SKF @ptitude Observer

Installation Manual – Open Document
Part Number **32170700**
Revision **ZA – January 2025**
Software version **13.6**

⚠️ Read this manual carefully before using the product. Failure to follow the instructions and safety precautions in this manual can result in serious injury, damage to the product or incorrect readings. Keep this manual in a safe location for future reference.

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Product Support Contact Information

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1 Requirements

1.1 Overview

The SKF @ptitude Observer software installation includes the following components:

- @ptitude Observer
- @ptitude Observer database administrator
- @ptitude Observer monitor and monitor manager
- @ptitude Observer on-line device configurator

There are various installation scenarios to be considered:

- **Network configuration** – **Network Client**: a computer running only the SKF @ptitude Observer client software.

- **Network configuration** – **Server:** a computer running the Monitor service and hosting the Microsoft SQL Server database.

- **Stand-alone configuration** – a single computer running the SKF @ptitude Observer client software, the Monitor service and hosting the SQL Server database.
- **Custom** – any system combination not covered by the above.

1.2 Hardware requirements

1. **Processor** – For stand-alone and network client installations, a minimum of dual-core CPU with 2.5 GHz or higher.
   For an SQL/network server, at least four-core CPU with 2.5 GHz or higher.
   Note that the above recommendations are for a "dedicated PC".
   Simultaneously running other applications may degrade performance.

2. **RAM** – For stand-alone and network server configurations, a minimum of 8 GB, with more recommended. For an SQL/network client, 4 GB or higher.

3. **HDD free space** – For stand-alone and network server configurations, a minimum of 1.2 GB for the software installation is required. Note that additional storage space for data is required.
   For each network client, 1 GB or more is recommended, 0.5 GB minimum.

4. **Other requirements** – Stand-alone and network clients require a display with a minimum resolution of 1366 × 768 with 1920 × 1200 or larger recommended. Note that SKF @ptitude Observer is designed for a default Windows font size (smaller:100%). Using a larger font size may result in display anomalies in some interfaces/forms.
   An effective backup system and procedure is highly recommended.

1.3 Software requirements

SKF @ptitude Observer client software and the Monitor service support all Windows versions from Windows 7, including server operating systems, and with each @ptitude Observer release, the aim is to support any newly introduced versions.

Whilst @ptitude Observer supports 32 and 64-bit operating systems, the Monitor service requires 64-bit. It is always recommended to install the latest available service packs.

Note that an admin-level account will be required to install the software and run the Monitor Manager tool.

For stand-alone and network server installations, Microsoft SQL server 2016, 2017, 2019 or 2022 is required. Microsoft SQL server software has its own operating system requirements, depending on the version.

2 General guidelines

If upgrading an existing @ptitude Observer installation and there are any databases from a previous version of @ptitude Observer that are to be used with the new version of @ptitude Observer, then these will need to be upgraded before use. Note that it is possible to retain and run several different versions of @ptitude Observer software on the same computer, but each will require databases that are consistent with that software version. In addition, each database will have an individual monitor service.

For more information on all these aspects refer to Software Upgrade.

Note that references to 'X.Y' in this user manual relate to the software version X.Y. Where the new @ptitude Observer software has a different version to that already installed then no existing version need be uninstalled, but a new licence key will be required and existing databases being used with the new version should be upgraded.

If the new @ptitude Observer software is a 'patch' having a designation X.Y.Z (for example 12.1.1) then the X.Y versioning is unchanged, any existing X.Y version will have to be uninstalled, but the existing licence key will still function and X.Y databases do not need to be upgraded before they can be used.
If installing a completely new instance of SKF @ptitude Observer, follow the general guidelines on installation and setup that follow below.

2.1 Installation and setup guidelines

1. Install the **database engine** that will be used by @ptitude Observer.

    The @ptitude Observer system uses Microsoft SQL Server as the recommended database engine. As detailed above, @ptitude Observer is compatible with a wide range of SQL server versions and the royalty free version of SQL server can be used for databases with sizes up to 10 GB.

    • To install SQL Server Express version, follow the instructions in SQL Server Express Installation.

        ➢ To install a different version of SQL Server other than Express, check the SQL Server documentation for installation instructions.

2. Install SKF @ptitude Observer components by following the instructions in the installer and referring also to the @ptitude Observer Installation section.
    It contains the following components:

- @ptitude Observer is for data management and analysis of measurement data for condition monitoring. @ptitude Observer runs on all clients.

- @ptitude Observer database administrator is the tool for administrating @ptitude Observer databases.

- @ptitude Observer monitor is the service which works as the connector between the IMx system, database and @ptitude Observer clients. Detailed information can be found in @ptitude Observer Monitor Service.

- @ptitude Observer Online device configurator is a tool which can set the network configuration and identification for the on-line device. It also enables viewing of what the on-line device is measuring right now, clearing measurement data, showing current measurement configuration and synchronizing the time.

3. Create @ptitude Observer database(s).

   To be able to run @ptitude Observer, at least one database must be available that is compatible with the latest installed @ptitude Observer version.

   The creation of a new database or upgrading of an existing database is accomplished with @ptitude Observer Database administrator.

   If @ptitude Observer Database administrator component has not been installed, repeat step 2 and make sure to select @ptitude Observer Database administrator at the Custom Setup screen.

   - Start @ptitude Observer Database administrator by clicking on the shortcut on the start menu located under **All Programs\SKF @ptitude Monitoring Suite X.Y\Database Administrator** or for Windows 10 **SKF @ptitude Monitoring Suite X.Y\Database Administrator** in the alphanumeric list of installed programs.

   - A description of the use interface for the Database administrator is included in the Prepare an Observer Database section. In addition, further detailed information is contained in the **SKF @ptitude Observer Database Administrator** user manual, part number 32170600.

   The database settings are stored in a connection file for each database.

4. Set up **@ptitude Observer** with language and register with the license key.

   - Start @ptitude Observer by clicking on the shortcut on the start menu located under **Programs\SKF @ptitude Monitoring Suite X.Y\Observer** or for Windows 10 **SKF @ptitude Monitoring Suite X.Y\Observer**

in the alphanumeric list of installed programs.

- Select a language to use.
- Register with the license key.

It is possible to change the language and license key after the initial settings have been made. For more information, refer to Edit Observer Settings.

5. Create a connection between @ptitude Observer and the database(s).

The connection between @ptitude Observer and the Observer database(s) is described in detail in the Manage Databases section of the **SKF @ptitude Observer** user manual, part number 32170900.

6. Configuration of monitor settings.

To be able to use @ptitude Observer as an on-line system, the communication and database storage are performed by an Observer monitor service. The configuration of the monitor settings is described in @ptitude Observer Monitor Service.

If @ptitude Observer monitor component has not been installed, repeat step 2 and make sure to select @ptitude Observer monitor at the Custom Setup screen.

7. Set up @ptitude Observer monitor computer and on-line devices.

For the @ptitude Observer monitor computer and on-line devices to communicate, then IMx/MasCon Network Settings need to be configured and Time synchronization activated.
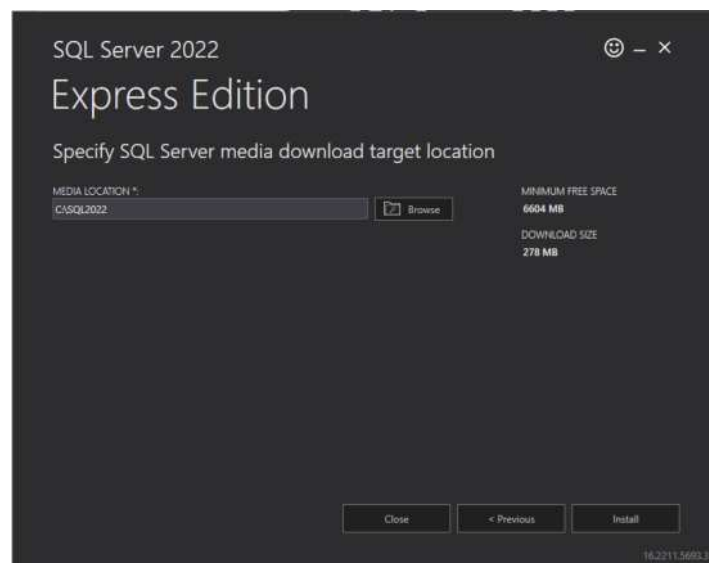
3 SQL Server Express installation

3.1 Installation procedure

An SQL Express server installer is available as a download from Microsoft. The following screenshots and installation steps describe the installation of SQL Server 2022.

1. Double-click on the installer to initiate the installation. Select installation type. For this illustration, a new **Custom** installation type is being performed.
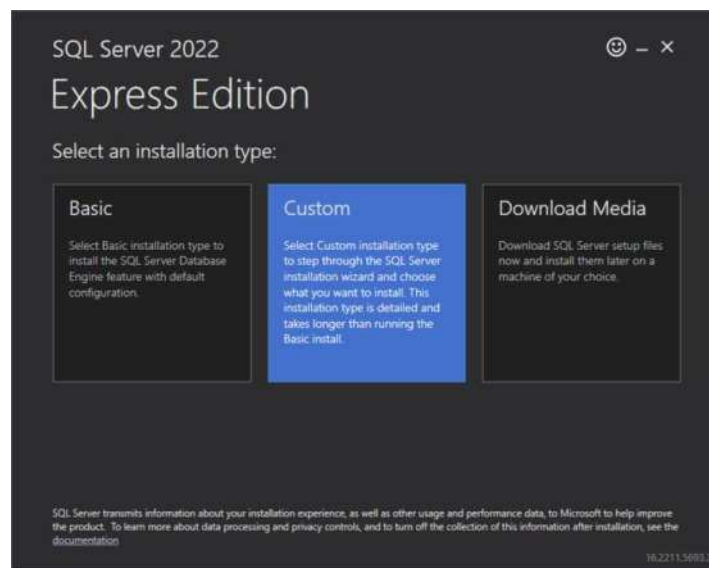
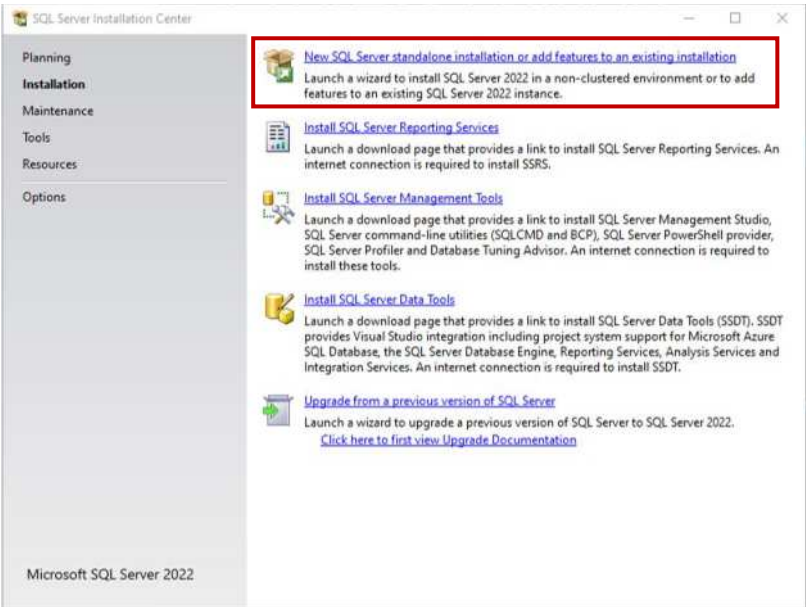
2. Select media download location and click **Install**.
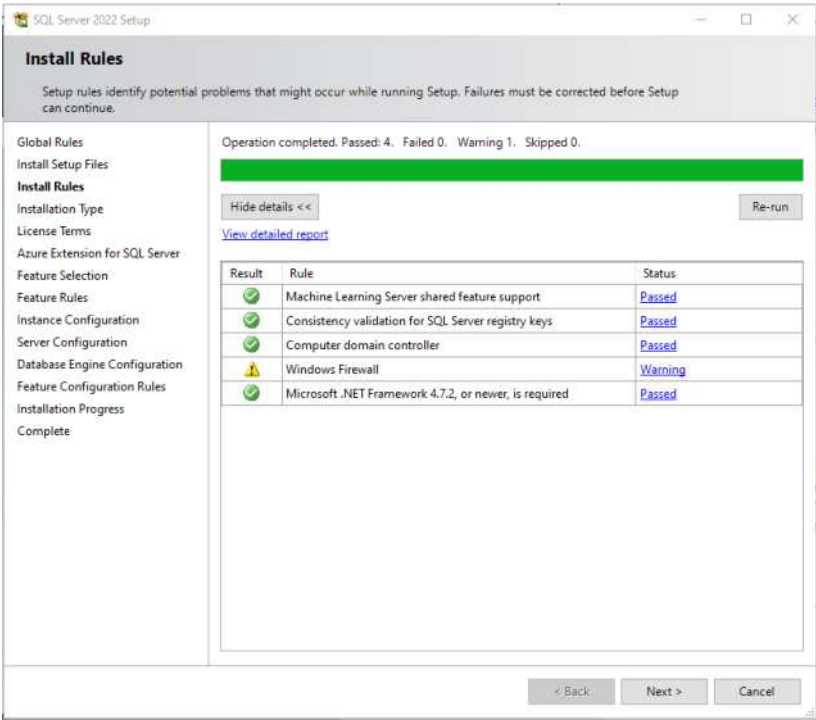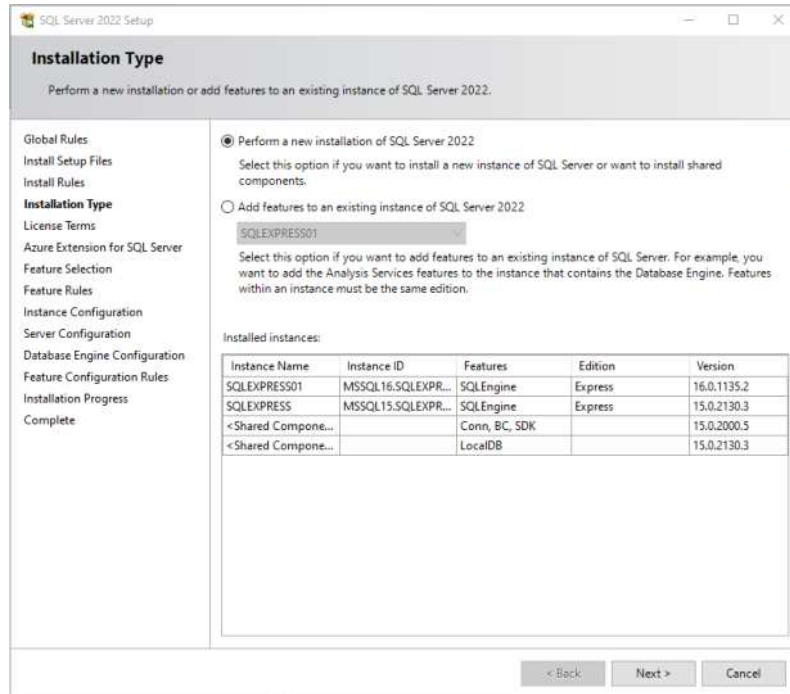
3. In the **Installation Center** screen select installation. For this illustration, a new stand-alone installation is being performed.
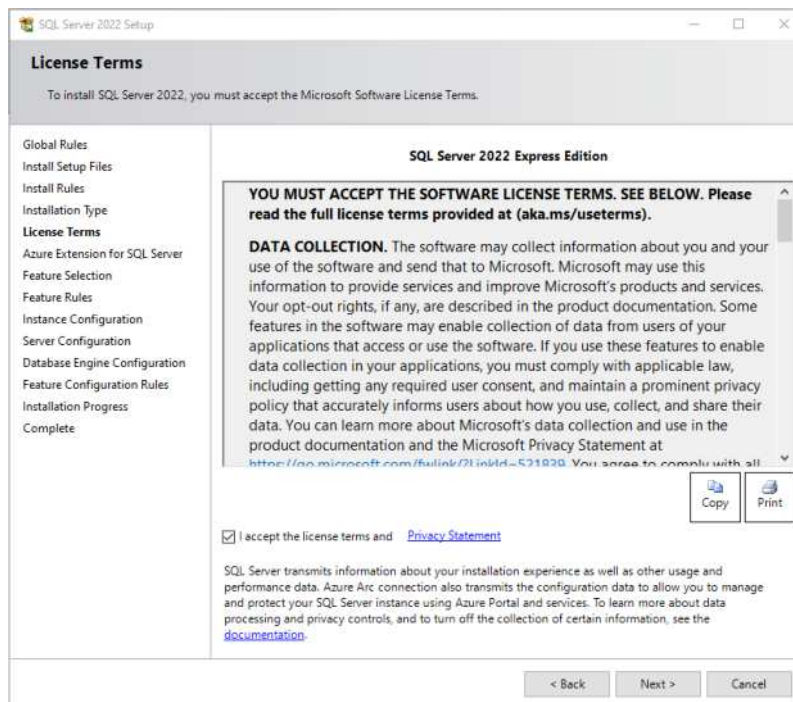

4. In the **Install Rules** screen, the results are presented. If no operations have failed, click **Next**.
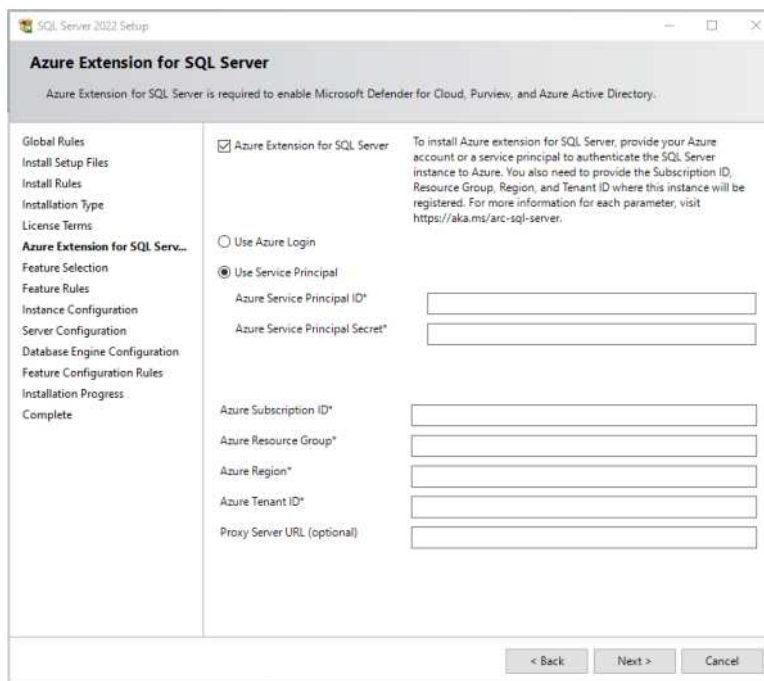
5. Select **Installation Type**, for this illustration we will perform a new installation. Click **Next** to continue.
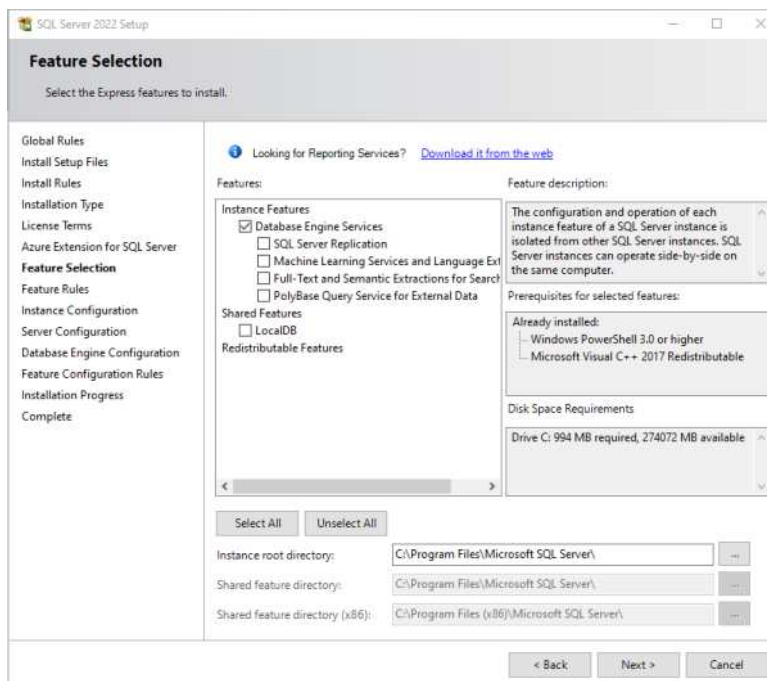

6. On the **License Terms** screen, read through the license terms and accept them. Then click **Next** to continue.
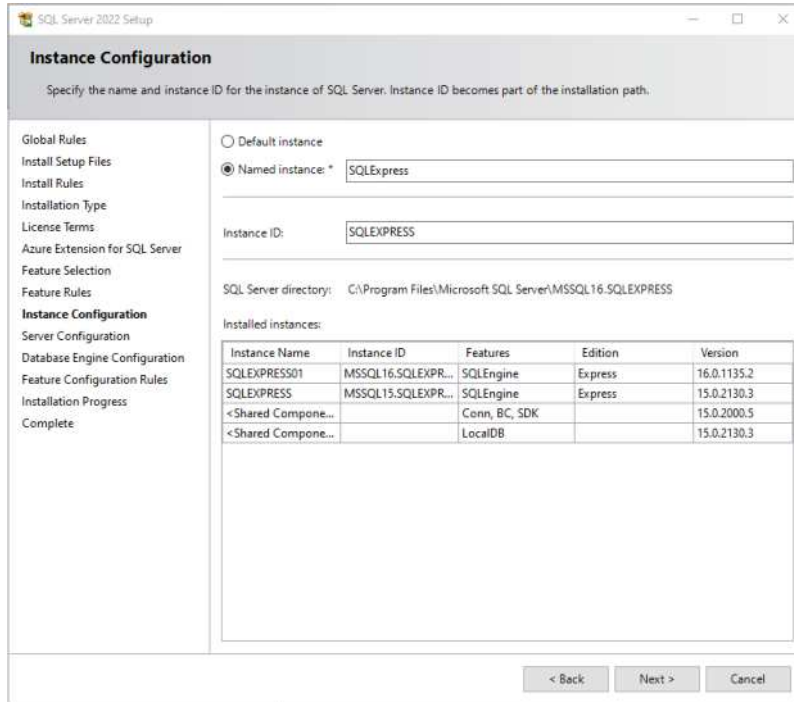
7. On the **Azure Extension** screen, decide whether to install **Azure extension for SQL Server**. If you choose to install it, select either **Azure Login** or **Service Principal** and provide the required information.

8. When prompted to select which features to install, make sure to install at least the options **Database Engine Services.** Click **Next**.

9. When the **Instance Configuration** screen is displayed, note the default naming and click **Next** to continue.

10. On the **Server Configuration** screen, click **Next**.

11. **Important:** on the Database Engine Configuration screen, select **Mixed Mode authentication** and fill in a **System Administrator** password.

In addition, SQL Server needs to have a SQL Server administrator specified. If unsure about which account to pick and the current user is not already visible, it is recommended to click the **Add Current User** button.
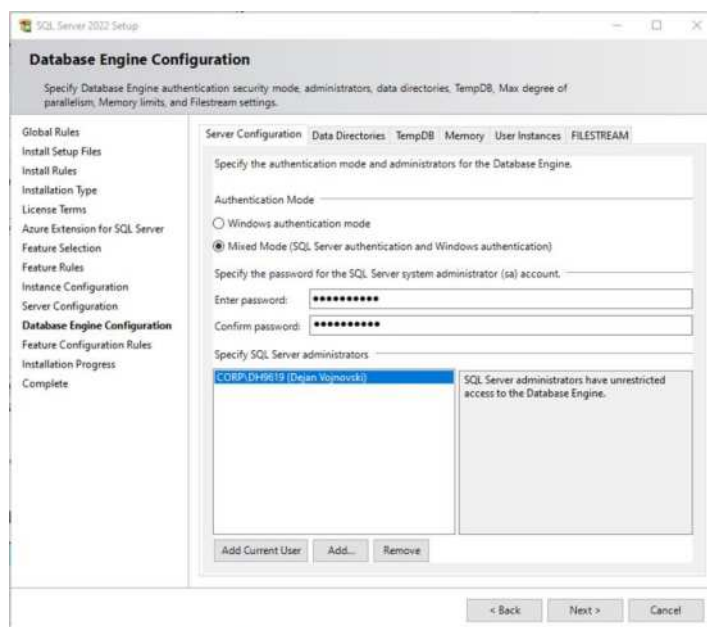
12. On clicking **Next**, the install will begin, and a progress bar shown:
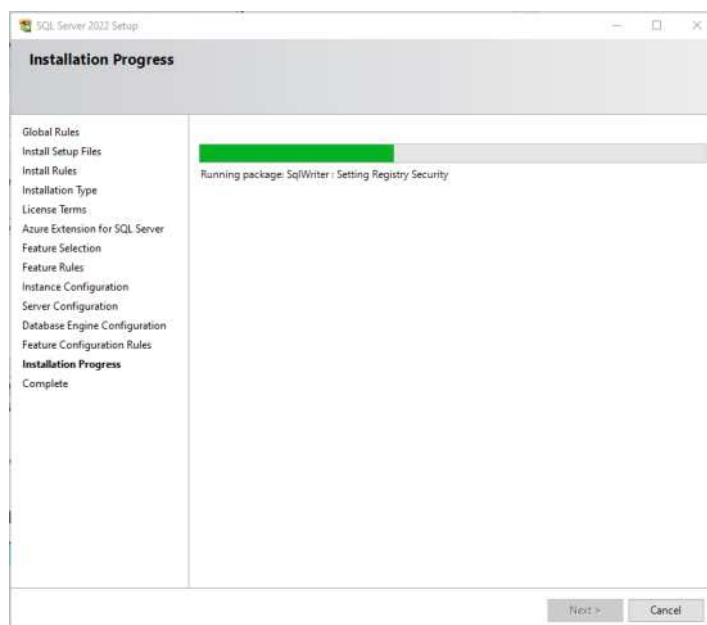
13. After the installation is complete, click **Close** and if still open, the **Installation Center** screen can also be closed.

4 @ptitude Observer installation

4.1 Installation procedure

1. Run the SKF @ptitude Observer install file.

2. To select install location, click **Options** > **Browse** and select location. Click **OK** to confirm.

3. Click **Install** to start the installation. The installer will first check for any missing required third-party packages, install them, and then continue with the installation of Observer.
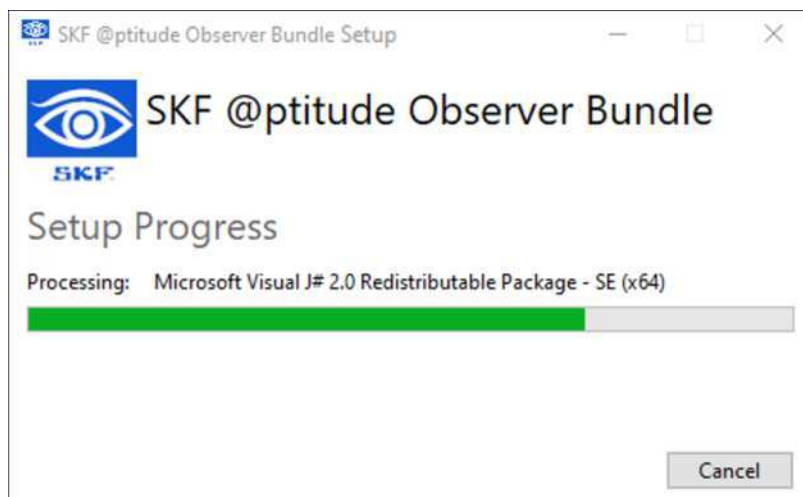
4. The InstallShield® Wizard will guide the @ptitude Observer installation. Click
Next to continue.
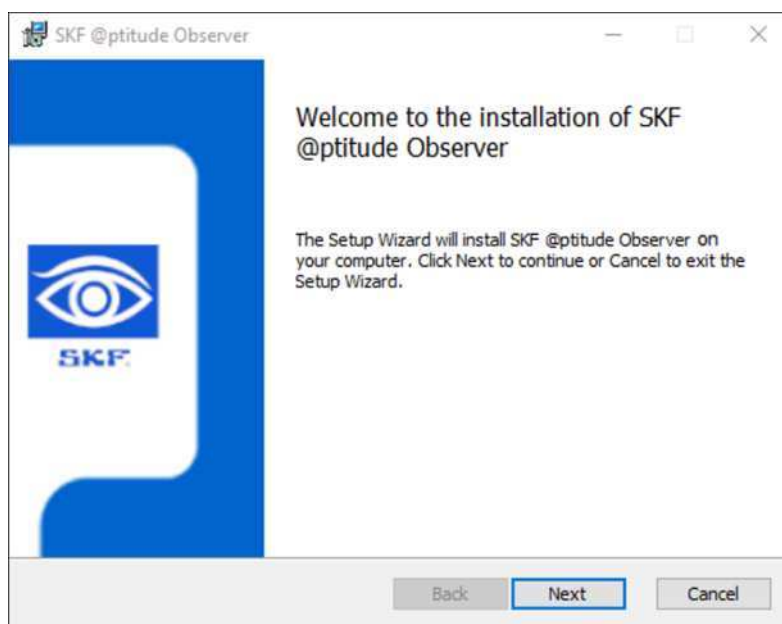
5. Read the EULA and to proceed, select "I accept the terms in the license
agreement" and then click **Next**.

6. Choose a setup type and click **Next** to continue.

- Client and Server installation will install all the necessary components for
those installation types.

- **Custom** enables choices to be made on which features to install, as shown in the next step.
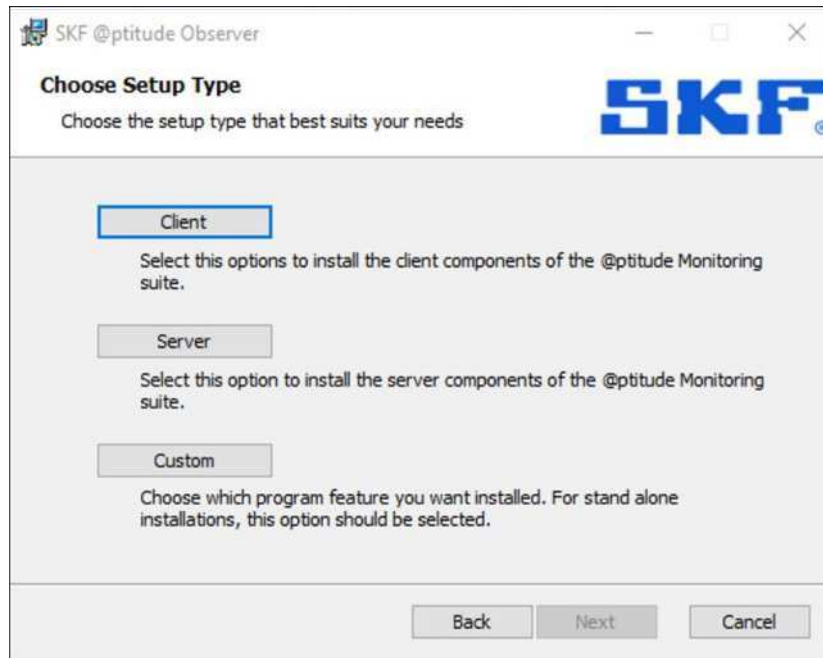
7. Select features to install, typically all of them for a full installation, then click **Next**.
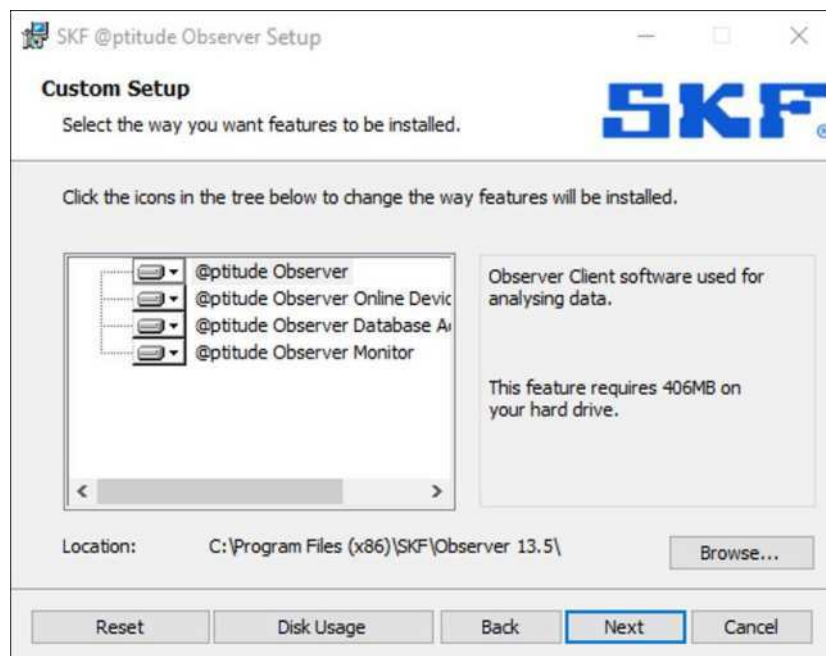
8. After a further confirmation screen, @ptitude Observer will now install.
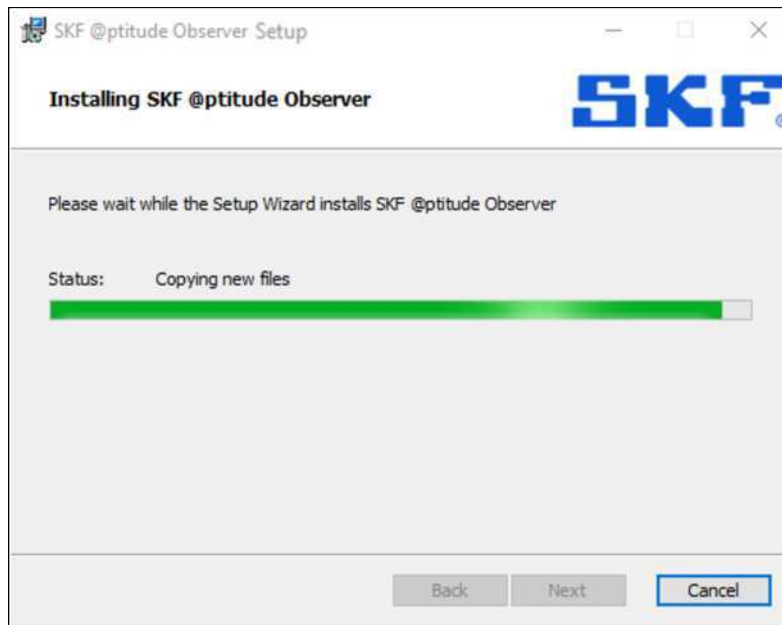
9. Click **Finish** to complete the installation and exit the InstallShield® Wizard.
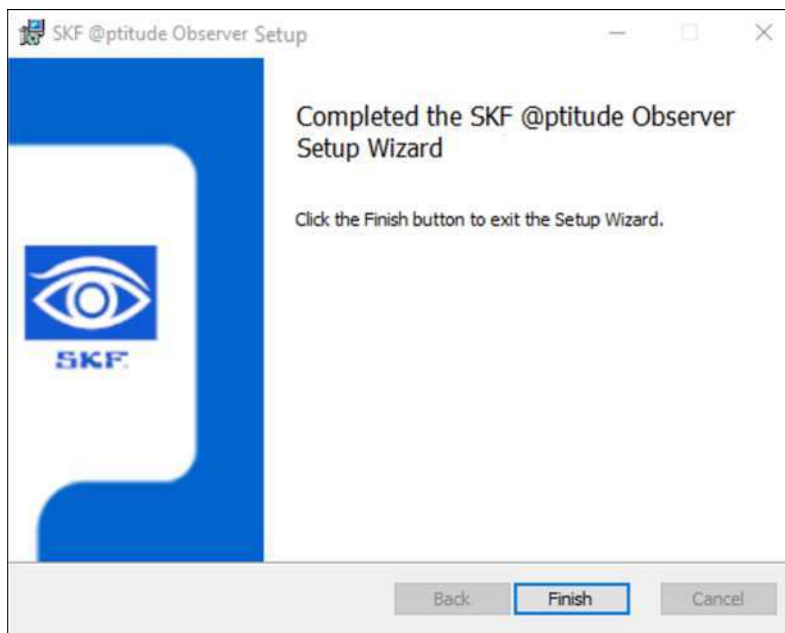
5 Prepare an Observer database

Note: For more information about @ptitude Observer database administrator, refer to the **SKF @ptitude Observer Database Administrator** user manual, part number 32170600.

After the @ptitude Observer software has been installed, it is necessary to connect it to an Observer database. Ensure that relevant SQL services are started, before proceeding.

If an Observer database from an earlier software version already exists, the database needs to be upgraded to the @ptitude Observer version now installed.

If an Observer database does not exist, it is necessary to create a new Observer database.

5.1 Upgrade an existing Observer database

1. Start the @ptitude Observer database administrator software by clicking on the shortcut on the start menu or program list. If asked, at first use, set the program language.

2. Logon to the database server using the credentials specified when installing the SQL server. It is recommended to fully name the database according to the form: 'ComputerName\SQLSeverInstance'.

3. In the database list, select the database to be upgraded and click the menu option **Database** / **Upgrade selected databases**. Note that databases can only be updated one at a time.
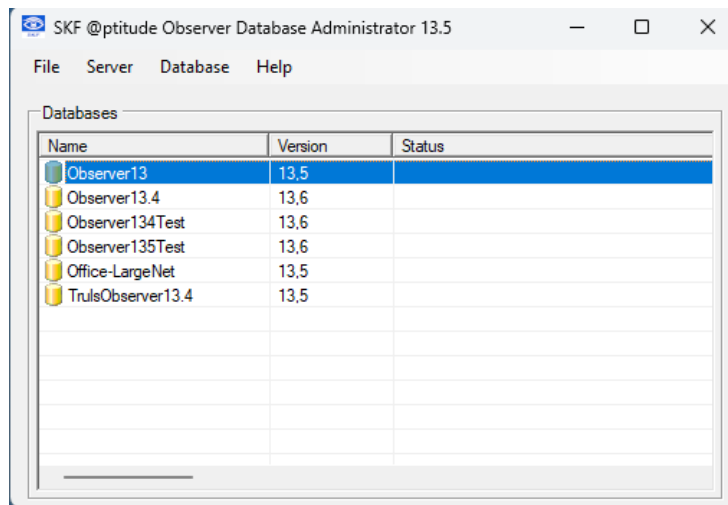
4. The database definition file, extension .DEF, that contains the information on upgrading the database is located in the @ptitude Observer installation directory. Use the ellipsis button to select it and click OK. When completed, the user will first receive a message asking if indexes are to be rebuilt (recommended), then the bearing database is updated and finally a message stating that the upgrade has been finished. Otherwise, the user will receive an error message.

5. After the procedure is finished, the selected database is upgraded and if no further databases are to be upgraded then the @ptitude Observer database administrator software can be closed.

⚠️ *Important - After a database conversion, all diagnoses in the database need to be recalculated in the Observer software. Until this is done, all diagnoses will display a zero value. The recalculation can be done at Observer Hierarchy view, by right clicking on a node and selecting Configure\Recalculate diagnosis.*

5.2 Create a new Observer database

1. Start the @ptitude Observer database administrator software by clicking on the shortcut from the start menu. If asked, at first use, set the program language.

2. Log in to the database server using the login credentials specified when installing the SQL server. It is recommended to fully name the SQL database according to the form: 'ComputerName\SQLSeverInstance', refer step 2.

3. Click on the menu option **Server / Create new database**.
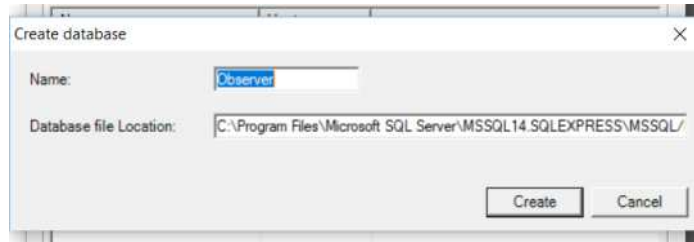
4. Select a database name (default is Observer) and select where the database files should be stored (default is SQL server data directory).

   Note: The database name **cannot** be the same as an existing database

5. Click **Create**.

6. At the end of the Create database procedure, at the prompt, select the measurement units to use for the Diagnosis and the Protean Diagnosis rules in @ptitude Observer and click the **Update** button.
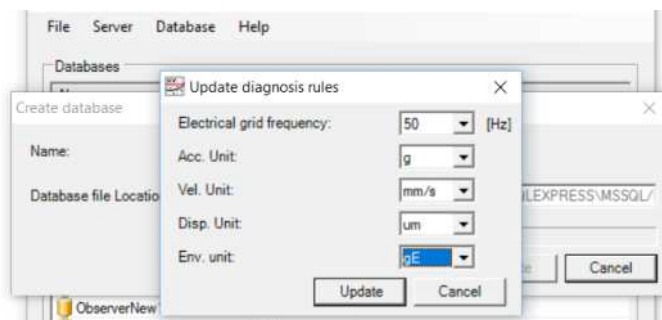
Note that if the choices are not yet decided upon, clicking **Cancel** at this point will still create the new database and the Update diagnosis rules dialog can be launched again by selecting the database and choosing **Database / Update diagnosis**. This latter option is a general feature that allows settings for an existing database to be changed.

As the creation process ends, a message confirms that a default administrator account with the credentials admin/admin has been automatically created for the new database.

6 @ptitude Observer Monitor service

To be able to use @ptitude Observer as an on-line system, the communication and database storage are performed by an Observer monitor service. There can be several Observer monitor services operational at the same time, supporting different databases, but each will need to be allocated a different port.

6.1 Adding a Monitor service

1. To add or manage an Observer monitor service, start the @ptitude Observer Monitor Manager software by clicking on the shortcut on the start menu under

   - **All Programs\SKF @ptitude Monitoring Suite X.Y\Monitor Service Manager**

   - or for Windows 10 **SKF @ptitude Monitoring Suite X.Y\Monitor Service Manager** in the alphanumeric list of installed programs. If asked, the user will need to give permission for the software to make the necessary changes.
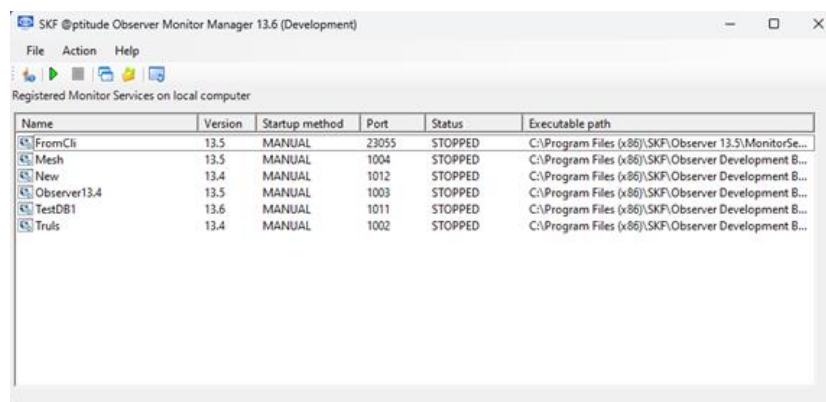
Figure 1   Example of @ptitude Observer Monitor (Service) Manager

Observer Monitor (Service) Manager screen lists all the registered monitor services on the local computer. If this is a new install, no services will be listed.

Action allows the following interfaces:

- **New** adds new monitor services on the local computer.

- **Properties** opens the Connection interface where the properties of already registered services can be edited.

- o Monitor Manager can only edit the properties of services created with the same version of the tool.

- **Delete** deletes the selected registered service.

- **Start** starts the selected monitor service.

- **Stop** stops the selected monitor service.

- **Monitor Service Viewer** displays events, connections and status of the selected monitor service.

- **View Log** File views a log file for the selected monitor service.

- **Refresh** updates the list with most current information.

2. To register a new monitor service, click **Action**, then select **New**.
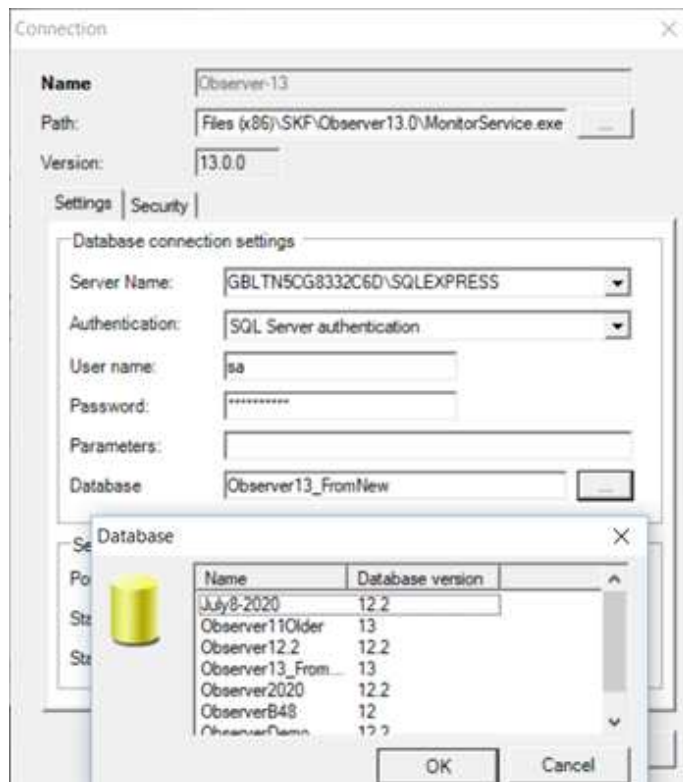
Figure 2   Example of @ptitude Observer Monitor Service - Connection

Name is a unique name which has to be given to the service used to identify the registered database connection. Once a new service is registered, the name cannot be changed.

Path defines the location of the executable file to be used as the service. The default path is C:\Program Files (x86)\SKF\Observer X.Y.

Version displays the version of @ptitude Observer in use currently.

On the **Settings** tab:

Database connection settings

Server Name is for specifying the location of the SQL database, a full path comprised of 'ComputerName\SQLSeverInstance', is recommended.
Authentication defines whether to use *Windows authentication* or *SQL Server authentication* for SQL Server. Select *SQL Server authentication* and then enter the user name and password.

User name is the database user name.

Password is the password for that user.

Parameters allows additional parameters to be entered, for the connection. For example, to force TCP/IP protocol, enter "*Network=DBMSSOCN;*" in this text box.

Database is the selected database from a list of available databases on the database server. **As shown in Figure 6 – 2 above**, clicking the ellipsis button will cause the software to connect and retrieve a list of the available databases. A selection can then be made. The Observer software version and the version of the selected database must match.

Service settings

Port is used to assign which port the Observer monitor service should use to communicate with @ptitude Observer and IMx devices. The default value is 1000, but other ports can be allocated if 1000 is already in use.

Start delay is used to give the database server some time (in seconds) to start before @ptitude Observer monitor tries to open the connection. It is recommended to set this field to 20 for the start-up method *Automatic*. Whereas, it is recommended to set this field to 0 for the start-up method *Manual*.

Startup method sets the start-up method of the service to either Automatic, Manual or Disabled. Automatic is the usual setting for an @ptitude Observer system.

- **Automatic** means that the service starts when the operating system boots up.
- **Manual** means that the service has to be started by the user either through @ptitude Observer Monitor Manager or through the services interface in windows.
- **Disabled** means that the service is completely disabled.
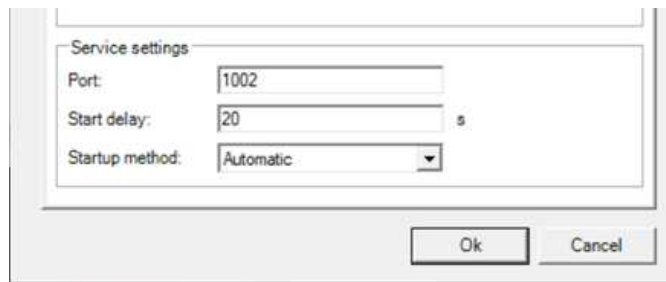
Figure 3   Example of service settings

The second tab, **Security**, is only needed for SKF Enlight Collect IMx-1 systems where the Monitor service is required to run an MQTT service with Transport Layer security (TLS) and encryption enabled. This aspect can be revisited and revised once the basic Monitor service has been created and is functioning.

Refer to the **SKF @ptitude Observer** user manual, part number 32170900 and/or the S**KF Enlight Collect IMx-1 System** user manual, part number 15V-090-00087-100 for further details on configuring IMx-1 systems. Both documents describe the TLS, security aspects of @ptitude Observer Monitor Manager including the possibility of generating a self-signed certificate from within that tool. For more general guidance on independently generating and installing a self-signed certificate, refer TLS certificate.

After completing the configuration, press **OK** to create the service, it should now appear on the list of 'Registered Monitor Services'.

3. A recovery plan, in case of an unrecoverable error, for registered monitor services resides within Windows' interface **Services (Local)** which is located under Administrative Tools in Control Panel.

- Observer monitor services start with the text "ObsService_".
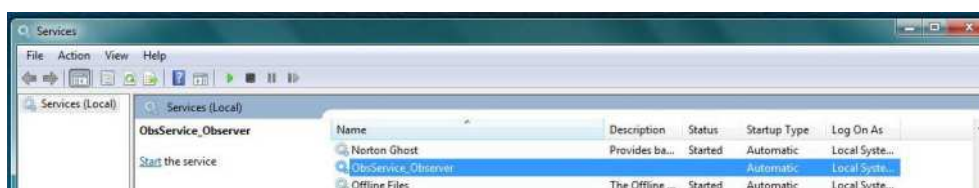
Figure 4   Example of Windows's interface services
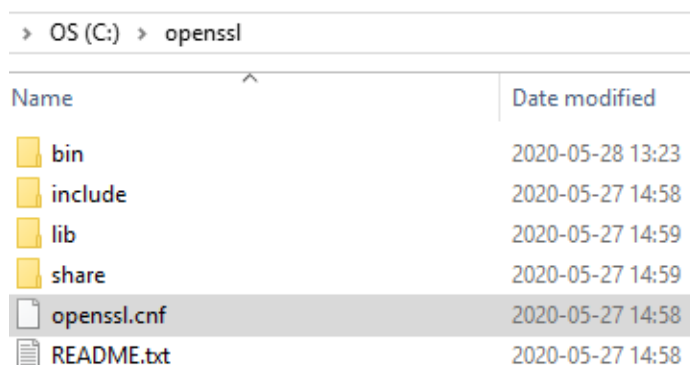
Select an Observer monitor service, then select **Properties** under Action, or, right-click on an Observer monitor service and select **Properties**. Select **Recovery** tab

4. It is recommended to set the First, Second and Subsequent failures of the Recovery setting to **Restart the Service**, the likely default settings.

6.2 TLS Certificate

To generate and install a self-signed certificate for use with an IMx-1 system the Generate function within @ptitude Observer Monitor Manager can be used. Alternatively, it will be necessary to follow these steps:

1. Create a folder c:\openssl

2. Download openSSL from https://sourceforge.net/projects/openssl/

3. Extract the contents of the downloaded zip file into c:\openssl

4. Copy the openssl.cnf file, that is found in the bin folder, so that it is directly under the c:\openssl directory:

> OS (C:) > openssl

Name	Date modified
bin	2020-05-28 13:23
include	2020-05-27 14:58
lib	2020-05-27 14:59
share	2020-05-27 14:59
openssl.cnf	2020-05-27 14:58
README.txt	2020-05-27 14:58

5. Open a Command Prompt as Administrator

6. Go to c:\openssl\bin

7. Run the following command to generate a 4096-bit long RSA key for the root CA and the certificate with **X** given days:

   openssl req -new -newkey rsa:4096 -x509 -sha256 -days **X** -nodes -out **cert_name**.crt -keyout **cert_name**.key

8. Fill out all the information. Keep in mind that:

   - Common Name is the name displayed in the certificate store

   - Common Name and Monitor Address must match

Figure 5   Example of Command Prompt use

A certificate and a key must have been created in the directory

9. Run the following command to combine the private key and the certificate:
openssl pkcs12 -inkey **cert_name**.key -in my.crt -export -out **cert_name**.pfx

10. Enter an Export Password. Remember this as it is required to use the certificate

11. Right click **cert_name**.pfx file located in C:\openssl\bin and choose Install PFX

12. For Store Location select Local Machine and click Next

13. Select the .pfx file and click Next

14. Enter the password set on the .pfx file and in the Import options section tick the following two options:

    • "Mark this key as exportable...."
    • "Include all extended properties"

15. Select Place all certificate in the following store and choose Personal, then click Next followed by Finish

16. Open the Windows certificate store for Local Computer. The certificate should be shown in the Personal > Certificates folder.

17. For the certificate to be trusted, it also needs to be included in Trusted Root Certification Authorities > Certificates. Import the certificate into that folder.
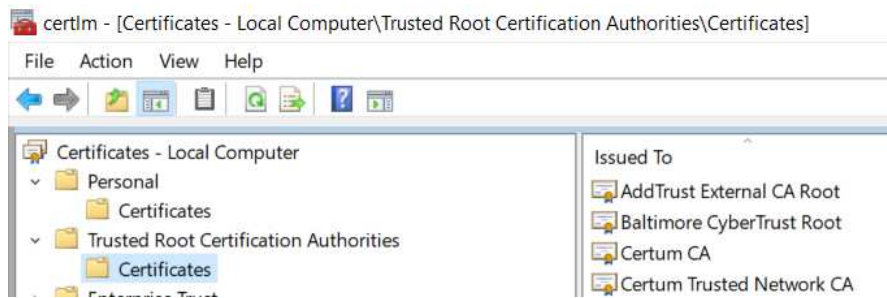
Figure 6   Local computer certificate stores in Windows Certificate Manager tool

18. Now the certificate is installed, it can be selected in the Monitor service connection

- In the TLS section, click Select and choose the self-signed certificate

7 Edit Observer settings

7.1 Language and licence key

When installing @ptitude Observer, a setting file called @ptitude Observer.ini is created in the user application data folder, which by default is located at:

C:\Users\[User name]\AppData\Roaming\SKF\Observer X.Y\@ptitude Observer.ini.

The following is an example of the contents of the @ptitude Observer.ini file, System section:

[System]

Language=English

RegKey=X58BB892JJ85XY73GHPC493LD6CA9786

Language specifies which language to use.

RegKey is the license key entered when installing the product.

The language and license key entries in this file, may be edited, although both aspects can be managed within the @ptitude Observer software. If changes are made these take effect the next time the @ptitude Observer software is started.

7.2 Application data folder

The application data folder is used to store user specific data for the @ptitude Observer application such as connection files and .ini files. Which folder to use as the application data folder can be specified, the default is the user's own application data folder as mentioned above.

One of two command line methods, described below, can be used.

Specify a custom folder via the properties of the @ptitude Observer shortcut

7.2.1 Using the USE_APP_PATH keyword on the Observer properties shortcut

Using this USE_APP_PATH keyword will cause the @ptitude Observer system to use the same folder that the executable file resides in, for its application data.

Figure 7   USE_APP_PATH example

Create a new shortcut to the ObserverWinUI.exe file and then edit its properties. Add the text USE_APP_PATH in the target field as shown in the screen shot, above.

7.3 Specify a custom folder via the properties of the @ptitude Observer shortcut

Instead of using the USE_APP_PATH keyword, it is also possible to specify a custom folder as an application data folder, for example "C:\MyFolder". The specified folder must already exist.

- There is a shortcut "**Application data**" located on the start menu under **All Programs\SKF @ptitude Monitoring Suite X.Y** or for Windows 10 **SKF @ptitude Monitoring Suite X.Y** in the alphanumeric list of installed programs. Note that this shortcut opens a file explorer window at C:\ProgramData\SKF\Observer X.Y. This is the location where log and similar files are stored, not the 'ini' and connection files referred to above.

8 IMx/MasCon network settings

For communications to be established between IMx/MasCon devices and @ptitude Observer monitor the on-line devices require some initial configuration of their network settings.

For further information, refer to the corresponding IMx device/model user manual and the **SKF @ptitude Observer On-line Device Configurator** user manual, part number 32170800.

9 Time synchronization

This step is only needed if the PC is being used as the @ptitude Observer monitor computer.

9.1 Activating time synchronization

IMx and MasCon devices use a built-in function in Windows for time synchronization. The @ptitude Observer monitor computer is used as the reference for time in the IMx/MasCon system. In order to activate time synchronization, follow the procedure below.

1. Open port 123 in the firewall. The procedure for this will depend on the operating system and/or firewall software in use.

2. Go to services and check that "Windows Time" service start-up method is set to "Automatic" and that it has started.

3. Double click on the file EnableTimeSync.reg in the Extra\TimeSync folder. This will enter information in the registry to enable the time synchronization service on the computer

.

4. Stop and start "Windows Time" service to make this change take effect.

10 Software upgrade

This section of the installation manual describes how to upgrade @ptitude Observer.

> ⚠️ *Important - It is strongly recommended that a backup of the database is created, before starting the upgrade procedure.*

10.1 Guidance for system upgrades and updates

Important notes:

Before the upgrade is started, a full database backup should be made.

SKF does rigorous testing on new firmware and software. However, it is impossible to test all parameter permutations of a configurable system.

When a customer deploys a new version of SKF software or firmware, it is advised to test the configurations on a small scale under real world operating conditions. A complete roll-out should only be performed one database at a time, after successful small-scale testing.

The SKF software has some specific tools that can help with the distribution of new firmware over a large fleet. The use of these tools is encouraged for the deployment of updates and upgrades.

General software update procedure:

Note that there is no need to uninstall the database manager such as SQL Server, in order to upgrade the system. The process for upgrading the SKF software will be generally as follows:

- Use the services interface in windows to stop all related services such as "ObsService_" plus any that are SQL related.

- If not retaining the earlier @ptitude Observer version or if required to by the install, uninstall the current @ptitude Observer instance.

- Install the new @ptitude Observer software.

- Restart any stopped services or reboot the computer.

- Use @ptitude Observer database administrator to upgrade any existing databases to the latest structures and/or create new, empty databases for use with this software version.

- Start @ptitude Observer and check via the lower status bar that it has connected correctly to the database and to the monitor service.

- Add firmware for all DADs being used in the system. This can include IMx (pkg file), MasCon 16 (pkg file), Enlight Collect IMx-1 sensor and gateway (a zip file for each).

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