merbon

SCADA

Installation notes

Contents

1 Introduction

These installation notes are a manual for installation of Merbon SCADA inclusive all its components. MerbonSCADA includes multiple Windows services, some of which are essential for the system operation (Merbon SCADA server, Domain server), while other extend its functionalities (Alarm serverDatabase, Database Adapter).

1.1   Merbon SCADA

Merbon SCADA is a server application used for process visualisation. The package is designed for creating monitor networks of various technologies through telemetric networks and different types of local communication. The system takes advantage of the most modern software tools and communication standards, but incorporates a great deal of verified "technically standard" solutions as well. The modularity of the system enables gradual construction of the dispatching sites from the simplest visualization of metering data to distributed integrated systems. Special focus is put on high reliability, fast application engineering and easy settings even for less experienced users.

1.1.1 What is Merbon SCADA good for

The software communicates with technologies (building control systems, process controllers, and metering and readout systems, such as data collectors, communicative sensors etc.).

Merbon SCADA brings these data to technology schemas, where all instantaneous values of all peripherals and important variables are displayed, as well as to the historical data database. It shows the values, such as temperatures or energy consumptions, across a defined time range, which helps to diagnose problems and to optimize the system (fine tuning). This is important for setup of critical parameters to achieve maximum sensitivity to errors while maintaining the comfort level. It is also possible to enable and disable plants, change setpoints, time schedules etc., according to the design of the plant graphics. Last but not least, alarms are indicated as pop-ups or voice message.
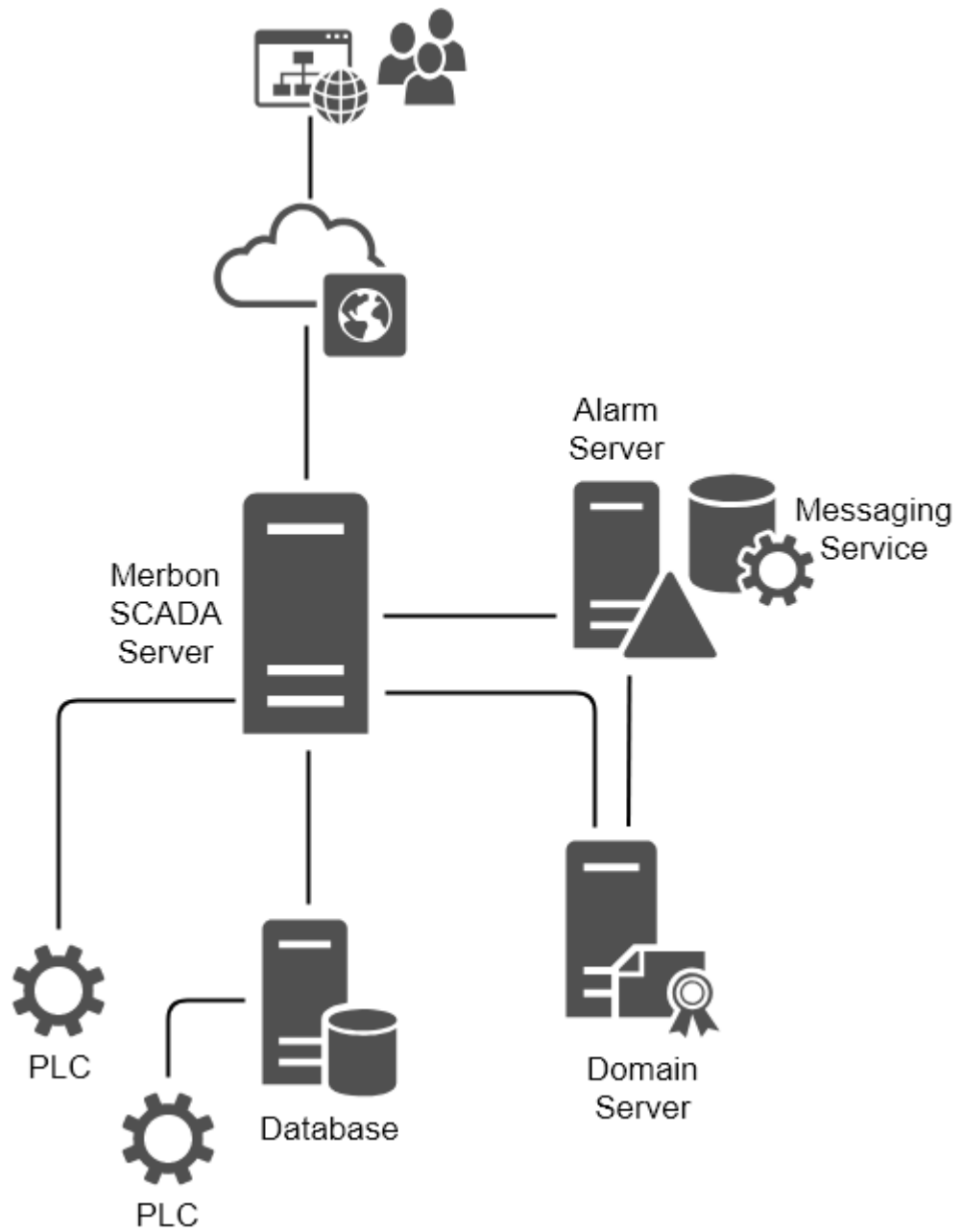
Fig. 1 - Merbon SCADA topology

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2 System requirements

2.1 Operating system

Merbon SCADA and its components may only be installed on a Windows computer.

Supported Windows OS versions:

- Windows 8.1
- Windows 10 Anniversary Update
- Windows 10 Creators Update
- Windows Server 2012 R2
- Windows Server 2016

User who performs the installation must have system administrator rights. The administrator rights are required for the changes executed in the system setup procedure.

Merbon SCADA installation is not possible when using some virtual machines. If Merbon SCADA should be run in a virtual operating system we recommend to contact Domat technical support prior to installation. In general, it is required to ensure static parameters of hardware resources of the PC (such as MAC address of the network card). Proven environments are VMware or Hyper-V. These virtualization tools supports the Merbon SCADA installation. On the contrary, Merbon SCADA can NOT be installed and run in e.g. VirtualBox.

2.2 Hardware system requirements

Merbon SCADA and its components should run without problems on computers with processors of Core i3/i5 family. For trouble-free system operation it is recommended to use 8GB RAM or more. The used disk space depends on project sizes, trend data record parameters, and other factors. It is advised to reserve 200 GB for this. A good choice are SSD disks which make the Merbon SCADA system running faster and increase user comfort substantionally.

2.3 Ports required for Merbon SCADA and components

Merbon SCADA and its components need several TCP ports for its correct functionality.

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1. Merbon SCADA – web server uses TCP port **80** as a standard, or **443** if SSL and https access is used. The service (SCADA data access) needs port TCP **8520.**

2. Domain server – a web service on TCP port **9696**, connecting to data server at port **18502**

3. Merbon Database – the API listens at port **9876**, web access for administration is at TCP port **11112**

4. Merbon Database Adapter – listens at TCP **8080**

5. Alarm server – port **8511**

Please check that these port numbers are free to ensure correct operation of the whole system.

2.4   Add-ons and applications necessary for correct operation of Merbon SCADA and its components

Before the Merbon SCADA installation begins, there must be following applications and packages installed on the target PC:

2.4.1 Installation of Merbon DB only

- **.NET Framework 4.7.2**, download e.g. here:
https://www.microsoft.com/net/download/dotnet-framework-runtime

2.4.2 Installation of Merbon SCADA and related products

- **.NET CORE SDK version 2.1.301**, download e.g. here:
https://dotnet.microsoft.com/download/dotnet-core/2.1
- **.NET Framework 4.7.2**, download e.g. here:
https://www.microsoft.com/net/download/dotnet-framework-runtime
- **Microsoft Visual C++ redistributable package version 2012**
https://www.microsoft.com/en-us/download/details.aspx?id=30679
- **Microsoft Visual C++ redistributable package version 2015**
https://www.microsoft.com/cs-cz/download/details.aspx?id=48145
- **Universal C runtime update**
    - depends on the installed operating system

Note: The installer was tested with the above mentioned versions, which were the most recent at the Merbon SCADA release date. More recent versions of the above mentioned products may not support installation of all Merbon SCADA products.

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2.5   Setup of the system

2.5.1 Installation of Merbon DB only

For correct Merbon DB installation, no specific system setup changes are required.

2.5.2 Installation of Merbon SCADA and related products

For correct installation and operation of Merbon SCADA and its components, the **Internet Information Server (IIS) manager** must be enabled and run in the operating system**.**
The service is enabled in the Windows OS configuration.

At desktop versions of Windows, which are **Windows 8.1 and 10,** the setup follows over Control panel:
Settings\All items\Windows features\Turn windows features on and off

This setting can be done automatically using the „Setup IIS" button at the installer page where installed packages are checked. Click the button to automatically configure the IIS and other features in the Windows system.

Note: Some PCs do not allow automatic setup using the **Setup IIS** button. This can be identified so that after clicking the button, the progress bar does not reach 100 %. In this case, please set the IIS manually in *Windows Features*, *Turn Windows features on and off*. Set the checkbox as shown at Fig. 3 (and Fig. 4 for Windows Server installation).
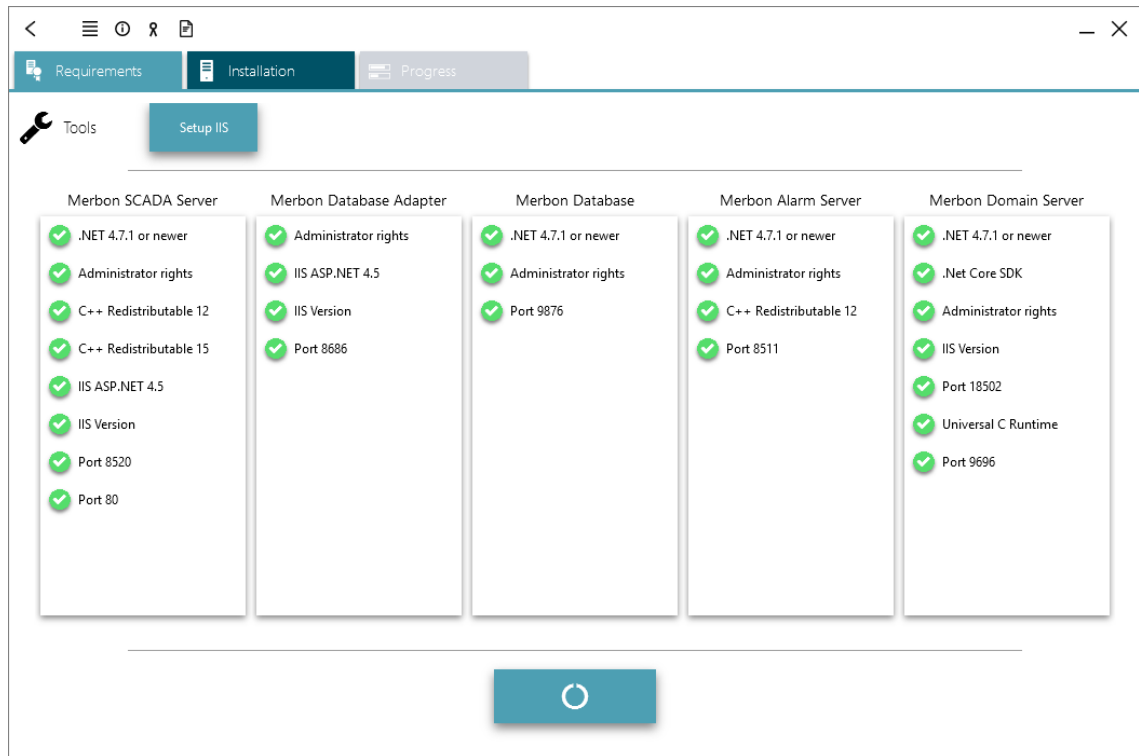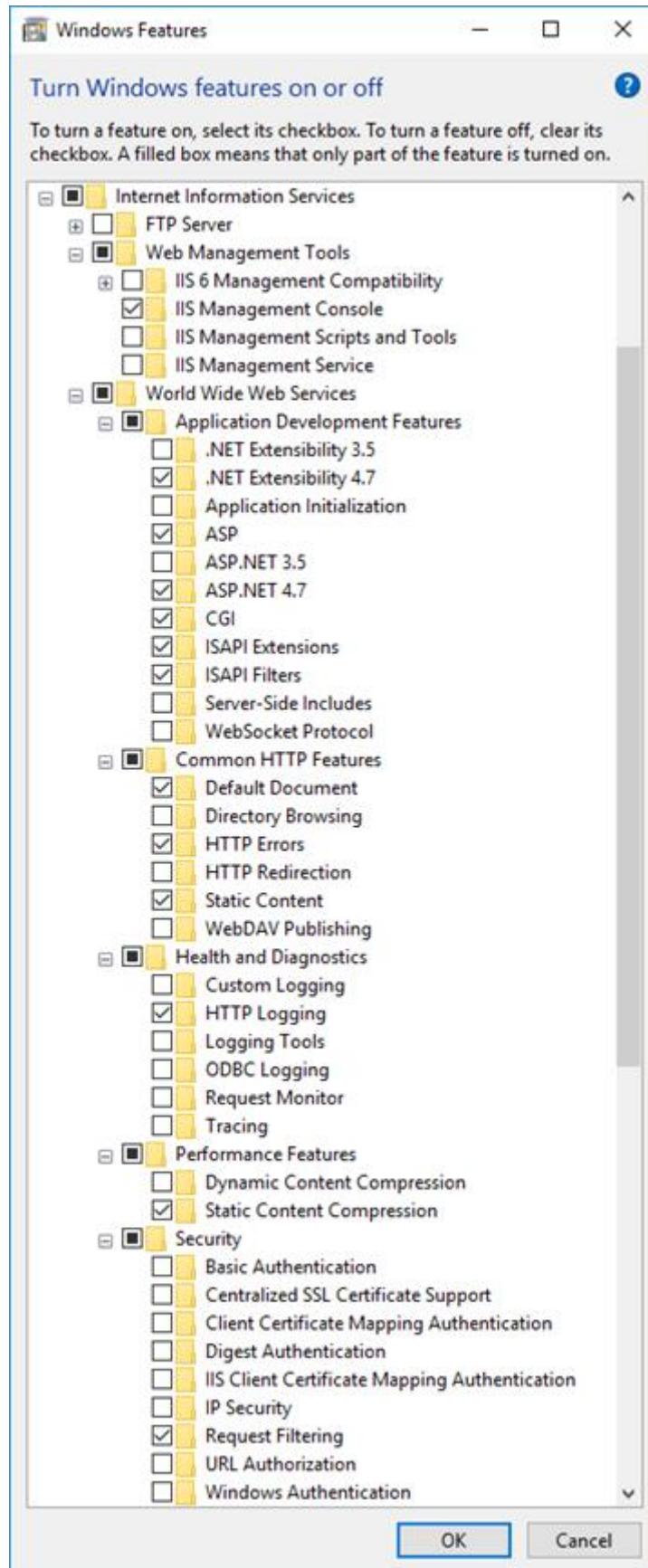
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Fig. 2 - Automatic IIS configuration

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Fig. 3 - IIS settings for a desktop Windows OS

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At server operating systems, i.e. Windows Server 2012 R2 a Windows Server 2016, the IIS manager is enabled in the server settings: *Server Manager/Add Roles and Features/:*
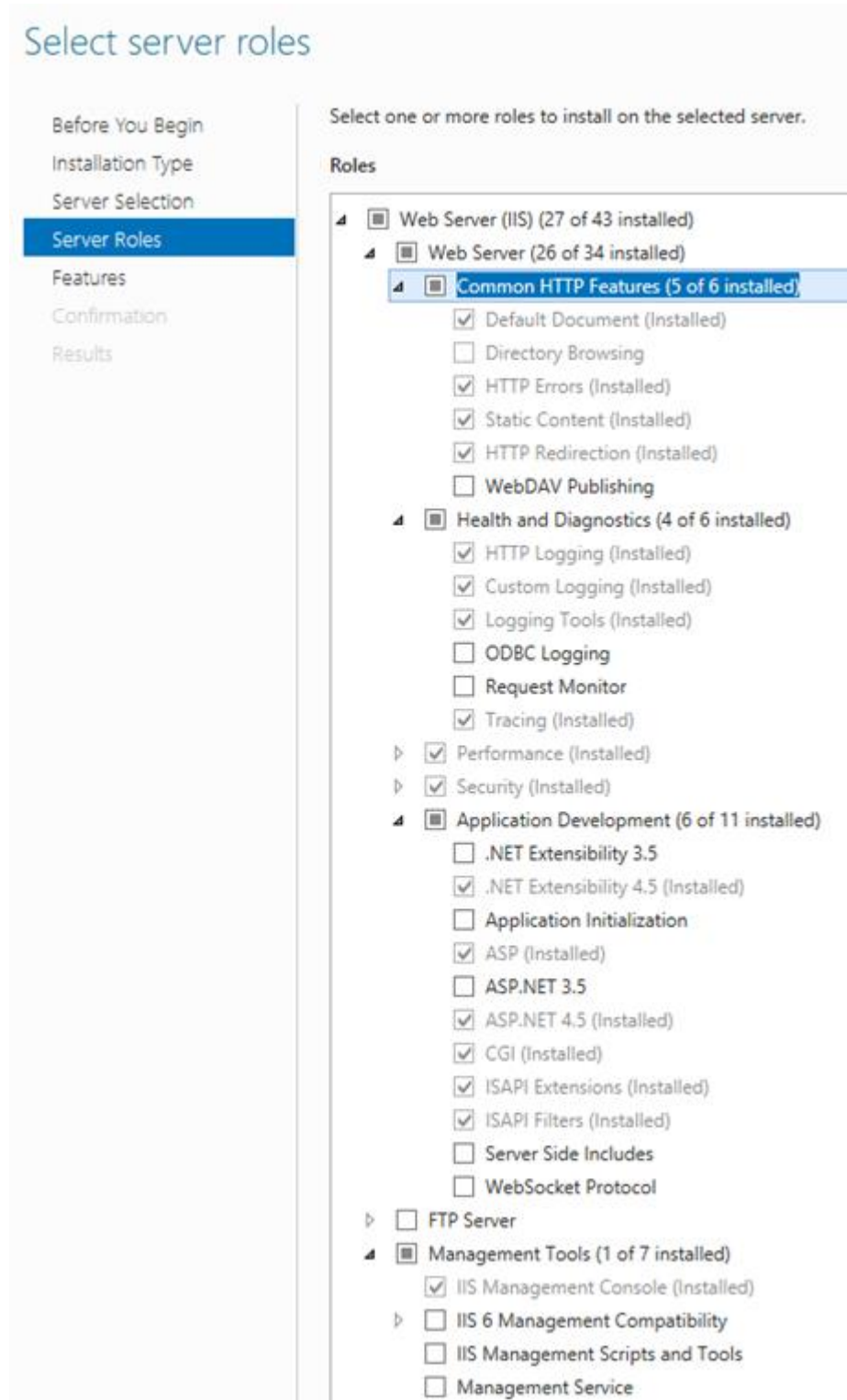

Fig. 4 - IIS setting in a Windows Server system

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If this is the first IIS setup at a particular computer, the IIS management console is installed. At the same time, a default web is also created (*Default Web Site*) running at TCP port 80. Therefore in the Merbon SCADA installer, the information about occupied port 80 (red indicator with a cross) may be displayed after IIS setup and refresh of the *Requirements* page.

This can be fixed by several ways:

1. Stop the *Default Web Site* in IIS

   Run the *IIS Manager* application. Unfold the tree structure in the left window pane, focus the *default Web SIte*, and stop the web by clicking the *Stop* button in the right part of the window (*Manage web*).
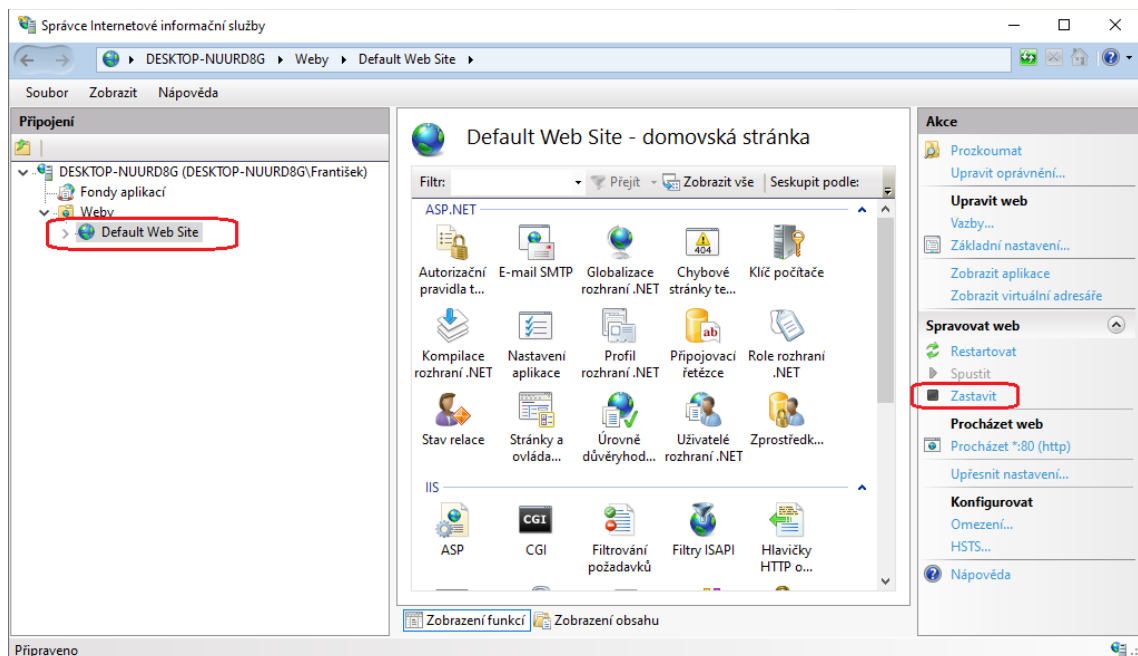
Fig. 5 – Stopping the web in the IIS Manager

2. Remove the *Default Web Site* in the IIS

   In the *IIS Manager* application, right click the *Default Web SIte*, and select *Remove*.

Note: If the *Default Web Site* is stopped only, it may happen (e.g. with automatic Windows update) that the default web is started again. Merbon SCADA then can not start. This is prevented by complete removing of the *Default Web Site*.

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3 Installation of Merbon SCADA and its components

The Merbon SCADA and its components installation follows using **Merbon SCADA Installer** program. This application is an installation and configuration tool for server management.

To install the tool, run *Merbon SCADA Package .msi.* This application creates folders which contain the installation files for Merbon SCADA and its components.

After this application has been successfully installed, a shortcut appears on the desktop.

Fig. 6 - Shortcut of the installer application

Run the installer and select the action you want to perform. If this is the first installation on this computer, select *Installation*.

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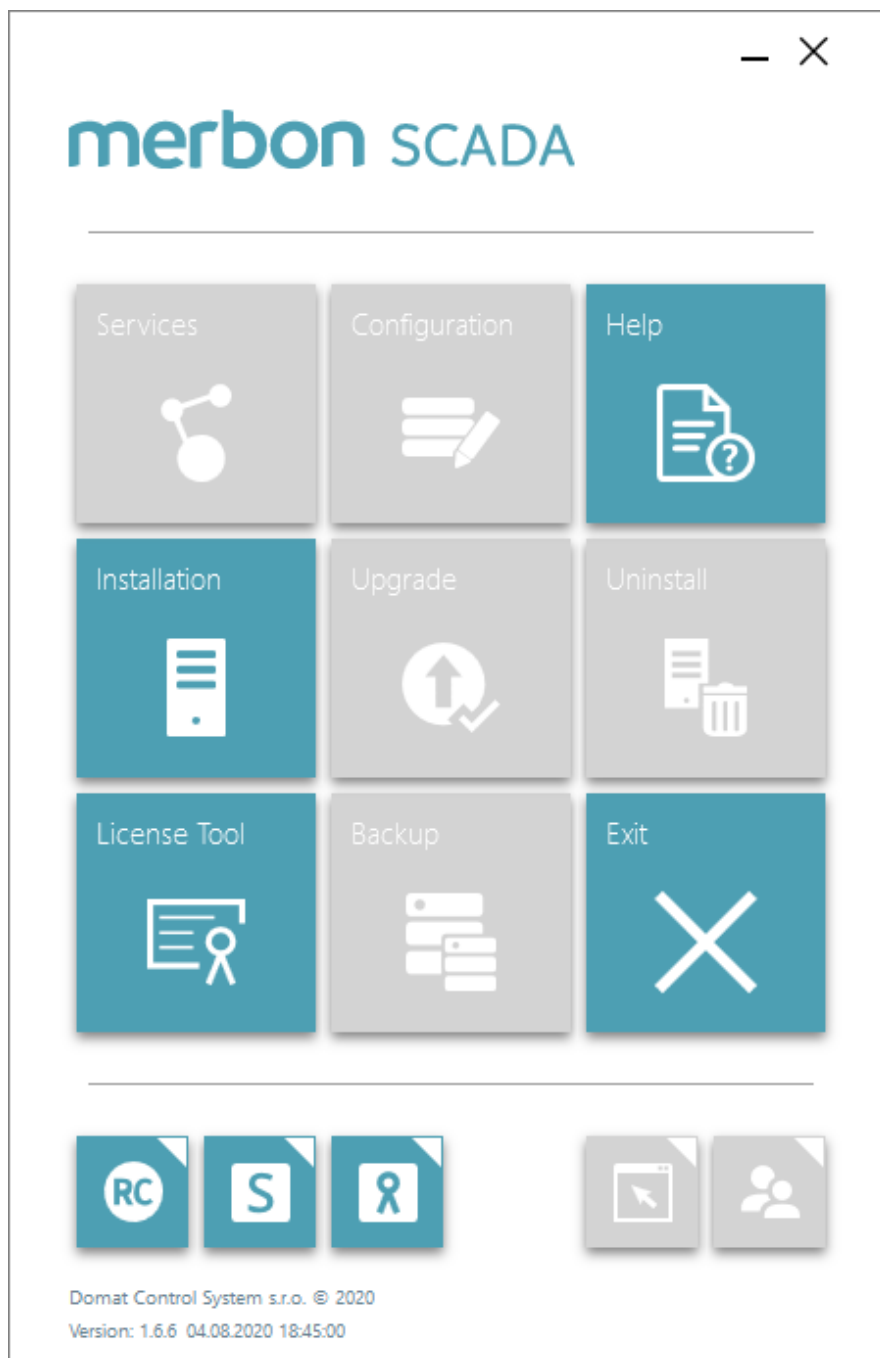
Fig. 7 - The main window of the installer

The next screen is to check if all necessary requirements for installation of selected components have been met. If everything is OK, the points must be marked by green check symbols. If any of them is marked in red, yellow, or grey, please check this item and set it up correctly. The ports occupied by correctly installed and run Merbon SCADA components are marked blue. On focus on the status indication, information about the particular problem or version are displayed.

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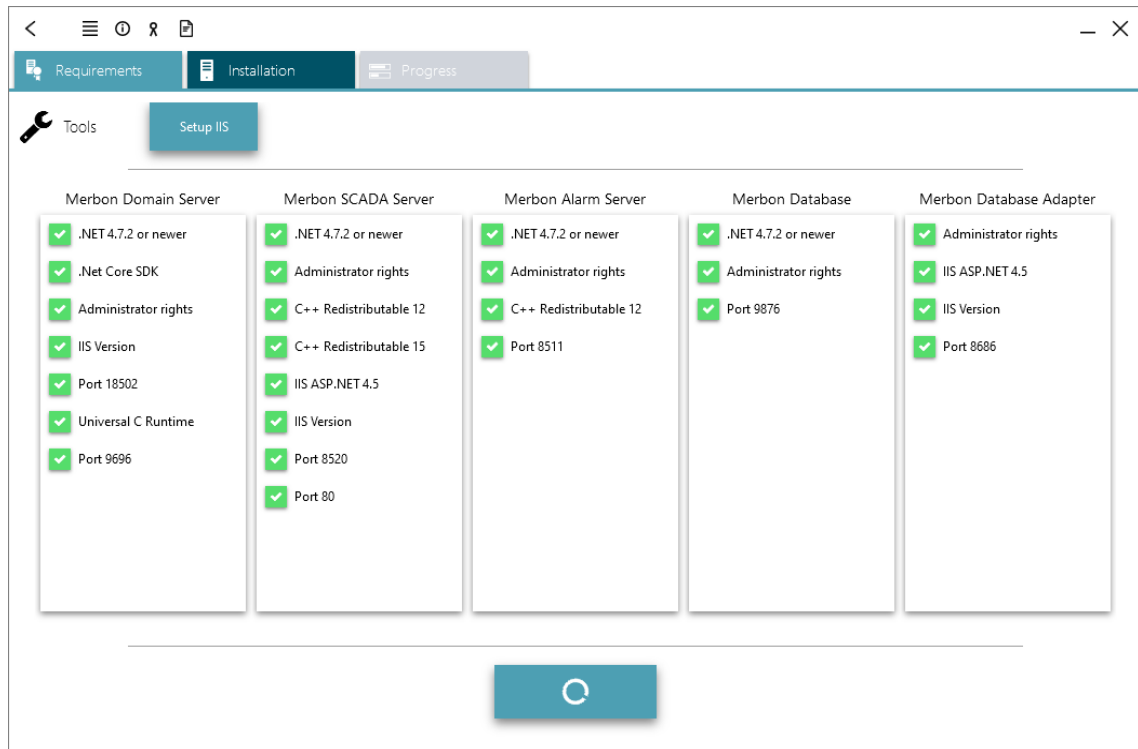
Fig. 8 - Checking of prerequisites for installation

If all necessary components have been installed, the installation itself may follow. Select the components to install on the next screen. Some components are protexted by licences, others only need to enter user name and password. Installation of the components is described below.

Select the items to install using the „▼ " button.

3.1   Merbon SCADA Server installation

This package is the core of Merbon SCADA. It is a licensed product. The licensing process is very similar to this of Alarm server or Merbon DB. The license file is generated over the web page listed below, which is also referenced by the *License activation web* button. Below the licence selection field there is a path to the project source files. This is where the projects are read from when the Merbon SCADA Server service starts. Please do not change this path unless there is a good reason for it.

It also has to be specified if trend data will be saved into native text files, or into Merbon DB database. This selection can be changed later. The last option is blocking of web pages at TCP port 80: If there is a running service in the IIS which uses TCP port 80, the checkbox *Stop Web Sites* blocks this service so as not to collide with the Merbon SCADA web.
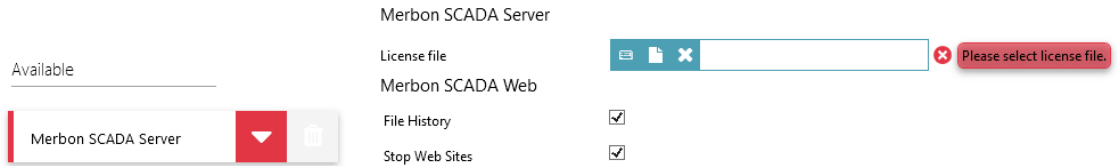
Fig 9 - Installation of the Merbon SCADA Server

3.1.1 Merbon SCADA Server licensing

Part of Merbon SCADA delivery is the license key. This license key must be enterd in the licensing tool which is part of the installer.
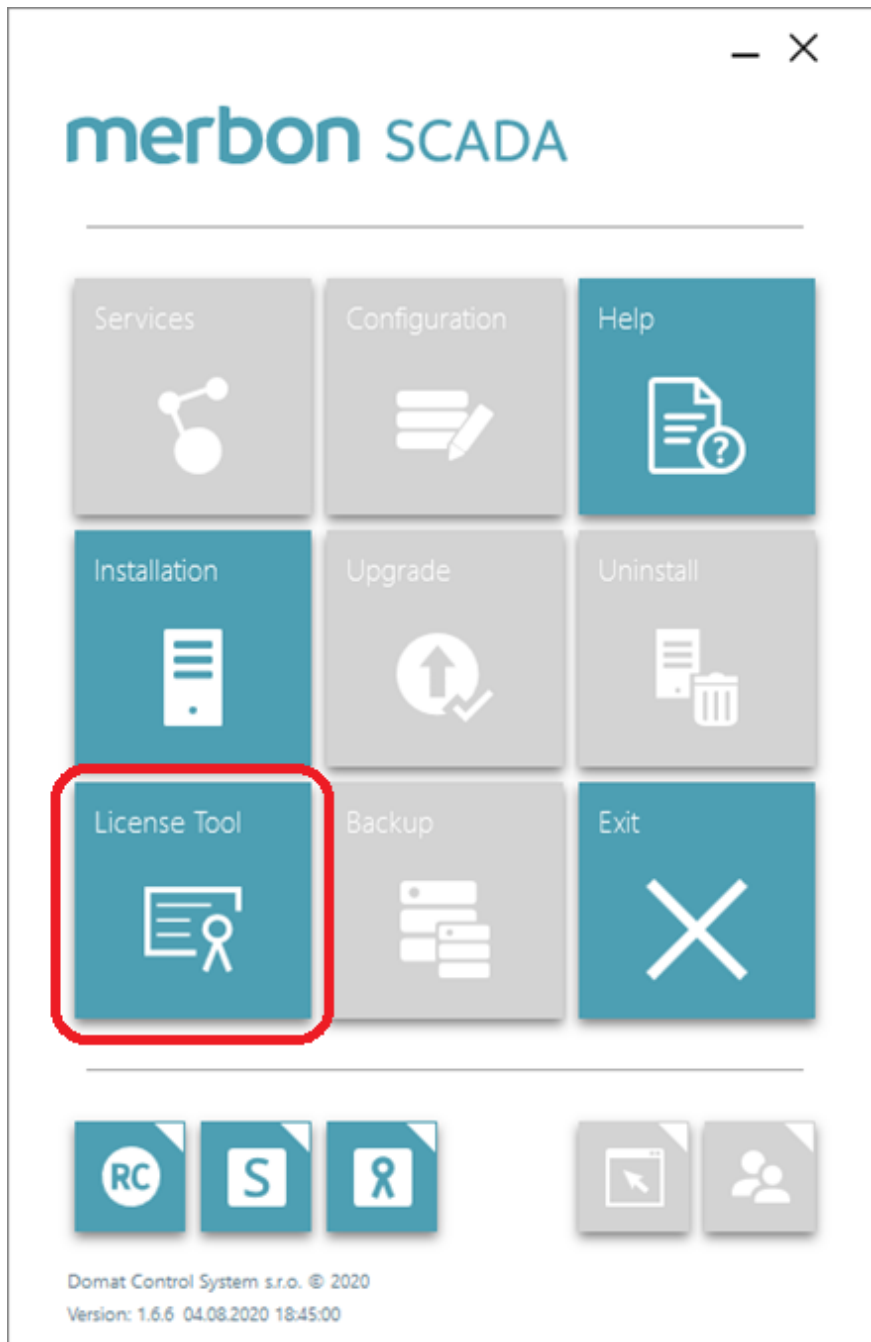

Fig. 10 - License Tool

The tool can also be launched by the button next to the license number text field.
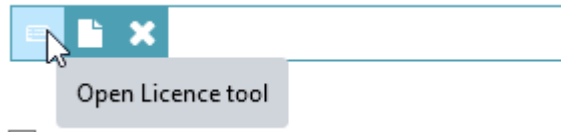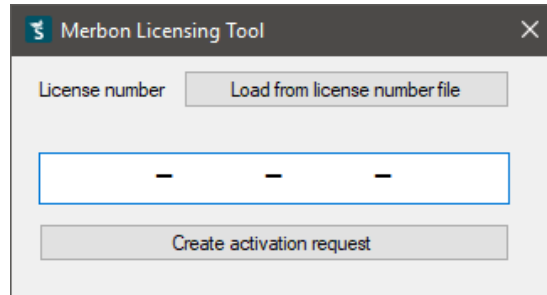

Fig. 11 - Button to launch the licensing tool

Fig. 12 - Licensing tool

Enter the license key and click the *Create activation request* button. A file is generated which must be uploaded to the licensing server, https://licenses.domat.cz/ .

Fig. 13 - Web page of the licensing server

The next step is entering an e-mail address where the license activation file link will be sent.

The downloaded activation file then must be entered in the installer dialogue.

3.2   Merbon Database Adapter

The trend data may be written into the database either directly by PLCs, or by the Merbon SCADA. If Merbon SCADA writes into Merbon DB, the Merbon Database Adapter **needs not to be installed**. If the PLCs, or runtimes of the PLCs, write into the Merbon DB directly, the Merbon Database Adapter **must be installed**. No other settings are required for this component.
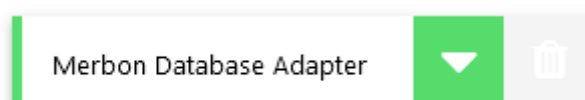

Fig. 14 - Merbon Database Adapter installation

3.3 Merbon Database (Merbon DB) installation

The Merbon DB installation process is very similar to installation of Merbon Alarm Server. Merbon DB is a fast and powerful database for storage of trend data.

This product is licensed and the license number must be purchased for every installation.
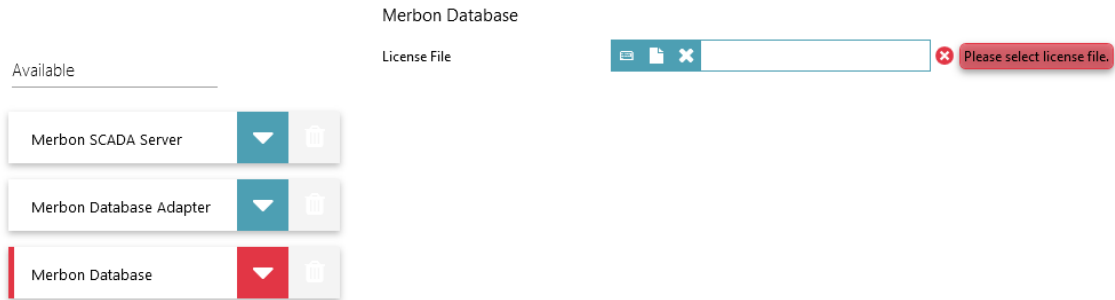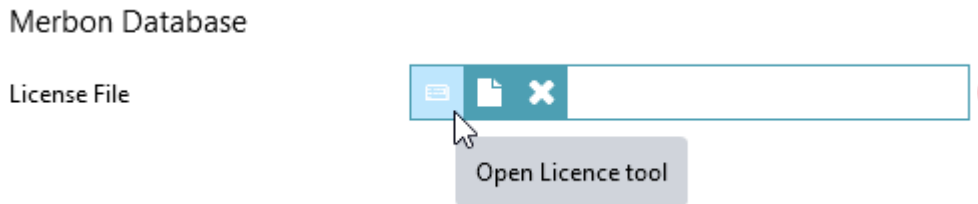

FIg. 15 - Merbon Database installation

3.3.1 Merbon Database licensing

Part of the delivery is the license key. This license key must be entered in the licensing tool which is part of the installer.

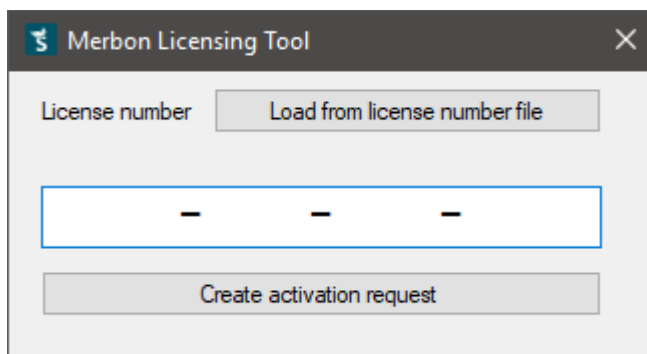*Fig. 16 - Button to launch the licensing tool*

Fig. 17 - Licensing tool

Enter the license key and click the *Create activation request* button. A file is generated which must be uploaded to the licensing server, https://licenses.rcware.eu/new/.

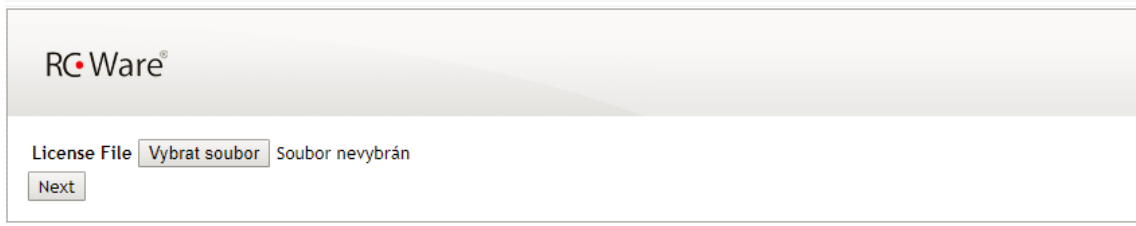01/2021 This document is current for version Merbon SCADA installer 1.7.6.

Fig. 18 - Web page of the licensing server

The next step is entering an e-mail address where the license activation file link will be sent.

The downloaded activation file then must be entered in the installer dialogue.

3.4   Merbon SCADA ALARM Server

Merbon SCADA ALARM Server is a tool for advanced alarm management of the SCADA projects. It is not necessary for the basic functionality of Merbon SCADA. This product is licensed and a license number is obtained automatically with every purchase of a Merbon SCADA licence.
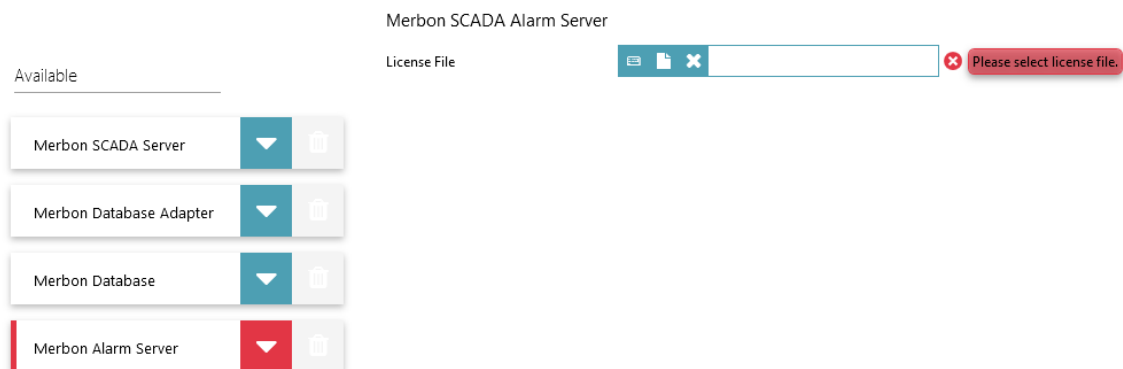

FIg. 19 - Installation of Merbon SCADA ALARM Server

3.4.1 Merbon SCADA ALARM Server licensing

Part of the delivery is the license key. This license key must be entered in the licensing tool which is part of the installer.
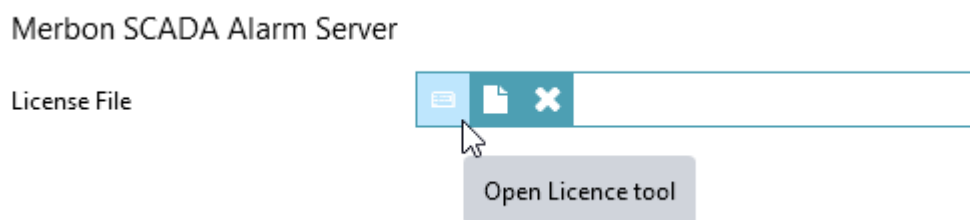

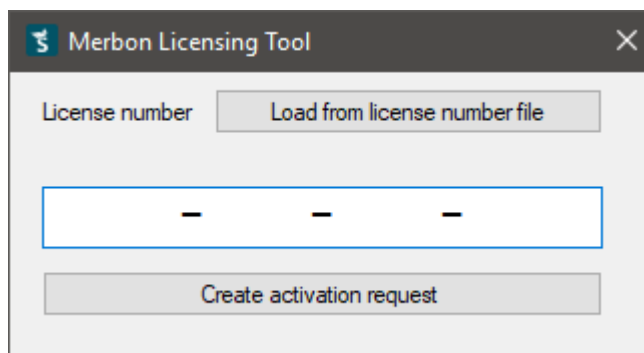*FIg. 20 - Button to launch the licensing tool*

Fig. 21 - Licensing tool

Enter the license key and click the *Create activation request* button. A file is generated which must be uploaded to the licensing server, https://licenses.domat.cz/ .

Fig. 22 - Web page of the licensing server

The next step is entering an e-mail address where the license activation file link will be sent.

The downloaded activation file then must be entered in the installer dialogue.

3.5   Merbon Domain Server

Merbon Domain Server is an integral part of Merbon SCADA. This server manages user policy and access to Merbon SCADA. The product is not licensed, just check that is has to be installed. After checking, a dialogue for administrator username and password definition opens.

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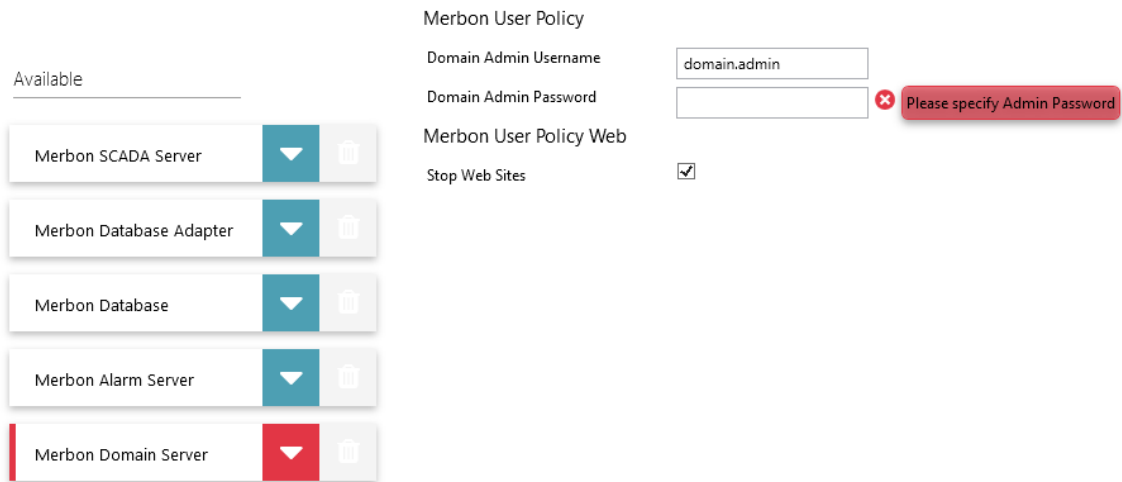
Fig. 23 - Installation of Merbon User Policy

The password must meet following requirements:

- Must contain 8 or more characters

- Must contain both small and capital letters

- Must contain at least one numeric character

- Must contain at least one non-alphanumeric character (. / _ ; , - \ | ?!,....)

Please save this password carefully as this is one of the major administrator passwords important for system management.

The last option is stopping the web pages service at TCP port 9696. If there is already a web server running on this port in the PC, check the *Stop Web Sites* checkbox to stop it and avoid collision with the Merbon Domain Server web.

3.6   Launching of installation

Once all items to install have been selected, click the arrow in the lower part of the window. The installation process starts, and you will be notified about successfully completed installation after the process is finished.

4 Verification of correct installation

4.1 Test of Merbon SCADA Server

To test the correct Merbon SCADA Server functionality, open any browser and enter the http://localhost (http://127.0.0.1) page. This is where the Merbon SCADA web access should be available.
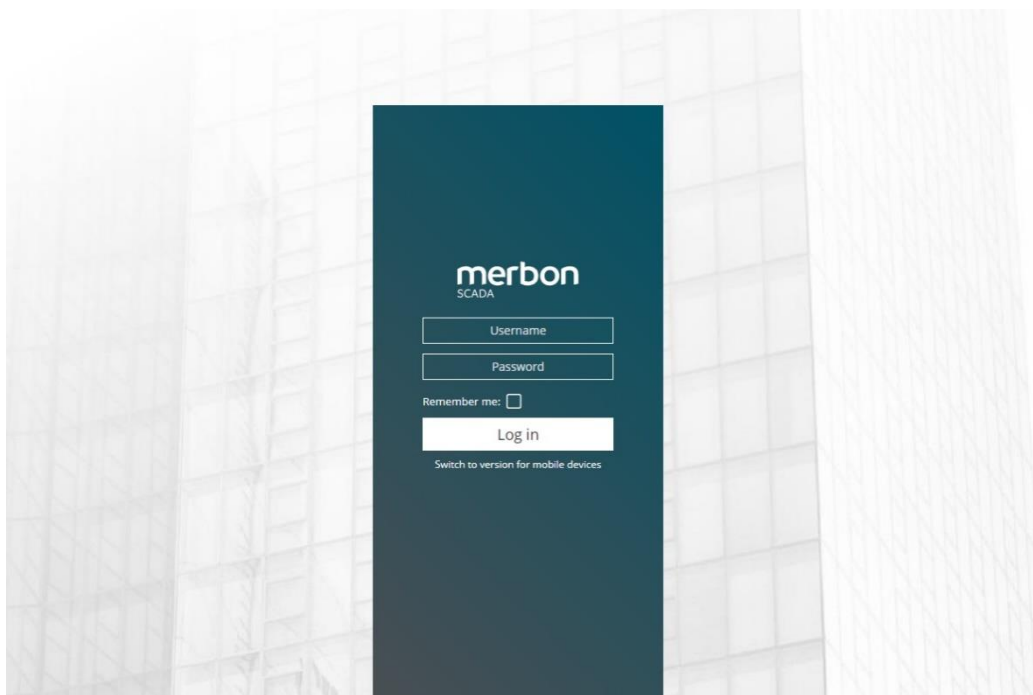

Fig. 24 - Merbon SCADA login window

For initial login, use the admin username and password which were entered at the Merbon Domain Server installation.

After login, the following window appears:

Fig. 25 - Merbon SCADA logged-in user

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If the login has been correct, the Merbon SCADA Server and Merbon User Policy (domain server) are working correctly and have been set up properly.

Another way to check the Merbon SCADA Server functionality is the Windows service manager (*services.msc*). There should be a service named „*MerbonSCADA_MerbonSCADAServer*" among the running services, with status *Running*.

If Skype is installed on the computer, it may be necessary to fix the port settings in Skype settings. Skype in older versions has an option which uses ports 80 and 443 for incoming connections. This option is checked by default and must be **unchecked**. It is available in Skype Settings:
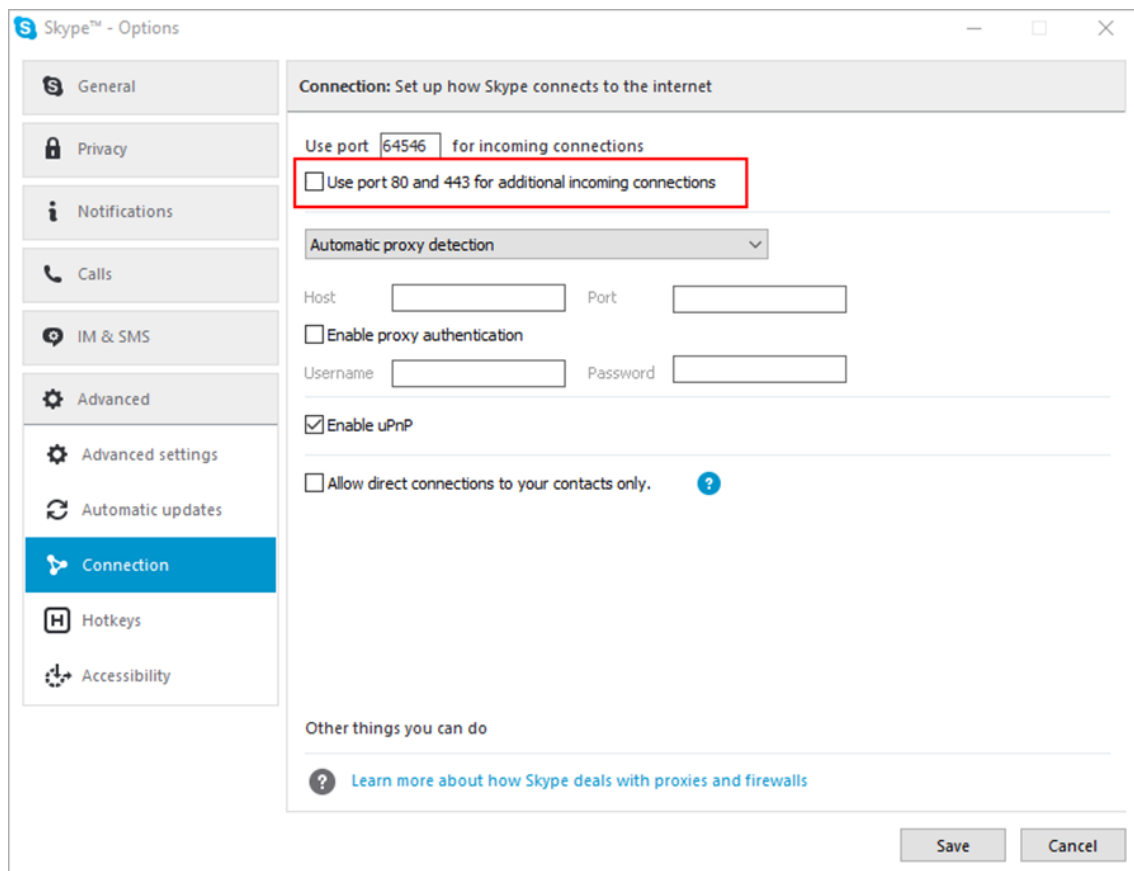

Fig. 26 - Port settings in Skype

4.2   Test of Merbon User Policy

The Merbon User Policy web access is available at localhost, on TCP port 9696 – enter http://localhost:9696 or http://127.0.0.1:9696 in your browser.
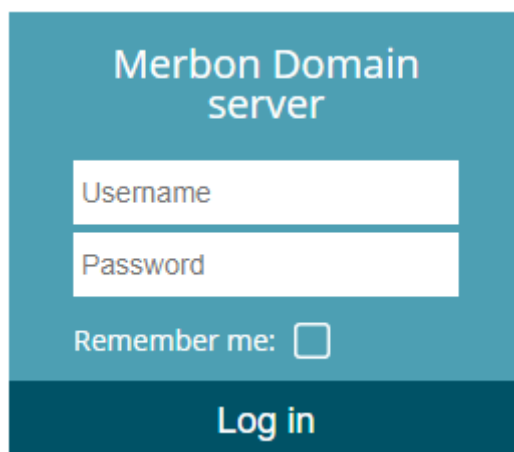
Fig. 27 - Log in into the domain server

Use the user name and password which was entered at the installation time.

4.3   Test of Merbon Database

To test the Merbon Database functionality, just check the web pages at http://127.0.0.1:11112/admin/#/login or http://localhost:11112/admin/#/login. User name is „admin" and password is „rw".

If the page displays correctly and login is successfull, it can be supposed that the Merbon Database has been installed correctly.

In case that **Acronis Backup** is running on the computer, please check that it does not occupy TCP port 9876, which is used by Merbon Database by default.

5 Reconfiguring Merbon SCADA web to https and port 443

If customer requires encrypted web access to Merbon SCADA (https) at port 443, following steps must be completed:

First, the server needs a certificate. An IIS certificate is a *.pfx file. If there is a certificate in another format available, it must be converted to *.pfx – contact the IT security manager or certificate supplier please.

In the Internet Information Service manager, this certificate must be added to the server certificates.
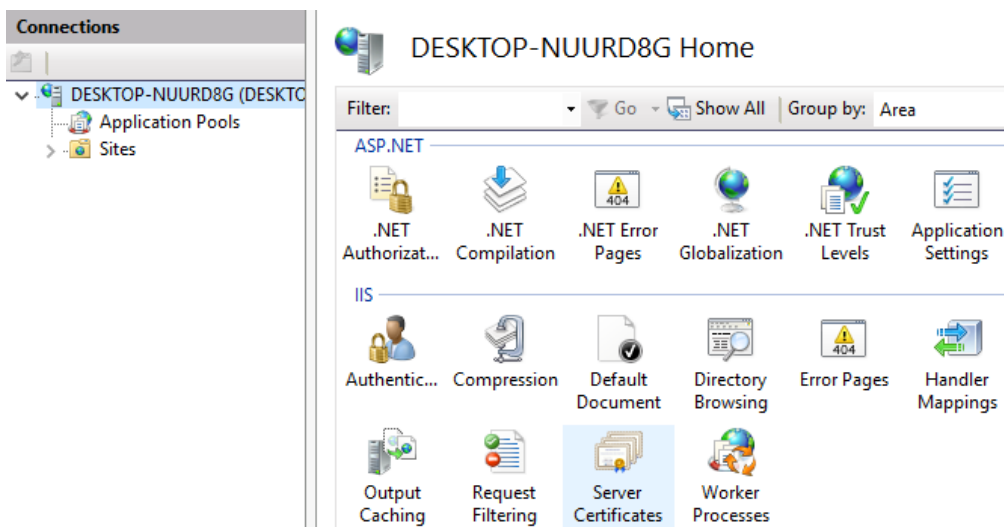
Fig. 28 - Server certificates

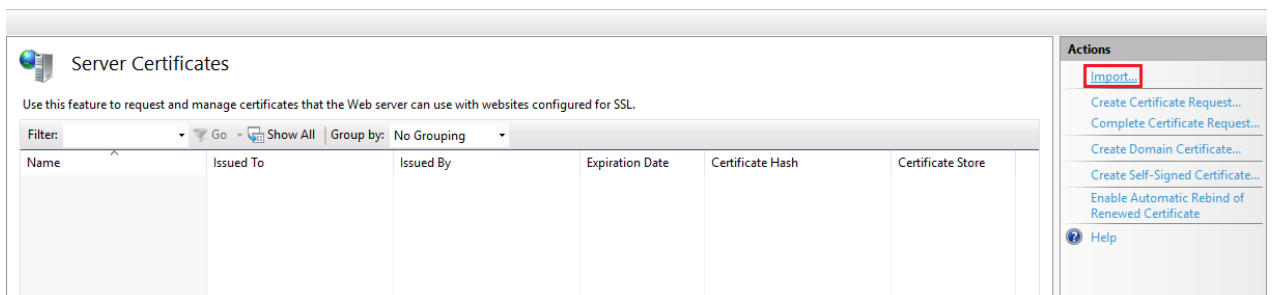Open the editor and click Import in the right part of the window.

Fig. 29 - Certificate import

Select the *.pfx file in the next window, and enter the import password for the certificate. Then, set the „Select certificate storage" to „Personal" and keep the last option checked.
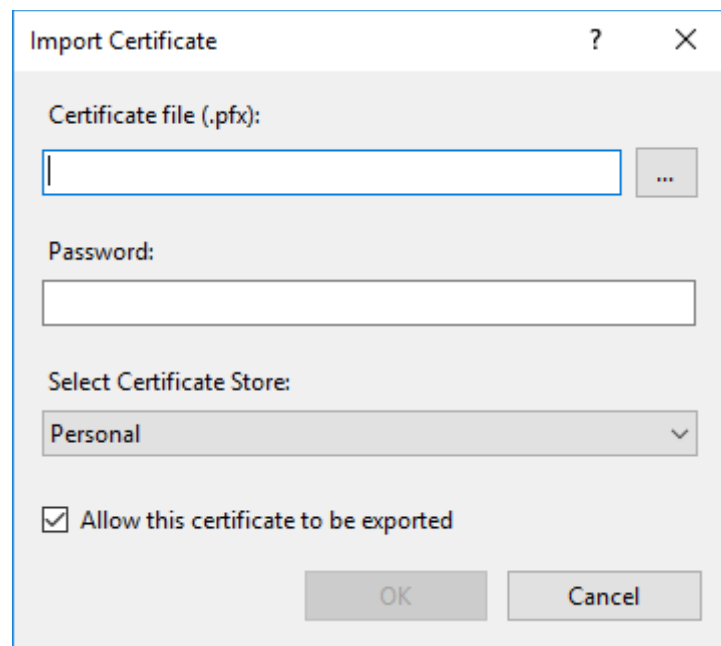
Fig. 30 - Certificate import, step 2

After the certificate has been imported, go to the Merbon SCADA web and select „Bindings".
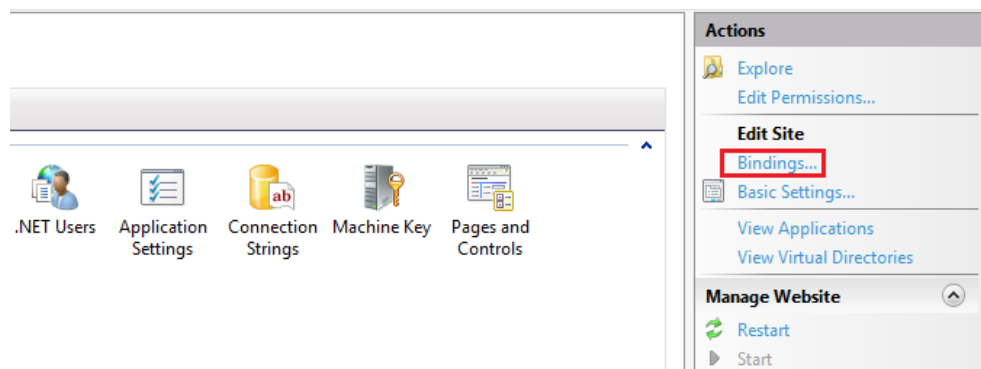

Fig. 31 - Settings of Bindings

In the next window, select „Add…" another binding. Select „https" as the binding type.

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Fig. 32 - Definition of binding

The last step is selecting the certificate. The host name and other data remain unchanged.

After this binding has been added, the Merbon SCADA web is available at ports http – 80 nda https – 443. If only encrypted connection is required, remove the binding for port 80 from the binding list.

FInd more about SSL certificates and their application in the *Merbon SCADA Operating Information* manual.

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