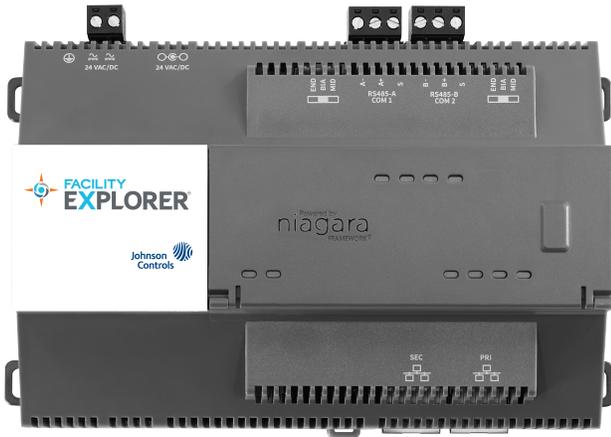


## Overview

**Figure 1: FX90 Supervisory Controller**



The FX90 is a web-based supervisory controller in the Facility Explorer® product family, with advanced features for enhanced performance. It provides integrated control supervision and network management services for local networks of equipment controllers. The FX90 Supervisory Controller supports a full set of building automation features, such as scheduling, alarming, historical data collection and management, data sharing, 3D system graphics, energy management, totalization, customized control routines, tagging, templates, search, and hierarchies, which are specifically designed for commercial facilities.

Each FX90 Supervisory Controller includes a graphical system user interface with an HTML5 web profile, a configuration tool that you can access with the web browser, and robust security. Remote access is easily achieved using a wired or wireless connection from the Internet or intranet. Multiple users can connect to the FX90 Supervisory Controller concurrently. You can manage security and presentation preferences through user profiles, log on IDs, and passwords.

The FX90 Supervisory Controller is a compact DIN rail mountable controller with the capability for remote external input and output points.

In addition, the FX90 Supervisory Controller's hardware and software design is modular, so you can plug in accessories such as optional communication modules. The device and point licensing options allow you to select the device and point capacity most appropriate for the size of your facility and the options best needed to control it.

## Features and benefits

### Web-based user interface

Provides rich, graphical displays for system operation and analysis.

### Adoption of industry standard communication protocols

Assures compliance to standards to support interoperability with third-party equipment controllers.

### Modular design

Allows you to select only those components needed to meet specific project requirements.

### Small, compact design

The FX90 Supervisory Controller is easy to install.

### FX Workbench

Reduces engineering and installation time by providing you a way to easily and quickly create the FX90 database from equipment controller configurations offline.

### FX Appliance

The FX Appliance offers over 20 distinct productivity features built on top of the Niagara framework. It enables users to quickly build a system configuration database in minutes, with automatic tagging, auto-generated 3D graphics, and more, saving time and money from bid to operation.

### Niagara® analytics

Allows you to apply a variety of analytical algorithms and diagnostics to both historical and real-time data.

## Options to commission and license the FX90 Supervisory Controller

At this release with 14.13.2 software, the FX90 Supervisory Controller is available in one option:

- A stock option that the customer commissions. The customer stocks the unit and chooses when to commission and start the maintenance period.
  - **Important:** The stock option requires FX Workbench to commission and upgrade the unit.

The factory commissioned and licensed option will be available for the FX90 Supervisory Controller at a later release.

① **Note:** Update the FX release from the factory release to a currently supported release to ensure the latest fixes, cybersecurity fixes, and features.

## Communication interfaces

The FX90 Supervisory Controller supports multiple onboard and optional communication interfaces. The FX90 Supervisory Controller can integrate with many different types of equipment controllers and provides different methods of remote user access.

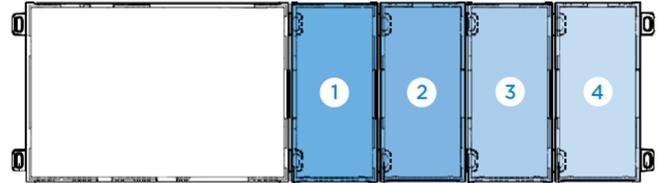
The FX90 Supervisory Controller includes the following onboard communication hardware interfaces:

- Two 10/100/1000 MB Ethernet ports.
- Two isolated RS-485 ports with selectable bias and termination.
- USB Type C for serial debug connection.

You can order and install the following optional modules to obtain additional communication hardware interfaces:

- Dual port, isolated RS-485 communication module: up to two maximum.
- LonWorks FTT-10A communication module: up to four maximum.
- RS-232 communication module: up to four maximum.

**Figure 2: Optional communication module positions**



**Table 1: Maximum combinations of optional communication modules**

| Optional communication module position |                             |                             |                             |                             |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Maximum configuration option           | 1                           | 2                           | 3                           | 4                           |
| <b>A</b>                               | RS-232 or LonWorks protocol |
| <b>B</b>                               | Dual port RS-485            | RS-232 or LonWorks protocol | RS-232 or LonWorks protocol | RS-232 or LonWorks protocol |
| <b>C</b>                               | Dual port RS-485            | Dual port RS-485            | RS-232 or LonWorks protocol | n/a                         |
| <b>D</b>                               | Dual port RS-485            | Dual port RS-485            | n/a                         | n/a                         |

## Networking protocols

The FX90 Supervisory Controller can use network protocol driver software to obtain and model external device data. The FX90 Supervisory Controller licenses include the following network driver features enabled as standard:

- Johnson Controls® N2. This is exclusive to FX80 and FX90 Supervisory Controllers
- BACnet MS/TP
- BACnet/IP Client and Server
- BACnet/SC
- Modbus® Remote Terminal Unit (RTU) Client and Server
- Modbus Transmission Control Protocol (TCP) Client and Server
- LonWorks FTT-10A. This requires LonWorks communication module
- LonWorks over IP
- M-Bus
- EIB/KNX
- Simple Network Management Protocol (SNMP)

## Building automation control features

The FX90 Supervisory Controllers transform data obtained from network device integrations and direct I/O into a common set of data types, allowing you to apply the FX90 controller's full set of building automation control features, including scheduling, alarming, histories, energy

management, totalization, and custom control logic, consistently to all data points, regardless of their source.

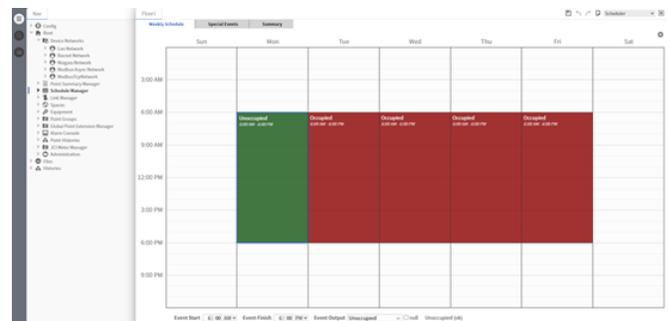
## Scheduling

You can configure the FX90 Supervisory Controller to automate various functions in a facility based on a time schedule:

- Determine the expected occupancy periods
- Start or stop HVAC equipment
- Turn lights on and off

You can link any writable point in the FX90 Supervisory Controller system database to a schedule. The scheduler interface provides a visually intuitive method for you to configure the daily, weekly, and exception or holiday schedules.

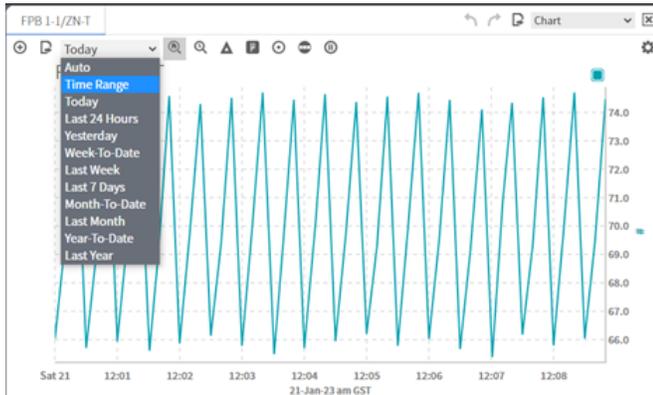
**Figure 3: Scheduler**



## Histories

The Histories feature collects, stores, and displays pertinent system data for analysis, such as control performance indication, energy consumption, and system troubleshooting. You can configure the FX90 Supervisory Controller to create a history on any data point in its system database. Histories are presented either graphically or in a sortable table, and you can export the data in a TXT, PDF, or CSV format.

**Figure 4: Histories**



## Alarming

The Alarming feature initiates, routes, and manages alarms and events according to user-defined criteria. You can configure the FX90 Supervisory Controller to generate alarms on any data point in its system database. Each alarm record contains valuable information that includes the alarm and return to normal time and date, time duration in current state, text description, and alarm class.

You can create alarm classifications so that alarms with similar characteristics are routed to common recipients. You can also create multiple alarm classes to provide a variety of alarm routing options, such as to the browser-based Alarm Console or to an email address. Alarm recipients have a variety of options to manage alarms, including sorting, acknowledging, silencing, and tagging.

You can route alarms to the people who need them based on schedules and on-call lists. These lists can be prioritized and escalated based on the recipient's actions. These actions include delivery and acknowledgment through email and SMS.

## Energy management

The FX90 Supervisory Controller features several energy management functions that you can enable and configure:

- Electrical demand limiting or load shedding
- Optimized start and stop
- Free cooling determination

## Totalization

The Totalization feature enables the FX90 Supervisory Controller to accumulate data over a period of time. You can add a totalization extension to any data point in the FX90 Supervisory Controller system database to summarize runtime, accumulate change of state counts, or summarize dynamic analog data. Totalized data is presented in a sortable table, and you can export it in a TXT, PDF, or CSV file format.

## Tagging and templating

Metadata tagging provides ways for you to find data, through search and navigation hierarchies, as well as providing ways to narrow results by filtering the data. Similarly, creating templates using pre-tagged devices results in built-in reusability, which translates to shorter integration time.

## Niagara Analytics

Niagara Analytics is a data analytics extension to the Niagara Framework® available on FX Supervisory Software. Niagara Analytics gives FX90 Supervisory Controller users the ability to apply a variety of analytic algorithms and diagnostics to both historical and real-time data available.

## Algorithm Library

The algorithm library has a group of predefined algorithms that you can customize and extend to meet the specific needs of the site. Also provided are more than 40 functional and mathematical blocks to help you design and create your own custom algorithms. Use your algorithm to evaluate a single piece of equipment or all pieces of equipment in your enterprise, then save your entire analytics operation as a template and redeploy as often as needed.

## Intuitive Programming

You can drag and drop algorithms onto the wiresheet from the Analytics palette.

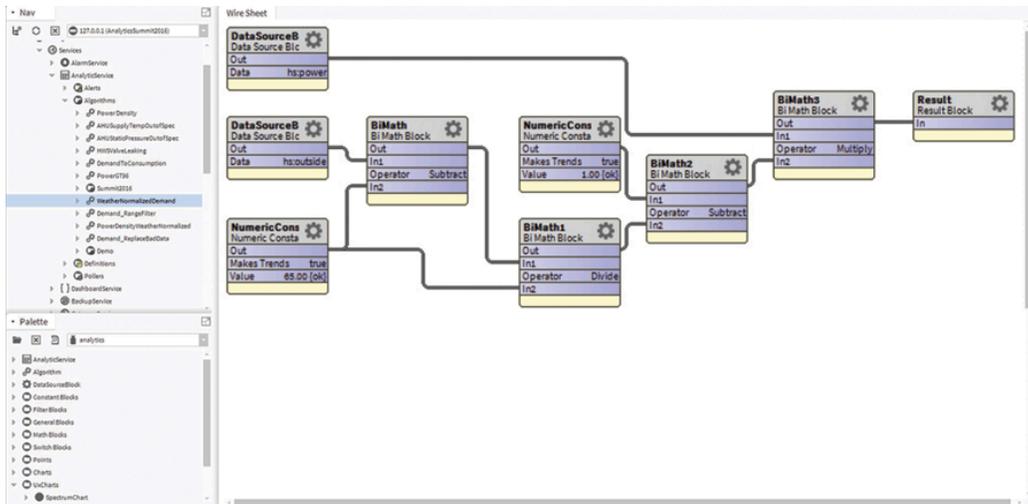
## Real-time, On-Premise Analytics Control

You can run on-site analytics directly on the FX90 Supervisory Controller to identify a situation and make a change in real time, which enables you to make faster decisions while conserving computing power. Results can then be pushed up to the server to make changes across the enterprise.

## Automated-Control Strategies

Advanced alarming can collect data from multiple real-time data sources, and can make intelligent decisions based on custom algorithms and therefore provide a more sophisticated analysis. This process eliminates many end-user nuisance alarms.

Figure 5: Analytics



### Customized control logic

The FX90 Supervisory Controller includes a library of control logic modules that you can enable, configure, and link together to create your own customized control routines:

- Boolean logic: AND, OR, XOR, NOT
- Comparative: greater than, less than, equal, not equal
- Mathematical: add, subtract, multiply, divide, average, negative
- Sequencers
- Proportional-Integral-Derivative (PID) control
- On or Off control

### Web-based user interface

The FX Supervisory Controller’s web-based user interface (Web UI) provides system-wide monitoring and control capability through a web browser. The Web UI capability is embedded in every FX Supervisory Controller, allowing users to access the system using a web browser over an Ethernet LAN or internet connection.

When you create your Web UI pages, you can choose from a full library of colorful, 3D graphical symbols including the following symbols:

- HVAC equipment
- Duct work
- Coils
- Piping
- Control devices, for example, dampers or valves
- Widgets, for example, buttons, tables, or hyperlinks

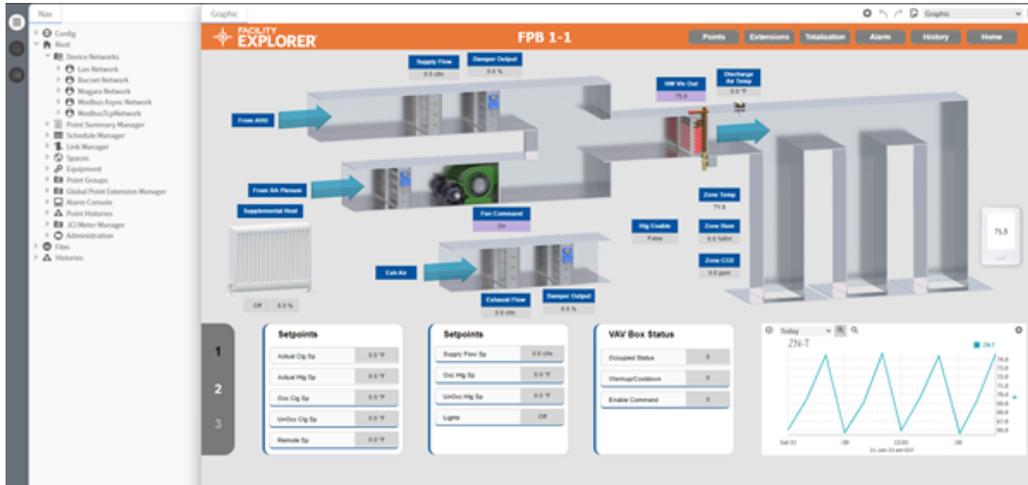
In addition, you can import your own digital images, for example, a floor-plan JPEG, and incorporate them into your Web UI.

The FX90 features modernized 3D graphics that have the same look and feel on any tablet, laptop, mobile phone device, without the need to create separate graphics for different device platforms. You can view devices, points, schedules, alarms, and graphics with the convenience of a wireless handheld device. You can also acknowledge alarms, command points, and modify schedules. The user interface updates dynamically, so that when changes are made to the FX Supervisor configuration, these changes automatically appear.

Figure 6: Mobile device Web UI



Figure 7: Full-sized Web UI



### FX Workbench and the FX Appliance

You can configure the FX90 Supervisory Controller with the FX Workbench software application. The FX Appliance offers exclusive productivity features built on top of the Niagara framework. These tools aim to streamline and automate workflows, enabling you to quickly build a system configuration database in minutes, with automatic tagging, auto-generated 3D graphics, and more. FX Workbench is embedded in every FX90 Supervisory Controller and is served up to web browsers of authorized users. In addition, you can purchase FX Workbench as a separate software application that resides on a computer. You can configure the FX90 Supervisory Controller online while you directly or remotely connect with FX Workbench.

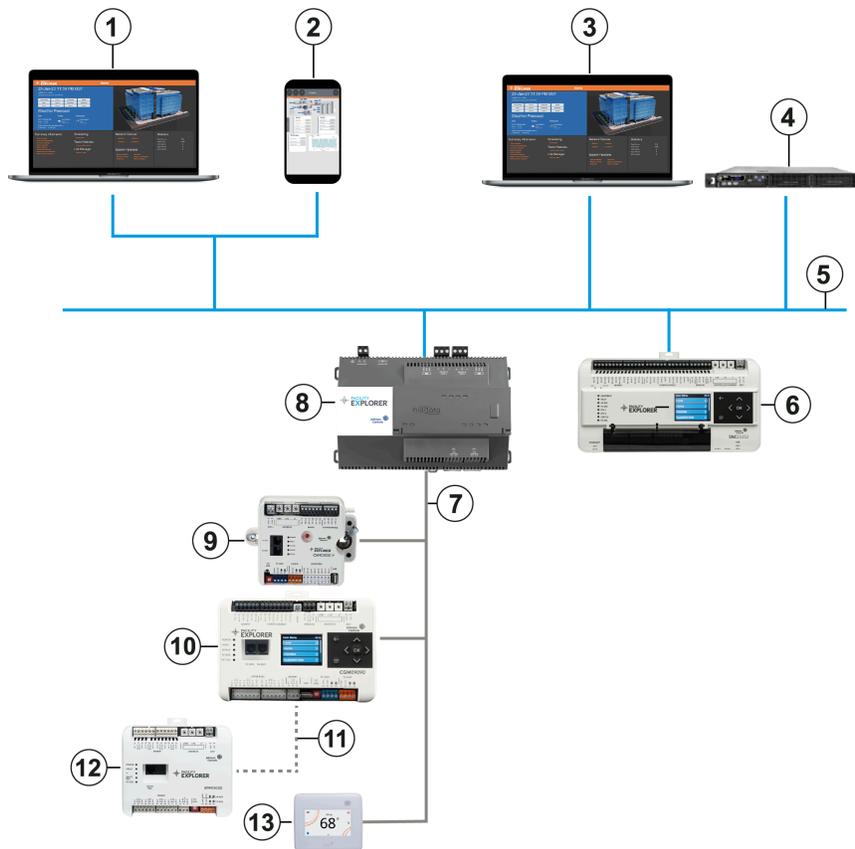
FX Workbench includes many labor-saving configuration features:

- Import FX equipment controllers configuration files to automatically create the point database with automatic tagging, 3D system graphic, point and alarm summaries, Histories, and Trend graphs

- Online discovery of LonWorks and BACnet devices and points
- Online discovery of N2 devices with assisted importing of N2 points
- A check box method to enable and disable points and create point extensions, such as alarms, histories, and totalizations
- Intuitive managers for grouping points, creating master schedules, and linking points
- A library of predefined systems, with associated graphic, points list, and default features
- Automated graphic page creation

For more information about FX Workbench and the FX Appliance productivity features, refer to the *FX Workbench 14.x User Guide (LIT-12012256)*.

**Figure 8: Example of a Facility Explorer configuration**



| Callout | Component                       |
|---------|---------------------------------|
| 1       | Browser                         |
| 2       | Mobile device                   |
| 3       | FX Workbench                    |
| 4       | FX Server                       |
| 5       | Ethernet, TCP/IP, HTTP, BACnet  |
| 6       | F4-SNC Supervisory Controller   |
| 7       | MS/TP bus                       |
| 8       | FX90 Supervisory Controller     |
| 9       | F4-CVM Equipment Controller     |
| 10      | F4-CGM Equipment Controller     |
| 11      | SA bus                          |
| 12      | F4-XPM Expansion Module         |
| 13      | TEC3000 Color Series Thermostat |

## Ordering information

For every FX90 Supervisory Controller you purchase, you will need a core device license and a software maintenance license.

- A core device license (FX-SC9CL###-0): A core device license is required for each FX90. Core device licenses come in 5, 10, 25, 100, 200, and demo sizes. Only one core license can be applied to each FX90.
- A software maintenance license (FX-SC9D###M#-0): The software maintenance must match the total number of device licenses (core and additional). Choose from 1, 3, or 5 years.

- ① **Note:** The demo version does not require the software maintenance license. The demo license requires yearly renewal and expires on October 31st.

After the above requirements are met, additional licenses may be added to the FX90:

- Additional device licenses (FX-SC8DL##-0): These licenses extend the total device license count of an FX80 or FX90. For example, if a total of 50 device licenses are required for an FX90, you would purchase the FX-SC8DL25-0 in addition to the core device license, FX-SC9CL025-0.

- ① **Note:** To order additional device licenses, the same product code FX-SC8DL##-0 applies to the FX80 and FX90 Supervisory Controllers.

## FX90 Supervisory Controller

**Table 2: FX90 Supervisory Controller ordering information**

| Region   | Product code number | Description  |
|----------|---------------------|--|
| Americas | FX-SC9BASE-0        | FX90 Supervisory Controller (non-WiFi model) and micro Secure Digital (SD) card, licensing required and purchased separately |
| Americas | FX-SC9BASE-700      | Replacement FX90 Supervisory Controller (non-WiFi model), no micro SD card, no licenses                                      |

## FX90 core device licenses

- ① **Note:** You can purchase the following parts in multiples.

**Table 3: Americas**

| Product code number  | Description   |
|--|---|
| FX-SC9CL005-0  | FX90 Supervisory Controller core device license, 5 field devices or 250 points  |
| FX-SC9CL010-0  | FX90 Supervisory Controller core device license, 10 field devices or 500 points   |
| FX-SC9CL025-0  | FX90 Supervisory Controller core device license, 25 field devices or 1,250 points   |
| FX-SC9CL100-0  | FX90 Supervisory Controller core device license, 100 field devices or 5,000 points  |
| FX-SC9CL200-0  | FX90 Supervisory Controller core device license, 200 field devices or 10,000 points   |
| FX-SC9CLDEMO-0   | FX90 Supervisory Controller demo license, 500 field devices. Enables all features needed to engineer and demonstrate FX Supervisory Controllers and FX Server stations. Intended for installing contractors. Requires annual support fee. Expires yearly. |
| ① <b>Note:</b> Software Maintenance is not required for the FX-SC9CLDEMO-0. The existing annual support and renewal fee covers this. |   |

## FX90 software maintenance licenses

**Table 4: Americas**

| Product code number                               | Description   |
|---|---|
| <b>FX90 Software Maintenance Licenses: 1 Year</b> |   |
| FX-SC9D005M1-0                                    | Initial purchase 1-Year Software Maintenance for FX90 with 5–9 field devices        |
| FX-SC9D010M1-0                                    | Initial purchase 1-Year Software Maintenance for FX90 with 10–24 field devices      |
| FX-SC9D025M1-0                                    | Initial purchase 1-Year Software Maintenance for FX90 with 25–99 field devices      |
| FX-SC9D100M1-0                                    | Initial purchase 1-Year Software Maintenance for FX90 with 100–199 field devices    |
| FX-SC9D200M1-0                                    | Initial purchase 1-Year Software Maintenance for FX90 with 200 and up field devices |
| FX-SC9D005M1-6                                    | Additional 1-Year Software Maintenance for FX90 with 5–9 field devices              |
| FX-SC9D010M1-6                                    | Additional 1-Year Software Maintenance for FX90 with 10–24 field devices            |
| FX-SC9D025M1-6                                    | Additional 1-Year Software Maintenance for FX90 with 25–99 field devices            |

**Table 4: Americas**

| Product code number                               | Description   |
|---|---|
| FX-SC9D100M1-6                                    | Additional 1-Year Software Maintenance for FX90 with 100–199 field devices                        |
| FX-SC9D200M1-6                                    | Additional 1-Year Software Maintenance for FX90 with 200 and up field devices                     |
| <b>FX90 Software Maintenance Licenses: 3 Year</b> |   |
| FX-SC9D005M3-0                                    | Initial purchase or additional 3-Year Software Maintenance for FX90 with 5–9 field devices        |
| FX-SC9D010M3-0                                    | Initial purchase or additional 3-Year Software Maintenance for FX90 with 10–24 field devices      |
| FX-SC9D025M3-0                                    | Initial purchase or additional 3-Year Software Maintenance for FX90 with 25–99 field devices      |
| FX-SC9D100M3-0                                    | Initial purchase or additional 3-Year Software Maintenance for FX90 with 100–199 field devices    |
| FX-SC9D200M3-0                                    | Initial purchase or additional 3-Year Software Maintenance for FX90 with 200 and up field devices |
| <b>FX90 Software Maintenance Licenses: 5 Year</b> |   |
| FX-SC9D005M5-0                                    | Initial purchase or additional 5-Year Software Maintenance for FX90 with 5–9 field devices        |
| FX-SC9D010M5-0                                    | Initial purchase or additional 5-Year Software Maintenance for FX90 with 10–24 field devices      |
| FX-SC9D025M5-0                                    | Initial purchase or additional 5-Year Software Maintenance for FX90 with 25–99 field devices      |
| FX-SC9D100M5-0                                    | Initial purchase or additional 5-Year Software Maintenance for FX90 with 100–199 field devices    |
| FX-SC9D200M5-0                                    | Initial purchase or additional 5-Year Software Maintenance for FX90 with 200 and up field devices |

① **Note:** When a period of time occurs between when the software maintenance license expires and the renewal license begins, you will be required to pay for this lapsed period.

## FX80 and FX90 additional field device licenses

**Table 5: Americas**

| Product code number | Description  |
|---------------------|--|
| FX-SC8DL10-0        | License enabling an additional 10 field devices or 500 points for one FX80 or FX90   |
| FX-SC8DL25-0        | License enabling an additional 25 field devices or 1,250 points for one FX80 or FX90 |
| FX-SC8DL50-0        | License enabling an additional 50 field devices or 2,500 points for one FX80 or FX90 |

## Niagara Analytics licenses

**Table 6: Americas**

| Product code number | Description  |
|---------------------|--|
| FX-ASCL100-0        | License enabling 100 analytic points for Niagara Analytics on an FX80 or FX90 Supervisory Controller   |
| FX-ASCL250-0        | License enabling 250 analytic points for Niagara Analytics on an FX80 or FX90 Supervisory Controller   |
| FX-ASCL500-0        | License enabling 500 analytic points for Niagara Analytics on an FX80 or FX90 Supervisory Controller   |
| FX-ASCL1000-0       | License enabling 1,000 analytic points for Niagara Analytics on an FX80 or FX90 Supervisory Controller |

① **Note:** Niagara Analytics products require Niagara Analytics N4 certification. Niagara Analytics certification training requires Niagara 4 TCP Certification.

## FX90 supporting software

**Table 7: FX90 supporting software**

| Region   | Product code number | Description                              |
|----------|---------------------|--|
| Americas | FX-WBALM-0          | License that enables Alarm Portal Client |

## FX80 and FX90 Controller software accessories

**Table 8: Americas**

| Product code number | Description  |
|---------------------|--|
| FX-SC8LCCN-0        | License enabling Carrier® Communication/Comfort Network (CCN) driver for one FX80 or FX90 Supervisory Controller; initial purchase |
| FX-SC8LCCN-6        | License enabling Carrier CCN driver for one FX80 or FX90; upgrade after initial purchase   |
| FX-SC8LAC-6         | License enabling AC256 over RS-232 or RS-485 driver  |
| FX-SC8LAINF-6       | License enabling Andover® Infinity driver  |
| FX-SC8LAPHP-6       | License enabling American Auto-Matrix™ PHP over RS-232 or RS-485 driver  |
| FX-SC8LAPUP-6       | License enabling American Auto-Matrix™ PUP over RS-232 or RS-485 driver  |
| FX-SC8LFLEX-6       | License enabling Flex™ driver over RS-232 or RS-485  |
| FX-SC8LMCQUAY-6     | License enabling McQuay® driver to OPM driver  |

## FX80 and FX90 Controller hardware accessories

**Table 9: FX80 and FX90 Controller hardware accessories ordering information (Americas)**

| Product code number | Description  |
|---------------------|--|
| FX-SC9SD-700        | FX90 micro SD replacement, micro SD only, no licenses  |
| FX-SC8XLON-0        | LonWorks FX80 and FX90 expansion module for the FX80 and FX90 Supervisory Controller   |
| FX-SC8XD485-0       | Dual port isolated RS-485 expansion module for the FX80 and FX90 Supervisory Controller  |
| FX-SC8X232-0        | RS-232 expansion module for the FX80 and FX90 Supervisory Controller   |
| FX-SC8AKIT-700      | FX80 and FX90 accessory kit including replacement connectors   |
| FX-SC8XKIT-700      | FX80 and FX90 expansion module kit including one-size-fits-all replacement connector   |
| FX-SC8XPS-0         | FX80 and FX90 universal wall mount power supply 100–240 VAC/24 V includes United States, Europe, United Kingdom, and Australia style plugs     |
| FX-SC8XIOR16-0      | Remote input/output module for the FX Supervisory Controllers; includes 8 universal inputs, 4 relay outputs, and four 0-10 V analog outputs    |
| FX-SC8XIOR34-0      | Remote input/output module for the FX Supervisory Controllers; includes 16 universal inputs, 10 relay outputs, and eight 0-10 V analog outputs |

## FX80 and FX90 Controller - E-SIGN and FIPS 140-2 accessories (Americas only)

**Table 10: FX80 and FX90 Controller - E-SIGN and FIPS 140-2 accessories (Americas only)**

| Product code number | Description   |
|---------------------|---|
| FX-SC8FIPS-0        | Provides FIPS 140-2 Level 1 conformance that uses the integrated FIPS-certified BouncyCastle module for an FX80 and FX90. Compatible with FX version 14.6 and later |
| FX-SC8LES250-0      | License enabling e-signature application with 250 points for FX80 and FX90  |
| FX-SC8LESUNL-0      | License enabling e-signature application with unlimited points for FX80 and FX90  |
| FX-SC8LESUP25-0     | License adding 250 e-signature points for FX80 and FX90   |
| FX-TSES-0           | E-signature technical support - up to 8 hours in 90-day period following order placement  |

① **Note:** FX-TSES-0 is required with the first E-SIGN order.

**Table 11: FX80 and FX90 Controller - JSON and HTTP Client software licenses**

| Product code number | Description   |
|---------------------|---|
| FX-SC8LJSON-0       | License enabling JSON Toolkit for FX80 and FX90 (Valid Software Maintenance required)   |
| FX-SC8LHTTP-0       | License enabling HTTP Client to integrate webservices and RESTful API endpoints for FX80 and FX90 (Valid Software Maintenance required) |

FX90 is restricted from being sold in the following countries

**Table 12: Restricted countries**

| Country     | Country code |
|-------------|--------------|
| Belarus     | BY           |
| Cuba        | CU           |
| Iran        | IR           |
| North Korea | KP           |
| Russia      | RU           |
| Sudan       | SD           |
| South Sudan | SS           |
| Syria       | SY           |
| Venezuela   | VE           |

## Technical specifications

**Table 13: FX90 Supervisory Controller technical specifications**

| Specification               | Description  |
|-----------------------------|--|
| <b>Enclosure</b>            | Plastic  |
| <b>Mounting</b>             | DIN rail   |
| <b>Dimensions (h x w d)</b> | 179 mm x 110 mm x 61 mm (7.05 in. x 4.33 in. x 2.40 in.)   |
| <b>Power supply</b>         | 24 VAC rated at 24 VA minimum, or 24 VDC rated at 1 A (24 W) minimum   |
| <b>Processor</b>            | NXP iMX8M+ Quad Core CPU   |
| <b>RAM memory</b>           | 2GB LPDDR4 RAM   |
| <b>Flash memory</b>         | 8 GB onboard EMMC storage<br>8 GB micro-SD card: backup media  |
| <b>Environment</b>          | Operating temperature: -20°C to 60°C (-4°F to 140°F)<br>Storage temperature: -40°C to 85°C (-40°F to 185°F)<br>Humidity: 5% to 95%, non-condensing |
| <b>Onboard</b>              | Two Ethernet ports: 10/100/1000 MB<br>Two isolated RS-485 ports with selectable bias and termination<br>USB type C                                 |
| <b>Plug-in options</b>      | Two isolated RS-485 ports with selectable bias and termination   |
| <b>Network drivers</b>      |  |
| <b>Embedded</b>             | N2, BACnet, FX 14.13.2 or higher   |
| <b>Direct I/O</b>           |  |
| <b>Onboard</b>              | None   |
| <b>Optional</b>             | Up to 256 I/O when you use 16 remote I/O modules. The I/O module part numbers are IO-R-16 and IO-R-34  |
| <b>Local (NDIO)</b>         | None   |
| <b>Remote I/O</b>           | Up to 256 I/O when you use 16 remote I/O modules. The I/O module part numbers are IO-R-16 and IO-R-34  |

**Table 13: FX90 Supervisory Controller technical specifications**

| Specification   | Description  |
|---|--|
| <b>Compliance</b>   | <b>United States</b><br>UL Listed, File E207782, CCN PAZX, under UL 916, Energy Management Equipment<br>FCC compliant to CFR 47, part 15, subpart C, Class B               |
|   | <b>Canada</b><br>UL Listed, File E207782, CCN PAZX7, under CSA C22.2 No. 205, Signal Equipment<br>Industry Canada compliant to ICES-003                                    |
|  | <b>Europe</b><br>CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive |

**Table 14: FX Workbench requirements**

| Requirement             | Description  |
|-------------------------|--|
| <b>Processor</b>        | Intel® Pentium® Core 2 Duo, 2 GHz  |
| <b>Operating System</b> | <b>64-bit:</b> Windows® 10 and 11 Pro or Enterprise, Windows Server 2016 or higher |
| <b>Memory</b>           | 8 GB minimum   |
| <b>Hard disk</b>        | 2 GB minimum. 10 GB minimum for any supervisor                                     |
| <b>Network support</b>  | Ethernet 100 Mbit or 1 Gbit network interface card (NIC) with TCP/IP support       |

**Note:** The information that relates to Processor in this table applies to the FX Supervisory Software Release 14.x.

## North American Emissions Compliance

### United States

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.  
Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

### Product warranty

This product is covered by a limited warranty, details of which can be found at [www.johnsoncontrols.com/buildingswarranty](http://www.johnsoncontrols.com/buildingswarranty).

### Software terms

**Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable end-user license, open-source software information, and other terms set forth at [www.johnsoncontrols.com/techterms](http://www.johnsoncontrols.com/techterms).** Your use of this product constitutes an agreement to such terms.

### Patents

Patents: <https://jciapat.com>

## Single point of contact

| APAC  | EU   | UK   | NA/SA   |
|---|--|--|---|
| JOHNSON<br>CONTROLS<br>C/O CONTROLS<br>PRODUCT<br>MANAGEMENT<br>NO. 32<br>CHANGJIANG<br>RD NEW<br>DISTRICT<br>WUXI JIANGSU<br>PROVINCE<br>214028<br>CHINA | JOHNSON<br>CONTROLS<br>VOLTAWEG 20<br>6101 XK ECHT<br>THE<br>NETHERLANDS | JOHNSON<br>CONTROLS<br>TYCO PARK<br>GRIMSHAW<br>LANE<br>MANCHESTER<br>M40 2WL<br>UNITED<br>KINGDOM | JOHNSON<br>CONTROLS<br>5757 N GREEN<br>BAY AVE.<br>GLENDALE, WI<br>53209<br>USA |

## Contact information

Contact your local Johnson Controls representative:  
[www.johnsoncontrols.com/locations](http://www.johnsoncontrols.com/locations)

Contact Johnson Controls: [www.johnsoncontrols.com/  
contact-us](http://www.johnsoncontrols.com/contact-us)