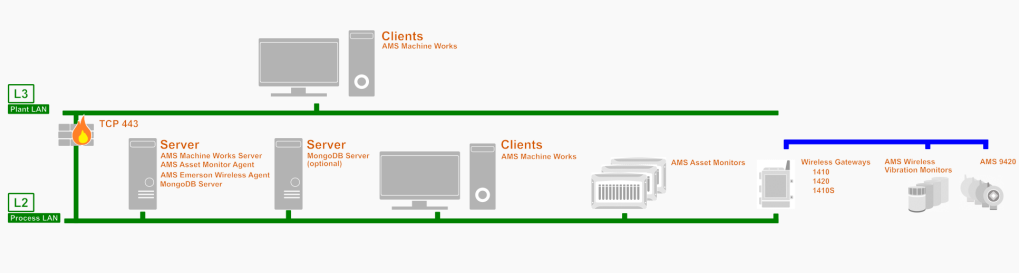


Figure 2-7: Single Server with Client Access from Business WAN

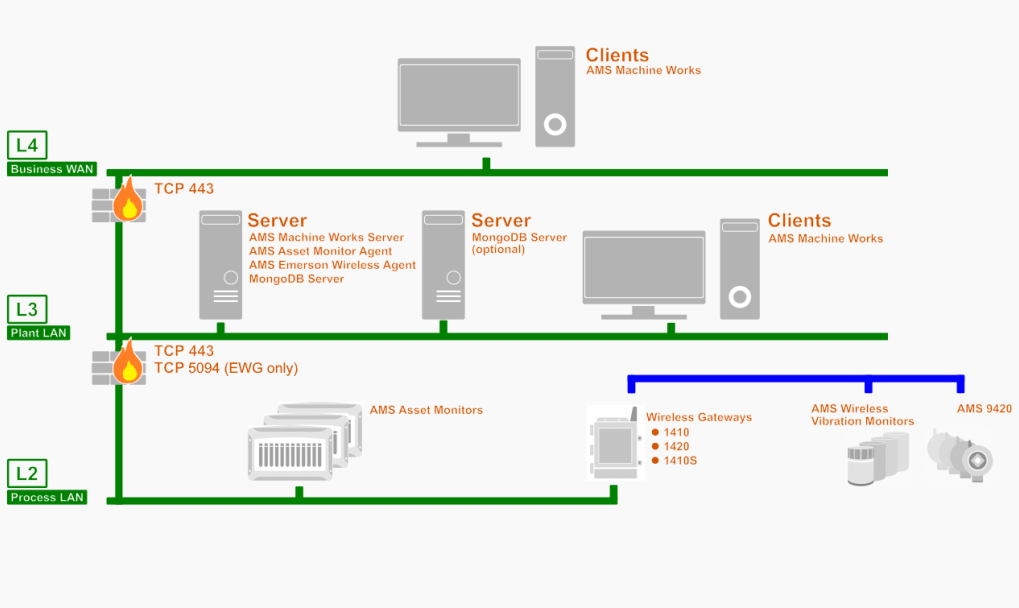


Figure 2-8: Standard Architecture

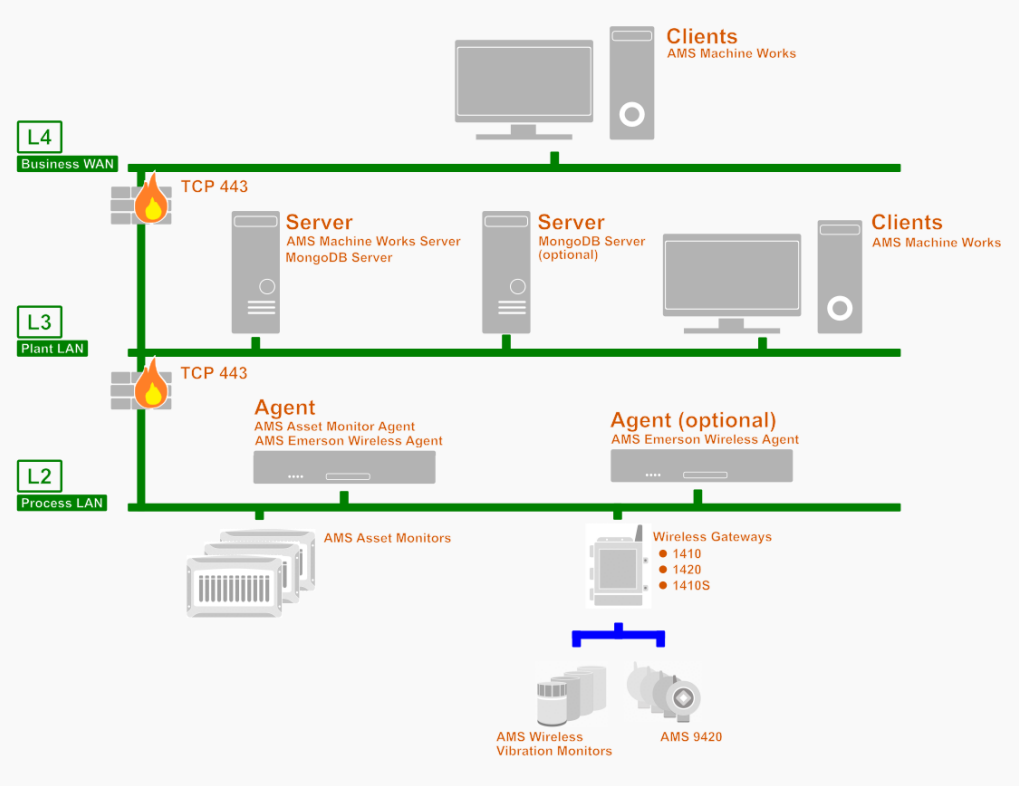
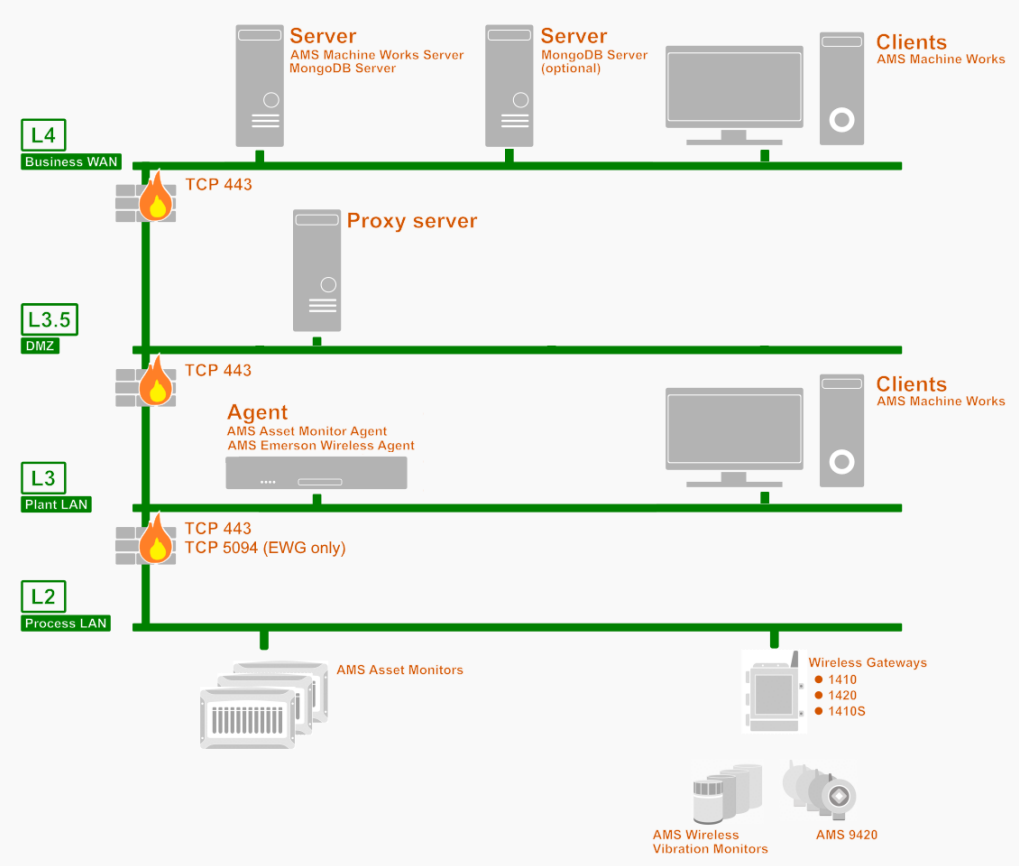


Figure 2-9: Enterprise Deployment



1

2.8.4 Unsupported Installation Scenarios

The following installation scenarios are not supported in AMS Machine Works v1.7.5:

- **Installing AMS Machine Works v1.7.5 as a Non-administrator** - The installation always requires administrator privileges.
- **Installing some parts as one user, and the rest as a different user** - The installation has to be completed by one user with administrator privileges.
- **Installing without following the installation procedures as directed by the AMS Machine Works v1.7.5 System Guide** - The Installation procedures detailed in this System Guide are the only guaranteed method of installing AMS Machine Works v1.7.5.
- **Installing AMS Machine Works on FIPS enabled machine (FIPS Compliance)** - FIPS is not supported in AMS Machine Works v1.7.5.

1 *Installation procedures for a Proxy Server are described in KBA: NK-2400-0060*

- **Upgrading a demo version of the software to support agents** - A demo software version cannot be upgraded to a full AMS Machine Works v1.7.5 version. A new installation is required.
- **Installing AMS Machine Works v1.7.5 with AMS Machinery Manager v6.3 or v6.3.1, or v 5.71** - The aforementioned versions of AMS Machinery Manager are not supported.
- **Install Plantweb Optics v1.6 with AMS Machine Works v1.7.5 on the same server** - Plantweb Optics and Machine Works have to be installed on separate servers.

2.8.5 Other Deployment Scenarios

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

2.9 System Requirements

After ensuring that all following system requirements are met, return to Step 2 of the *Preparing for Installation* topic and continue your installation.

Note
Some features require email connectivity to operate, e.g. **Reset Password**. If your installation does not have this connectivity you will have to set up an On-Premise SMTP.

AMS Machine Works Server

Note
Use system specifications marked "recommended" for deployments including AMS Asset Monitor, Emerson Wireless Gateway, and other devices.

Operating system	Windows Server 2022 Standard or Datacenter Windows Server 2019 Standard or Datacenter Windows Server 2016 Standard or Datacenter
CPU architecture	64-bit
Internet Information Services (IIS)	v8.5, v10 (supplied with OS)
Browsers[1]	Google Chrome (latest version) Microsoft Edge (latest version)
Processor[2]	Large and Extra-Large Systems — 3.2 GHz, 8-core processor, Intel Xeon-scalable (Gold) or faster (recommended) Small and Medium Systems — 2.4 GHz, 6-core processor, Intel Xeon-scalable (Gold) or faster (minimum)
RAM[2]	Large and Extra-Large Systems — 64 GB Medium Systems — 32 GB Small Systems — 16 GB
Hard drive[3]	SSD hard drive (recommended) SAS hard drive (10K RPM) (minimum)

Available disk space	1 TB (recommended) 500 GB (minimum) 100 GB (for wireless-only setup)
Screen resolution	4K UHD (3840 x 2160 pixels) SXGA (1280 x 1024 pixels) (minimum)
Network	2 x 1 GB NIC (use 2 NICs to isolate Level 3 traffic from Level 2 traffic) (recommended) 1 x 1 GB NIC (supported)

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

AMS Machine Works Agent Server

Operating system	Windows Server 2022 Standard or Datacenter Windows Server 2019 Standard or Datacenter Windows Server 2016 Standard or Datacenter
CPU architecture	64-bit
Processor[1]	Two Agent Systems — 2.4 GHz, 6-core processor Intel Xeon-scalable or faster Single Agent Systems — 2.4 GHz, 4-core processor Intel Xeon-scalable or faster
RAM[1]	Two Agent Systems — 32 GB Single Agent Systems — 16 GB
Hard drive[2]	SSD hard drive (recommended) SAS hard drive (10K RPM) (minimum)
Available disk space	10 GB (Wireless Agent) 10 GB (AMS Asset Monitor Agent)
Network	2 x 1 GB NIC (use 2 NICs to isolate Level 3 traffic from Level 2 traffic) (recommended) 1 x 1 GB NIC (supported)

1 *Refer to Processor and Memory Specifications for more details.*
2 *Refer to Hard disk type per system profile for more details.*

AMS Machine Works Vibration Analyzer Client

Operating system	Windows Server 2022 Standard or Datacenter Windows Server 2019 Standard Windows Server 2016 Standard Windows 10 Pro Windows 10 Enterprise
CPU architecture	64-bit

Processor	2.2 GHz, 4-core processor Intel Xeon, Intel Core i5 6th Gen (i5 6400T) or better
RAM	16 GB (recommended) 8 GB (minimum)
Hard drive	SAS hard drive (10K RPM)
Available disk space	100 GB
Screen resolution	4K UHD (3840 x 2160 pixels) SXGA (1280 x 1024 pixels) (minimum)

External MongoDB Server

2

Operating system	Windows Server 2022 Standard or Datacenter Windows Server 2019 Standard or Datacenter Windows Server 2016 Standard or Datacenter
CPU architecture	64-bit
MongoDB Server[1]	MongoDB 6.0.10
Processor	2.4 GHz, 4-core processor, Intel Xeon-scalable or faster
RAM	Large and Extra-Large Systems — 32 GB Small and Medium Systems — 16 GB
Hard drive	SSD hard drive, separated for OS and Data
Available disk space	Refer to Storage capacity requirements per system profile
Network	2 x 1 GB NIC

1 *To download, please visit: https://fastdl.mongodb.org/windows/mongodb-windows-x86_64-6.0.10-signed.msi*

Microsoft SQL Server

Operating system	Windows Server 2022 Standard or Datacenter Windows Server 2019 Standard or Datacenter Windows Server 2016 Standard or Datacenter
CPU architecture	64-bit
Internet Information Services (IIS)	v8.5, v10 (supplied with OS)
Microsoft SQL Server[1]	MS SQL Server 2019 or 2017 with per core licensing (recommended) MS SQL Server 2017 Express Edition (supported, included by default for Limited Storage installations)
Processor	3.2 GHz, 4-core processor, Intel Xeon-scalable or faster
RAM	32 GB or more

2 *External MongoDB Server requirements will scale upwards from these values as the processing requirements and storage capacity grows.*

Hard drive	SSD hard drive, separated for OS and Data
Available disk space	Refer to Storage capacity requirements per system profile
Network	2 x 1 GB NIC

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

Additional specifications

Ethernet	One or more Ethernet Network Interface Card (NIC) 2 x 1 GB NIC (use 2 NICs to isolate Level 3 traffic from Level 2 traffic) (recommended) 1 x 1 GB NIC (supported)
Internet connectivity	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.)
Supported virtualization	• VMware 6 to 6.7 • Hyper-V 2012 or 2016
Supported antivirus software	• Symantec™ Endpoint Protection • McAfee™ Endpoint • Norton™ Security with Backup • CrowdStrike

Note

Computers with system components installed must have:

- system clocks synchronized
- date/time in the same format

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

Anti-virus exclusion list

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

Component	Item	Path (default locations)
AMS Machine Works Web Services and Service Layer (embedded)	Applications (*.exe)	`C:\Windows\System32\inetsrv\w3wp.exe` `C:\Windows\SysWOW64\inetsrv\w3wp.exe`

Component	Item	Path (default locations)
	Program Files	C:\Program Files\Emerson\AMS Machine Works\ C:\EMERSONMW* C:\Program Files (x86)\Emerson* C:\inetpub\wwwroot\EmersonCSI*
	Log files	C:\inetpub\wwwroot\EmersonCSI\Logs* C:\inetpub\wwwroot\EmersonCSI\WebLogs*
	Cachecow	C:\Windows\Temp\ARES\Cache*
MongoDB	Program Files	C:\Program Files\MongoDB\Server\6.0\bin
Asset Monitor Agent	Program Files	C:\Program Files\Emerson\AMS Machine Works\AMA
Emerson Wireless Agent	Program Files	C:\Program Files\Emerson\AMS Machine Works\EWA
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:..\Support\MigrationTool\OpcDesktop\OpcMigrationTool.exe
	Program Files	C:\ProgramData\Emerson\AMSMachineWorks\Data\DOPC\pki\server\trusted\certs\ C:\ProgramData\Emerson\AMSMachineWorks\Data\DOPC\pki\user\trusted\certs\
RabbitMQ	Applications	C:\Program Files\Erlang OTP\erts-13.1.1\bin\erlsrv.exe
	Program Files	C:\Program Files\RabbitMQ Server\rabbitmq_server-3.11.2
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*

2.9.1 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 2-3: AMS Machine Works and Plantweb Optics computer membership

	AMS Machine Works	Plantweb Optics	Supported
Computer Membership	Workgroup	Workgroup	✔
	Domain	Domain	✔
	Workgroup	Domain	✔
	Domain	Workgroup	✔

Table 2-4: AMS Machine Works and DeltaV computer membership

	AMS Machine Works	DeltaV	Supported
Computer Membership	Workgroup	Workgroup	✔
	Domain	Domain	✔
	Workgroup	Domain	✔
	Domain	Workgroup	✔

Table 2-5: AMS Machine Works and Ovation computer membership

	AMS Machine Works	Ovation	Supported
Computer Membership	Workgroup	Workgroup	✔
	Domain	Domain	✔
	Workgroup	Domain	✔
	Domain	Workgroup	✔

2.10 System Scalability

Table 2-6: AMS Machine Works System

Components	AMS Machine Works
Server Specifications	
Assets	500 machine trains
Configured users	25 total users
Concurrent users	15
Concurrent VibApp users	10
Devices[1]	
AMS 9420	600 devices maximum per system connected across 50 Emerson Wireless Gateways 600 devices maximum per Agent server
AMS Asset Monitor	400 AMS Asset Monitors maximum per system and per AMS Asset Monitor Agent server
AMS Wireless Vibration Monitor	5000 devices maximum per system connected across 120 Emerson Wireless Gateways One Wireless Agent can be installed per server.
Devices per Emerson Wireless Gateway	
AMS 9420	50 devices maximum per 1420 50 devices maximum per 1410B 50 devices maximum per 1410S
AMS Wireless Vibration Monitor	50 devices maximum per 1420 50 devices maximum per 1410B 200 devices maximum per 1410S
OPC UA	
Number of Assets	500 Assets
Number of Total Monitored Tags	20000 Monitored Tags
Number of Clients	2 Clients

1 *Refer to Supported Data Storage and Update Rates.*

2.11 Supported Agent Combinations

In AMS Machine Works v1.7.5 there are two types of **Agent**.

- Emerson Wireless Gateway Agent
- AMS Asset Monitor Agent

The simplest single server deployment can support both types of **Agent** at the same time. With more complicated distributed deployments many machines can be deployed to support more **Agents**. See: Deployment Scenarios

Emerson Wireless Agent

- 600 AMS 9420 Wireless Vibration Transmitters maximum per Wireless Agent server
- 5000 AMS Wireless Vibration Monitors maximum per Wireless Agent server
- Supports many Wireless Agent servers to a maximum of 5000 AMS Wireless Vibration Monitors or 600 AMS 9420s

AMS Asset Monitor Agent

- 400 AMS Asset Monitors maximum per system
- 400 AMS Asset Monitors maximum per AMS Asset Monitor Agent server

AMS Asset Monitor Agent + Emerson Wireless Agent

Supports a combination of AMS Asset Monitors and wireless devices. Consult the System Requirements for more information.

2.12 System Profiles and Number of Agent 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 Agent 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 20 000. The tables in this section are based on Supported Data Storage and Update Rates.

Note
Consult your Emerson representative about device limits and **Agent** server requirements for a system with a combination of AMS Asset Monitors and wireless devices.

Note
The tables in this section assume a distributed deployment, which has 2 additional servers, one for AMS Machine Works, and one for an **External** MongoDB server. See: External Agents and MongoDB Scenario

Table 2-7: AMS Asset Monitor Agent Servers required per amount of AMS Asset Monitors

System Profile	AMS Asset Monitors	Vibration tags (maximum)	AMS Asset Monitor Agent Servers
Small (S)	0-80	960	1
Medium (M)	81-160	1,920	1
Large (L)	161-300	3,600	1
Extra Large (XL)	301-400	4800	1

Note
- One AMS Asset Monitor Agent Server can support up to 400 AMS Asset Monitors.
- One AMS Asset Monitor has a maximum of 12 vibration CHARMs.
- One vibration CHARM constitutes one vibration tag, including installed spare CHARMs.
- The maximum number of AMS Asset Monitors supported in AMS Machine Works is 400.

Table 2-8: Emerson Wireless Gateway Agent Servers required per amount of AMS Wireless Vibration Monitor Units

System Profile	AMS Wireless Vibration Monitors	Vibration tags (maximum)	Emerson Wireless Gateway Agent Servers
Small (S)	0-600	1800	1
Medium (M)	601-1200	3600	1
Large (L)	1,201-1,800	5400	1
Extra Large (XL)	1,801-5000	7200-20000	1[1]

1 *More Emerson Wireless Gateway Agent Servers might be required to meet network topology requirements such as devices being located in separate locations with their own local networks.*

Note

- One AMS Wireless Vibration Monitor uses three vibration tags, one per axis.
- The maximum number of AMS Wireless Vibration Monitors supported in AMS Machine Works is 5000.

Table 2-9: Emerson Wireless Gateway Agent Servers required per amount of AMS 9420 Units

System Profile	AMS 9420s	Vibration tags (maximum)	Emerson Wireless Gateway Agent Servers
Small (S)	0-600	1,200	1

Note

- One Emerson Wireless Gateway Agent server can accommodate connections to up to 600 AMS 9420 units.
- One AMS 9420 constitutes a maximum of two vibration tags, one per sensor.
- The maximum number of AMS 9420s supported in AMS Machine Works is 600.

2.13 Processor and Memory Specifications

Depending on your system profile and scale, your processor and memory needs will change for each machine. Refer to the tables for resources, after selecting the number of servers described in System Profiles and Number of Agent Servers. If the system will include an AMS Asset Monitor Agent Server or other device types, then the specifications should reflect the higher value of Table 2-10 and Table 2-11.

Table 2-10: Processor specifications for system profiles with an Emerson Wireless Gateway Agent Server

System Profile	AMS Machine Works Server			Emerson Wireless Gateway Agent Server		
	Processor	Cores	RAM (minimum)	Processors	Cores	RAM (minimum)
Small (S)	2.4 GHz	6	16 GB	2.4 GHz	4	16 GB
Medium (M)	2.4 GHz	6	32 GB	2.4 GHz	4	16 GB
Large (L)	3.2 GHz	8	32 GB	2.4 GHz	4 [1] 6 [2]	16 GB
Extra Large (XL)	3.2 GHz	8	32 GB 64 GB [2]	2.4 GHz	4 [1] 6 [2]	16 GB

1 *Minimum*
2 *Recommended*

Table 2-11: Processor specifications for system profiles with an AMS Asset Monitor Agent Server

System Profile	AMS Machine Works Server			AMS Asset Monitor Agent Server		
	Processor	Cores	RAM (minimum)	Processors	Core	RAM (minimum)
Small (S)	2.4 GHz	6	16 GB	2.4 GHz	4	16 GB
Medium (M)	3.2 GHz	8	32 GB	2.4 GHz	4	16 GB
Large (L)	3.2 GHz	8	32 GB	2.4 GHz	4	16 GB

2.14 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 2-12: 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
Small (S)	Acceptable	Recommended
Medium (M)	Acceptable	Recommended
Large (L)	Not Recommended	Recommended
Extra Large (XL)	Not Recommended	Recommended

Table 2-13: Hard disk for AMS Asset Monitor

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

2.15 Storage capacity requirements per system profile

There are two types of storage for AMS Machine Works, configuration settings which are stored in an SQL database, and data storage, which is stored in a MongoDB database.

In general Microsoft SQL server is not recommended, the Microsoft SQL Express Internal installation is enough for all configuration data scenarios.

Table 2-14: Long term storage capacity requirements for Wireless systems with AMS 9420 and AMS Wireless Vibration Monitor

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

Table 2-15: Long term storage capacity requirements for AMS Asset Monitor

System Profile	AMS Asset Monitor	Data Storage		
		1-3 Years	3-5 Years	5-10 Years
Small (S)	<81	1.0 TB	2.5 TB	5.0 TB
Medium (M)	81-160	2.5 TB	4.0 TB	7.5 TB
Large (L)	161-300	4.0 TB	6.4 TB	12.0 TB
Extra Large (XL)	301-400	5.0 TB	8.0 TB	15.0 TB

3 AMS Machine Works Security

Emerson recommends working with qualified IT personnel to ensure that your installation complies with both the network security policy for your plant and industry best practices. For more detailed information about cyber security refer to the AMS Product Security Documentation (AMS-SEC-PSG-001).

After verifying that all of the security and communication requirements have been met, return to Step 3 of the *Preparing for Installation* topic and continue your installation.

4 Installation Procedures

These installation procedures present the most common installation scenarios for installing AMS Machine Works v1.7.5. For more information on supported, and unsupported, scenarios refer to Deployment Scenarios. If a scenario you are looking for is not listed in that section, work with your Emerson representative to review your preferred deployment scenario and determine if it is possible.

If upgrading from AMS Machine Works v1.7.2, go to the Upgrades and Updates chapter.

4.1 Installation Overview

For an optimum system, follow this recommended installation process for a new system. This is a summary of the installation procedure. Refer to Installation Procedures for the full installation procedure.

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

4.1.1 Preparing for Installation

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

Procedure

1. Design and plan your system. See: Planning your system.
2. Ensure all of the system requirements are met for all required components. See: System Requirements.
3. Ensure all security requirements have been met. See: AMS Machine Works Security.
4. If you are planning on using an **External Agent** server deployment, ensure that you have administrator privileges on all the machines. See: Installation of AMS Machine Works with an External Agent Server
5. If you are planning on using an **External MongoDB** server deployment, ensure that you have administrator privileges on the machines. See: External MongoDB Server Installation
6. If you are planning on using an **External SQL** server deployment, ensure that you have administrator privileges on the machines and sysadmin privileges in SQL. See: External SQL Server Installation
7. It is recommended to run the Pre-Installation Checklist tool before beginning installation. See: Pre-Installation Checklist Tool

4.1.2 Installing AMS Machine Works

This is a general overview of the installation process. Refer to Installation Procedures for the full installation procedure.

Procedure

1. Install AMS Machine Works standalone installation. Unzip the `Install_1.7.X.X.zip` file on the AMS Machine Works server. Refer to Installation Procedures for the detailed steps.
2. Install AMS Machine Works server certificate on any AMS Machine Works Agent servers and PCs. See: AMS Machine Works Security

   ⚠ 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.

4.1.3 Post-installation steps

Next, complete configuration and set up the system for use. You can refer to the sections indicated below, or to the AMS Machine Works v1.7.5 User Guide, or to the AMS Machine Works v1.7.5 Online Help, for more information.

Procedure

1. For AMS Machine Works to function properly certain Windows services must be running. See: Check services
2. When you launch AMS Machine Works for the first time you need to log in with the default password and then set a custom password. See: First Launch of AMS Machine Works
3. When you have logged in for the first time you will be prompted to register AMS Machine Works. See: Register your License
4. Next, you need to set the line frequency used in your installation in order to get accurate measurements. In this step you can also choose which derived measurement types to display. See: Set the Line Frequency and Configure the Display of Derived Measurements
5. AMS Machine Works is integrated with a sophisticated analysis tool, the Vibration Analyzer, or VibApp. You should install this application to get insights into your data. See: Install the Vibration Analyzer - VibApp
6. (Optional) You can manually control data retention with the Data Retention Policy Tool, or schedule a data retention policy with Schedule the Data Retention Policy Tool.

7. (Optional) If you need to use an OPC UA client, ensure that you have an OPC license in the **User Manager** module of AMS Machine Works. See: OPC UA Server

You are now ready to start using AMS Machine Works.

4.2 Server Installation Pre-Check

Procedure

1. **Server names:**

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

   - It must be at least 1 character, but not more than 14.
   - It cannot contain any of the following characters:
     - backslash ****
     - slash mark **/**
     - colon **:**
     - asterisk *
     - question mark **?**
     - quotation mark "
     - less than sign **<**
     - greater than sign **>**
     - vertical bar **|**
     - underscores **_**
     - comma **,**
     - tilde ~
     - semicolon **;**
     - exclamation mark **!**
     - at sign @
     - number sign **#**
     - dollar sign **$**
     - percent **%**
     - caret **^**
     - ampersand **&**
     - apostrophe '
     - period **.**
     - parentheses **( )**
     - braces **{ }**

— white space **(blank)**

2. **Check the Properties for all the drives you intend to install any element of AMS Machine Works on.**

   These drives cannot have the **Compress this drive to save space** option checked.

   Note
   AMS Machine Works does not support installations on compressed drives.

3. **Check Server Time:**

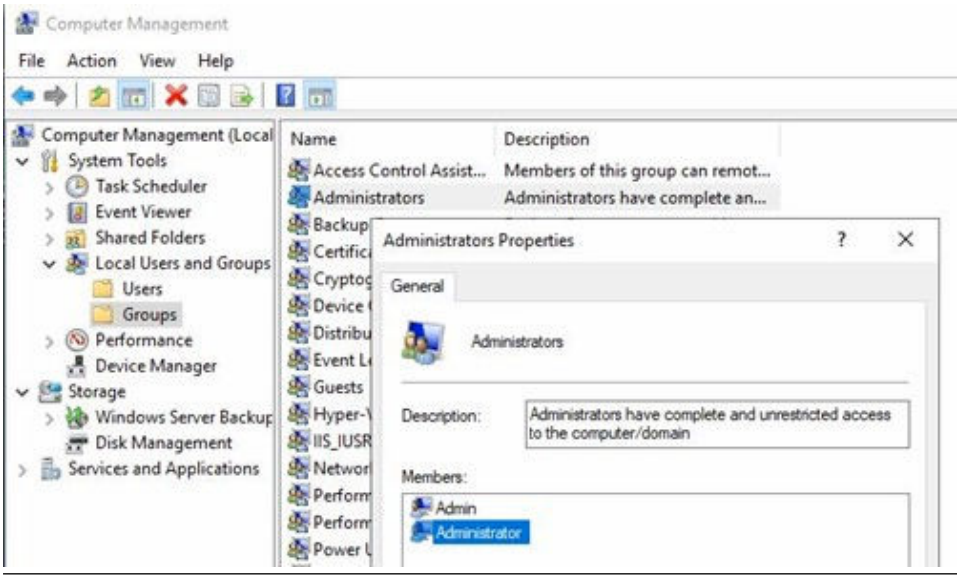
   Make sure time and time-zones are correct before proceeding (If you have multiple servers make sure they all match time and time-zones).

4. **Administrator Account:**

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

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

Figure 4-1: Administrator Properties



5. **Group Policies:**

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

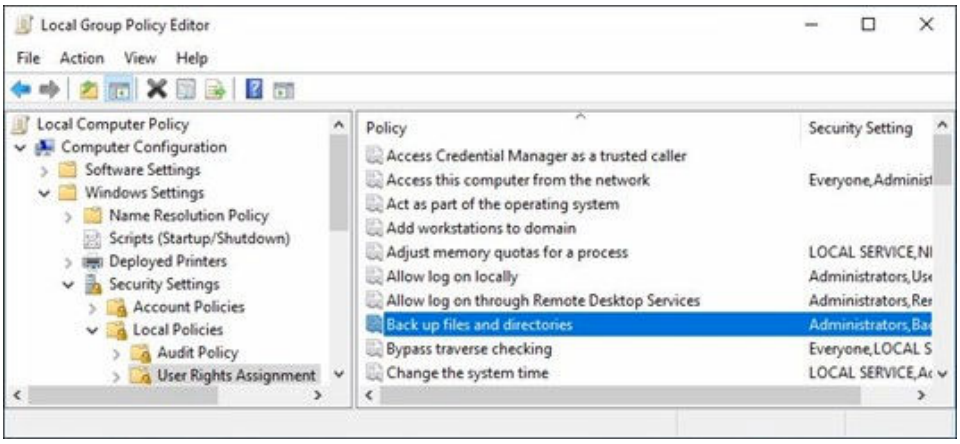
   a. Debug programs

b. Backup files and directories

c. Manage auditing and security logs

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

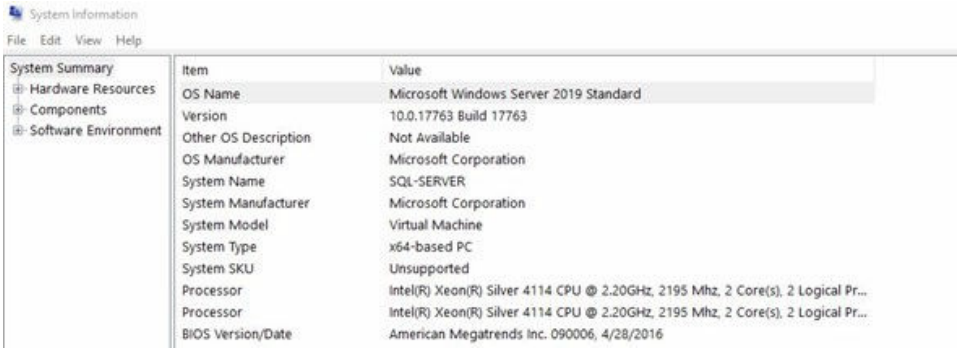
Figure 4-2: Local Group Policy Editor



6. **Hardware Details:**

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

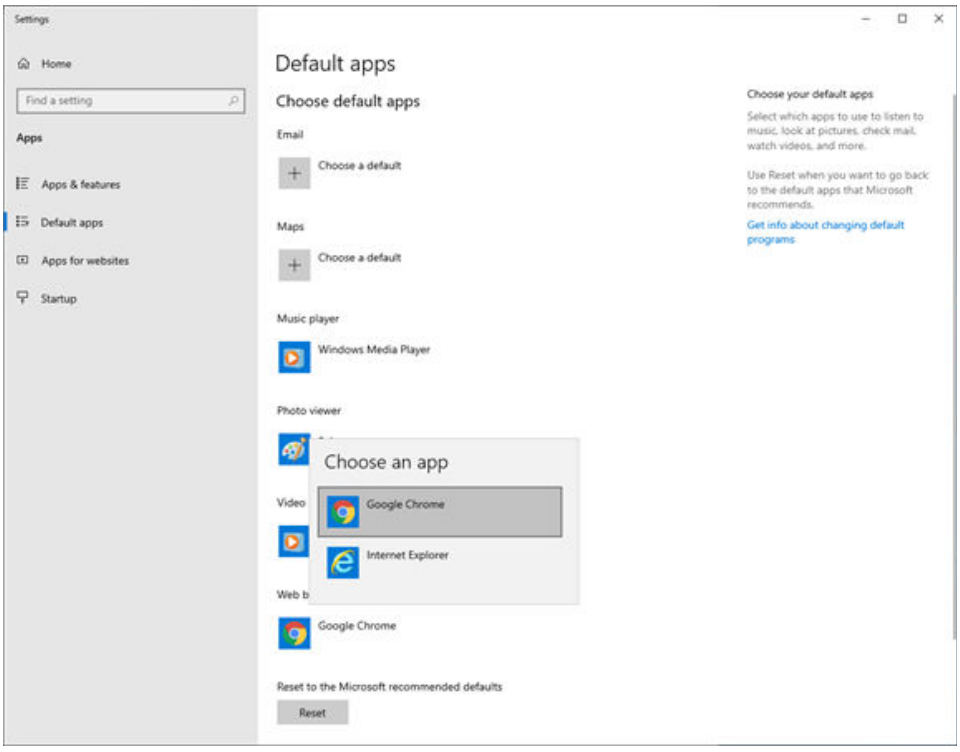
Figure 4-3: System summary under System Information



7. **Default Browser:**

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

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



4.3 Install AMS Machine Works

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

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

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

After completing these procedures, return to Installing AMS Machine Works and continue your installation.

4.3.1 Single server deployment

This installation section shows the single server deployment scenario of installing all web components and every **Agent** on the AMS Machine Works server. This installation is an example of the deployment scenario shown in Internal — Single Server Scenario.

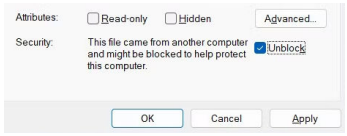
Simplest Full Installation

This procedure provides instructions for installing all the necessary AMS Machine Works web components, an AMS Asset Monitor Agent, an Emerson Wireless Gateway Agent, a MongoDB database, and an SQL Express database on a single server. This is the simplest form of a complete installation. See: Internal — Single Server Scenario

Procedure

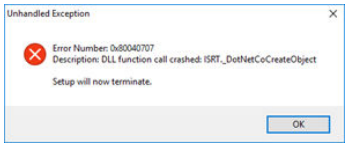
1. Log into the server with an Administrator account.
2. Download the installation files for AMS Machine Works 1.7.5.
3. Before extracting, right-click on the file and select Properties. Check the **Unblock** checkbox, and click **Apply**.

Figure 4-5: File Properties



Note
A **Blocked** file will usually result in an error.

Figure 4-6: Error pop-up



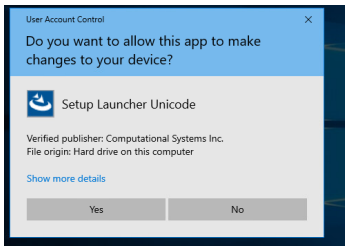
To recover from this error, delete the extracted folder, **Unblock** the file, and re-extract the installation files.

4. Extract the AMS Machine Works v1.7.5 installation files.

Note
Extract the files to a top level folder. Long file path names can result in an error during installation.

5. Right-click on `setup.exe`, and click **Run as administrator**.
6. If the **User Access Control** window appears, click **Yes** to allow `setup.exe` to install.

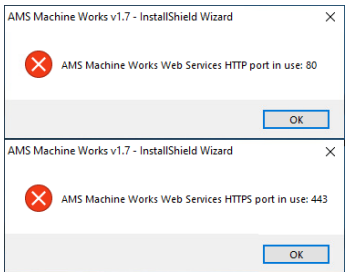
Figure 4-7: User Access Control



⚠ CAUTION

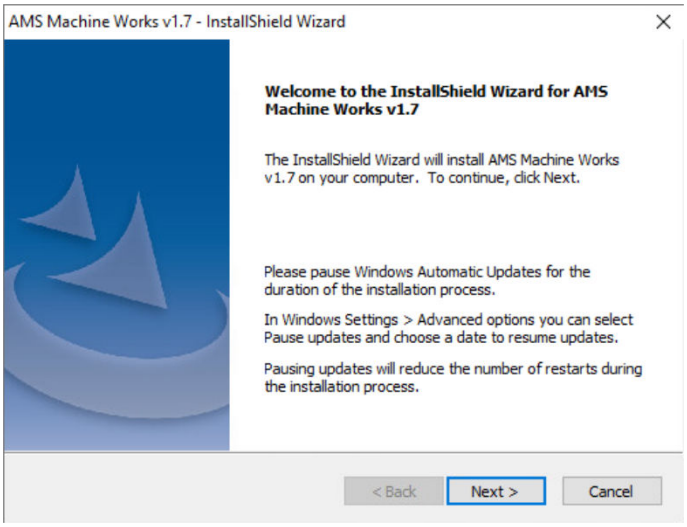
If one of the following warning pop-ups appears it means that the server does not meet the System Requirements for AMS Machine Works v1.7.5. It is recommended to stop the installation and reconfigure the server so that all the requirements are met. See: Pre-Installation Checklist Tool

Figure 4-8: Warning: AMS Machine Works Web Services ports in use



7. AMS Machine Works v1.7.5 – InstallShield Wizard, click **Next** to continue.

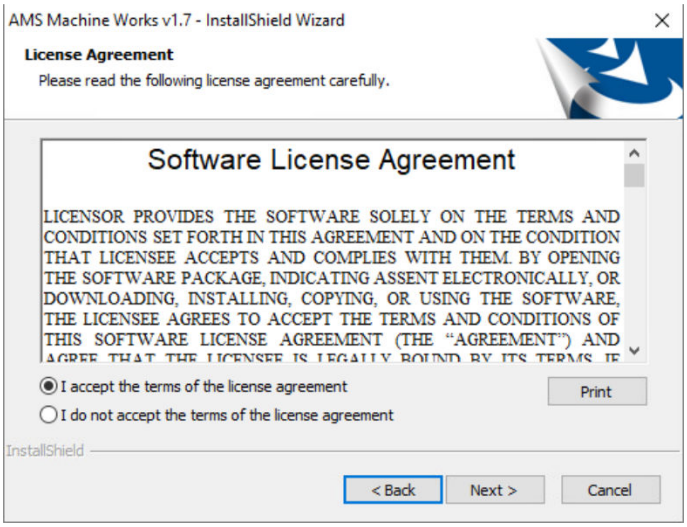
Figure 4-9: InstallShield Wizard - Welcome



Note
It is strongly recommended that you pause Windows Automatic Updates during the installation process. Failure to do so can result in inconsistent results.

8. Accept the terms of license agreement, and click **Next** to continue.

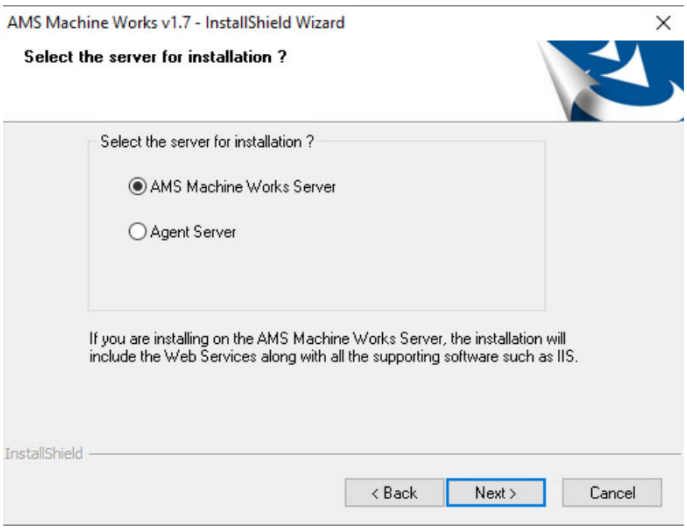
Figure 4-10: InstallShield Wizard - License Agreement



9. Select AMS Machine Works Server for a new installation, then click **Next** to continue.

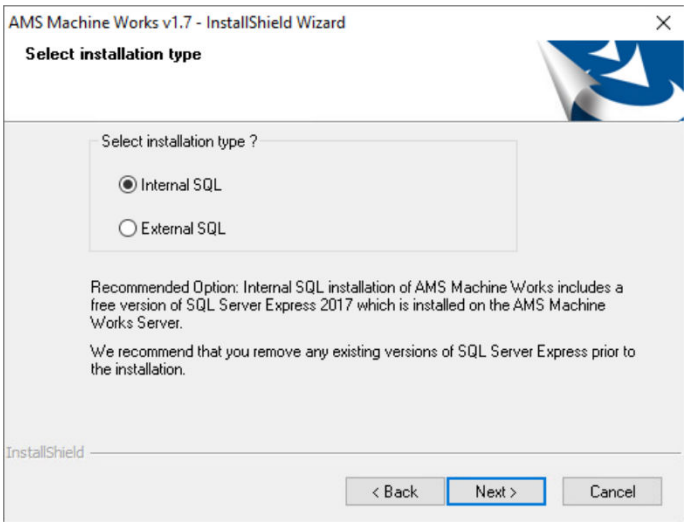
Note
If you are adding an AMS Machine Works Agent Server to an existing installation, select **Agent Server**. See: External AMS Machine Works Agent Server Installation

Figure 4-11: InstallShield Wizard - Select the server for installation



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

Figure 4-12: InstallShield Wizard - Select Internal SQL

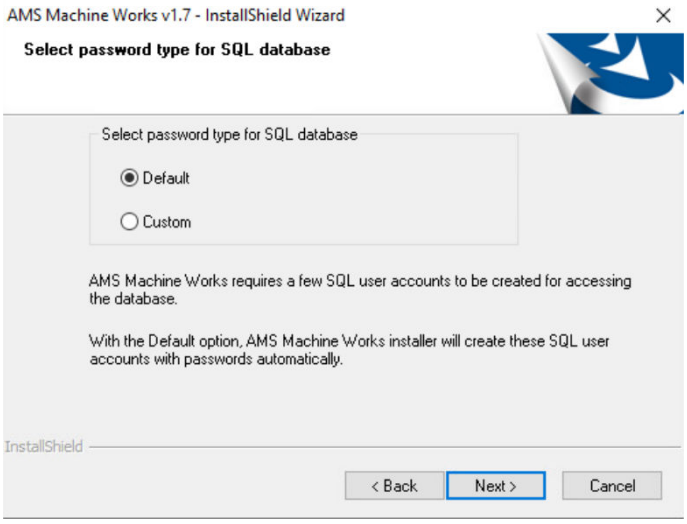


11. Select **Default** to allow the installation software to create passwords to access the SQL database for you.

    If you want to define the passwords for the Machinery Health Manager (MHM) accounts in SQL go to the next step.

Note
If this is an upgrade from AMS Machine Works v1.7.2, you must select the same password type and if applicable, reuse the same custom passwords. See: Database Migration Wizard

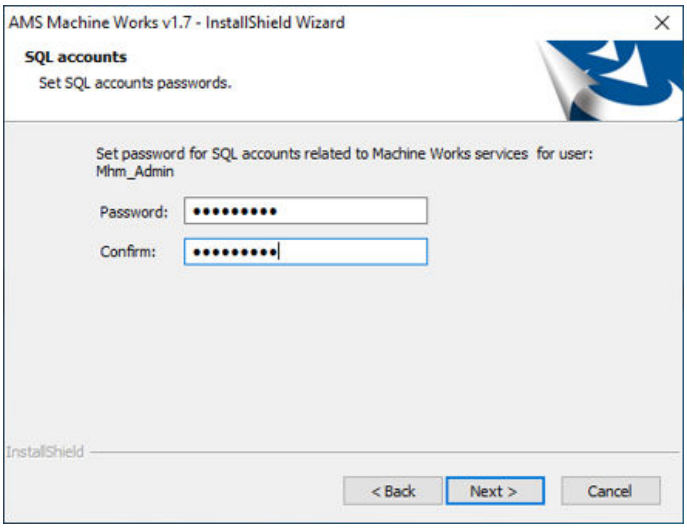
Figure 4-13: InstallShield Wizard - Select password type for SQL database



12. Select **Custom** if you would like to create your passwords for the Machinery Health Manager (MHM) accounts in SQL.

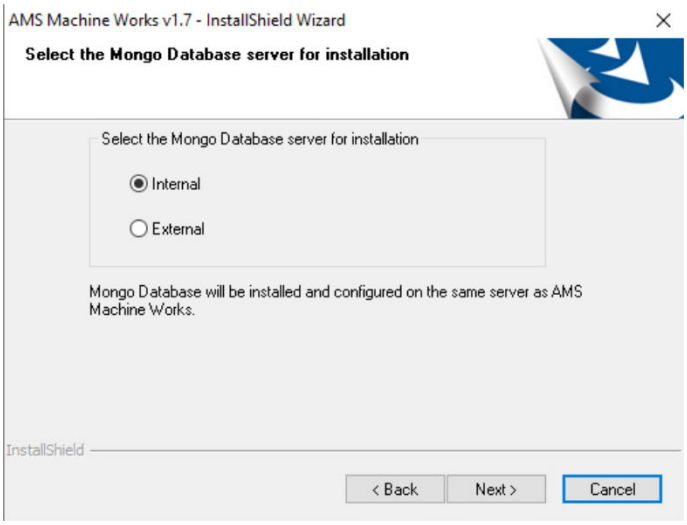
    You will be stepped through setting up Passwords for the Machinery Health Manager (MHM) accounts: Mhm_Admin, Mhm_Reader, and Mhm_Writer.

Figure 4-14: InstallShield Wizard - Set SQL account passwords



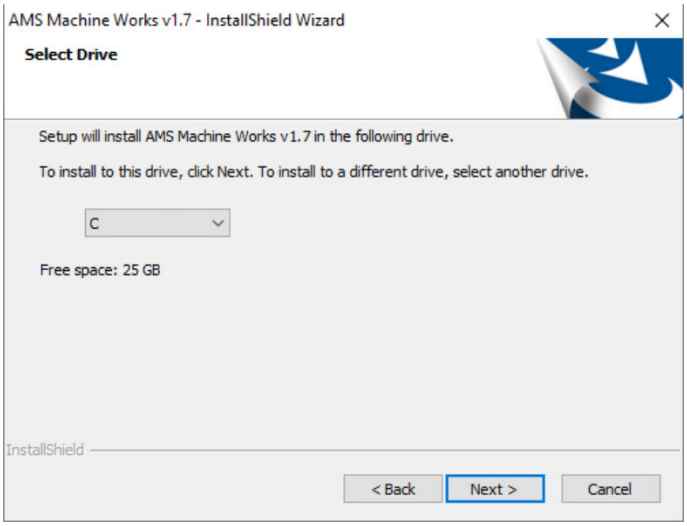
13. Select **Internal** MongoDB installation, and then click **Next.**

Figure 4-15: InstallShield Wizard - Select Internal



14. Select the Drive letter for the location you want to store the **Internal SQL** data, **Internal MongoDB** data, and the AMS Machine Works web components.

Figure 4-16: InstallShield Wizard - Select drive

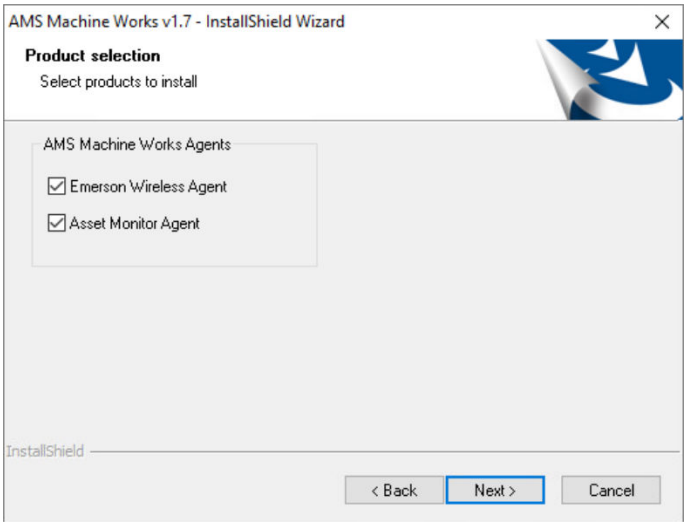


Note
It is recommended best practice to install the databases that AMS Machine Works uses on a different drive than the boot drive.

Note
Information about the recommended disk space can be found in System Requirements.

15. Select every **Agent** which you will need to access the devices on your network, then click **Next** to continue.

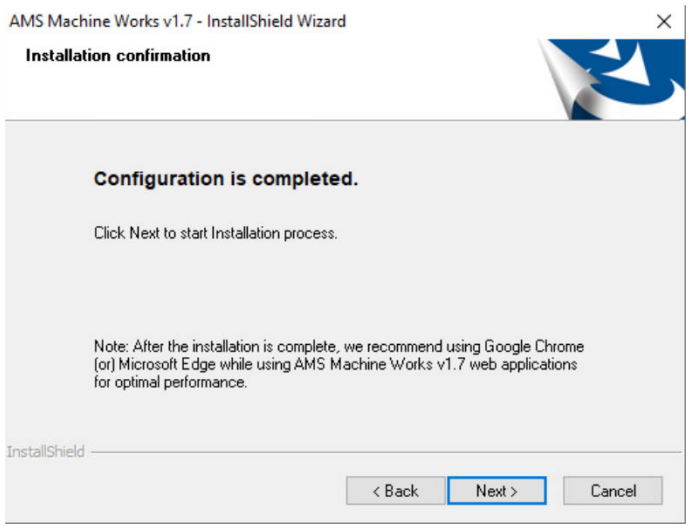
Figure 4-17: InstallShield Wizard - Agent Selection



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

16. The configuration is complete, click **Next** to start the Installation process.

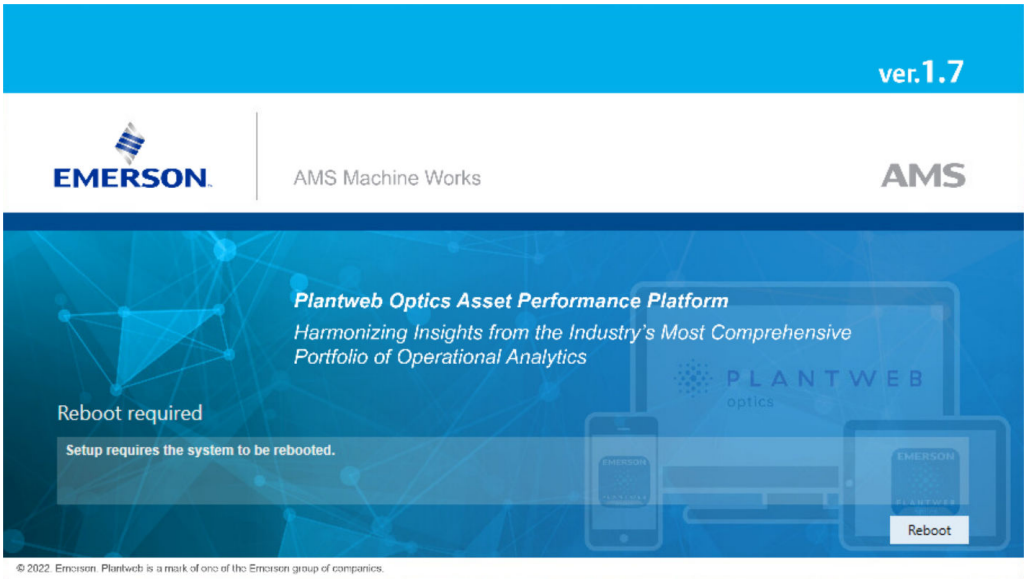
Figure 4-18: InstallShield Wizard - Configuration Completed



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

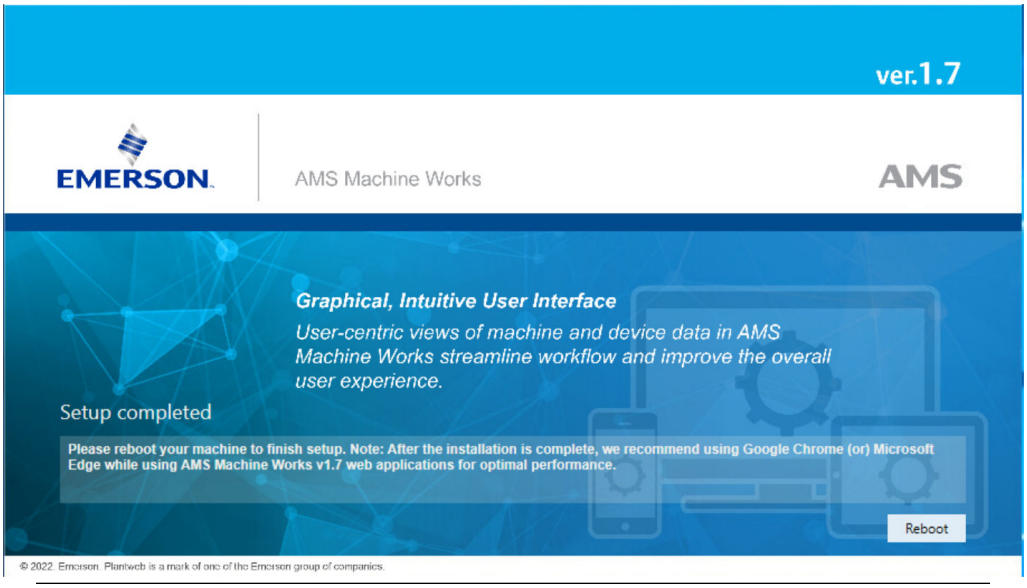
Figure 4-19: AMS Machine Works 1.7 is installing

Figure 4-20: A reboot is required



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

Figure 4-21: Final reboot request



19. The installation is now complete. Please continue to Post-installation steps.

4.3.2 Distributed Deployments

This installation section has the steps required for the three main distributed deployment scenarios shown in External — Distributed Server Scenarios.

Installation of AMS Machine Works with an External Agent Server

AMS Machine Works can support **Internal Agent** servers residing on the same server machine, a single **External Agent** server, multiple **External Agent** servers, or a mixture of **Internal** and **External Agent** servers. See: External Agents Scenario

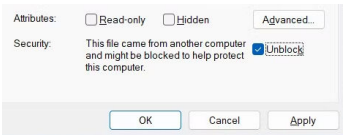
This installation is an example of how to set up an **External Agent Server** and is divided into two main tasks:

1. First, a modified version of the Simplest Full Installation so that no **Agents** are installed on the AMS Machine Works server.
2. Second, after the AMS Machine Works server installation is complete, we will perform an External AMS Machine Works Agent Server Installation.

Procedure

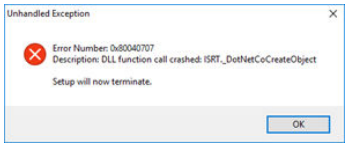
1. Log into the server with an Administrator account.
2. Download the installation files for AMS Machine Works 1.7.5.
3. Before extracting, right-click on the file and select Properties. Check the **Unblock** checkbox, and click **Apply**.

Figure 4-22: File Properties



Note
A **Blocked** file will usually result in an error.

Figure 4-23: Error pop-up



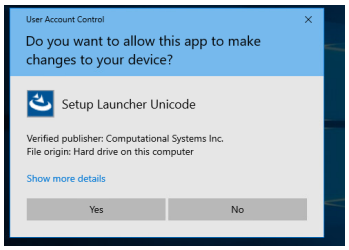
To recover from this error, delete the extracted folder, **Unblock** the file, and re-extract the installation files.

4. Extract the AMS Machine Works v1.7.5 installation files.

Note
Extract the files to a top level folder. Long file path names can result in an error during installation.

5. Right-click on `setup.exe`, and click **Run as administrator**.
6. If the **User Access Control** window appears, click **Yes** to allow `setup.exe` to install.

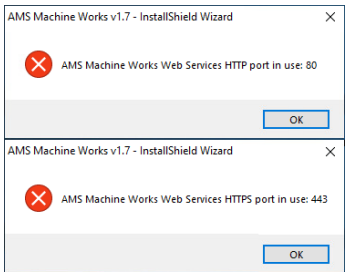
Figure 4-24: User Access Control



⚠ CAUTION

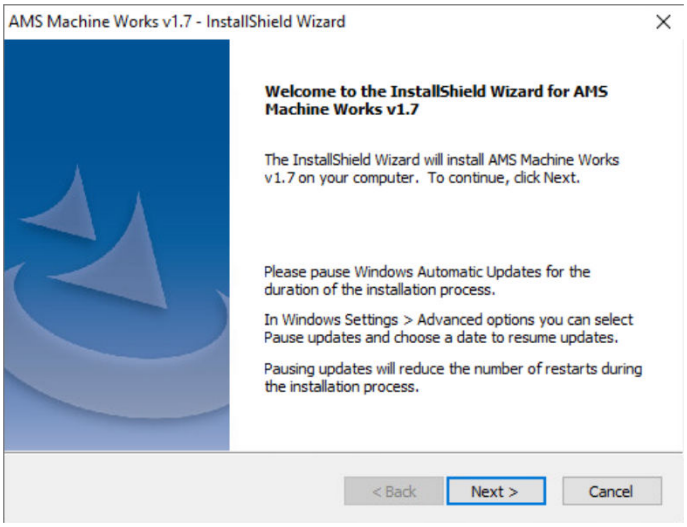
If one of the following warning pop-ups appears it means that the server does not meet the System Requirements for AMS Machine Works v1.7.5. It is recommended to stop the installation and reconfigure the server so that all the requirements are met. See: Pre-Installation Checklist Tool

Figure 4-25: Warning: AMS Machine Works Web Services ports in use



7. AMS Machine Works v1.7.5 – InstallShield Wizard, click **Next** to continue.

Figure 4-26: InstallShield Wizard - Welcome



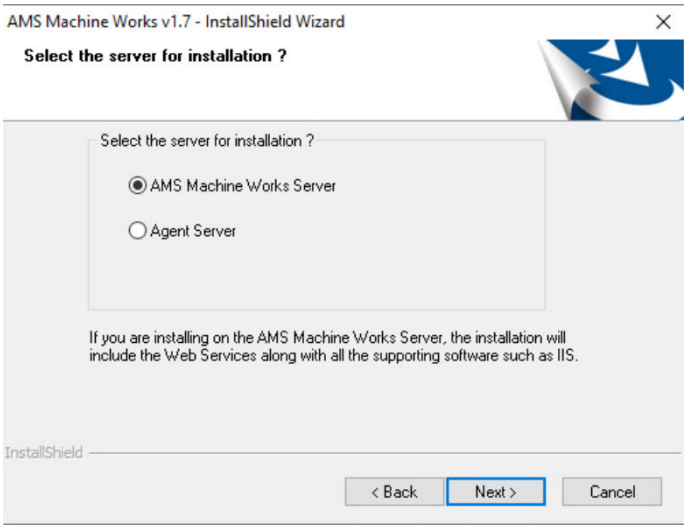
8. Accept the terms of license agreement, and click **Next**

Figure 4-27: InstallShield Wizard - License Agreement

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

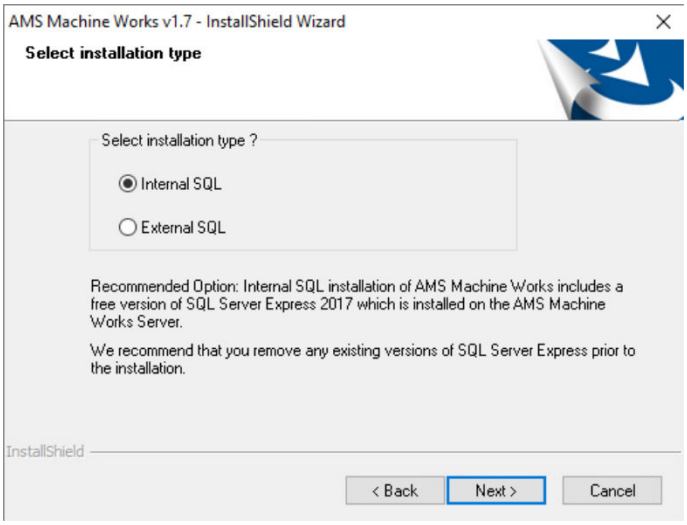
Note
If you are adding an AMS Machine Works Agent Server to an existing installation, select **Agent Server**. See: External AMS Machine Works Agent Server Installation

Figure 4-28: InstallShield Wizard - Select the server for installation



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

Figure 4-29: InstallShield Wizard - Select Internal SQL

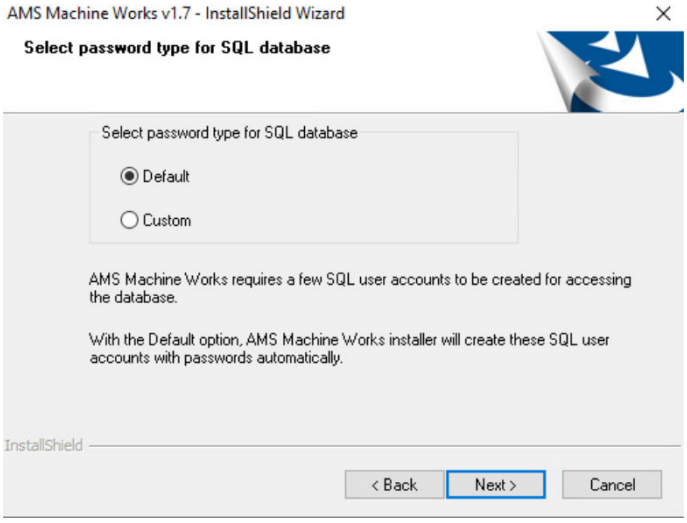


11. Select **Default** to allow the installation software to create passwords to access the SQL database for you.

    If you want to define the passwords for the Machinery Health Manager (MHM) accounts in SQL go to the next step.

Note
If this is an upgrade from AMS Machine Works v1.7.2, you must select the same password type and if applicable, reuse the same custom passwords. See: Database Migration Wizard

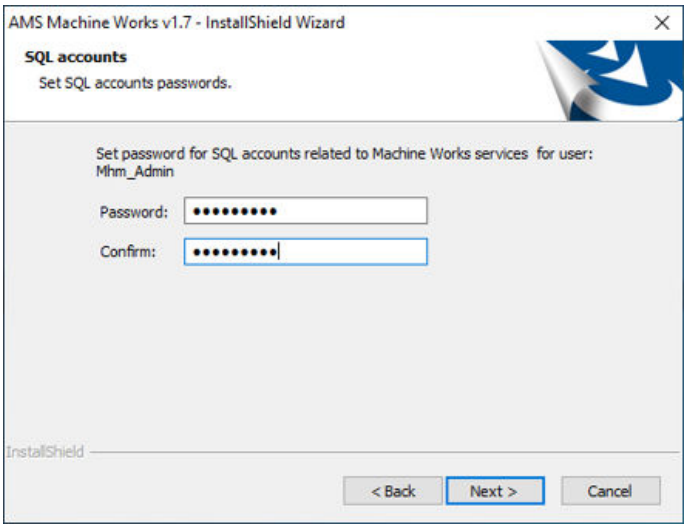
Figure 4-30: InstallShield Wizard - Select password type for SQL database



12. Select **Custom** if you would like to create your passwords for the Machinery Health Manager (MHM) accounts in SQL.

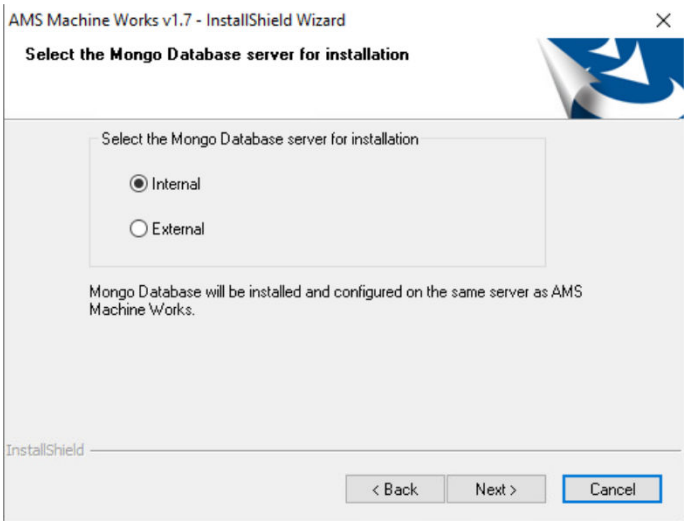
You will be stepped through setting up Passwords for the Machinery Health Manager (MHM) accounts: Mhm_Admin, Mhm_Reader, and Mhm_Writer.

Figure 4-31: InstallShield Wizard - Set SQL account passwords



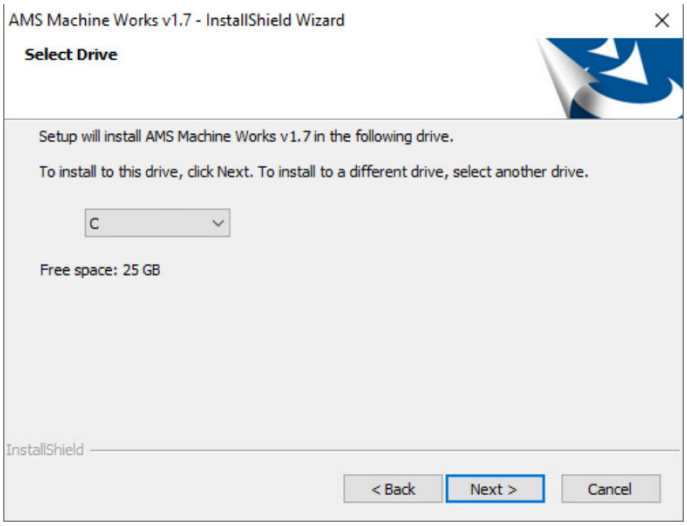
13. Select **Internal** MongoDB installation, and then click **Next.**

Figure 4-32: InstallShield Wizard - Select Internal



14. Select the Drive letter for the location you want to store the **Internal SQL** data, **Internal MongoDB** data, and the AMS Machine Works web components.

Figure 4-33: InstallShield Wizard - Select drive

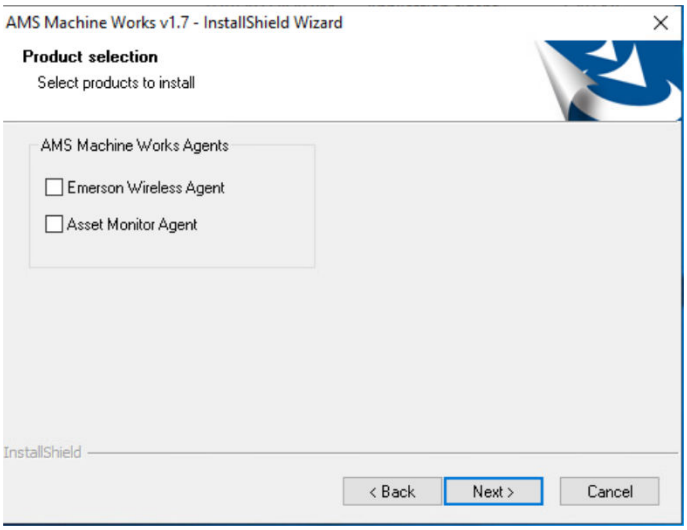


Note
It is recommended best practice to install the databases that AMS Machine Works uses on a different drive than the boot drive.

Note
Information about the recommended disk space can be found in System Requirements.

15. This example installation does not have any **Agent** configured on the main AMS Machine Works Server. Make sure that no **Agent** is selected, then click **Next** to continue.

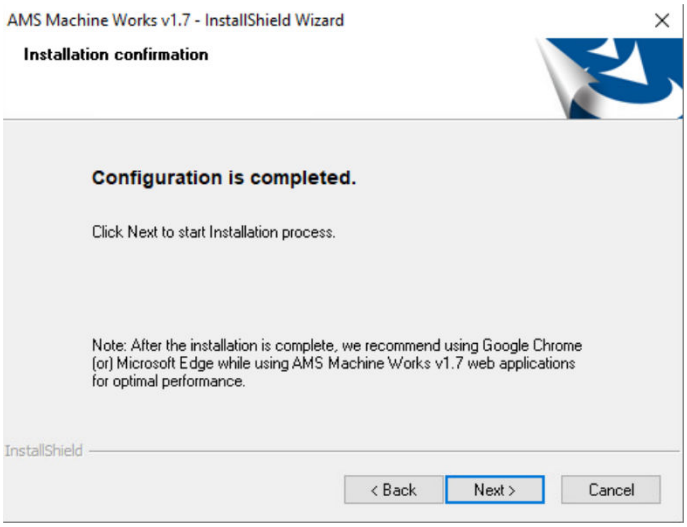
Figure 4-34: InstallShield Wizard - Agent Selection



Note
AMS Machine Works can support multiple copies of an **Agent** on different servers.

16. The configuration is complete, click **Next** to start the Installation process.

Figure 4-35: InstallShield Wizard - Configuration Completed



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

Figure 4-36: AMS Machine Works 1.7 is installing

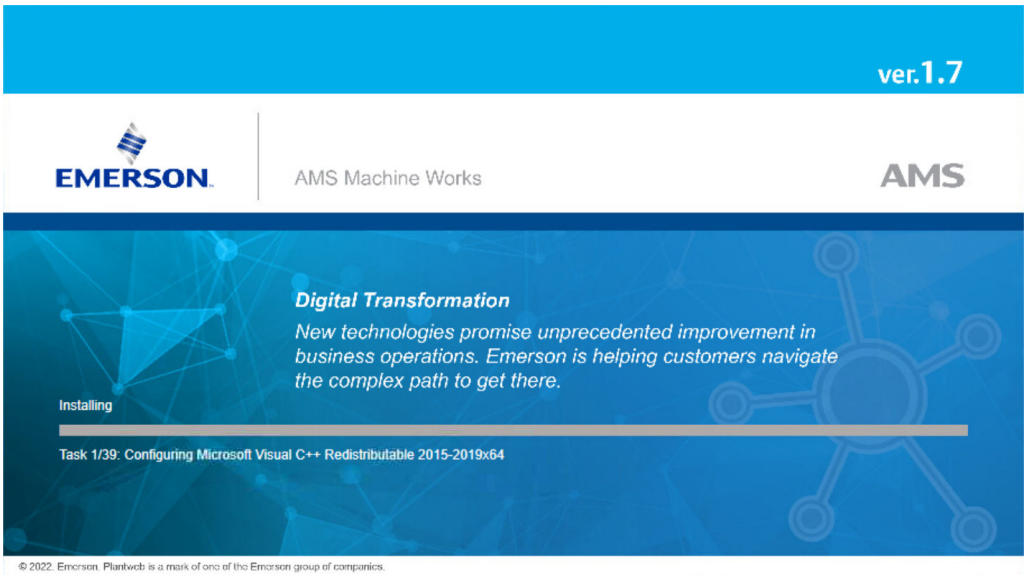
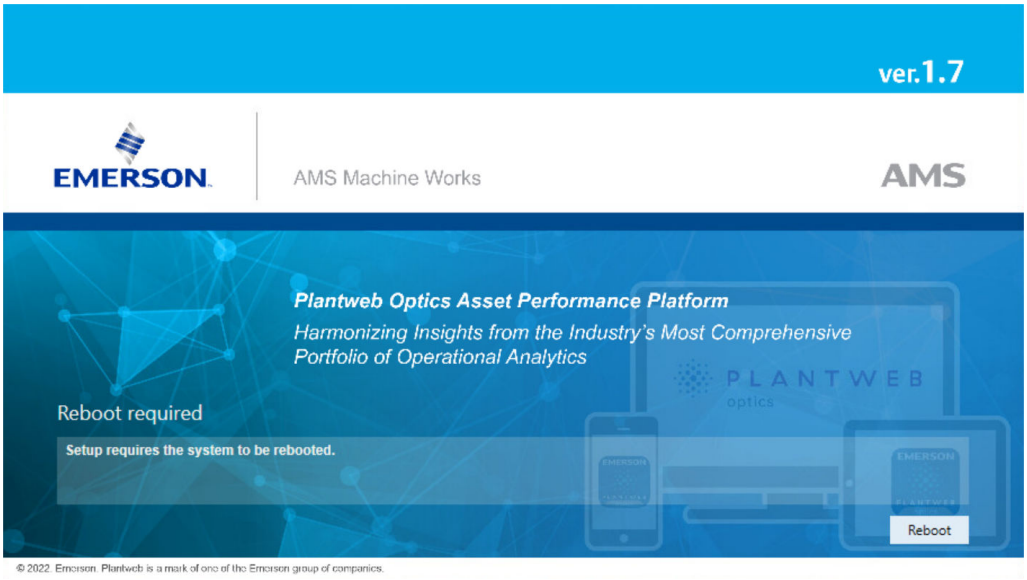
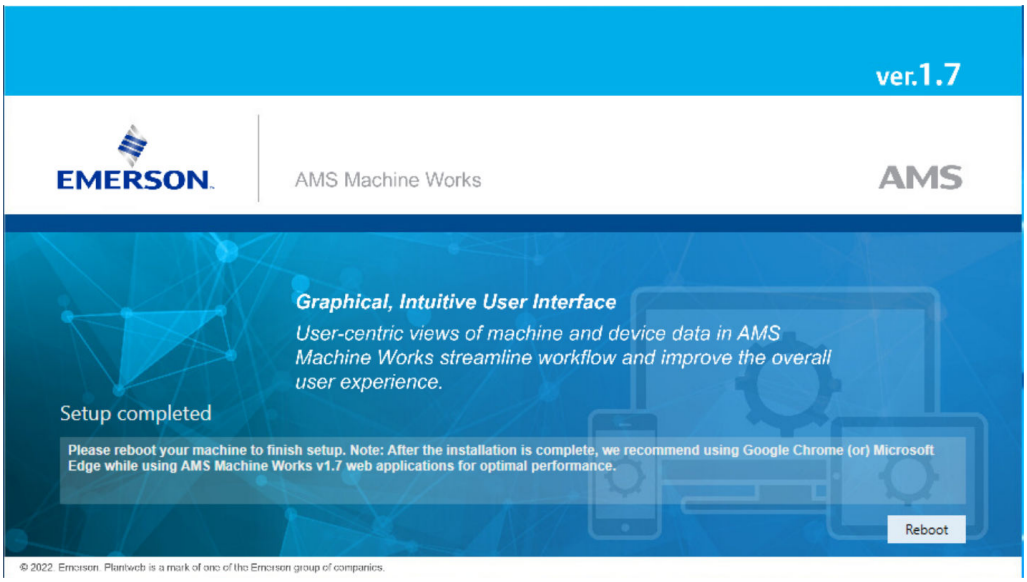


Figure 4-37: A reboot is required



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

Figure 4-38: Final reboot request



19. The installation is now complete. Please continue to Post-installation steps.
20. Next, we perform the steps of an External AMS Machine Works Agent Server Installation.

External Agents and MongoDB Installation

AMS Machine Works can support **Internal MongoDB** servers residing on the same server machine, or an **External MongoDB** server.

This installation example is a modification of the Installation of AMS Machine Works with an External Agent Server where the **Agent** server(s) are installed on an **External** machine. Now, we are adding a further layer of complexity with an **External MongoDB** installation. See: External Agents and MongoDB Installation

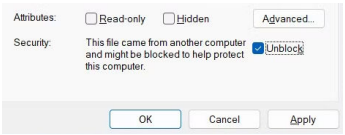
Note
There is no requirement for the **Agent** server to be **External** in order to install an **External MongoDB** server. These instructions are given in increasing levels of complexity in order to demonstrate the modularity of AMS Machine Works.

1. First, we perform the steps of an External MongoDB Server Installation.
2. Next, we will modify the steps for the Installation of AMS Machine Works with an External Agent Server, so that we connect to a **External MongoDB** server.

Procedure

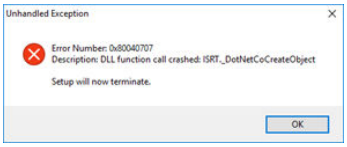
1. First perform an External MongoDB Server Installation
2. Log into the server with an Administrator account.
3. Download the installation files for AMS Machine Works 1.7.5.
4. Before extracting, right-click on the file and select Properties. Check the **Unblock** checkbox, and click **Apply**.

Figure 4-39: File Properties



Note
A **Blocked** file will usually result in an error.

Figure 4-40: Error pop-up



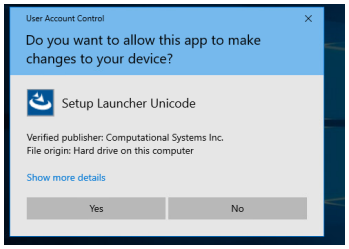
To recover from this error, delete the extracted folder, **Unblock** the file, and re-extract the installation files.

5. Extract the AMS Machine Works v1.7.5 installation files.

Note
Extract the files to a top level folder. Long file path names can result in an error during installation.

6. Right-click on `setup.exe`, and click **Run as administrator.**
7. If the **User Access Control** window appears, click **Yes** to allow `setup.exe` to install.

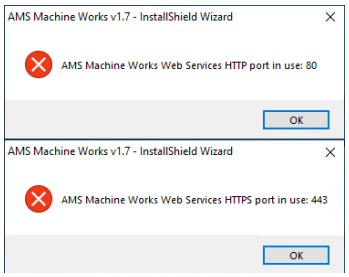
Figure 4-41: User Access Control



⚠ CAUTION

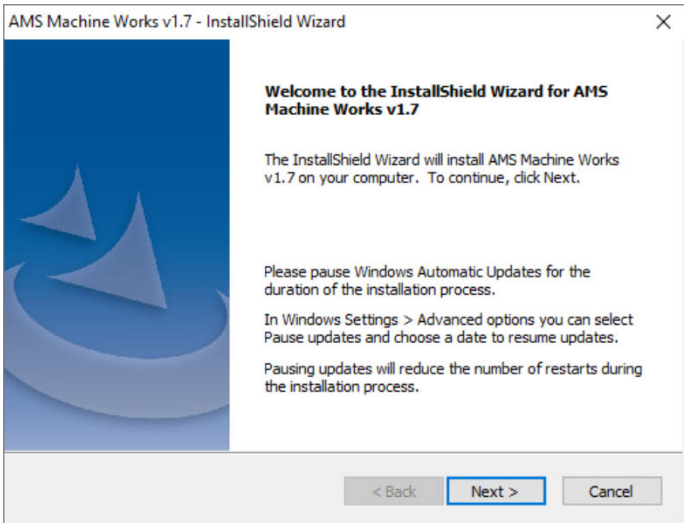
If one of the following warning pop-ups appears it means that the server does not meet the System Requirements for AMS Machine Works v1.7.5. It is recommended to stop the installation and reconfigure the server so that all the requirements are met. See: Pre-Installation Checklist Tool

Figure 4-42: Warning: AMS Machine Works Web Services ports in use



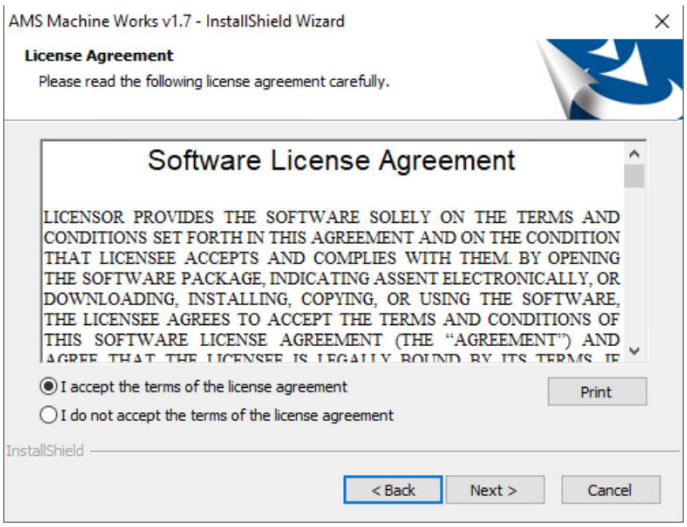
8. AMS Machine Works v1.7.5 – InstallShield Wizard, click **Next** to continue.

Figure 4-43: InstallShield Wizard - Welcome



9. Accept the terms of license agreement, and click **Next**

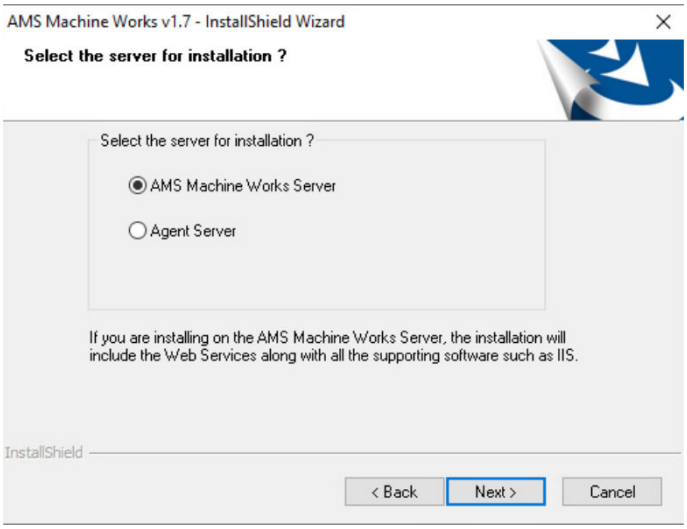
Figure 4-44: InstallShield Wizard - License Agreement



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

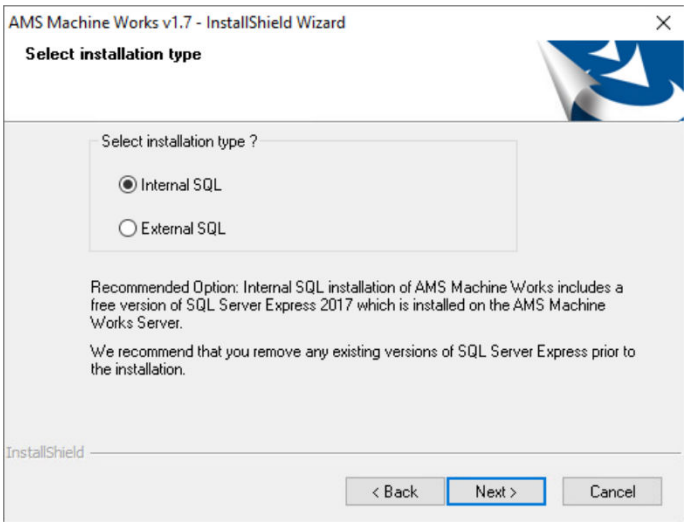
Note
If you are adding an AMS Machine Works Agent Server to an existing installation, select **Agent Server**. See: External AMS Machine Works Agent Server Installation

Figure 4-45: InstallShield Wizard - Select the server for installation



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

Figure 4-46: InstallShield Wizard - Select Internal SQL

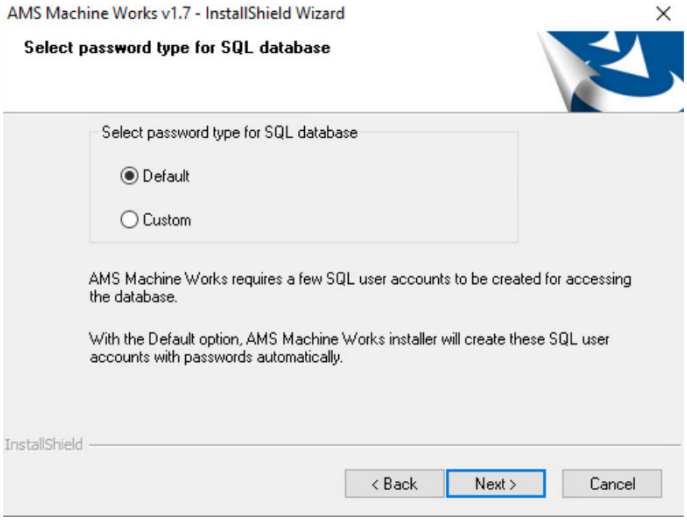


12. Select **Default** to allow the installation software to create passwords to access the SQL database for you.

    If you want to define the passwords for the Machinery Health Manager (MHM) accounts in SQL go to the next step.

Note
If this is an upgrade from AMS Machine Works v1.7.2, you must select the same password type and if applicable, reuse the same custom passwords. See: Database Migration Wizard

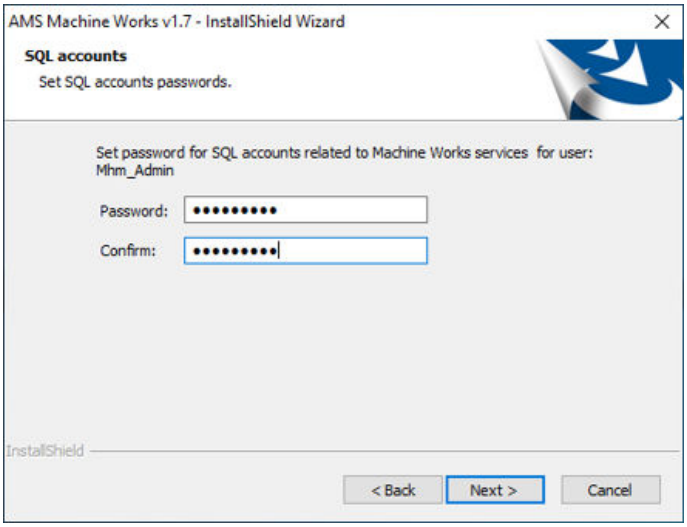
Figure 4-47: InstallShield Wizard - Select password type for SQL database



13. Select **Custom** if you would like to create your passwords for the Machinery Health Manager (MHM) accounts in SQL.

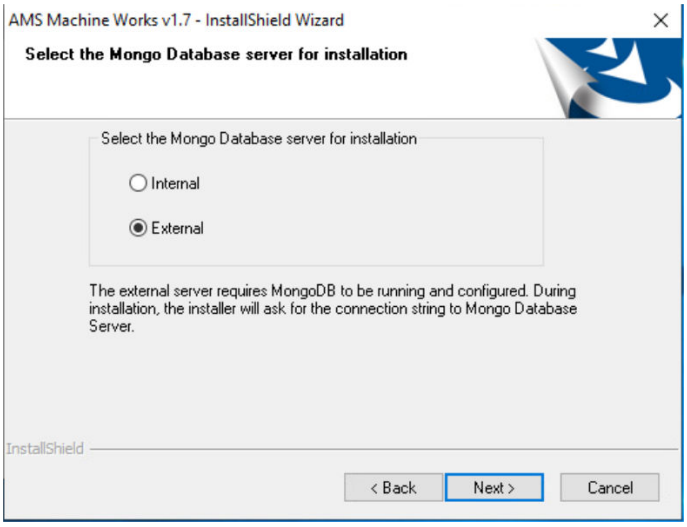
    You will be stepped through setting up Passwords for the Machinery Health Manager (MHM) accounts: Mhm_Admin, Mhm_Reader, and Mhm_Writer.

Figure 4-48: InstallShield Wizard - Set SQL account passwords



14. Select **External** MongoDB installation, and then click **Next.**

Figure 4-49: InstallShield Wizard - Select External



15. Enter the connection string for the **External MongoDB** database, then click **Test connection**.

⚠ CAUTION

If you used the **Advanced Connection Options** in **Compass** to generate a connection string and you have a string that contains,

```
/?authMechanism=DEFAULT
```

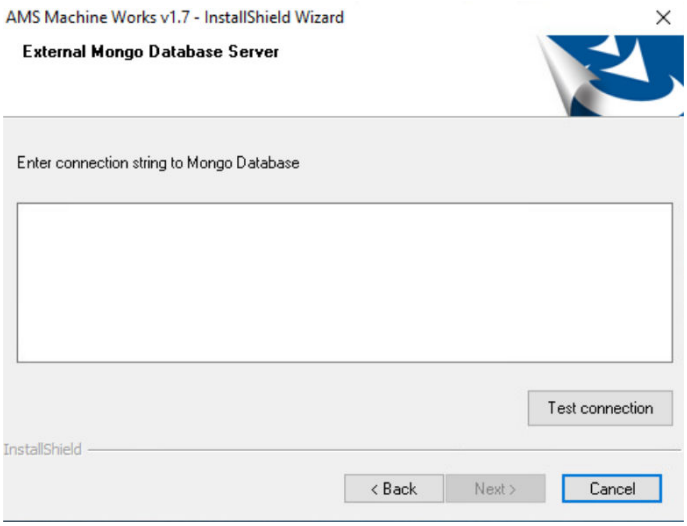
, some AMS Machine Works services will not be able to connect to this database.

Try using a connection string which contains,

```
/?authSource=admin&tls=true
```

, instead.

Figure 4-50: InstallShield Wizard - Enter Connection String



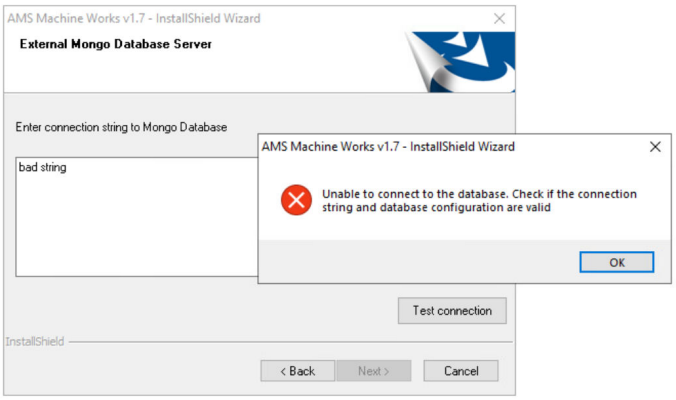
Note

The MongoDB database connection string depends on your MongoDB configuration. Contact your System Administrator for assistance. For more information about MongoDB connection strings go to either:

- https://www.mongodb.com/docs/compass/current/connect/advanced-connection-options/
- https://www.mongodb.com/docs/manual/reference/connection-string/

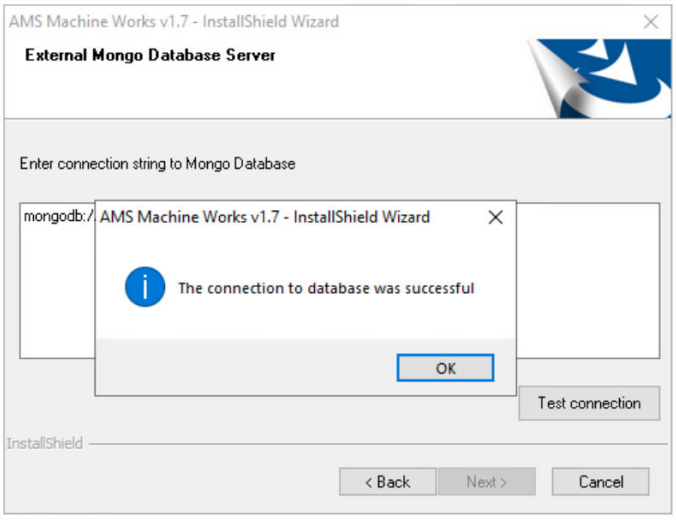
16. If the **External MongoDB** database does not connect you will get the following error. Click **OK**, and then check and reenter the connection string. If the problem persists check AMS Machine Works Security and seek the assistance of your System Administrator.

Figure 4-51: InstallShield Wizard - Incorrect Connection String



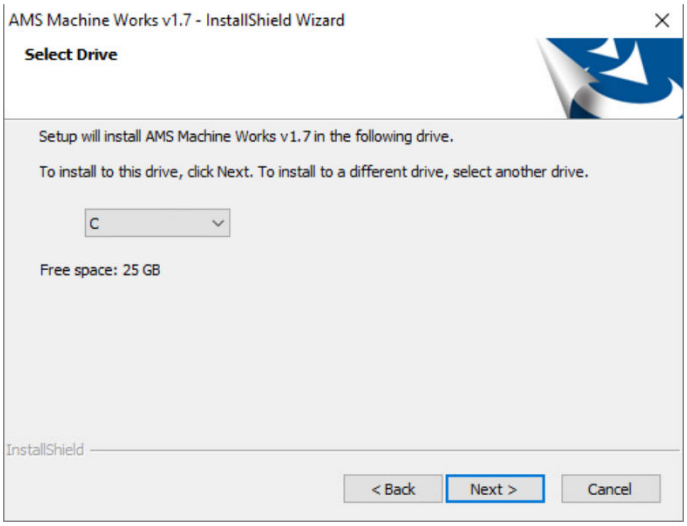
17. When the **External MongoDB** database connects you will see the following message. Click **OK**, and then click **Next** to continue the installation.

Figure 4-52: InstallShield Wizard - Database Connection Successful



18. Select the Drive letter for the location you want to store the **Internal SQL** data and the AMS Machine Works web components.

Figure 4-53: InstallShield Wizard - Select drive

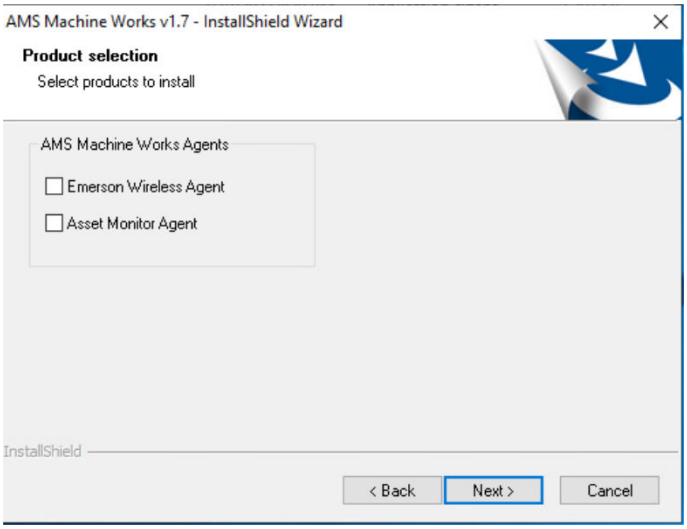


Note
It is recommended best practice to install the databases that AMS Machine Works uses on a different drive than the boot drive.

Note
Information about the recommended disk space can be found in System Requirements.

19. This example installation does not have any **Agent** configured on the main AMS Machine Works Server. Make sure that no **Agent** is selected, then click **Next** to continue.

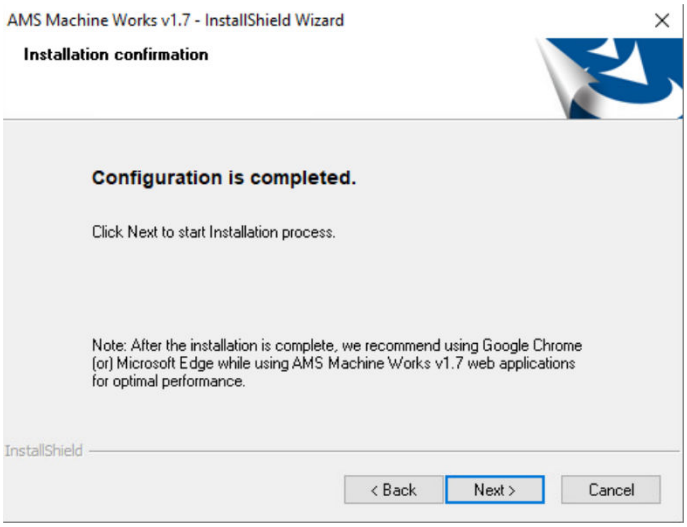
Figure 4-54: InstallShield Wizard - Agent Selection



Note
AMS Machine Works can support multiple copies of an **Agent** on different servers.

20. The configuration is complete, click **Next** to start the Installation process.

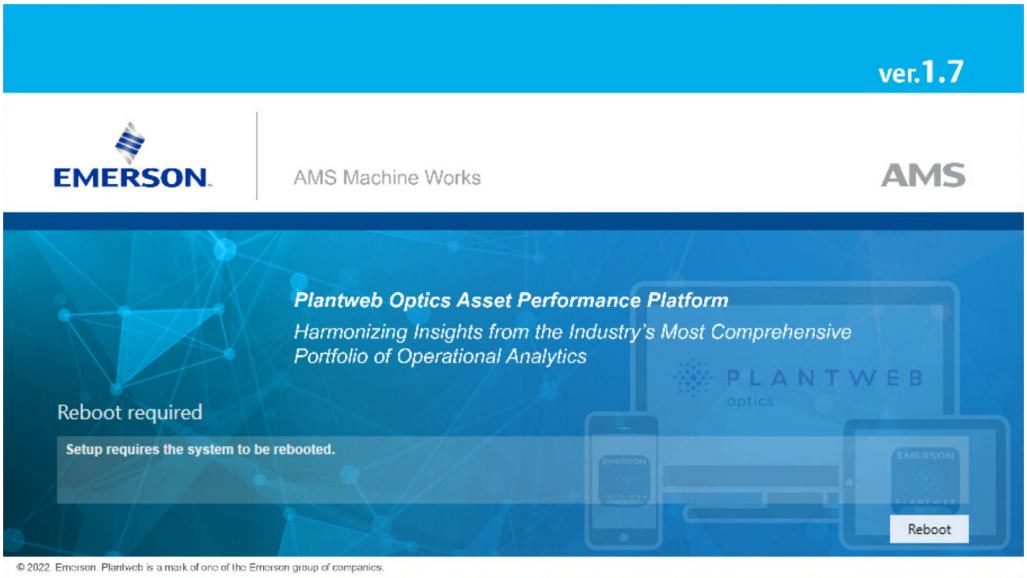
Figure 4-55: InstallShield Wizard - Configuration Completed



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

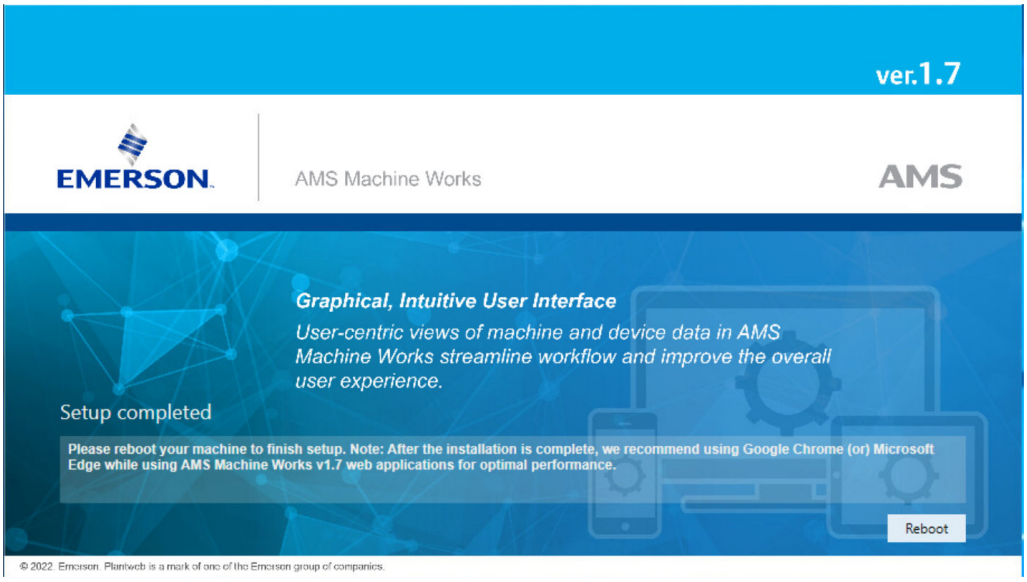
Figure 4-56: AMS Machine Works 1.7 is installing

Figure 4-57: A reboot is required



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

Figure 4-58: Final reboot request



23. The installation is now complete. Please continue to Post-installation steps.
24. Next, we perform the steps of an External AMS Machine Works Agent Server Installation.

External Agents, MongoDB, and SQL Installation

AMS Machine Works can support an **Internal SQL** server, or an **External SQL** server.

This installation example is a modification of the External Agents and MongoDB Installation where the **Agent** server(s) are installed on an **External** machine. And the MongoDB server is an **External MongoDB** installation. Now, we are adding a further layer of complexity with an **External SQL** installation. See: External Agents and MongoDB Installation

Note
There is no requirement for the **Agent** server to be **External**, or the **MongoDB** server to be **External** in order to install an **External SQL** server. These instructions are given in increasing levels of complexity in order to demonstrate the modularity of AMS Machine Works.

⚠ CAUTION

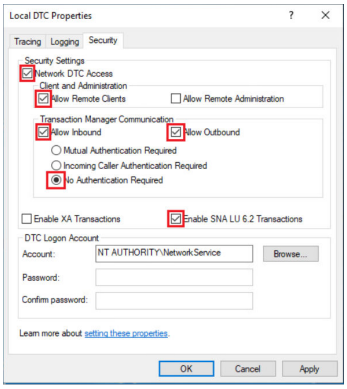
Ensure you have administrator privileges on all affected machines and system administrator privileges in SQL.

Procedure

1. First, we perform the steps of an External SQL Server Installation.
2. Pre-setup for Standard installation of AMS Machine Works v1.7.5, which must be completed before starting the installation.

a. Enable the same firewall rules on the AMS Machine Works server following the same setup steps used when setting up the SQL server

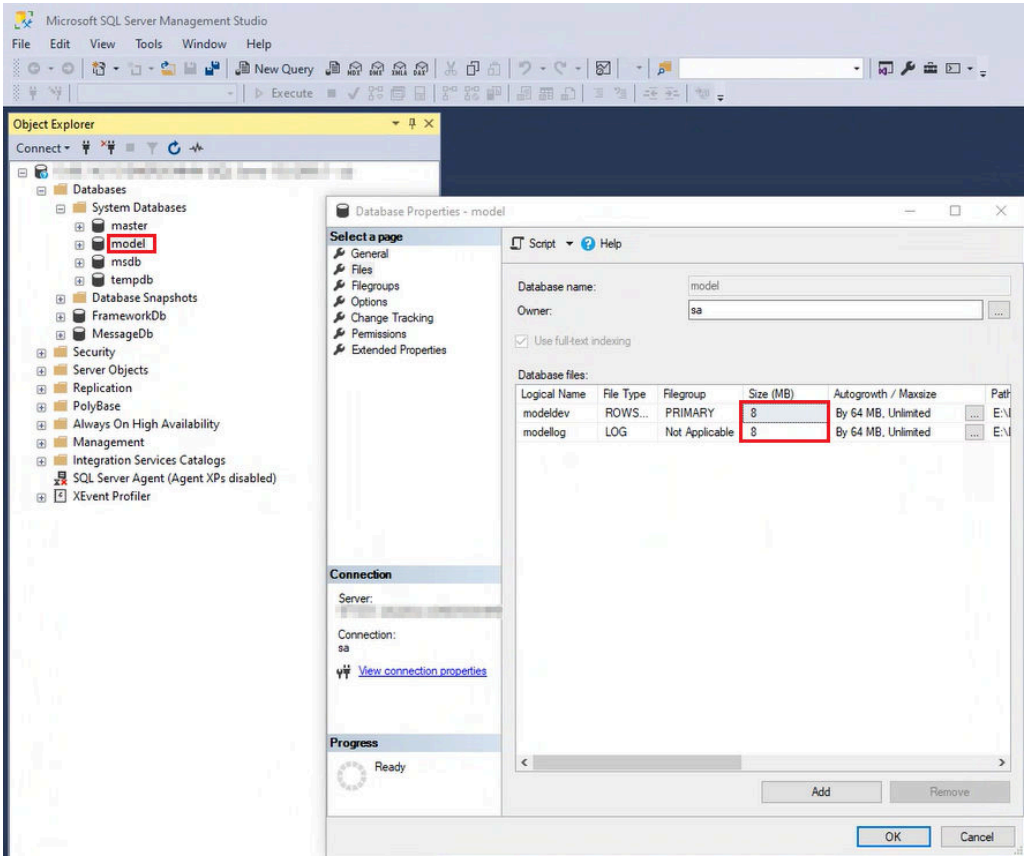
Figure 4-59: Local DTC Properties



b. Enable the Local DTC on the AMS Machine Works server in the same manner as you did for the SQL Server installation. See: External SQL Server Installation

3. Run **Microsoft SQL Server Management Studio** and in the System Databases folder under your machine name, find the **model** database. Right-click it and choose **Properties**. Set the size of both the **modeldev** and **modellog** databases to 8MB

Figure 4-60: Model Database Properties in SSMS

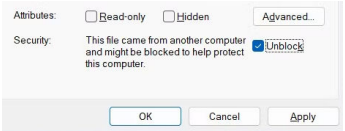


⚠ CAUTION

This step is crucial for a proper installation of AMS Machine Works v1.7.5

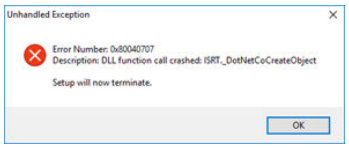
4. Log into the server with an Administrator account.
5. Download the installation files for AMS Machine Works 1.7.5.
6. Before extracting, right-click on the file and select Properties. Check the **Unblock** checkbox, and click **Apply**.

Figure 4-61: File Properties



Note
A **Blocked** file will usually result in an error.

Figure 4-62: Error pop-up



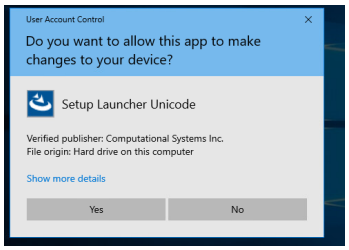
To recover from this error, delete the extracted folder, **Unblock** the file, and re-extract the installation files.

7. Extract the AMS Machine Works v1.7.5 installation files.

Note
Extract the files to a top level folder. Long file path names can result in an error during installation.

8. Right-click on `setup.exe`, and click **Run as administrator**.
9. If the **User Access Control** window appears, click **Yes** to allow `setup.exe` to install.

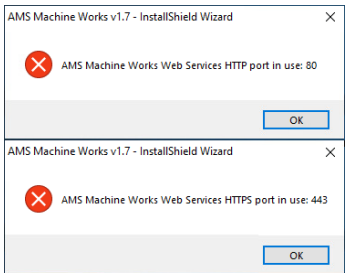
Figure 4-63: User Access Control



⚠ CAUTION

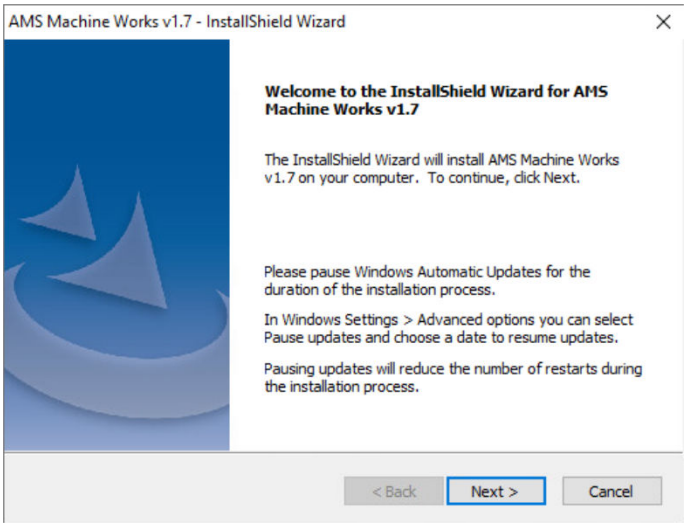
If one of the following warning pop-ups appears it means that the server does not meet the System Requirements for AMS Machine Works v1.7.5. It is recommended to stop the installation and reconfigure the server so that all the requirements are met. See: Pre-Installation Checklist Tool

Figure 4-64: Warning: AMS Machine Works Web Services ports in use



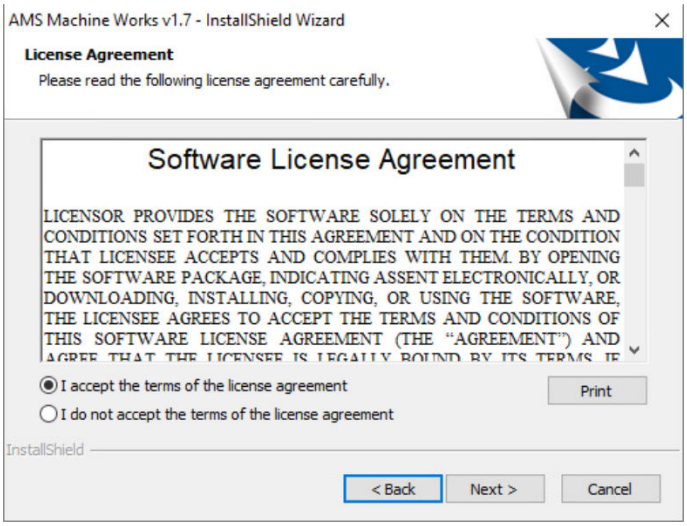
10. AMS Machine Works v1.7.5 – InstallShield Wizard, click **Next** to continue.

Figure 4-65: InstallShield Wizard - Welcome



11. Accept the terms of license agreement, and click **Next**

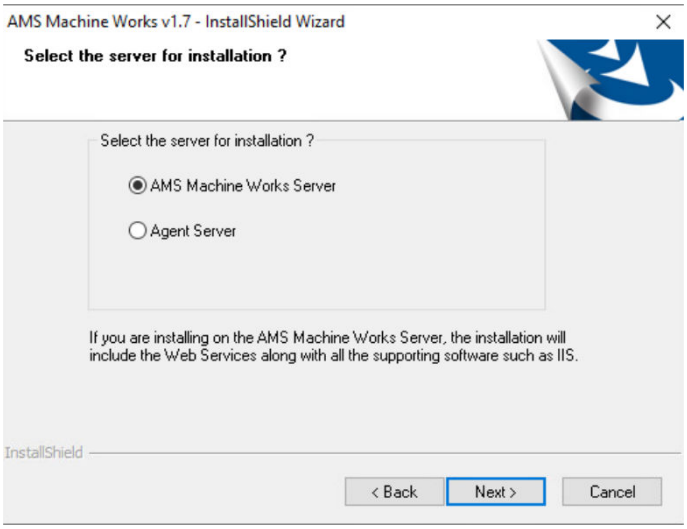
Figure 4-66: InstallShield Wizard - License Agreement



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

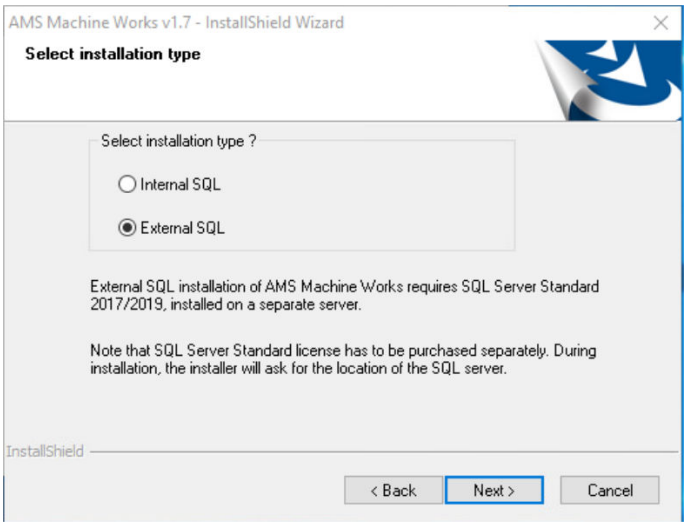
Note
If you are adding an AMS Machine Works Agent Server to an existing installation, select **Agent Server**. See: External AMS Machine Works Agent Server Installation

Figure 4-67: InstallShield Wizard - Select the server for installation



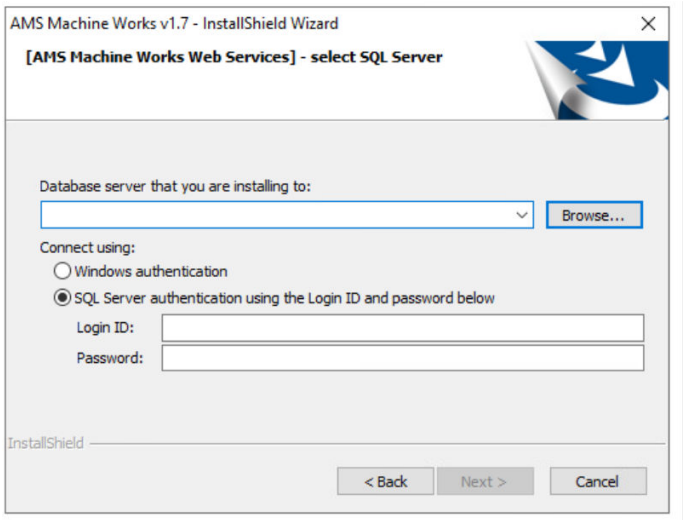
13. Select the **External SQL** installation type to use an **External SQL** database with this installation, then click **Next** to continue.

Figure 4-68: InstallShield Wizard - Select External SQL



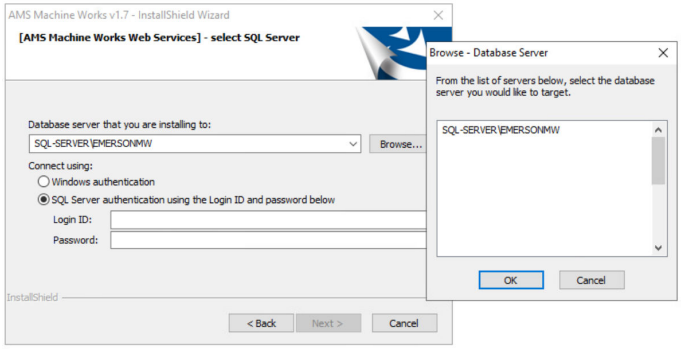
14. Click **Browse** to find the **External SQL** databases available on your network.

Figure 4-69: Browse for SQL Databases



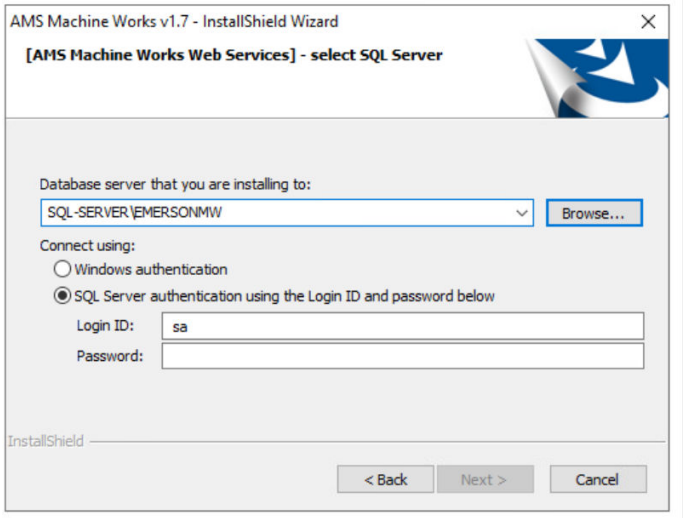
15. Select an **External SQL** database to connect to, then click **OK**.

Figure 4-70: Select a SQL Database Server



16. Enter the **Login ID** and **Password** for the **External SQL** database. Click **Next** when you have made a connection.

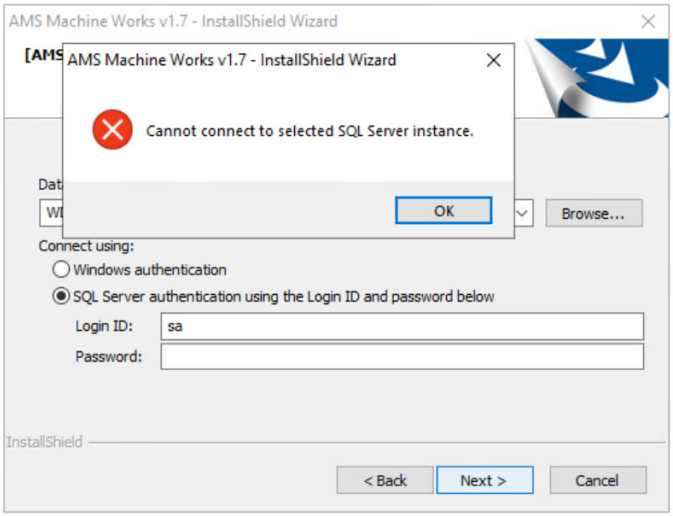
Figure 4-71: Enter Login ID and Password



Note
The **Login ID** is always 'sa' for this purpose, but the password is custom. See: External SQL Server Installation

17. If you get this message, check your **Password** and then enter it again.

Figure 4-72: Password Error



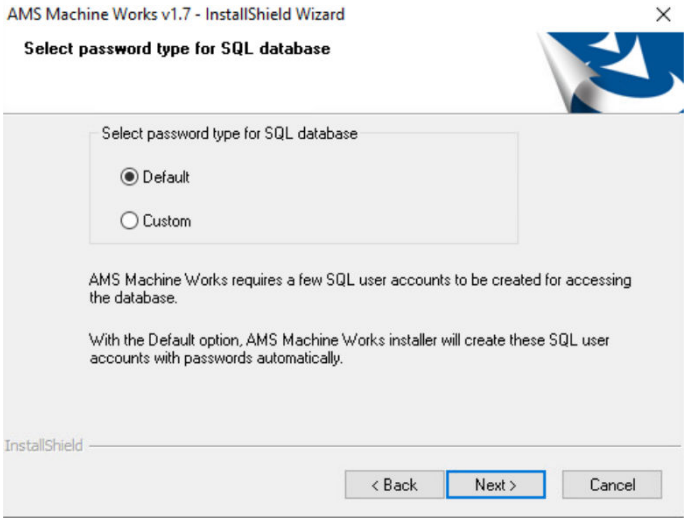
Note
The **Login ID** is always 'sa' for this purpose, but the password is custom. See: External SQL Server Installation

18. Select **Default** to allow the installation software to create passwords to access the SQL database for you.

If you want to define the passwords for the Machinery Health Manager (MHM) accounts in SQL go to the next step.

Note
If this is an upgrade from AMS Machine Works v1.7.2, you must select the same password type and if applicable, reuse the same custom passwords. See: Database Migration Wizard

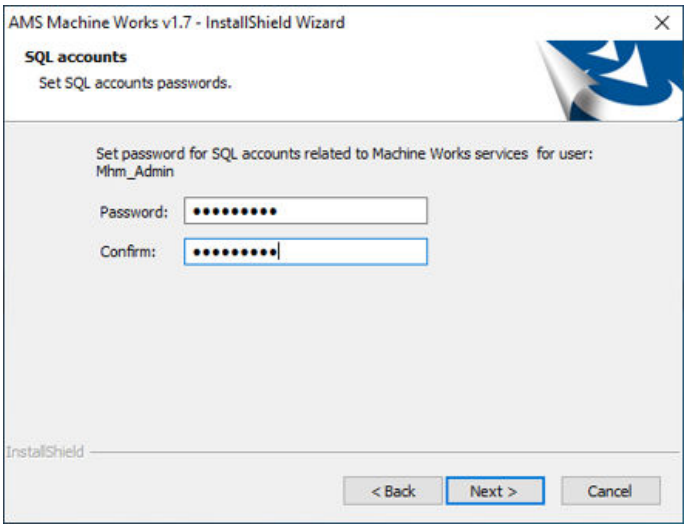
Figure 4-73: InstallShield Wizard - Select password type for SQL database



19. Select **Custom** if you would like to create your passwords for the Machinery Health Manager (MHM) accounts in SQL.

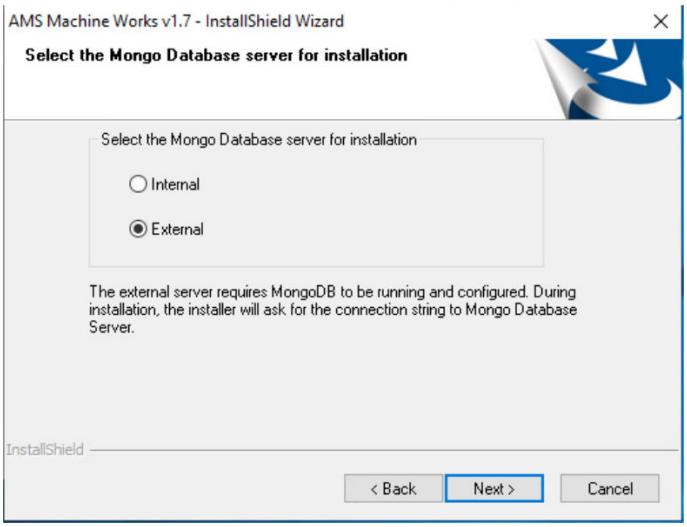
    You will be stepped through setting up Passwords for the Machinery Health Manager (MHM) accounts (Mhm_Admin, Mhm_Reader, and Mhm_Writer)

Figure 4-74: InstallShield Wizard - Set SQL account passwords



20. Select **External** MongoDB installation, and then click **Next.**

Figure 4-75: InstallShield Wizard - Select External



21. Enter the connection string for the **External MongoDB** database, then click **Test connection**.

⚠ CAUTION

If you used the **Advanced Connection Options** in **Compass** to generate a connection string and you have a string that contains,

```
/?authMechanism=DEFAULT
```

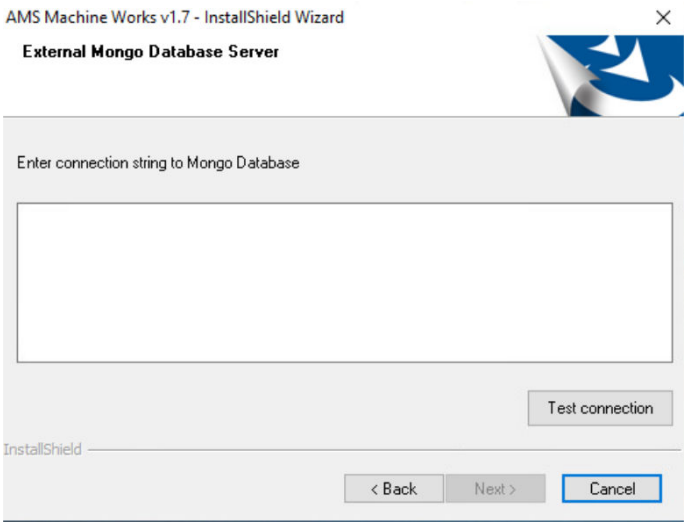
, some AMS Machine Works services will not be able to connect to this database.

Try using a connection string which contains,

```
/?authSource=admin&tls=true
```

, instead.

Figure 4-76: InstallShield Wizard - Enter Connection String



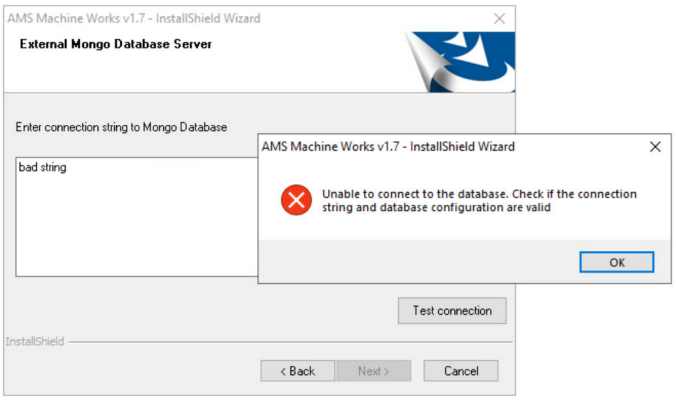
Note

The MongoDB database connection string depends on your MongoDB configuration. Contact your System Administrator for assistance. For more information about MongoDB connection strings go to either:

- https://www.mongodb.com/docs/compass/current/connect/advanced-connection-options/
- https://www.mongodb.com/docs/manual/reference/connection-string/

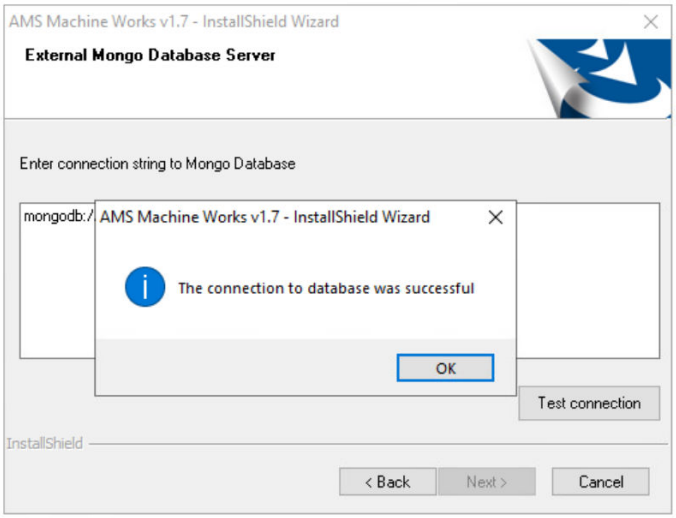
22. If the **External MongoDB** database does not connect you will get the following error. Click **OK**, and then check and reenter the connection string. If the problem persists check AMS Machine Works Security and seek the assistance of your System Administrator.

Figure 4-77: InstallShield Wizard - Incorrect Connection String



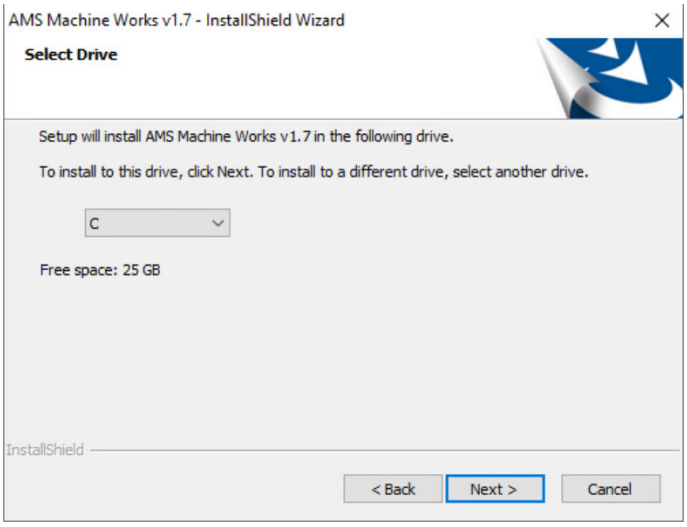
23. When the **External MongoDB** database connects you will see the following message. Click **OK**, and then click **Next** to continue the installation.

Figure 4-78: InstallShield Wizard - Database Connection Successful



24. Select the Drive letter for the location you want to store the **Internal SQL** data and the AMS Machine Works web components.

Figure 4-79: InstallShield Wizard - Select drive

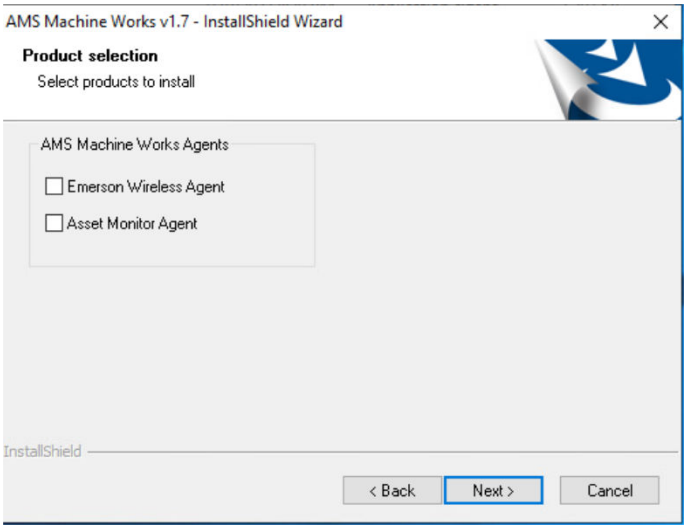


Note
It is recommended best practice to install the databases that AMS Machine Works uses on a different drive than the boot drive.

Note
Information about the recommended disk space can be found in System Requirements.

25. This example installation does not have any **Agent** configured on the main AMS Machine Works Server. Make sure that no **Agent** is selected, then click **Next** to continue.

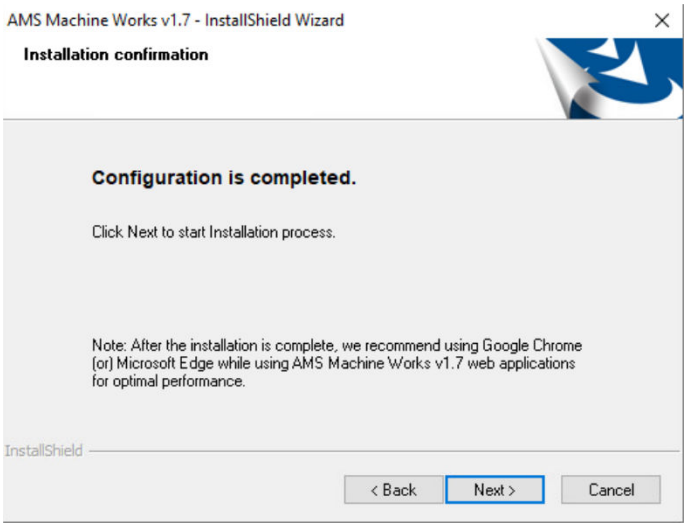
Figure 4-80: InstallShield Wizard - Agent Selection



Note
AMS Machine Works can support multiple copies of an **Agent** on different servers.

26. The configuration is complete, click **Next** to start the Installation process.

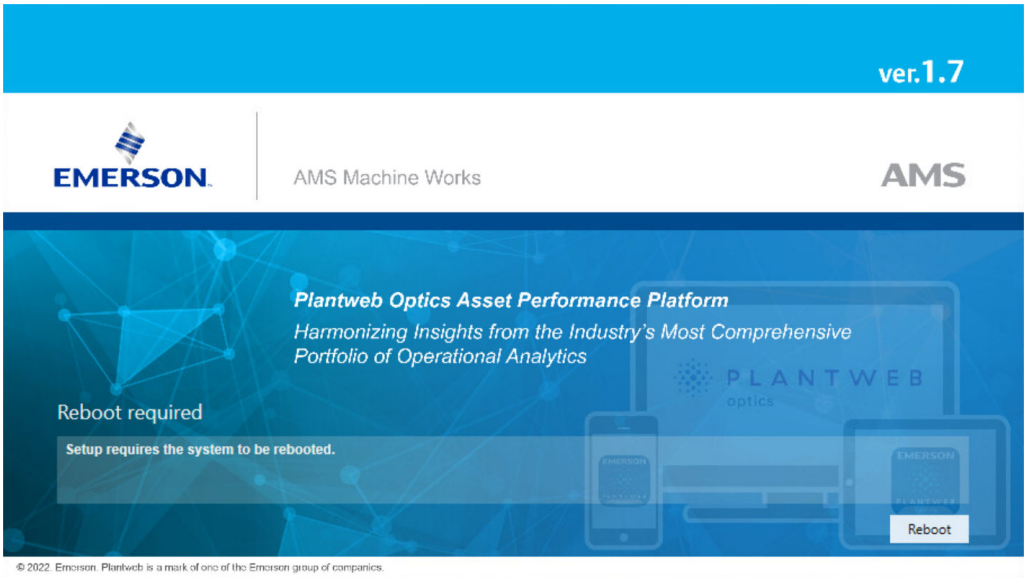
Figure 4-81: InstallShield Wizard - Configuration Completed



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

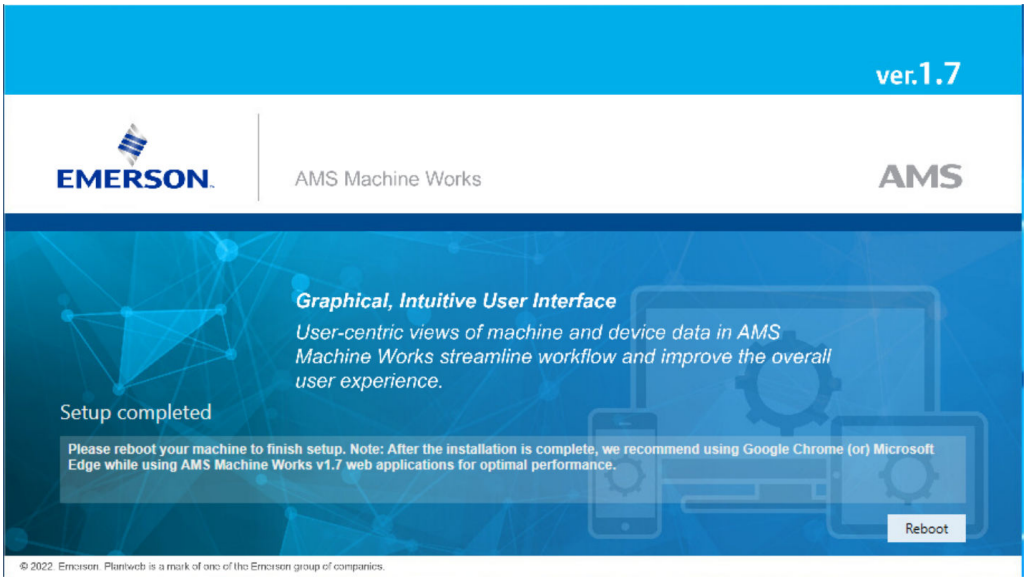
Figure 4-82: AMS Machine Works 1.7 is installing

Figure 4-83: A reboot is required



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

Figure 4-84: Final reboot request



29. The installation is now complete. Please continue to Post-installation steps.
30. Next, we perform the steps of an External AMS Machine Works Agent Server Installation.

Modular Component Installation Procedures

Various components used in the AMS Machine Works system can be distributed to different servers and on different levels of network topology. These include:

- External AMS Machine Works Agent Server Installation
- External MongoDB Server Installation
- External SQL Server Installation

External AMS Machine Works Agent Server Installation

This installation procedure shows the distributed deployment scenario of installing every **Agent** on the AMS Machine Works Agent server. This procedure shows installing both an Emerson Wireless Agent and an AMS Asset Monitor Agent.

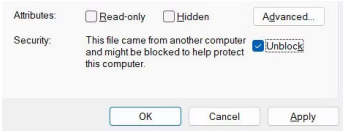
Prerequisites

Install components on the AMS Machine Works server. Ensure that you select which **Agent Servers** you need to install before starting this procedure. See: AMS Machine Works Security

Procedure

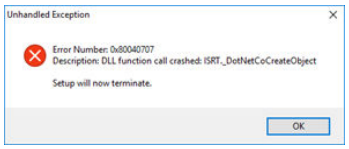
1. Log into the server with an Administrator account.
2. Download the installation files for AMS Machine Works 1.7.5.
3. Before extracting, right-click on the file and select Properties. Check the **Unblock** checkbox, and click **Apply**.

Figure 4-85: File Properties



Note
A **Blocked** file will usually result in an error.

Figure 4-86: Error pop-up



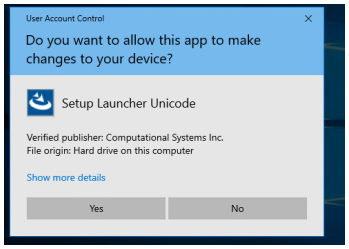
To recover from this error, delete the extracted folder, **Unblock** the file, and re-extract the installation files.

4. Extract the AMS Machine Works v1.7.5 installation files.

Note
Extract the files to a top level folder. Long file path names can result in an error during installation.

5. Right-click on `setup.exe`, and click **Run as administrator**.
6. If the **User Access Control** window appears, click **Yes** to allow `setup.exe` to install.

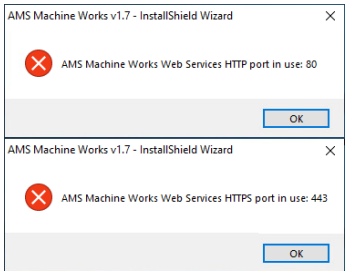
Figure 4-87: User Access Control



⚠ CAUTION

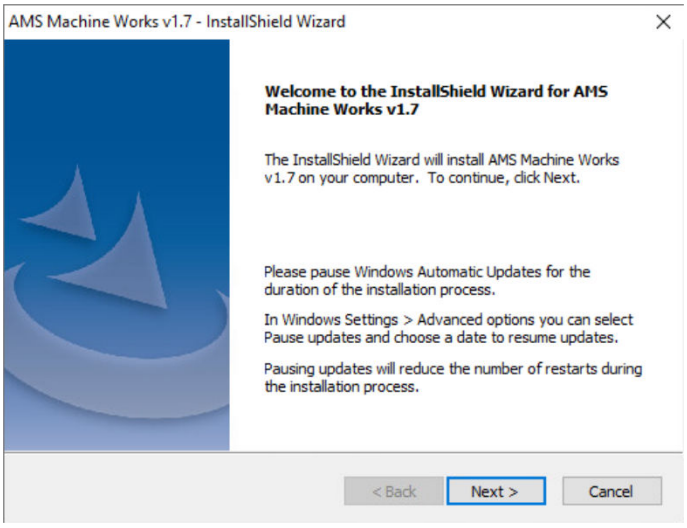
If the following warning pop-ups appears it means that the server does not meet the System Requirements for AMS Machine Works v1.7.5. It is recommended to stop the installation and reconfigure the server so that all the requirements are met.

Figure 4-88: Warning: AMS Machine Works Web Services ports in use



7. AMS Machine Works v1.7.5 – InstallShield Wizard, click **Next** to continue.

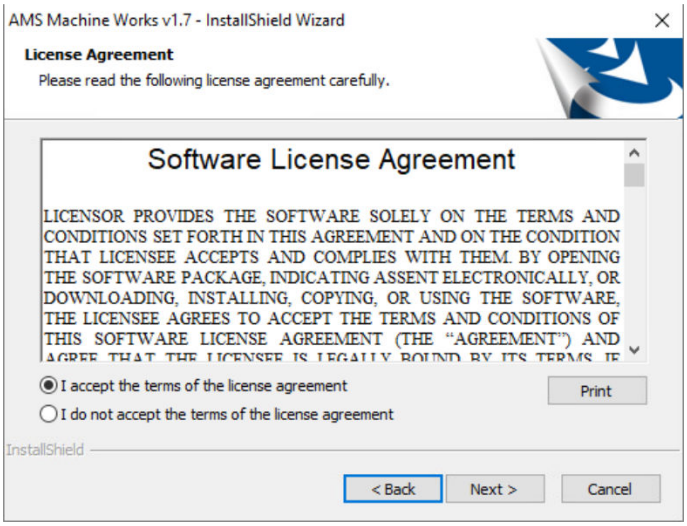
Figure 4-89: InstallShield Wizard - Welcome



Note
It is strongly recommended that you pause Windows Automatic Updates during the installation process. Failure to do so can result in inconsistent results.

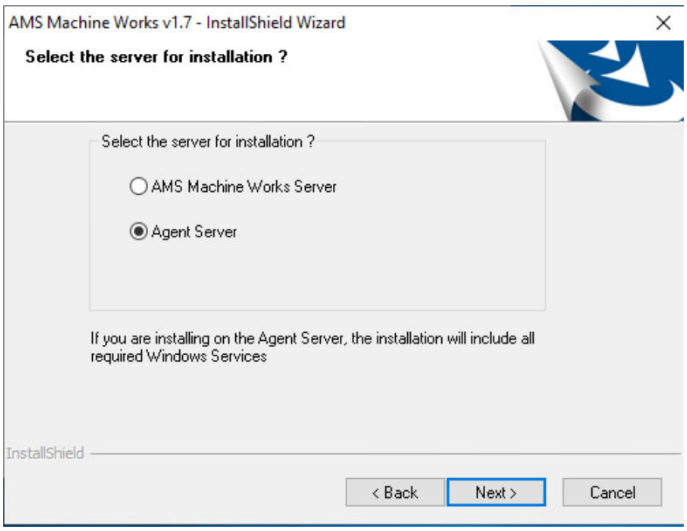
8. Accept the terms of license agreement, and click **Next**

Figure 4-90: InstallShield Wizard - License Agreement



9. Select Agent Server for a new installation.

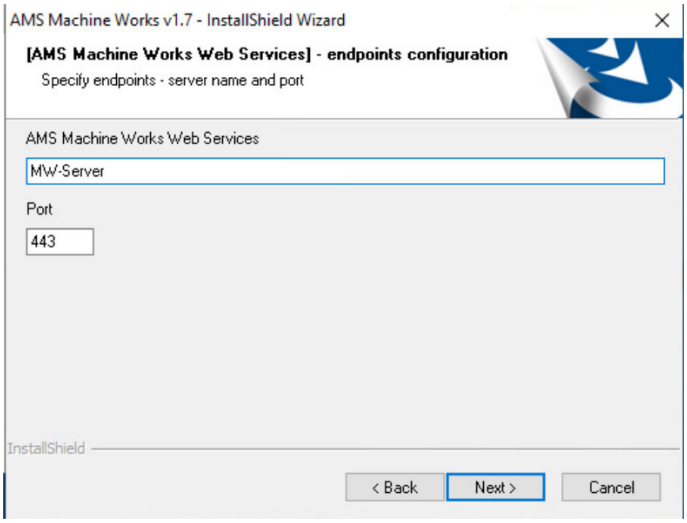
Figure 4-91: InstallShield Wizard - Select the Agent Server Installation Option



10. Enter the name and port number of the AMS Machine Works Server you want to connect to, then click **Next** to continue.

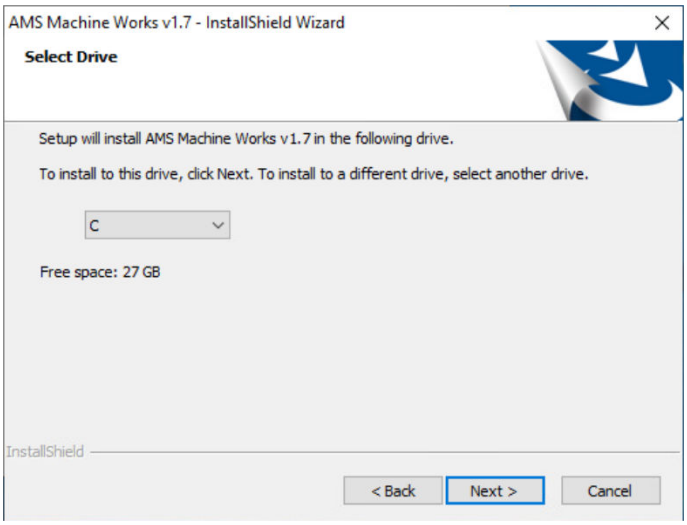
Note
If you have a FQDN (Fully Qualified Domain Name) network, you must enter the **Full computer name** for the AMS Machine Works server here. On the AMS Machine Works server select **This PC** → **Properties** to find this information.

Figure 4-92: InstallShield Wizard - Enter the AMS Machine Works Server Information



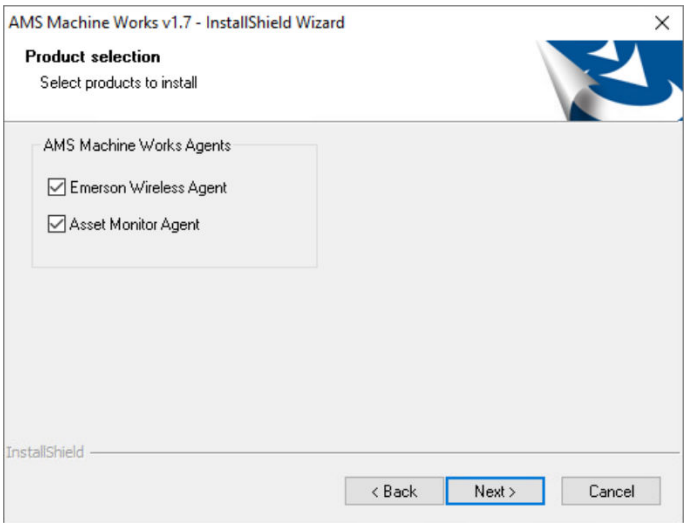
11. Select which drive you would like to install the Agent Server on, then click **Next** to continue.

Figure 4-93: InstallShield Wizard - Drive Selection



12. Select every **Agent** which you will need to access the devices on your network, then click **Next** to continue.

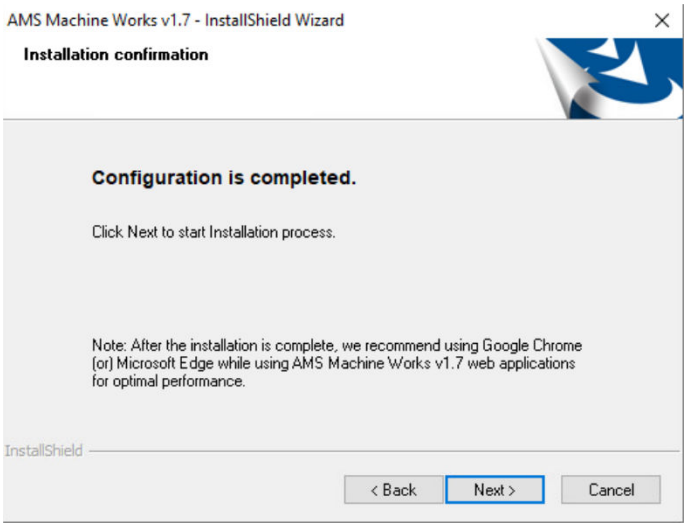
Figure 4-94: InstallShield Wizard - Agent Selection



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

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

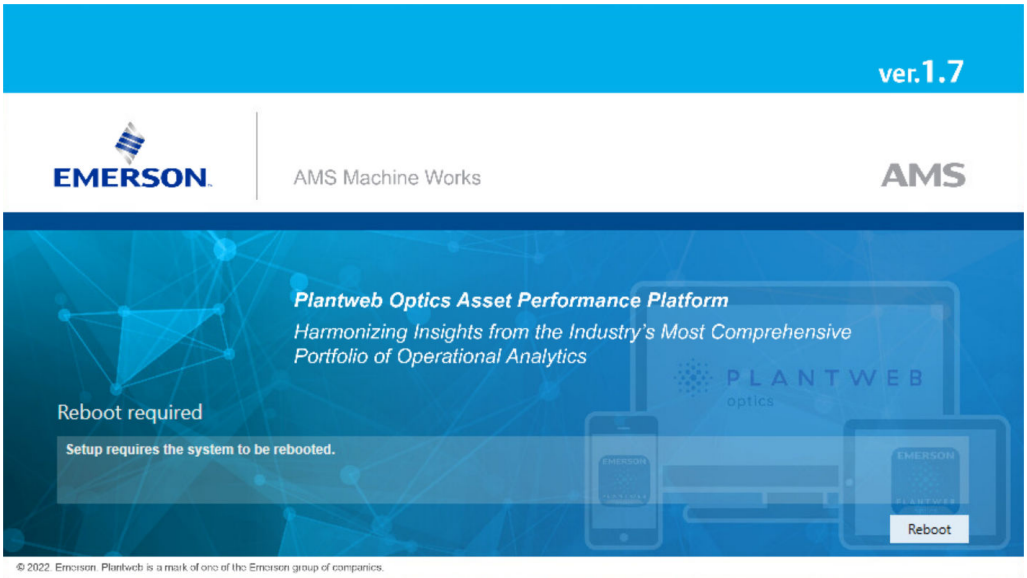
Figure 4-95: InstallShield Wizard - Configuration Completed



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

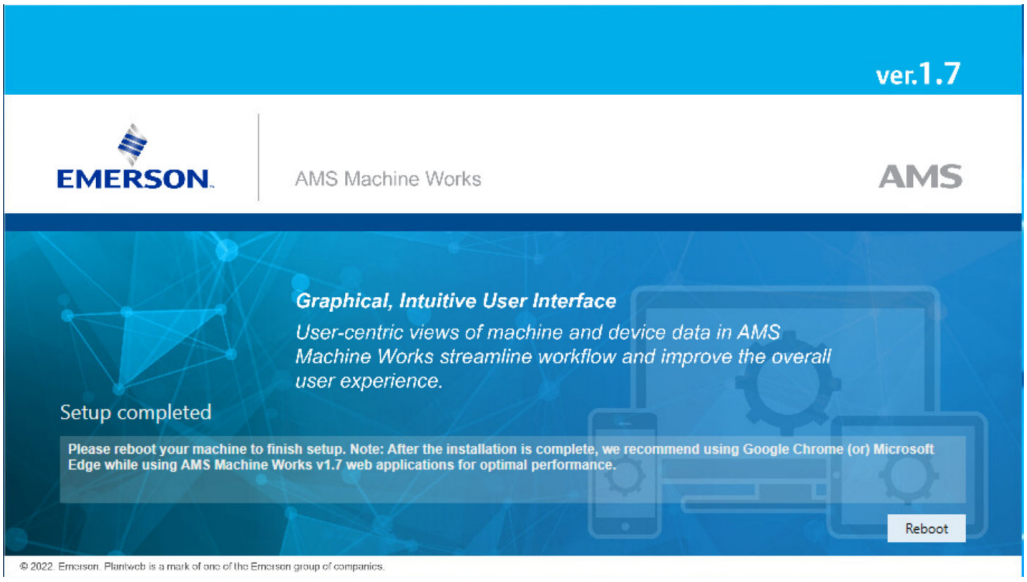
Figure 4-96: AMS Machine Works 1.7 is installing

Figure 4-97: A reboot is required



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

Figure 4-98: Final reboot request



16. The installation is now complete. Please continue to Post-installation steps.
17. Export the certificate from the AMS Machine Works server and install it on the AMS Machine Works Agent server. See: AMS Machine Works Security or consult your System Administrator for further instructions.

The installation is now complete. Please continue to Post-installation steps.

External MongoDB Server Installation

This procedure provides instructions for installing a new **External** MongoDB Database Server.

The default installation is to have an **Internal** MongoDB database which is automatically configured. If you need to install an **External** MongoDB Database Server, follow these steps.

Prerequisites

1. Ensure that the machine meets the minimum specification for an **External** MongoDB Server.
2. Ensure that the machine does not have a previous installation of MongoDB.
3. Get the MongoDB 6.0.10 installer from one of the following locations:

Note
AMS Machine Works v1.7.5 is only compatible with MongoDB 6.0.10 versions.

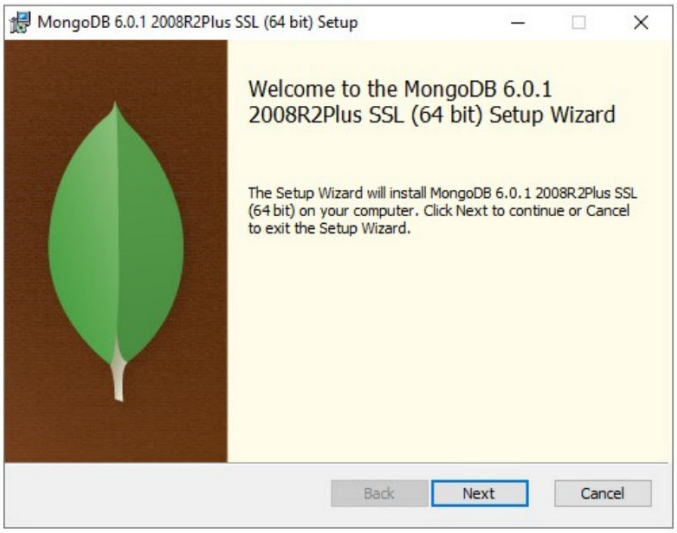
   a. AMS Machine Works v1.7.5 installer package — `..\dep\_Support\MongoDB\mongodb-windows-x86_64-6.0.10-signed.msi`

b. Online — Download the installation file for MongoDB 6.0.10 to the machine. https://fastdl.mongodb.org/windows/mongodb-windows-x86_64-6.0.10-signed.msi

Procedure

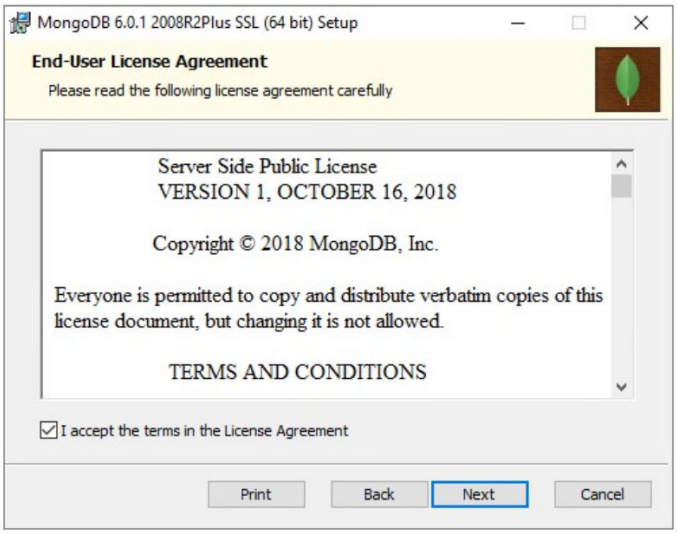
1. Run the MongoDB 6.0.10 installer, and then click **Next**.

Figure 4-99: Welcome Screen



2. Accept the terms in the License Agreement, and then click **Next**.

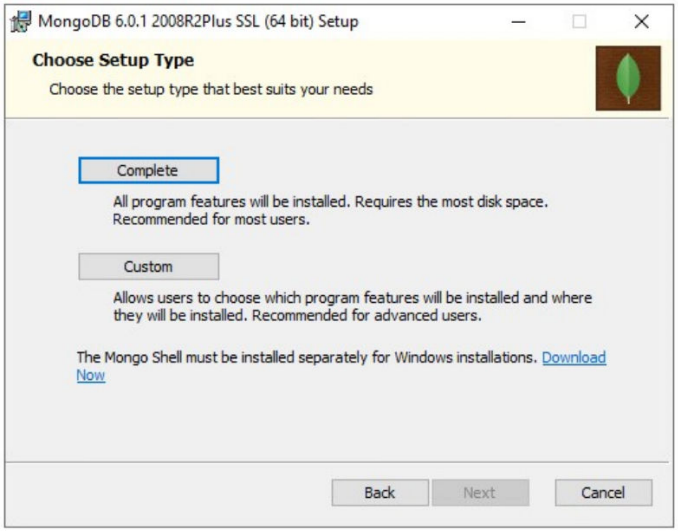
Figure 4-100: License Agreement



3. Choose the Setup Type for your MongoDB, and then click **Next**.

Note
The **Complete** option is recommended. For **Custom** options contact your System Administrator.

Figure 4-101: Choose Setup Type



4. Configure the MongoDB Server, and then click **Next**.

Note
Recommendation:

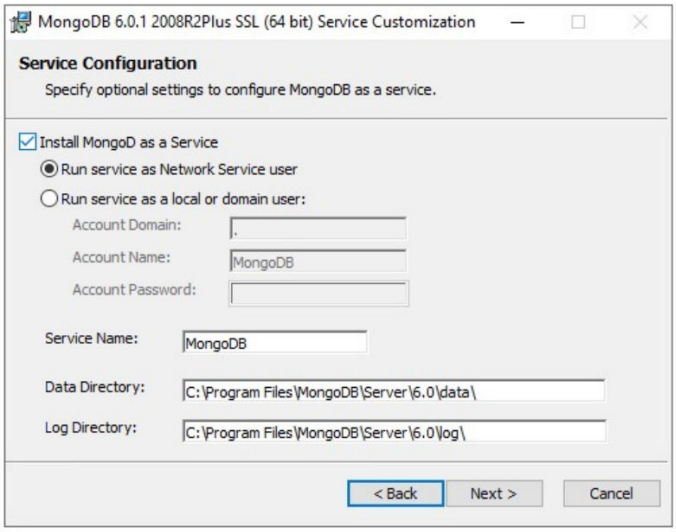
a. Accept the default options to install MongoD as a service named MongoDB.

b. Run the MongoDB service as a Network Service user.

c. Install the Data Directory and the Log Directory on a drive other than `C:`, and establish a backup schedule for this drive.

For other configuration options contact your System Administrator.

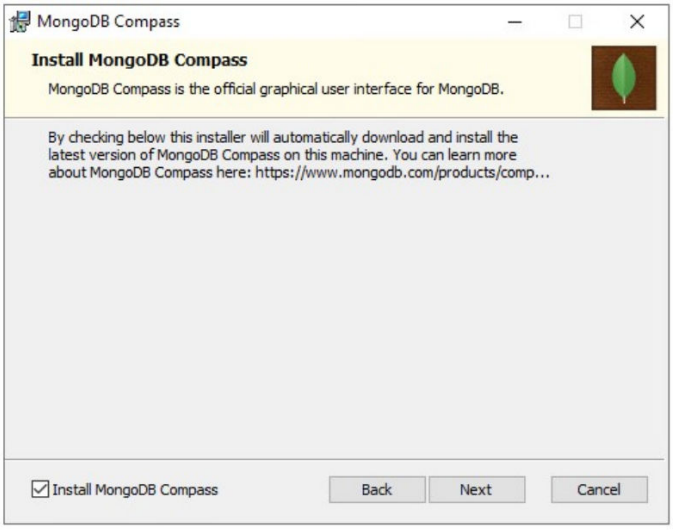
Figure 4-102: Service Configuration



5. Decide if you want to Install MongoDB Compass, and then click **Next**.

Note
Installing MongoDB Compass is recommended because it makes preparing, configuring, and managing the database easier.

Figure 4-103: Install MongoDB Compass



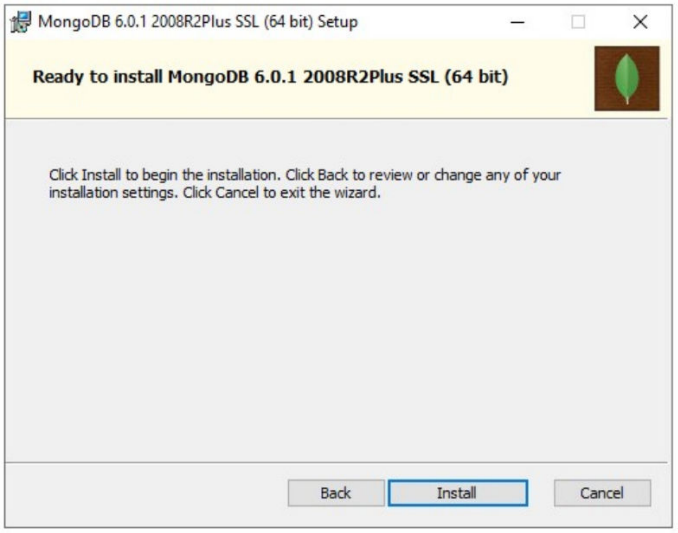
Note
If the automatic installation of MongoDB Compass fails, for example because of corporate security policies, then you must install it manually. The installer is located at: `..\dep\_Support\MongoDB\mongodb-compass-1.39.3-win32-x64.exe`.

If you want to perform additional installations of MongoDB Compass, for example on the AMS Machine Works server, you can manually perform this installation in multiple places.

6. Confirm your installation choices, and then click **Install**.

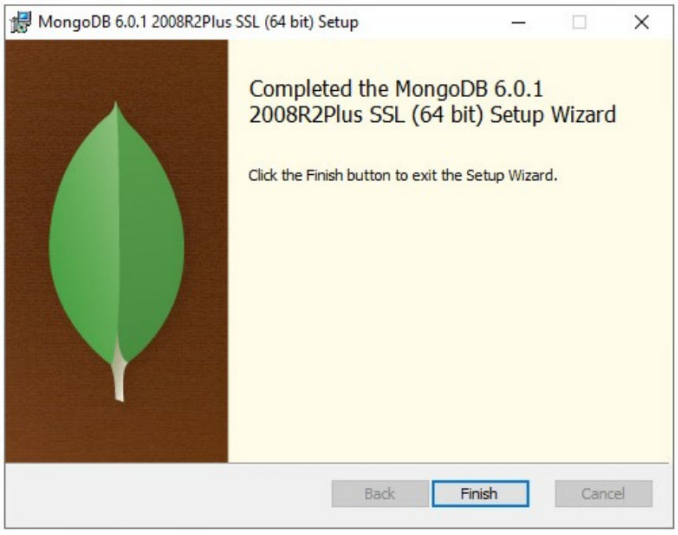
Note
You can use the **Back** and **Next** keys to review your choices and then return to this screen.

Figure 4-104: Install this Configuration



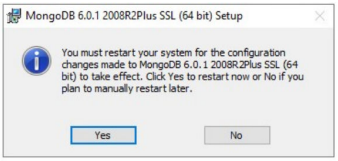
7. When the installation is complete click **Finish**.

Figure 4-105: Finish Installation



8. MongoDB requires a system restart to operate properly. Choose **Yes** to restart automatically now, or **No** to restart manually later.

Figure 4-106: Restart Required

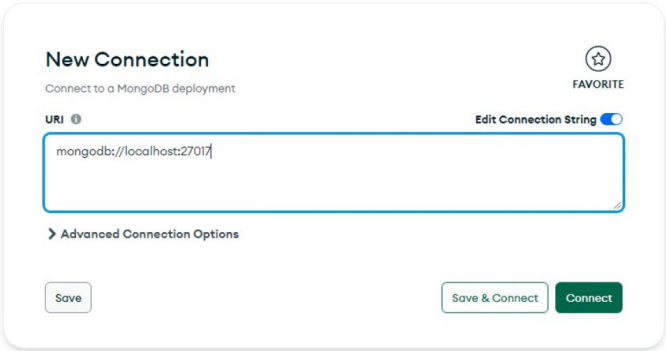


9. Run MongoDB Compass, enter the default credentials, and then click **Connect**.

Note
If you did not install MongoDB Compass as was recommended in one of the previous steps:

- Either, contact your System Administrator about how to proceed.
- Or, download and install MongoDB Compass now.

Figure 4-107: New Connection



⚠ CAUTION

If you used the **Advanced Connection Options** in **Compass** to generate a connection string and you have a string that contains,

```
/?authMechanism=DEFAULT
```

, some AMS Machine Works services will not be able to connect to this database.

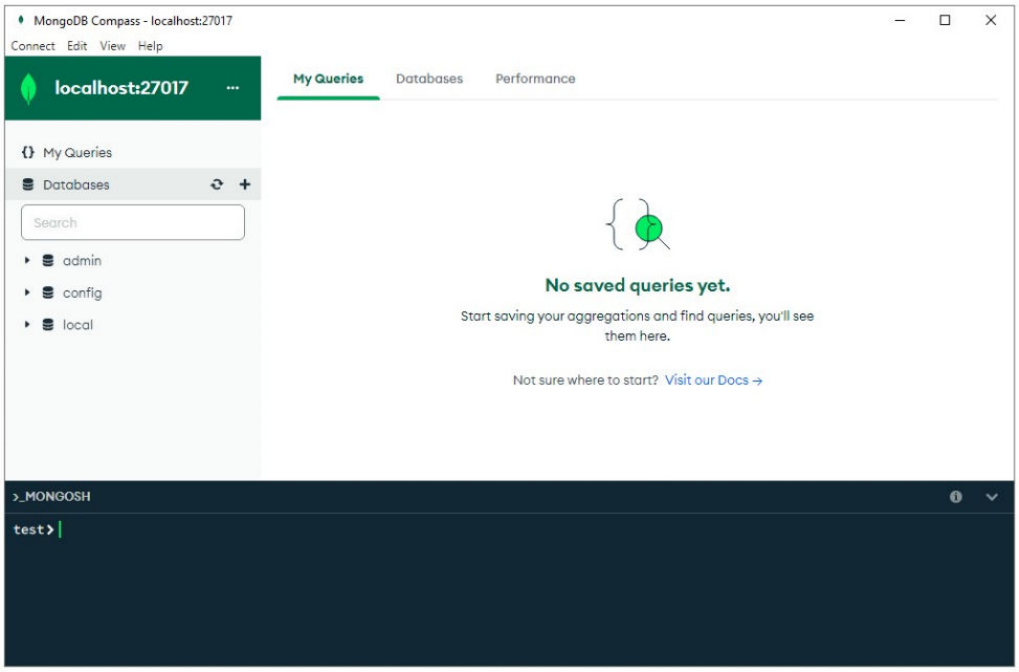
Try using a connection string which contains,

```
/?authSource=admin&tls=true
```

, instead.

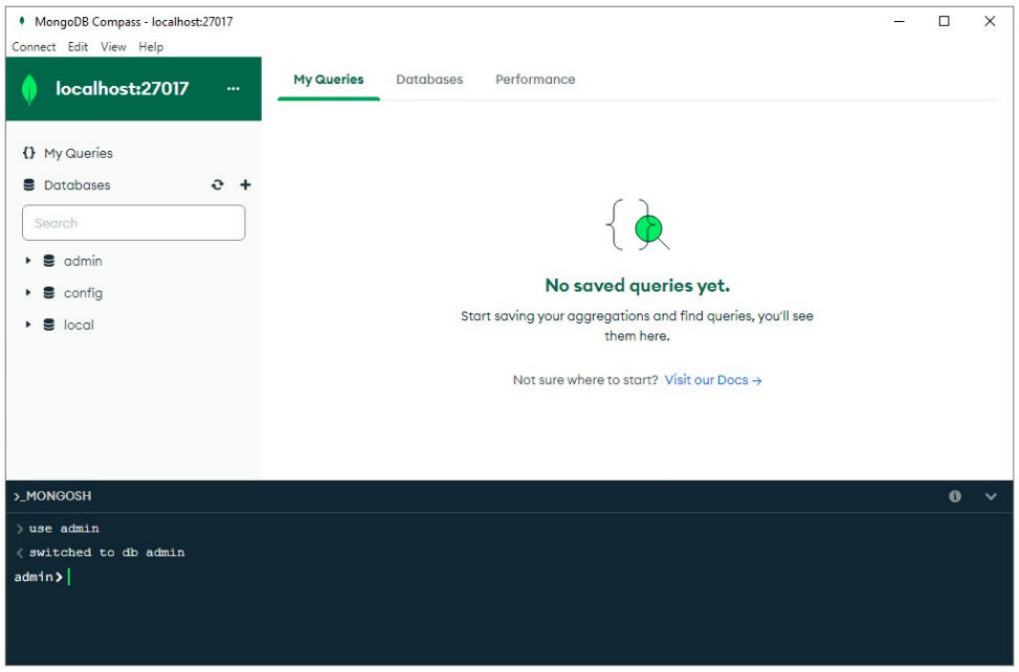
10. Expand the MongoDB command line interface by clicking on **_MONGOSH** at the bottom of the window.

Figure 4-108: Access the MongoDB Shell



11. Switch to the Admin database by entering the command: `use admin`.

Figure 4-109: Enter the 'use admin' Command



12. Enter and modify the text below to create an admin user for managing the MongoDB.

```
db.createUser(
  {
    user: "admin",
    pwd: "Password123",
    roles: [
      { role: "userAdminAnyDatabase", db: "admin" },
      { role: "readWriteAnyDatabase", db: "admin" }
    ]
  }
)
```

Note
Text entered into the MongoDB shell is case sensitive.

Note
The example password, "Password123", should be replaced with a password which meets your organization's security policies.

Figure 4-110: Create an Admin User to Manage the MongoDB

13. Enter and modify the text below to create a database user for the AMS Machine Works services.

Note
This user requires `readWrite` privileges for the following databases:

- EmersonMWcoreData
- EmersonMWCore
- EmersonMWOnline

```
db.createUser(
  {
    user: "mwservice",
    pwd: "Password123",
    roles: [
      { role: "readWrite", db: "EmersonMWcoreData" },
      { role: "readWrite", db: "EmersonMWCore" },
      { role: "readWrite", db: "EmersonMWOnline" }
    ]
  }
)
```

Note
Text entered into the MongoDB shell is case sensitive.

Note
The example password, "Password123", should be replaced with a password which meets your organization's security policies.

Figure 4-111: Create a Database User for AMS Machine Works Services

14. Open the default `mongod.cfg` file. The default location of the file is: `C:\Program Files\MongoDB\Server\6.0\bin`

Figure 4-112: Example MongoDB Configuration File — mongod.cfg

```
# mongod.conf

# for documentation of all options, see:
#   http://docs.mongodb.org/manual/reference/configuration-
options/

# Where and how to store data.
storage:
  dbPath: C:\Program Files\MongoDB\Server\6.0\data
  journal:
    enabled: true
#  engine:
#  wiredTiger:

# where to write logging data.
systemLog:
  destination: file
  logAppend: true
  path:  C:\Program Files\MongoDB\Server\6.0\log\mongod.log

# network interfaces
net:
  port: 27017
  bindIp: 127.0.0.1


#processManagement:

#security:

#operationProfiling:

#replication:

#sharding:

## Enterprise-Only Options:

#auditLog:

#snmp:
```

15. Modify the `# network interfaces` and `#security` sections of the `mongod.cfg` file.

Figure 4-113: Recommended Configuration

 # network interfaces section

```
# network interfaces
net:
  port: 27018
  bindIp: 0.0.0.0
  tls:
    mode: requireTLS
    certificateKeyFile: C:\Program Files\MongoDB\Server
\6.0\bin\certificate.pem
```

#security section

```
security:
    authorization: enabled
```

Note

- Remember to remove the comment symbol,

  ```
  #
  ```

  , in front of

  ```
  security:
  ```

  or an error will occur.
- Do not use the **Tab** key to indent the configuration file, only use the **Space** key. Using the **Tab** key will result in a configuration error.
- The default **port** is recommended to be changed from 27017 to another port number.
- Setting the **bindIp** to 0.0.0.0 allows it to bind an IP address other than localhost.
- **certificateKeyFile** is a certificate file in the **.pem** format. A matching **.crt** file must be installed on the AMS Machine Works server machine. Contact your System Administrator for details about generating these files. See: AMS Machine Works Security
- If **authorization** is not enabled, any user can access the MongoDB database.

Note

The MongoDB Atlas cloud solution also requires a user that has the proper permissions for the Emerson databases. The MongoDB Atlas cloud solution has a graphical interface for configuring these options. These options should be configured to the same values as shown above. Please seek the assistance of your System Administrator, and refer to your MongoDB Atlas cloud documentation for how to perform these steps.

16. Restart the **MongoDB Server (MongoDB)** service.

The MongoDB server is now correctly configured and running.

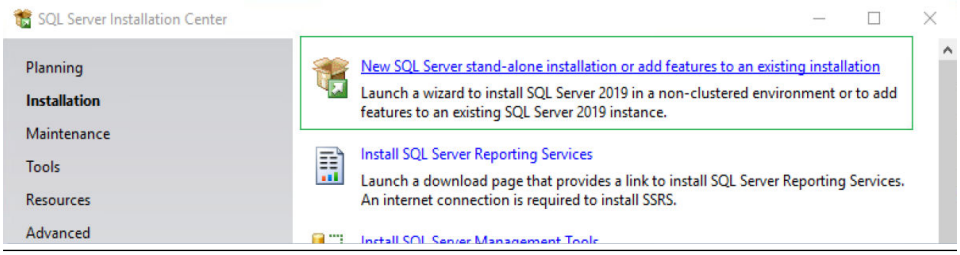
External SQL Server Installation

This procedure provides instructions for a new installation of SQL Server. If this is an upgrade from AMS Machine Works v1.7.2, please skip this section and proceed directly to External Agents, MongoDB, and SQL Installation. For installation of the AMS Machine Works Agert Server software go to External AMS Machine Works Agent Server Installation

Procedure

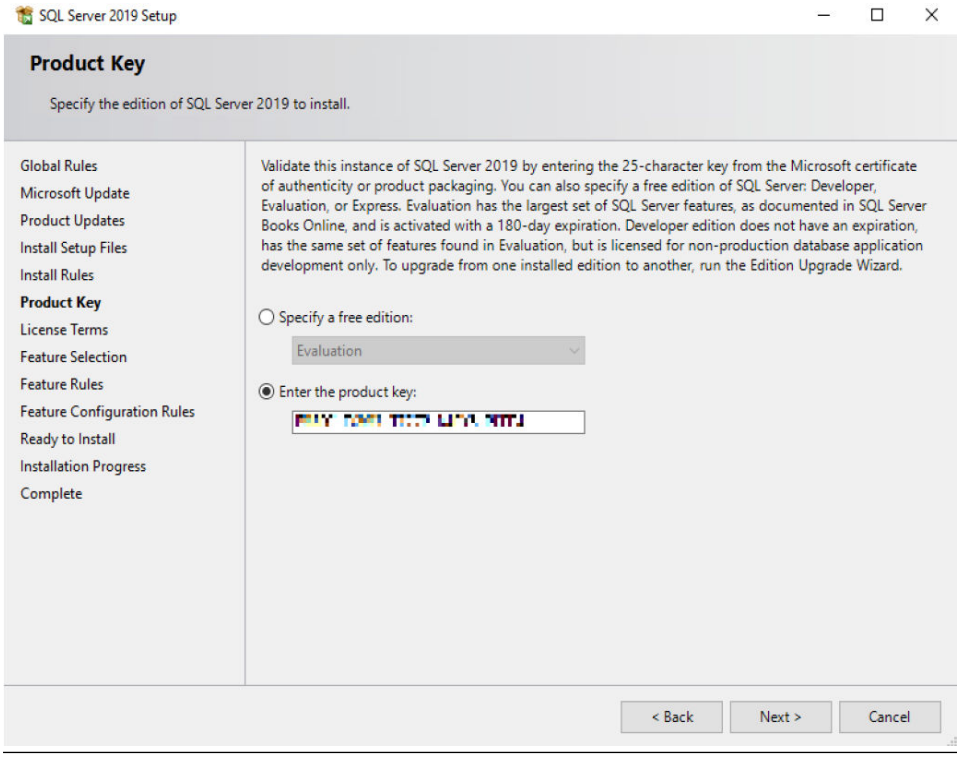
1. Start a NEW SQL Server stand-alone installation from your installer disc/image
2. If you are using an ISO you might have to right click the ISO file and select mount, this will mount the image and create a drive using the next available drive letter. Right-click the `Setup.exe` and choose **Run as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

Figure 4-114: SQL Server Installation



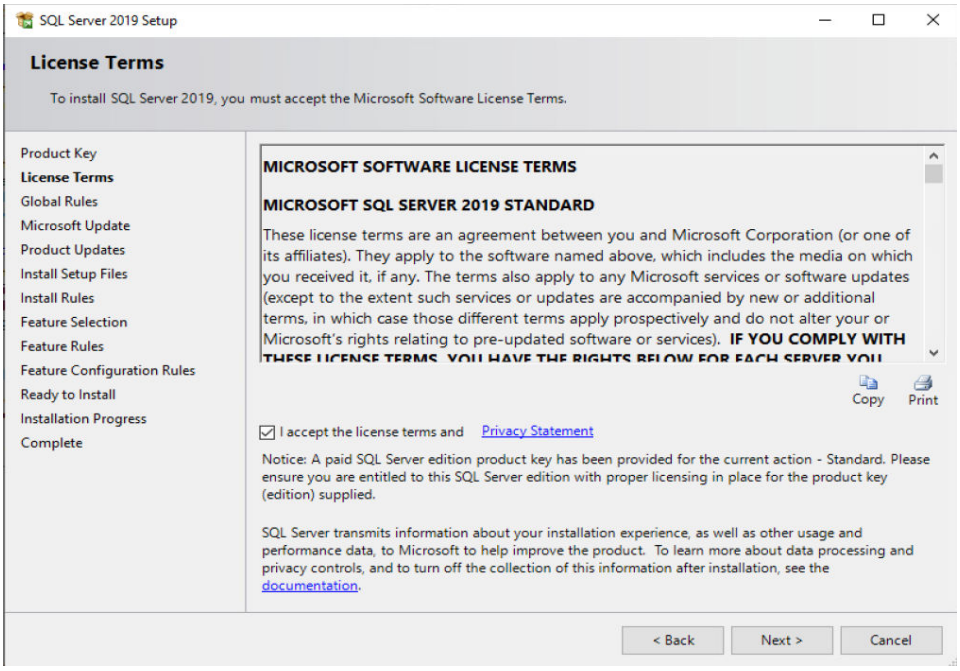
5. Input your product key as needed and click **Next**.

Figure 4-115: Product Key step



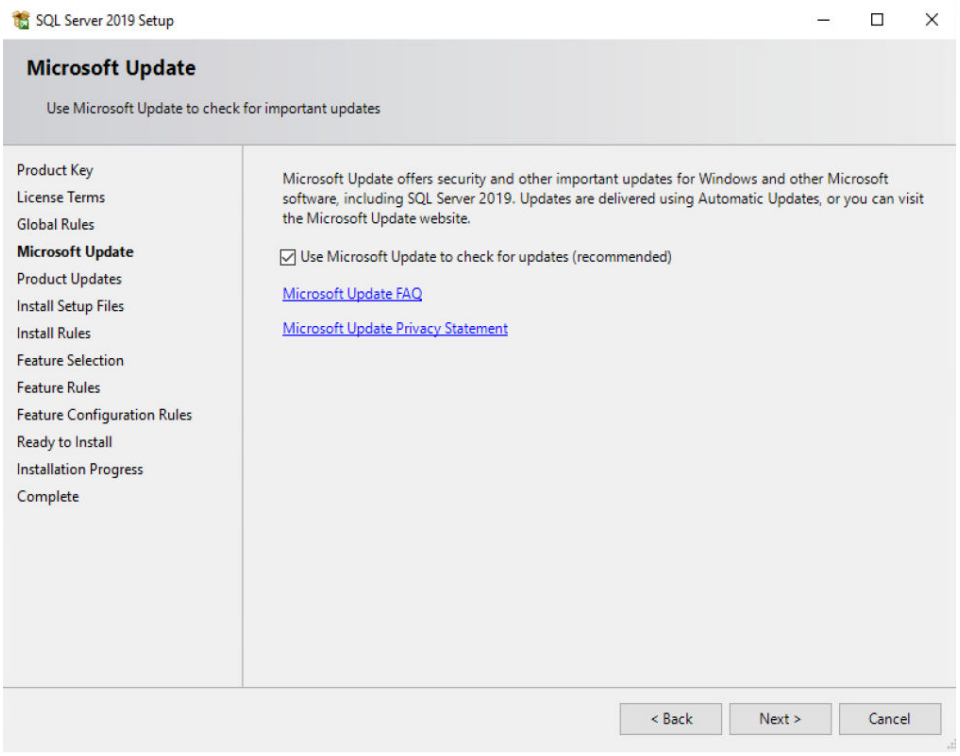
6. Accept the license and click **Next**.

Figure 4-116: License Terms step



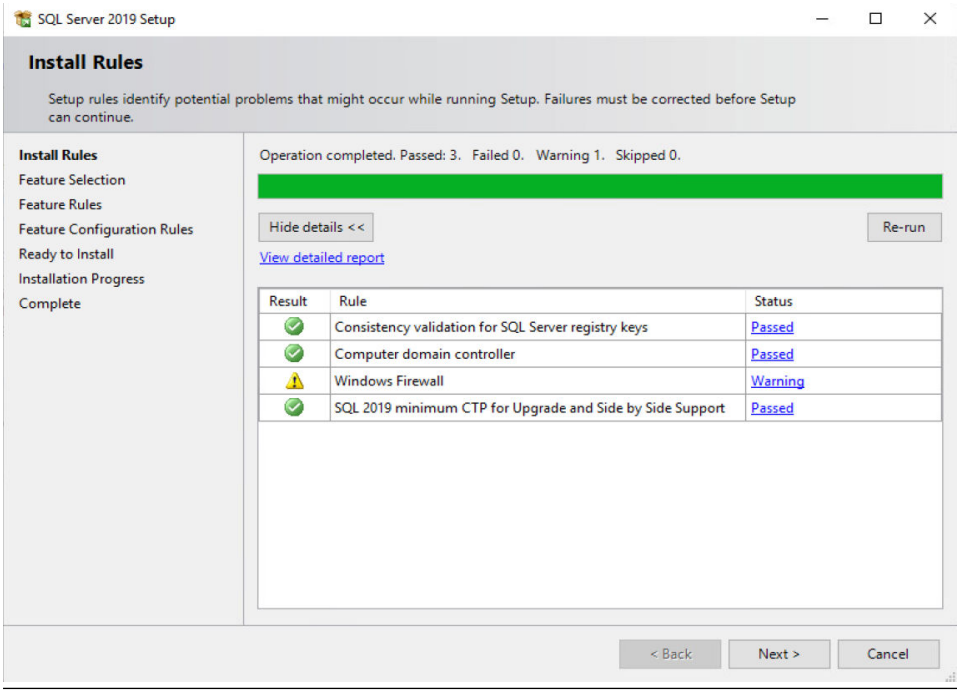
7. Select **Use Microsoft Update** as recommended and click **Next**.

Figure 4-117: Microsoft update step



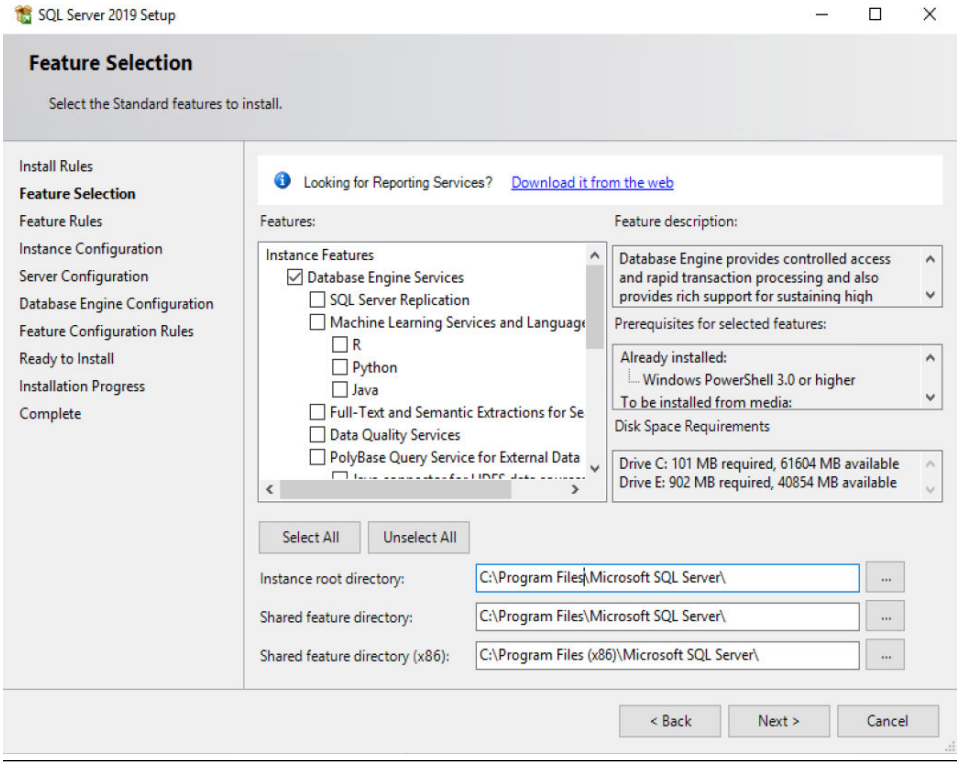
8. Install Rules: Click **Next** to proceed if everything is passed. You might get a warning about Windows Firewall – we will set the required rules in further steps.

Figure 4-118: Install Rules step



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

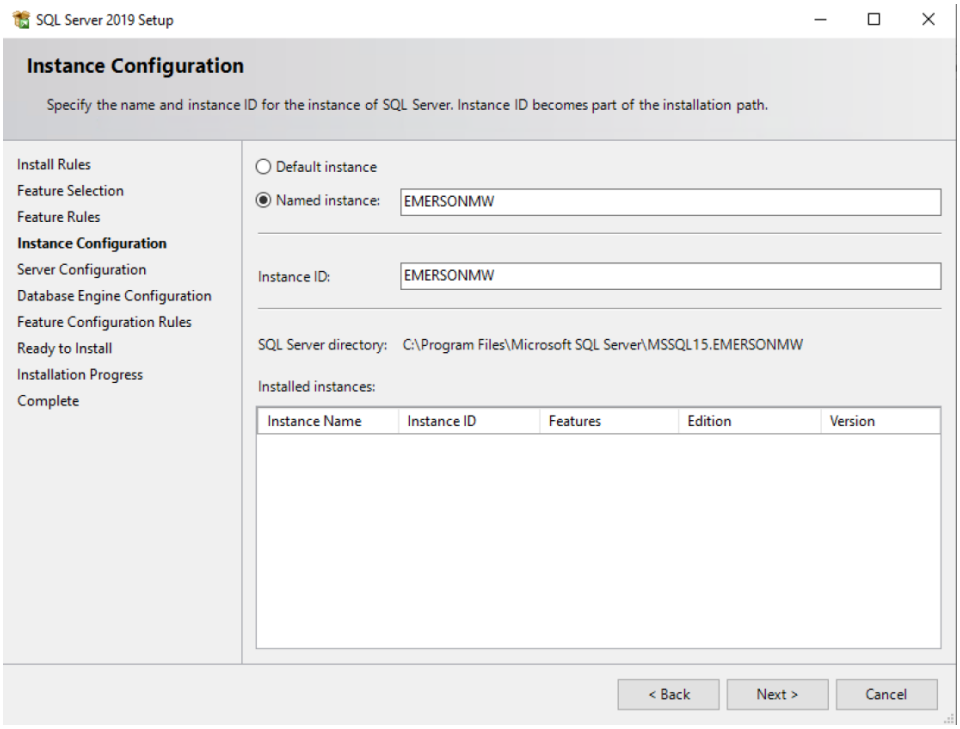
Figure 4-119: Feature Selection step



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

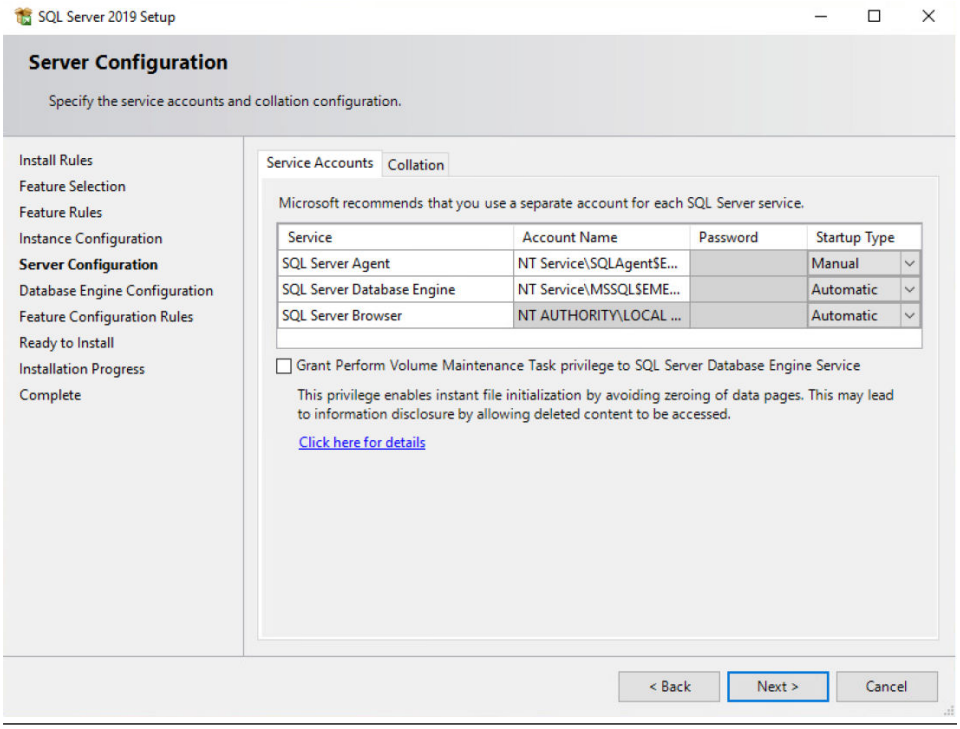
Note
Any other Instance Name will not work for AMS Machine Works

Figure 4-120: Instance Configuration step



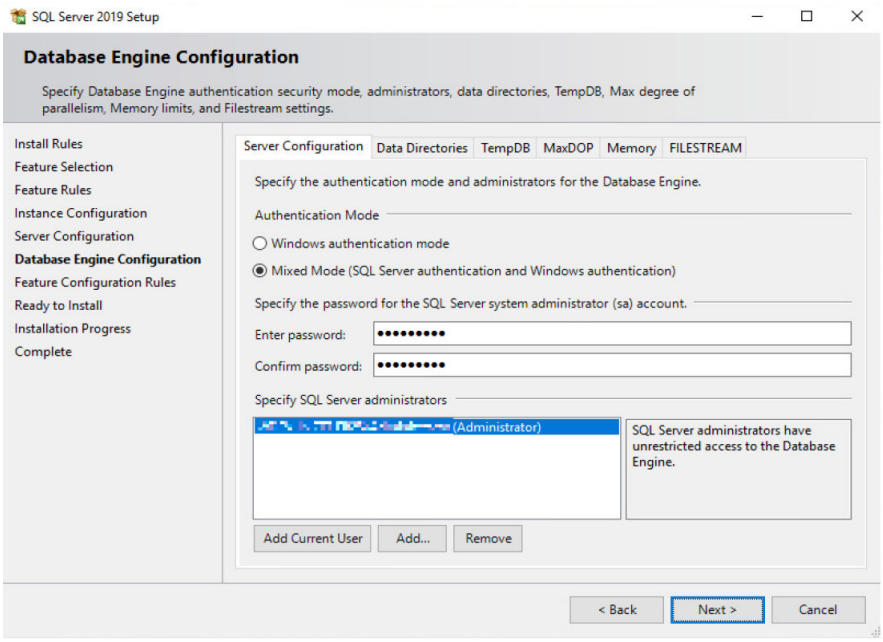
11. Server Configuration
    a. *(optional step) You can tick the "**Grant Perform Volume...**" checkbox for instant file initialization, which may improve performance, but pose a security threat for the non-zeroed out files.*
    b. Click **Next**.

Figure 4-121: Server Configuration step



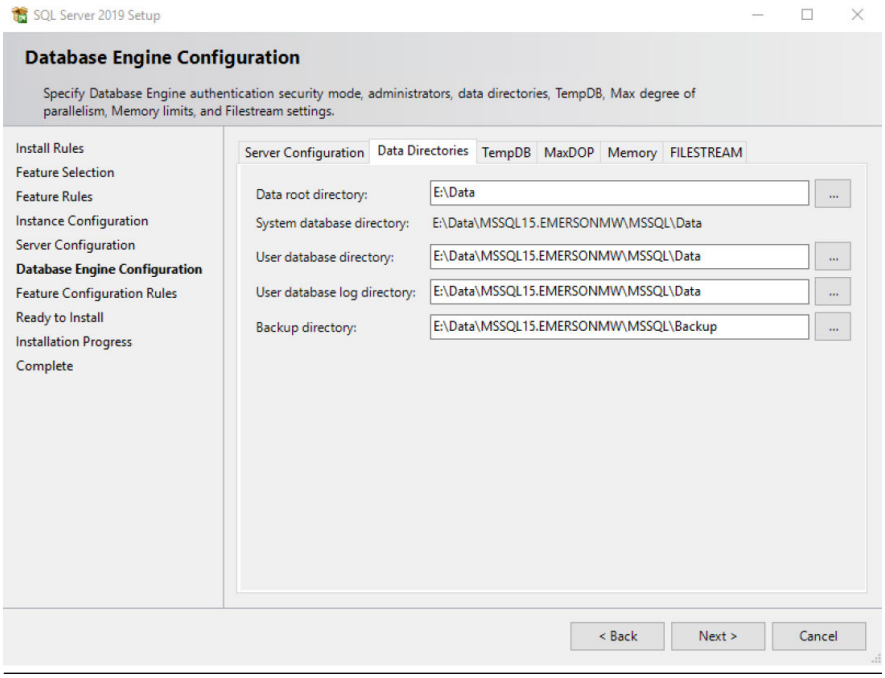
12. Database Engine Configuration
    a. Server Configuration tab: Choose Mixed Mode authentication, input chosen system administration (sa) password, and click Add Current User to add logged admin account.
    b. Add any additional administrators that might be needed, including for the person who will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

Figure 4-122: Database Engine Configuration - Server Configuration tab



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

Figure 4-123: Database Engine Configuration - Data Directories tab



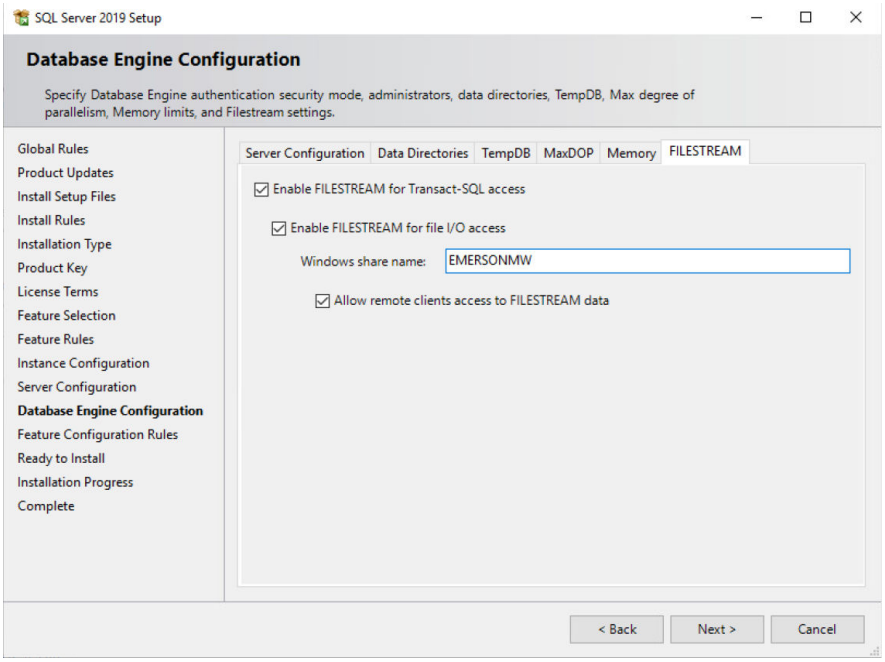
d. TempDB tab: Make sure 'Number of files' value equals to the number of Processor Cores (up to 8), as well as that Data and Log directories here reflect the changes from Data Directories tab.

e. MaxDOP tab: Don't change this information.

f. Memory tab: Leave as Default.

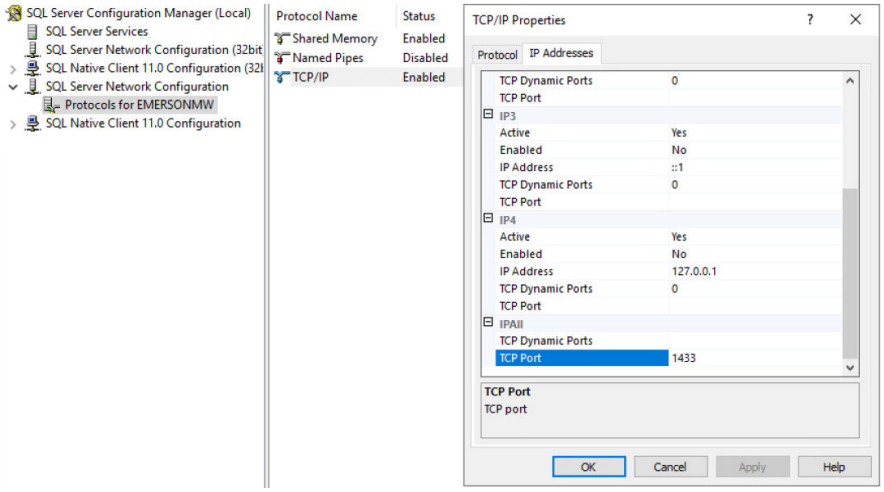
g. FILESTREAM tab: Check all checkboxes on the tab – **Enable FILESTREAM for Transact-SQL access**, **Enable FILESTREAM for file I/O access**, **Allow remote clients access to FILESTREAM data**. Click **Next**.

Figure 4-124: Database Engine Configuration - FILESTREAM tab



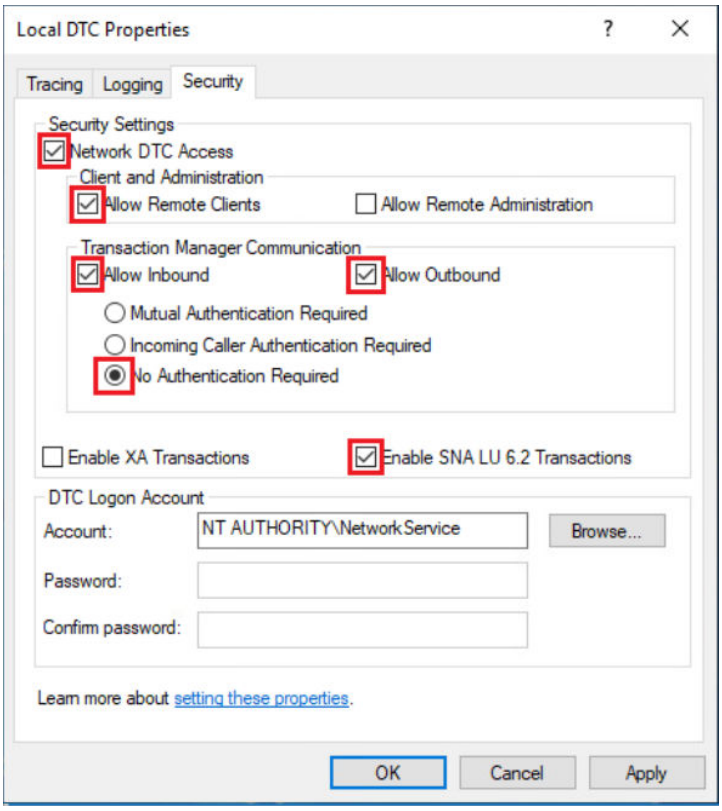
13. Review the summary and then click **Install**.
14. After installation is complete, click **Close** and reboot the machine if prompted.
15. Go to **Start -> Microsoft SQL Server *version* -> SQL Server Configuration Manager -> SQL Server Network Configuration -> Protocols for EMERSONMW**. Make sure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

Figure 4-125: TCP/IP Properties window



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

Figure 4-126: Local DTC Properties



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

Figure 4-127: Windows Firewall with Advanced Security

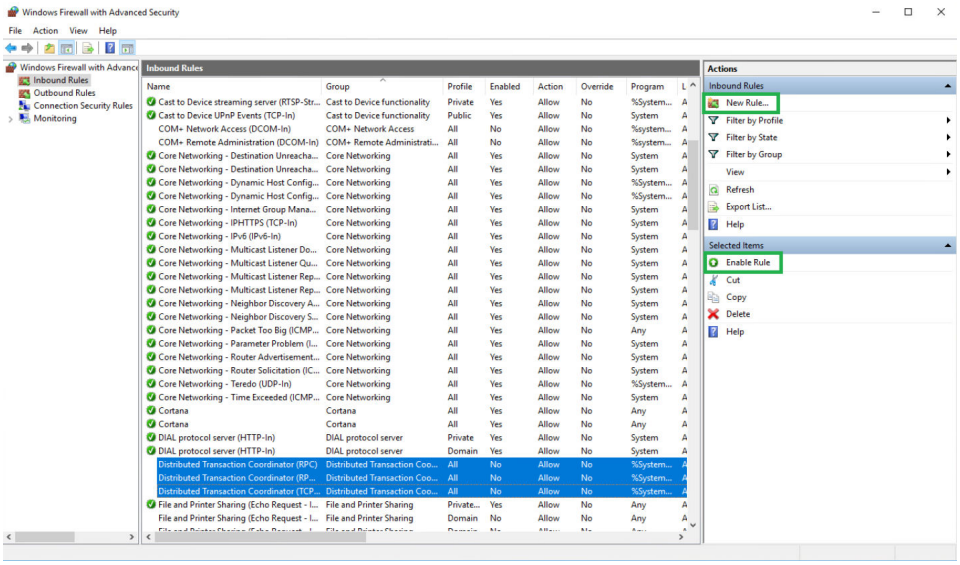


Table 4-1: Inbound Rules

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

Table 4-2: Outbound Rules

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

a. Enable a Predefined Firewall rule.

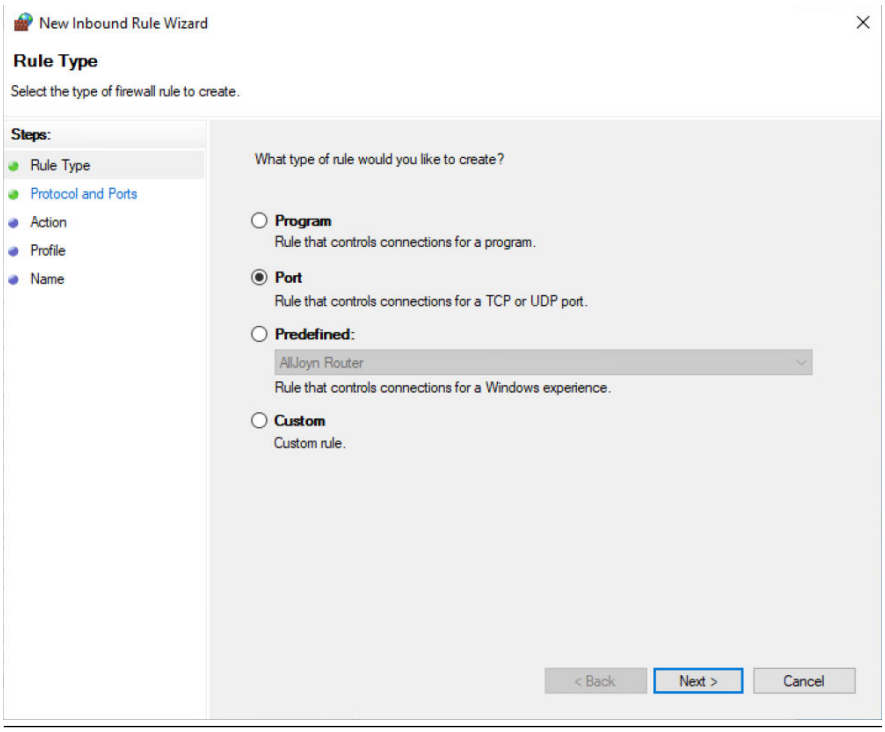
b. Scroll through the rules for Inbound and Outbound Rules and scroll until you find the items indicated as predefined firewall rules from the tables above. Click **Enable Rule** on the right for each of them.

c. Add a new Firewall rule.

d. Select Inbound or Outbound Rules depending on which rule you are adding and then click **New Rule** on the right under **Actions**.

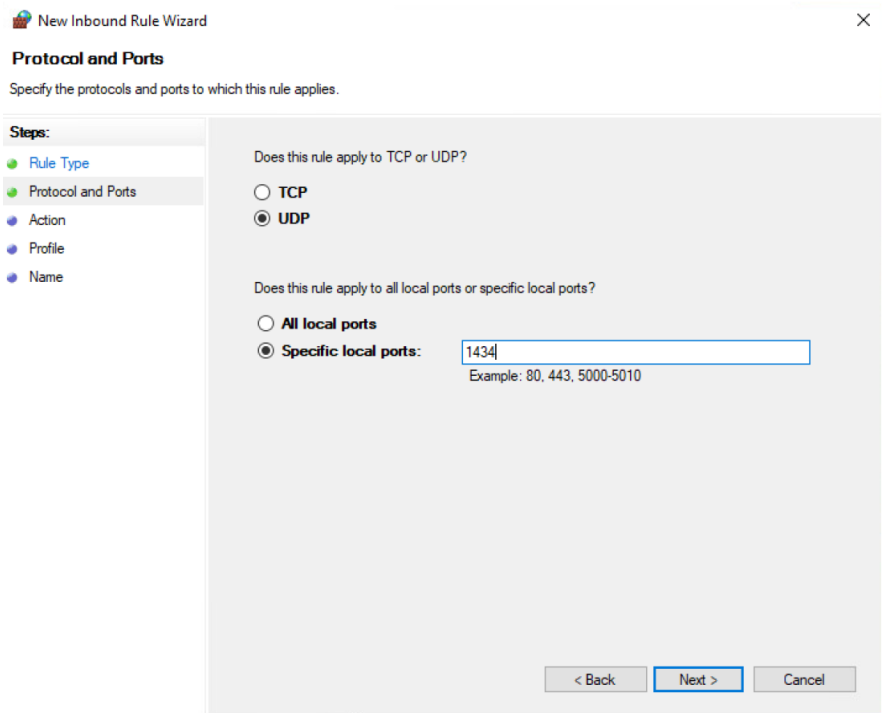
e. Select **Port** type and click **Next**.

Figure 4-128: New Inbound Rule Wizard - port type



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

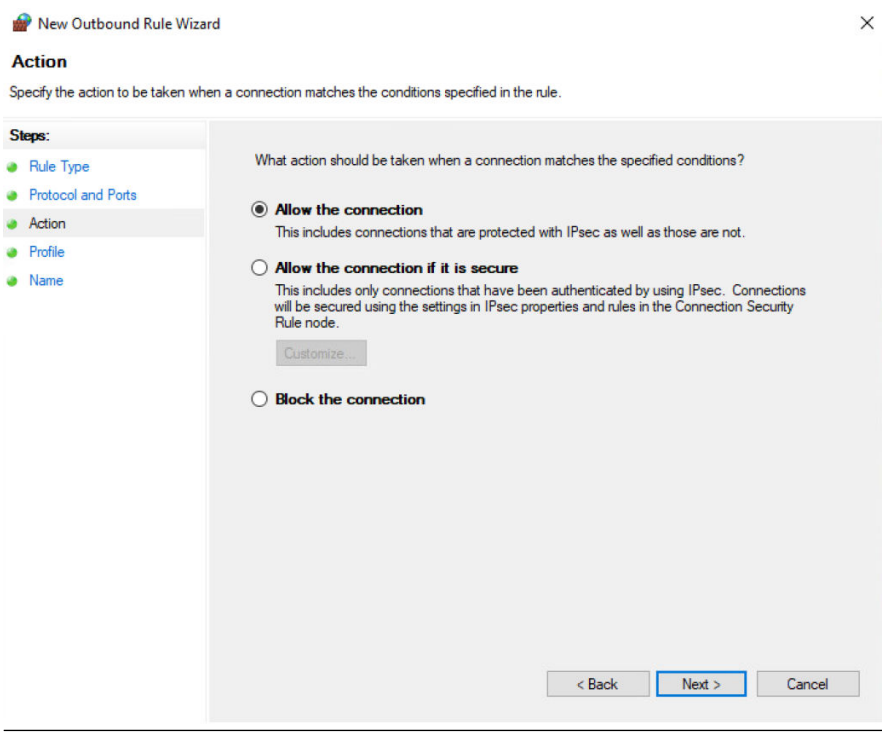
Figure 4-129: New Inbound Rule Wizard - protocol type



g. Select **Allow the connection** and then click **Next**.

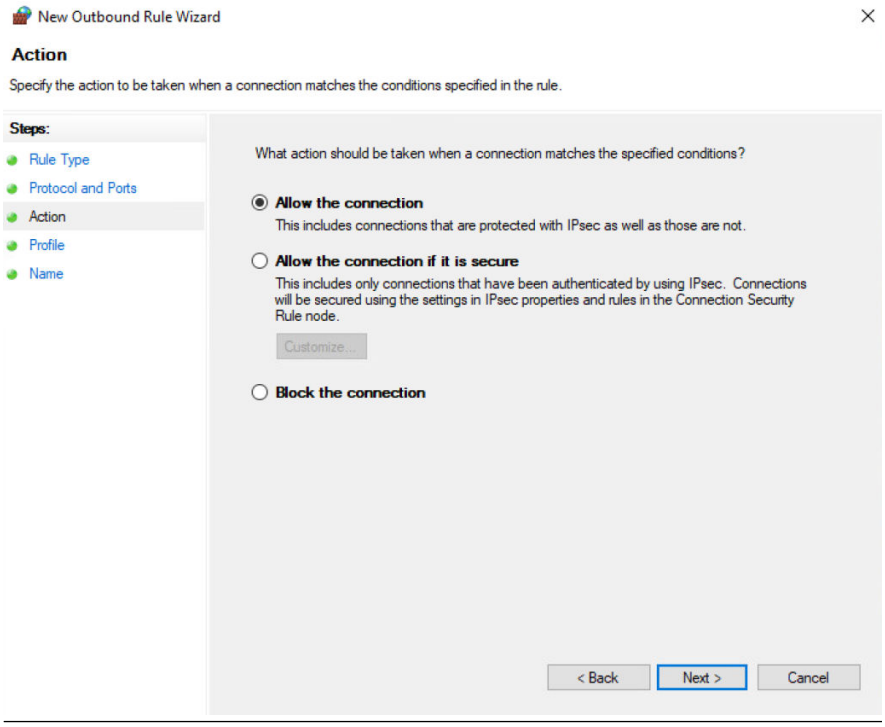
Note
This action will be the default for setting Inbound Rules but needs to be manually selected when setting Outbound Rules.

Figure 4-130: New Inbound Rule Wizard - Action



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

Figure 4-131: New Inbound Rule Wizard - Profile



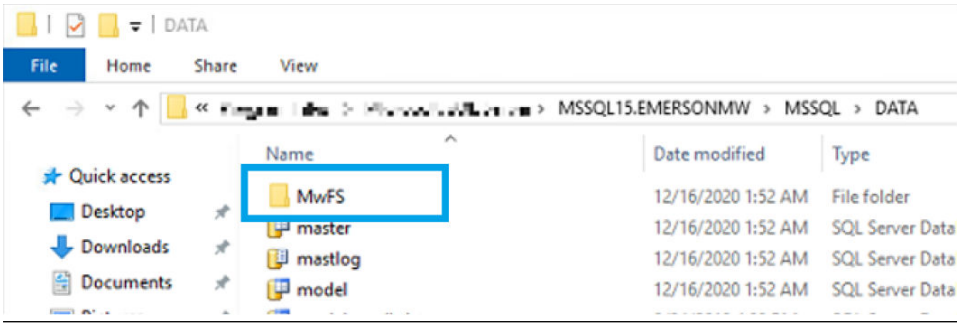
i. Name the rule the suggested names from the Table above and click Finish.

j. Add all the Rules mentioning ports in the above tables for Inbound and Outbound Rules.

18. Manually create a New Folder named **MwFS*User database directory*\MwFS**

    User database directory was shown during the installation Figure 4-123. Example: **C:\Data\MSSQL15.EMERSONMW\MSSQL\DATA\MwFS**

Figure 4-132: User database directory - example

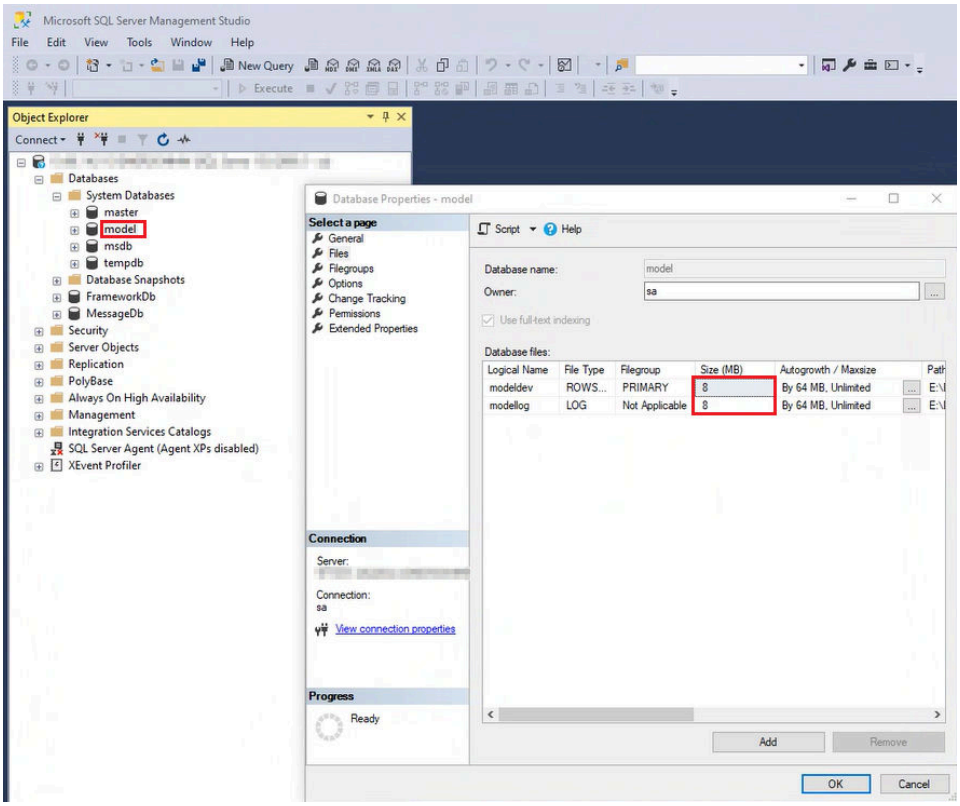


The number after MSSQL may vary depending on the MSSQL Server version used (15 in the example corresponds to SQL Server 2019).

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

20. Run **Microsoft SQL Server Management Studio** and in the System Databases folder under your machine name, find the **model** database. Right-click it and choose **Properties**. Set the size of both the **modeldev** and **modellog** databases to 8MB

Figure 4-133: Model Database Properties in SSMS



⚠ CAUTION

This step is crucial for a proper installation of AMS Machine Works v1.7.5

4.3.3 Optional Installation Steps for Using a Fully Qualified Domain Name (FQDN)

These instructions show how to modify the AMS Machine Works installation process to use a Fully Qualified Domain Name, or FQDN, in the place of a `<computer-name>` in distributed deployments of AMS Machine Works.

A FQDN network specifies device addresses in the following format: `<computer-name>.<domain-name>`

These instructions are necessary when:

1. You have a FQDN network.

2. You have one, or both, of the following AMS Machine Works elements deployed on a separate server:
    a. External SQL Server Installation
    b. External AMS Machine Works Agent Server Installation

In general, to perform this task you must replace the **Computer name** of some devices with the **Full computer name** of those devices in specific steps of the installation process and in specific configuration files.

This information is found in the operating system of each affected device here: **This PC** → **Properties**

⚠ CAUTION

If any of the **Full computer name** values are more than 42 characters long you must perform an addition step after the installation is complete. See: #unique_15/unique_15_Connect_42_postreq_gs5_4bw_fzb

Prerequisites

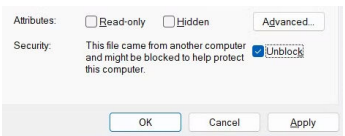
1. On the AMS Machine Works server:
    a. Go to: **This PC** → **Properties**
    b. Make note of:
        1. **Computer name** — We will refer to this value as: **AMS_MW_CN**
        2. **Full computer name** — We will refer to this value as: **FULL_AMS_MW_CN**

2. (Optional) On the External SQL server:
    a. Go to: **This PC** → **Properties**
    b. Make note of:
        1. **Computer name** — We will refer to this value as: **EXT_SQL_CN**
        2. **Full computer name** — We will refer to this value as: **FULL_EXT_SQL_CN**

Procedure

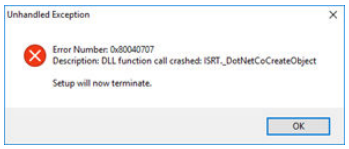
1. Download the zipped installation package for AMS Machine Works 1.7.5.
2. Before you extract the installation files you must unblock them.
   On the zipped installation package: **Right-click** → **Properties** → **Unblock** → **Apply**.

Figure 4-134: File Properties



Note
A **Blocked** file will usually result in an error.

Figure 4-135: Error pop-up



To recover from this error, delete the extracted folder, **Unblock** the file, and re-extract the installation files.

3. Extract the AMS Machine Works v1.7.5 installation files to a top level folder.
   On the zipped installation package: **Double-click → Extract all → Browse → Select Folder → Extract**

   Note
   Extract the files to a top level folder. Long file path names can result in an error during installation.

4. Run the **Command Prompt** as an **Administrator**.
   Right-click → Run as administrator
5. Use the **cd** command to navigate to the installer folder.
   In the **Command Prompt** enter: **cd <filepath_to_installer> → Enter**
6. Run the `Setup.exe` from the **Command Prompt** with the `/Z"NORUN"` flag.
   In the **Command Prompt** enter: **Setup.exe /Z"NORUN" → Enter**
7. Configure your installation according to the requirements you identified in the Planning your system chapter.
   The installer will exit after preparing the configuration files.
8. In the file system, navigate to: `C:\ProgramData\Emerson\AMS Machine Works`
9. Use **Notepad++**, or any text editor with search and replace functionality, to open the `ContextProperties-MI.json` file, and to search for some **Computer name** values and replace them with the corresponding **Full computer name** values you made note of earlier.
   a) Use your text editor to open: `C:\ProgramData\Emerson\AMS Machine Works\ContextProperties-MI.json`
   b) Search for the value you made note of earlier, **AMS_MW_CN**, and replace all instances of it with the value you made note of for **FULL_AMS_MW_CN**.
   c) (Optional) If you have an **External SQL** deployment, search for the value you made note of earlier, **EXT_SQL_CN**, and replace all instances of it with the value you made note of for **FULL_EXT_SQL_CN**.
   d) Save the file in the same location.

10. Manually create a folder named `AM` in the following location: `C:\EMERSONMW\Data\Interfaces`
    The file path `C:\EMERSONMW\Data\Interfaces\AM` exists, and the reconfigured installation parameters are ready to be used.
11. Navigate to the following folder in the installer package: `..\dep\_Support\SetupHelper`
12. With the `SetupHelperExt.exe` application: **Right-click → Run as administrator**
    The installation process will continue normally and require reboots.

Postrequisites

(Optional) After the installation has completed, an additional step is required if any of the **Full computer name** values you used are **more than 42 characters long**.

1. Run the `long-FQDN-database-fix.exe` tool on the AMS Machine Works server.
    a. Application location: `..\Support\FQDN Fix\long-FQDN-database-fix.exe`
    b. With the `long-FQDN-database-fix.exe` application: **Right-click → Run as administrator**

Result: AMS Machine Works is using **Full computer name** values larger than 42 characters.

4.4 Check services

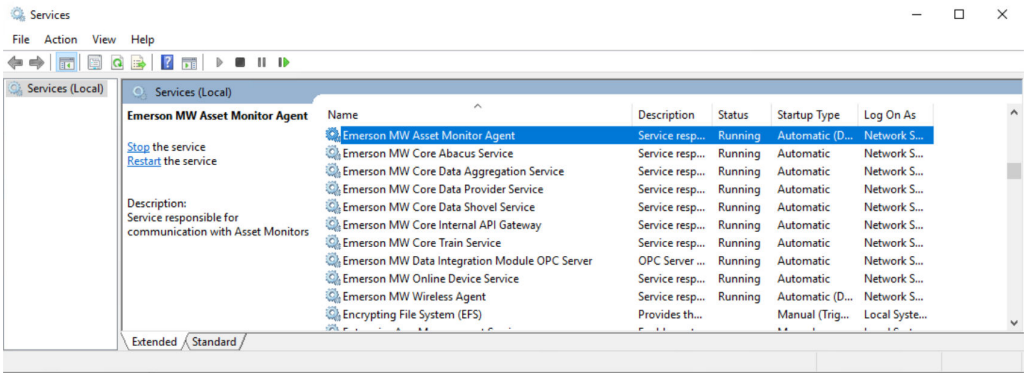
Procedure

1. After rebooting your system and logging in, wait for about 5 to 7 minutes so that all the services have some time to start. Next, open Windows Services and check that the service is running for each **Agent** that you installed.

Note
The following services have a **delayed start** setting:

- Emerson MW Asset Monitor Agent
- Emerson MW Wireless Agent

Figure 4-136: Windows services



2. Check that the following services are running:
    a. Emerson MW Core Abacus Service
    b. Emerson MW Core Data Aggregation Service
    c. Emerson MW Core Data Provider Service
    d. Emerson MW Core Data Shovel Service
    e. Emerson MW Core Internal API Gateway
    f. Emerson MW Core Train Service
    g. Emerson MW Data Integration Module OPC Server
    h. Emerson MW Online Device Service
    i. RabbitMQ
    j. Agent Services:
        1. Emerson MW Asset Monitor Agent
        2. Emerson MW Wireless Agent

    Note
    If you have chosen to only have **External Agents**, these services will not be present on this machine.

    k. MongoDB Services:
        1. MongoDB Server (MongoDB)

    Note
    This service will be running **even if** you have chosen to have an **External MongoDB**.

    l. SQL Services:
        1. SQL Server (EMERSONMW)
        2. SQL Server Agent (EMERSONMW)
        3. SQL Server CEIP service (EMERSONMW)

4. SQL Server Browser
5. SQL Server VSS Writer

Note
If you have chosen to have an **External SQL** installation, these services will not be present on this machine.

4.5 First Launch of AMS Machine Works

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

Prerequisites

- Use Google Chrome for optimal performance. AMS Machine Works web applications use web technologies that are no longer supported in Internet Explorer 11. See: Troubleshooting
- Security certificates must be installed. See: AMS Machine Works Security

Procedure

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

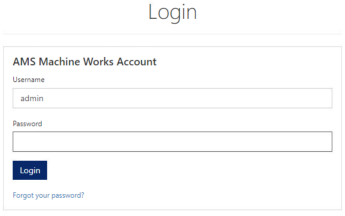
   Where `[server]` is the computer name of the AMS Machine Works server.[3]
3. If this is the first time you have launched AMS Machine Works from a client computer, install the certificate.

   Install the AMS Machine Works certificate so you can perform actions such as adding asset sources. See: AMS Machine Works Security
4. Open Asset Explorer via Google Chrome then enter the initial credentials:

   Username : **admin**

   Password : **Emerson#1**

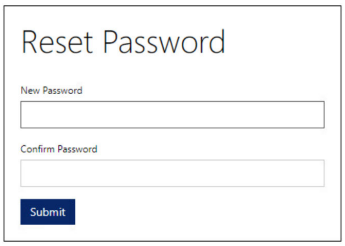
Figure 4-137: AMS Machine Works login pop-up



5. After successfully logging you must change your password.

3 *If a port number is required, also include the port number, for example,* `https://MachineWorksServer:443/AMSMW`.

Figure 4-138: AMS Machine Works 1.7.5 Reset Password pop-up



Note
Some users set the 'new' password to **Emerson#1**, but this is against recommended security practices.

6. 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.
7. Next, you will be prompted to Register your License for your copy of AMS Machine Works. Follow the steps found in that section.
8. Depending on the your electrical system and informational requirements you must also Set the Line Frequency and Configure the Display of Derived Measurements.

⚠ CAUTION

The choice between 50 Hz or 60 Hz for the line frequency of your electrical system will affect many calculations. **Correct configuration of this setting is essential for accurate system performance!**

Postrequisites

You can launch other applications from inside the various AMS Machine Works modules. Or, you can access them by typing their address in the web browser address field. If you have used the default port for the AMS Machine Works installation, 443, then you do not need to enter a port number in the URL.

Launch	From this URL	To perform the following
AMS Machine Works Analysis Dashboard	`https://[server]:[port number]/AMSMW`	• Access KPIs on devices, machine alerts and device measurement alerts.
Network Device Module	`https://[server]:[port number]/network-device/`	• Add Agents and Devices. • Define Collections.
Machine Journal	`https://[server]:[port number]/Machine Journal`	• Add cases, posts, and journal entries of machine issues for diagnosis.

Launch	From this URL	To perform the following
Vibration Analyzer	`https://[server]:[port number]/VibApp`	• Analyze vibration data from machines and devices. **Note** If the Vibration Analyzer, VibApp, has not been installed yet, this link will launch a download page for the VibApp installer.
User Manager	`https://[server]:[port number]/UserManager`	• Set up users. • Control and monitor access to the software.
Asset Explorer	`https://[server]:[port number]/AssetExplorer`	• Set up your site. • Access and manage assets in your plant.
Event Viewer	`https://[server]:[port number]/EventViewer`	• View events generated in the software.

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

For example, to launch the Asset Explorer utility from the server named MachineWorksServer and port number of 443, enter `https://MachineWorksServer:443/AssetExplorer`.

Note
In this example we use port 443, which is the default port. You only need to add the port number if you are using a nonstandard port.

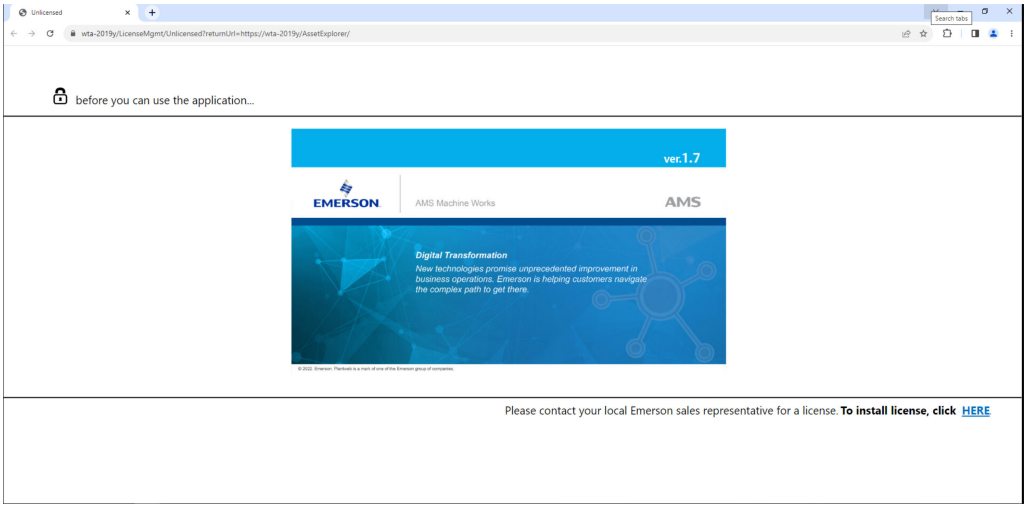
4.6 Register your License

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

Procedure

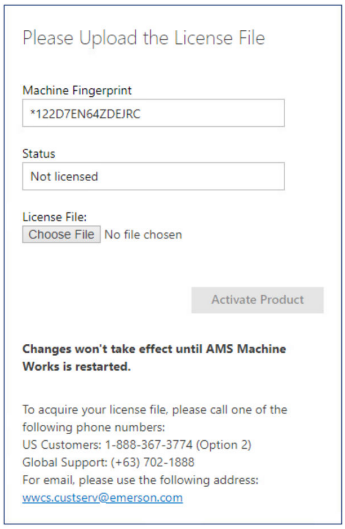
1. After the password reset, which happens during the First Launch of AMS Machine Works the licensing page appears.
2. Click **HERE** to install the license.

Figure 4-139: AMS Machine Works License page pop-up



3. Upload your license file.

Figure 4-140: AMS Machine Works License upload pop-up

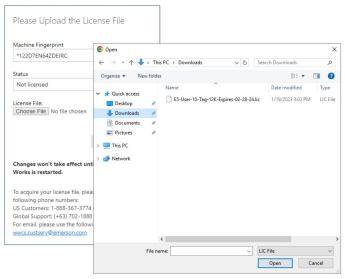


Note

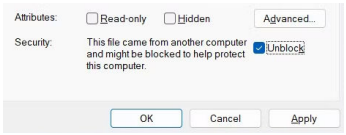
If you do not have your license file yet, email your machine fingerprint and serial number, customer name, address, and contact information to wwcs.custserv@emerson.com. For a faster response, call toll free at 1-888-367-3774, option 2 (U.S. and Canada customers) or at (+63) 702-1888 (Global Support).

4. Click **Choose File**, select the correct `.lic` license file from your file system, and then click **Open**.

Figure 4-141: Find your License File



5. If you get the following error, “License is currently out of date, please renew it to continue system operations.”, even when your license has not expired, you must unblock the license file before uploading it. Do the following:
    a. Right-click the license file, and then select **Properties**.
    b. Open the **General** tab.
    c. Under Attributes, select the checkbox for **Unblock**.

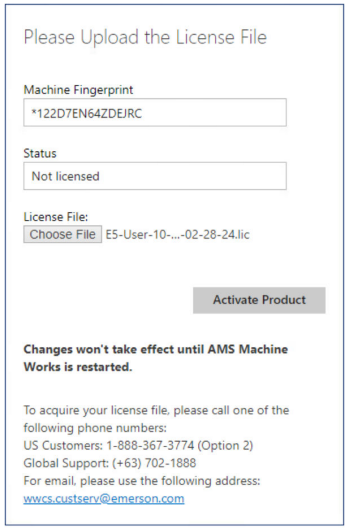


    d. Click **Apply**, and then click **OK**.

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

6. If the license file is correct you can now click **Activate Product** and you can begin using AMS Machine Works.

Figure 4-142: Activate Product



Note
Once AMS Machine Works is active, you can use **User Manager** utility to check information about your license. Use the **Online Help** to find detailed instructions.

Postrequisites

Depending on the your electrical system and informational requirements you must also Set the Line Frequency and Configure the Display of Derived Measurements.

⚠ CAUTION

The choice between 50 Hz or 60 Hz for the line frequency of your electrical system will affect many calculations. **Correct configuration of this setting is essential for accurate system performance!**

Postrequisites

Congratulations, you are now ready to begin using AMS Machine Works! You could start by connecting to monitoring devices in the **Network Device Module**, or by defining a **Location** or a **Machine Train** in the **Asset Explorer**.

For more information you can always search in the **Online Help** inside AMS Machine Works.

4.7 Set the Line Frequency and Configure the Display of Derived Measurements

The line frequency of your electrical system affects the operation of some instruments and equipment. Most AC electrical systems operate on either 50 Hz or 60 Hz, and it is essential to have this properly configured.

⚠ CAUTION

The choice between 50 Hz or 60 Hz for the line frequency of your electrical system will affect many calculations. **Correct configuration of this setting is essential for accurate system performance!**

AMS Machine Works v1.7.5 is capable of calculating and displaying many more types of **Derived Measurements** than most users need. AMS Machine Works v1.7.5 has the option for you to enable and disable the display of **Derived Measurements**, so that you can focus on only the types of information which are relevant to your tasks.

⚠ CAUTION

While you are performing an upgrade of AMS Machine Works you must enable the display of all **Derived Measurements**, and only after successfully migrating your data can you disable those **Derived Measurements** which will not be used in your new system.

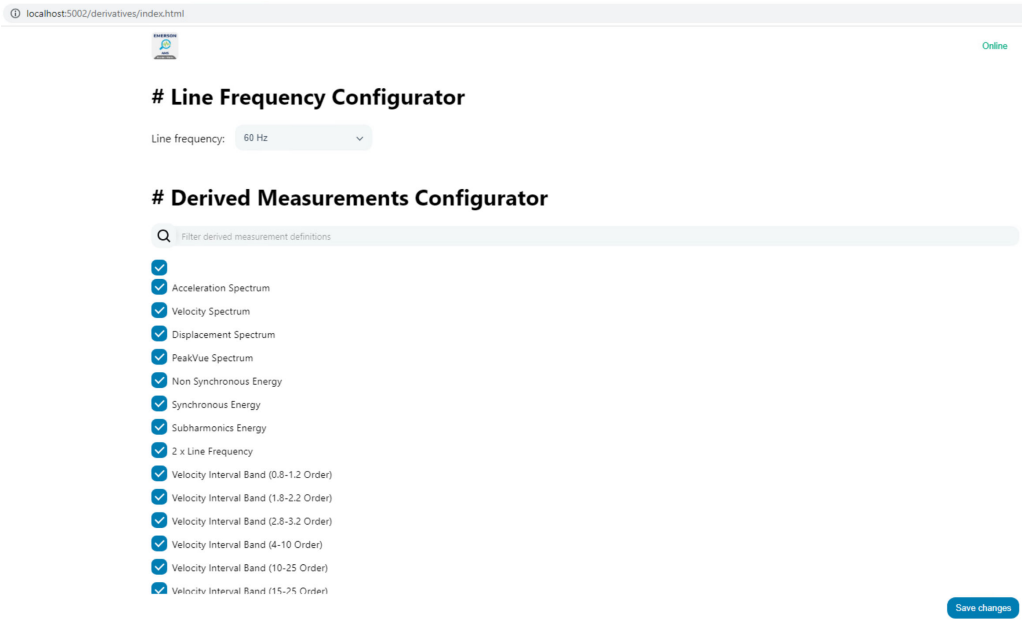
Note
Some **Measurement Names** have changed or become unavailable in AMS Machine Works v1.7.5. For more information see: Measurement Type Naming Convention Changes

Procedure

1. Open a web browser on the system where AMS Machine Works v1.7.5 is installed.
2. Enter the address: http://localhost:5002/derivatives/index.html

   Note
   This address must begin with `http`. If your browser is forcing the use of `https`, try using your browser's incognito mode.

Figure 4-143: Main Configuration Window



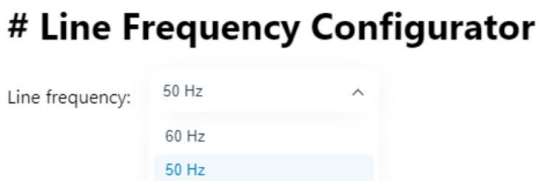
- The **Configuration server connection status** is in the top right corner of the screen.
- The **Line Frequency Configurator** section.
- The **Derived Measurements Configurator** section.
- The **Save changes** button is in the bottom right corner of the screen.

Note
Saving your changes can take a long time for systems which have a lot of Machine Trains, Locations, and Devices. Please be patient and wait for the **Changes applied** message.

The web page for configuring the **Line Frequency** and the display of **Derived Measurements** is displayed.

3. Choose a **Line Frequency**, and then click **Save changes** at the bottom right of the screen.

Figure 4-144: Choose your Line Frequency



⚠ CAUTION

The choice between 50 Hz or 60 Hz for the line frequency of your electrical system will affect many calculations. **Correct configuration of this setting is essential for accurate system performance!**

Your line frequency has now been set to the value you chose.

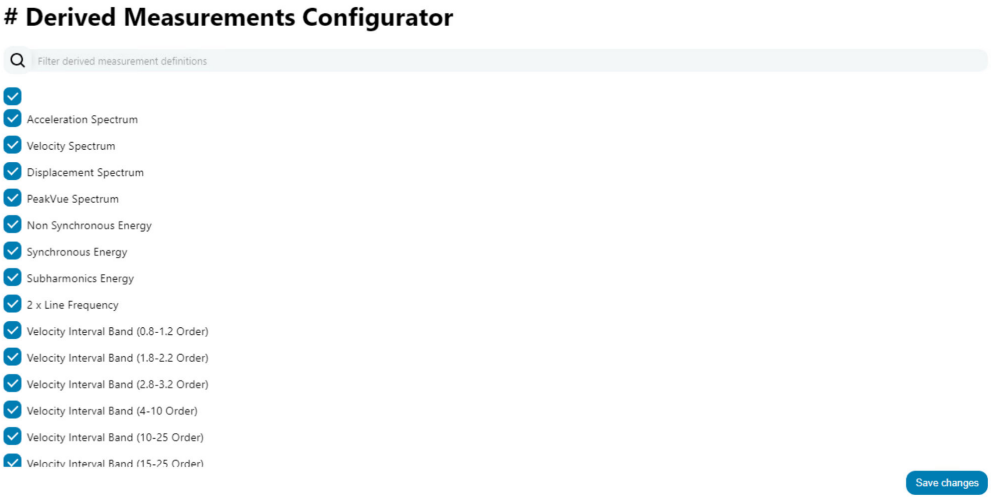
Note
Saving your changes can take a long time for systems which have a lot of Machine Trains, Locations, and Devices, e.g. more than half an hour. Be patient and wait for the **Changes applied** message.

4. Choose which **Derived Measurements** you want to be available in your installation, and then click **Save changes** at the bottom right of the screen.

⚠ CAUTION

While you are performing an upgrade of AMS Machine Works you must enable the display of all **Derived Measurements**, and only after successfully migrating your data can you disable those **Derived Measurements** which will not be used in your new system.

Figure 4-145: Derived Measurement Configurator



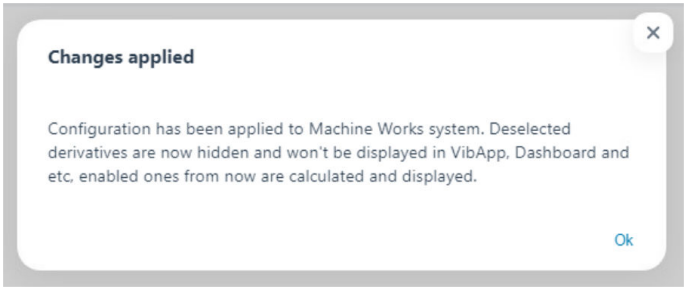
a) (Optional) Use the checkbox at the top of the column to Select/Deselect all the **Derived Measurements**.

Note
While you are upgrading AMS Machine Works you **must select all** the **Derived Measurements** to ensure a successful data migration. After data migration is complete you can disable any **Derived Measurements** which will not be used in the new system.

b) (Optional) Use the **Search** area to find **Derived Measurements** to Select/Deselect.

5. Remember to click **Save changes** at the bottom right of the screen to save all of your changes.

Figure 4-146: Save Complete



Note
Saving your changes can take a long time for systems which have a lot of Machine Trains, Locations, and Devices, e.g. more than half an hour. Please be patient and wait for the **Changes applied** message.

Postrequisites

- Install the Vibration Analyzer - VibApp
- Begin using AMS Machine Works v1.7.5.

4.8 Install the Vibration Analyzer - VibApp

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.

   Note
   The Vibration Analyzer installer is also available as a .exe file at: `(Installer Folder)/Products/AMS Machine Works Vibration Analysis Service`

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.

5 Uninstall AMS Machine Works

Steps for uninstalling AMS Machine Works.

⚠ CAUTION

If you are upgrading AMS Machine Works from v1.7.2 to v1.7.5 and migrating data, there are exceptions and modifications to these steps.

Prerequisites

1. Stop the following application pools in the Internet Information Services (IIS) Manager:
    a. AMS_MW_API
    b. AMS_MW_Apps
    c. AMS_MW_HistorianNext
    d. AMS_MW_NetworkDevice
    e. AMS_MW_OMG
    f. AMS_MW_Status
    g. AMS_MW_StatusEval
    h. AMS_MW_Svcs
2. If the following OPC UA components are present, uninstall them before uninstalling AMS Machine Works:
    a. Plantweb Optics OPC UA Server Registration
    b. Plantweb Optics OPC UA Server

⚠ CAUTION

If your are migrating to AMS Machine Works v1.7.5, backup the file `C:\Program Files (x86)\Emerson\Plantweb Optics OPC UA Server\OPCUA \Emerson.Opc.Ua.PlantwebOptics.DataSource.db` to use with the OPC Mapping Tool.

Procedure

Uninstall the following components (if applicable) in the order they are listed according to your installed version of AMS Machine Works. Open the **Settings**, select **Apps**, select **Apps & Features**, select a component to uninstall, and click **Uninstall**.

To Uninstall AMS Machine Works v1.7 to v1.7.2:

1. AMS Machine Works Vibration Analyzer
2. AMS Machine Works Help

3. AMS Machine Works ATG Interface

Note
All Interfaces in this list should be uninstalled, even if they are on separate servers.

4. AMS Machine Works Wireless Interface
5. AMS Machine Works Ovation MHM Interface
6. AMS Machine Works Asset Monitor Interface
7. AMS Machine Works Alarm Evaluation Service
8. AMS Machine Works Calculation Service
9. AMS Machine Works Data Aggregation Service
10. AMS Machine Works Data Shovel Service
11. AMS Machine Works Knowledge Service
12. AMS Machine Works Pre-Historian
13. AMS Machine Works Pre-EventViewer
14. AMS Machine Works Snapshot Generator Service
15. AMS Machine Works Platform Integration Service
16. AMS Machine Works Interface Router
17. AMS Machine Works Historian
18. AMS Machine Works Web Services
19. AMS Machine Works MongoDB
20. AMS Machine Works Nats (Stop nats-server in Services first)

⚠ CAUTION

DO NOT uninstall the AMS Machine Works NATS service if you are uninstalling AMS Machine Works v1.7.2 before upgrading to v1.7.5, only **Stop** this service.

21. Plantweb Optics Web Services
22. MongoDB 6.0.1

To Uninstall AMS Machine Works v1.7.5 and higher:

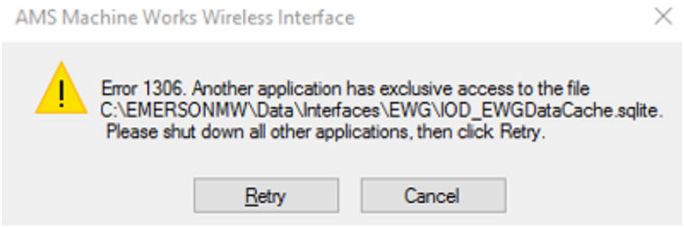
1. AMS Machine Works Vibration Analyzer
2. AMS Machine Works Help
3. AMS Machine Works Asset Monitor Agent

Note
All Agents in this list should be uninstalled, even if they are on external servers. Also, some files should be cleaned up on the external servers. See: Post-uninstallation clean-up

4. AMS Machine Works Wireless Agent
5. AMS Machine Works Core Abacus
6. AMS Machine Works Core Data Aggregation Service
7. AMS Machine Works Core Data Provider Service
8. AMS Machine Works Core Data Shovel Service
9. AMS Machine Works Core Internal API Gateway
10. AMS Machine Works Core Train Service
11. AMS Machine Works Online Device Service
12. AMS Machine Works Data Integration Module OPC Server
13. AMS Machine Works Web Services
14. AMS Machine Works MongoDB
15. AMS Machine Works RabbitMQ
16. Plantweb Optics Web Services
17. MongoDB 6.0.10

Note

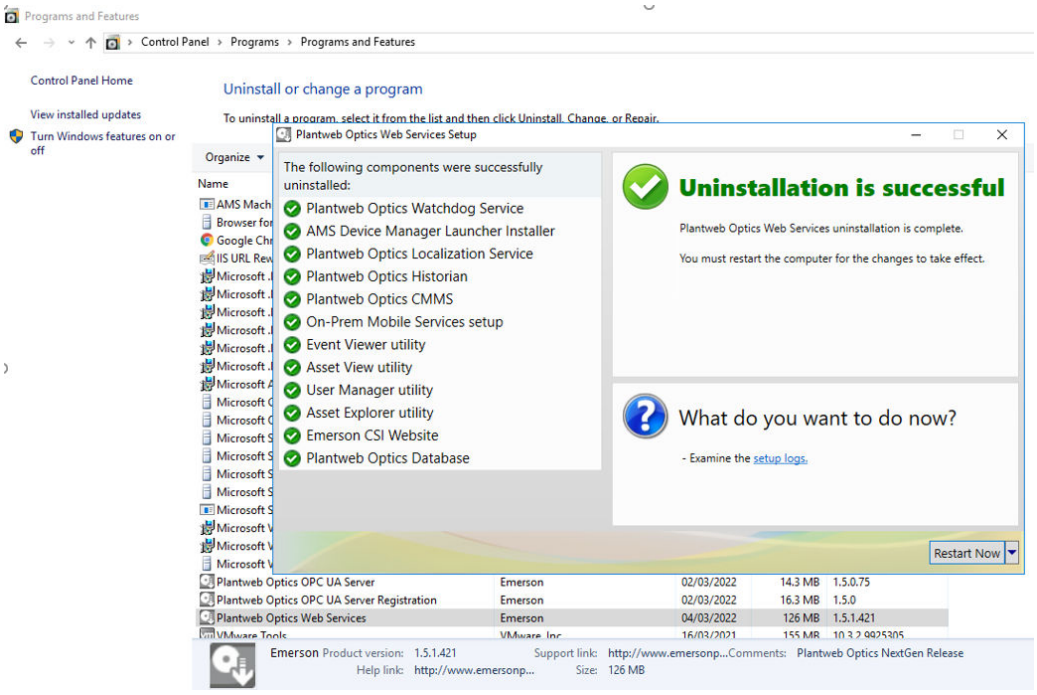
Figure 5-1: Example error: If a service is still running you may experience a similar error. Simply retry after a minute.



Note

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

Figure 5-2: Plantweb Optics web services setup



Post-uninstallation clean-up

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

⚠ CAUTION

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

⚠ CAUTION

There are exceptions and modifications to these steps if you are performing an upgrade to AMS Machine Works v1.7.5. Read every Note and Caution attached to a step before performing the step.

Procedure

1. Delete the `Emerson` folder in `Program Files`.

   Go to both `C:\Program Files` directory and `C:\Program Files (x86)` directory and delete the `Emerson` folder in each.

⚠ CAUTION

If you are performing an upgrade **DO NOT** delete this folder because the NATS information in it is still required.

2. Delete the `Emerson` folder in `ProgramData`.

   Go to `C:\ProgramData` and delete the `Emerson` folder.

Note

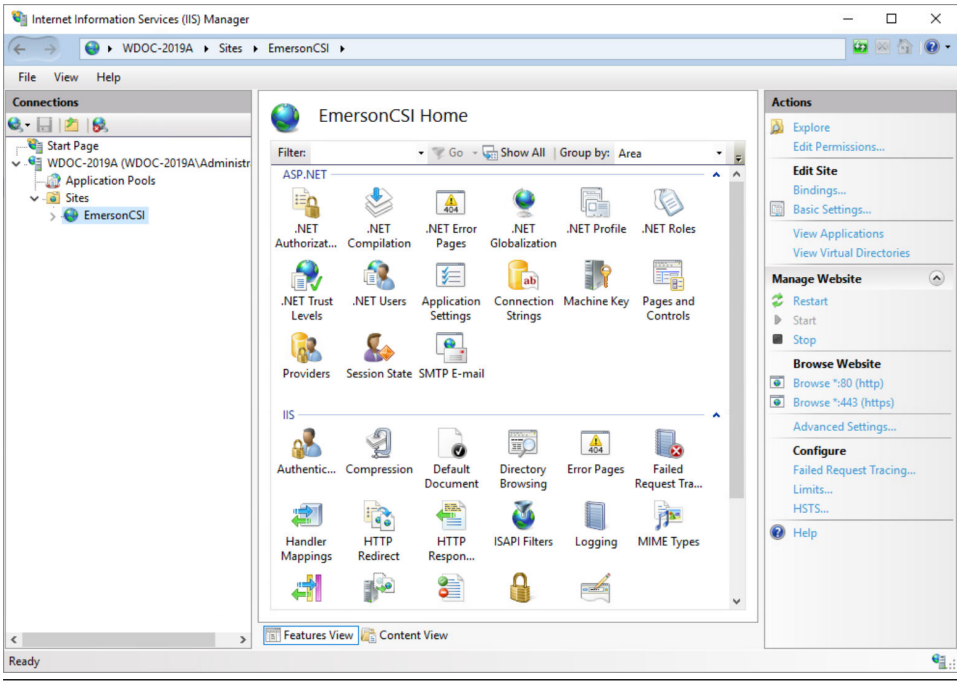
`ProgramData` is a hidden folder. You need to enable **Show hidden files, folders, and drives** in Windows Folder Options.

⚠ CAUTION

If you are performing an upgrade **DO NOT** delete this folder because the NATS information in it is still required.

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

Figure 5-3: Internet Information Services (IIS) Manager



In the Windows search bar type **ISS** and run the suggested **Internet Information Services (IIS) Manager**. On the left side navigation panel click on your PC name and open the **Sites** folder.

a) If a **Site** called **EmersonCSI** is present, right-click on it and choose **Remove**.

b) If a **Site** called **EmersonINT** is present, right-click on it and choose **Remove**.

4. Next, use the File Explorer to delete the **EmersonCSI** and **EmersonINT** folders.

   Folder locations:

   - `C:\inetpub\wwwroot\EmersonCSI`
   - `C:\inetpub\wwwroot\EmersonINT`

5. Delete the **Machine Works OPC UA Users** group.
   a) Open the **Computer Management** system utility.
   b) Right click on **Computer Management** → **System Tools** → **Local Users and Groups** → **Groups** → **Machine Works OPC UA Users**
   c) Select **Delete**.

6. Backup and then delete the following MongoDB folders:

   - `C:\EMERSONMW\Data\Interfaces\AM\MongoDBFiles`
   - `C:\Users\Administrator\AppData\Local\mongodb`
   - `C:\Users\Administrator\AppData\Roaming\mongodb`

   Note
   If AMS Machine Works v1.7.2 was installed by a different user than **Administrator**,then two of the folders will be located at the following locations where <username> is the name of that user:

   - `C:\Users\<username>\AppData\Local\mongodb`
   - `C:\Users\<username>\AppData\Roaming\mongodb`

AMS Machine Works and all related leftover files have been removed from the machine.

6 Upgrades and Updates

This procedure only applies to updates from AMS Machine Works v1.7.2 to v1.7.5.

Note
You must complete every upgrade of prior versions of AMS Machine Works in succession until you reach AMS Machine Works v1.7.2 in order to use these instructions.

6.1 Manual Upgrade from 1.7.2 to 1.7.5

You must complete the following steps in the order they are given to upgrade from AMS Machine Works v1.7.2 to AMS Machine Works v1.7.5.

⚠ CAUTION

When you are upgrading AMS Machine Works and migrating data, there are exceptions and modifications to the steps used to uninstall AMS Machine Works.

Procedure

1. Perform the steps to uninstall AMS Machine Works with some exceptions:
   a) Stop the NATS service, but **DO NOT** uninstall NATS.
   b) Stop the SQL server, but **DO NOT** uninstall the SQL Server.
   c) Some folders should not be deleted because they contain NATS elements.
   d) See: Uninstall AMS Machine Works
2. If OPC UA is installed, open the operating system's **Computer Management** utility, and delete the existing OPC UA user group: **Plantweb Optics OPC UA Users**.
3. Install AMS Machine Works v1.7.5. See: Installation Procedures

   ⚠ CAUTION

   While you are performing an upgrade of AMS Machine Works you must enable the display of all **Derived Measurements**, and only after successfully migrating your data can you disable those **Derived Measurements** which will not be used in your new system. See: Set the Line Frequency and Configure the Display of Derived Measurements

   Note
   Some **Measurement Names** have changed or become unavailable in AMS Machine Works v1.7.5. For more information see: Measurement Type Naming Convention Changes
4. Perform the steps found in the Agent and Device Migration section. See: Device Migration Tool
5. Launch the Network Device Module and confirm that all the Agents and Devices are present.

6. Perform the steps found in the Database Migration Wizard section. See: Database Migration Wizard
7. (Optional) If you were using OPC in your AMS Machine Works v1.7.2 system, you must now run the OPC Mapping Tool.
8. Restart the machine.

6.2 External SQL to Internal SQL Express Migration

In AMS Machine Works v1.7.5 the database for storing measurement data is MongoDB. The SQL database is **now only used for storing configuration information**, and an **Internal SQL Express installation is sufficient** for this purpose.

If your AMS Machine Works v1.7.2 installation used an **External SQL** installation to meet your measurement data storage needs, you can eliminate this dependency and migrate to an **Internal SQL Express** installation with the following procedure.

Note

- **External SQL** is also called the **Source Server** for the purposes of this migration.
- **Internal SQL Express** is also called the **Target Server** for the purposes of this migration.

External SQL to Internal SQL Express Migration Overview

There are two scenarios to choose between:

- **Single AMS Machine Works Server** — Install AMS Machine Works v1.7.5 on the system where AMS Machine Works v1.7.2 was installed, and use an **Internal SQL Express** instead of an **External SQL** server.
- **Parallel AMS Machine Works Servers** — Maintain the previous AMS Machine Works v1.7.2 system, and create a parallel AMS Machine Works v1.7.5 system which uses an **Internal SQL Express** instead of an **External SQL** server.

The migration has two phases:

- **First Migration** — Configuration Data Migration
- **Second Migration** — Measurement Data Migration

Prerequisites

In both scenarios you must:

1. Perform all steps as an **Administrator**.
2. Install the SQL Server Management Studio (SSMS) application on the **Source Server** used by the AMS Machine Works v1.7.2 system.
    a. Run `SSMS-Setup-ENU.exe` application found in the folder `..\dep\_Support\PWO\bin\_Support\SQL2017Exp\SSMS` as administrator.

    Note
    Alternatively you can download and install a later version of SSMS.

3. **Choose between the Single Server vs. the Parallel Servers scenarios and execute ONLY the substeps associated with the scenario you have chosen:**
   - **Single AMS Machine Works Server** — Install AMS Machine Works v1.7.5 on the system where AMS Machine Works v1.7.2 was installed, and use an Internal SQL Express instead of an External SQL server.
     Execute the following steps ONLY with the Single AMS Machine Works Server scenario:
     a. Perform the steps to uninstall AMS Machine Works with some exceptions:
     b. Stop the NATS service, but DO NOT uninstall NATS.
     c. Stop the Source SQL server, but **DO NOT** uninstall the SQL Server.
     d. Some folders should not be deleted because they contain NATS elements. See: Uninstall AMS Machine Works
     e. Uninstall AMS Machine Works v1.7.2. See: Uninstall AMS Machine Works
     f. If OPC UA is installed, open the operating system's **Computer Management** utility, and delete the existing OPC UA user group: **Plantweb Optics OPC UA Users**.
   - **Parallel AMS Machine Works Servers** — Maintain the previous AMS Machine Works v1.7.2 system, and create a parallel AMS Machine Works v1.7.5 system which uses an Internal SQL Express instead of an External SQL server.
     Execute the following steps ONLY with the Parallel AMS Machine Works Servers scenario:
     a. Stop the IIS (World Wide Web Publishing Service) service on the AMS Machine Works v.1.7.2 Server.
     b. Stop all the Emerson services on the AMS Machine Works v1.7.2 Server, and on any Interface Servers.
     c. Stop the MongoDB Server (MongoDB) service on the AMS Machine Works v.1.7.2 Server.
     d. Stop the nats-server service on the AMS Machine Works v.1.7.2 Server.

Only once you have successfully completed the prerequisite steps associated with **ONLY ONE** of the migration scenarios, you may proceed to the following steps.

Procedure

1. Extract the AMS Machine Works configuration data from the **Source Server** and transfer it to the **Target Server**.
   a) Ensure that the **EMERSONMW** SQL Server is running.
   b) Create a backup of the **MhmDb** database on the **Source Server**.
   c) In SSMS, execute the script named `CleanData175.sql` which is located in the installer package in the `..\Support\SQL External to SQL Internal Scripts` folder.

Note
`CleanData175.sql` removes the measurement data so that only the relevant configuration data will be migrated at this time. The measurement data will be recovered and migrated in a later step.

d) Stop the **EMERSONMW** SQL Server service on the **Source Server**.

e) On the **Target Server** manually create two folders, `EMERSONMW` and `Data`, so that you have the file path `C:\EMERSONMW\Data`.

Note
You may use custom file paths in this step. Make note of these values to use in a later steps.

f) Copy everything **except** the `Backups` and `Interfaces` folders from `C:\EMERSONMW\Data` folder on the **Source Server** to the `C:\EMERSONMW\Data` folder on the **Target Server**.

Note
Copy the following items:

- All `*.mdf` files.
- All `*.ndf` files.
- All `*.ldf` files.
- The `MwFs` folder.

Do NOT copy the following folders:

- `Backups`
- `Interfaces`

Note
If you didn't use the default location for the `Data` folder for your AMS Machine Works v1.7.2 installation you must copy the data from your custom location.

g) Start **EMERSONMW** SQL Server service on the **Source Server**.

h) Restore the backup of **MhmDb** database on the **Source Server**.

2. Install SQL Server Express on the **Target Server**.

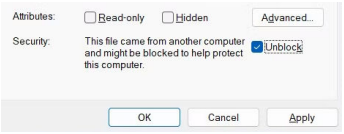
Note
The installer package contains the SQL Server Express 2017 version.

a) Log into the **Target Server** with an Administrator account.

b) Download the installation files for AMS Machine Works v1.7.5 to the **Target Server**.

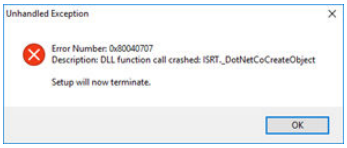
c) Before extracting, right-click on the file and select **Properties**. Check the **Unblock** checkbox, and click **Apply**.

Figure 6-1: File Properties



Note
A **Blocked** file will usually result in an error.

Figure 6-2: Error pop-up



To recover from this error, delete the extracted folder, **Unblock** the file, and re-extract the installation files.

d) In the unzipped installer package, navigate to the x64 folder:
`..\dep\_Support\PWO\bin\_Support\SQL2017Exp\x64`

e) (Optional) To change the location of the System Database that SQL Express uses for it's own operations and purposes:

1. In the parent directory, `SQL2017Exp`, open the `ConfigurationFile.ini` file found in this directory.
2. Search for `INSTANCEDIR="C:\Program Files\Microsoft SQL Server"`.
3. Replace with `INSTANCEDIR="<Your_Drive>:\<Your_Custom_File_Path>"`.
4. Save your changes.

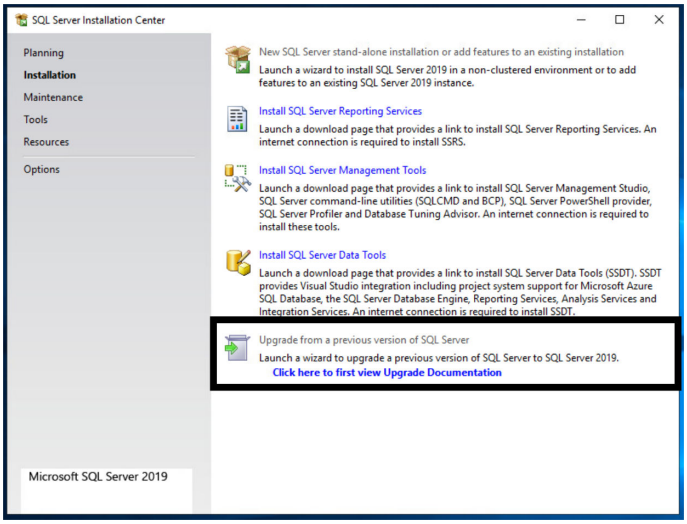
f) Run the SQL Setup application found in this folder with the following options and configuration file:

On the command line enter:

```
SETUP.EXE /Q /SKIPRULES=RebootRequiredCheck /
ConfigurationFile=..\ConfigurationFile.ini
```

g) (Optional) If your previous installation used SQL Express 2019, you must upgrade this installation from SQL Express 2017 to SQL Express 2019. The following substeps will ensure that your folder hierarchy remains untouched.

1. Download the Microsoft SQL Server 2019 Express updater from the Microsoft web page.
2. Run the **SQL2019-SSEI-Expr.exe** application.
3. Select the option **Download Media**.
4. When the media is downloaded, run the application **SQLEXPR_x64_ENU.exe**.
5. Choose the option **Update from a previous version of SQL Server.**



6. Accept the defaults and click **Next** for every step in the installer, and then click **Finish**.

h) Navigate to `..\dep\_Support\PWO\bin \_Support\SQL2017Exp \SSMS` and run SSMS-Setup-ENU.exe as an administrator.

> **Note**
> If you used Microsoft SQL Server 2019 Express in Step g above, you should download and install a 2019 or later version of SSMS in this step.

i) Open SSMS, and connect to the SQL Server **EMERSONMW** on the **Target Server**.

j) In SSMS open the `AttachDbs175.sql` script, which is located in the installer package in the `..\Support\SQL External to SQL Internal Scripts` folder, and edit all the paths to the database files to match your setup.

> **Note**
> You can edit the file directly in SSMS, or in another application such as "Notepad".

In the **MhmDb** section of `AttachDbs175.sql` there is a **FILESTREAM** group which is created with a single file by default: `MhmDb_FG_MeasFS1` . If your database configuration contains more files in this filegroup uncomment

subsequent lines by removing the two dashes -- from in front of the line, or add more lines with file names and paths which match your configuration.

Note
If you used a custom data directory location in a previous step, you must adjust all the file paths. For example from:
`C:\EMERSONMW\Data\MhmDb_Primary.mdf`

To:

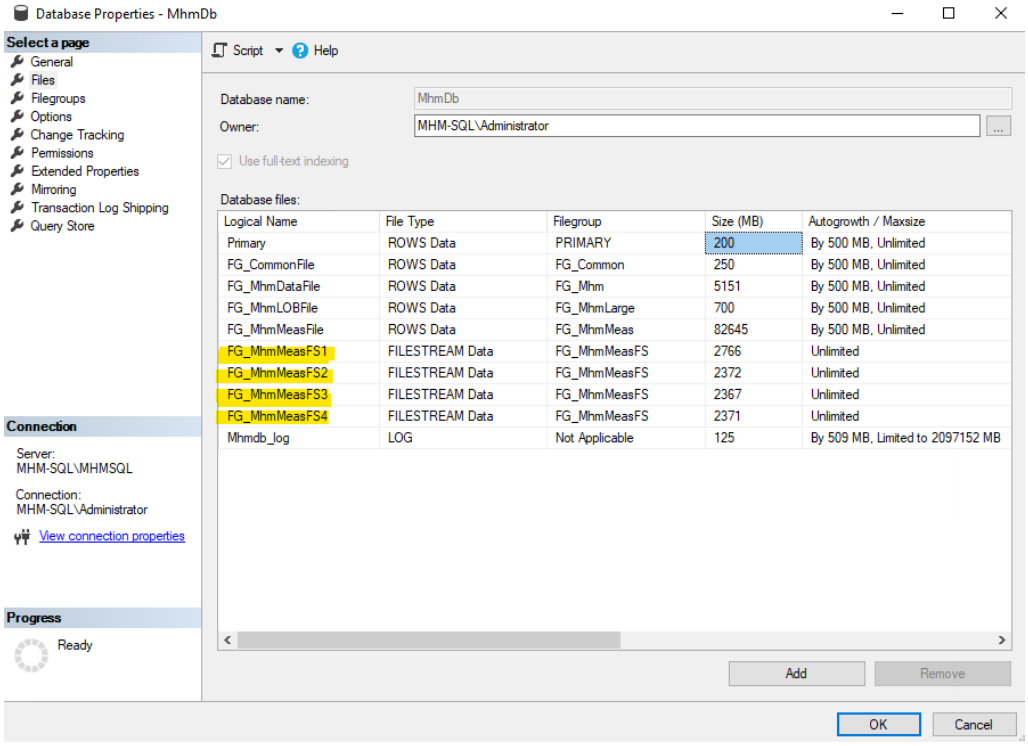
`<drive_name>:\<custom_file_path>\MhmDb_Primary.mdf`

Figure 6-3: Example of Lines Commented Out with --

```
CREATE DATABASE [MhmDb] ON
( FILENAME = N'C:\EMERSONMW\Data\MhmDb_Primary.mdf' ),
( FILENAME = N'C:\EMERSONMW\Data\MhmDb_log.ldf' ),
( FILENAME = N'C:\EMERSONMW\Data\MhmDb_FG_Data.ndf' ),
( FILENAME = N'C:\EMERSONMW\Data\MhmDb_FG_LOB.ndf' ),
( FILENAME = N'C:\EMERSONMW\Data\MhmDb_FG_Meas.ndf' ),
( FILENAME = N'C:\EMERSONMW\Data
\MhmDb_FG_Common.ndf' ),
FILEGROUP [FG_MhmMeasFS] CONTAINS FILESTREAM DEFAULT
( NAME = N'FG_MhmMeasFS1', FILENAME = N'C:\EMERSONMW
\DATA\MwFS\MhmDb_FG_MeasFs1' )
--( NAME = N'FG_MhmMeasFS2', FILENAME = N'C:\EMERSONMW
\DATA\MwFS\MhmDb_FG_MeasFs2' )
--( NAME = N'FG_MhmMeasFS3', FILENAME = N'C:\EMERSONMW
\DATA\MwFS\MhmDb_FG_MeasFs3' )
FOR ATTACH
GO
```

To find which additional files you may need to add to the `AttachDbs175.sql` script for the **MhmDb** database, in SSMS on the **Source Server**, select **MhmDb** → **Properties** → **Files**.

Figure 6-4: Example of a File List for a Particular Installation



k) In SSMS on the **Target Server**, open and then execute the `SQLCleanup175.sql` script, which is located in the installer package in the `..\Support\SQL External to SQL Internal Scripts` folder.

Note
This script removes some references to the old AMS Machine Works server from the database.

3. Install AMS Machine Works v1.7.5. See: Installation Procedures

⚠ CAUTION

You have just migrated the configuration data to the **Internal SQL Express Server**. **Do not overwrite the installation that you have just performed.**

See **Step 13** of External Agents, MongoDB, and SQL Installation, and choose **External SQL**, and in **Step 15** browse, and connect to the database named **LOCALHOST**.

⚠ CAUTION

While you are performing an upgrade of AMS Machine Works you must enable the display of all **Derived Measurements**, and only after successfully migrating your data can you disable those **Derived Measurements** which will not be used in your new system. See: Set the Line Frequency and Configure the Display of Derived Measurements

⚠ CAUTION

The following steps involve running migration tools on the **Target Server**. In the case the database is migrated from an **External SQL Server** to an **Internal SQL Express Server** installation on the **Target Server** with data deleted, the migration tools need to be run with different SQL Servers. Be careful with specifying which server to use in each step.

Note
Some **Measurement Names** have changed or become unavailable in AMS Machine Works v1.7.5. For more information see: Measurement Type Naming Convention Changes

4. Perform the steps found in the Agent and Device Migration section and use the connection to the **SQL Express Server** on the **Target Server**. See: Device Migration Tool
5. Launch the **Network Device Module** and confirm that all the **Agents** and **Devices** are present.
6. **First Migration** — Perform the steps found in the Database Migration Wizard section with the following configuration:
   a) Use the connection to the **SQL Express Server** on the **Target Server**.
   b) Select the option **Initial / Repair Mode** in Step 13.
   c) Uncheck the checkboxes in **Migrate Measurements** section in Step 17.
   See: Database Migration Wizard
7. **Second Migration** — Perform the steps found in the Database Migration Wizard section with the following configuration:
   a) **Skip the steps which involve running SQL scripts manually.**

      ⚠ CAUTION

      Running these scripts in this situation will result in data corruption in the External SQL Server used by the original AMS Machine Works v1.7.2 installation.

   b) Use the connection to the original **External SQL Server**.
   c) Go through connection settings steps, **Steps 2-11**, as described in Database Migration Wizard.

d) In **Step 12**, click **Next** to skip the **Data Transformation Precheck**.

e) In **Step 13**, select the **Incremental Mode**.

f) Go through **Steps 14-16** as described in Database Migration Wizard section.

g) In **Step 17**, specify a time range for data migration, or use the default option which is all data, **First available measurement** and **Last available measurement**. You can perform this operation several times to migrate measurements in chunks.

h) Go through **Steps 18-21** as described in Database Migration Wizard.

See: Database Migration Wizard

8. (Optional) If you were using OPC in your AMS Machine Works v1.7.2 system, you must now run the OPC Mapping Tool.
9. Restart the machine.

7 Migration Tools

There are some tools which are included in the AMS Machine Works installation package to assist deployment personnel in performing a Manual Upgrade from 1.7.2 to 1.7.5.

Deployment personnel are qualified Service Engineers from your organization, or from Emerson.

These tools are intended to be used by deployment personnel who:

- Have full knowledge of the configuration settings.
- Have administrative privileges on all the affected machines.
- Have the login names and passwords for all the relevant services and databases.

⚠ CAUTION

Do not proceed with migration unless you are fully qualified as noted above, data loss or corruption is possible.

⚠ CAUTION

Performing a backup of the affected data is highly recommended.

⚠ CAUTION

AMS Machine Works v1.7.5 does not support AMS 6500 ATG units, and migration does not support databases which have AMS 6500 ATG data. **Do not proceed with migration if your database has AMS 6500 ATG data.**

These tools must be run in the following order:

1. Device Migration Tool: This tool must run successfully before proceeding.
2. Database Migration Wizard
3. (Optional) OPC Mapping Tool: This tool is only necessary for systems which previously used OPC.

7.1 Device Migration Tool

The Device Migration tool is designed to assist qualified deployment personnel with upgrading from AMS Machine Works v1.7.2 to AMS Machine Works v1.7.5.

⚠ CAUTION

Any devices which are offline, or are not detected for some other reason, e.g. poor network connection, long reporting interval, **will be migrated in offline mode**. However, the **gateway itself must be online** for this to proceed.

Gateways which are **not assigned** to an interface in AMS Machine Works v1.7.2 **will not be migrated** to AMS Machine Works v1.7.5.

Ensure that all the devices you intend to migrate have power, network connection, and a reporting schedule which allows them to be quickly detected.

Prerequisites

For the application to operate certain conditions must be true.

- The Device Migration Tool should be run on the same machine as the AMS Machine Works server is located.
- For most installations the default `.json` file found at `MachineWorksInstaller\Support\MigrationTool\OnlineDesktop\appsettings.json` is correctly configured for this migration. This file can be modified in the following ways:
  - Old system: SQL database connection settings
  - Old system: NATS connection settings
  - New system: MongoDB database connection settings
  - New system: Network Device Module Application website address
  - New system: MW Online Device Service (ODS) address
  - Migration tool: Logging level
  - The `appsettings.json` file has the following structure:

Figure 7-1: Sample appsettings.json file

```
{
  "SqlSettings": {
    "dbAddress": "",
    "dbName": "",
    "dbUserName": "",
    "dbPassword": ""
  },
  "MongoDbSettings": {
    "dbAddress": "",
    "dbPort": "27018",
    "dbUserName": "",
    "dbPassword": ""
  },
  "NatsSettings": {
    "Address": "",
    "Port": "4223",
    "UserName": "",
    "Password": ""
  },
  "OnlineAppAddress": "http://localhost/network-device",
  "ODSAddress": "http://localhost:5001/",
  "Serilog": {
    "MinimumLevel": {
      "Default": "Debug",
      "Override": {
        "Microsoft": "Information",
        "MW": "Information",
        "System": "Warning"
      }
    }
  }
}
```

Note
If the Network Device Module interface is not displaying properly, then edit your appsettings.json file to change the section beginning with

```
"OnlineAppAddress":
```

to

```
"OnlineAppAddress": "http://YOUR_SERVER_NAME_HERE/network-
device",
```

.

- Most of the components of AMS Machine Works v1.7.2 must be uninstalled, except for two:
  - The SQL service from the v1.7.2 installation must still be available.
  - The NATS service from the v1.7.2 installation must still be available.
- AMS Machine Works v1.7.5 must be installed. See: Installation Procedures

- All the Agent Servers that you need to use must be installed to replace the servers that were previously external 'interface' machines. See: External AMS Machine Works Agent Server Installation
  - An AMS Asset Monitor Agent server should be installed if you want to map assets that were previously mapped by an AMS Asset Monitor interface server.
  - An Emerson Wireless Gateway Agent server should be installed if you want to map assets that were previously mapped by an AMS Wireless Gateway interface server that was used.
- Before running device migration application please open the Network Device Module website, `https://[server]/network-device`, and check if the AMS Machine Works v1.7.5 system is working.
- The Device Migration application must be run on the machine hosting the new AMS Machine Works v1.7.5 installation.
- The Device Migration Tool is in the following location:
  `MachineWorksInstaller\Support\MigrationTool\OnlineDesktop\DeviceMigrationTool.exe`
- Logging — The application logs information about its actions and stores it in the `Logs` directory. In the case of an application fault, it is possible to read the error details in the file which matches that date.

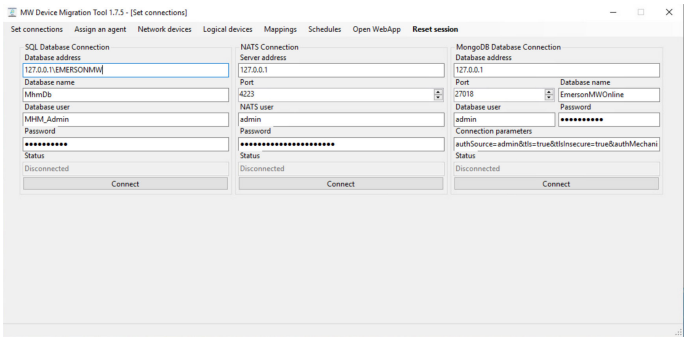
  Note
  - When the tool is run for the first time the `Logs` directory is created in the directory where the tool was run from.

- Errors — If the application crashes, a message box with information and error details is displayed.
- Clear the cache for the browser that you will be using with this installation of AMS Machine Works.
- Restart the computer that you will be performing the migration on.

Procedure

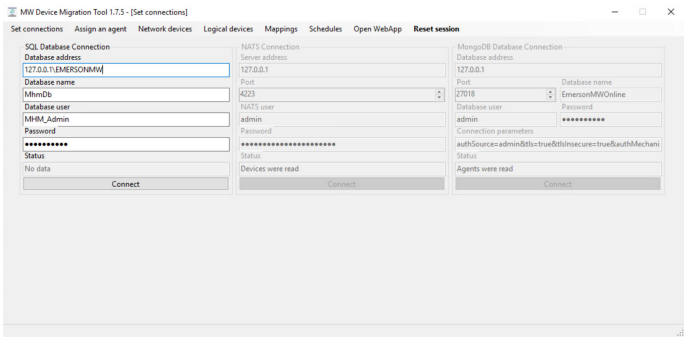
1. The screen is automatically filled with the default settings, or the contents of your `appsettings.json` file.

Figure 7-2: Set connections screen



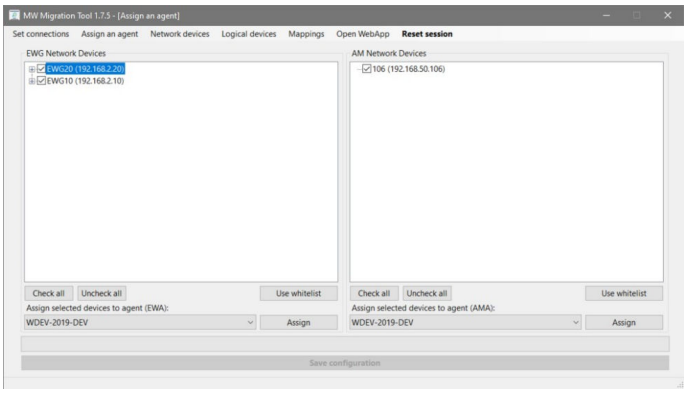
2. Correct any fields which are outdated, then click **Connect** in each section to connect to each service and read the device and agent data.

Figure 7-3: Successful Connection Screen



3. Below the title bar click the **Assign an agent** control to move on to the next step.

Figure 7-4: Assign an agent screen



The screen is divided into two sections for network devices, EWG (Emerson Wireless Gateway), and AM (Asset Monitor).

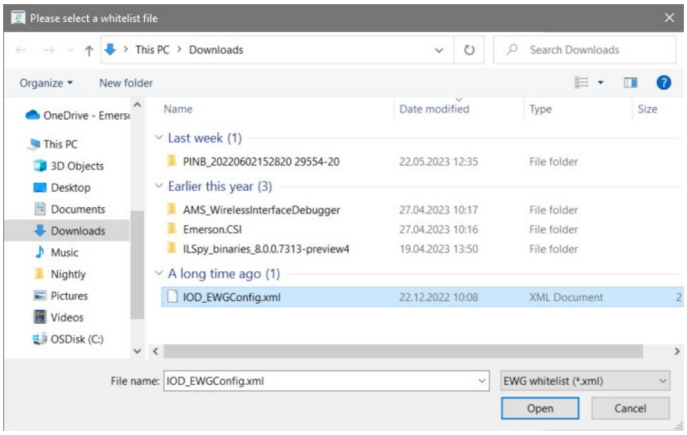
a) Option 1: Select devices manually by clicking in individual checkboxes.

b) Option 2: Select or deselect all devices by clicking **Check all** and **Uncheck all** buttons.

c) Option 3: Select devices by clicking the **Use whitelist** buttons.

4. (Optional) If you have a whitelist file from AMS Machine Works v1.7.2, you can navigate to it now.

Figure 7-5: Select a whitelist file

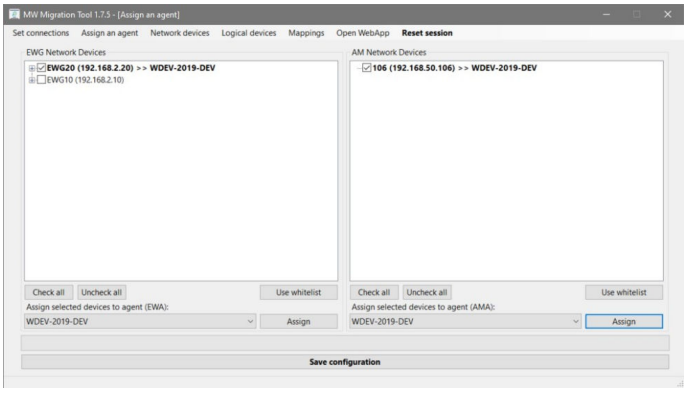


a) There are two **Use whitelist** buttons, one on the EWG / Emerson Wireless Gateway side of the interface, and the other one on the AM / Asset Monitor side of the interface. Choose which kind of whitelist you want to use.

b) Navigate to the whitelist `.xml` file for EWG devices, or to the `.dat` file for Asset Monitor devices, which you want to use, and then click **Open** to continue.

5. Choose an **Agent** for the devices you have selected, then click **Assign**.

Figure 7-6: Choose an Agent for the Devices



6. (Optional) If you have more devices to assign, click **Uncheck all** and then repeat steps 3, 4, and 5 until you are finished assigning all of the necessary devices.

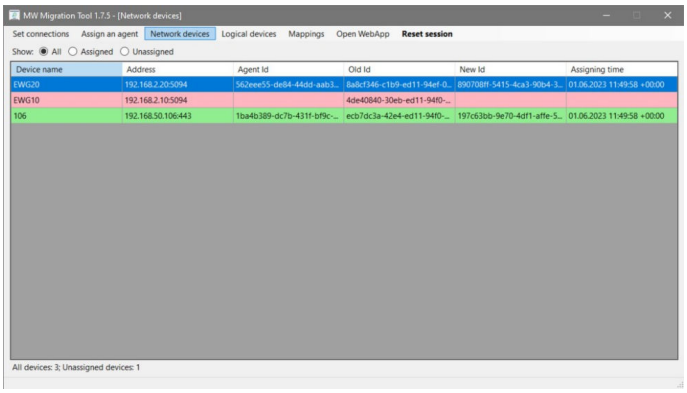
Note
The amount of devices which are assigned is displayed in the progress bar above the **Save configuration** button.

7. Verify your configuration, and then click **Save configuration**.
8. If there are more devices that can be assigned you will receive the following message.

Figure 7-7: Assignment Status

9. Click on the **Network devices** tab at the top of the window to see the following screen.

Figure 7-8: Network devices screen



This information on this screen can be filtered to show:

- All — All devices.
- Assigned — Only assigned devices, which have a green background color in the table.
- Unassigned — Only unassigned devices, which have a light red background color in the table.

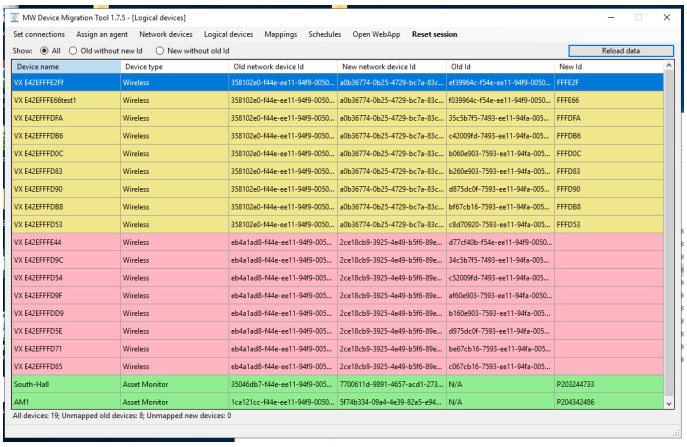
The table for the devices has the following columns:

- Device name — The name of the device.
- Address — This is the IP address and port number where the device is located.
- Agent Id — The ID of the Agent to which this device is assigned. This is blank for unassigned devices.
- Old Id — The device identifier in the old system.
- New Id — The device identifier in the new system. This is blank for unassigned devices.

- Assigning time — This is the date and time when the device was assigned to the agent. This is blank for unassigned devices. The date format is set according to your computer settings.

10. Click on the **Logical devices** tab at the top of the window to see the following screen.

Figure 7-9: Logical devices screen



This information on this screen can be filtered to show:

- All — All devices.
- Old without new Id — Only devices from the previous system which do not have a new ID, these have a red background color in the table.
- New without old Id — Only new devices which were not present in the old system, these have a normal white background color in the table.

Note

Items highlighted with a **yellow** background are items which will be migrated in **offline mode**. The configuration of offline migrated devices will be updated when the device comes online.

To minimize the number of devices migrated in **offline mode**, it is recommended that you wait at least 15 minutes and then **Reload data** and so that as many devices as possible are migrated normally.

The table for the devices has the following columns:

- Device name — The name of the device.
- Device type — The type of the device, which is either **Wireless** or **Asset Monitor**.
- Old network device Id — This is the old Id of the device which contains this logical device.
- New network device Id — This is the new Id of the device which contains this logical device.
- Old Id — The device identifier in the old system.

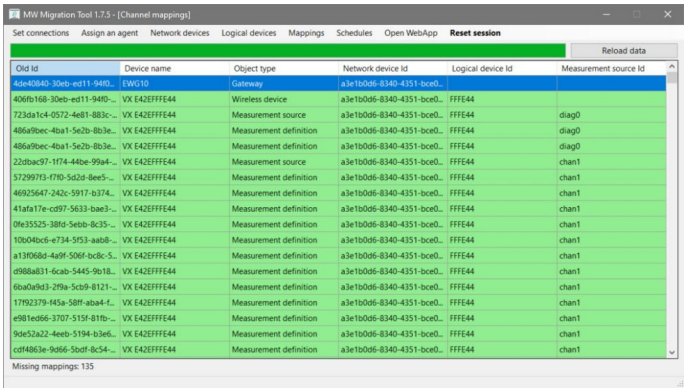
- New Id — The device identifier in the new system. This is blank for unassigned devices.

Note
This screen does not refresh its data automatically. To refresh the data, click the **Reload data** button in the top right corner of the window.

Data collection for the devices can take up to 30 minutes for an Emerson Wireless Gateway.

11. Click on the **Mappings** tab at the top of the window to see the following screen.

Figure 7-10: Mappings screen



The table for the devices has the following columns:

- Old Id — This is a unique identifier of the object in the old system.
- Device name — The name of the device.
- Object type — This column can have the following values: Gateway, Asset Monitor, Wireless device, Measurement source, and Definition
- Network device Id — Unique device identifier in the new system.
- Logical device Id — Logical device identifier located within the device identified by the Network device Id.
- Measurement source Id — This ID is part of the path set by the Logical device.

This screen displays the status of the mapping from the old system component identifiers to the new system component identifiers.

Rows with a green background have correctly mapped identifiers, and rows with a light red background have unmapped identifiers. Rows with a white background are new devices which weren't present in the old system.

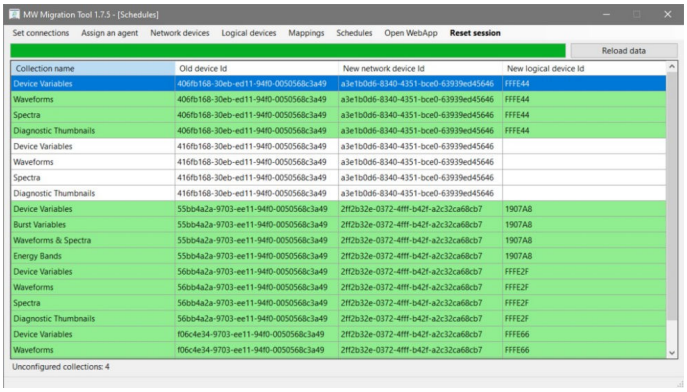
Note
This screen does not refresh its data automatically. To refresh the data, click the **Reload data** button in the top right corner of the window.

Data collection for the devices can take up to 30 minutes for an Emerson Wireless Gateway.

Note
After matching all the necessary logical devices, the mapping screen must be displayed to verify the status, and to store these mappings in the database for the next steps of the migration process.

12. Click on the **Schedules** tab at the top of the window to see the following screen.

Figure 7-11: Schedules screen



Note
The **Schedules** screen only has data from wireless devices. If you do not have any wireless devices, this screen will be empty and you can proceed.

The table for the devices has the following columns:

- Collection name — This is the collection name given by the wireless devices in the old system.
- Old device Id — The device identifier in the old system.
- New network device Id — The device identifier in the new system.
- New logical device Id — Logical device identifier located within the device identified by the New Network device Id.

This screen displays the status of the wireless device collection schedules and the synchronization of measurement flags between the old and the new systems.

Rows with green backgrounds indicate correctly configured and/or disabled collections from old system. Rows with light red backgrounds indicate collections from old system which are not configured. Rows with a white background indicate collections in the new system which did not exist in the old system.

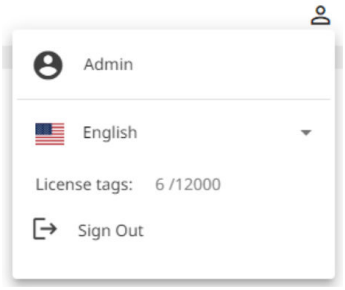
Note
This screen does not refresh its data automatically. To refresh the data, click the **Reload data** button in the top right corner of the window.

Data collection for the devices can take up to 30 minutes for an Emerson Wireless Gateway.

13. Check if the **Device Migration** has succeeded. Click on the **Open WebApp** tab at the top of the window to open the Network Device Module in the default browser

for this system. Click the **User Menu** in the top right corner. Verify that some license tags are being used. **If no license tags are in use, the procedure has failed.**

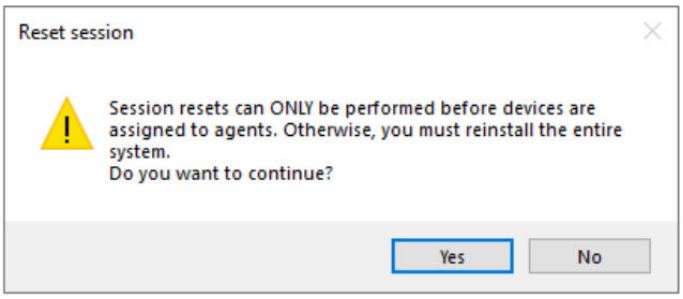
Figure 7-12: User Menu and License Tags



Note
The address for the Network Device Module is defined in the `appsettings.json` file.

14. (Optional) If you want to repeat the migration, click on the **Reset session** tab at the top of the window to reset the Device Migration tool to its initial state.

Figure 7-13: Reset Session Popup



⚠ CAUTION

The **Reset session** tab can only be used when a fresh installation of AMS Machine Works v1.7.5 is present and no data has been collected, or when all network devices have been manually removed from the new system.

Using this button in any other situation will result in this tool becoming disabled, and errors occurring in the tool.

Postrequisites

When you have successfully migrated all your devices you are ready to use the Database Migration Wizard.

⚠ CAUTION

Do not proceed until the Device Migration Tool has succeeded. See **Step 13** above.

7.2 Database Migration Wizard

The Database Migration Wizard should be run after the Device Migration Tool has completed its operations. The Database Migration Wizard is designed to assist deployment personnel with upgrading from AMS Machine Works v1.7.2 to AMS Machine Works v1.7.5.

The version number of the Database Migration Wizard is given in the title bar of the application window.

In general the migration process has the following phases:

1. Preparing the `appsettings.json` file.
2. Testing the database connections.
    a. (Optional) Updating and correcting the `appsettings.json` file.
3. Performing the Data Transformation Precheck to verify that any items not marked for migration are unnecessary.
4. Select between:
    a. **Initial / Repair Mode** — used to initialize, or reinitialize, the databases, and to transfer data.
    b. **Incremental Mode** — used to transfer data, or to overwrite data, in existing databases.
5. Select which measurements, and what date period to migrate.
    a. Option 1 — Migrate everything in one pass by choosing **Initial / Repair Mode** in **Step 13** and **First available measurement** and **Last available measurement** in **Step 17**.
    b. Option 2 — Break the migration into parts by choosing **Incremental Mode** in **Step 13** and defining various periods in **Step 17**.

Prerequisites

1. Verify that all the devices have been successfully discovered. See: Device Migration Tool
2. Verify that there no new Machine Trains and Locations (folders) have been created in the new installation of AMS Machine Works v1.7.5.

    Note
    The migration process does not merge the migrated data with any data that exists in the system.

3. Open `appsettings.json` file found in the `..\MachineWorksInstaller\Support\MigrationTool\CoreDesktop` folder and update the configurations for the connection strings. You must replace every instance of the text `change-password-before-run` with the appropriate passwords used on your server.

Note
Information entered into the Database Migration Wizard will not overwrite the `appsettings.json` file, you must update the `appsettings.json` file manually.

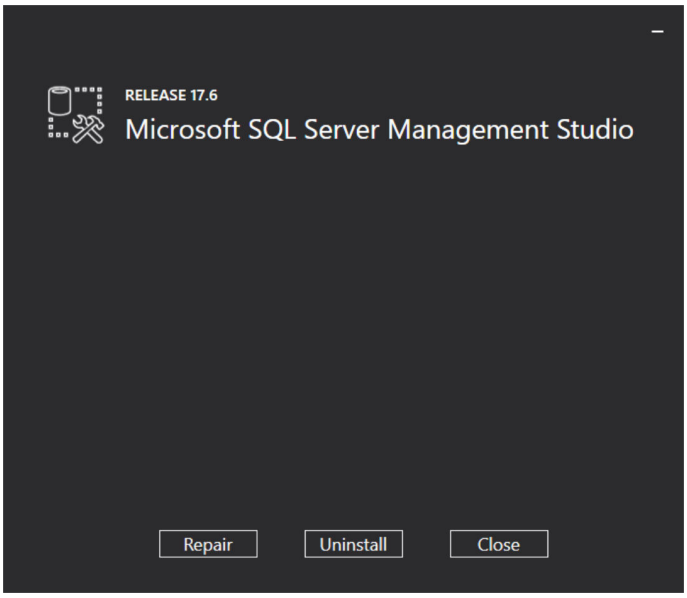
```
{
  "Serilog": {
    "MinimumLevel": {
      "Default": "Debug",
      "Override": {
        "Microsoft": "Information",
        "MW": "Information",
        "System": "Warning"
      }
    }
  },
  "coreDbConfig": {
    "connectionString": "mongodb://mongodb-admin:change-
password-before-run@127.0.0.1:27018/?
tls=true&tlsInsecure=true&authMechanism=SCRAM-SHA-256",
    "dbName": "EmersonMWCore"

  },
  "dataDbConfig": {
    "connectionString": "mongodb://mongodb-admin:change-
password-before-run@127.0.0.1:27018/?
tls=true&tlsInsecure=true&authMechanism=SCRAM-SHA-256",
    "dbName": "EmersonMWcoreData"
  },
  "onlineDbConfig": {
    "connectionString": "mongodb://mongodb-admin:change-
password-before-run@127.0.0.1:27018/?
tls=true&tlsInsecure=true&authMechanism=SCRAM-SHA-256",
    "dbName": "EmersonMWOnline"
  },
  "rabbitMq": {
    "serverUrl": "amqp://127.0.0.1:5672",
    "initialConnectionRetryAttempts": 5,
    "InitialConnectionRecoveryInterval": "0.00:00:05",
    "topology": {
      "sources": {
      },
      "sinks": {
        "TRAIN_CONFIG": "core.ex.train.def"
      }
    }
  },
  "frameworkDbConfig": {
    "connectionString": "data source=DATA_SOURCE;initial
catalog=DATABASE;User
ID=USER_ID;Password=DB_PASSWORD;MultipleActiveResultSets=Fal
se;Trust Server Certificate=True;Pooling=true;Max Pool
Size=1024;Connect Timeout=5;",
    "overwrites": {
      "userId": "sql-admin",
      "dataSource": "127.0.0.1\\EMERSONMW",
      "password": "change-password-before-run",
      "initialCatalog": "FrameworkDb"
    }
  },
  "mhmDbConfig": {
```

```
    "connectionString": "data source=DATA_SOURCE;initial
catalog=DATABASE;User
ID=USER_ID;Password=DB_PASSWORD;MultipleActiveResultSets=Fal
se;Trust Server Certificate=True;Pooling=true;Max Pool
Size=1024;Connect Timeout=5;",
    "overwrites": {
      "userId": "sql-admin",
      "dataSource": "127.0.0.1\\EMERSONMW",
      "password": "change-password-before-run",
      "initialCatalog": "MhmDb"
    }
  },
  "scripts": {
    "generateSqlScript": true
  }
}
```

Procedure

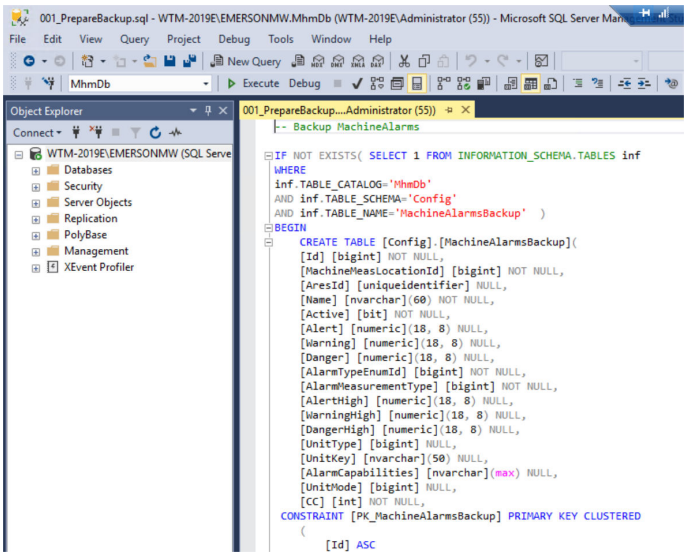
1. Install Microsoft SQL Server Management Studio, which is also called SSMS. The SSMS installer is included in the AMS Machine Works v1.7.5 installation package at the following location: `..\dep\_Support\PWO\bin\_Support\SQL2017Exp\SSMS`. Launch the installer and then follow its instructions. For more information about Microsoft SQL Server Management Studio refer the Microsoft's product support pages.

Figure 7-14: Microsoft SQL Server Management Studio



   a) Load the `001_PrepareBackup.sql` script found in `..\Support\MigrationTool\CoreDesktop\Scripts` folder, select the **MhmDb** database, and then click **Execute**.

Figure 7-15: Execute `001_PrepareBackup.sql`

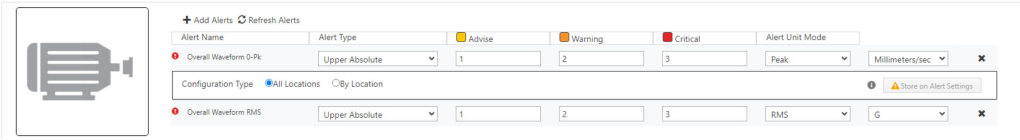


⚠ CAUTION

This script must be executed before running the `Migration.Core.App.Desktop.exe` application.

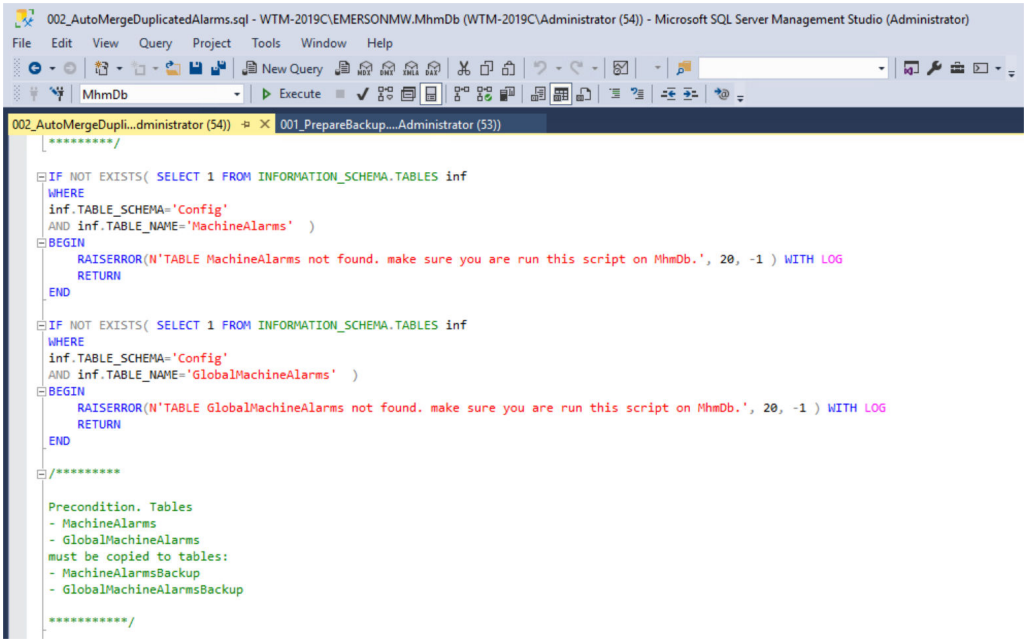
b) (Optional) Open **Asset Explorer** and click **Edit Alert** to see which **Alerts** exist for each **Machine Train**. These should currently have warning symbols next to the entries in the **Alert Name** column.

Figure 7-16: Check Alerts — Definition



c) Load the `002_AutoMergeDuplicatedAlarms.sql` script found in the `..\Support\MigrationTool\CoreDesktop\Scripts` folder, select the **MhmDb** database, and then click **Execute**.

Figure 7-17: Execute `002_AutoMergeDuplicatedAlarms.sql`



⚠ CAUTION

This script must be executed before running the `Migration.Core.App.Desktop.exe` application.

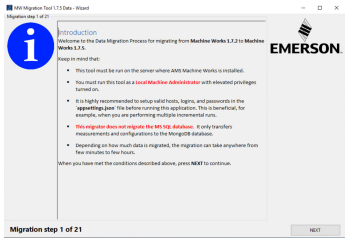
Note

This script only merges alarms when an automatic merge is possible. This script skips alarms where:

- different alarm types are defined for the alarm
- there are different alarm levels
- there are different measurement unit types

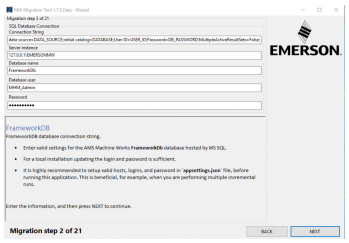
2. Navigate to `..\MachineWorksInstaller\Support\MigrationTool\CoreDesktop` and launch the `Migration.Core.App.Desktop.exe` found in that folder. Read the Introduction screen, and when you are sure that you meet all the requirements, click **Next** to continue.

Figure 7-18: Step 1 — Introduction Screen



3. This window is filled with information from the `appsettings.json` file. Correct any errors, and then click **Next** to continue.

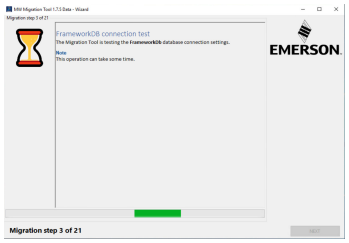
Figure 7-19: Connect to the FrameworkDb Database



Note
Information entered in to the Database Migration Wizard will not overwrite the contents of the `appsettings.json` file, that file must be updated manually.

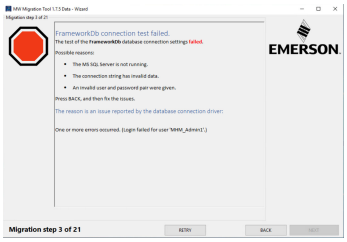
4. Wait for the connection test to complete.

Figure 7-20: FrameworkDb Connection Test — In Progress



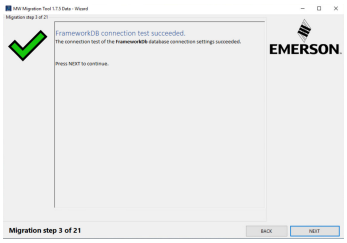
a) The test failed, make notes about any reported errors and other possible reasons for the failure. Then click **Back** to return to the previous step and correct the problems.

Figure 7-21: FrameworkDb Connection Test — Failed



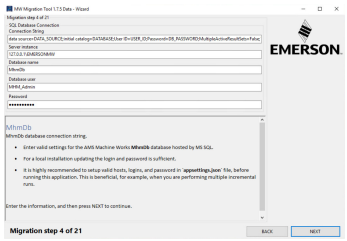
b) Click **Next** to continue.

Figure 7-22: FrameworkDb Connection Test — Succeeded



5. This window is filled with information from the `appsettings.json` file. Correct any errors, and then click **Next** to continue.

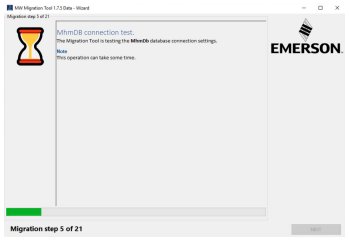
Figure 7-23: Connect to the MhmDb Database



Note
Information entered in to the Database Migration Wizard will not overwrite the contents of the `appsettings.json` file, that file must be updated manually.

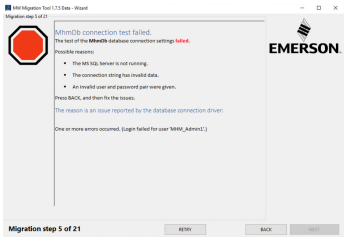
6. Wait for the connection test to complete.

Figure 7-24: MhmDb Connection Test — In Progress



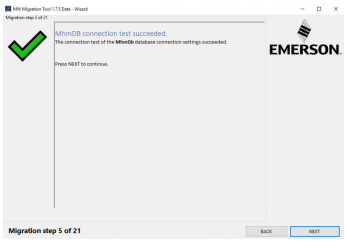
a) The test failed, make notes about any reported errors and other possible reasons for the failure. Then click **Back** to return to the previous step and correct the problems.

Figure 7-25: MhmDb Connection Test — Failed



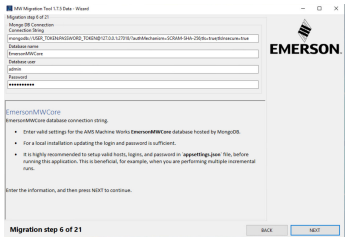
b) Click **Next** to continue.

Figure 7-26: MhmDb Connection Test — Succeeded



7. This window is filled with information from the `appsettings.json` file. Correct any errors, and then click **Next** to continue.

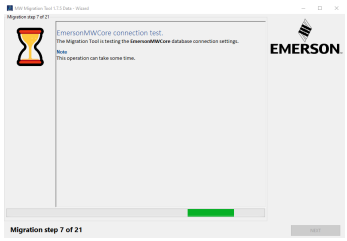
Figure 7-27: Connect to the EmersonMWCore Database



Note
Information entered in to the Database Migration Wizard will not overwrite the contents of the `appsettings.json` file, that file must be updated manually.

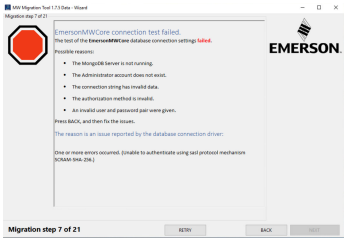
8. Wait for the connection test to complete.

Figure 7-28: EmersonMWCore Connection Test — In Progress



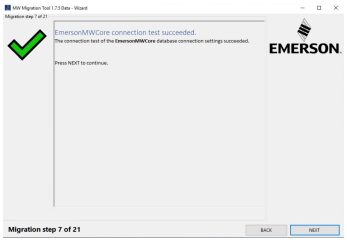
a) The test failed, make notes about any reported errors and other possible reasons for the failure. Then click **Back** to return to the previous step and correct the problems.

Figure 7-29: EmersonMWCore Connection Test — Failed



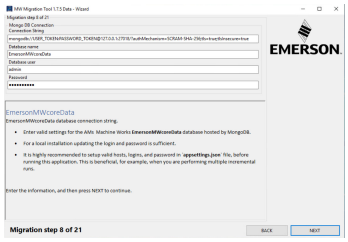
b) Click **Next** to continue.

Figure 7-30: EmersonMWCore Connection Test — Succeeded



9. This window is filled with information from the `appsettings.json` file. Correct any errors, and then click **Next** to continue.

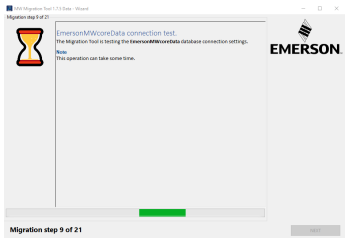
Figure 7-31: Connect to the EmersonMWCoreData Database



Note
Information entered in to the Database Migration Wizard will not overwrite the contents of the `appsettings.json` file, that file must be updated manually.

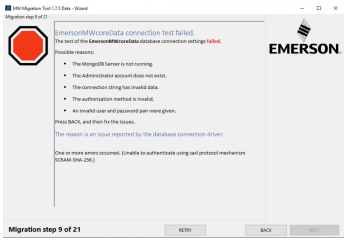
10. Wait for the connection test to complete.

Figure 7-32: EmersonMWCoreData Connection Test — In Progress



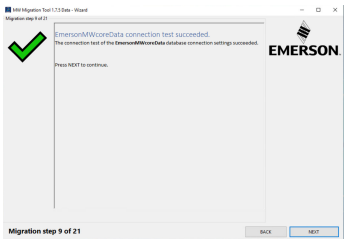
a) The test failed, make notes about any reported errors and other possible reasons for the failure. Then click **Back** to return to the previous step and correct the problems.

Figure 7-33: EmersonMWCoreData Connection Test — Failed



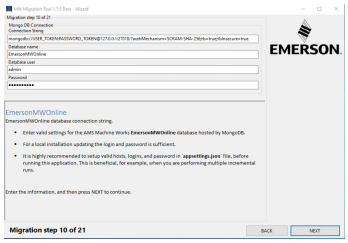
b) Click **Next** to continue.

Figure 7-34: EmersonMWCoreData Connection Test — Succeeded



11. This window is filled with information from the `appsettings.json` file. Correct any errors, and then click **Next** to continue.

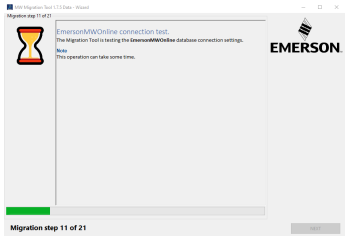
Figure 7-35: Connect to the EmersonMWOnline Database



Note
Information entered in to the Database Migration Wizard will not overwrite the contents of the `appsettings.json` file, that file must be updated manually.

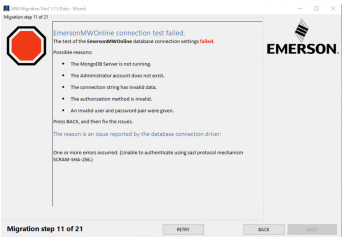
12. Wait for the connection test to complete.

Figure 7-36: EmersonMWOnline Connection Test — In Progress



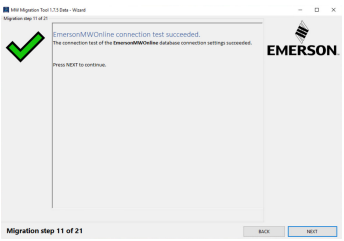
a) The test failed, make notes about any reported errors and other possible reasons for the failure. Then click **Back** to return to the previous step and correct the problems.

Figure 7-37: EmersonMWOnline Connection Test — Failed



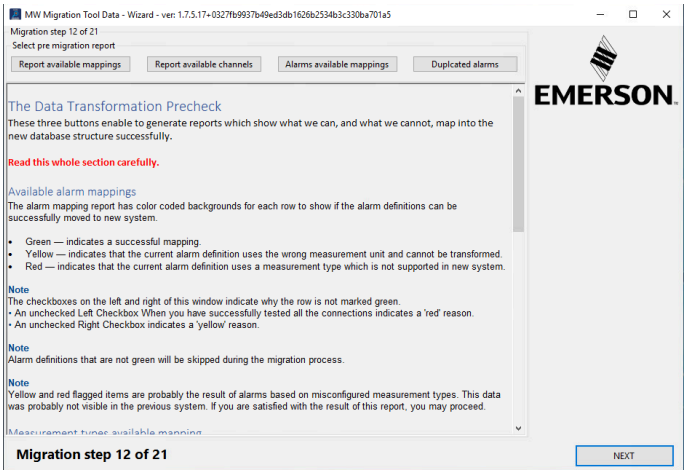
b) Click **Next** to continue.

Figure 7-38: EmersonMWOnline Connection Test — Succeeded



13. Read the documentation displayed about the Data Transformation Precheck reports. Follow the substeps below to view the reports. When you are satisfied with the reports, click **Next** to proceed with the migration.

Figure 7-39: Data Transformation Precheck — Main Window

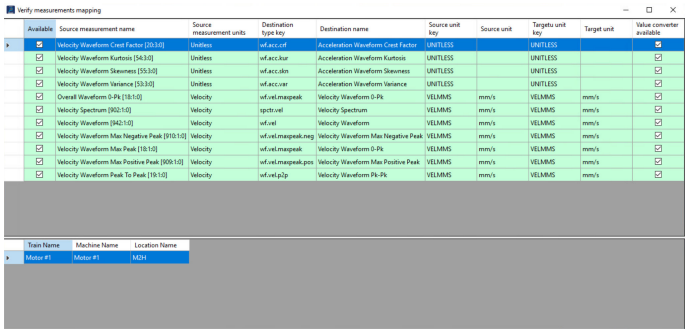


Note

All items which have a **yellow** or **red** background in these reports **WILL NOT** be migrated. The items with **yellow** or **red** backgrounds are probably the result of devices from the previous system which had misconfigured measurement types. This data was probably not visible in the previous system.

a) Click **Report available mappings** to display the report. Verify that the items with **yellow** and **red** backgrounds are the result of misconfiguration in the previous system.

Figure 7-40: Verify the Measurement Mappings



The measurement type mapping report shows how existing measurement types are going to be migrated to the new system.

When the row with measurement types is selected, the bottom section shows a list of trains, machines and locations containing the specified measurement types.

The background color of a row indicates its status:

- Green — indicates a successful mapping.
- Yellow — indicates that the current measurement definition uses the wrong measurement unit and cannot be transformed.

- Red — indicates that the current measurement type is not supported in new system.

Note
The checkboxes on the left and right of this window indicate why the row is not marked green.

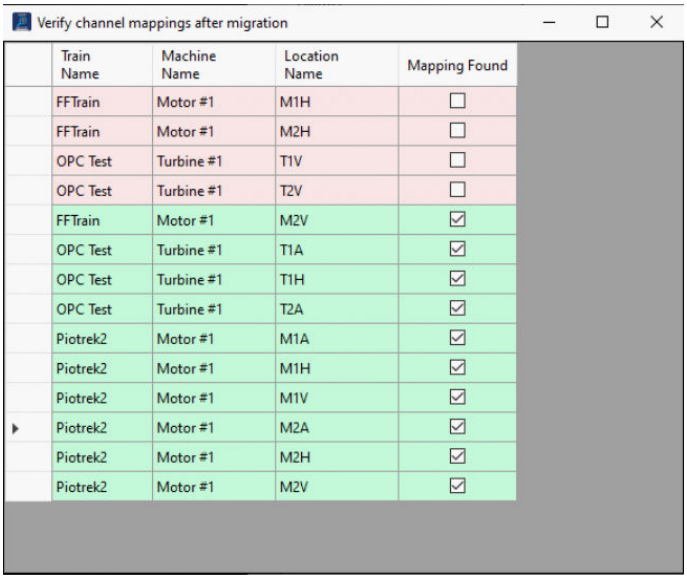
- An unchecked **Left Checkbox** indicates a 'red' reason.
- An unchecked **Right Checkbox** indicates a 'yellow' reason.

Note
Measurement definitions that are not green will be skipped during the migration process. Yellow and red flagged items are probably the result of devices with misconfigured measurement types. This data was probably not visible in the previous system.

If you are satisfied with the result of this report you may proceed.

b) Click **Report available channels** to display the report. Verify that the device channels have been mapped.

Figure 7-41: Verify the Channel Mappings



Train Name	Machine Name	Location Name	Mapping Found
FFTrain	Motor #1	M1H	☐
FFTrain	Motor #1	M2H	☐
OPC Test	Turbine #1	T1V	☐
OPC Test	Turbine #1	T2V	☐
FFTrain	Motor #1	M2V	☑
OPC Test	Turbine #1	T1A	☑
OPC Test	Turbine #1	T1H	☑
OPC Test	Turbine #1	T2A	☑
Piotrek2	Motor #1	M1A	☑
Piotrek2	Motor #1	M1H	☑
Piotrek2	Motor #1	M1V	☑
Piotrek2	Motor #1	M2A	☑
Piotrek2	Motor #1	M2H	☑
Piotrek2	Motor #1	M2V	☑

The background color of a row indicates its status:

- Green means that a location will be mapped after migration.
- Red means that a location will not be mapped after migration.

Note
The checkboxes on the right side of this window indicate why the row is not marked green.

- An unchecked **Right Checkbox** indicates a 'red' reason.

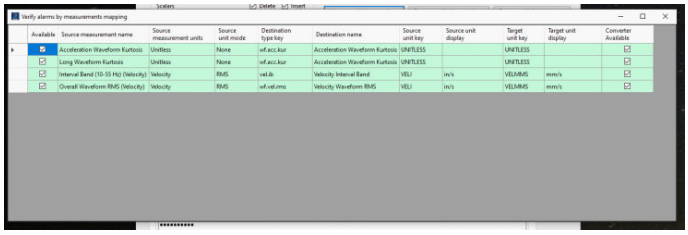
Note
Individual items marked in red will have to be manually handled by the user after the migration has finished.

Note
If every location is marked with a red background, make sure that all the devices were correctly discovered by the Device Migration Tool.

If you are satisfied with the result of this report you may proceed.

c) Click **Alarms available mappings** to display the report.

Figure 7-42: Verify the Alarm Mappings



The alarm mapping report has color coded backgrounds for each row to show if the alarm definitions can be successfully moved to a new system.

- Green — indicates a successful mapping.
- Yellow — indicates that the current alarm definition uses the wrong measurement unit and cannot be transformed.
- Red — indicates that the current alarm definition uses a measurement type which is not supported in new system.

Note
The checkboxes on the left and right of this window indicate why the row is not marked green.

- An unchecked **Left Checkbox** indicates a 'red' reason.
- An unchecked **Right Checkbox** indicates a 'yellow' reason.

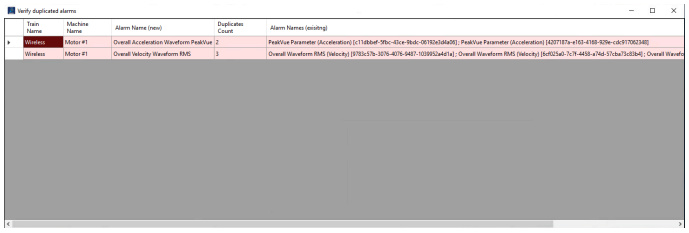
Note
Alarm definitions that are not green will be skipped during the migration process.

Note
Yellow and red flagged items are probably the result of alarms based on misconfigured measurement types. This data was probably not visible in the previous system.

If you are satisfied with the result of this report you may proceed.

d) Click the **Duplicated alarms** button to display the report. If this report is empty, there are no duplicated alarms and you may proceed.

Figure 7-43: Duplicated Alarms



Note

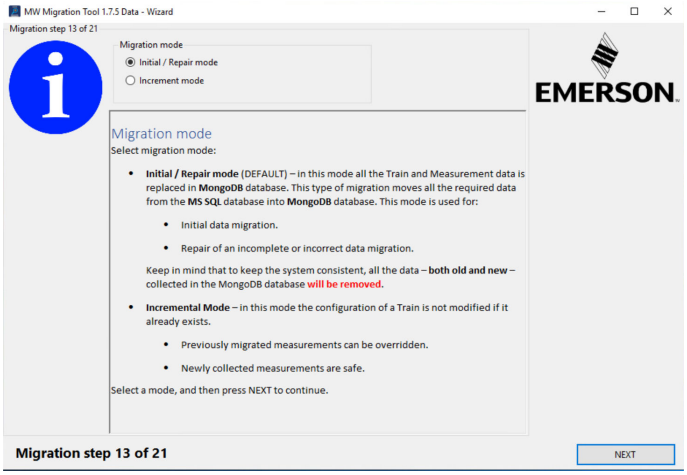
When there are duplicated alarms there are two scenarios for dealing with them.

- Scenario 1: The `002_FixDuplicatedAlarms.sql` script **was not run**. — Run the script as shown in **Step 1.c** above, and then click the **Duplicated alarms** button again to generate the report again. If the report is now empty, you may proceed.
- Scenario 2: The `002_FixDuplicatedAlarms.sql` script **was run**. — These duplicated alarms cannot be removed automatically and must be **removed manually after the migration process completes**.
  - Copy the report. — Select and copy the report with **Ctrl + A**, and then **Ctrl + C**. Then paste the report into an application such as **Notepad**, or **Excel**.
  - Proceed with the migration tool.
  - After the migration tool completes, delete the unwanted duplicates in AMS Machine Works.

When all four **Data Transformation Prechecks** have been completed successfully you may proceed to the actual data migration process.

14. Select a migration mode, then click **Next** to continue.

Figure 7-44: Migration Mode Selection



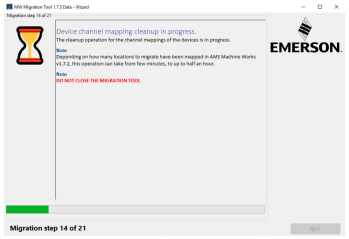
a) (Default) Choose the **Initial / Repair Mode** to **initialize** the databases, or to **reinitialize** the databases.

b) Choose the **Incremental Mode** to perform a migration which **preserves Machine Train** configurations and new measurements, but which **can overwrite** previously migrated measurements.

Note
To perform an **Incremental Mode** migration, you will later select successive date periods in the **Measurement and Date Period Selection** step. (Step 17)

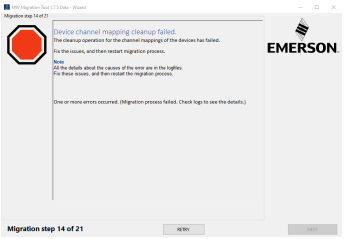
15. Wait for the device channel mapping cleanup process to complete.

Figure 7-45: Device Channel Mapping Cleanup — In Progress



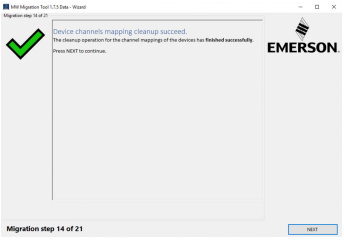
a) Fix the issue or issues reported, and click **Retry** to continue with the migration process.

Figure 7-46: Device Channel Mapping Cleanup — Failed



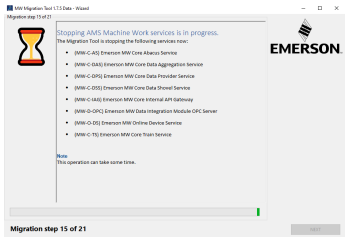
b) Click **Next** to continue.

Figure 7-47: Device Channel Mapping Cleanup — Succeeded



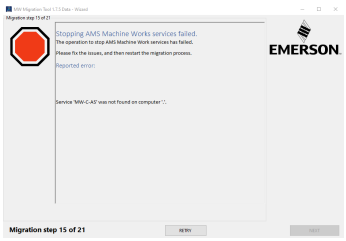
16. Wait for the AMS Machine Works Services to stop.

Figure 7-48: Stopping AMS Machine Works Services — In Progress



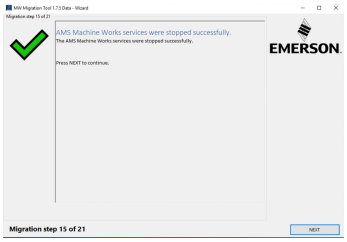
a) Correct the issue, or issues, mentioned, and then click **Retry** to continue.

Figure 7-49: Stopping AMS Machine Works Services — Failed



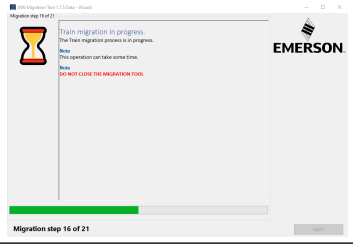
b) Click **Next** to continue.

Figure 7-50: Stopping AMS Machine Works Services — Succeeded



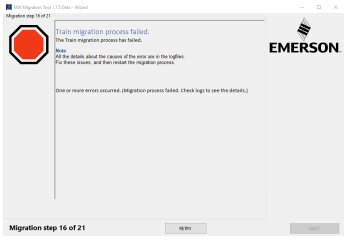
17. Wait for the Machine Train migration process to complete.

Figure 7-51: Train Migration — In Progress



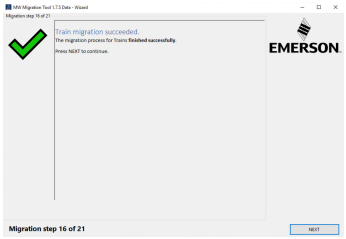
a) The Train Migration process failed. Check the most recent log file found in `..\Support\MigrationTool\CoreDesktop\Logs`. Fix the issues, and then click **Retry**, or restart the migration process.

Figure 7-52: Train Migration — Failed



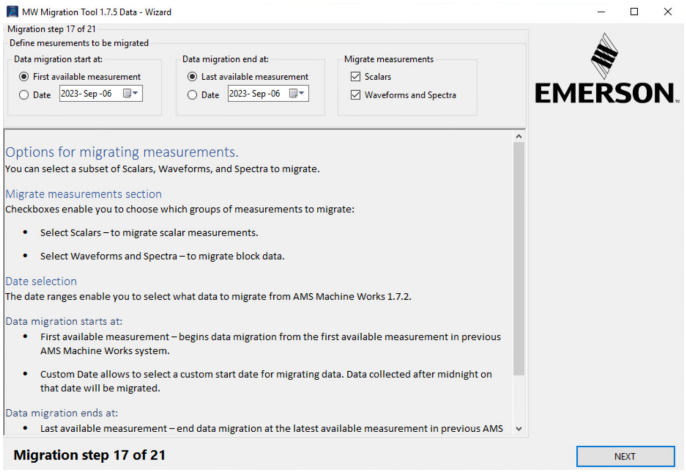
b) Click **Next** to continue.

Figure 7-53: Train Migration — Succeeded



18. Choose which measurements to migrate, and for what period.

Figure 7-54: Measurement and Date Period Selection



Note

Measurement migration can take a very long time. The length depends on the size of your installation and the length of the data collection period. For very large installations it is recommended to do an **Initial / Repair Mode** migration, followed by successive **Incremental Mode** migrations for measurements and date periods.

a) (Default) Complete Dataset Migration — Choose **First available measurement** and **Last available measurement** for the longest period possible.

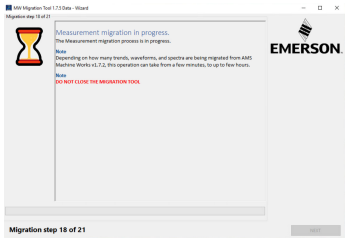
b) Partial Migration — Choose specific starting and ending dates.

c) Incremental Migration — Break your migration into multiple phases.

1. Migrate data from **First available measurement** to **Date 1**.
2. Migrate data from **Date 1** to **Date X**
3. Break the migration into as many steps as you desire.
4. Migrate data from **Previous End Date** to **Last available measurement**.

19. Wait for the measurement migration to complete.

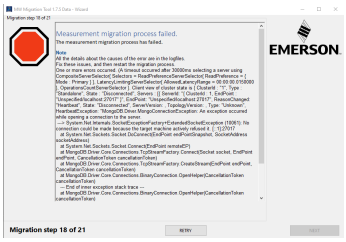
Figure 7-55: Measurement Migration — In Progress



Note
This process can take hours for large databases.

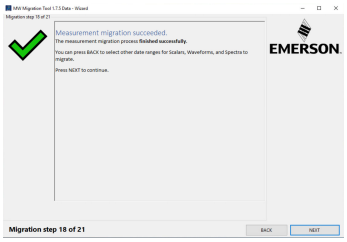
a) The Measurement Migration process failed. Check the most recent log file found in `..\Support\MigrationTool\CoreDesktop\Logs`. Fix the issues, and then click **Retry**, or restart the migration process.

Figure 7-56: Measurement Migration — Failed



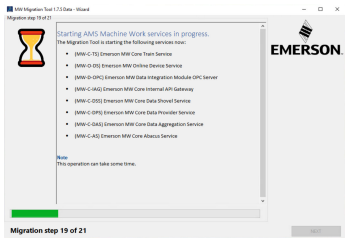
b) If you have other date ranges in an **Incremental Mode** migration to migrate, click **Back**, otherwise click **Next** to continue.

Figure 7-57: Measurement Migration — Succeeded



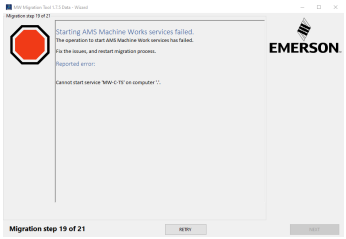
20. Wait for the AMS Machine Works services to restart, this process takes a few minutes.

Figure 7-58: Restarting AMS Machine Works services — In Progress



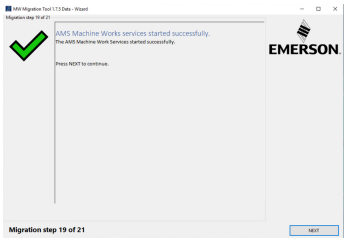
a) Fix the issue or issues reported, and click **Retry** to continue with the migration process.

Figure 7-59: Restarting AMS Machine Works services — Failed



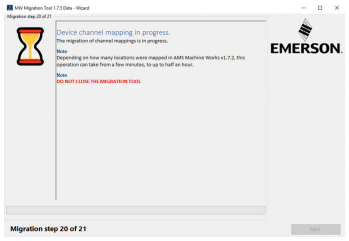
b) Click **Next** to continue.

Figure 7-60: Restarting AMS Machine Works services — Failed



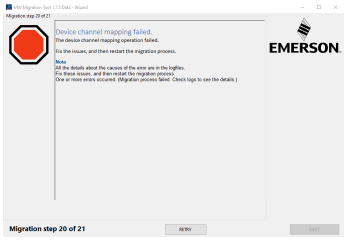
21. Wait for the process to complete, this process takes a few minutes.

Figure 7-61: Device Channel Mapping Process — In Progress



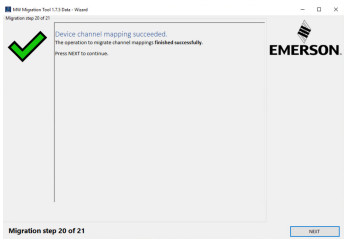
a) The Device Channel Mapping process failed. Check the most recent log file found in `..\Support\MigrationTool\CoreDesktop\Logs`. Fix the issues, and then click **Retry**, or restart the migration process.

Figure 7-62: Device Channel Mapping Process — Failed



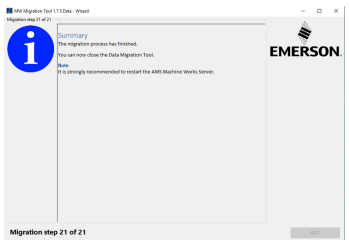
b) Click **Next** to continue.

Figure 7-63: Device Channel Mapping Process — Succeeded



22. The process has completed successfully, you can now safely exit the Database Migration Wizard.

Figure 7-64: Migration Process Completed



23. Launch the Microsoft SQL Server Management Studio, which is also called SSMS, that you installed in the first step. It is located in: `C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Microsoft SQL Server Tools 17`

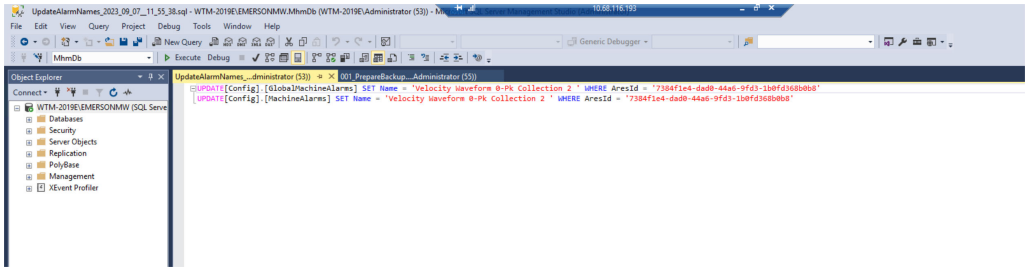
    a) Load the **most recent** `(date)` of the `UpdateAlarmNames(date).sql` script found in the `..\Support\MigrationTool\CoreDesktop\Scripts` folder, select the **MhmDb** database, and then click **Execute**.

    ⚠ CAUTION

    Only run the **most recent** version of this script. It is possible for multiple versions of this script to be generated while running the Data Migration Wizard. The `(date)` is given in `_YYYY_MM_DD_HH_MM_SS` format.

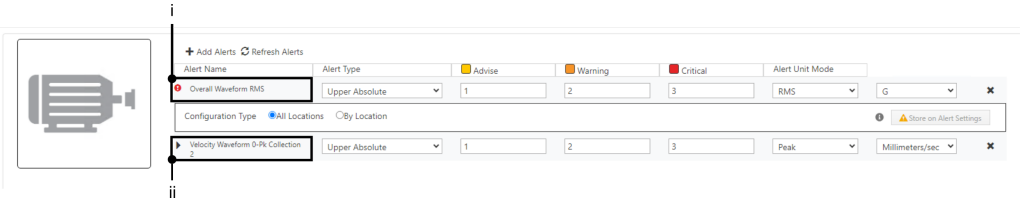
    Note
    This script only fixes the alarm names for alarms which have associated measurements that have been collected and stored.

    Figure 7-65: Execute `UpdateAlarmNames(date).sql`

    b) Open **Asset Explorer** and click **Edit Alert** to see which **Alerts** exist for each **Machine Train**. These should currently have warning symbols next to the entries in the **Alert Name** column.

    Figure 7-66: Check Alerts — Mappings

    A. *This **Alert** is not mapped to a measurement.*

    Note
    If this mapping was broken in the previous system, it will remain broken in the new system.

    B. *This **Alert** is mapped to a measurement.*

24. Restart the AMS Machine Works v1.7.5 server.

Postrequisites

(Optional) Run the OPC Mapping Tool .

7.3 OPC Mapping Tool

The OPC Mapping Tool produces a map of OPC node IDs which were available in your previous AMS Machine Works v1.7.2 system, and matches them with the corresponding nodes from the AMS Machine Works v1.7.5 system. The tool produces a `.csv` file, which is intended to help system administrators to change node identifiers in external applications.

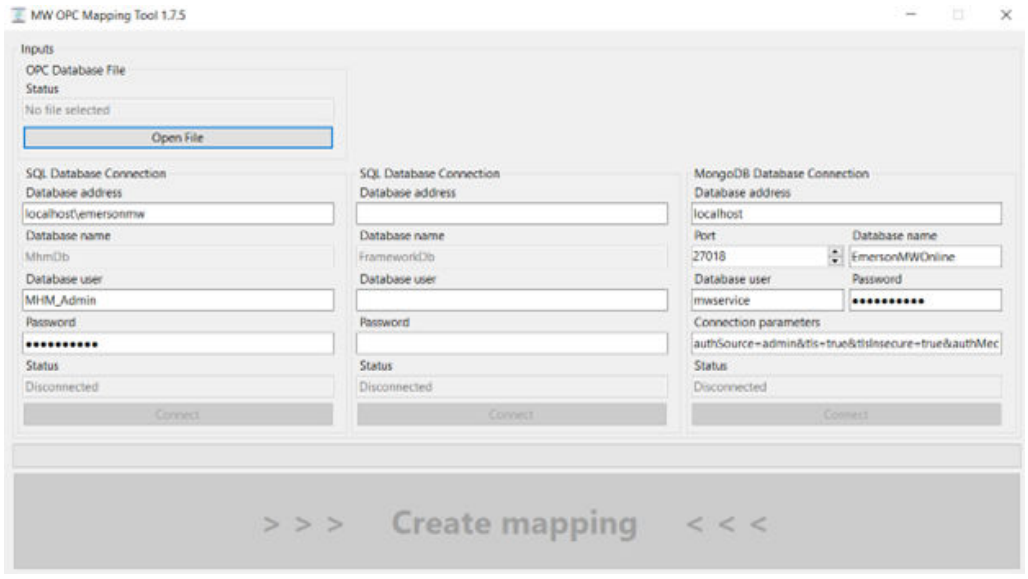
Prerequisites

- **Backup this file from your AMS Machine Works v1.7.2 installation** `C:\Program Files (x86)\Emerson\Plantweb Optics OPC UA Server\OPCUA \Emerson.Opc.Ua.PlantwebOptics.DataSource.db` **before performing the** Uninstall AMS Machine Works **steps.**
- Devices must be migrated before running the application. See: Device Migration Tool
- Data should be migrated before running the application. See: Database Migration Wizard
- This application must be run on the AMS Machine Works v1.7.5 server because it connects to two services:
  - Emerson MW Online Device Service
  - Emerson MW Core Train Service

The OPC Mapping Tool is only required to be used in migration scenarios where the previous AMS Machine Works v1.7.2 system used OPC.

Once you successfully complete one section of the OPC Mapping Tool the next section will become available for editing.

Figure 7-67: OPC Mapping Tool Interface



Procedure

1. Run the `MW OPC Migration Tool 1.7.5` application which is located in the installer package at: `C:..\Support\MigrationTool\OpcDesktop \OpcMigrationTool.exe`.

   When you first run the `OpcMigrationTool.exe` it creates a `Logs` directory in the same directory it was run from.

2. Navigate to the OPC database file from your AMS Machine Works v1.7.2 installation and click the **Open File** button.

   Note
   The default file location is: `C:\Program Files (x86)\Emerson\Plantweb Optics OPC UA Server\OPCUA \Emerson.Opc.Ua.PlantwebOptics.DataSource.db`

   After successfully reading the data:

   - The message **Data has been read** will appear in the status field in the top left corner.
   - The **SQL Database Connection** section for the database named **MhmDb** will be unlocked.

3. Enter your **custom parameters** for the **SQL Database Connection** to the **MhmDb** database from your AMS Machine Works v1.7.2 installation, or use the **default values** provided.
4. Click the **Connect** button in the **SQL Database Connection** section for the database named **MhmDb**.
   After successfully reading the data:

   - The message **Data has been read** will appear in the status field in the top left corner.
   - The **SQL Database Connection** section for the database named **FrameworkDb** will be unlocked.

5. Enter your **custom parameters** for the **SQL Database Connection** to the **FrameworkDb** database from your AMS Machine Works v1.7.2 installation, or use the **default values** provided.
6. Click the **Connect** button in the **SQL Database Connection** section for the database named **FrameworkDb**.
   After successfully reading the data:

   - The message **Data has been read** will appear in the status field in the top left corner.
   - The **MongoDB Database Connection** section for the database named **EmersonMWOnline** will be unlocked.

7. Enter your **custom parameters** for the **MongoDB Database Connection** to the **EmersonMWOnline** database for this AMS Machine Works v1.7.5 installation, or use the **default values** provided.

8. Click the **Connect** button in the **MongoDB Database Connection** section for the database named **EmersonMWOnline**.
   After successfully reading the data:
   - The message **Data has been read** will appear in the status field in the top left corner.
   - The large **Create mapping** button at the bottom of the window will be unlocked.
9. Click the **Create mapping** button at the bottom of the window.
   A progress bar above the **Create mapping** button starts, and when the task finishes a message is displayed that the mapping has been completed and the location of the file.

Note
The file `Mappings.csv` is saved to the same directory that the `MW OPC Migration Tool 1.7.5` was launched from. The default location is in the installer package in: `C:..\Support\MigrationTool\OpcDesktop\`

Postrequisites

Use the `Mappings.csv` file to identify and change node identifiers in external applications.

8 Support Tools

A group of support tools and utilities is included with the installation package in the `Support` folder. For additional information on some common problems read the Troubleshooting section.

Note
The `Support` folder is in the hierarchy created when you unzipped the `Install_1.7.X.X.zip` file. See: Installation Procedures

Each of these applications is dedicated to a specific purpose:

- The Pre-Installation Checklist tool checks for common problems which can disrupt or halt the installation process. See: Pre-Installation Checklist Tool
- The Installation Analyzer tool produces a general overview of an existing installation which you can send to Customer Support. See: Installation Analyzer Tool
- The PWO Installation Log Checker tool collects common errors from the PlantWeb Optics Service Layer (embedded) installation log files, and saves them into a file. See: PWO Installation Log Checker
- The SQL Checker tool analyzes the SQL Server database to check two things, the version number of the SQL Server, and the presence of all the tables that AMS Machine Works requires. See: SQL Checker
- The Installation Log File Zip Utility creates a compressed `.zip` file of the installation logs which you can send to Customer Support. See: Installation Log File Zip Utility

8.1 Pre-Installation Checklist Tool

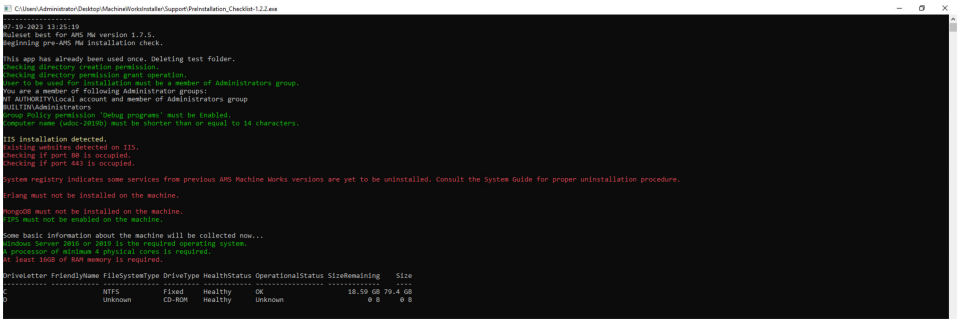
The Pre-Installation Checklist tool checks for common problems which can disrupt or halt the installation process. It is located at `..\Support\Pre-Installation_Checklist_Tool-1.*.*.exe`

Note
The Pre-Installation Checklist tool should be run prior to using the AMS Machine Works installer. The tool should be used on every machine where you plan to use the AMS Machine Works installer.

Procedure

1. Launch the `Pre-Installation_Checklist_Tool-1.*.*.exe` application from the `Support` folder to begin the analysis.

Figure 8-1: Initial Analysis



Note

When performing a migration from AMS Machine Works v1.7.2, the following warnings can be safely disregarded:

- System registry indicates some services from previous AMS Machine Works versions are yet to be uninstalled. Consult the System Guide for proper uninstallation procedure.
- MongoDB must not be installed on the machine.

2. (Optional) Press the 'Y' key to perform an antivirus test, or press the 'N' key to skip this test.

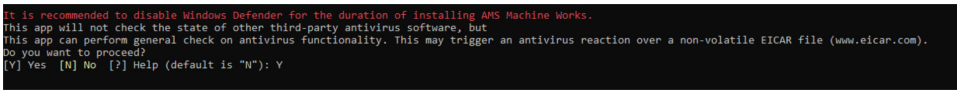
Note

Pressing the '?' key display a short help text.

Note

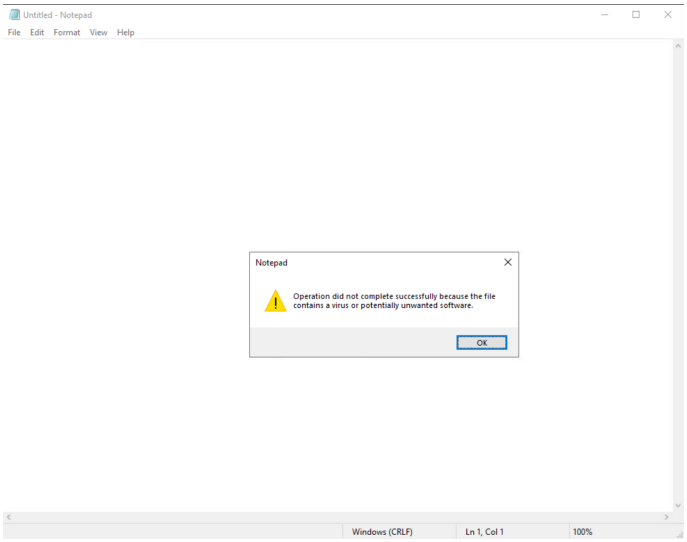
Antivirus software should be disabled while running the AMS Machine Works Installer.

Figure 8-2: Perform Antivirus Test



a) Every antivirus system reacts differently. The example below shows the response of Windows Defender.

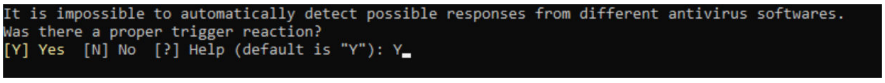
Figure 8-3: Evaluation of Antivirus Test Results: One



Note
The test involves creating a non-volatile file in the your default application for `.txt` files, which may trigger an antivirus reaction. (See: www.eicar.com) Antivirus reactions are different for each antivirus software, the response pictured is for Notepad and Windows Defender.

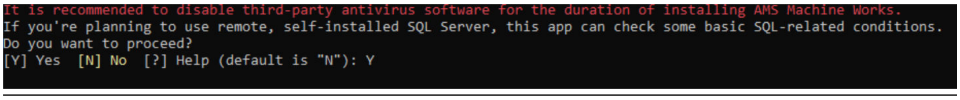
b) If the test did not trigger an antivirus reaction, click **N** to proceed. Click **Y** to indicate that an antivirus response occurred, and you will proceed and also receive a warning to turn off your antivirus software during the installation process.

Figure 8-4: Evaluation of Antivirus Test Results: Two



3. (Optional) Press the 'Y' key to perform a test of the version number and DTC configuration of a remote SQL Server, or press 'N' to skip this test.

Figure 8-5: External SQL Tests

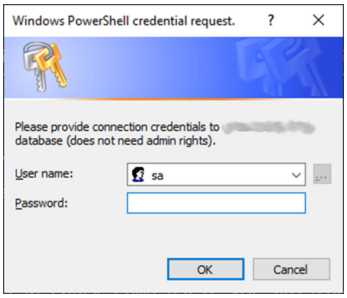


a) Enter the name of a SQL Server where you have previously created a database named **EMERSONMW**, and then press **Enter**.

Figure 8-6: Enter Server Name

b) The following dialog will appear and you should enter your **User name** and **Password**. Click **OK** to proceed.

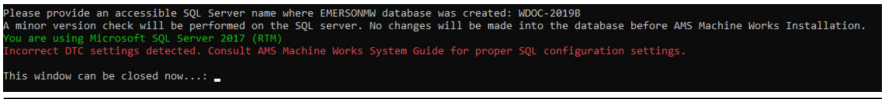
Figure 8-7: Windows PowerShell credential request



c) If the connection is successful you will receive messages about the version number and DTC configuration.

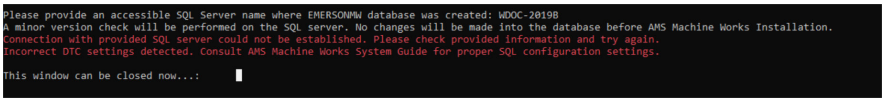
Note
DTC settings are checked on the machine you are running the tool on, so this test is performed even in the case of an unsuccessful connection.

Figure 8-8: Successful External SQL Server Connection



If the connection is unsuccessful you will receive the following message:

Figure 8-9: Unsuccessful External SQL Server Connection



Note
If your connection was unsuccessful, please check the name of the SQL server, the **User name**, and the **Password** that you used.

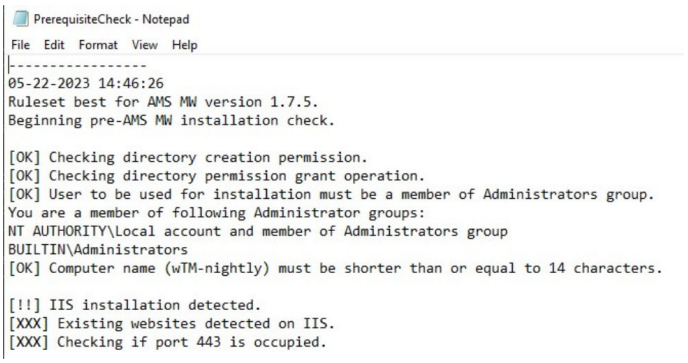
4. Press **Enter** to exit this application.

The application produces an output file: `PrerequisiteCheck.txt`. The outcomes of these checks have lines beginning with **[OK]**, **[!!]**, or **[XXX]**.

- **[OK]** indicates an acceptable outcome.

- **[!!]** indicates a warning about an unusual setting, but installation can proceed.
- **[XXX]** indicates a setting which must be corrected before proceeding with installation.

Figure 8-10: Example Output File



Note
The `Pre-Installation_Checklist_Tool-1.*.*.exe` application is typically located in the `Support` folder, and it will save its output to the same location. If you run the application from another location it will save its output there.

8.2 Installation Analyzer Tool

The Installation Analyzer tool produces a general overview of an existing installation which you can send Customer Support. It is located at `..\Support\Installation_Analyzer-1.*.*.exe`. This overview includes information about:

- installation configuration
- installer logs
- machine specifications
- installed services

This tool can be run on any system where the installer has been run at least once. This tool creates at least two files:

- One `Summary_System.txt` file is produced which contains a list of system specifications, and a list of the version numbers of the Emerson services which are installed.
- For each time the AMS Machine Works Installer was successfully run a `Summary_Archive-x.txt` file is produced.

  Note
  The `'x'` in the `Summary_Archive-x.txt` file name will be replaced with the number of each successful installation run.

  This file includes the following configuration and summary information:
  - Core services configuration
  - Agent configuration

— A list of the services which were installed.

— An overview of the System Architecture.

— A summary of common errors found in certain installer log files.

Procedure

1. Launch the `Installation_Analyzer-1.*.*.exe` application from the `Support` folder to begin the analysis.
2. The program runs for some time and then exits.

A file, named `Summary_System.txt`, and one or more files, named `Summary_Archive-x.txt`, are created.

Note
The `Installation_Analyzer-1.*.*.exe` application is typically located in the `Support` folder, and it will save its output to the same location. If you run the application from another location it will save its output there.

8.3 PWO Installation Log Checker

The PWO Installation Log Checker looks for common errors in the PWO installation log files after an installation error is reported. The application is located at `..\Support\PWO_Install_Log_Checker-1.*.*.exe`. Run this application on machines where Core Web Services and PlantWeb Optics were installed.

This application produces a short overview file which you can send Customer Support. This overview includes information about:

- A summary of common embedded PWO installation error logs.

Procedure

1. Run this application on machines where Core Web Services and PlantWeb Optics were installed.
2. Launch the `PWO_Install_Log_Checker-1.*.*.exe` application from the `Support` folder to begin the analysis.
3. The program runs for some time and then exits.

A file, named `Summary_PWOlogs.txt`, is created.

Note
The `PWO_Install_Log_Checker-1.*.*.exe` application is typically located in the `Support` folder, and it will save its output to the same location. If you run the application from another location it will save its output there.

8.4 SQL Checker

The SQL Checker does an analysis of the SQL database which was created during the installation process. It checks the database version, and for the presence of all the required database tables. The results of this check can indicate certain installation process issues.

The application is located at `..\Support\SQL_Checker-1.3.*.exe`. You can run this application on any machine in the network which can access the SQL Server used by your AMS Machine Works system.

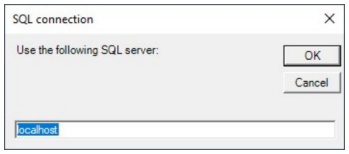
This application produces a file, `Summary_SQL.txt`, which you can send Customer Support. This overview includes information about:

- SQL Version Number
- Required Tables

Procedure

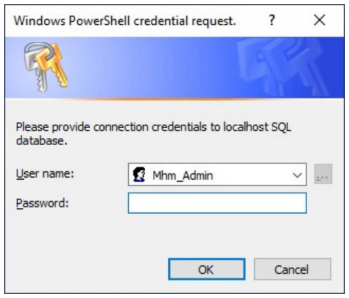
1. Run this application on any machine in the network which can access the SQL Server used by your AMS Machine Works system.
2. Launch the `SQL_Checker-1.3.*.exe` application from the `Support` folder. A main application window and an SQL connection window open.
3. In the SQL connection window, enter the SQL Server you would like to check, then click **OK** to proceed.

Figure 8-11: Enter Server Name



4. Enter your **User name** and **Password** for the server, then click **OK** to continue.

Figure 8-12: Enter your credentials



   a) With a successful connection the application writes a `Summary_SQL.txt` file, and then exits silently.

   b) An unsuccessful connection results in an error message in the main application window, "A connection with SQL server could not be established." Exit the application, and restart it after you recheck the server name, **User name**, and **Password**.

A file, named `Summary_SQL.txt`, is created.

Note
The `SQL_Checker-1.3.*.exe` application is typically located in the `Support` folder, and it will save its output to the same location. If you run the application from another location it will save its output there.

8.5 Installation Log File Zip Utility

The Installation Log File Zip Utility creates a compressed `.zip` file of the installation logs which you can send to Customer Support. The application is located at `..\Support \Zip_Installation_Log_Files-1.*.*.exe`. You can run this application on any machine where the AMS Machine Works Installer was used at least once.

Note
This utility works on all installation types; Core Services, Agent Servers, etc.

This application produces a file, `InstallLogs_*computerName*.zip`, which you can send Customer Support. The part of the file name, `*computerName*`, is the specified by the computer the utility is run on. This file includes information about:

- AMS Machine Works installation logs
- PWO installation logs

Procedure

1. Run the application located at `..\Support \Zip_Installation_Log_Files-1.*.*.exe` on the affected machine.
2. The application will run and then exit silently.

A file, named `InstallLogs_*computerName*.zip`, is created.

Note
The `Zip_Installation_Log_Files-1.*.*.exe` application is typically located in the `Support` folder, and it will save its output to the same location. If you run the application from another location it will save its output there.

8.6 How to send log files to Emerson Support

Customers should take a screenshot of any error messages during installation, and also of any errors while using AMS Machine Works.

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

The Log Export Tool has 2 applications which are located in the installer package at: `..\Support\LogExportTool`

- `MWExportLogs.exe` exports all the log files automatically to the folder from which the application was run.
- `MWChangeLogging.exe` increases logging levels for further troubleshooting automatically.

This logging process will capture the following:

- AMS Machine Works Installation Files (including platform component)
- System Event Logs
- IIS Services Logs applicable to AMS Machine Works

Log Export Tool Use

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

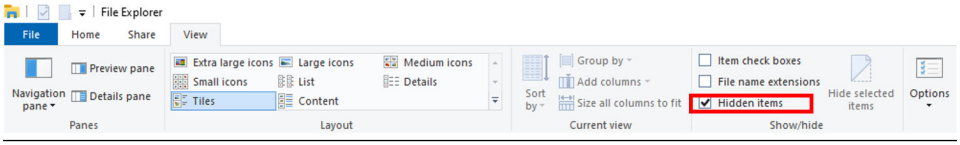
- Run the `MWChangeLogging.exe` application and enter '1' to increase the logging, then allow some system runtime prior to running `MWExportLogs.exe` .
- Afterwards, use the `MWChangeLogging.exe` application again and enter '0' to reset the logging levels to normal.

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

Installer Logs: When the installer fails

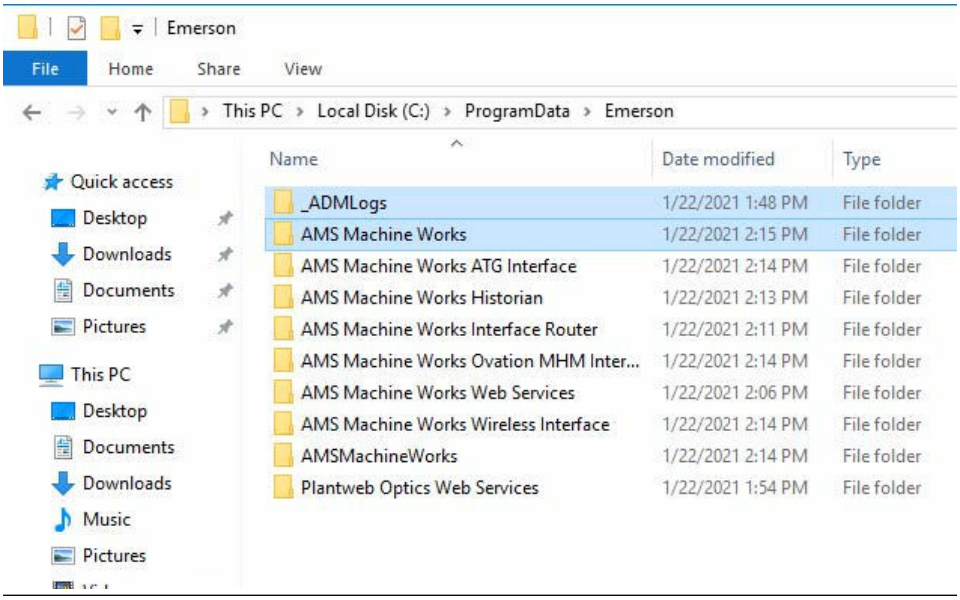
1. Access the AMS Machine Works Server
2. Open File Explorer
3. Select View and check **Show Hidden Items**

Figure 8-13: Show Hidden Items



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

Figure 8-14: Install log files location

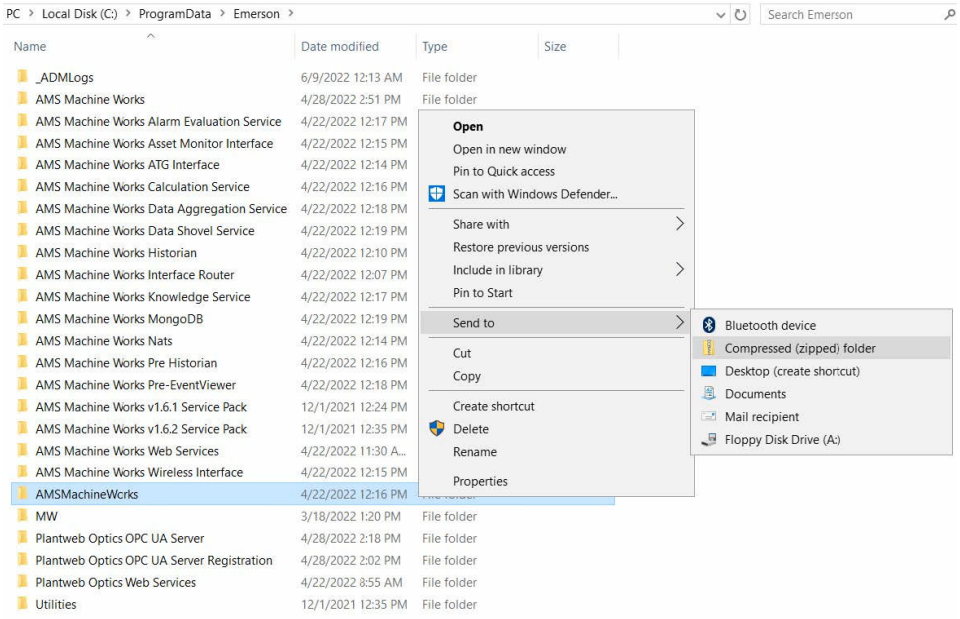


Web Services Logs for Troubleshooting

1. The Agent logs can be found in the Agent Server.
2. Go to the following locations where the Agents for EWG and AMS Asset Monitor are installed.
3. Usually the needed log file is located in `C:\ProgramData\Emerson\AMSMachineWorks` folder

Note
the folder name does not have spaces: `AMSMachineWorks` and is all in one word.

Figure 8-15: Agent Server logs location

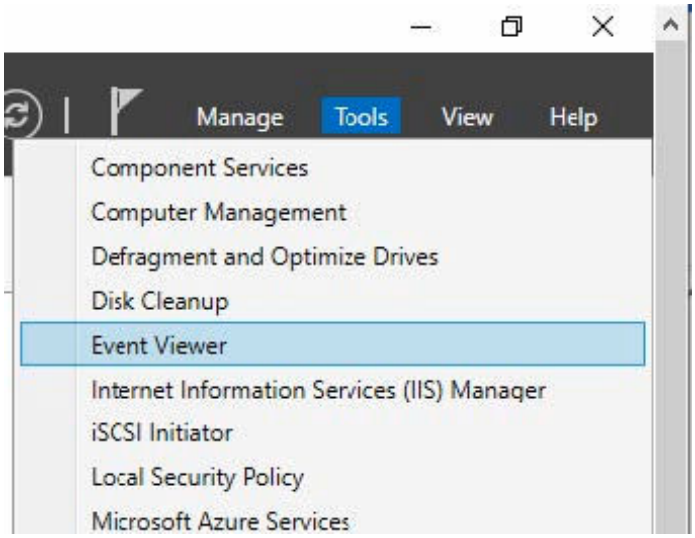


4. Zip the folder

Windows Server Logs

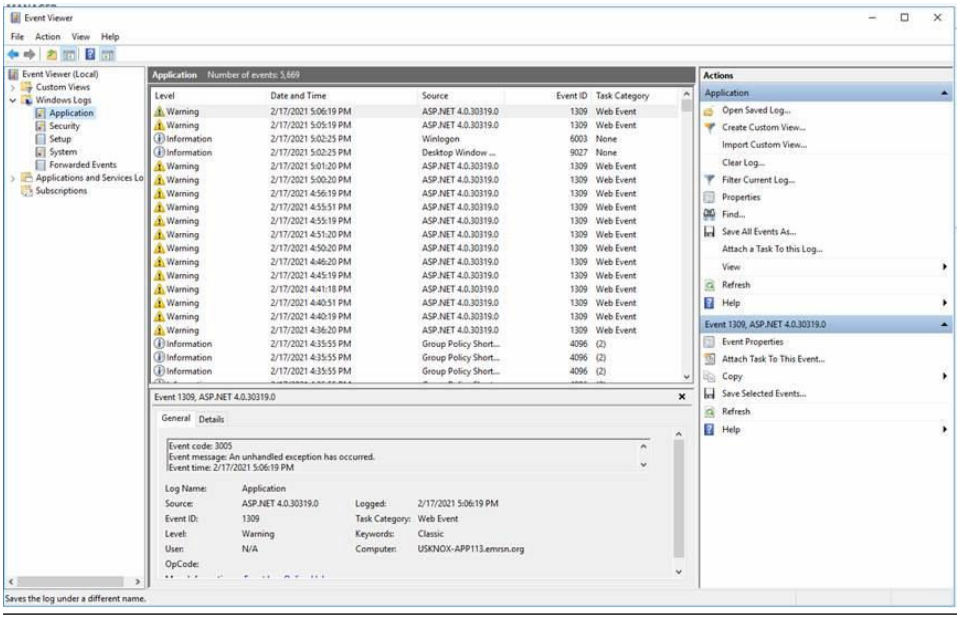
1. Open Server Manager
2. Go to Event Viewer

Figure 8-16: Event Viewer from Server Manager



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

Figure 8-17: Event Viewer



Sending the Install and Troubleshooting Logs to Emerson Product Support

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

Contact Information

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

8.7 Data Retention Policy Tool

The Data Retention Policy Tool is a **command line** tool which is used to set retention limits for data in your AMS Machine Works system. The tool can be run with a combination of options, and can also be set up as a scheduled task. See: Schedule the Data Retention Policy Tool

Tool name: `MW.Utils.RetentionTool.exe`.

Tool location: `C:\ProgramData\Emerson\AMS Machine Works MongoDB \RetentionTool`

Tool options:

- `-s | --scalars` — Set this option to remove scalar data.
- `-b | --block-data` — Set this option to remove block data.
- `-c | --cut-off YYYY-MM-DD` — Measurement data older than this date (YYYY-MM-DD) will be removed.
- `-c | --cut-off D` — Measurement data older than this many days ago (D) will be removed.
- `-f | --force` —Suppress confirmation.
- `-? | -h | -help` — Show the help information.

Usage: `MW.Utils.RetentionTool.exe execute [options]`

Example One: `MW.Utils.RetentionTool.exe execute -s -c 2023-09-03`

Example Two: `MW.Utils.RetentionTool.exe execute -s -c 90`

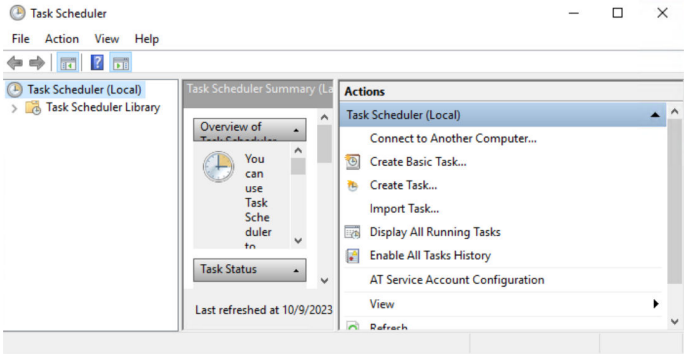
8.7.1 Schedule the Data Retention Policy Tool

When you have determined a data retention policy that you want to automatically implement the operating system's **Task Scheduler** can schedule this.

Procedure

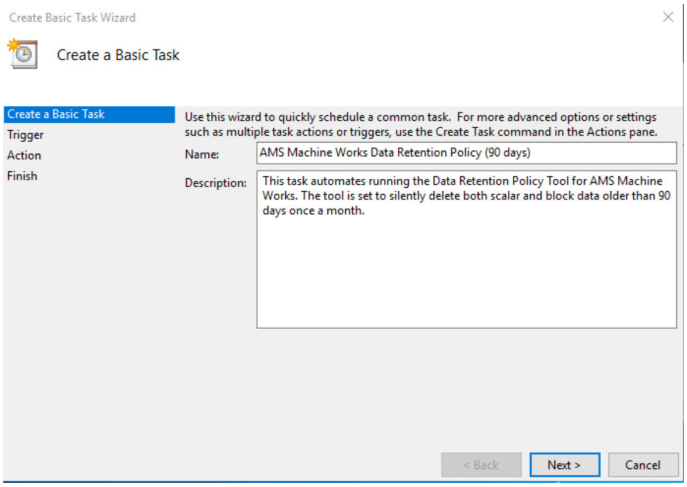
1. Determine which options you want to use with the Data Retention Policy Tool.
2. Launch the operating system's **Task Scheduler**, and click **Create Basic Task...** .

Figure 8-18: Task Scheduler



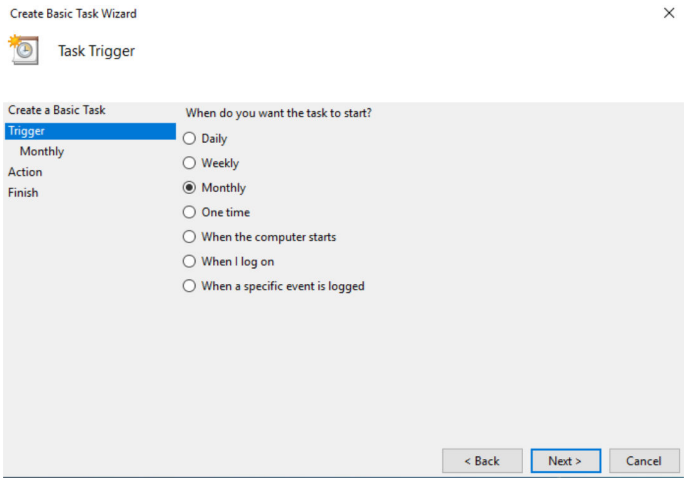
3. Enter a name and description for this task, and then click **Next** to continue.

Figure 8-19: Add a Name and Description



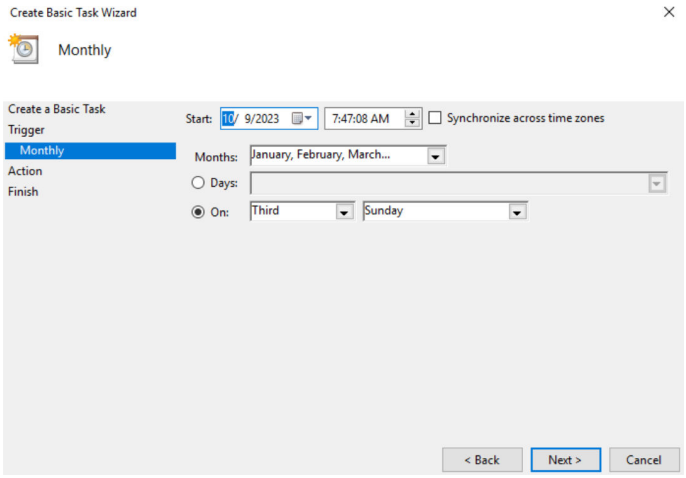
4. Set the period for your task, and then click **Next** to continue.

Figure 8-20: Set Period



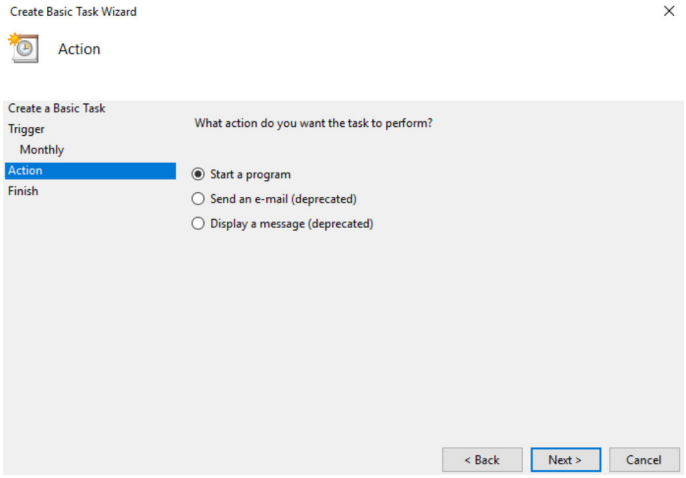
5. Refine the period for the task, and then click **Next** to continue.

Figure 8-21: Refine Period



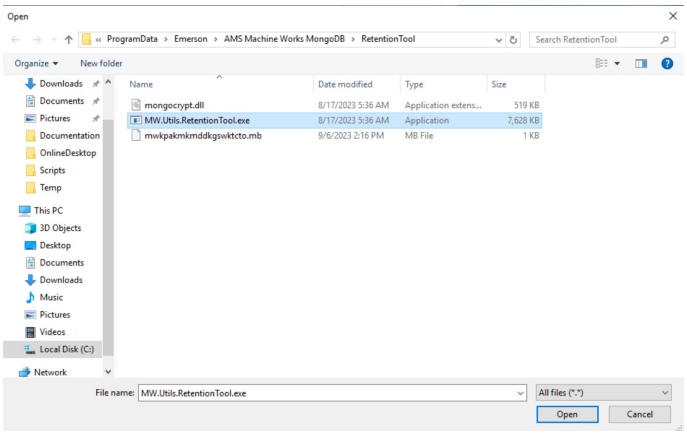
6. Set the type of **Action** to **Start a program**, and then click **Next** to continue.

Figure 8-22: Select Action as "Start a program"



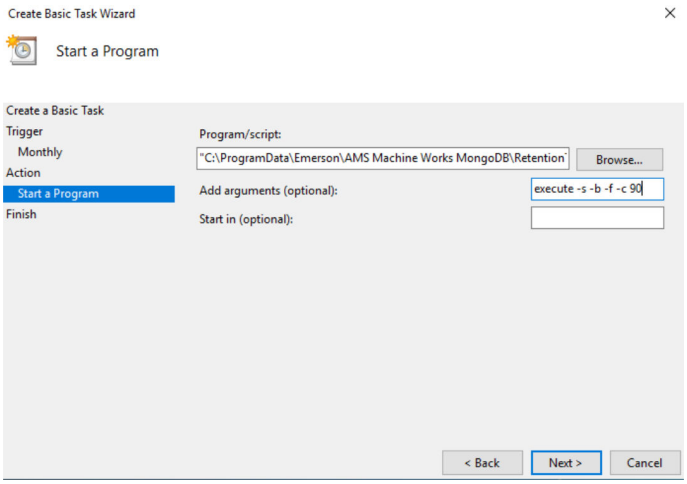
7. Browse to the tool location: `C:\ProgramData\Emerson\AMS Machine Works MongoDB\RetentionTool`, select `MW.Utils.RetentionTool.exe`, and click **Open** to continue.

Figure 8-23: Browse to the `RetentionTool` folder.



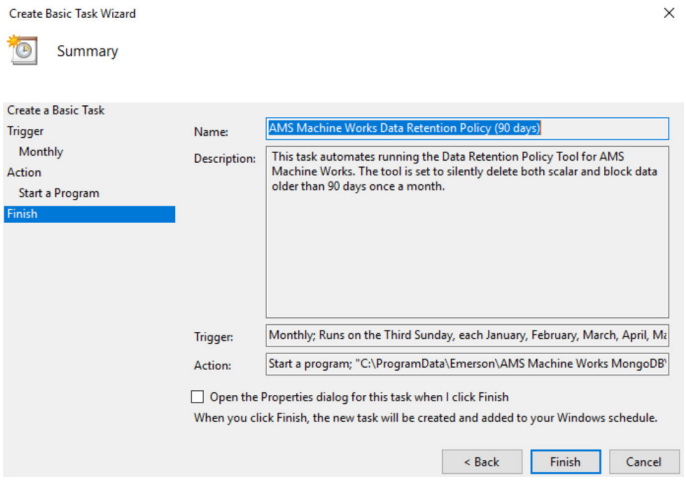
8. Add the command line arguments you need to use for your installation, and then click **Next** to continue.

Figure 8-24: Set Command Line Arguments



9. Review the task summary. If you are satisfied, then click **Finish** to complete the process.

Figure 8-25: Review the Task Summary



9 Databases

AMS Machine Works uses two types of database:

1. SQL — SQL is used to store configuration data for the system.
2. MongoDB — MongoDB is used to store measurement data.

Note
With a distributed AMS Machine Works deployment, you can have the configuration database and the measurement database on separate servers. See: External — Distributed Server Scenarios

SQL Databases

The AMS Machine Works installation process deploys databases into a SQL Server instance named **EMERSONMW**.

Each database consists of files that are created on the drive selected during the installation process. For example, with `D:\` drive, the filepath is: `D:\EMERSONMW\Data`

Table 9-1: SQL Configuration Databases

Module	Database
AMS Machine Works	MhmDb
Embedded Platform Components	EventDb
	FrameworkDb
	ImageDb
	MessageDb
	OnPremMobileServicesDb
	CMMSDb
	OpticsHistorianDb

MongoDB Databases

The AMS Machine Works installation process installs **MongoD** as a service named **MongoDB**.

Each database consists of files that are created on the drive selected during the installation process. For example, with `D:\` drive, the filepath is: `D:\EMERSONMW\Data\Interfaces\AM\MongoDBFiles\`

Table 9-2: MongoDB Measurement Databases

Module	Database
Measurement Databases	EmersonMWcoreData
	EmersonMWCore
	EmersonMWOnline

9.1 Backup and Restore

Every computer which contain an AMS Machine Works database must be regularly backed up. The number of computers which must be backed up depends on your deployment. See: Deployment Scenarios.

The recommended method for backing up AMS Machine Works is a full computer backup.

⚠ CAUTION

To limit the scope of potential data loss, perform your backup procedures as often as possible.

⚠ CAUTION

Backup and restore procedures must be synchronized on every affected computer to minimize the likelihood and scope of data loss.

10 OPC UA Server

AMS Machine Works v1.7.5 includes OPC UA Server functionality running as a service to provide secure communication between devices which support the OPC UA standard. The service automatically launched if you have an active license for it.

Figure 10-1: OPC Service Name

```
Emerson MW Data Integration Module OPC Server
```

Figure 10-2: OPC Service Application

```
C:\Program Files\Emerson\AMS Machine Works\DOPC
\MW.Dim.OpcServer.exe
```

OPC Server functionality is not a standard part of every AMS Machine Works v1.7.5 license. To check if your installation has this functionality enabled go to the **User Manager** module in AMS Machine Works and click the **LICENSES** tab.

You can upgrade your AMS Machine Works license at any time.

If you upgrade your AMS Machine Works license, you need to **Reboot** your server for the functionality to become available.

10.1 Manage Certificates in OPC UA Clients and Servers

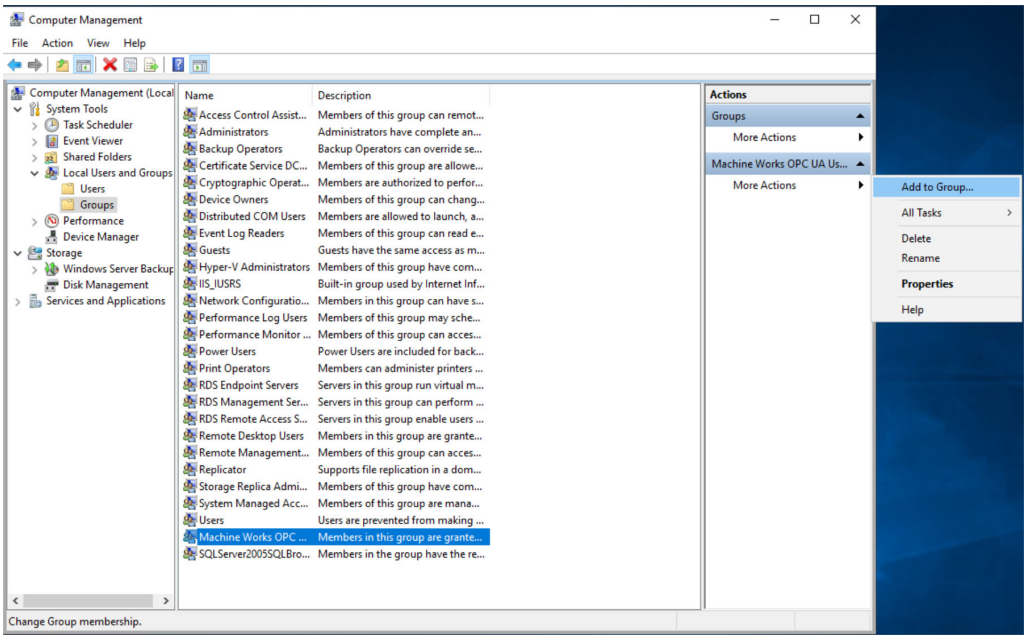
To connect an OPC UA client to the AMS Machine Works OPC UA Server, you need to generate a certificate in your client then add it as a trusted certificate for the server if a user wants to use a certificate for user authentication.

The process has a few general steps:

Procedure

1. Generate a certificate in a compatible OPC client. See: OPC UA Software compatibility
   a) With **UaExpert**, which is used in the Configure an OPC UA Client example below, the file path is: `C:\Users\Administrator\AppData\Roaming\unifiedautomation\uaexpert\PKI\own\certs`
2. (Optional) If you want users to use login and password authentication, then in the operating system's **Computer Management** utility, add a **User** to the **Machine Works OPC UA Users** group.

Figure 10-3: Add a User to the Group



3. Copy the certificate generated in **Step 1** from the folder it was saved to.
    a) Paste the certificate into: `C:\ProgramData\Emerson\AMSMachineWorks\Data\DOPC\pki\server\trusted\certs\`
    b) (Optional) If you want a user to use certificate based authentication, paste the certificate into: `C:\ProgramData\Emerson\AMSMachineWorks\Data\DOPC\pki\user\trusted\certs\`

Postrequisites

For an example installation with details see: Configure an OPC UA Client

10.2 Configure an OPC UA Client

This example shows how to connect a particular OPC UA client, **UaExpert**, to the AMS Machine Works v1.7.5 OPC UA Server,

```
Emerson MW Data Integration Module OPC Server
```

Other clients are also compatible. See: OPC UA Software compatibility

Prerequisites

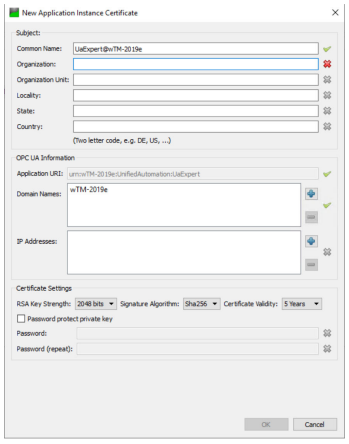
- Click the **LICENSES** tab in the **User Manager** to confirm that the OPC UA Server license is enabled.
- Complete the steps found in: Manage Certificates in OPC UA Clients and Servers

- **Server Information** — From your OPC UA Client, supply the connection information of the OPC UA Server. The URL for the OPC UA Server is **opc.tcp:///[server]:4840**, where [server] is the computer's name, IP address, or localhost of the AMS Machine Works server.
- **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:
  - **Security Policy**
    - Aes256-Sha256-RsaPss
    - Aes128-Sha256-RsaOaep
    - Basic256Sha256
  - **Message Security Mode**
    - Sign
    - Sign and Encrypt
- **Encrypt 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 Machine Works OPC UA Users Windows Group.

Procedure

1. Download, install, and then run **UaExpert** from unified-automation.com. Enter some value into the **Organization** field and then click **OK** to continue.

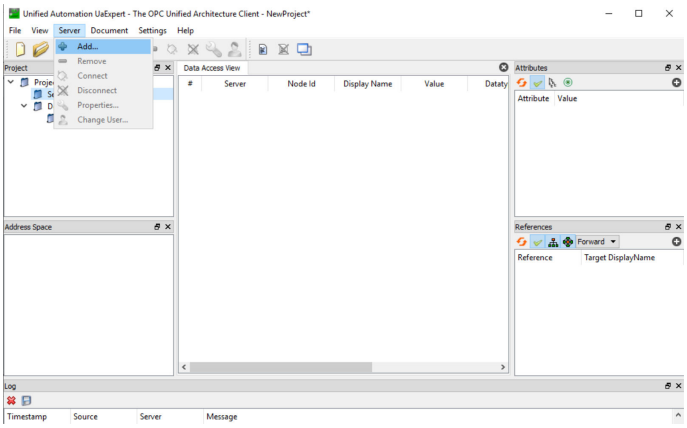
Figure 10-4: Start UaExpert



Note
This is third party software which is shown only for demonstration purposes. Other clients are also compatible. See: OPC UA Software compatibility

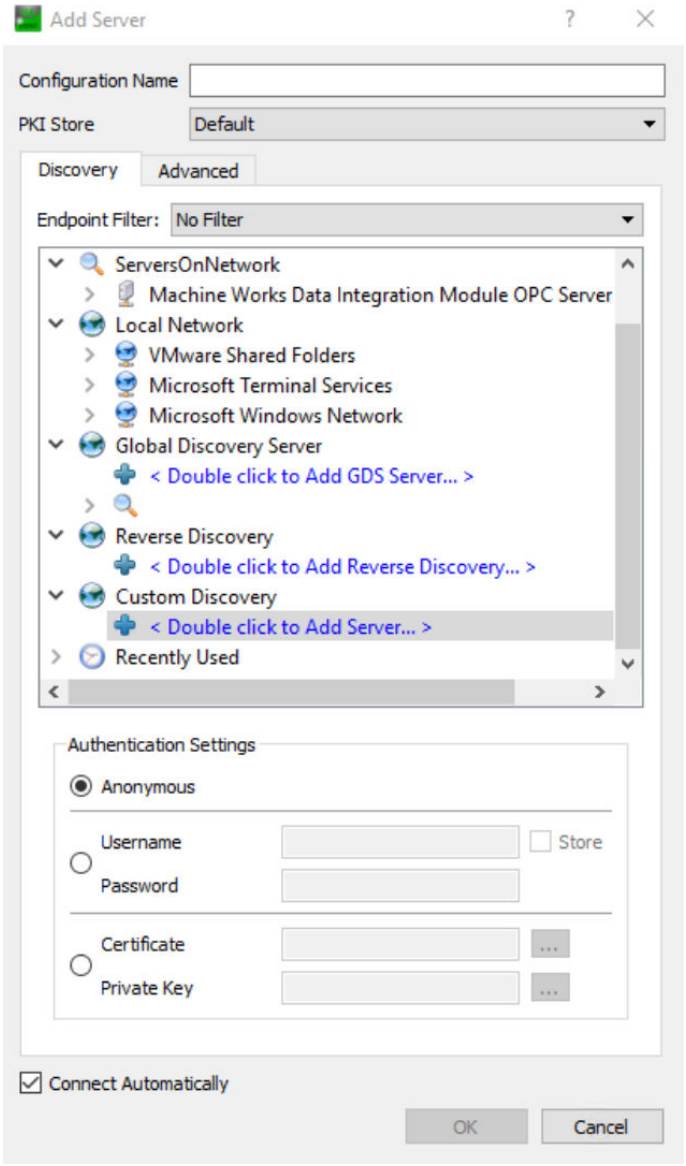
2. Select **Server** → **Add...** to begin configuring the server connection.

Figure 10-5: Add a Server



3. In the **Custom Discovery** section, double click the + symbol to add a server.

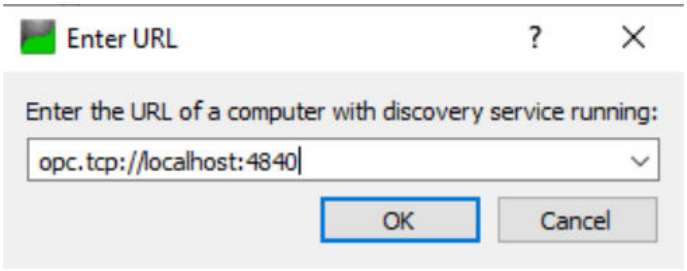
Figure 10-6: Click Custom Discovery



A popup window will open for you to enter the URL for the OPC UA Server.

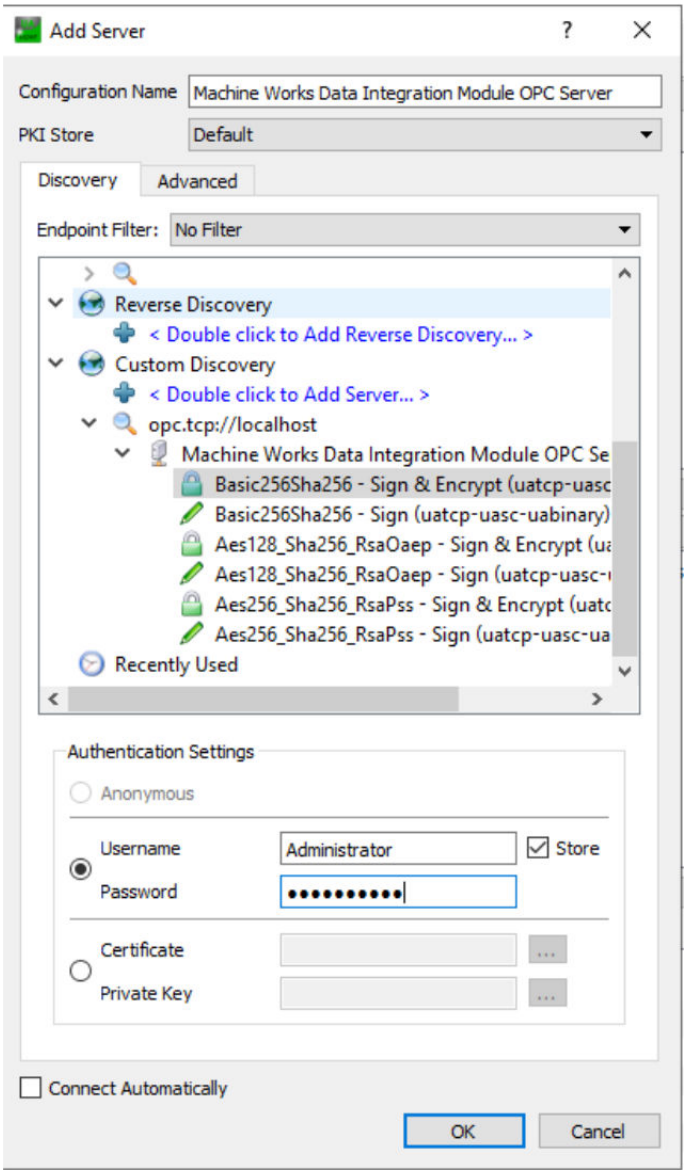
4. Enter the server **name**, **IP**, or **localhost**, followed by **:4840** and then click **OK** to continue.

Figure 10-7: Enter URL



5. Configure the **Security Settings**, **User**, and **Password**.

Figure 10-8: Configure Settings



a) Select your **Security Policy** and **Message Security Mode**.

b) Enter the **User** name, select **Store**, and enter the **Password**.

Note
This is the **User** that you added in the Manage Certificates in OPC UA Clients and Servers steps.

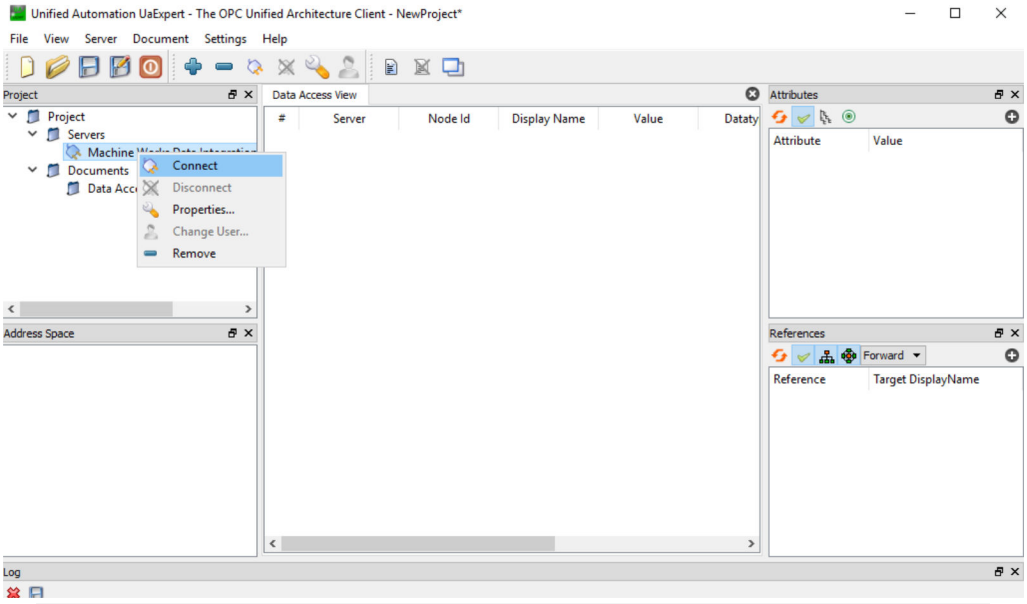
c) (Optional) Click **Connect Automatically** so that this server is always connected.

d) Click **OK** to save your changes and continue.

You are now ready to connect to the server and acquire the hierarchy.

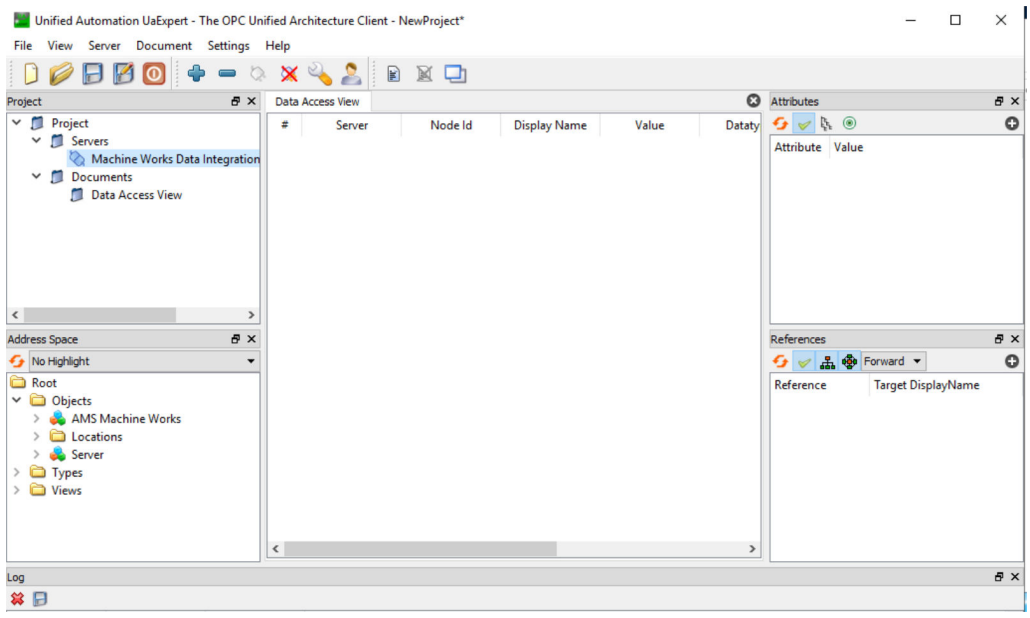
6. Right click on the server you have configured and select **Connect**.

Figure 10-9: Connect to Server



The client is now fully configured and you can interact with the AMS Machine Works hierarchy as shown in the bottom left of the window.

Figure 10-10: Configured Client with Hierarchy



10.3 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 AMS Machine Works is available through OPC.

Hierarchy and node names, which reflect the hierarchy and structure in other parts of the system, are automatically updated.

All nodes are identified by a UUID, or by an opaque byte string. IDs are unambiguous and immutable, even if a node is renamed or relocated within the hierarchy.

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

Table 10-1: Example Nodes in the OPC Hierarchy

OPC Browse Path	Node Description
`AMS Machine Works`	The root node of the AMS Machine Works system.
`AMS Machine Works\Network Devices`	The **Network Devices** node contains sub-nodes for each type of **Device** or **Gateway**.
`AMS Machine Works\Network Devices\Asset Monitors`	The **Asset Monitors** node contains sub-nodes for all the **Asset Monitors** defined in the system.
`AMS Machine Works\Network Devices\Wireless Gateways`	The **Wireless Gateways** node contains sub-nodes for all the **Wireless Gateways** defined in the system..
`AMS Machine Works\Network Devices\Asset Monitors\ [Device]`	The name and device structure of a particular **Asset Monitor**, which was set in the **Network Device Module**.
`AMS Machine Works\Network Devices\Wireless Gateways\ [Gateway]`	The name of a particular **Wireless Gateway**, which was set in the **Network Device Module**.
`AMS Machine Works\Network Devices\Wireless Gateways\ [Gateway]\[Wireless Device]`	The name of a particular **Wireless Device**, which was set in the **Network Device Module**.
`AMS Machine Works\Network Devices\Asset Monitors\ [Device]\Health`	The **Health** information about this **Device**.
`AMS Machine Works\Network Devices\Asset Monitors\ [Device]\[Measurement Source] \Health`	The **Health** information about this **Measurement Source**.

Table 10-1: Example Nodes in the OPC Hierarchy *(continued)*

OPC Browse Path	Node Description
`AMS Machine Works\Network Devices\Asset Monitors\ [Device]\[Measurement Source]\ [Measurement]`	A **Measurement** value from a specific **Measurement Source** in a specific **Device**.
`AMS Machine Works\Network Devices\Asset Monitors\ [Device]\Temperature`	The internal temperature of a **Device**.
`AMS Machine Works\[Site]`	This node contains the root of your **Location** hierarchy. The **Site** name is set in the **Asset Explorer** module, and has an initial value of, 'Default Site'.
`AMS Machine Works\[Site]\ [Location]`	This node contains the name of a **Location** as defined in the **Asset Explorer**. A **Location** can contain multiple **Location** nodes, as well as multiple **Machine Train** nodes.
`AMS Machine Works\[Site]\ [Location]\[Machine Train]`	This node contains the name and structure of a **Machine Train** as defined in the **Asset Explorer**.
`AMS Machine Works\[Site]\ [Location]\[Machine Train] \Health`	The overall **Health** data for a specific **Machine Train** in a specific **Location**.
`AMS Machine Works\[Site]\ [Location]\[Machine Train]\ [Asset]`	An **Asset** name as defined in the **Machine Configuration Process**, for example the name of a motor, gearbox, or pump.
`AMS Machine Works\[Site]\ [Location]\[Machine Train]\ [Asset]\Health`	The **Health** information of a specific **Asset**.
`AMS Machine Works\[Site]\ [Location]\[Machine Train]\ [Asset]\[Measurement Location]`	A specific **Measurement Location** name such as **Inboard**, **Outboard**, or a **Custom Location**.
`AMS Machine Works\[Site]\ [Location]\[Machine Train]\ [Asset]\[Measurement Location] \[Measurement]`	A **Measurement** from a specific **Measurement Location**.

11 Troubleshooting

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

11.1 Installation troubleshooting

Table 11-1: 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.	1. Launch IIS Manager. 2. On the Connections pane, expand **PC name** → **Sites**. 3. Click **Default Web Site**. 4. On the Actions pane, click **Bindings**. 5. On the Site Bindings page, select port 80 or port 443 and click **Edit**. 6. On the Edit Site Binding page, enter another port number, and click **OK**.
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 `C:\ProgramData\Emerson\AMS Machine Works\`.
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.
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 **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.

Table 11-1: Installation troubleshooting *(continued)*

Error	Background	Solution
No error given	Windows Update service is not running.	Ensure the Windows Update service is running. **Note** 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 **setup.exe** and **setup.msi** included, always run **setup.exe** rather than setup.msi to install and its components. Running setup.exe checks that the system has necessary prerequisite software, for proper installation to continue.
No error given	The installation is being performed on a computer where the system is already installed or has been uninstalled.	Software installation will fail if there are database files from a previous installation in the EmersonMW\Data folder. You need to remove the database files from a previous installation. See Knowledge Base Article NK-1600-0344 for a complete list of database files to be removed.
Error when installing SQL Server 2017	**Note** 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. 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.	1. Launch Control Panel. 2. Go to **Administrative Tools** → **Local Security Policy**. 3. Navigate to **Local Policies** → **User Rights Assignment**. 4. Double-click the **Back up files and directories** policy. 5. Check to see if the user account running the SQL Server setup is listed. If it is not, click **Add User or Group** to add it, and click **OK** to close the dialogs. 6. Double-click the **Debug programs** policy. 7. Check to see if the user account running the SQL Server setup is listed. If it is not, click **Add User or Group** to add it, and click **OK** to close the dialogs. 8. Double-click the **Manage auditing and security log** policy. 9. Check to see if the user account running the SQL Server setup is listed. If it is not, click **Add User or Group** to add it, and click **OK** to close the dialogs.
Error that ribbon bar is not updated after an interface registration install has been processed successfully.	This results from the software's cache not being updated.	Reboot the server to correct the problem.

Table 11-1: Installation troubleshooting *(continued)*

Error	Background	Solution
Error when installing AMS Machine Works Web Services	Prior to installing AMS Machine Works Web Services, FileStream must be enabled.	See External Agents, MongoDB, and SQL Installation for instructions.

11.2 OPC UA Server Troubleshooting

Table 11-2: OPC UA Server Troubleshooting

Error	Background	Solution
The data and hierarchy are out of sync between the OPC UA client and the **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 the data in the OPC UA client is still not in sync with the data in the software, do the following: 1. On the AMS Machine Works server, in Windows Services, locate the `Emerson MW Data Integration Module OPC Server` service. 2. Stop and then restart the service.

11.3 SSL and certificates troubleshooting

Table 11-3: SSL and certificates

Error	Background	Solution
Cannot add an Emerson Wireless Gateway, or another 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.

11.4 Vibration Analyzer troubleshooting

Table 11-4: 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. 1. In Windows, open **Control Panel**. 2. Click **Programs** → **Programs and Features** → **View installed updates**. 3. Select **KB3098779** and click **Uninstall**. 4. Click **Yes**.

11.5 How to use the installation log files

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

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

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

More details about logs:

`C:\ProgramData\Emerson\AMS Machine Works\Archive-x\Logs\`

Note
The installation log files have an 'x' in the `Archive-x` part of the file path. The 'x' is a integer starting at 1, and it is incremented for each installation attempt, or service pack installation attempt, which is performed on that machine. `Archive-1` is for the first installation attempt, and the folder with the highest value for 'x' is the most recent.

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

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

The `MsiSilent` folder contains files such as `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 are named by component such as, CoreWebServices.

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

Look for messages like this at the end of the log file :
4-24-2020 09:44:58;Executing [C:\TEMP\dev_Installer_dev1.6.0.32\dep_Support \SetupHelper\SetupHelper.exe]: "CreateCertificate" -Name "AMSMW16"
4-24-2020 09:44:58;Executed (0) [C:\TEMP\dev_Installer_dev1.6.0.32\dep_Support \SetupHelper\SetupHelper.exe]: "CreateCertificate" -Name "AMSMW16"

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

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

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

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

A Internet Information Services (IIS) reference

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

Table A-1: AMS Machine Works IIS Modules

Application Pool	Site
AMS_MW_Apps	/AMSMW
AMS_MW_Apps	/MachineJournal
AMS_MW_Apps	/MwDataMaintenance
AMS_MW_Apps	/MWUI
AMS_MW_Apps	/VibApp
AMS_MW_Svcs	/CaseHistory
AMS_MW_Svcs	/DataProvider
AMS_MW_Svcs	/HostServices
AMS_MW_Svcs	/MWASI
AMS_MW_Svcs	/MWLicense
AMS_MW_Svcs	/SystemStatus
AMS_MW_Svcs	/VibAnalysis
AMS_MW_API	/API
AMS_MW_HistorianNext	/HistorianNext
AMS_MW_NetworkDevice	/network-device
AMS_MW_OMG	/OMG
AMS_MW_Status	/Status
AMS_MW_StatusEval	/StatusEval
Plantweb_Optics_Apps	/DM
Plantweb_Optics_Apps	/EventViewer
Plantweb_Optics_Apps	/OnPremAssetView
Plantweb_Optics_Apps	/UserManager
Plantweb_Optics_AssetExplorer	/AssetExplorer
Plantweb_Optics_AssetView	/AssetView
Plantweb_Optics_IdSrv	/OnPremMobileServices
Plantweb_Optics_IdSrv	/OpticsIdSrv

Table A-1: AMS Machine Works IIS Modules *(continued)*

Application Pool	Site
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	/MoblieServices
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

B 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 Asset Monitor Agent	Emerson Asset Monitor Agent
AMS Machine Works Wireless Agent	Emerson Wireless Agent
AMS Machine Works Core Abacus Service	Emerson MW Core Abacus Service
AMS Machine Works Core Data Aggregation Service	Emerson MW Core Data Aggregation Service
AMS Machine Works Core Data Provider Service	Emerson MW Core Data Provider Service
AMS Machine Works Core Data Shovel Service	Emerson MW Core Data Shovel Service
AMS Machine Works Core Internal API Gateway	Emerson MW Core Internal API Gateway
AMS Machine Works Core Train Service	Emerson MW Core Train Service
AMS Machine Works Data Integration Module OPC Server	Emerson MW Data Integration Module OPC Server
AMS Machine Works MongoDB	MongoDB Server (MongoDB)
AMS Machine Works Online Device Service	Emerson MW Online Device Service
AMS Machine Works RabbitMQ	RabbitMQ

C Measurement Type Naming Convention Changes

During the development of AMS Machine Works v1.7.5 certain measurement types were renamed so that they followed a standard naming convention. When upgrading from previous versions of AMS Machine Works some measurement types that were used in your workflows might have new names. Use the tables in the following sections to find the new names for these measurements.

C.1 AMS Machine Works v1.7.2 to AMS Machine Works v1.7.5

In AMS Machine Works v1.7.2 the names of measurement types were different from the new standardized names in AMS Machine Works v1.7.5. In some cases measurement names from v1.7.2 are no longer available, and in other cases new measurement names are now available which do not nave a direct match in v1.7.2.

The **Type Key** is a unique identifier for a measurement. Consult the following table for a list of changes.

Table C-1: Changes in Measurement Naming between AMS Machine Works v1.7.2 and v1.7.5

AMS Machine Works v1.7.2 Name	AMS Machine Works v1.7.5 Name	Type Key
N/A	Acceleration Interval Band	acc.ib
Overall Waveform 0-Pk	Overall Acceleration Waveform 0-Pk	acc.maxpeak
Overall Waveform Pk-Pk	Overall Acceleration Waveform Pk-Pk	acc.p2p
Overall Waveform PeakVue	Overall Acceleration Waveform PeakVue	acc.peakvue
N/A	PeakVue Interval Band	acc.peakvue.ib
Overall Waveform RMS	Overall Acceleration Waveform RMS	acc.rms
Overall Waveform 0-Pk	Overall Displacement Waveform 0-Pk	disp.maxpeak
Overall Waveform Pk-Pk	Overall Displacement Waveform Pk-Pk	disp.p2p
Overall Waveform RMS	Overall Displacement Waveform RMS	disp.rms
Intervalband	N/A	ib
Non Synchronous Intervalband	N/A	ib.async

Table C-1: Changes in Measurement Naming between AMS Machine Works v1.7.2 and v1.7.5 *(continued)*

AMS Machine Works v1.7.2 Name	AMS Machine Works v1.7.5 Name	Type Key
Synchronous Intervalband	N/A	ib.sync
N/A	Lubrication Severity PeakVue Plus	pvp.lub
N/A	Bearing/Mechanical Severity PeakVue Plus	pvp.mech
Acceleration Spectrum Max Peak	Acceleration Spectrum 0-Pk	spctr.acc.maxpeak
N/A	Acceleration Diagnostic Thumbnail	spctr.acc.peaklist
Displacement Spectrum Max Peak	Displacement Spectrum 0-Pk	spctr.disp.maxpeak
PeakVue Spectrum Max Peak	PeakVue Spectrum 0-Pk	spctr.peakvue.maxpeak
N/A	PeakVue Diagnostic Thumbnail	spctr.peakvue.peaklist
N/A	PeakVuePlus Diagnostic Thumbnail	spctr.peakvue.prdc
N/A	PeakVue Diagnostic Thumbnail	spctr.peakvue.thmb
Velocity Spectrum Max Peak	Velocity Spectrum 0-Pk	spctr.vel.maxpeak
N/A	Velocity Diagnostic Thumbnail	spctr.vel.peaklist
N/A	Velocity Diagnostic Thumbnail	spctr.vel.thmb
N/A	Velocity Interval Band	vel.ib
N/A	Velocity 2 x Line Frequency	vel.ib.2linefreq
Overall Waveform 0-Pk	Overall Velocity Waveform 0-Pk	vel.maxpeak
N/A	Velocity Nonsynchronous Energy	vel.nsync
Overall Waveform Pk-Pk	Overall Velocity Waveform Pk-Pk	vel.p2p
Overall Waveform RMS	Overall Velocity Waveform RMS	vel.rms
N/A	Velocity Subsynchronous Energy	vel.subharm
N/A	Velocity Synchronous Energy	vel.sync
N/A	Overall Voltage Waveform 0-Pk	voltage.maxpeak
N/A	Overall Voltage Waveform Pk-Pk	voltage.p2p
N/A	Overall Voltage Waveform RMS	voltage.rms
Acceleration Waveform Max Peak	Acceleration Waveform 0-Pk	wf.acc.maxpeak

Table C-1: Changes in Measurement Naming between AMS Machine Works v1.7.2 and v1.7.5 *(continued)*

AMS Machine Works v1.7.2 Name	AMS Machine Works v1.7.5 Name	Type Key
Acceleration Waveform Peak To Peak	Acceleration Waveform Pk-Pk	wf.acc.p2p
Displacement Waveform Max Peak	Displacement Waveform 0-Pk	wf.disp.maxpeak
Displacement Waveform Peak To Peak	Displacement Waveform Pk-Pk	wf.disp.p2p
PeakVue Waveform Max Peak	PeakVue Waveform 0-Pk	wf.peakvue.maxpeak
PeakVue Waveform Peak To Peak	PeakVue Waveform Pk-Pk	wf.peakvue.p2p
Velocity Waveform Max Peak	Velocity Waveform 0-Pk	wf.vel.maxpeak
Velocity Waveform Peak To Peak	Velocity Waveform Pk-Pk	wf.vel.p2p

C.2 AMS Machine Works v1.7.2 OPC UA Naming to AMS Machine Works v1.7.5

In AMS Machine Works v1.7.2 the names of measurement types used in OPC UA were different in some cases from the new standardized names in AMS Machine Works v1.7.5. In certain cases multiple v1.7.2 OPC UA names now refer to a single measurement type.

The **Type Key** is a unique identifier for a measurement. Consult the following table for a list of changes.

Figure C-1: Changes in Measurement Naming between OPC UA Naming in v1.7.2 and AMS Machine Works v1.7.5 Naming

OPC UA Name in v1.7.2	AMS Machine Works v1.7.5 Name	Type Key
PeakVue Parameter	Overall Acceleration Waveform PeakVue	acc.peakvue
Lubrication Severity PeakVuePeakVue Plus	Lubrication Severity PeakVue Plus	pvp.lub
Bearing Severity PeakVue Plus	Bearing/Mechanical Severity PeakVue Plus	pvp.mech
Bearing Severity PeakVuePeakVue Plus	Bearing/Mechanical Severity PeakVue Plus	pvp.mech
Long Waveform Spectrum	Acceleration Spectrum	spctr.acc
Long Waveform Spectrum PeakVue	PeakVue Spectrum	spctr.peakvue

OPC UA Name in v1.7.2	AMS Machine Works v1.7.5 Name	Type Key
Long Waveform Spectrum	Velocity Spectrum	spctr.vel
Speed Rotational	Rotational Speed	speed.rot
Overall Waveform RMS	Overall Velocity Waveform RMS	vel.rms
Bias	Voltage	voltage
Long Waveform	Acceleration Waveform	wf.acc
Long Waveform Crest Factor	Acceleration Waveform Crest Factor	wf.acc.crf
Crest Factor	Acceleration Waveform Crest Factor	wf.acc.crf
Long Waveform Kurtosis	Acceleration Waveform Kurtosis	wf.acc.kur
Kurtosis	Acceleration Waveform Kurtosis	wf.acc.kur
Long Waveform Peak	Acceleration Waveform 0-Pk	wf.acc.maxpeak
Waveform Peak	Acceleration Waveform 0-Pk	wf.acc.maxpeak
Acceleration Waveform Max Pk	Acceleration Waveform 0-Pk	wf.acc.maxpeak
Acceleration Waveform Max Peak	Acceleration Waveform 0-Pk	wf.acc.maxpeak
Long Waveform Negative Max Peak	Acceleration Waveform Max Negative Peak	wf.acc.maxpeak.neg
Waveform Negative Max Peak	Acceleration Waveform Max Negative Peak	wf.acc.maxpeak.neg
Long Waveform Positive Max Peak	Acceleration Waveform Max Positive Peak	wf.acc.maxpeak.pos
Waveform Positive Max Peak	Acceleration Waveform Max Positive Peak	wf.acc.maxpeak.pos
Long Waveform Pk-Pk	Acceleration Waveform Pk-Pk	wf.acc.p2p
Waveform Pk-Pk	Acceleration Waveform Pk-Pk	wf.acc.p2p
Long Waveform PkToPk	Acceleration Waveform Pk-Pk	wf.acc.p2p
Long Waveform RMS Normal	Acceleration Waveform RMS	wf.acc.rms
Waveform RMS Normal	Acceleration Waveform RMS	wf.acc.rms
Overall Broadband RMS	Acceleration Waveform RMS	wf.acc.rms
Long Waveform Skewness	Acceleration Waveform Skewness	wf.acc.skn
Skewness	Acceleration Waveform Skewness	wf.acc.skn
Long Waveform Variance	Acceleration Waveform Variance	wf.acc.var

OPC UA Name in v1.7.2	AMS Machine Works v1.7.5 Name	Type Key
Variance	Acceleration Waveform Variance	wf.acc.var
Long Waveform PeakVue	PeakVue Waveform	wf.peakvue
Long Waveform Peak PeakVue	PeakVue Waveform 0-Pk	wf.peakvue.maxpeak
Long Waveform Pk PkVue	PeakVue Waveform 0-Pk	wf.peakvue.maxpeak
PkVue Waveform Max Pk	PeakVue Waveform 0-Pk	wf.peakvue.maxpeak
PeakVue Waveform Max Peak	PeakVue Waveform 0-Pk	wf.peakvue.maxpeak
Long Waveform Negative Max Peak PeakVue	PeakVue Waveform Max Negative Peak	wf.peakvue.maxpeak.neg
Long Waveform Positive Max Peak PeakVue	PeakVue Waveform Max Positive Peak	wf.peakvue.maxpeak.pos
Long Waveform Pk-Pk PeakVue	PeakVue Waveform Pk-Pk	wf.peakvue.p2p
Long Waveform RMS PeakVue	PeakVue Waveform RMS	wf.peakvue.rms
Long Waveform RMS PkVue	PeakVue Waveform RMS	wf.peakvue.rms
Overall Broadband RMS	Velocity Waveform RMS	wf.vel.rms

D OPC UA Software compatibility

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

Table D-1: Tested OPC UA Software

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

E Device compatibility

AMS Asset Monitor

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

AMS Wireless Vibration Monitor

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

AMS 9420 Wireless Vibration Transmitter

The following versions of the AMS 9420 are supported.

Revision	Latest version	Older versions
HART/Universal	7	7
Field device	4	3
Software	8	4 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 Agent supports the following Emerson Wireless Gateway versions:

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

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

F Co-deployment and Co-existence

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

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

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

AMS Machine Works Application Components	Plantweb Optics	AMS Machinery Manager	AMS Device Manager	DeltaV	Ovation	Plantweb Insight
AMS Machine Works Server	✔ *Will not coexist in the same server*	X	X	X	✔ Approved Architecture only	N/A
AMS Machine Works Emerson Wireless Agent	✔ *Will not coexist in the same server*	X	X	✔ Installed on Application Station	N/A	N/A
AMS Machine Works AMS Asset Monitor Agent	✔ *Will not coexist in the same server*	X	X	X	N/A	N/A

G Supported Data Storage and Update Rates

G.1 AMS Asset Monitor Data Storage and Update Rates

Table G-1: AMS Asset Monitor Data Storage and Update Rates

		Data Storage and Update Rates			
		Fastest[1]	**Slowest**	**Default**	**Recommended**[2]
Data Type	**Scalars**	1 min	1 hour	30 min	15 min
	Waveform / Spectrum	1 hour	1 month	Disabled	1 day

1 *Using the fastest rate should only be used with a single AMS Asset Monitor at a time.*
2 *Data update rates are configured in each AMS Asset Monitor individually.*

G.2 AMS Wireless Vibration Monitor Data Storage and Update Rates

These are the AMS Wireless Vibration Monitor scalability limitations:

- Overall AMS Machine Works System Maximum Device Limit: 5000 devices
- Maximum number of devices supported at the fastest rates: 200 devices

Table G-2: AMS Wireless Vibration Monitor Data Storage and Update Rates

		Data Storage and Update Rates[1]			
		Fastest[2]	**Slowest**	**Default**	**Recommended[1]**
Data Type	**Scalars**[3]	1 min[4]	22 hours	1 hour	1 hour
	Thumbnails	6 hours	31 days	Disabled	6 hours
	Spectra	6 hours	31 days	Disabled	1 day
	Waveforms	1 day	31 days	Disabled	7 days

1 *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.*
2 *Use only with a maximum of 200 devices, and never more than 10 devices from the same gateway.*
3 *With AMS Machine Works v1.7.5, setting an update rate for scalars of over an hour is only possible by using the AMS Device Manager to modify the device directly. (Slowest: 22 hours)*
4 *Not recommended. Depending on your network reliability and speed, there may be some gaps in data collection. Only use this setting temporarily, and only when absolutely required.*

G.3 AMS 9420 Data Storage and Update Rates

These are the AMS 9420 data performance and scalability limitations:

- Overall AMS Machine Works System Maximum Device Limit: 600 devices
- Maximum number of devices supported at the fastest rates: 60 devices

Table G-3: AMS 9420 Data Storage and Update Rates

		Data Storage and Update Rates[1]			
		Fastest[2]	**Slowest**	**Default**	**Recommended[1]**
Data Type	**Burst Variables**	1 min[3]	1 day	1 hour	1 hour
	Scalars[4]	8 hours	31 days	Disabled	Disabled[5]
	Energy Bands	8 hours	31 days	Disabled	8 hours

Table G-3: AMS 9420 Data Storage and Update Rates *(continued)*

		Data Storage and Update Rates[1]			
		Fastest[2]	**Slowest**	**Default**	**Recommended[1]**
	Waveforms & Spectra	1 day	31 days	Disabled	7 days

1 *Applies to all the applicable measurements across all channels per device.*
2 *Use only with a maximum of 60 devices, and never more than 10 devices from the same gateway.*
3 *Not recommended. Depending on your network reliability and speed, there may be some gaps in data collection. Only use this setting temporarily, and only when absolutely required.*
4 *Scalars are published at rate which is stored in the device. This rate can be set by the AMS Machine Works software.*
5 *In most cases Scalar collection contains the same parameters as Burst Variables collection and can be kept disabled. However, some older firmware versions of an AMS 9420 may not publish all scalar parameters. In that case, the remaining parameters can be collected using Scalar collection with an appropriate schedule.*

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