

Harmony Edge Box HMI

Demo Setup Guide – Database



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Preface

(1) About this quick start guide

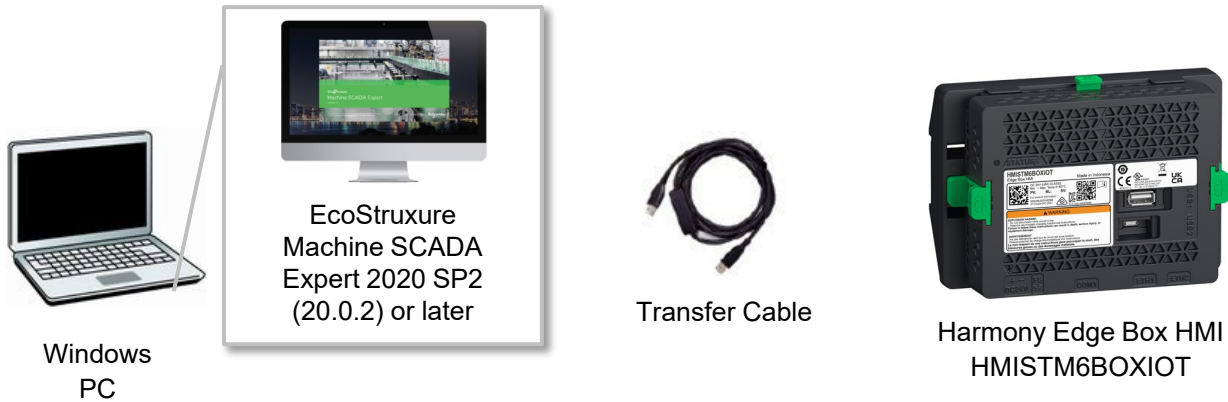
This Edge Box HMI Demo Setup Guide is intended for individuals using the Edge Box HMI and its software for demonstration purposes and not for a production environment. This publication will help you quickly configure hardware, software and cloud services.



Preface

(2) Building a development environment

Prepare the following environment.



(A) EcoStruxure Machine SCADA Expert

EcoStruxure Machine SCADA Expert is a development and runtime software that incorporates all the tools users need to create SCADA HMI applications, dashboards and OEE interfaces.

(B) Transfer Cable

Two ways of transferring project files



USB Cable
(Type A – Micro-B)

Use an optional USB transfer cable or commercial USB cable (Type A to Micro-B) for transfer.



LAN Cable

Use LAN cable (Ethernet cable) for transfer.

(C) Harmony HMISTM6BOXIOT

Please visit <https://www.se.com> for more information on the Harmony Edge Box HMI.



Harmony Edge Box HMI
HMISTM6BOXIOT

Preface

(3) How to get EcoStruxure Machine SCADA Expert

To create HMI Screen for the Edge Box HMI, the version of EcoStruxure Machine SCADA Expert needs to be V2020 SP2 or later.



You can download EcoStruxure Machine SCADA Expert Installer from the following link.

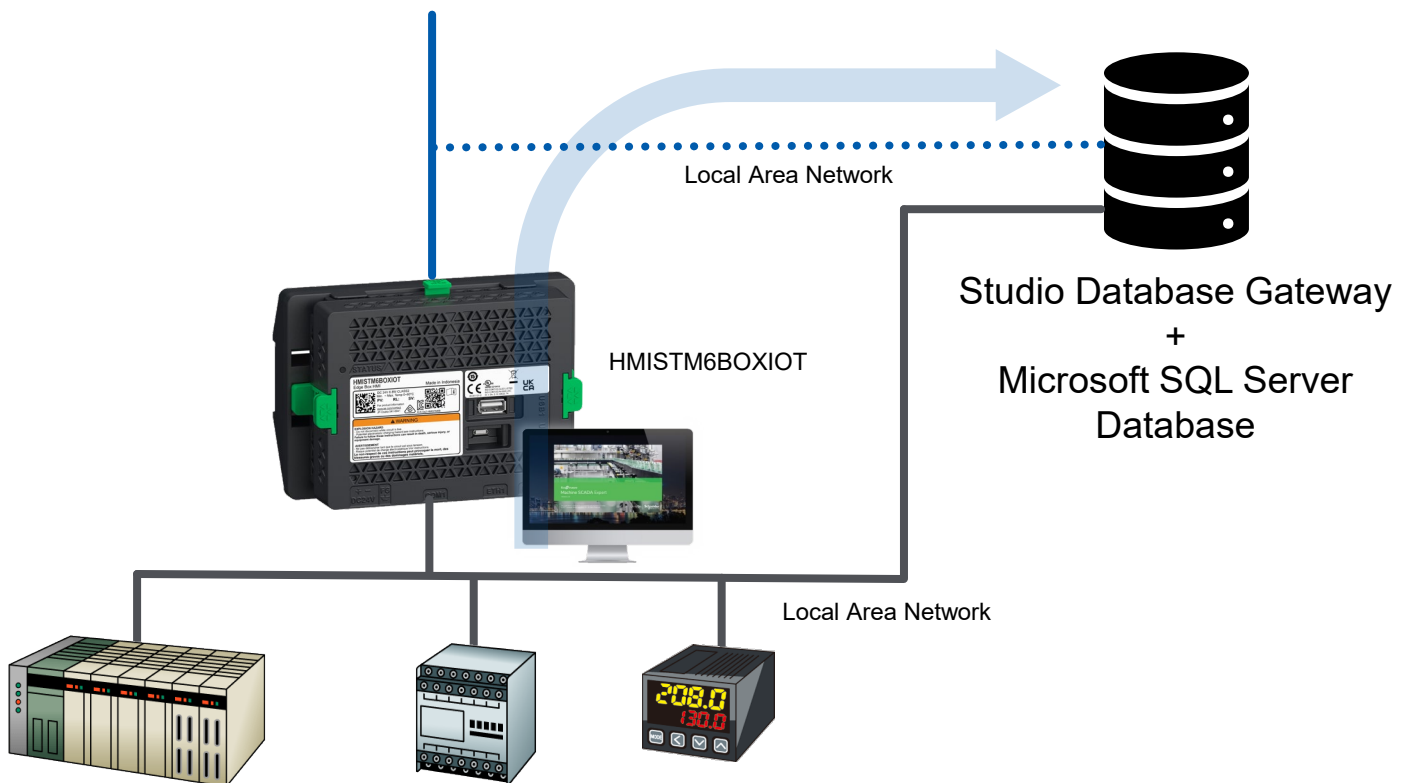
<https://www.se.com/ww/en/product-range/63734-ecostruxure-machine-scada-expert/?preferredCountry=yes#software-and-firmware>

You can use the software without a license in Evaluation Mode for 40 hours. After the evaluation period ends, the program automatically converts into Demo Mode until you apply a valid license. You cannot reactivate the Evaluation Mode even if you reinstall the software on your computer.

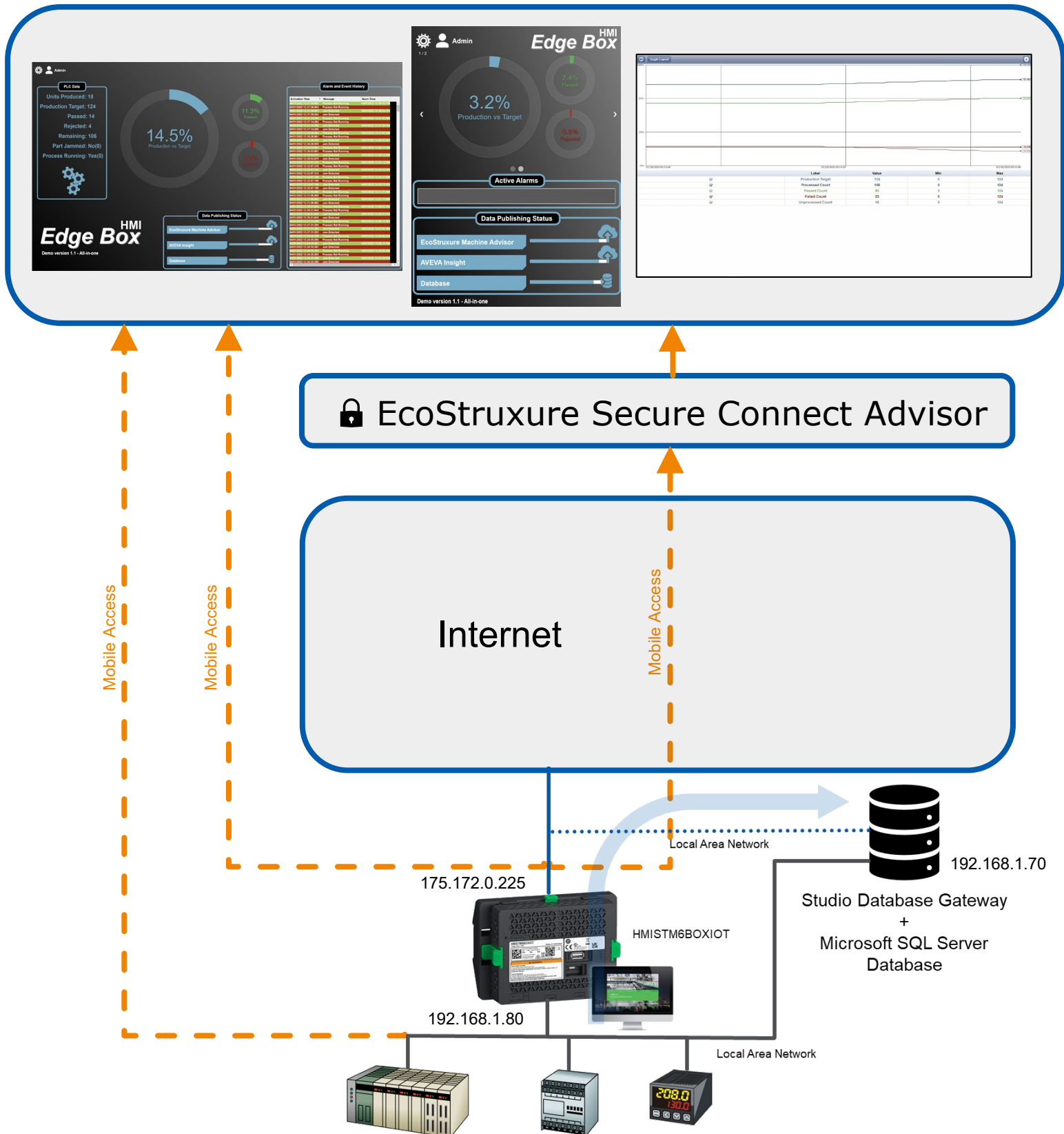
Please access the [FAQ page](#) to check how to activate EcoStruxure Machine SCADA Expert.

2. Harmony Edge Box HMI Demo Overview

The Harmony Edge Box HMI Demo – Database demonstrates pushing data from internal tags to a local database. Microsoft SQL Server is used for the local database. Although a PLC or other device can supply data, for demonstration purposes data is internally generated.



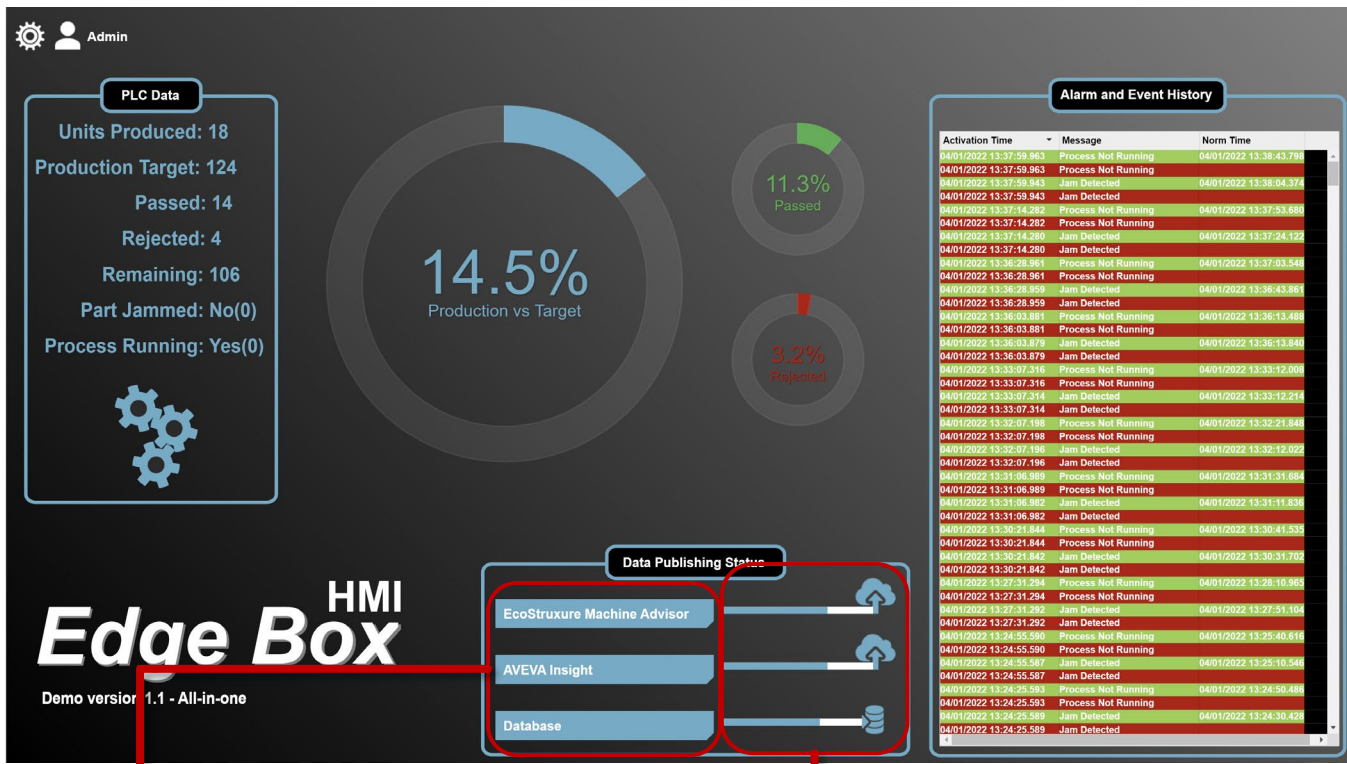
The Harmony Edge Box HMI cannot be used with an integrated display. However, you can view screens and more within a web browser using Mobile Access. Mobile Access can be used via one of the two possible IP addresses of the Edge Box HMI. For secure remote viewing utilise EcoStruxure Secure Connect Advisor + the local IP.



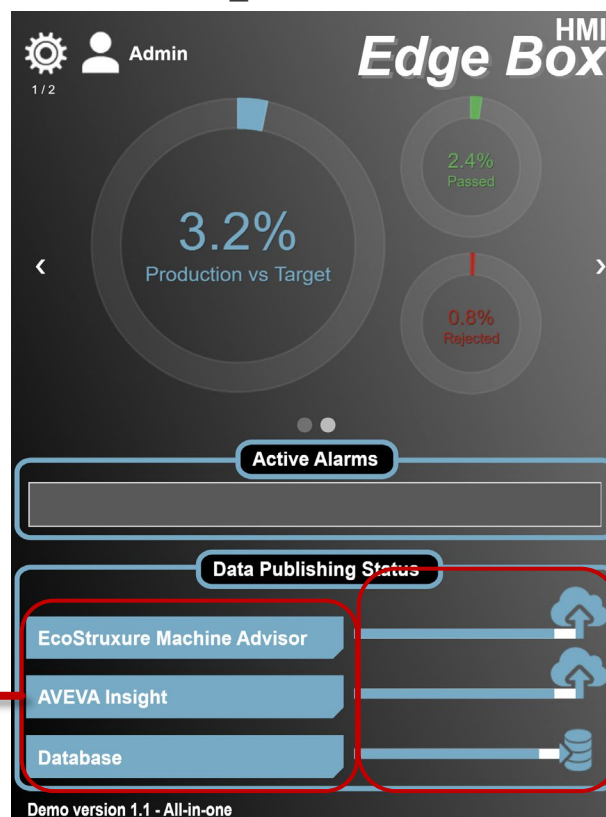
The demonstration project has two user accounts:

- Guest, password = (blank)
- Admin, password = Admin

main_desktop screen

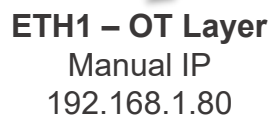


main_mobile screen



Enable / Disable
Communication

Communication Status
and Links to Cloud Websites

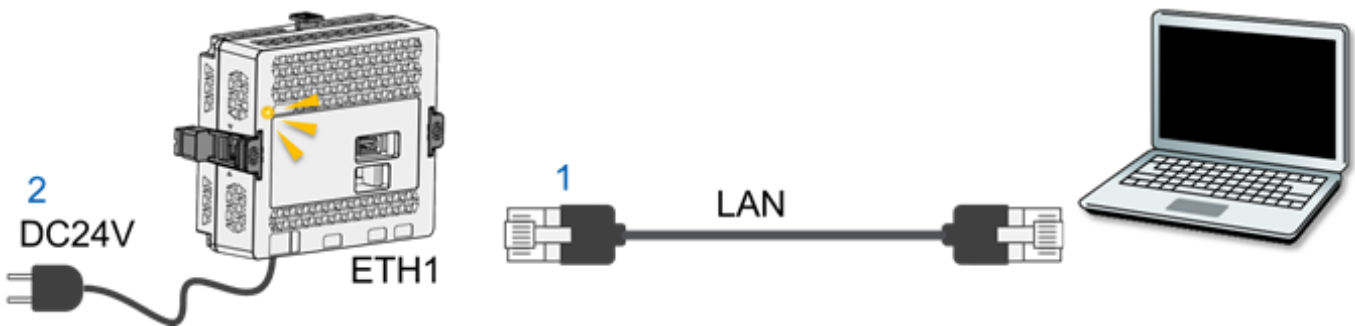


ETH2 – IT Layer
Automatic/DHCP
(e.g. 175.172.0.225)

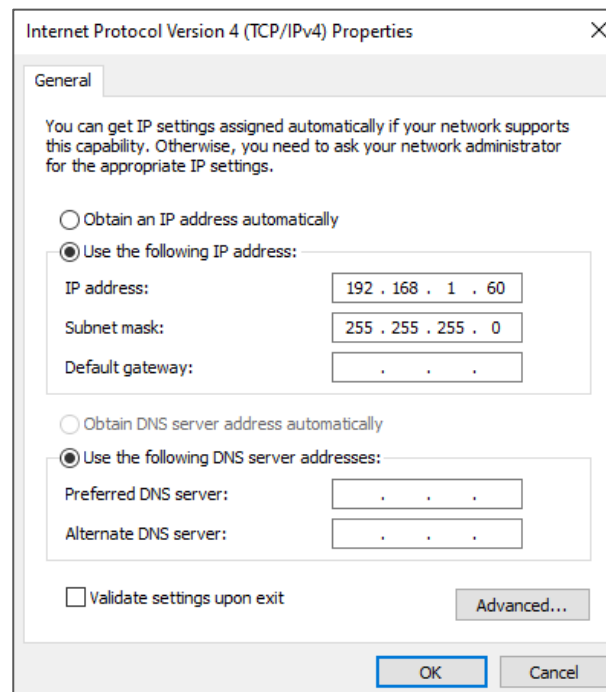
Manual IP, Subnet, Gateway settings that allows access to the Internet
(e.g. IP = 175.172.0.225
Subnet = 255.255.255.0
Gateway = 175.172.0.1)

- ETH1 is primarily for the Operational Technology layer (OT) and is potentially connected to OT devices. For an easy demonstration experience a database service can also be connected to this layer. No internet connectivity on this port.
- ETH2 is primarily for the Internet Technology layer (IT) and is potentially connected to the internet via a router, Local Area Network (LAN) or other edge/IT devices. Connections to cloud services, databases and other services can be done from this port.

1. Connect a USB transfer cable (micro-B) to Edge Box HMI.
or Connect to the same network as PC (development environment) using ETH1 port of Edge Box HMI.
2. Turn on Harmony Edge Box HMI. The status LED flashes orange.



3. Set IP address of your computer as follows:
IP address: 192.168.1.60,
Subnet Mask: 255.255.255.0



4. Open a web browser on your PC, and in the address bar enter the IP address of Edge Box HMI.
 (Ethernet) <https://192.168.1.80>
 (USB) <https://169.254.100.100>

The message “Your connection is not private” is displayed. To continue, click Advanced and then click Proceed to *** (***) is the IP address).

5. Hardware Configuration screen is displayed.
 Set a login password and click [Submit]. e.g. !Se12345, and click [Submit]
 Note: The user name is “Admins” and cannot be changed.

The password must meet the following requirements:

Number of characters	At least 8 single-byte characters, up to 64 characters
Types of characters	Use at least one of each of the following types of characters: <ul style="list-style-type: none"> • Uppercase letter (A-Z) • Lowercase letter (a-z) • Number (0-9) • Symbol (special character): ! # - = _ .

Note: If you forget the password, note that you will not be able to reset it. To restore the product to its original state (at time of purchase), contact customer support. All user data in the product will be lost.

5. Enter the User Name, Admins and the newly created password, e.g. !Se12345. Click [Login]

Login

Login

Hardware Configuration

INFORMATIONETHERNETCOMUSBDOWNLOADSITEMANAGERSECURITYSYSTEM

System Status

Status

Runtime does not exist. Or, Waiting for download. Please download runtime.

System Version

1.0.10

Runtime Version

Project File

Ethernet 1

IP Mode

Manual

IP Address

192.168.1.80255.255.255.0

MACAddress

00:80:F4:A2:23:F1

Ethernet 2

IP Mode

Disabled

IP Address

0.0.0.00.0.0.0

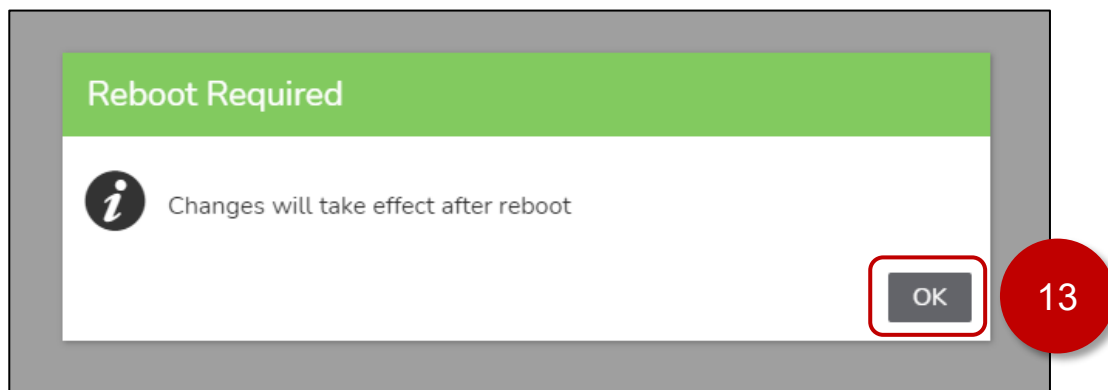
MACAddress

00:80:F4:A2:23:F2

6. Click [DOWNLOAD].

The screenshot shows the 'Hardware Configuration' page with a green header bar containing tabs: INFORMATION, ETHERNET, COM, USB, DOWNLOAD, MANAGER, SECURITY, and SYSTEM. The 'DOWNLOAD' tab is highlighted with a red box and a red circle labeled '10'. Below the tabs, the 'Enable Project File Download' checkbox is checked and highlighted with a red box and a red circle labeled '11'. A warning message below it states: 'If the download is enabled, the risk of unauthorized access and infection of malicious software increases. Disable download after use'. A green 'Submit' button is highlighted with a red box and a red circle labeled '12'.

7. Check [Enable Project File Download]
8. Click [Submit]. Changes will take effect after a reboot.
9. Click [OK] to accept the Reboot required message.



10. Click [SYSTEM]

The screenshot shows the 'Hardware Configuration' page with the 'SYSTEM' tab selected and highlighted with a red box and a red circle labeled '14'. The 'Enable Project File Download' checkbox is checked. The 'Submit' button is visible. The warning message is also present.

11. Set the [Date], [Time], [Time-zone] for your region.

Hardware Configuration

INFORMATION ETHERNET COM USB DOWNLOAD SITEMANAGER SECURITY SYSTEM

Date and Time Firmware Update Factory Reset Backup and Restore Configuration

Date
2022-04-12

Time
05:56:00 PM

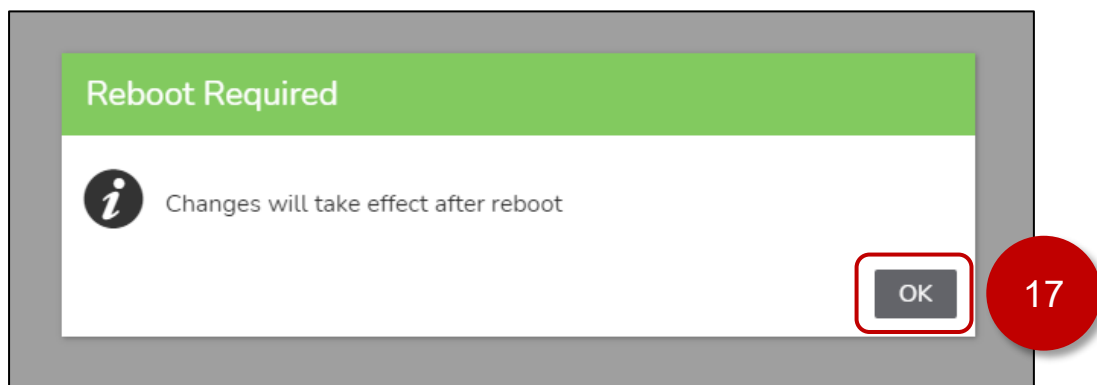
Time-zone
(UTC-04:00) Canada/Eastern

Synchronized with NTP Server ☐

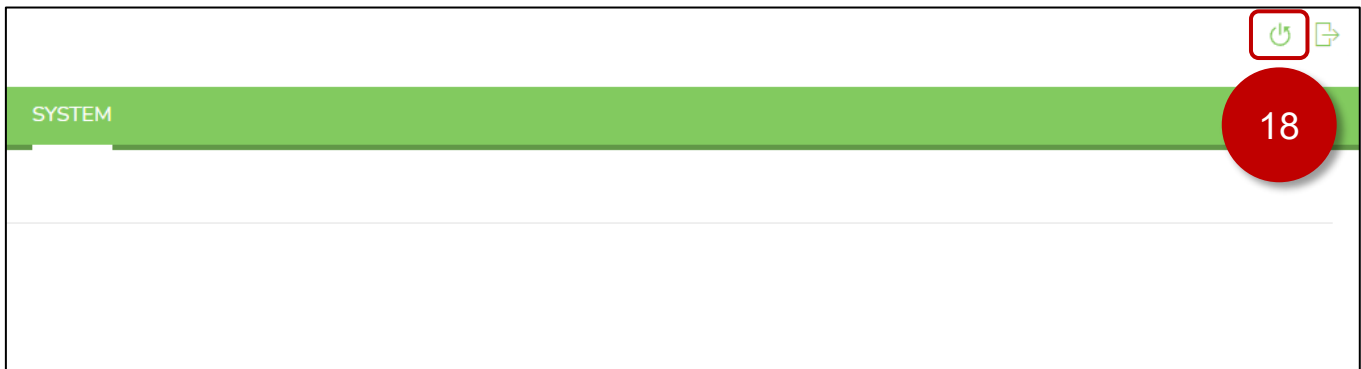
NTP Server

Submit

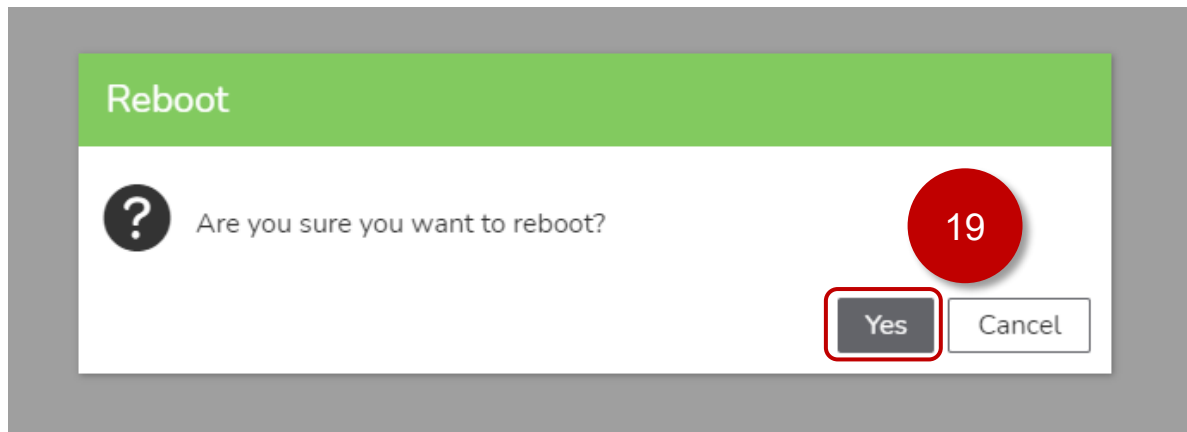
12. Click [Submit], changes will take effect after reboot.
13. Click [OK] to dismiss the Reboot Required dialog.



14. Click the [Reboot] icon  at the top right of the web page.



15. Click [Yes] in the Reboot dialog.



16. After the Edge Box HMI has rebooted. Confirm the [Ethernet 2] Settings, [Enable Project File Download] check box, [Date], [Time], [Time-zone] are as previously selected.

Hardware Configuration

INFORMATION	ETHERNET	COM	USB	DOWNLOAD	SITEMANAGER	SECURITY	SYSTEM
-------------	----------	-----	-----	----------	-------------	----------	--------

System Status

Status Runtime does not exist. Or, Waiting for download. Please download runtime.

System Version 1.0.10

Runtime Version -----

Project File -----

Ethernet 1

IP Mode Manual

IP Address 192.168.1.80 255.255.255.0

MACAddress 00:80:F4:A2:23:F1

Ethernet 2

IP Mode Disabled

IP Address 0.0.0.0 0.0.0.0

MACAddress 00:80:F4:A2:23:F2

16

Hardware Configuration

INFORMATION	ETHERNET	COM	USB	DOWNLOAD	SITEMANAGER	SECURITY	SYSTEM
-------------	----------	-----	-----	----------	-------------	----------	--------

Enable Project File Download ☒

ⓘ If the download is enabled, the risk of unauthorized access and infection of malicious software increases. Disable download after use

Submit

16

Hardware Configuration

INFORMATION	ETHERNET	COM	USB	DOWNLOAD	SITEMANAGER	SECURITY	SYSTEM
-------------	----------	-----	-----	----------	-------------	----------	--------

Date and Time Firmware Update Factory Reset Backup and Restore Configuration

Date

2022-04-12

Time

05:56:00 PM

Time-zone

(UTC-04:00) Canada/Eastern

Synchronized with NTP Server ☐

NTP Server

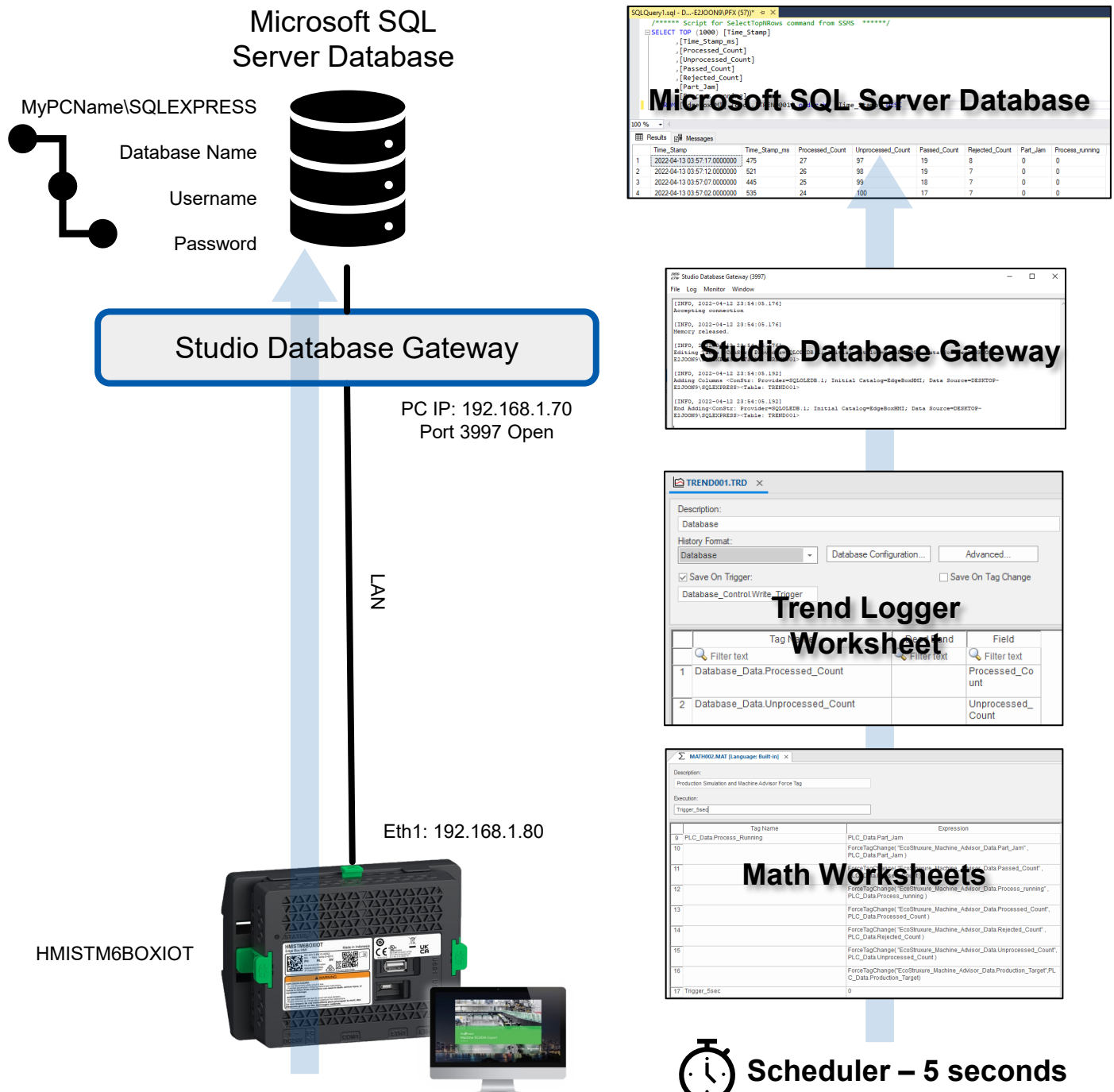
Submit

16

4. Database Configuration

Overview

The Harmony Edge Box HMI Demo – Database uses a Trend Logger worksheet to log data to a Microsoft SQL Server Database. Trend Logger data is logged every 5 seconds. Each time the trend logger sheet is triggered data is sent via the Studio Database Gateway which contains the communication driver for Microsoft SQL Server. The Studio Database Gateway establishes a connection to the database on behalf of the Edge Box HMI and logs the data to a table called TREND001.



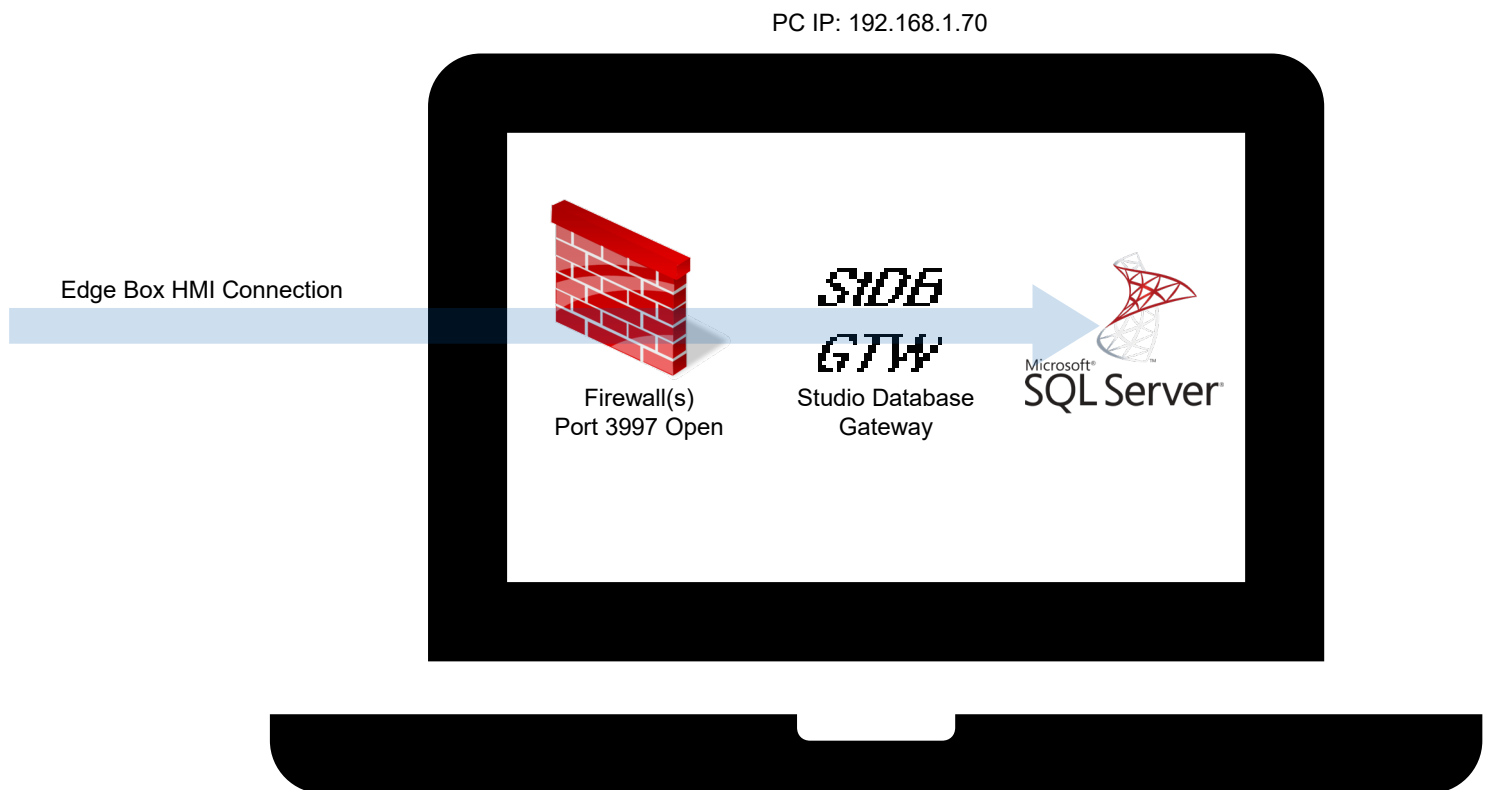
A simple configuration would have both the SQL Server instance and the Studio Database Gateway installed on the same Windows PC. The PC is configured with an IP Address of 192.168.1.70

For example, SQL Server 2019 installed on a Windows 10 PC with the following:

- Path to SQL Server = PCNAME\SQLEXPRESS
- Database name = EdgeBoxHMI
- Mixed mode authentication with a local user account as db_Owner for the EdgeBoxHMI database and login rights
 - Username = EdgeBoxHMI
 - Password = !Se12345

On the same PC as SQL Server the Studio Database gateway is installed and running on port 3997.

PC Firewall(s) open for port 3997 for access to the Studio Database Gateway.



Microsoft SQL Server 2019 Installation and Configuration

(requires internet connection)

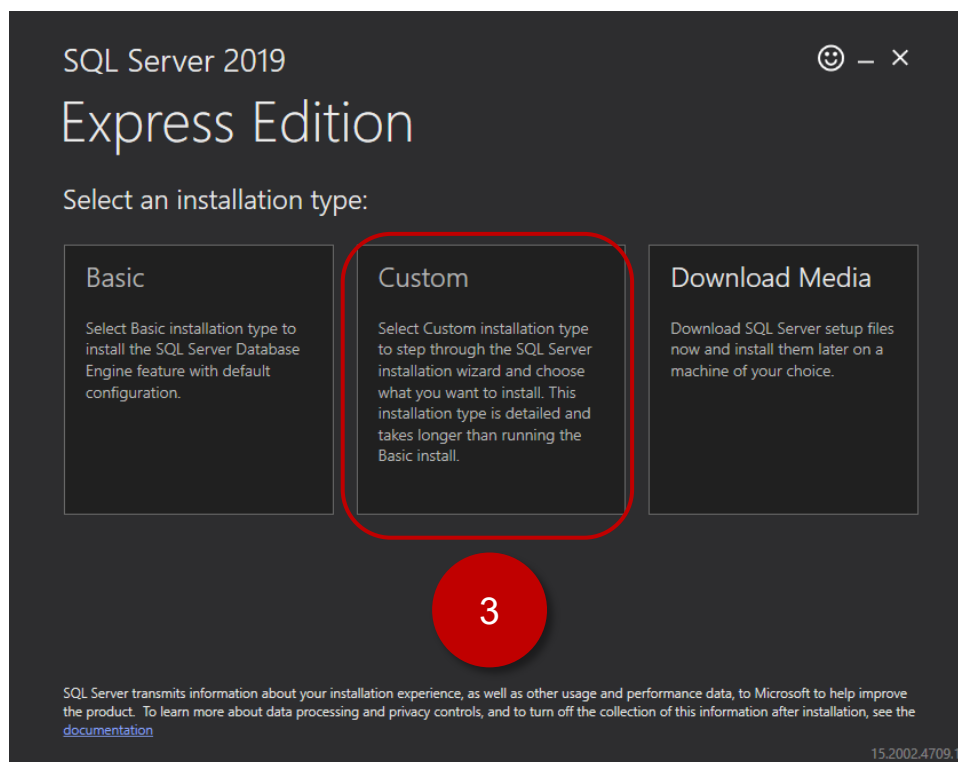
For ease of configuration both Microsoft SQL Server 2019 and Microsoft SQL Management Studio will be required. It is assumed that there is no existing Microsoft SQL Server 2019 instance and no existing Microsoft SQL Management Studio installed on the PC.

1. Download SQL Server 2019 Express installer (SQL2019-SSEI-Expr.exe or similar @ ~6MB) from the following link:

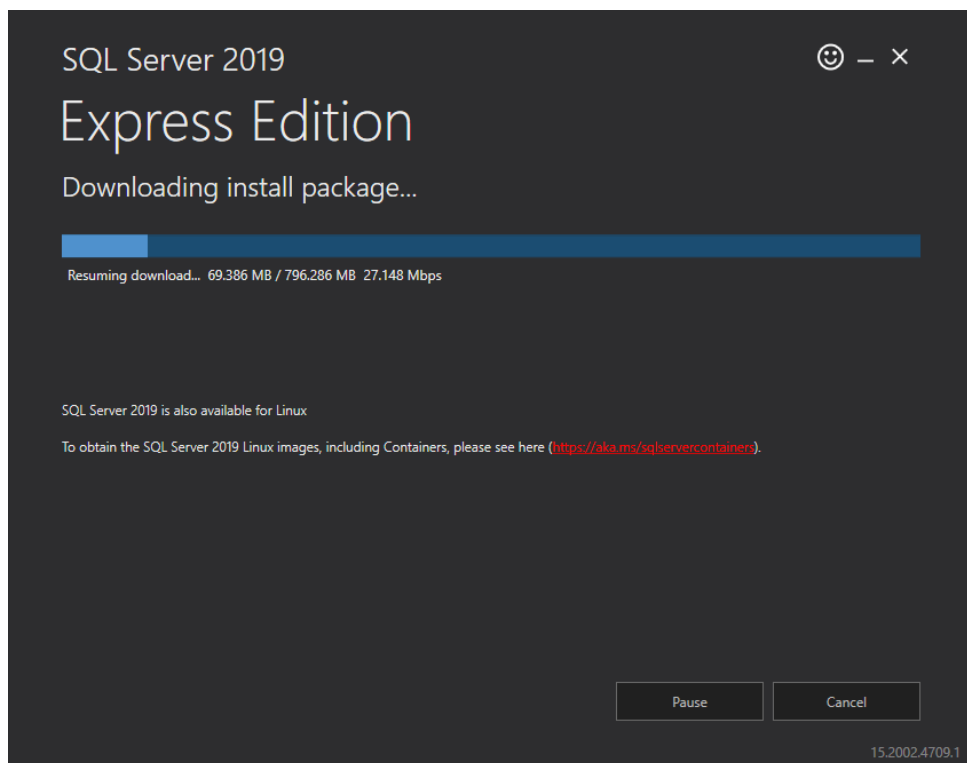
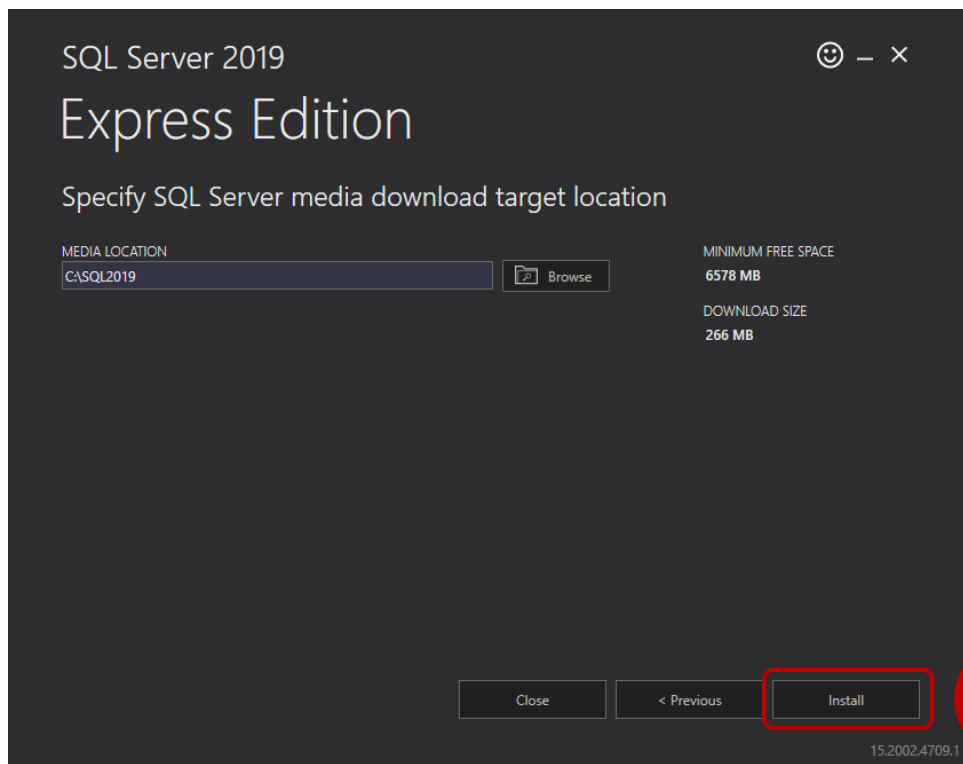
<https://www.microsoft.com/en-ca/sql-server/sql-server-downloads>

Note: other versions of SQL Server can be used however this procedure is specifically for SQL Server 2019 Express as of April 2022. Choose your localised language version, as necessary.

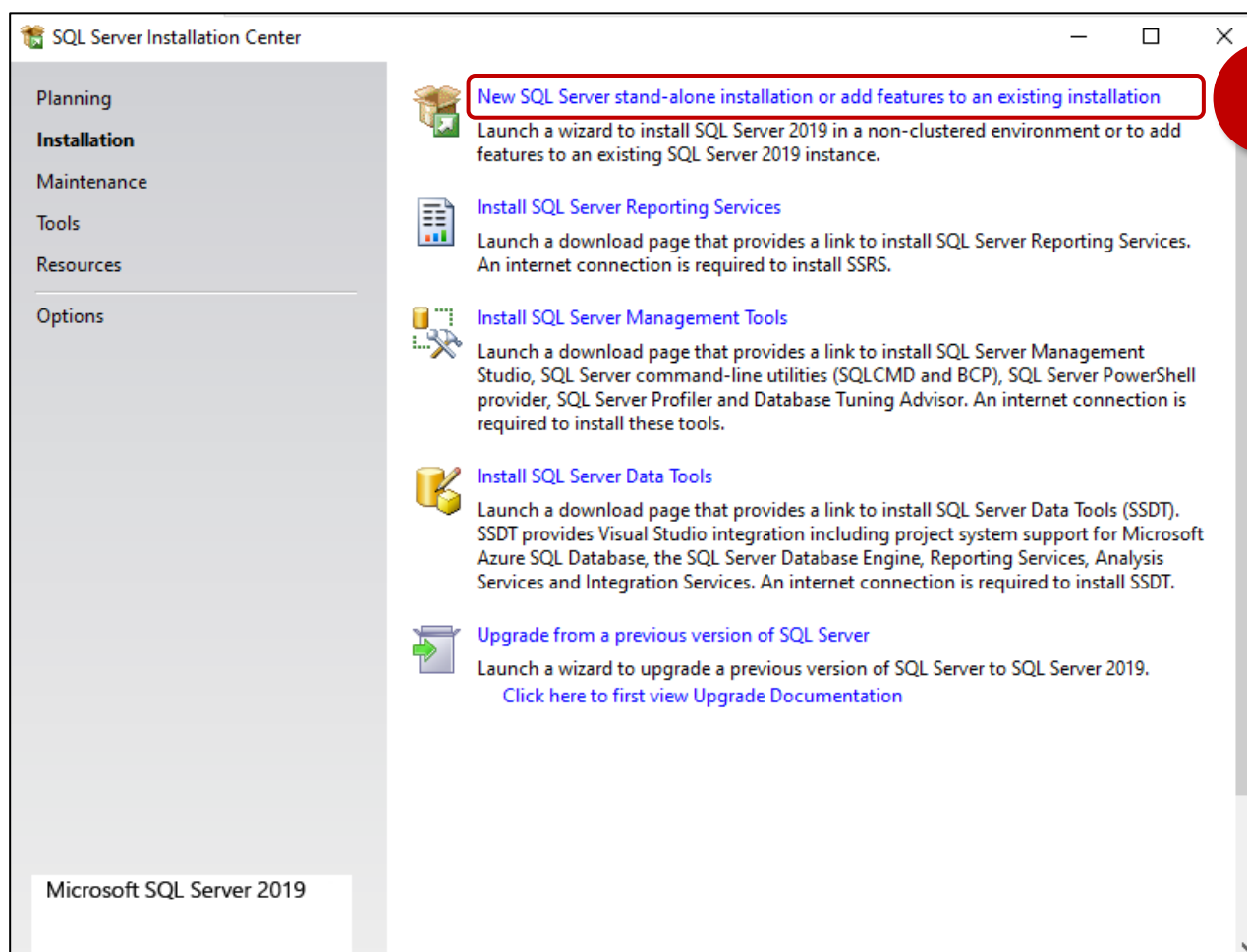
2. Run SQL2019-SSEI-Expr.exe
3. Select [Custom]



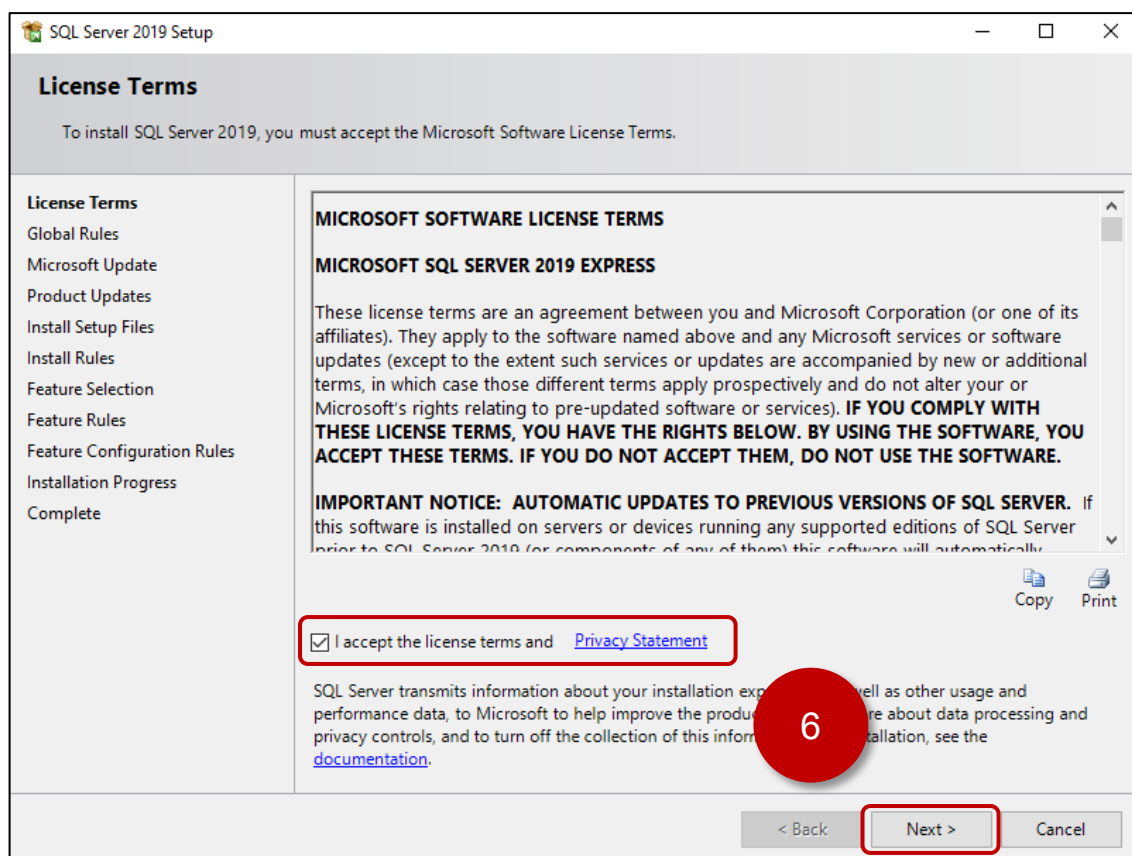
4. Confirm the download location is acceptable and there is enough free space on the drive. Click [Install]



5. Click [New SQL Server stand-alone installation or add features to an exiting installation]

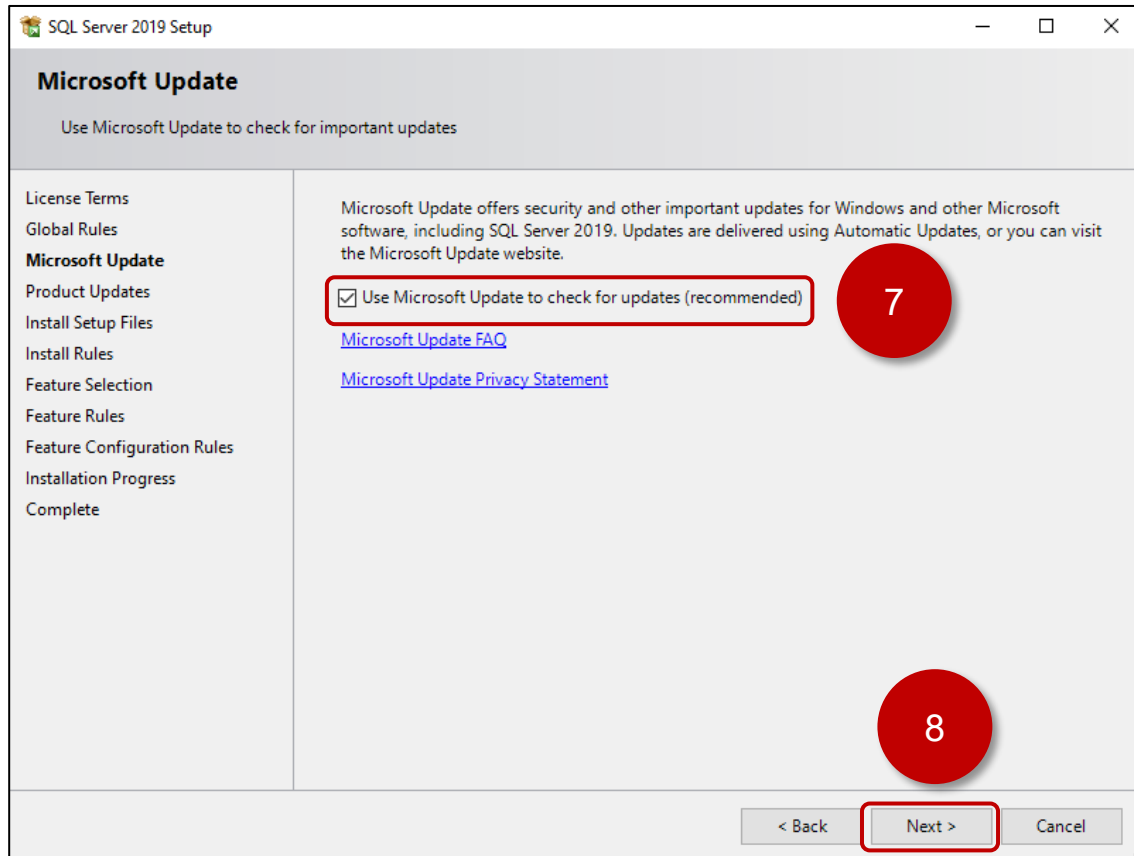


6. Check the “I accept the license terms...” checkbox and click [Next]



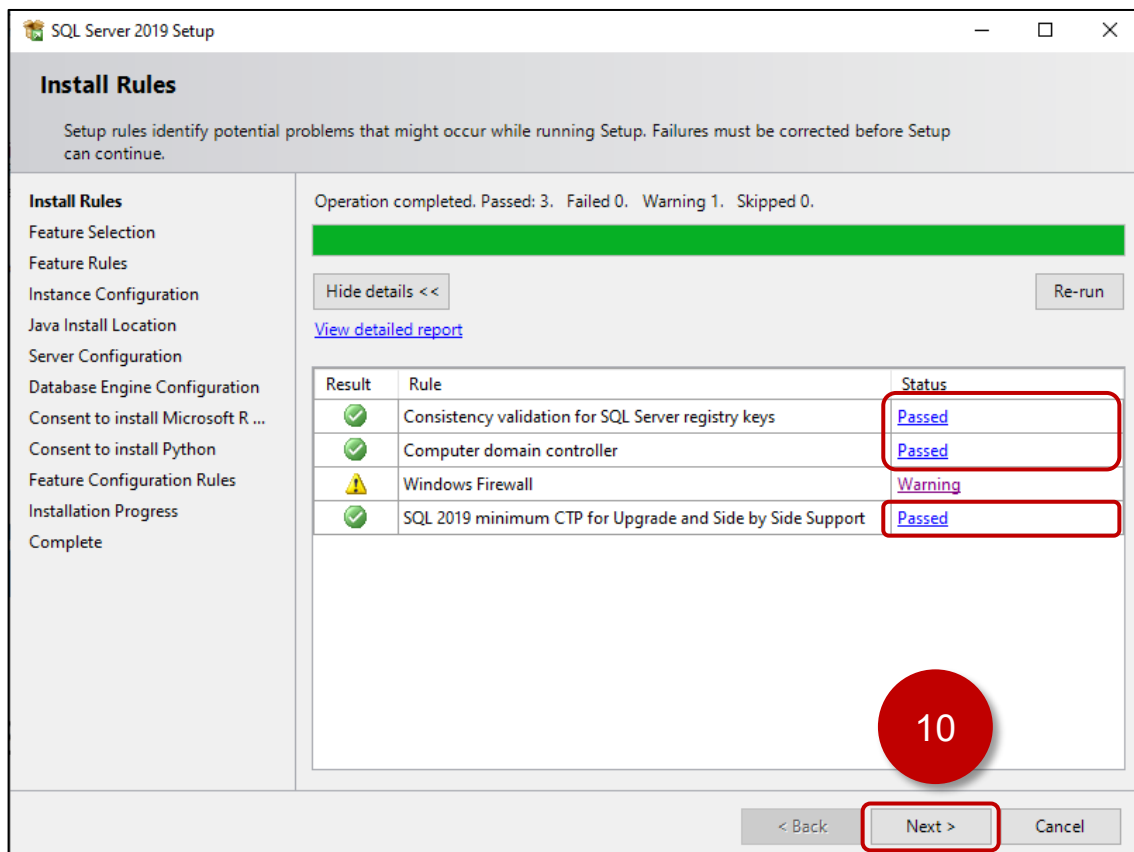
7. Optional: Check the “Use Microsoft Update to check for updates...”

8. Click [Next]

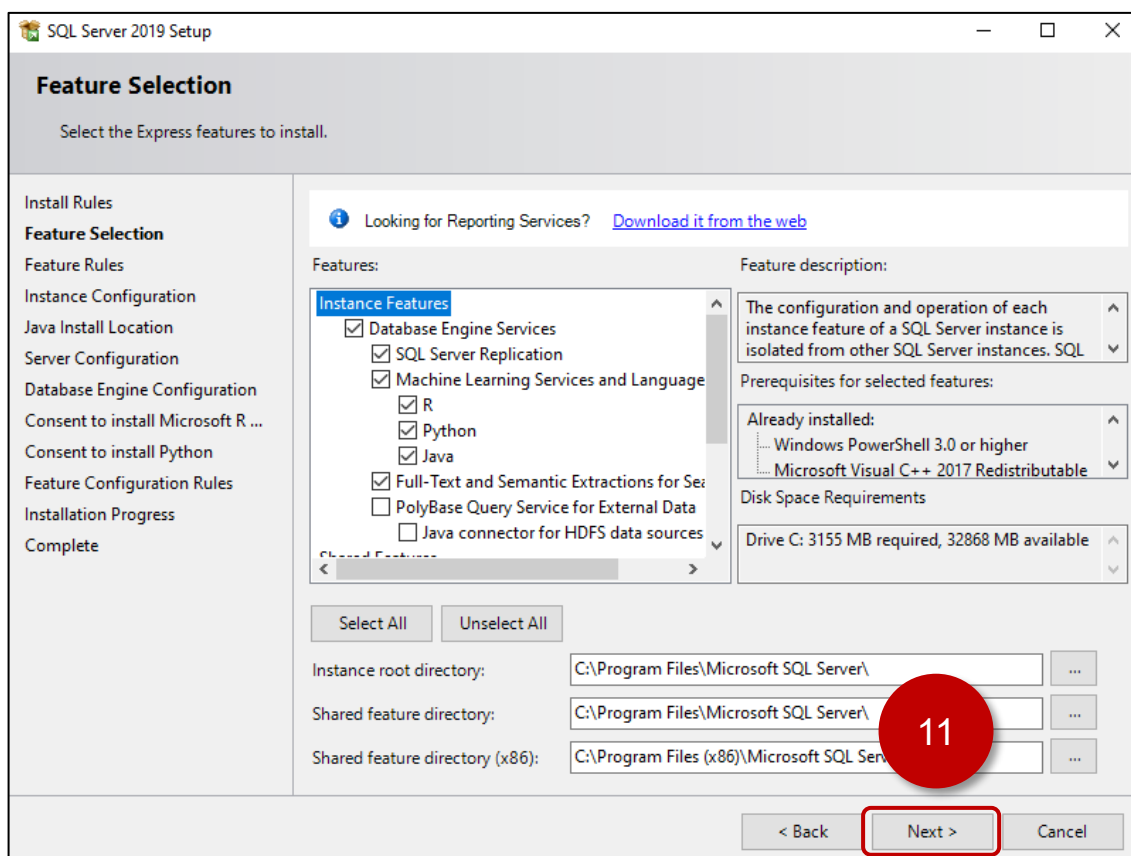


9. Confirm status is “Passed” for 3 of the 4 entries. Windows Firewall exception is option for SQL server itself for the purposes of the demo. The Studio Database Gateway cover later will require a firewall exception.

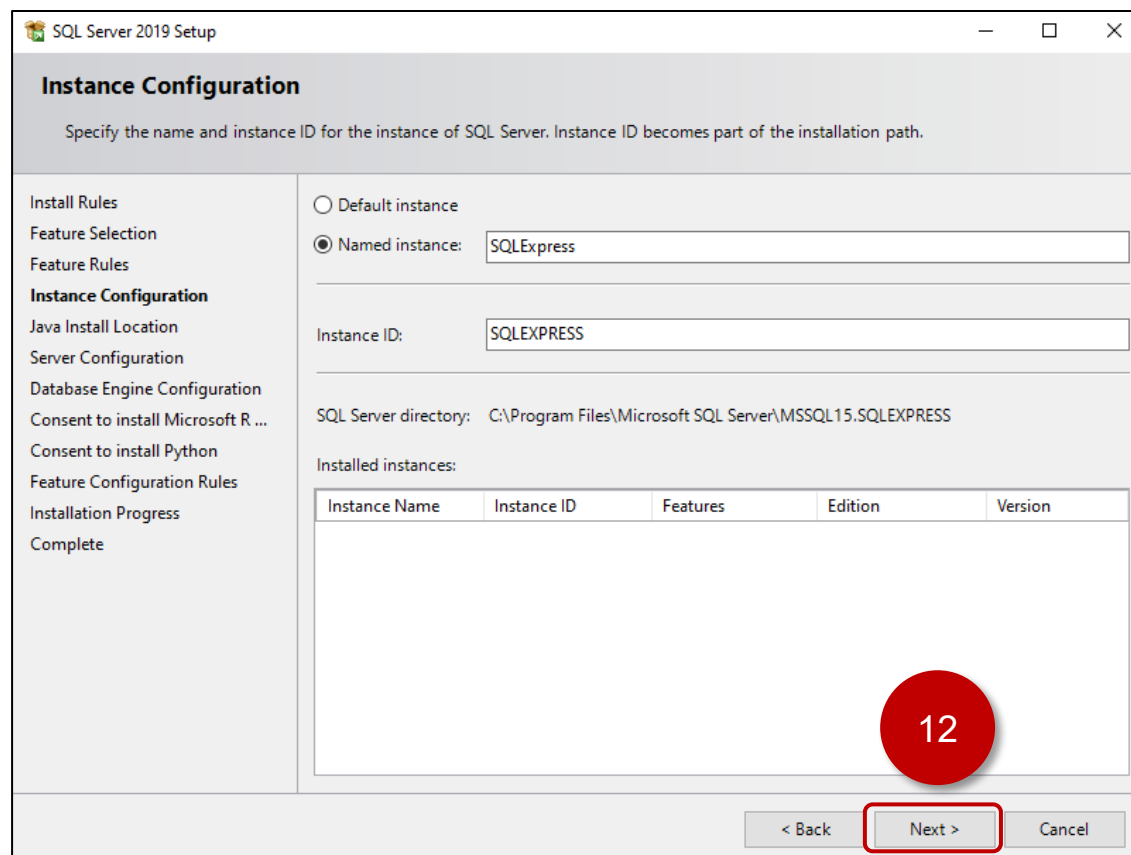
10. Click [Next]



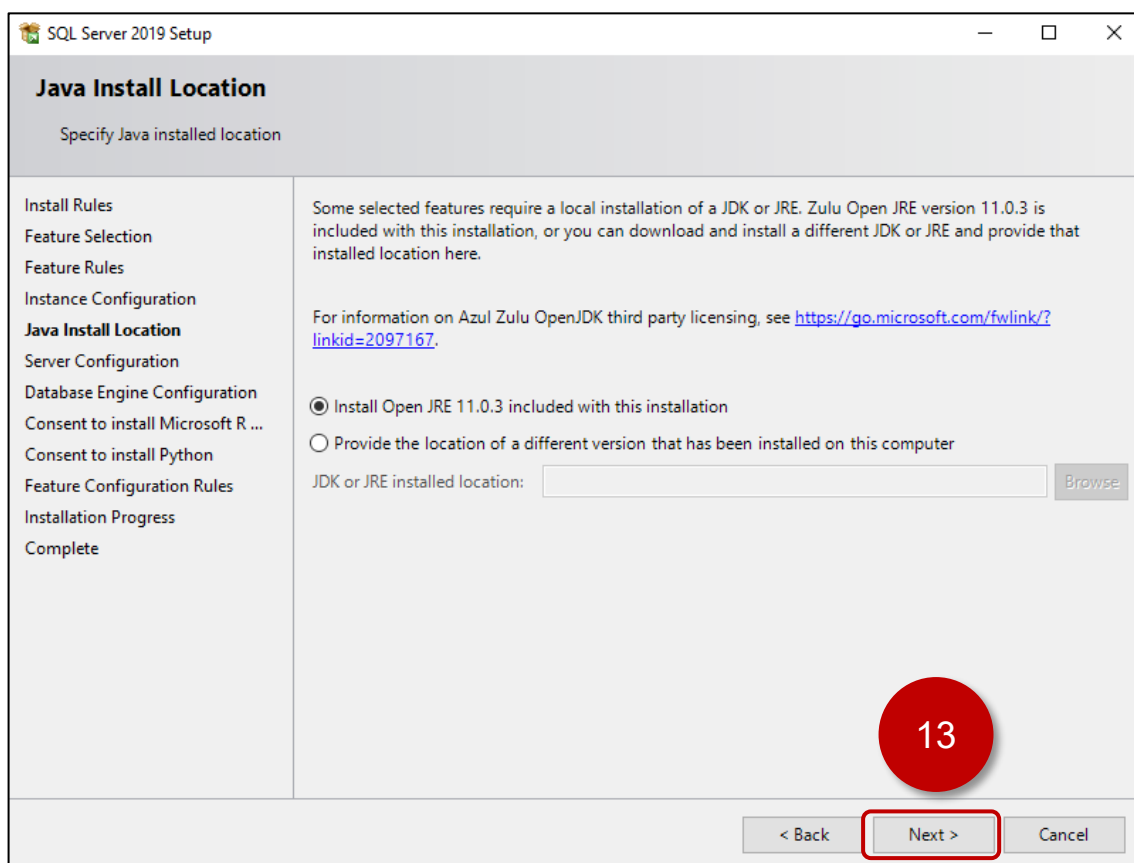
11. Leave the Feature Selection as default. Click [Next]



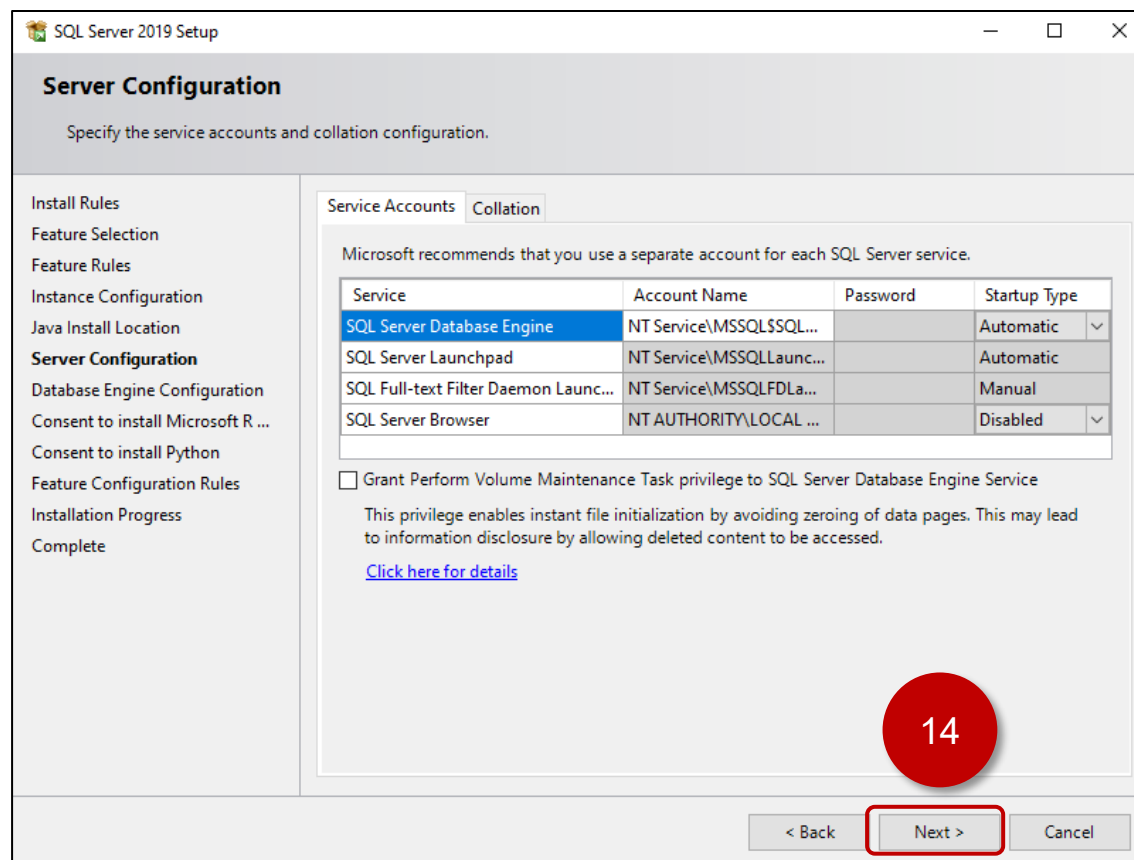
12. Leave the Instance Configuration as default. Click [Next]



13. Leave the Java Install as default. Click [Next]



14. Leave the Server Configuration as default. Click [Next]



15. Set the Authentication Mode to “Mixed Mode”.

16. Enter the sa account password.

17. Specify Windows accounts that will act as administrator for SQL Server. Can be left as default.

18. Click [Next].

SQL Server 2019 Setup

Database Engine Configuration

Specify Database Engine authentication security mode, administrators, data directories, TempDB, Max degree of parallelism, Memory limits, and Filestream settings.

Install Rules
Feature Selection
Feature Rules
Instance Configuration
Java Install Location
Server Configuration
Database Engine Configuration
Consent to install Microsoft R ...
Consent to install Python
Feature Configuration Rules
Installation Progress
Complete

Server Configuration | Data Directories | TempDB | Memory | User Instances | FILESTREAM

Specify the authentication mode and administrators for the Database Engine.

Authentication Mode

☐ Windows authentication mode

☒ Mixed Mode (SQL Server authentication and Windows authentication) (15)

Specify the password for the SQL Server system administrator (sa) account.

Enter password: (16)

Confirm password: (16)

Specify SQL Server administrators

DESKTOP-E2JOON9\PFX (PFX) (17)

SQL Server administrators have unrestricted access to the Database Engine.

Add Current User | Add... | Remove

< Back | Next > (18) | Cancel

19. Click [Accept] and click [Next].

SQL Server 2019 Setup

Consent to install Microsoft R Open

Download and install necessary pre-requisite.

Install Rules
Feature Selection
Feature Rules
Instance Configuration
Java Install Location
Server Configuration
Database Engine Configuration
Consent to install Microsoft R ...
Consent to install Python
Feature Configuration Rules
Installation Progress
Complete

Microsoft R Open is an enhanced distribution of R made available by Microsoft under the GNU General Public License v2.

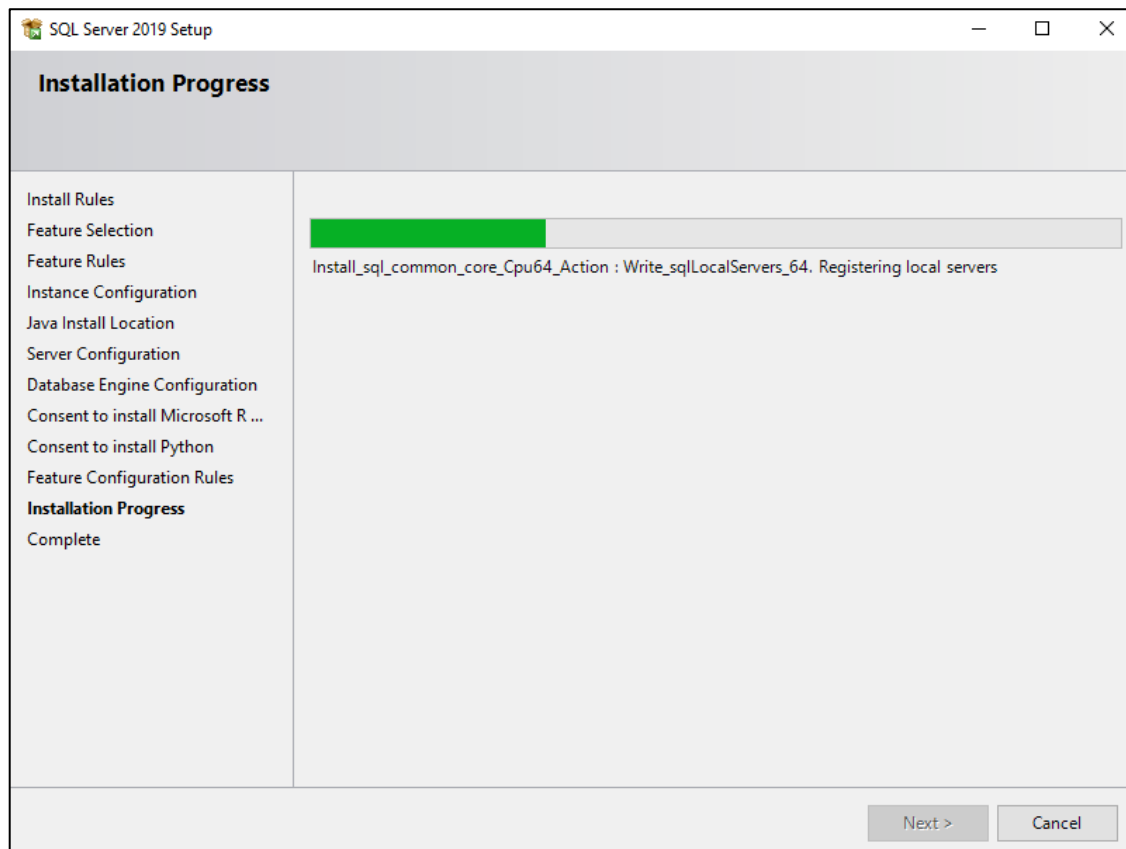
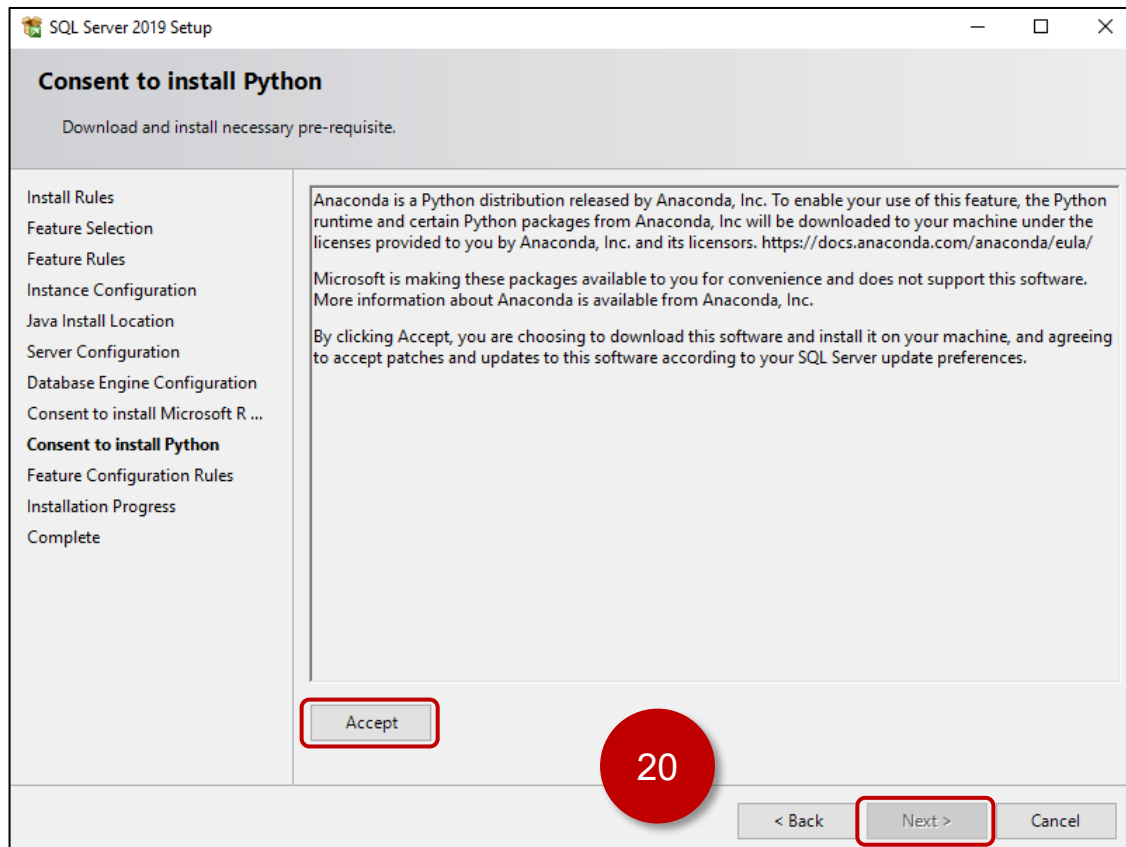
R is © the R Foundation for Statistical Computing. For more information on R-related products and services, visit <http://r-project.org>.

By clicking "Accept" you are choosing to download Microsoft R Open and install it on your machine, and agreeing to accept patches and updates to this software according to your SQL Server update preferences.

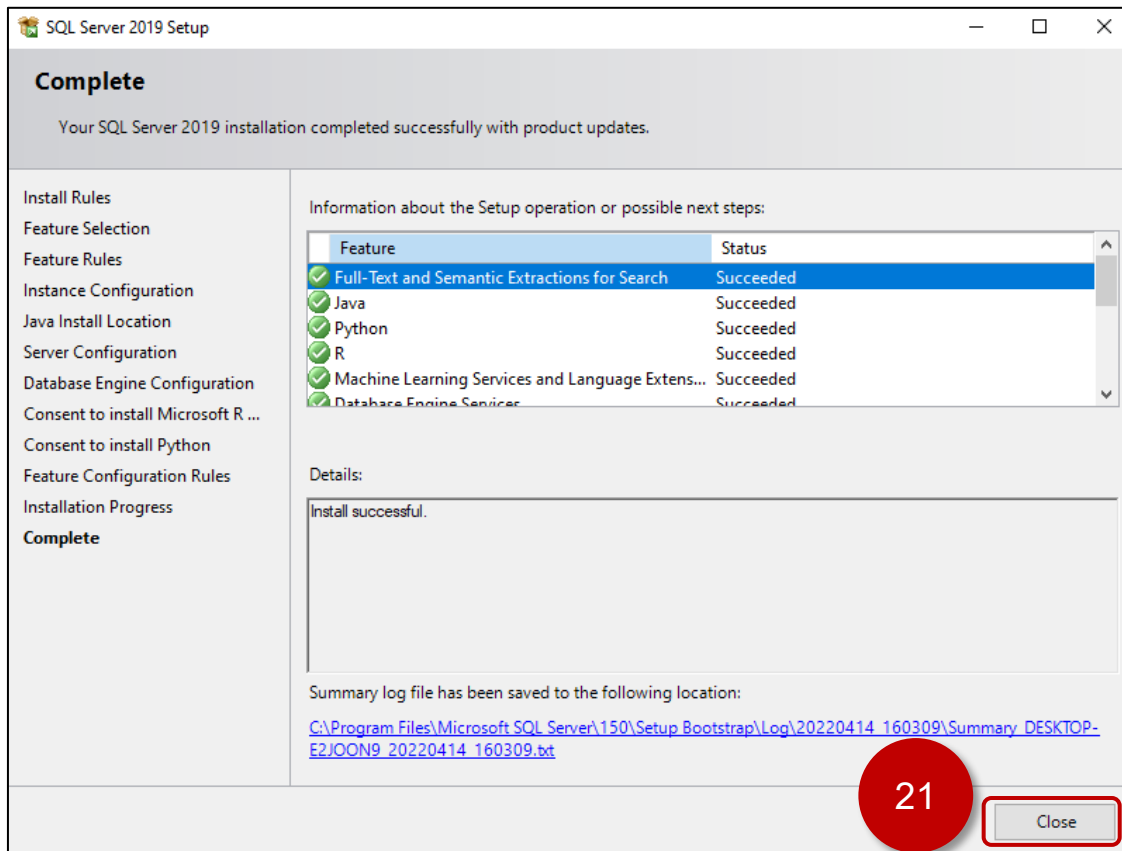
Accept (19)

< Back | Next > | Cancel

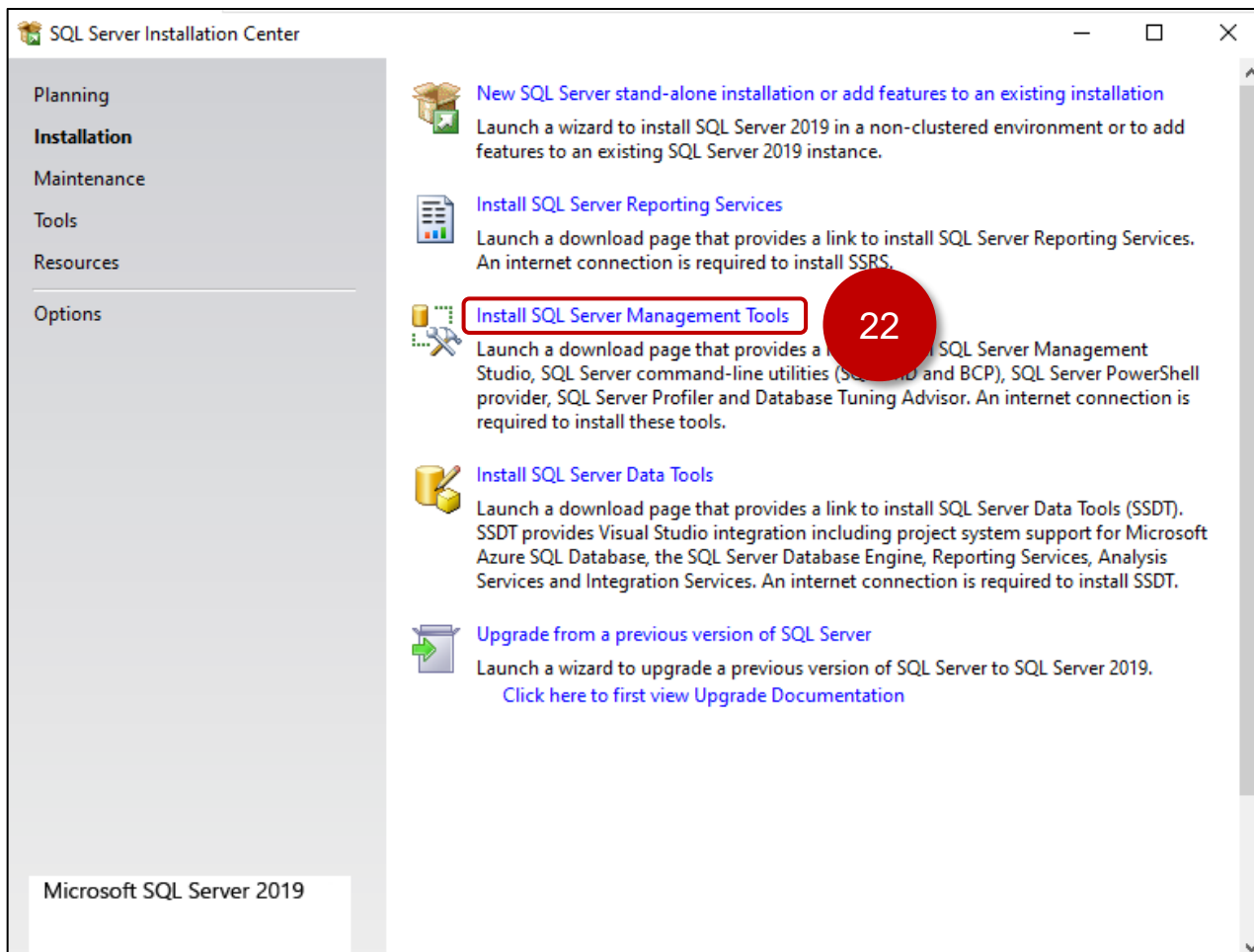
20. Click [Accept] and click [Next]



21. Confirm that all features show Status as “Succeeded”. Click [Close]



22. Click [Install SQL Server Management Tools].



23. Download the latest version of SQL Server Management Studio (~690 MB)



SQL Server Management Studio (SSMS)

- Download SSMS
- Release Notes
- Overview
- Quickstarts
- Tutorials
- Concepts
- How-to
- References
- Resources
- SqlPackage.exe
- SQL Server Profiler
- Visual Studio native helpers

Download SSMS

[Free Download for SQL Server Management Studio \(SSMS\) 18.11.1](#)

SSMS 18.11 is the latest general availability (GA) version. If you have a previous version of SSMS 18 installed, installing SSMS 18.11.1 upgrades it to 18.11.1.

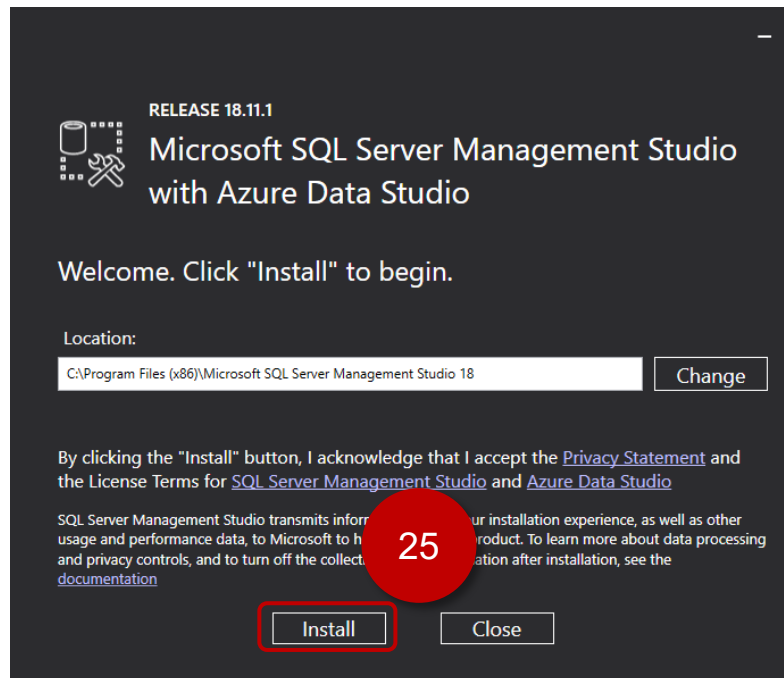
- Release number: 18.11.1
- Build number: 15.0.18410.0
- Release date: March 08, 2022

By using SQL Server Management Studio, you agree to its [license terms](#) and [privacy statement](#). If you have comments or suggestions, or you want to report issues, the best way to contact the SSMS team is at [SQL Server user feedback](#).

The SSMS 18.x installation doesn't upgrade or replace SSMS versions 17.x or earlier. SSMS 18.x installs side by side with

24. Run the SSMS-SETUP_ENU.exe or similar installer that was downloaded.

25. Click [Install].



RELEASE 18.11.1

Microsoft SQL Server Management Studio with Azure Data Studio

Welcome. Click "Install" to begin.

Location:

C:\Program Files (x86)\Microsoft SQL Server Management Studio 18

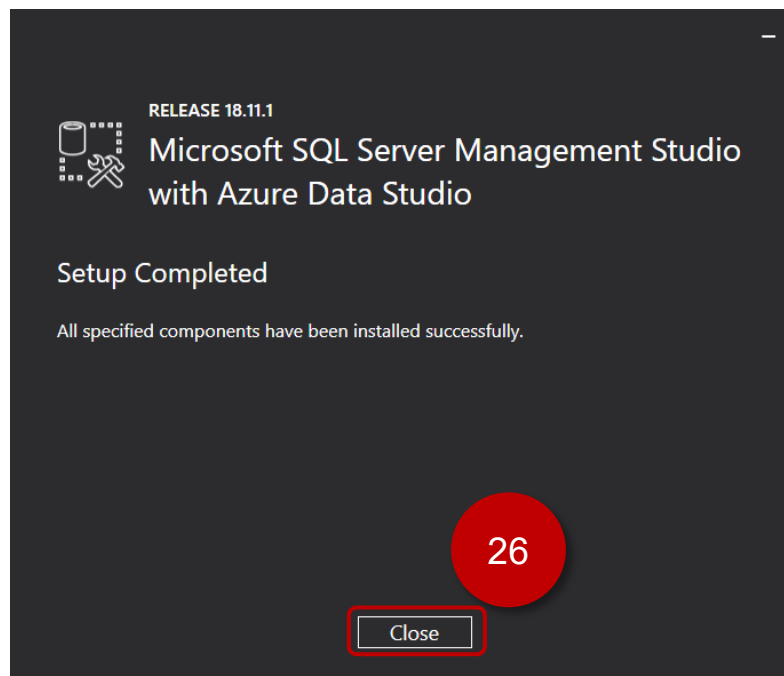
Change

By clicking the "Install" button, I acknowledge that I accept the [Privacy Statement](#) and the License Terms for [SQL Server Management Studio](#) and [Azure Data Studio](#)

SQL Server Management Studio transmits information about your installation experience, as well as other usage and performance data, to Microsoft to help improve our product. To learn more about data processing and privacy controls, and to turn off the collection of this information after installation, see the [documentation](#)

Install Close

26. Click [Close]



RELEASE 18.11.1

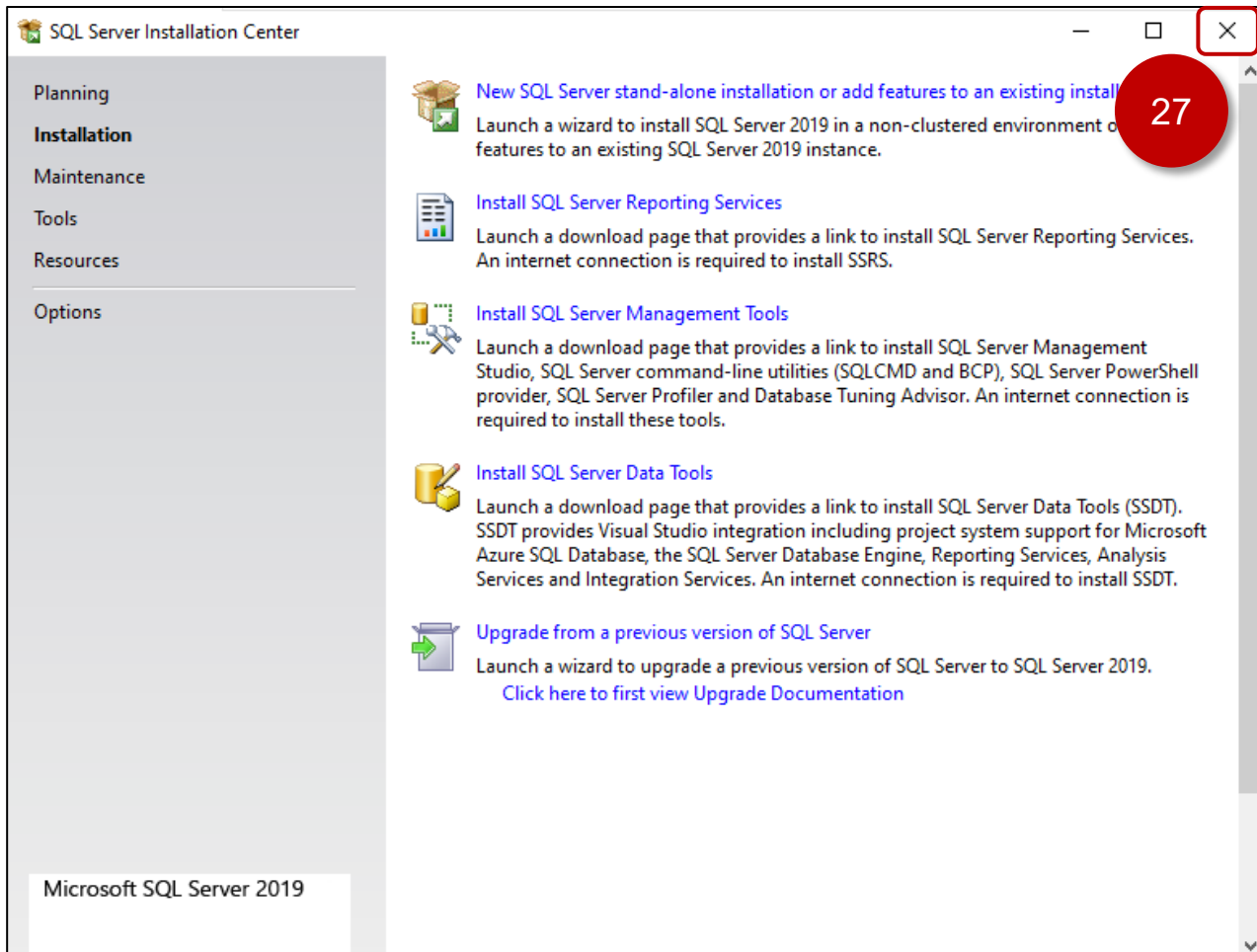
Microsoft SQL Server Management Studio with Azure Data Studio

Setup Completed

All specified components have been installed successfully.

Close

27. Close the “SQL Server Installation Center” window.

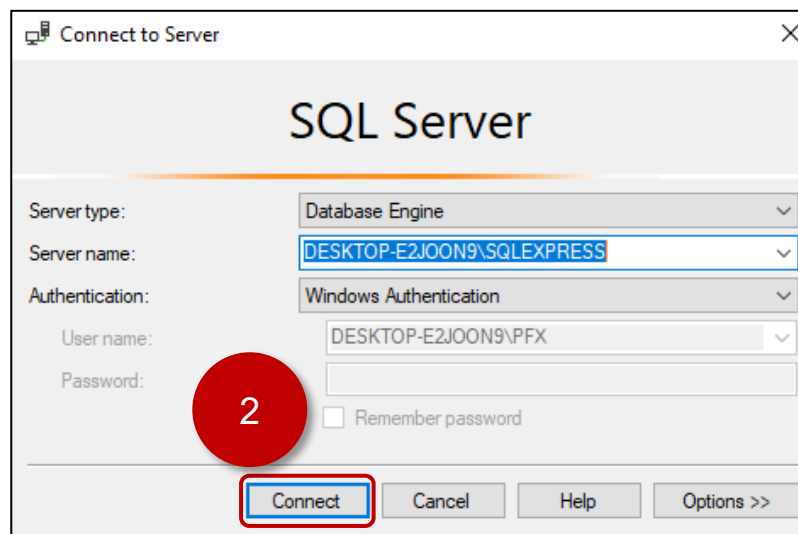


Create a SQL Database

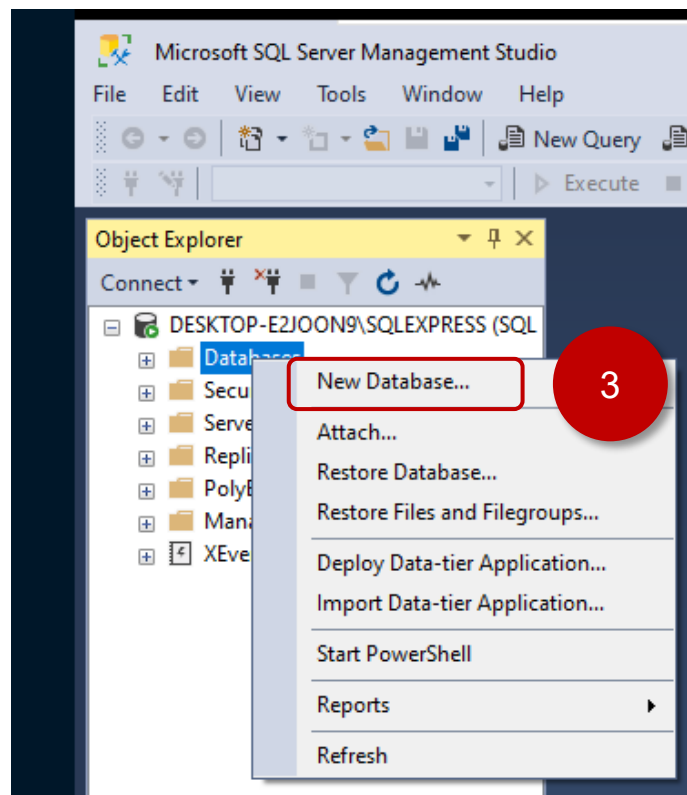
This procedure assumes there is not an existing database for use with the project.

This database setup is for demonstration purposes only. Please ensure the appropriate security measures are taken before deploying any database in a production environment.

1. Start [Microsoft SQL Management Studio]
2. If you followed the previous section's instructions and the current Windows user account is an administrator for SQL, leave the [Connect to Server] dialog settings as default and click [Connect]. If not, enter the correct Server name and Authentication details.

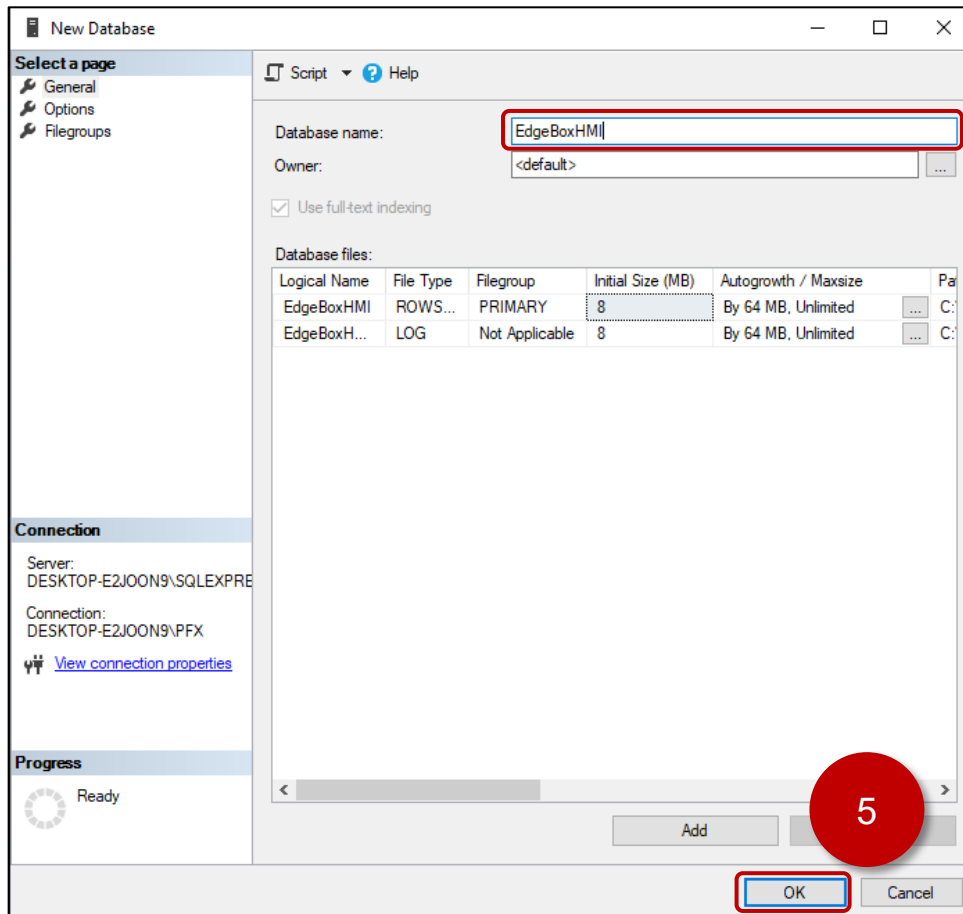


3. [Object Explorer] -> [Databases] right-click [Databases] and click [New Database...].

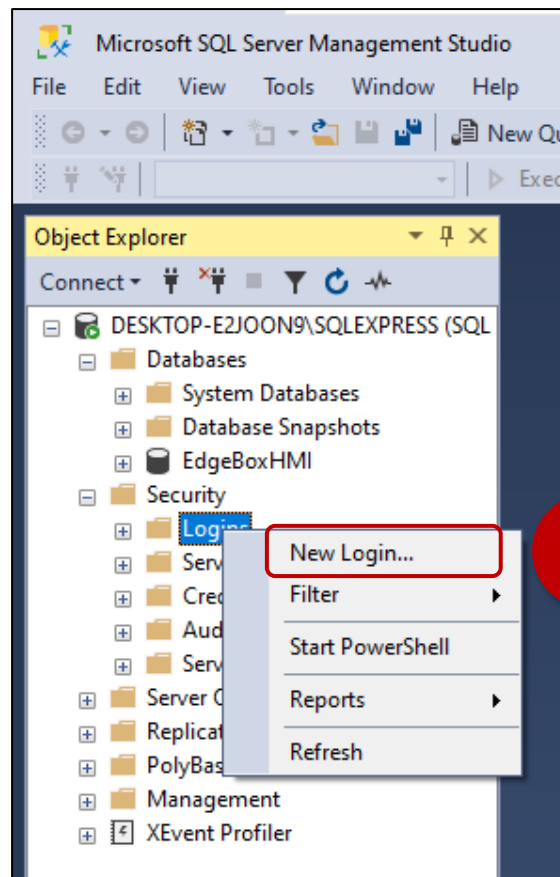


4. Enter the Database name as “EdgeBoxHMI”

5. Click [OK]



6. [Object Explorer] -> [Security] -> [Logins] right-click [Logins], click [New Login...]



7. Enter a Login Name: EdgeBoxHMI
8. Select [SQL Server Authentication]
9. Enter a password and confirm the password: !SE1234
10. Uncheck [Enforce password policy]
11. Change the [Default Database] to [EdgeBoxHMI]
12. Select the [User Mapping] page.

Login - New

Select a page

- General
- Server Roles
- User Mapping**
- Securables
- Status

Connection

Server: DESKTOP-E2JOON9\SQLEXPRESS

Connection: DESKTOP-E2JOON9\PFX

[View connection properties](#)

Progress

Ready

Script ? Help

Login name: EdgeBoxHMI

☐ Windows authentication

☒ **SQL Server authentication**

Password:

Confirm password:

☐ Specify old password

Old password:

☐ **Enforce password policy**

☐ Enforce password expiration

☐ User must change password at next login

☐ Mapped to certificate

☐ Mapped to asymmetric key

☐ Map to Credential

Mapped Credentials

Credential	Provider
------------	----------

Add

Default database: EdgeBoxHMI

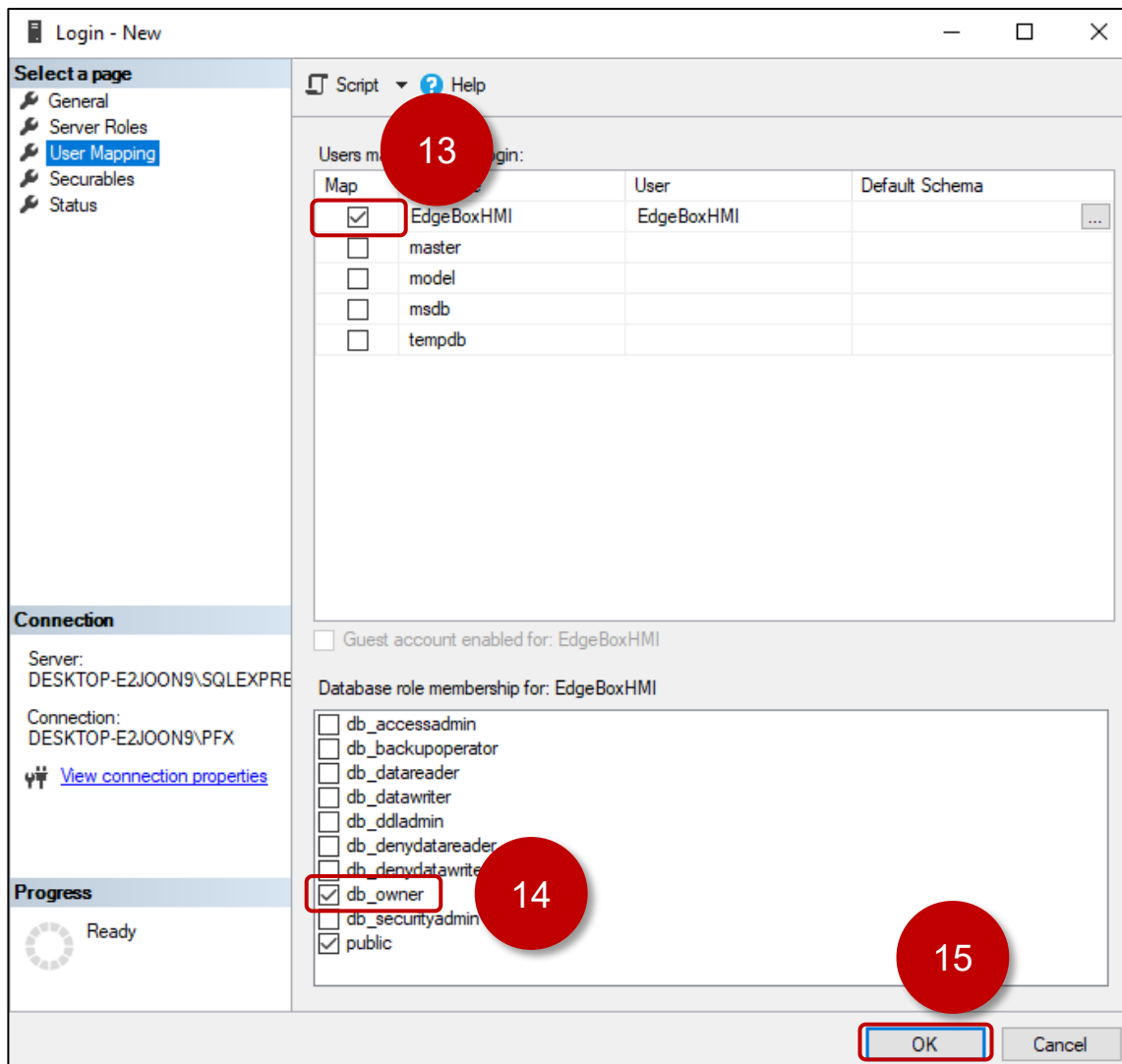
Default language: <default>

OK Cancel

13. Check [Map] for the [EdgeBoxHMI] database

14. Check [db_owner]

15. Click [OK]



Studio Database Gateway Installation

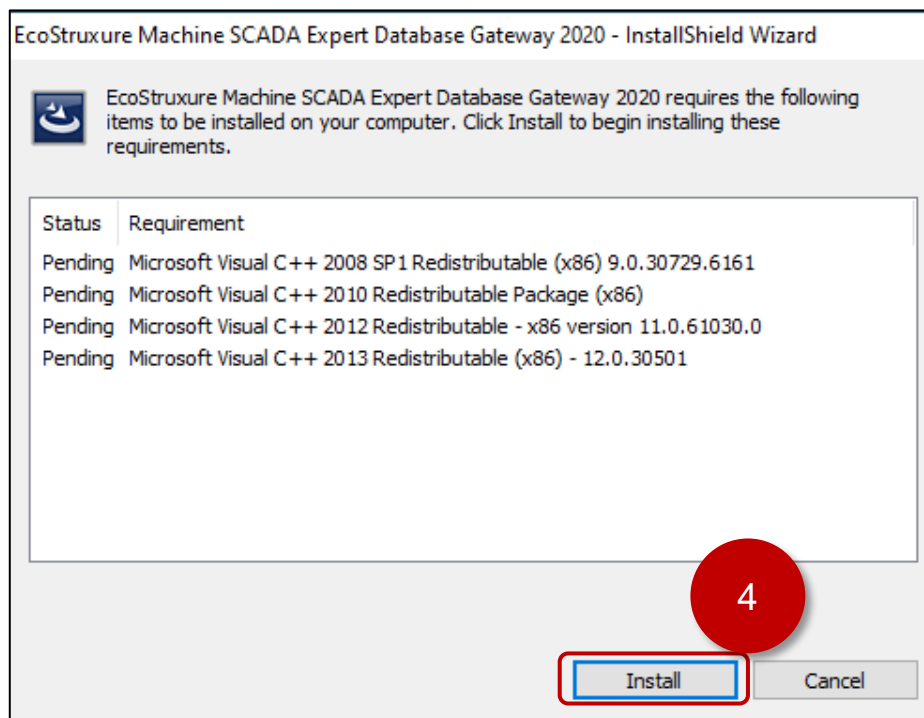
To allow the HMI runtime running on the Edge Box HMI to communicate with SQL Server the Studio Database Gateway needs to be installed on a Windows PC on the same network as the Microsoft SQL Server. For an easy demonstration configuration, install the Studio Database Gateway on the same Windows PC as the Microsoft SQL Server Database.

If EcoStruxure Machine SCADA Expert is already installed on the Windows PC, the Studio Database Gateway is already installed in the EcoStruxure Machine SCADA Expert BIN directory. The default path would be:

C:\Program Files (x86)\Schneider Electric\EcoStruxure Machine SCADA Expert 2020\Bin\DatabaseGateway\StADOSvr.exe

Skip to **STEP 11** if EcoStruxure Machine SCADA Expert is already installed. Otherwise install the Studio Database gateway by starting at **STEP 1**.

1. If not already installed on the Microsoft SQL Server Windows PC, install .NET Framework 3.5 via [Turn Windows features on or off].
2. On the EcoStruxure Machine SCADA Expert development PC copy the [GatewaySteup.exe] from **C:\Program Files (x86)\Schneider Electric\EcoStruxure Machine SCADA Expert 2020\Redist\DatabaseGateway\GatewaySetup.exe** to the Windows PC that has Microsoft SQL Server installed.
3. Run the GatewaySetup.exe
4. If prompted to install redistributables, click [Install]

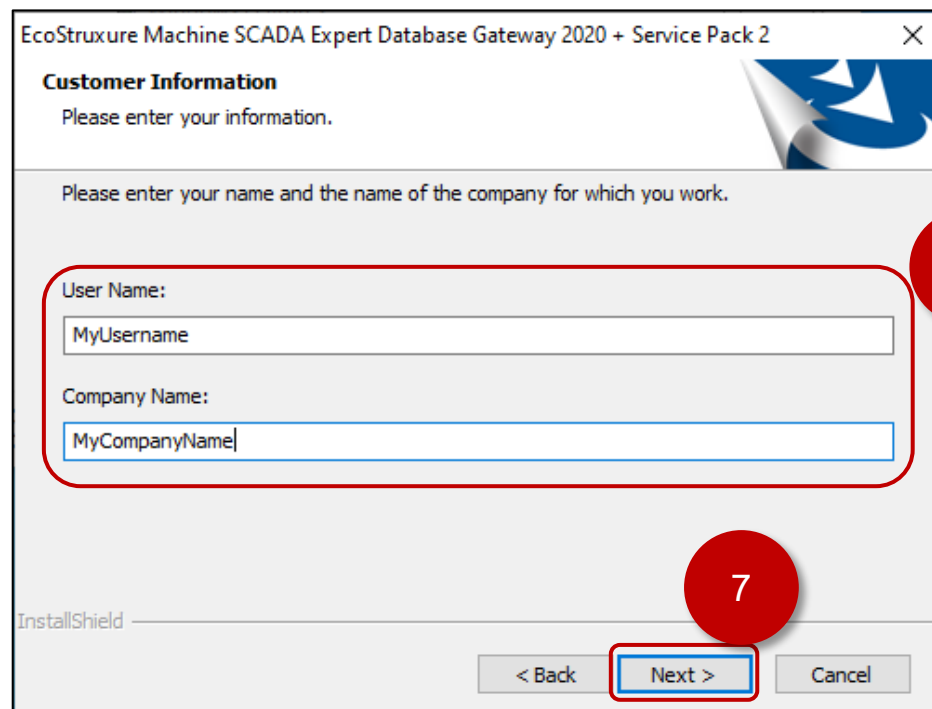


5. Click [Next].

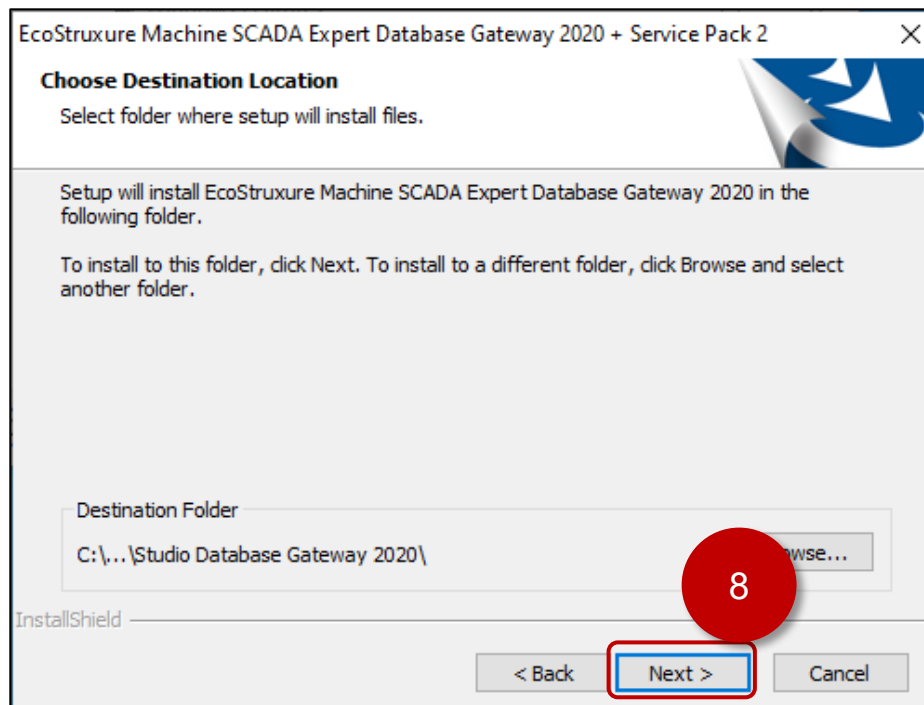


6. Enter a [User Name] and [Company Name]

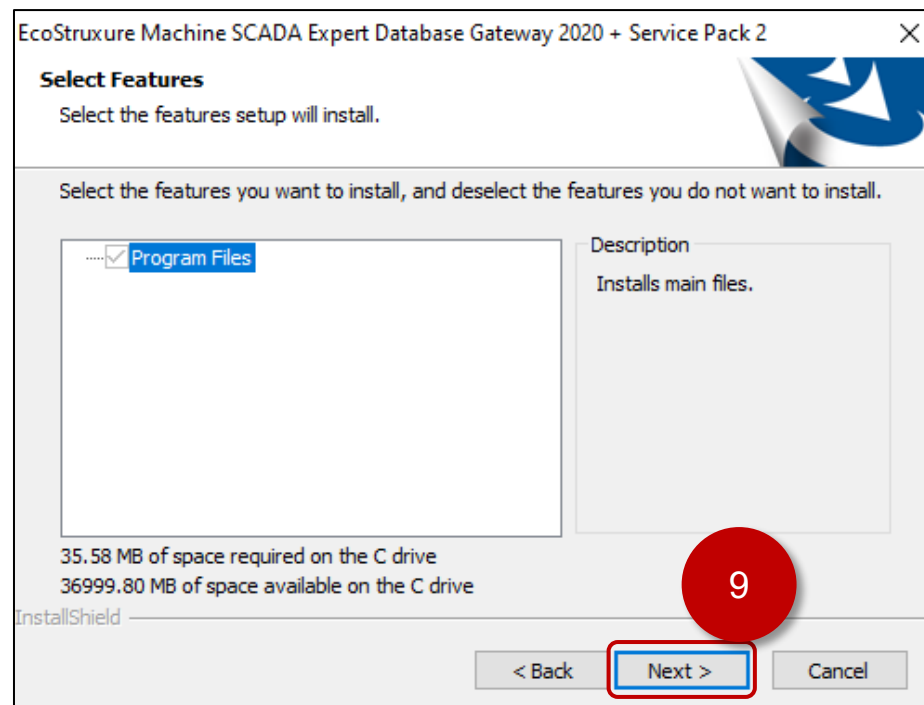
7. Click [Next]



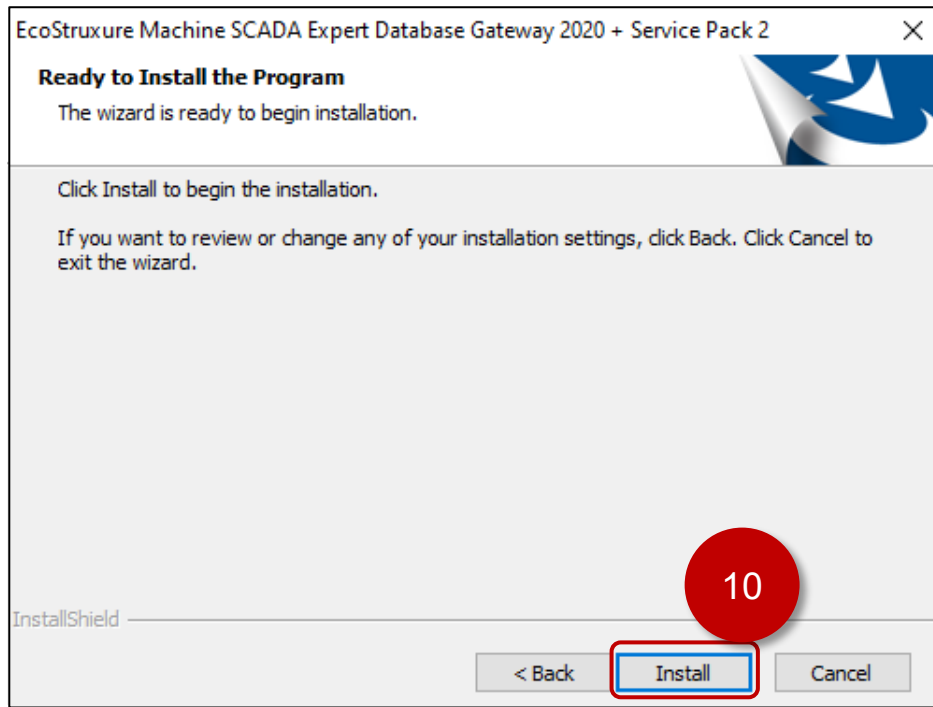
8. Click [Next].



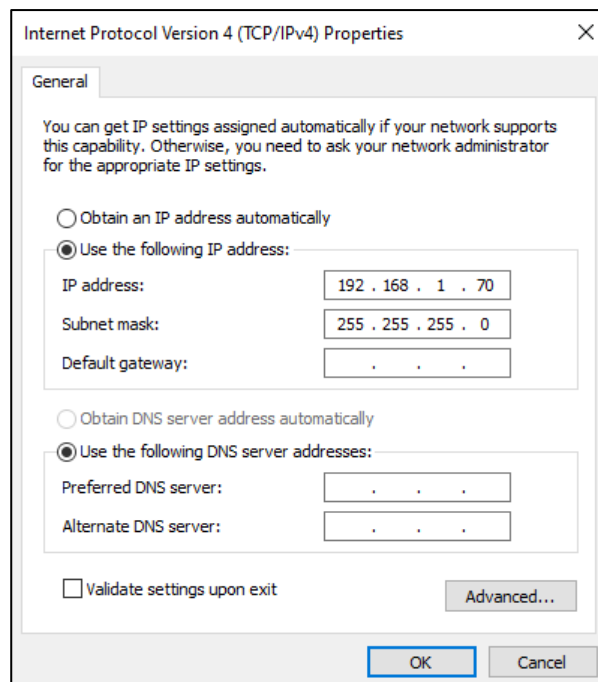
9. Click [Next].



10. Click [Install].



11. Create a firewall exception for the Studio Database gateway which uses port 3997. For example configure Microsoft Windows Defender Firewall and any other security software that would block communication.
12. Set the IP Address of the Windows PC that is running the Studio Database Gateway to 192.168.1.70

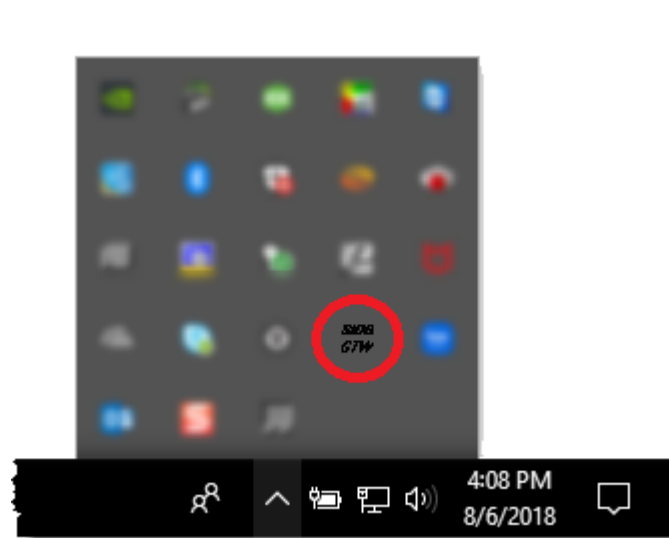


13. Start the Studio Database Gateway Manually or set the program to autostart on Windows log in using a shortcut in the startup folder, task scheduler, registry or other method to auto start a program in Windows.

To manually start the Studio Database Gateway on a Windows PC without EcoStruxure Machine SCADA Expert installed, execute: **C:\Program Files (x86)\Studio Database Gateway 2020\StADOSvr.exe**

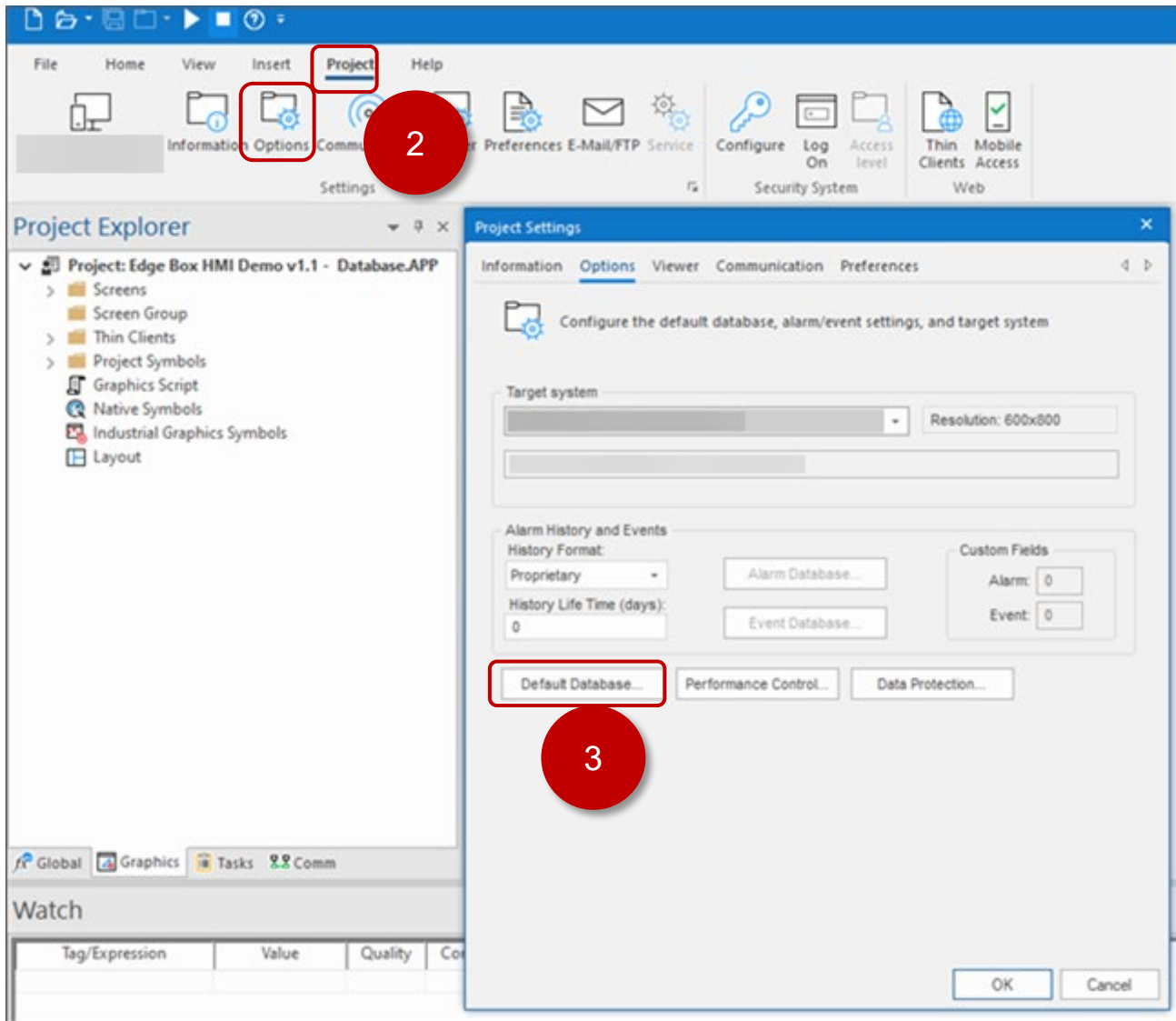
To manually start the Studio Database Gateway on a Windows PC with EcoStruxure Machine SCADA Expert installed, execute: **C:\Program Files (x86)\Schneider Electric\EcoStruxure Machine SCADA Expert 2020\Bin\DatabaseGateway\StADOSvr.exe**

14. Confirm the Studio Database Gateway is running by checking for the Icon in the notification area of the taskbar.

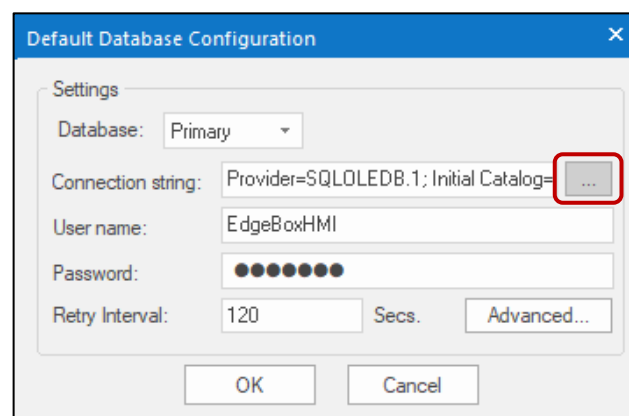


EcoStruxure Machine SCADA Expert Project settings

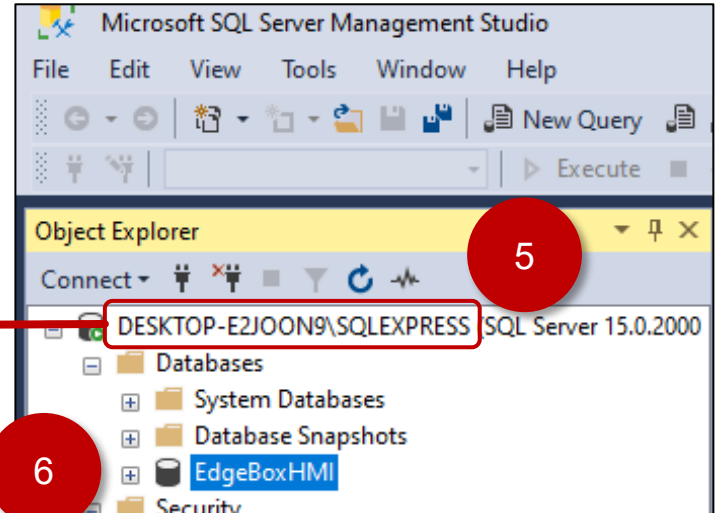
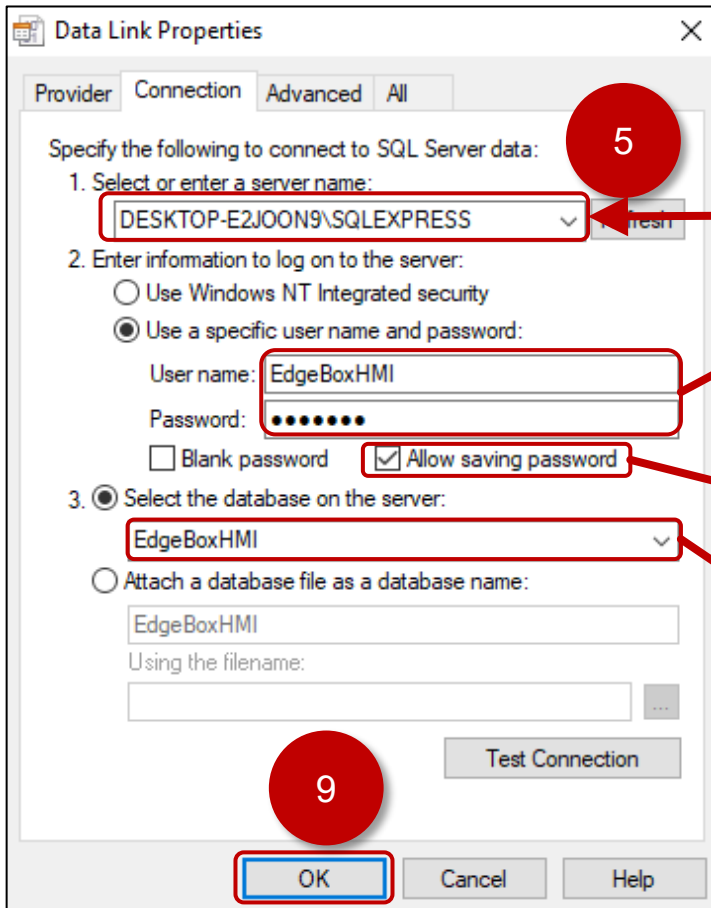
1. Open the Edge Box HMI Demo v1.1 – Database.app project in EcoStruxure Machine SCADA Expert
2. [Project] menu -> [Options]
3. Click [Default Database]



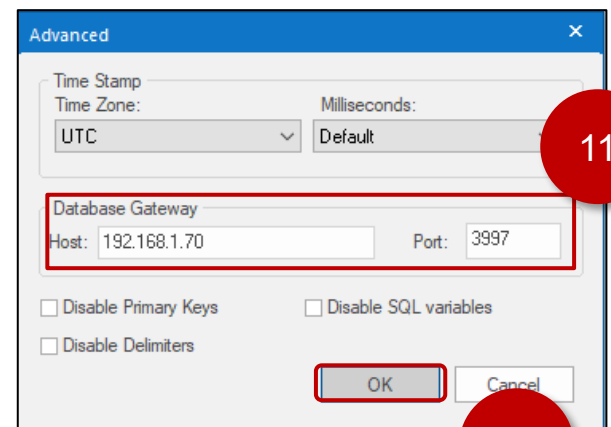
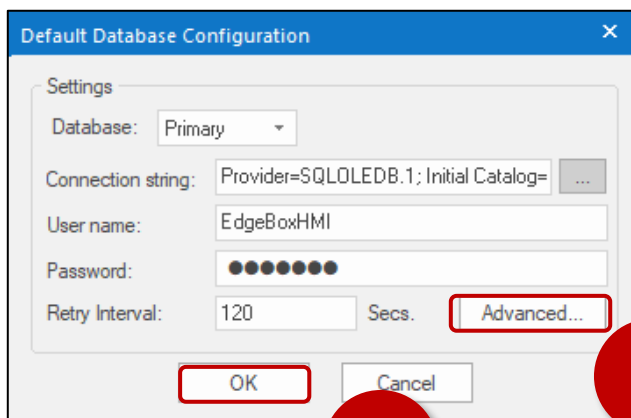
4. Click [...]



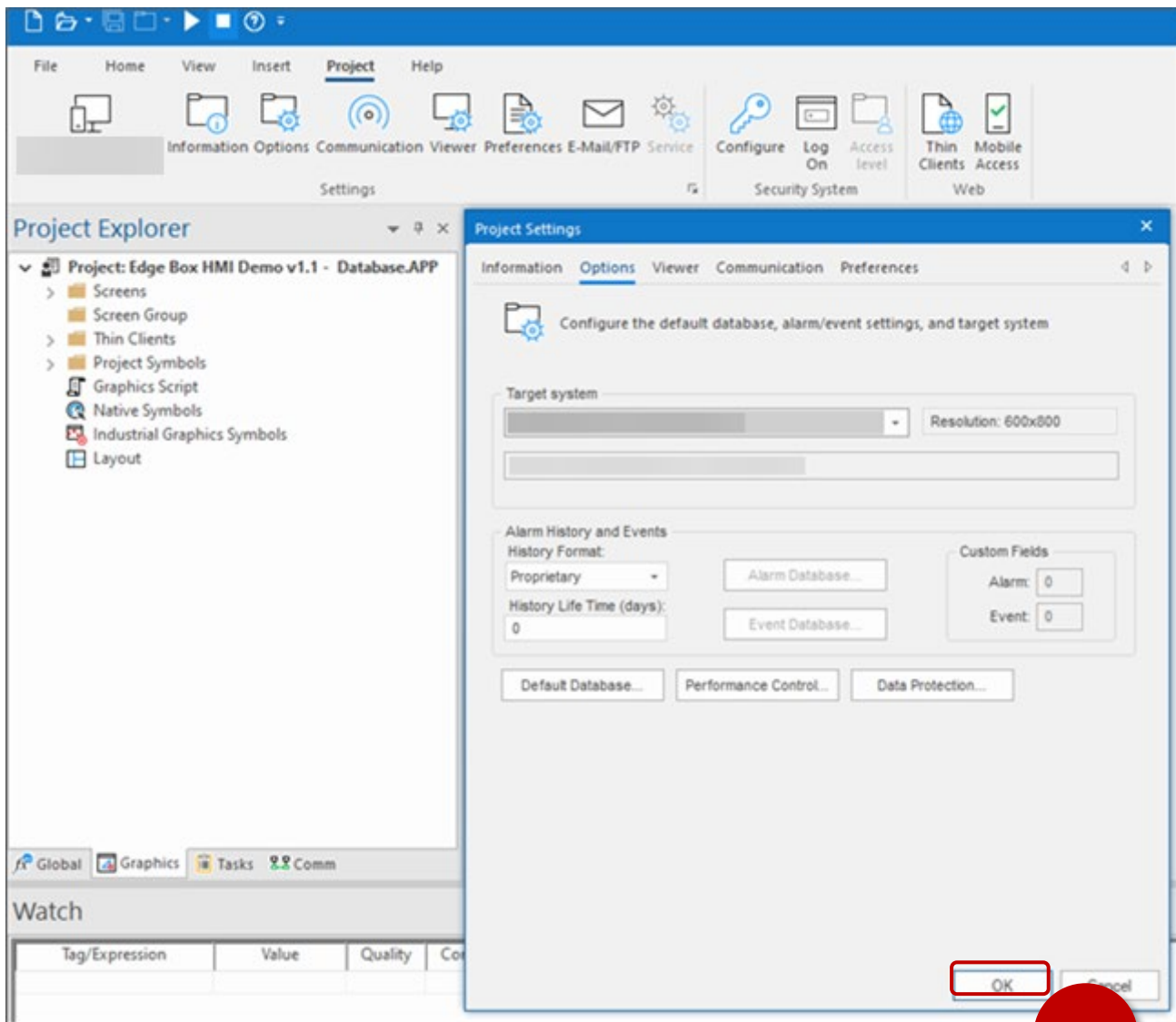
5. Enter the server name so that it matches the SQL server instance name.
6. Enter the user name and password if different (user name = EdgeBoxHMI, password = !SE1234)
7. Check [Allow saving password]
8. Enter the database if different (EdgeBox HMI)
9. Click [OK]



10. Click [Advanced]
11. Enter the Database Gateway Host and Port if different (Host = 192.168.1.70, Port = 3997)
12. Click [OK]
13. Click [OK]



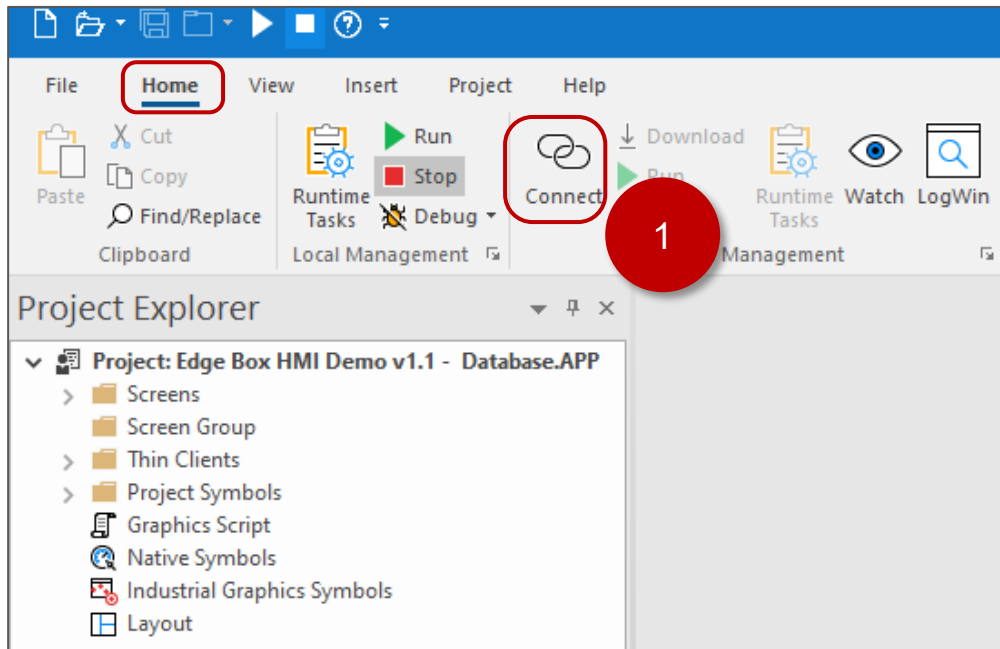
14. Click [OK]



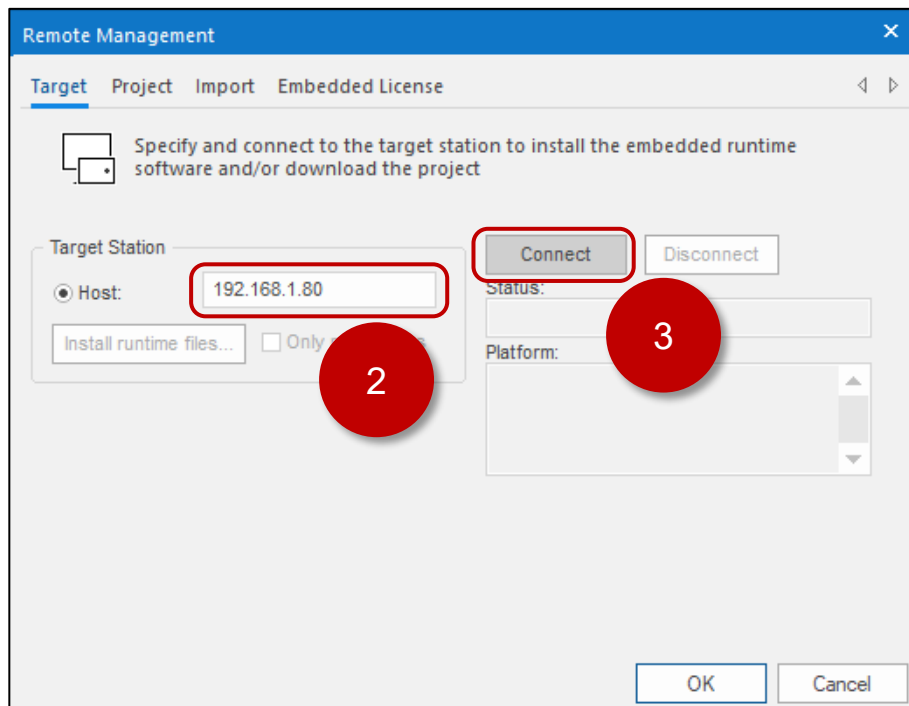
14

5. Transfer Runtime and Project Files

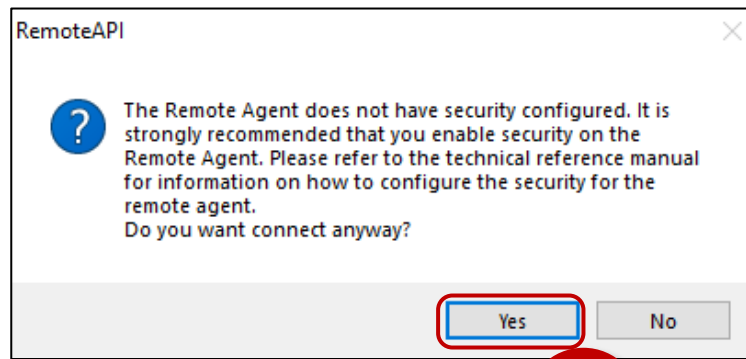
1. [Home] tab and Click [Connect] in Remote Management.



2. Set the IP Address of your Edge Box HMI e.g. 192.168.1.80
3. Click [Connect]

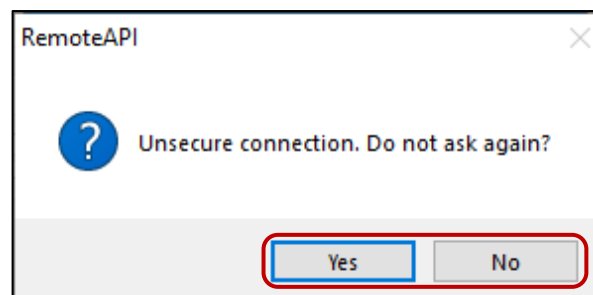


4. If prompted about Remote Agent, click [Yes]



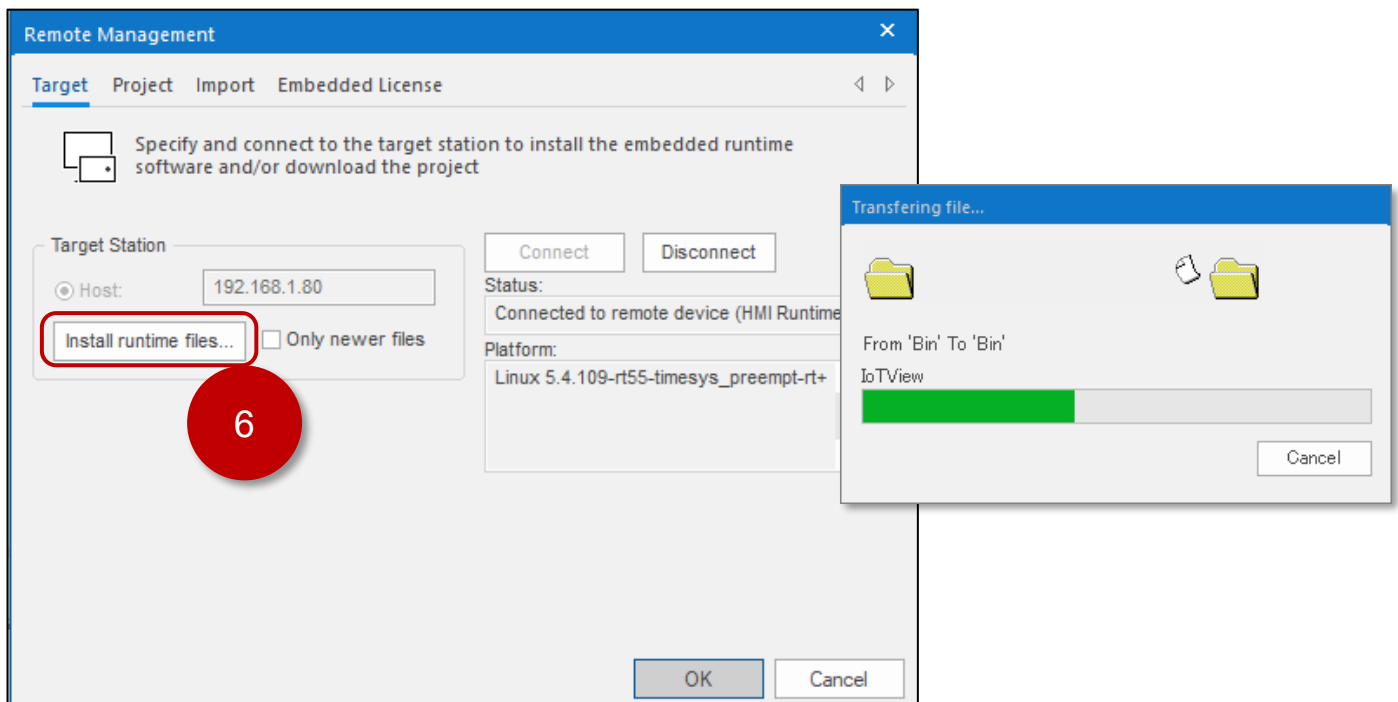
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5. Answer the question by clicking [Yes] or [No] as appropriate.



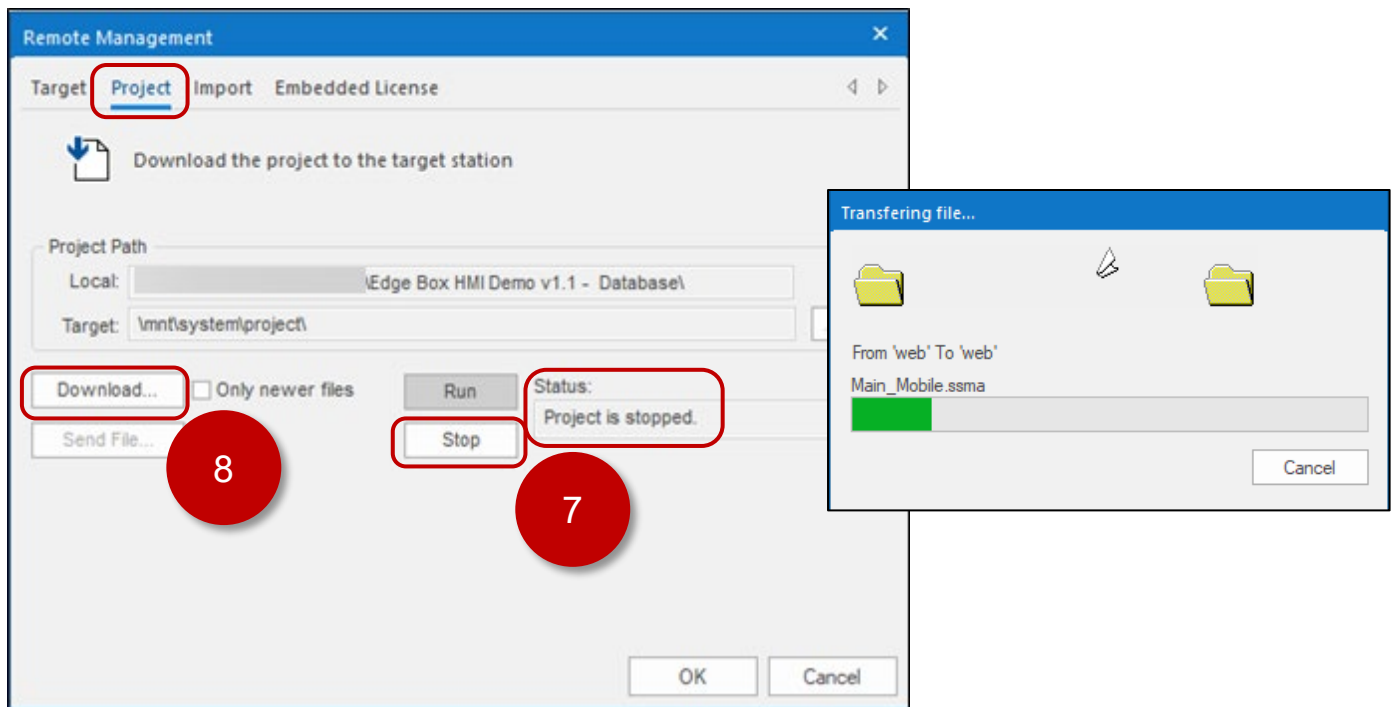
5

6. Click [Install Runtime Files]

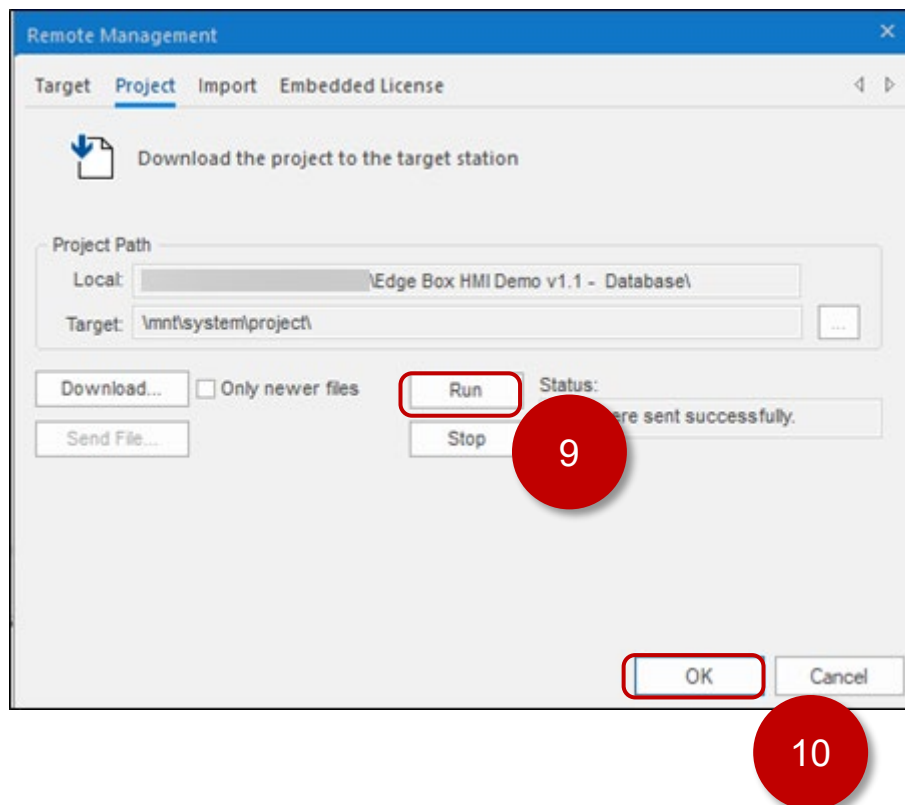


6

7. [Project] tab, confirm that the Status is stopped. If running, click [Stop]
8. Click [Download]



9. Click [Run]
10. Click [OK]



6. Mobile Access

Mobile access is used for both local and remote viewing of Edge Box HMI. You can use either ETHERNET 1 or ETHERNET 2 as the IP address for mobile access.

There are a several mobile access URL options to view the Edge Box HMI.

- Mobile Access Generic Interface
- Mobile Access Direct to screen access
- Mobile Access Watch screen Access

Web Browser URL Examples for the Edge Box HMI Demo:

Link	Description
https://192.168.1.80/MA	Generic Interface login prompt
https://192.168.1.80/MA/#guestuser=1	Generic Interface auto login as Guest
https://192.168.1.80/MA/#user=Admin&password=Admin	Generic Interface auto login as Admin
https://192.168.1.80/MA/#screen=main_desktop	Direct to main_desktop screen login prompt
https://192.168.1.80/MA/#screen=main_desktop&guestuser=1	Direct to main_desktop screen auto login as Guest
https://192.168.1.80/MA/#screen=main_desktop&user=Admin&password=Admin	Direct to main_desktop screen auto login as Admin
https://192.168.1.80/MA/#screen=main_mobile	Direct to main_mobile screen login prompt
https://192.168.1.80/MA/#screen=main_mobile&guestuser=1	Direct to main_mobile screen auto login as Guest
https://192.168.1.80/MA/#screen=main_mobile&user=Admin&password=Admin	Direct to main_mobile screen auto login as Admin
https://192.168.1.80/MA/#watch=1	Watch screen login prompt Guest access denied
https://192.168.1.80/MA/#watch=1&guestuser=1	Watch screen auto login as Guest Guest access denied
https://192.168.1.80/MA/#watch=1&user=Admin&password=Admin	Watch screen auto login as Admin