Spirit^{IT} eXLerate
Measurement supervisory software

ABB

Installation and system configuration

Measurement made easy

Spirit^{IT} eXLerate Human Machine Interface

Introduction

Welcome to the exciting world of Spirit^{IT} eXLerate!

Using SpiritIT eXLerate, you can create your complete real-time HMI applications.

There are two reference manuals:

– The 'Installation manual', with the system installation and setup guide.
– The 'Configuration manual' describes how to create a full-featured, real-time HMI application using Spirit^{IT} eXLerate.

For more information

All publications of Spirit^{IT} eXLerate are available for free download from:

	Search for
eXLerate Installation manual	IM/eXL-EN
eXLerate Configuration manual	CM/eXL-EN
Flow-X function reference manual	CM/FlowX/FR-EN
eXLerate release notes	RN/eXL-EN

Contents

1.   Introduction

Spirit[IT] eXLerate is the supervisory software package of ABB. With Spirit[IT] eXLerate, you can create full-featured, real-time HMI applications, using a well-known, user-friendly spreadsheet environment.

A Spirit[IT] eXLerate application gives the operators a robust and complete visualization and control of the process.

1.1.   Features

Spirit[IT] eXLerate has the following functionality:

– Full-featured real-time HMI software;
– Made for oil & gas systems;
– Acquire real-time measurement data from field devices, such as flow computers, logical controllers, gas chromatographs, utilizing different communication protocols like Flow-X Client, Modbus, OPC;
– Display and monitor measurement values and equipment status, both textual and graphical;
– Operation control (proving, batch, sampling)
– Certified gas & liquid calculations
– User defined calculations
– Virtual Flow Computing
– Reporting (Custody transfer)
– Alarm management
– Real-time & historical trending
– Security, audit trail and event log
– Database storage and retrieval
– System and communication redundancy
– Multi-lingual
– Virtual printer *'Flow-Xprint'*

1.2.   Application examples

eXLerate applications are used in different areas:

– Custody transfer metering
– Allocation metering
– Virtual flow computing
– Terminal automation
– Calibration facilities
– Leak detection
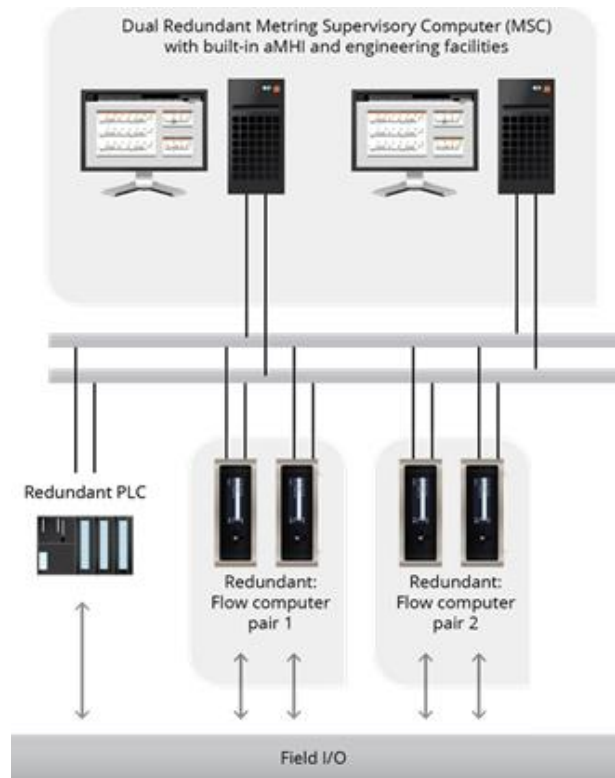
Figure 1 Control systems layers

1.3.   Cyber security

This product is designed to be connected to and to communicate information and data via a network interface. It is your sole responsibility to provide and continuously ensure a secure connection between the product and your network or any other network (as the case may be). You shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

ABB B.V. and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

1.4. Manuals

The Spiritᴵᵀ eXLerate manual set consist out of the following documents:

Installation manual

This manual describes the installation of eXLerate software and all required software on a computer system, as well as how to configure the system and eXLerate options for running Spiritᴵᵀ eXLerate applications.

Configuration manual

This manual introduces the principles and techniques of real-time application development, as well acts as a reference manual, in which all details of application engineering can be found.

This volume describes many topics, such setting up communication, create HMI displays and reports, utilize calculation worksheets, configuring and structuring your application.

Spiritᴵᵀ function library

This library describes the functions for flow, gas and liquid calculations used in ABB Spiritᴵᵀ products.

1.5. Target audience

This manual is written for a variety of readers:

Application developers

System integrators interested in all details required to set-up and develop a complete real-time application with Spiritᴵᵀ eXLerate.

IT departments

IT experts of companies who are centralized managing software installations on their company systems.

Interested persons

People investigating whether the capabilities and features of Spiritᴵᵀ eXLerate will satisfy his/her project requirements.

The reader is expected to be acquainted with the basics of HMI / SCADA visualization software packages and to be familiar with Microsoft Excel.

1.6. Document conventions

A book symbol in the text indicates a reference to another section or manual with more details or other relevant information.

A display symbol in the text indicates that the user can find more details on the subject in one of the example applications.

The exclamation mark symbol indicates an important remark made in the manual requiring special attention.

A tool symbol in the text specifies user instructions: the user is assumed to perform some specific action.

<…> Keyboard keys like function keys, navigation keys etc., are presented with the key text enclosed between '<' and '>' characters.

For example, <F1> refers to function key with the text 'F1' imprinted and <Esc> refers to the key with the text 'Esc' imprinted. When a user is assumed to press and release multiple keys simultaneously, those keys are separated by a '-' dash character, e.g. <Ctrl-F1> or <Ctrl-A>.

1.7.   Abbreviations

API   Application Programming Interface
An interface that allows an application to interact with an application or operating system, in our case, Spirit[IT] eXLerate. Most of the Spirit[IT] eXLerate API is implemented through Excel worksheet functions.

ASCII   American Standard Code for Information Interchange.
A set of standard numerical values for printable, control, and special characters used by PCs and most other computers. Other commonly used codes for character sets are ANSI, Unicode, and EBCDIC (Extended Binary-Coded Decimal Interchange Code, used by IBM for mainframe computers).

COM   Component Object Model
Standard for distributed objects, an object encapsulation technology that specifies interfaces between component objects within a single application or between applications. It separates the interface from the implementation and provides APIs for dynamically locating objects and for loading and invoking them (see ActiveX and DCOM).

CPU   Central Processing Unit

DCE   Distributed Computing Environment
Definition from the Open Software Foundation, DCE provides key distributed technologies such as RPC, distributed naming service, time synchronization service, distributed file system and network security.

DCOM   Distributed Component Object Model
Microsoft's protocol that enables software components to communicate directly over a network in a reliable, secure, and efficient manner. DCOM is based on the DCE-RPC specification and works with both Java applets and ActiveX components through its use of the COM. See also ActiveX.

DCS   Distributed Control System

DDE   Dynamic Data Exchange
A relatively old mechanism for exchanging simple data among processes in MS-Windows.

DLL   Dynamic Link Library.
A file containing a collection of Windows functions designed to perform a specific class of operations. Most DLLs carry the .DLL extension, but some Windows DLLs, such as Gdi32.exe, use the .EXE extension. Functions within DLLs are called (invoked) by applications as necessary to perform the desired operation.

EIA   Electrical Industries Association

GUI   Graphical User Interface

HART   Highway Addressable Remote Transducer.
A protocol defined by the HART Communication Foundation to exchange information between process control devices such as transmitters and computers using a two-wire 4-20mA signal on which a digital signal is superimposed using Frequency Shift Keying at 1200 bps.

HMI   Human Machine Interface.
Also referred to as a GUI or MMI. This is a process that displays graphics and allows people to interface with the control system in graphic form. It may contain trends, alarm summaries, pictures, and animations.

I/O   Input / Output

IEEE   Institute for Electrical and Electronics Engineers

ISO   International Standards Organization

MES   Management Execution System.
A level of monitoring of a process control system that is above the PLC and HMI level, where data analysis and integration with other aspects of a company such as accounting and purchasing play a significant role.

MIC   Machine Identification Code. License code of Spirit[IT] eXLerate which uniquely identifies your computer.

ODBC   Open Data Base Connectivity.
A standardized application programmer's interface (API) for databases. It supports Visual Basic, Visual C++, and SQL for Access, Paradox, Text, Excel and many more database standards.

OEM   Original Equipment Manufacturer

OLE   Object Linking and Embedding.
A protocol specification by which an object, such as a photograph, a spreadsheet, video, sound, etc., can be inserted into and used by an application. Renamed by Microsoft into 'ActiveX'.

OSI   Open System Interconnection.
An ISO standard for worldwide communications that defines a networking framework for implementing protocols in seven layers. Control is passed from one layer to the next, starting at the application layer in one station, proceeding to the bottom layer, over the channel to the next station and back up the hierarchy.

OPC   OLE for Process Control.
A COM interface specification. Applications which implement the OPC interface can inter-operate without the developer needing to control both the server and client development. By following the OPC interface, clients and servers from different manufacturers can communicate and interact successfully. The OPC interface is designed to offer the types of interactions that are typical of process I/O hardware such as PLC, DCS and direct I/O boards.

Spirit[IT] eXLerate 2016 is OPC DA 2.05 compliant, and ABB is a member of the OPC Foundation.

P&ID   Piping and Instrumentation Diagram

PC   Personal Computer

PLC	Programmable Logic Controller. A specialized device used to provide high-speed, low-level control of a process. It is programmed using Ladder Logic, or some form of structured language, so that engineers can program it. PLC hardware may have good redundancy and fail-over capabilities.
RPC	Remote Procedure Call A form of application-to-application communication that hides the intricacies of the network by using an ordinary procedure call mechanism. It is a tightly coupled synchronous process.
RS232	EIA standard for point to point serial communications in computer equipment
RS422	EIA standard for two-wire differential unidirectional multi-drop serial
RS485	EIA standard for two-wire differential bidirectional multi-drop serial communications in computer equipment
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
SQL	Standard Query Language
SVC	Supervisory Computer
TCP/IP	Transmission Control Protocol/Internet Protocol. Transmission Control Protocol/Internet Protocol. The control mechanism used by programs that want to speak over the Internet. It was established in 1968 to help remote tasks communicate over the original ARPANET.
TTL	Transistor-Transistor Logic
UART	Universal Asynchronous Receiver & Transmitter
URL	Uniform Resource Locator. The global address for documents and resources on the World Wide Web.
VBA	Visual Basic for Applications. The official name is "Visual Basic, Applications Edition." VBA is Microsoft's common application programming (macro) language for Excel, PowerPoint, Visio, Access, Project, Word, and the Visual Basic programming environment.
XLL	Excel Link Library. Special formatted DLL, which is recognized by Excel as extension library. In an XLL, typically worksheet calculations are defined.
XML	Extensible Markup Language. A specification for Web documents that allows developers to create custom tags that enable the definition, transmission, validation and interpretation of data contained therein.

1.8. Terms and definitions

ActiveX	A family of Microsoft object technologies, formerly called OLE, based on the Common Object Model (COM).
Asynchronous	A type of message passing where the sending task does not wait for a reply before continuing processing. If the receiving task cannot take the message immediately, the message often waits on a queue until it can be received.
Client/server	A network architecture in which each computer or process on the network is either a client or a server. Clients rely on servers for resources, such as files, devices, and even processing power. Another type of network architecture is known as a peer-to-peer architecture. Both client/server and peer-to-peer architectures are widely used, and each has unique advantages and disadvantages. Client/server architectures are sometimes called two-tier architectures.
Device driver	A program that sends data to and receives data from the outside world. Typically, a device driver will communicate with a hardware interface card that receives field device messages and maps their content into a region of memory on the card. The device driver then reads this memory and delivers the contents to the program.
Engineering units	Engineering units as used throughout this manual refers in general to the units of a tag, for example 'bar', or '°C', and not to a type of unit, as with 'metric' units, or 'imperial' units.
Ethernet	A LAN protocol developed by Xerox in cooperation with DEC and Intel in 1976. Standard Ethernet supports data transfer rates of 10 Mbps. The Ethernet specification served as the basis for the IEEE 802.3 standard, which specifies physical and lower software layers. A newer version, called 100-Base-T or Fast Ethernet supports data transfer rates of 100 Mbps, while the newest version, Gigabit Ethernet supports rates of 1 gigabit (1000 megabits) per second.
Event	Anything that happens that is significant to a program, such as a mouse click, a change in a data point value, or a command from a user.
Exception	Any condition, such as a hardware interrupt or software error-handler, that changes a program's flow of control.
Peer-to-peer	A type of network in which each workstation has equivalent capabilities and responsibilities. This differs from client/server architectures, in which some computers are dedicated to serving the others. Peer-to-peer networks are

	generally simpler, but they usually do not offer the same performance under heavy loads. Peer-to-peer is sometimes shortened to the term P2P.
Polling	A method of updating data in a system, where one task sends a message to a second task on a regular basis, to check if a data point has changed. If so, the change in data is sent to the first task. This method is most effective when there are few data points in the system. Otherwise, exception handling is generally faster.
Process visualization software	A system for monitoring and controlling production processes and managing related data. Typically, such a system is connected to external devices, which are in turn connected to sensors and production machinery.
	The term 'process visualization software' in this document is generally used for software with which SCADA software, HMI software, or supervisory computer software applications can be built. In this document, although strictly not correct, the terms 'SCADA, 'HMI, 'supervisory', and 'process visualization' are alternately used, and refer to the computer software applications that can be realized with eXLerate, ABB's PC-based supervisory software.
Protocol	An agreed-up format for transmitting data between two devices. In this context, a protocol mostly references to the Data Link Layer in the OSI 7-Layer Communication Model.
Query	In SCADA/HMI terms a message from a computer to a client; in a master/client configuration utilizing the message protocol with the purpose to request for information. Usually, more than 1 data-point is transmitted in a single query.
Real-time	The characteristic of determinism applied to computer hardware and/or software. A real-time process must perform a task in a determined length of time.
	The phrase "real-time" does not directly relate to how fast the program responds, even though many people believe that real-time means real-fast.
Registry	The Windows Registry is a hierarchical database that stores low-level settings for the Microsoft Windows operating system and for applications that opt to use the registry.
Resource	Any component of a computing machine that can be utilized by software. Examples include: RAM, disk space, CPU time, real-world time, serial devices, network devices, and other hardware, as well as O/S objects such as semaphores, timers, file descriptors, files, etc.

Synchronous	A type of message passing where the sending task waits for a reply before continuing processing.
Tag	A 'tag' as used within this document refers to a data point existing in the tag database, with several properties, such as assigned I/O address, current value, engineering units, description, alias name, and many others.
Visual Basic	A graphical programming language and development environment created by Microsoft in 1990, and currently used for scripting in applications like Microsoft Office. All macros in Office are created in Visual Basic.
Web Server	A computer that has server software installed on it and is used to deliver web pages to an intranet/Internet.

2.   Installation of eXLerate

This chapter guides the user through the installation process of Spirit^{IT} eXLerate. It lists the required hardware and software, explains the installation process and the license options and process.

2.1.   Hardware requirements

Spirit^{IT} eXLerate runs best on a computer with at least an Intel Corei5 processor with a clock-speed of **2.5 GHz** or higher and **4 GB** or more of RAM installed. For larger or more complex applications, processors with a clock-speed of **3.4GHz** or higher is recommended.

The use of multi-threaded calculations is limited in eXLerate. It is preferred to have a processor with higher clock-speed rather than a processor with more cores.

The better the CPU performance, the higher the clock speed and the more memory is available, the better the system performance will be.

Multitouch displays are **not** supported with eXLerate.

2.2.   BIOS settings

On runtime systems that require continuous operations it is recommended that the following options are set in the BIOS:

– Power options: Resume operation after a power failure.

– Never boot from CD, USB devices or network.

– Change the boot order to always boot from hard drive first.

2.3.   Software requirements

The following software needs to be installed prior to install and run Spirit^{IT} eXLerate:

– Microsoft Windows Operating System:
  • Windows 10 - version 1803 or newer
  • Server 2019 - version 1809 or newer
  • Server 2016 - version 1607 or newer

  Both **32-bit** and **64-bit** Operating Systems are supported.

– Microsoft .NET Framework 2.0
  https://www.microsoft.com/download/details.aspx?id=6523

– Microsoft .NET Framework 4.7.2 or later
  https://dotnet.microsoft.com/download/dotnet-framework

– Microsoft Visual C++ Redistributable 2019
  https://support.microsoft.com/en-us/help/2977003/the-latest-supported-visual-c-downloads

– Microsoft Office (Excel):
  • Office 2019
  • Office 2016
  • Office 365

  Only the **32-bit** editions of Microsoft Office are supported. Spirit^{IT} eXLerate it will not run on a 64-bit edition of Microsoft Office.

  We recommend installing **English** versions, although other languages will also work.

– Antivirus software
  It is recommended that you have an anti-virus program or application allowlisting installed and kept up to date to prevent, detect, and remove computer viruses, malware, etc.

In order to use eXLerate Terminal Services, you need a Microsoft Office Volume License, see http://www.microsoft.com/licensing.

> (!) Always make sure that the **latest updates** are installed to ensure optimal stability and protection.

2.4.   Windows configuration

2.4.1. Windows user accounts

A Windows Standard User can run the Spirit^{IT} eXLerate program. During installation administrative rights are needed. The installer program will show a pop-up for administrator name and password when these are required.

We recommend having at least two local users account configured in Windows: one being a member of the Administrators group and one being a member of the Standard Users group. You can configure users from *Control Panel\User Accounts*.

2.4.2. User Account Control

User Account Control (UAC) is Windows access control enforcement facility to improve the security of Microsoft Windows. It limits application software to standard user privileges until an administrator authorizes an increase or elevation. In this way, only applications trusted by the user may receive administrative privileges, and malware should be kept from compromising the operating system.

It is recommended to keep the default setting: *Notify me only when apps try to make changes to my computer*
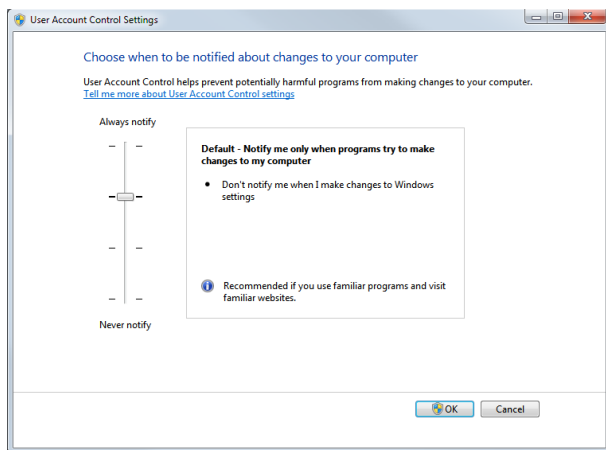

Figure 2 User account control

2.4.3. Kiosk mode

On runtime systems it might be required to have eXLerate continuously running in an orderly manner with groups of people working in shift needing to have instantaneous access. We call this the Kiosk mode: eXLerate will automatically run when a computer starts and a (specific) user logs into Windows. Additional security levels will be provided by eXLerate and the application.

Automatic start-up

Set up Windows to login with a specific Standard user. The eXLerate program will run as that user. To setup automatic logon for Windows:

– Run *'netplwiz'*
– Select the user to be logged on automatically
– Uncheck *'Users must enter a username and password to use this computer'.*
– Click OK
– Provide the password for the user (twice)
– set the user account option *'Password never expires'.*

On Windows Server, set in the registry tree *HKLM\Software\Microsoft\Windows NT \CurrentVersion\Winlogon.* the values for

– AutoAdminLogon
– DefaultUserName,
– DefaultPassword

Disable Windows user change

To avoid that the user can exit the kiosk mode, all items of the Windows Security menu (called by <Ctrl+Alt+Del> combination) should be disabled for the user account used for the kiosk mode:

– Lock computer
– Change a password (of the current account)
– Start Task Manager
– Logoff (from Windows)

These can be set in the Group Policy Editor (run *"gpedit.msc"*) *User Configuration\Administrative Templates\System\Ctrl+Alt+Del Options.*
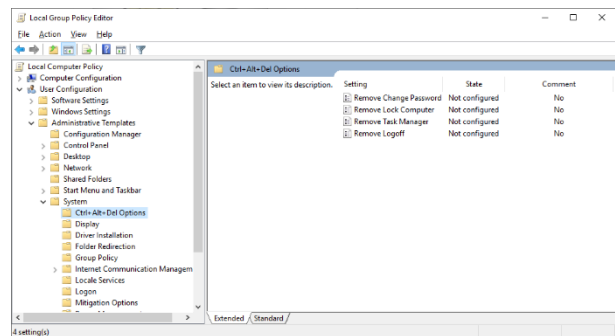

Figure 3 Group Policy Editor: Ctrl+Alt+Del options

If using the Group policy Editor is not possible, the same settings can be applied from the system registry.

Create the following entries in the registry tree *HKCU\Software\Microsoft\Windows \CurrentVersion\Policies\System*

– 'DisableLockWorkstation' as DWORD, value '1'.
– 'DisableChangePassword' as DWORD, value '1'.
– 'DisableTaskMgr' as DWORD, value '1'.
– 'NoLogoff' as DWORD, value '1'.

To avoid the user to switch to another account, fast user switching should be disabled. Note that this setting is global and applies for all users on the PC prepared for the kiosk mode. It can be done in the *Group Policy Editor* in *Computer Configuration\Administrative Templates\System\Logon*

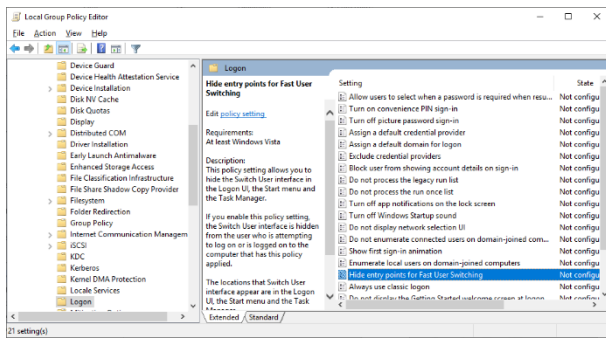– Hide entry points for Fast User Switching.

Figure 4 Group Policy Editor: Logon

If using the Group policy Editor is not possible, the same setting can be applied from the system registry. Set in the registry the following key: *HKLM\Software\Microsoft\Windows \CurrentVersion\Policies\System*

– 'HideFastUserSwitching' as DWORD, value '1'.

Power options

As on runtime systems the eXLerate program should be always active, set the Control Panel Windows Power Options to never put computer to sleep (processor and hard disk) and to never turn off the display. For the screensaver, either disable the 'On resume, display logon screen' or disable the screen saver completely.

Disable auto-run

For security reasons we recommend disabling autorun from CDs and USB sticks. This can be done from *Group Policy Editor* in *Computer Configuration\Administrative Templates\Windows Components\Autoplay Policies*

– Enable *Set the Default behavior for Auto Run*

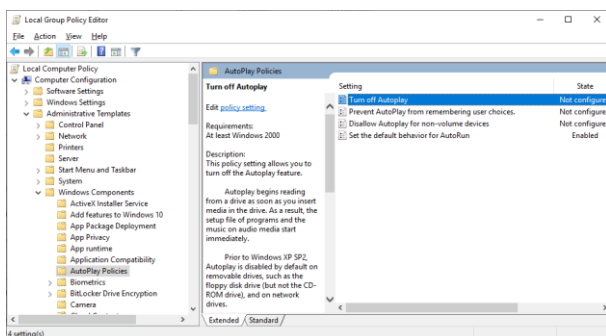– Set *Do not execute any autorun commands*

Figure 5 Group Policy Editor: Autoplay

System time

The eXLerate program can be used for time synchronization such as between eXLerate Servers and Clients, and for setting Daylight Saving Time.

Because default Windows Standard user configuration doesn't allow this, you must enable the permission to adjust date and time:

– Run *secpol.msc*

– Go to *Local Policies\User Rights Assignment*

– Double click on *Change the system time*,

– Add user or group

– Enter the user account that will run eXLerate.

For DST changeover, eXLerate adjusts the time in a different manner than exactly on hour change to avoid fiscal integrity problems with respect to these changeovers. For this alternative to function correctly, the daylight-saving option in Windows Date and time settings must be disabled.

Disable multi-touch

Multitouch is **not** supported with eXLerate so it is recommended that multitouch is disabled. This can be done by either disabling it in *Windows Configuration -- Devices* or by setting the system registry *HKLM\SOFTWARE\Microsoft\Wisp\Multitouch\.*

– Multitouch Enabled as DWORD, value to '0'

Sticky and Filter keys

We recommend that you disable the Sticky keys (keep modifier keys, such as Shift, Ctrl, Alt, or the Windows key, active after multiple times pressed) and Filter Keys (ignore brief or repeated keystrokes) unless you want to use these explicitly as these sometimes lead to unexpected behavior.

2.4.4. Windows Server

For Windows Server, disable the server manager in *Server Manager\Manage\Server Manager Properties*

– Enable *Do not start server manager automatically at logon*

We recommend you modify the following settings, using *Group Policy Editor* (run *gpedit.mscl*

– Disable '*Display shutdown event tracker'* (*Computer Configuration\Administrative Templates\System*)

– Disable '*Display Error Notification'* (*Computer Configuration\Administrative Templates\Windows Components\Windows*)

– Enable '*Disable Windows Error Reporting'* (*Computer Configuration\Administrative Templates\Windows Components\Windows*)

2.4.5. Terminal Services

Using eXLerate in combination with Terminal Services requires configuration at both the Operating System level and the eXLerate level.

In order to setup Microsoft Windows to use Terminal Services, make sure the following requirements are met.

– Install 'Remote Desktop Services' role on Windows Server.

– Purchase and install 'RDS CALs' for the users or computers which are to connect to the server.

– Set the remote desktop services setting 'Restrict each user to a single session' to 'No'.

– Create a Windows User called 'eXLerate_Remote' and give it 'Administrator' rights.

It is outside the scope of this document to describe these steps in detail. Please consult the Internet if you need information about a topic.

2.5. MS Office installation

Microsoft Office is designed in a way that it only allows one installation and once license to exist in a single device.

(!) If you have a previous release of Microsoft Office, remove this first and restart your computer before installing.

Installing Microsoft Office these days work online with limited choices. You must make sure that you install the **32-bit** version. When selecting the installation, select **Other install options**, choose the language (preferable English) and the 32-bit version, and then select **Install**.
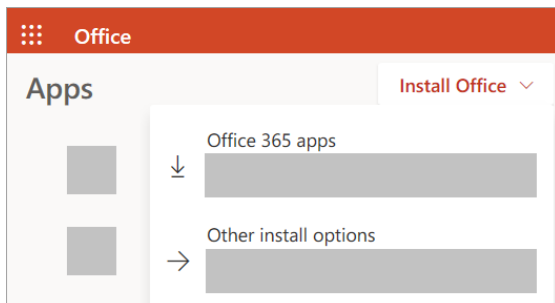

Figure 6 Microsoft Office Installation 1/2

Your installation is finished when you see the phrase: *You're all set! Office is installed now*.
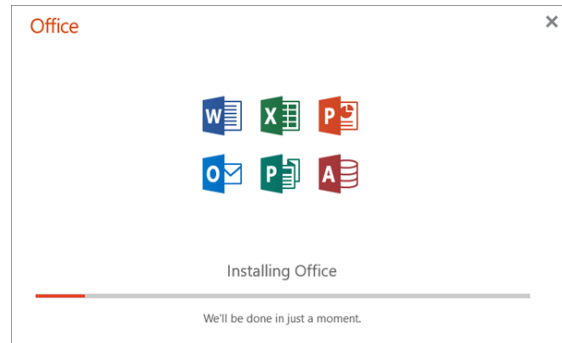

Figure 7 Microsoft Office Installation 2/2

After installation, start Excel and activate your Office installation. Once office is activated, set these Excel options for eXLerate applications to run smoothly:

– Disable 'Automatically Flash Fill'

– Disable 'Enable AutoComplete for cell values'

– Enable 'Disable hardware graphics acceleration'

You can set these options from Excel menu: **File | Options | Advanced**.

2.6. Database server

Since version 4.2, eXLerate supports the use of a local database server instead of the embedded database for the system events database. The benefit of a local database server is that it can be accessed by any SQL Client e.g. for troubleshooting.

To install a database server, download the appropriate installer. During installation, take into account the following steps:

– The database server must be MySQL compatible;

– The storage engine used must be 'MyISAM';

– Install with administrator rights.

– Install the database server on the same computer where eXLerate runs;

– Set user name and password for authentication;

– Enable TCP/IP and set the port the database server should listen to (default port 3306).

– Change the bind-address parameter to bind to only local addresses (post-installation).

At ABB Spirit[IT] we have used and tested this with the MariaDB database server. Other MySQL compatible database servers, may work as well but are not tested.

2.7. eXLerate installation

Make sure you have installed Microsoft Excel and all other required software packages prior to installing eXLerate. See the previous section Software requirements for more details.

Run the eXLerate setup program to install the software onto your computer. You can download the latest version from our website https://www.spiritit.com/downloads

During installation administrative rights are needed. The installer program will show a pop-up for administrator name and password when required. Select "**Yes**" if you see the User Account Control prompt **"Do you want to allow this app to make changes to your device?"**.
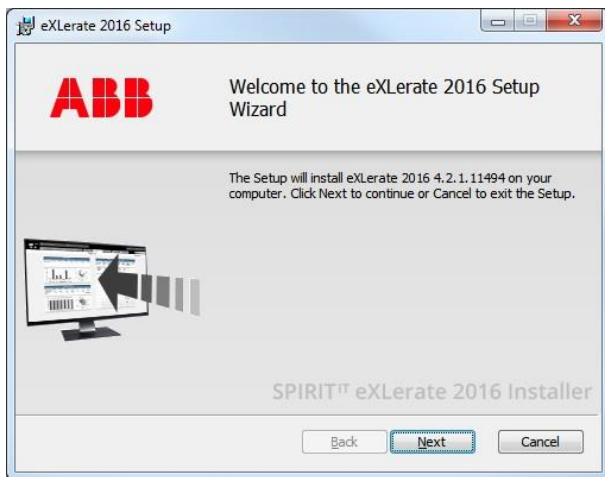

Figure 8 eXLerate welcome screen

In the Welcome screen press the **[Next]** button. The End User License Agreement dialog will be displayed. Read this very carefully and when you agree, select *"I accept the terms in the License Agreement"* and press **[Next]**.
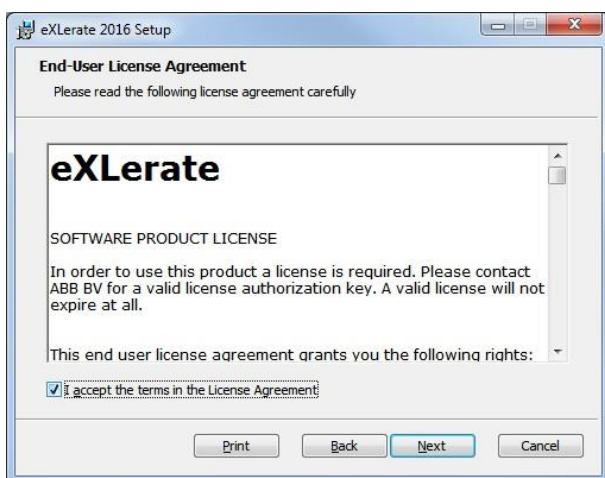

Figure 9 eXLerate license agreement

The next dialog allows you to change the installation folders and select which features need to be installed. You can click on a feature and the purpose will be shown in the right side of the dialog. We recommend installing all the options of eXLerate program.

The project folder is the default folder for the eXLerate applications. You can also change the folder for each application after installation.

The Samples are application that can be used as reference and example during engineering of an application. It is recommended to install these files on a development computer, and not to install these on a runtime system.
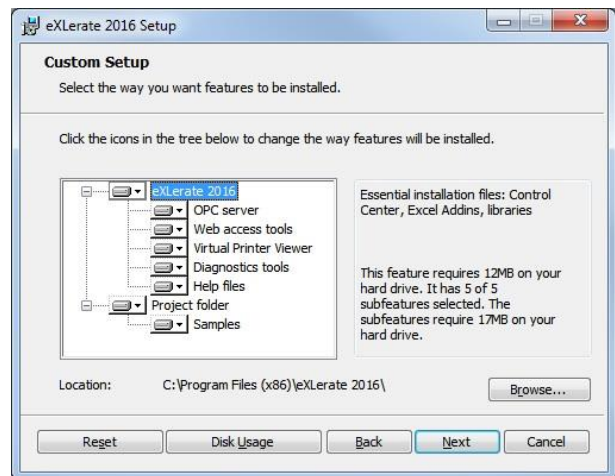

Figure 10 eXLerate installation options

After selecting the setup options, click **[Next]** to confirm and click [**Install**] in the next dialog to start the installation.
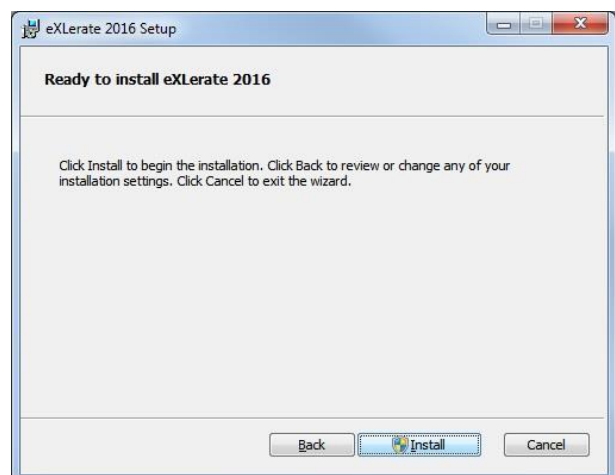

Figure 11 eXLerate ready to install

When the installation is completed, you can press **[Finish]** and then the license information will be presented.
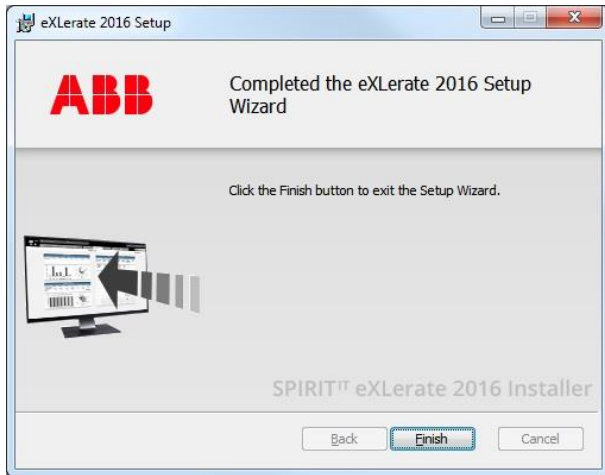
Figure 12 eXLerate installation completed

At the end of the installation, a dialog is presented in which you can enter the end-user name, company and system (by default the Windows configuration System name) for which the license needs to be granted.
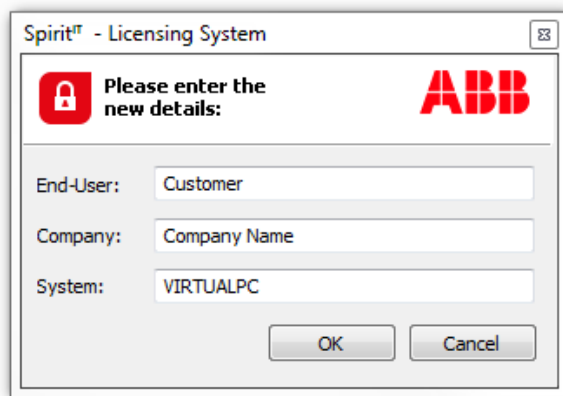

Figure 13 Spirit^{IT} Licensing System

2.8. Licensing

In all process visualization software packages, various options are based on limitations on both its functionality as well as on the number of tags that can be created within the package. These limitations are mostly for commercial aspects of the software.

Spirit^{IT} eXLerate comes in various flavors as well, each with its specific qualifications with respect functionality and to tag database. The availability of these depends on the installed license.

Two licensing methods are available for eXLerate. You can use a software-based license which is related to your computer hardware or an USB hardware key (dongle).

2.8.1. License options

Operation mode

The first license option is the Operating mode. The eXLerate program has two main operating modes:

– **Development**
 For developing and testing applications
– **Runtime**
 For runtime use of the applications, with live communication values, visualization, etc.

Tag count

The number of tags usable in eXLerate depends on the license as well. This size is however not so restricted as with other packages, since in Microsoft Excel each cell may contain a number or equation and can be presented to the user. Thus, theoretically each cell could be considered a 'tag'. In eXLerate restrictions only apply on number of values obtained from external devices, called: real-time data. eXLerate does not limit the number or size of the worksheets in your project. The following tag count license options are available:

– 75 tags
– 150 tags
– 300 tags
– 750 tags
– 1500 tags
– 3000 tags
– 6000 tags
– 32765 tags
– 1000000 tags

Communication protocols

Depending on the license, several communication protocols are available to communicate with other devices. Commonly used protocols are:

– Flow-X Client
– Modbus Client (TCP)
– Modbus Server (TCP)
– Modbus Master (serial)
– Modbus Slave (serial)
– OPC Client
– OPC Server

Other protocol drivers are deprecated and are being phased out.

Network set-up

The network arrangement of your system also defines the license you require. We have license options for

– Standalone systems,
– (Redundant) Server
– Clients
– Terminal services.

Additional license

Various other options are available, such as

– Real-time and historical trending,
– External databases,
– Flow-Xpert math libraries
– Virtual Flow Computing

You can start the License Manager to view and install licenses. The program can be found in the Start menu of Windows, named **License Manager**.

This will show you the current license for the selected product and the end user, company and system information you entered at the end of the program installation. You may press the **Edit Details** button to change this information.
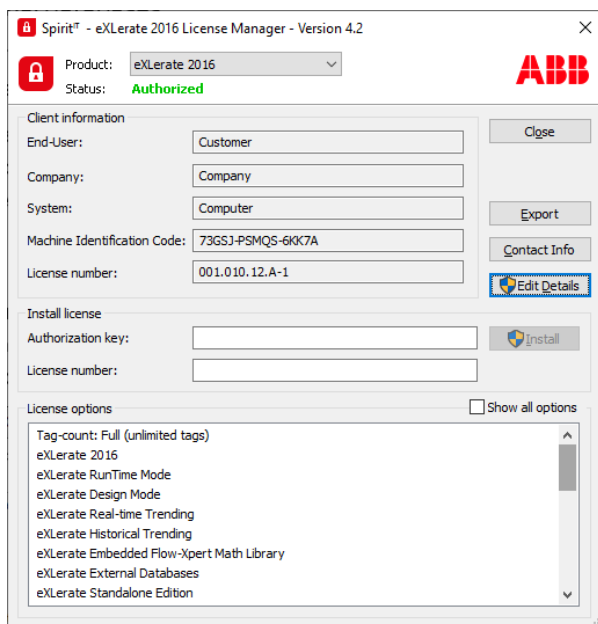

Figure 14 Spirit^{IT} License Manager

2.8.2. Software based license

To obtain a software-based license, start the **License Manager** and export the client information and the Machine Identification Code as well. This code is related to your computer hardware. Send this information together with the

purchase order or license number to us (nl-spiritit-support@abb.com). If you don't know which options you need or have any other questions, don't hesitate to contact our sales or support team.

Based in this information we will generate an **Authorization key** and **License number** and send these to you. Once received, you must run the **License Manager** again and enter these numbers in the appropriate fields and press the **Install** button to activate the license.
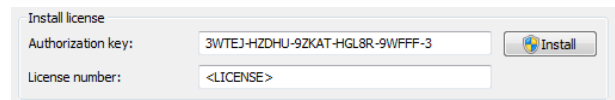

Figure 15 Installing software-based license

The license will then show to be Authorized and the installed license options will be shown. If installing the license doesn't work, please verify that:

– No Hardware-Key is attached (there is no green icon at the top)
– Both the Authorization-Key and License Number have been correctly entered.
– The date/time of your system is correct. Authorization-Keys can only be installed up to 15 days after they have been issued.
– You are installing the license onto the correct system.
– If you are still unable to install the license, please contact ABB.

If you replace (parts of) the machine on which the software is installed, the license may become invalid. A temporary license will then remain active for 14 days. In this period, you should request a new authorization key.

2.8.3. Hardware key license (dongles)

Alternative to software based-licenses, hardware-keys can be used as well. A hardware-key is a small device which connects to the USB port of your computer.

Hardware-keys are particularly useful for commissioning- and service personal that can take the hardware-keys with them and be always sure that they have the correct license rights for authorizing a system.

Hardware-keys can be purchased directly from ABB, please contact nl-spiritit-support@abb.com on how to obtain a licensed hardware-key.

A hardware-key can contain licenses for multiple products. Whenever the hardware-key is attached, the key overrules the software-based licenses. When a hardware-key is attached, the License Manager displays a green hardware-key icon at the top of the program.

Figure 16 Hardware key license

Whenever a hardware-key is attached to an USB port for the first time, Windows will try to install a driver for it. Only when a correct driver is installed will the hardware-key function properly. If no green hardware-key icon is displayed, then make sure your hardware-key is properly attached and that the Hasp HL Driver is installed.

In some cases, Windows will not be able to install a driver automatically and the driver must be installed manually. For this, download and run the latest version of Sentinel HASP LDK - Windows GUI Run-time Installer from https://sentinelcustomer.gemalto.com/sentineld ownloads.

Follow the instructions of the program to install the driver. After successful installation of the driver, the License Manager should display the green hardware-key icon at the top of the program.

2.8.4. License agreement

In order to use this product a license is required. Please contact ABB BV for a valid license authorization key. A valid license will not expire at all.

This end user license agreement grants you the following rights:

Application Software.

You may install and use one copy of the SOFTWARE PRODUCT, or any prior version for the same operating system, on a single computer. The primary user of the computer on which the SOFTWARE PRODUCT is installed may make a second copy for his or her exclusive use on a second computer such as a portable computer. Storage/Network Use. You may also store or install a copy of the SOFTWARE PRODUCT on a storage device, such as a network server, used only to install or run the SOFTWARE PRODUCT on your other computers over an internal network; however, you must acquire and dedicate a license

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2.9. Firewall

Firewalls are network security systems that monitor and control incoming and outgoing network traffic based on predetermined security rules. A firewall is the first line of defense for devices connected to your network. The configuration depends on the used device and software, refer to the configuration manual of the provider of the firewall.

When connecting to a network, make sure the firewall is turned on and configured according to your company's cyber security requirements: close all the ports that are not required.

2.9.1. Required network ports

For eXLerate applications to function correctly, several network ports are required. The table below provides a list of these ports and their purpose. Make sure these ports are not blocked by a firewall when using the specific functionality. Blocking these ports will have impact on the functionality.

Table 1 Network ports

Port	Service	Configurable	Optional
135	RPC (DCOM/OPC)	No	Yes
502	Modbus TCP	Yes	Yes
818	Flow-X Client	Yes	Yes
1947	HASP Driver	No	Yes
3306	Database	Yes	Yes
3389	Remote desktop	Yes	Yes
9666	xlNet	Yes	No
9666 + TS ID	xlNet	Yes	No
Dynamic Ports (see 2.9.3)	RPC (DCOM/OPC)	Yes	Yes

TS ID = Terminal services identification number.

Note that Excel itself can also perform network communication and connect/listen to network ports. This functionality depends on version of Excel and operating system and is not described here.

2.9.2. Allow network traffic

Firewall rules allow network traffic a specified TCP or UDP port number. Inbound rules allow any program that listens on a specified TCP or UDP port to receive network traffic sent to that port.

Configuration may vary on the firewall used. For Windows Defender Firewall, you can use the Advanced Security node in the Group Policy Management MMC snap-in:

– Open the *Windows Defender Firewall with Advanced Security*.

– Click *Inbound Rules*.

– In the *Actions* click *New Rule*.

– On the Rule Type page, select *Custom*. Note: Although you can create rules by selecting *Program* or *Port*, those choices limit the number of pages presented. If you select *Custom*, you see all of the pages, and have the most flexibility in creating your rules.

– On the *Program page*
  • click *This program path* and type the path to the program in the text box to limit traffic to a specified port and allow the traffic only when the specified program is running. The specified program cannot receive network traffic on other ports, and other programs cannot receive network traffic on the specified port. Use environment variables, where applicable, to ensure that programs installed work correctly.
  • click *All programs*, and then click Next.

– On the Protocol and Ports page, select the protocol type that you want to allow. To restrict the rule to a specified port number, you must select either TCP or UDP. Because this is an incoming rule, you typically configure only the local port number.

– On the Scope page, you can specify that the rule applies only to network traffic to or from the IP addresses entered on this page. Configure as appropriate for your design, and then click Next.

– On the Action page, select Allow the connection, and then click Next.

– On the Profile page, select the network location types to which this rule applies, and then click Next.

– On the Name page, type a name and description for your rule, and then click Finish.

2.9.3. RPC Dynamic Port configuration

OPC DA (Data Access) communication is based on COM and DCOM. OPC clients and servers use COM to communicate with each other over the same machine and use DCOM to communicate directly with each other across a network.

DCOM security can cause communication problems as it restricts the use of OPC technology to Windows operating systems. Dynamic port assignment for remote procedure call (RPC) configuration is required on the system where the OPC server is installed to allow remote clients to connect to it over the network.

The dynamic assignment of RPC ports tells the RPC program to use a particular random port. Port 135 is used to establish communication. Once established, new port numbers for communication negotiated and assigned dynamically.

To allow inbound remote procedure call (RPC) network traffic for OPC, create two firewall rules:

1. Allow incoming network packets to the RPC Endpoint Mapper service:
   a) This Program Path: "%systemroot%\system32\svchost.exe"
   b) Customize Service Settings: Apply to this service: Remote Procedure Call (RPC) (short name RpcSs)
   c) Protocol type: TCP
   d) Local port: RPC Endpoint Mapper

2. Allow the network traffic that is sent to the dynamically-assigned port number for the OPC Server (e.g. xlOPC.exe)
   a) This Program Path: "%ProgramFiles% (x86)\eXLerate 2016\Common\xlOPC.exe"
   b) Protocol type: TCP
   c) Local port: RPC Dynamic Ports

Using the two rules configured helps to protect your device by allowing network traffic only from devices that have received RPC dynamic port redirection and to only those TCP port numbers assigned by the RPC Endpoint Mapper. By default, RPC uses ports in the range 49152-65535. You can control the ports used by RPC by modifying the Registry key *HKLM\Software\Microsoft\Rpc\Internet*

with the following values:

– **Ports** (REG_MULTI_SZ): A list of ports Windows is allowed to use for

dynamic port allocation. Can be a single port like "**50000**" or a range like "**50000-51000**". Numbers should be between 1025 and 65535. Note: If you mess this part up by entering an invalid value, the entire configuration is invalid.

– **PortsInternetAvailable** (REG_SZ): Set to **Y** (case insensitive) to use the Ports list as an allowlist (only use those ports).

– **UseInternetPorts** (REG_SZ): Set to **Y** (case insensitive).

2.10. Antivirus protection

Windows Defender Antivirus is Microsoft's antivirus program that is installed with Windows by default. It provides protection against viruses, Trojans, ransomware, and other malware forms. eXLerate is tested to run with the latest updates of Windows Defender.

You may install another antivirus program as recommended by your (customer's) cyber security requirements. It is then recommended to test the compatibility prior to enroll updates to runtime systems as many different antivirus programs exist.

3.   eXLerate Control Center

The main program is the **eXLerate Control Center**. It is a Windows executable program in which all project applications are maintained, added, modified and removed, started, stopped and monitored. On runtime system any other type of program can be added to the Control Center, for example a word processor or print utility program, to make it available for operators in a secure environment.

3.1.   Control center functions

The eXLerate Control Center takes care of the following:

– Maintain common eXLerate settings;

– Start, monitor and terminate eXLerate applications;

– Show, store and print events generated by eXLerate program or applications;

– Act as a program shell in a production environment, e.g. automatically run an application when you start the computer.

– Providing access to external executables, like Word or Notepad, on runtime systems;

– eXLerate user management

– Provide security by preventing or allowing certain Windows actions, such as using the Windows key or task switching, depending on the user level.;

> You can start eXLerate from
> **Windows start - All programs - eXLerate**.

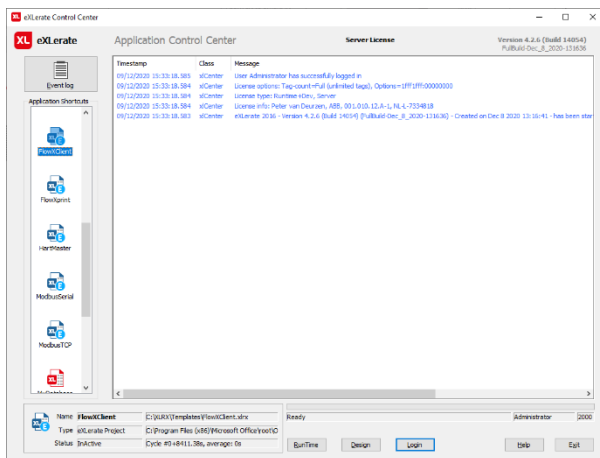The eXLerate Control Center will start and the following window is shown.

Figure 17 eXLerate Control Center

The Control Center windows is divided into several areas:

– On the right top, it shows the eXLerate version and build number;

– The center area shows either the event messages in case the Event log is selected, or the presentation image of the currently selected application.

– On the left-hand side, the top button **Event log** will show event messages in the presentation area;

– On the left-hand side, the list box with shortcuts to applications;
  When you click a shortcut, the presentation area will show you the presentation picture;

– At the bottom left, the status of the selected application, latest system message and the logged in user and level are shown;

– On the bottom, the buttons to start an application, log-in and exit:
  [RunTime] [Design] [Login] [Help] [Exit];

The **XL** system icon in the left top corner of the title bar gives access to the eXLerate user management and system settings menu.

3.2.   User accounts

Different users will have different access rights. Not everyone is allowed to start, edit or terminate applications, or modify settings. Similar in applications, user levels can be configured to allow or disallow certain run-time actions like alarm acknowledgement, modifying values, etc.

An eXLerate user account has a username, a password, and a security level. The security level is internally used by the Control Center itself and can be additionally used by an application developer to create application dependent security functions.

After first installation of eXLerate, various factory-default user accounts are created.

Table 2Default user accounts

User	Password	Level	Typical use
Guest	guest	10	View displays only
Operator	operator	500	Daily operations
Engineer	engineer	1000	Maintenance tasks
Administrator	admin	2000	Full control & Modify user accounts

CHANGE THE DEFAULT USER NAMES AND PASSWORDS AFTER INSTALLATION!

Users may only be created or modified by users having the administrator level of '2000'. The option is disabled when you have insufficient rights.

Log-in with an **administrator** account, click on the **XL** icon and select **Edit Users** to manage user accounts.
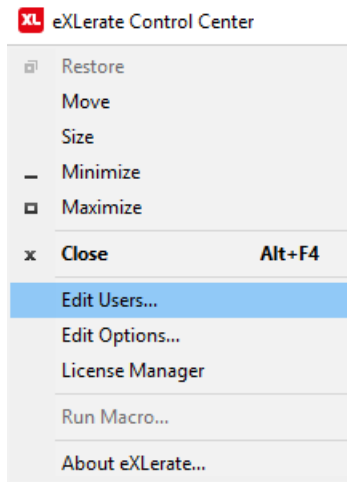

Figure 18 Control center menu Edit Users

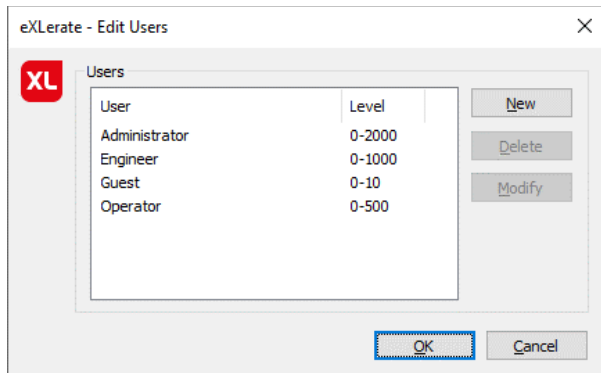You get a dialog with the user accounts and you can add, modify and delete users.

Figure 19 Edit Users dialog (1)

You can add new users, select the user to modify or delete. When you add a new user of modify a user, set a name, password, and the low and high levels.
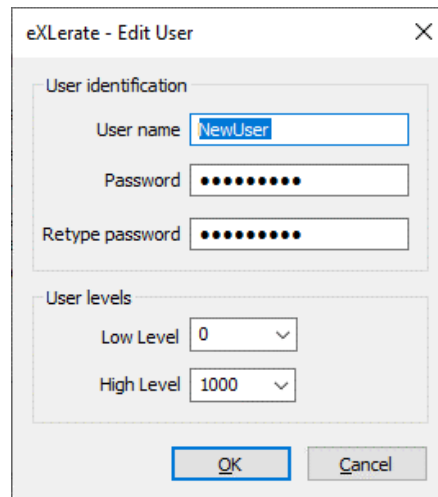

Figure 20 Edit Users dialog (2)

It is recommended to use unique usernames as this allows tracking individual user actions and supports tracking the user that performed an operation. Usage of group and shared accounts prevents individual user traceability and makes revoking rights from an individual user very difficult.

The users are applicable on the local computer for the eXLerate system. Different computers can have different users. The security in eXLerate applications is based on the user level (number); running an application on another computer will use the users as defined on that computer.

The two levels are used to extend the flexibility. Access is granted if the level of the current user is between the minimum and the maximum level. For example, an application developer may start an application in design-mode, to make a modification to a certain display page, but (s)he may not be allowed to actually start an application in Runtime mode - running an application would be only allowed for an operator. On his turn, an operator may be allowed to operate a control system, but not to make changes in an existing application. In addition, an operator may be allowed to start a project at computer startup, but not allowed to terminate a running application.

If this all sounds complex, the **Low Level** is typically set to zero, allowing a user to perform all the actions lower-level users can do.

3.3. eXLerate settings

The eXLerate Control Center allows you to change several settings that are applicable on the local computer for the eXLerate system.

Log-in with an **administrator** account, click on the XL icon and select **Edit Options** to change eXLerate system settings.
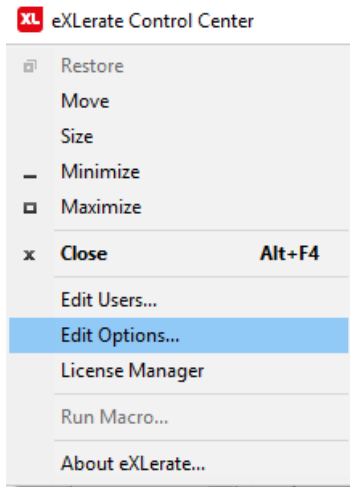

Figure 21 Control center menu Edit Options

The option is disabled when you have insufficient rights.
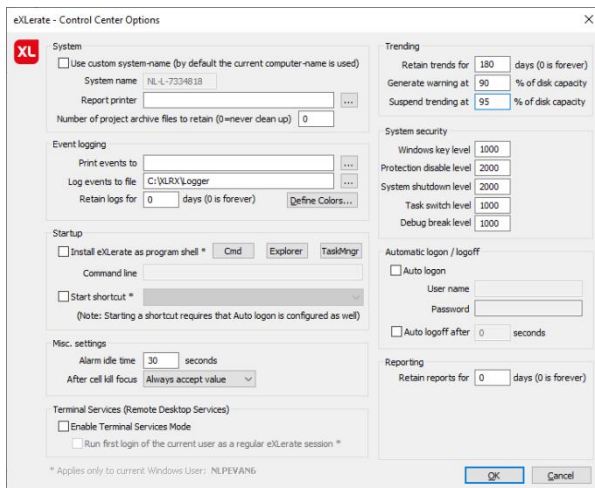
You get a dialog with the Control Center Options.

Figure 22 Control center Options

(!) **Only change settings when well understood.**

Changing these parameters without a thorough knowledge of their impact may result in unpredictable behavior and may cause application errors.

The following options and can be set:

System

– **System name**
The computer system in the eXLerate environment, used to identify the computer in eXLerate applications over the network.
This name is available in eXLerate applications

as a defined object name **'xSystemName'**.
By default, the Windows computer name is used. A custom name may be entered using this dialog. This changes only the internal name within the eXLerate environment, the Windows computer name is not affected.

– **Report printer**
Default printer for reports.
Standard Windows printers are supported by eXLerate. When no printer is configured, the default Windows printer is used.
You can browse the system for an existing printer with the **[...]** button on the right.
Printer names defined in an eXLerate application will overrule this configured printer.

– **Number of project archive files**
When you save an eXLerate application, a backup file is stored in the *Archive* folder. This setting limits the number of backup files per project to prevent disk capacity problems. For example, when set at 25, the latest 25 archive files are maintained, and older files are removed.
When all files are to be kept on disk, the value '0' (zero) may be entered.

Event logging

– **Print events to**
Printer for Alarms & Events.
When set, alarms and events will be sent to this printer when they occur.
Note that with 'cutting sheet' printers this might result in a single alarm or event per page, so it is recommended to use only 'fanfold' printer types for immediate alarms and events printing.
You can browse the system for an existing printer with the **[...]** button on the right.

– **Log events to**
Directory to store the plain text log files containing alarms, events and debug information.
You can browse the system for an existing location with the **[...]** button on the right.

– **Retain logs for**
The number of days to keep the log files and database records in the events table. Older files and database records will be removed by eXLerate in order to limit the disk space usage. To keep the events available forever on the computer, define '0' (zero)

– **Define colors**
Set the colors of event messages in the Control

Center window. This feature allows easy recognition of certain event messages in a system, because a specific color can be attached to certain messages type. For example, alarm messages can be colored with white text on a red background.

Startup

– **Install eXLerate as Program Shell**
    Enabling this option "locks" Windows: the eXLerate program will automatically start when the specific user logs in on Windows and the standard Windows desktop will not be available for the user.
    This prevents a system from being used for anything else than for running eXLerate.

– **Start shortcut**
    The application that is started in runtime mode, when eXLerate is started. For this to work, a user with sufficient security level needs to be logged in.

– **Command line arguments**
    When eXLerate is set as Windows program shell, command line arguments may be used for tweaking the start timing, application to run and user to log-on.
    See *Command line arguments* on the syntax to use.

– **Program buttons**
    Useful on systems running as program shell.

    • **Cmd**
        Starts the Windows command line process;
    • **Explorer**
        Starts the Windows explorer.
    • **TaskMngr**
        Starts the Windows task manager.

Automatic logon / logoff

– **Auto logon**
    When enabled and a valid username and password combination is provided, that user will automatically logon when eXLerate is started.

– **Auto logoff**
    When the enabled, users are logged off when no mouse or keyboard activity is detected for the set time.

Reporting

– **Retain reports for**
    The number of days that report files will be kept on disk.
    By default, this option is set to '0' (zero) which

means that all generated reports are retained indefinitely.

Trending

– **Retain trends for**
    The number of days that trend data will kept on the disk.
    The trending module will try to store as much data as possible, until the disk is full. This is not recommended as trending and possible Windows operation and all programs will halt when the disk is full.
    When set to zero '0', the trend data will remain on disk forever.

– **Generate warning at**
    eXLerate generates a warning to alert the user that system is running out of disk space when disk usage is reaching the specified percentage.

– **Suspend trending at**
    All trend recording is suspended when the disk usage exceeds this percentage. When the disk cleaned-up and the usage is below this setting, trending is resumed. This prevents a disk-full situation, causing an instable Windows system.

System security

– **Windows key level**
    For users with a security level below this level the *Windows key* will be disabled. This will block starting other tasks.

– **Protection disable level**
    The *protection* will be enabled for users with an insufficient security level.

– **System shutdown level**
    This parameter defines at which security level *System Shutdown* will be enabled.

– **Task switch level**
    <Alt+Tab> *task switching* will be disabled for users with insufficient security level.

– **Debug break level**
    This parameter defines at which security level the <ESC> key can be used to switch to *Verify* mode.

Misc. settings

– **Alarm idle time**
    This parameter specifies for how long the system suppresses alarms at system startup. This prevents generation/printing of many useless alarms, being part of the startup process of a system rather than being an alarm condition. After this period, the alarm manager

effectively starts monitoring events and alarms.

– **After cell kill focus**
This is an advanced option which controls how cells behave after they have been edited in runtime mode. For on-screen keyboards it may be useful to change this setting to a different value to get the desired behavior.

Terminal services options

– **Enable Terminal Services Mode**
This parameter enabled the option to run multiple client instances of eXLerate on a single machine using Terminal Services (Remote Desktop).

– **Run first logon of the current user as a regular eXLerate session**
When enabled, runs the first login for of the current user as a regular eXLerate session (e.g. as a Server-session). Use this option when you want to run Terminal Services on the same machine that is a duty/standby or a standalone server.

3.4. Command line arguments

Although designed as a Windows compliant program with a standard user interface, i.e. a windows dialog, the Control Center may be additionally started from the command line for automated system startup.

The control center application may be started using the following syntax:

xlcenter.exe -user {Username} -pswd {Password} -exec {Application} -open {Application}] -wait {Delay}

with:

> *-user {Username}*
> the Username to login at start-up
> *-pswd {Password}*
> the password for the username
> *-exec {Application}*
> application to launch in runtime mode; shortcut name or the whole application path
> *-open {Application}*
> application to launch in design mode; shortcut name or the whole application path
> *-wait {Delay}*
> wait time in seconds before the application is launched

3.5. Application shortcuts

The Control Center contains a list of shortcuts for your applications, as well as for other programs. The latter is useful in a production environment where the user does not have access to the Windows. With this application shortcut menu, you can start, edit or terminate applications.

An application shortcut in the eXLerate Control Center is like a regular program shortcut in Windows, with additional properties for eXLerate. Each shortcut has a set of properties that can be altered by right-click on the shortcut and select **Properties**.
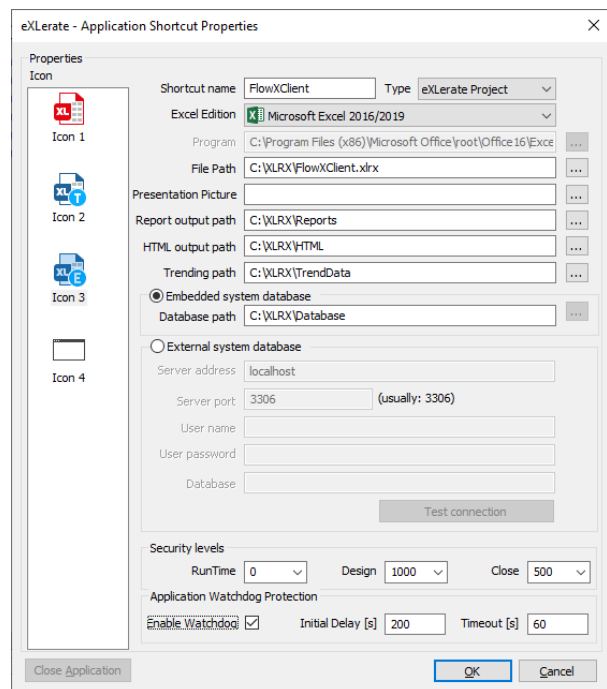

Figure 23 Application shortcut property dialog

In this dialog, you may define the following properties:

– **Icon**
Icon to show in the Control Center shortcut list. An icon may be selected from the icon list at the left of the dialog. Double-click on an icon to set it as the current icon. The current icon is highlighted.

– **Shortcut Name**
The name of the application shortcut as appearing in the shortcut list at the left-hand side of the Control Center main dialog. This name will be used as a key-value, under which various application parameters are stored in the system.

– **Type**
The program to run for the shortcut.
For eXLerate applications, choose *eXLerate Project* as the default type. Other application types are available for operator convenience, in order to create a complete but restricted Windows environment.
The type may be one of the following:

- eXLerate Project
- Windows application
- Windows Explorer
- Task Manager
- Microsoft Excel

– **Program**
This entry must be entered when the shortcut refers to a Windows application and not to an eXLerate application. It is the executable to run, with the name of the executable exactly defined, including the absolute path to the executable.
For the types *Windows Explorer* and *Task Manager* the default location and name are already entered.

– **File Path**
The file (including the full path) to open with the selected program. It may include other parameters as well.
In case of an eXLerate application, enter the name of your application file name.

– **Presentation Picture**
The image file that will be shown in the presentation area of the Control Center. When no presentation picture file is selected, the event logger will be displayed.

– **Report output path**
The location where this eXLerate application stores the reports when these are generated.

– **Trending path**
This is the location where eXLerate stores historical trend files. Standalone and Server systems store trend data to files in this location. Client systems retrieve trending information for the Servers and the path is ignored.

– **System database selection**
eXLerate uses the system database for event logging and to synchronize data between redundant servers. Since version 4.2, eXLerate supports two types for the system databases: the embedded system database or the external system database.

• **Embedded system database**
Use the embedded MySQL database, the embedded system database does not require an additional database server. The embedded system database is not accessible externally. Configuration is easy, just specify the

  – **Database path**
  The location where this eXLerate application stores the database tables.

• **External system database**
Use a local database server for eXLerate. The benefit is that external databases can be accessed by any SQL Client e.g. for troubleshooting.
The external database server used for the system database must be MySQL compatible and must run on the same computer where eXLerate runs.
Furthermore, the storage engine must be **'MyISAM'** for all tables.
To be able to connect to the external database, you must enter the database

  – **Server address**
  This must be the local PC: 'localhost'.
  – **Server port**
  Database server port to use to communicate - Typically port 3306.
  – **Username**
  User to connect to the database server.
  – **User password**
  Password for the user to connect to the database server.
  – **Database**
  Name of the database to access.

– **Security levels**
Minimum user levels required to Run / Design / Close the application.

– **Watchdog protection**
eXLerate allows you to monitor an application with a built-in watchdog mechanism. When enabled, this watchdog routine periodically checks if the application is still responding. If an application is not responding to the watchdog mechanism for the duration of the **timeou**t, the control center will terminate the application, and automatically restart the application again.
As the startup of an application can take a while, an **initial** delay can be set to only start the watchdog mechanism after the initial delay is elapsed.

3.6. System settings

In order to eXLerate run properly, it requires certain Windows system settings and Microsoft Excel settings to be set correctly. These settings are checked by eXLerate when an application is launched. If a misconfigured setting is found, it is logged in the Control Center. Whenever possible, eXLerate tries to fix these settings. If the severity of the misconfigured settings is treated as an Error, a warning message like the following is shown:
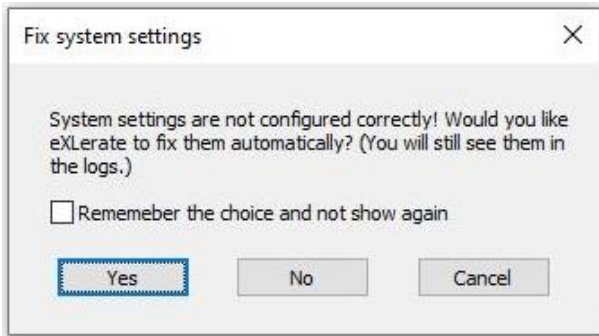

Figure 24 Misconfigured settings message

You can let eXLerate try to fix the settings by clicking **[Yes]**, continue with current settings by clicking **[No]** or abort application launch by clicking **[Cancel]**.

The fixes are carried out by the **xlSettings** tool, that requires administrative credentials to run. If the settings are fixed, the fixed settings are shown and the application is launched, but if eXLerate was not able to fix the settings then another message is shown:
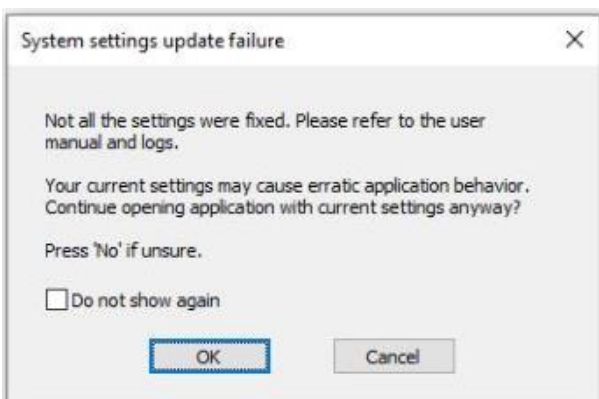

Figure 25 System settings update failure message

The eXLerate Control Center differentiates the severity between settings. Settings that cause applications to malfunction are considered as an error. Other settings that might influence the behavior but don't result in malfunction are considered as a warning.

The following settings are checked and considered an error:

– **Windows Regional Settings**
Identification tag: Locale
Log message: Your current regional settings may cause erratic application behavior. Should be English (United States) or English (United Kingdom)
Note: this setting must be manually fixed under Microsoft Windows.

– **Date and time settings**
Identification tag:
      eXLerate.SetSystemTimePrivilege
Log message: eXLerate cannot automatically change the system time. The Daylight-Saving Time functionality will not work.
Note: this setting must be manually fixed in Microsoft Windows.

– **MS Office End user license agreement**
Identification tag: AcceptAllEulas
Log message: Accept the Microsoft Office License Agreement

– **MS Office default file type**
Identification tag: ShownFileFmtPrompt
Log message: Resolve default file types settings

– **Access to Visual Basic**
Identification tag: AccessVBOM
Log message: Trust access to Visual Basic Project is disabled but should be enabled.

– **Macros usage inside Microsoft Excel**
Identification tag: VBAWarnings
Log message: All Macros is disabled but should be enabled.

The following settings are checked and considered a warning:

– **Multitouch displays**
Identification tag: Multitouch Enabled
Log message: Your monitor is currently configured for multitouch what is not supported by eXLerate

– **ActiveX controls on forms**
Identification tag: LoadControlsInForms
Log message: Disable ActiveX control in UserForms security policy.

– **Macros security level**
  Identification tag: MacroSecurityLevel
  Log message: Macro security level is 'High', but should be 'Low'

– **Trust level of add-ins**
  Identification tag: DontTrustInstalledFiles
  Log message: Trust all installed add-ins and templates is disabled but should be enabled.

– **Microsoft Excel autorecover**
  Identification tag: AutoRecoverEnabled
  Log message: Auto recover is enabled, but should be disabled.

– **Excel background error checking**
  Identification tag: BackgroundChecking
  Log message: Background error checking is enabled, but should be disabled.

The **xlSettings** tool can also be used directly from command line with the following syntax:
xlSettings.exe sid excel_internal_version settings_list

with:

– sid   User's security identifier of a Windows user on whose account eXLerate runs. If zero then current user is used.

– excel_internal_version

  • 14   for Excel 2010
  • 15   for Excel 2013
  • 16   for Excel 2016 / 2019 / 365

– settings   A series of identification tags separated by spaces.

Example of use:
xlSettings.exe 0 16 AccessVBOM VBAWarnings

3.7. Reset to default settings

To reset all settings and users to factory defaults when you need full access to the Windows environment.

– Log in with user that can close the eXLerate application

– Close the eXLerate application and Control Center.

– Open Windows Explorer

– Remove all files in the folder *'C:\Xlrx\Settings'*

When you've lost the user password to close the application or Control center, you can reset the settings as follows:

– Restart the computer

– Press and hold Shift key when Windows starts to load to bypass auto sign-in

– Log-in with Windows user that doesn't automatically starts eXLerate

– Open Windows Explorer

– Remove all files in the folder *'C:\Xlrx\Settings'*

All eXLerate users and Control Center settings will then revert to default.

4.   Document revisions

Revision A   February 2012

– Initial release for eXLerate 2010

– Added 'Import Sheets' and 'Advanced Replace'
  tools.

Revision B   December 2016

– Update to eXLerate 2016.

– Update to ABB lay-out.

– New document code: OI/eXL2016-EN.

Revision C   September 2018

– New document code: IM/eXL-EN.

– Reintroduce revisions chapter.

– Provisional support for MS Excel 2019 added.

– Windows 8 removed from software
  requirements.

Revision D   April 2019

– Support for MS Excel 2019 added.

– Added references to Function Reference
  manual.

– Added 'Required settings' documentation.

– Added information for system administrators
  for operation system settings for kiosk mode.

Revision E   April 2020

– Split document content with this document
  containing only Installation instructions

– Update and extended the Software
  requirements.

– Installing eXLerate chapter updated for new
  installer.

Revision F   January 2021

– Updated User Account Control

– eXLerate Application control moved to the
  Configuration Manual

Appendix A.   Installation checklist

BIOS Settings

- ☐   Resume operation after a power failure
- ☐   Disable boot from CD / USB devices / network
- ☐   Boot order set to boot from hard drive first

System info

Processor   _____

Clock-speed   _____

RAM   _____

Computer name: _____

Hard disk drives:

☐ C:\ _____ GB

☐ D:\ _____ GB

☐ E:\ _____ GB

Printers

Name _____   Make _____   Model _____

Name _____   Make _____   Model _____

Name _____   Make _____   Model _____

Name _____   Make _____   Model _____

Network settings

Adapters

1.   _____   DHCP / Static IP address _____   Subnet mask _____

2.   _____   DHCP / Static IP address _____   Subnet mask _____

3.   _____   DHCP / Static IP address _____   Subnet mask _____

4.   _____   DHCP / Static IP address _____   Subnet mask _____

Firewall ports

☐   xlNet   _____ (default 9666)

☐   Terminal services (xlNet + ID)

☐   Flow-X Client _____ (default 818)

☐   Modbus TCP   _____

☐   HASP Driver   1947

☐   Web Server   8080 – 9000

Windows Server options

☐ Enable 'Do not start server manager automatically at logon'.

☐ Disable 'Display shutdown event tracker'

☐ Disable 'Display Error Notification'

☐ Enable 'Disable Windows Error Reporting'

Windows user accounts

Username _____   Password _____   Member of group _____

Username _____   Password _____   Member of group _____

Username _____   Password _____   Member of group _____

Username _____   Password _____   Member of group _____

Appearance and Personalization

☐ Display resolution 1920x1080 / Other _____

☐ Magnification settings: Smaller (100%)

☐ Disable Windows screen saver

☐ Set Windows background

☐ Action Center settings Disable notifications.

☐ Ease of access Disable Turn on Sticky Keys

☐ Ease of access Disable Turn on Filter Keys

☐ Regional and Language (In principle select US or UK)

☐ Decimal symbol set to point "."

☐ List separator set to comma ","

 Windows software applications:

☐ Games removed

☐ Sounds removed

☐ Search removed

Software versions

 Operating System (run 'WinVer.exe'):

☐ Windows 10   Version _____ Build _____

☐ Server 2019   Version _____ Build _____

☐ Server 2016   Version _____ Build _____

 Microsoft Office / Excel (see 'Account'):

☐ Office 365   Version _____ Build _____

☐ Office 2019   Version _____ Build _____

☐ Office 2016   Version _____ Build _____

Required software packages

☐ Microsoft .NET Framework 2.0   Version _____

☐ Microsoft .NET Framework 4.7.2   Version _____

☐ Microsoft Visual C++ Redistributable 2019   Version _____

Spirit^{IT} eXLerate

☐ eXLerate   Version _____ Build _____

☐ End-user   _____

☐ Company   _____

☐ System _____

☐ Machine ID _____

☐ License number _____

☐ Authorization key _____

☐ Sentinel HASP   Version _____

☐ Flow-X GUI   Version _____

Optional software packages

☐ Anti-virus   _____   Version _____

☐ AnyDesk   _____   Version _____

☐ PDF reader   _____   Version _____

☐ OPC Server   _____   Version _____

☐ Port server _____   Version _____

Kiosk mode

☐ Automatic logon user _____

☐ Set User password never expires

☐ Disable Lock computer

☐ Disable Logoff (from Windows)

☐ Disable Change a password

☐ Disable Start Task Manager

☐ Disable Switch user

☐ Disable Autorun from CD's and USB sticks

☐ Disable Multitouch

☐ Power options Never put the computer to sleep (processor and hard disk)

☐ Power options Never turn off the display

- ☐ Enable Adjust date and time
- ☐ Disable Automatically adjust clock for Daylight Saving Time
- ☐ Time synchronization with Time Server [] No / [] Yes _____
- ☐ Action Center settings Turn messages off
- ☐ User Account Control set to *"Notify me only when apps try to make changes to my computer"*

eXLerate users

Username _____   Password _____   Level _____

Username _____   Password _____   Level _____

Username _____   Password _____   Level _____

Username _____   Password _____   Level _____

Control Center options

- ☐ System name _____
- ☐ Report printer _____
- ☐ Event printer _____
- ☐ Log events _____
- ☐ Install eXLerate as program shell
- ☐ Start shortcut _____
- ☐ Automatic logon user _____

Application shortcut

- ☐ Application path _____
- ☐ Report path _____
- ☐ Trending path _____
- ☐ Embedded database path _____
- ☐ External database _____
- ☐ Enable watchdog

Application

- ☐ Check communication ports
- ☐ Deselect in xlConnect log events for all protocols and queries
- ☐ Check that in VBA all active references are valid
- ☐ Compile VBA project
- ☐ Run the eXLerate Diagnostic tool and archive these files