FX80 Supervisory Controller Product Bulletin

Overview

The FX80 Supervisory Controller is a web-based supervisory-class controller in the *Facility Explorer®* product family. The FX80 controller manages networks of field controllers using open communication protocols, such as BACnet®, LONWORKS®, and N2 protocols. The FX80 controller supports a full set of building automation features, such as scheduling, alarming, historical data collection and management, data sharing, energy management, totalization, customized control routines, tagging, templates, search, and hierarchies, which are specifically designed for commercial facilities.

Each FX80 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 concurrently connect to the FX80 controller. You can manage security and presentation preferences through user profiles, login IDs, and passwords.

The FX80 Supervisory Controller is a compact DIN rail mountable controller with the capability for remote external input and output points.

In addition, the FX80 controller's hardware and software design is modular, so you can plug in accessories, such as communications option modules, if needed. Device and point licensing options allow you to select the device and point capacity most appropriate for the size of your facility and those options best needed to control it. And, in many cases, future expansions do not require the replacement of hardware.

Figure 1: FX80 Supervisory Controller

FX80 Features and Benefits

- **Fully Commissioned and Licensed Out of the Box** —Power up, connect to a web browser, change default passwords, set up network parameters, and start adding your field controllers.
- **Web-Based User Interface**—Provides rich, graphical displays for system operation and analysis.
- **Adoption of Industry Standard Communication Protocols**—Allows for the integration of a wide variety of field controllers, including *Facility Explorer* field controllers and controllers provided by others without intermediate gateways or translators.
- **Embedded Configuration Tool**—Requires no proprietary or desktop software to configure the FX80 controller. You only need a web browser for basic configuration and monitoring.
- **Modular Design**—Allows you to select only those components needed to meet specific project requirements.
- **Small, Compact Design**—Installs easily.
- **FX Workbench**—Reduces engineering and installation time by easily and quickly creating the FX80 database from field controller configurations offline.
- **Niagara® Analytics**—Allows you to apply a variety of analytical algorithms and diagnostics to both historical and real-time data.

FX80 Supervisory Controller

The FX80 Supervisory Controller provides integrated control supervision and network management services for one or more local networks of field controllers, and provides direct control over inputs and outputs. The FX80 controller uses these interfaces to monitor and control HVAC, lighting, and other electrical systems to:

- provide system-wide coordination
- improve occupant comfort
- annunciate off-normal and alarm conditions
- reduce energy usage
- optimize operating efficiencies

Each FX80 controller includes a 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.

The FX80 controller organizes system information into displays, reports, and graphics that you can access by using a web browser.

The FX80 controller is housed in compact, DIN rail mount enclosures. Its controller capacity and performance requirements make it ideally suited for:

- supervisory control of small- to large-sized facilities
- distributed supervisory control within larger facilities or between facilities

Communication Interfaces

The FX80 controller supports multiple onboard and optional communication interfaces, which enable the FX80 controller to integrate many different types of field controllers, as well as provide different methods of remote user access.

The FX80 controller includes the following onboard communication hardware interfaces:

- Wi-Fi (for use as a Client or an Access Point)
  - IEEE802.11a/b/g/n
  - IEEE802.11n HT20 at 2.4GHz
  - IEEE802.11n HT20/HT40 at 5GHz
  - Configurable radio (Off, Wireless Application Protocol [WAP], or Client)
  - WPAPSK/WPA2PSK supported
- Two 10/100 MB Ethernet ports
- Two isolated RS-485 ports with selectable bias and termination
- USB Type A (for backup and restore)
- Micro USB (for serial debug connection)

The FX80 controller also provides the ability for you to separately order and install optional modules to obtain additional communication hardware interfaces, including the following:

- Dual port, isolated RS-485 communication module (up to 2 maximum)
- LONWORKS FTT-10A communication module (up to 4 maximum)
- RS-232 communication module (up to 4 maximum)

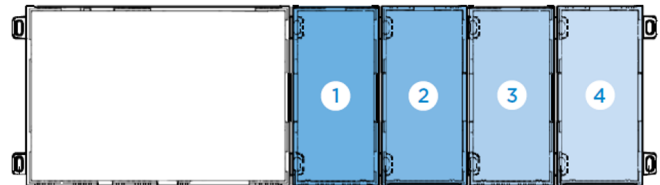**Figure 2: Optional Communication Module Positions**

Table 1: Maximum Combinations of Optional Communication Modules

Optional Communication Module Position				
Maximum Configuration Option	1	2	3	4
A	RS-232 or LONWORKS protocol	RS-232 or LONWORKS protocol	RS-232 or LONWORKS protocol	RS-232 or LONWORKS protocol
B	Dual port RS-485	RS-232 or LONWORKS protocol	RS-232 or LONWORKS protocol	RS-232 or LONWORKS protocol
C	Dual port RS-485	Dual port RS-485	RS-232 or LONWORKS protocol	NA
D	Dual port RS-485	Dual port RS-485	NA	NA

Support Networking Protocols

The FX80 controller can use network protocol driver software to obtain and model external device data. The FX80 controller licenses include the following network driver features enabled as standard:

- Johnson Controls® N2 (exclusive to FX80)
- BACnet Master-Slave/Token-Passing (MS/TP)
- BACnet IP Client and Server
- MODBUS® Remote Terminal Unit (RTU) Client and Server
- MODBUS Transmission Control Protocol (TCP) Client and Server
- LONWORKS FTT-10A (requires LONWORKS communication module)

- LONWORKS over IP
- M-Bus
- EIB/KNX
- Simple Network Management Protocol (SNMP)

You can purchase the optional **Carrier® CCN** network protocol driver feature and add it to the FX80 controller license. Also available for purchase is an AX license, which allows the FX80 controller to run Niagara AX software. This is typically required if you want to use an FX80 to replace other types of FX Supervisory Controllers on an existing site.

Inputs/Outputs (I/O)

In addition to obtaining data from field devices using network communication services, the FX80 controller also supports obtaining information, using remote inputs and outputs.

Remote I/O (RIO16)

All FX Supervisory Controllers support the optional Remote I/O (RIO) module. The RIO communicates to the FX Supervisory Controller through RS-485 and contains the following I/O:
- 8 universal inputs
- 4 relay outputs
- 4 analog outputs

Building Automation Control Features

The FX80 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 FX80 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 FX80 controller to automate various functions within a facility based on a time schedule. Some examples include:
- determining the expected occupancy periods
- starting or stopping HVAC equipment
- turning lights on and off

You can link any writable point in the FX80 controller system database to a schedule. The scheduler interface provides a visually intuitive method for you to configure the daily, weekly, and exception (holiday) schedules.

Figure 3: Scheduler
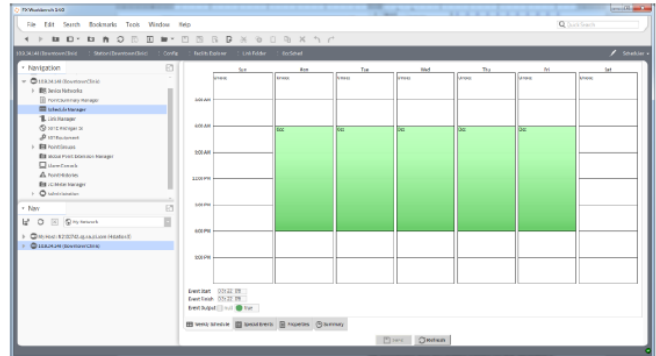
Histories

The Histories feature allows the FX80 controller to collect, store, and display pertinent system data for analysis, such as control performance indication, energy consumption, and system troubleshooting. You can configure the FX80 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
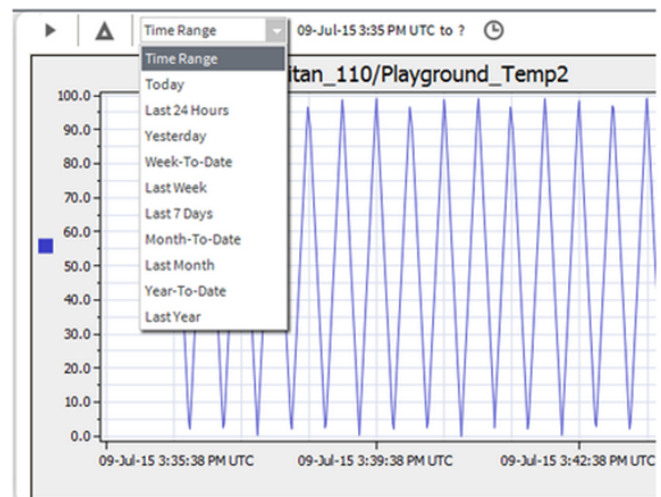
Alarming

The Alarming feature enables the FX80 controller to initiate, route, and manage alarms and events according to user-defined criteria. You can configure the FX80 controller to generate alarms on any data point in its system database. Each alarm record contains valuable information, including 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.

Figure 5: Alarm Console
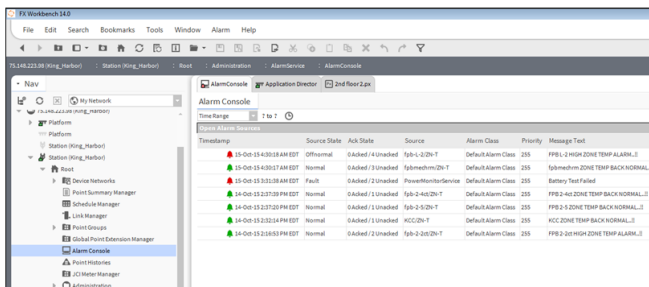
Energy Management

The FX80 controller features several energy management functions, which you can enable and configure, including:
- electrical demand limiting/load shedding
- optimized start/stop
- free cooling determination

Totalization

The Totalization feature enables the FX Supervisory Controller to accumulate data over a period of time. You can add a totalization extension to any data point in the FX 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 FX80 users the ability to apply a variety of analytic algorithms and diagnostics to both historical and real-time data available. At FX Supervisory Software Release 14.2, every FX80 is licensed for 25 analytic objects.

- 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 FX80 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 6: Analytics
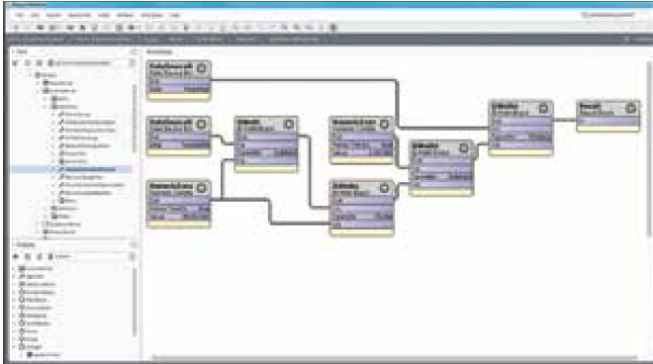
Customized Control Logic

The FX80 controller includes a library of control logic modules that you can enable, configure, and link together to create your own customized control routines. Some examples of the available control logic modules include the following:

- 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/off control

Web-Based User Interface

The FX Supervisory Controller's web-based user interface (Web UI) provides system-wide monitoring and control capability using 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, graphical symbols including:
- 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 floorplan JPEG) and incorporate them into your Web UI.

FX Workbench provides you with two sets of factory designed, standard application graphics to include in your Web UI. One set is designed for viewing with a full-sized computer screen, and the other set is optimized for viewing with a smartphone-sized device like an iPhone®, iPad®, or other similarly sized handheld devices. When you import a controller with a standard application, both sets of graphics can be **automatically generated**.

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. An automated configuration assistant is available to help set the correct screen size for many handheld devices.

Figure 7: Mobile Web UI

Figure 8: Full Size Web UI
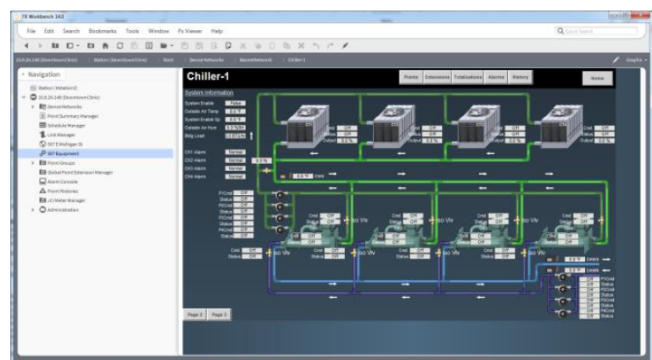
FX Workbench

FX Workbench is a software application that allows users to configure the FX80 controller. FX Workbench is embedded in every FX80 controller and is served up to web browsers of authorized users. In addition, you can purchase FX Workbench as a separate software application residing on a computer.

Users can configure the FX80 controller online while directly or remotely connected with FX Workbench.

FX Workbench includes many labor-saving configuration features, such as:

- importing of FX-PC Series configuration files to create the point database, graphics, 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 graphics, points list, and default features
- automated graphic page creation

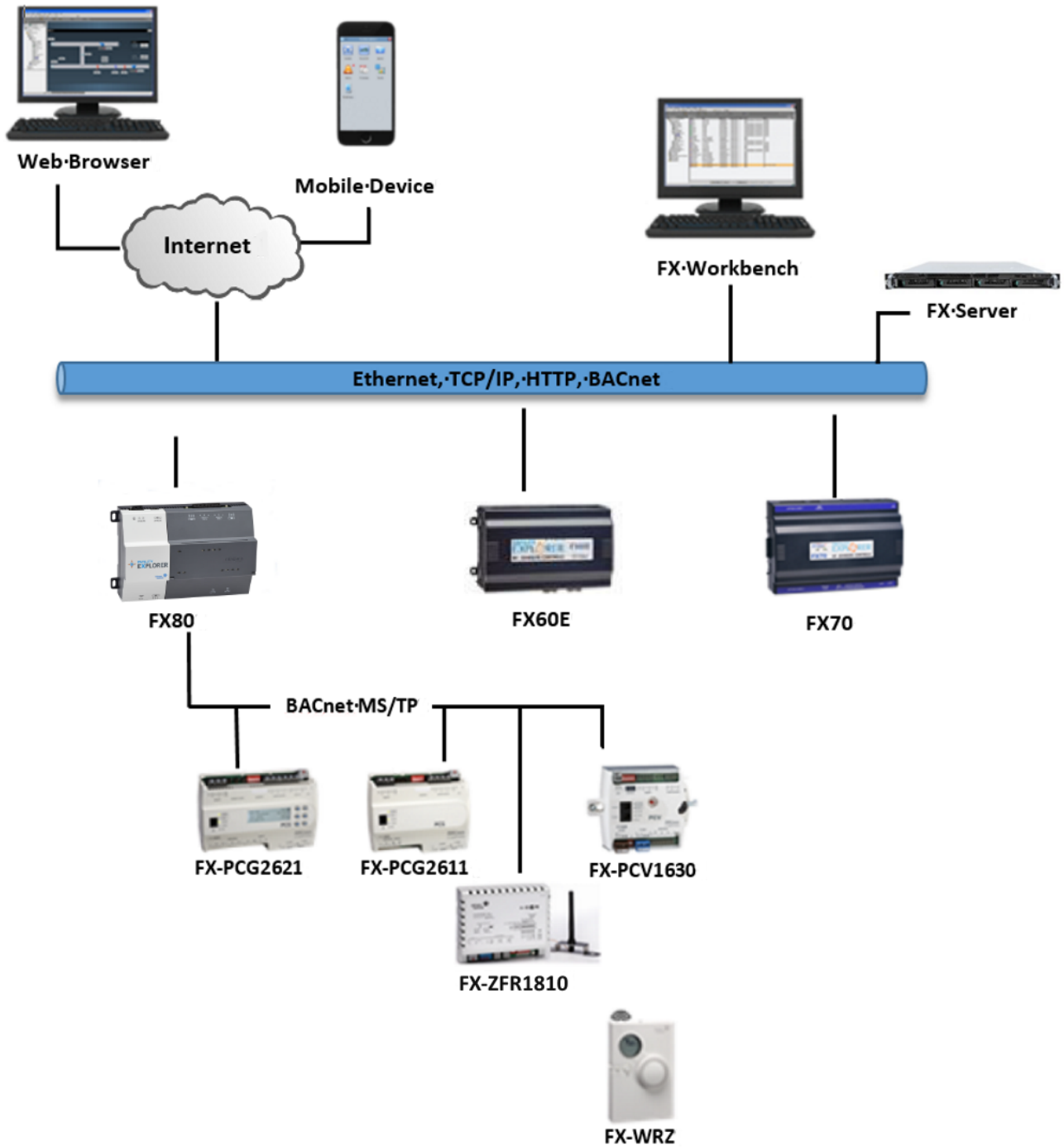**Figure 9: Example of a *Facility Explorer* Configuration**

Table 2: FX80 Supervisory Controller Ordering Information

Product Code Number	Description
FX-SC8BASE-0	FX80 Supervisory Controller and micro Secure Digital (SD) card, licensing required and purchased separately
FX-SC8BASE-700	Replacement FX80 Supervisory Controller, no micro SD card, no licenses
FX-SC8BWW-0[1]	FX80 Supervisory Controller Case, World Wide WLAN
FX-SC8BDWIFI-0	FX80 Supervisory Controller Case, Disabled WLAN

1   The FX80 World Wide Controller is intended and only orderable outside of North America.

Table 3: FX80 Core Device Licenses Ordering Information

Product Code Number[1]	Description[2]
FX-SC8CL005-0	FX80 Supervisory Controller core device license, 5 field devices, 250 points
FX-SC8CL010-0	FX80 Supervisory Controller core device license, 10 field devices, 500 points
FX-SC8CL025-0	FX80 Supervisory Controller core device license, 25 field devices, 1,250 points
FX-SC8CL100-0	FX80 Supervisory Controller core device license, 100 field devices, 5,000 points
FX-SC8CL200-0	FX80 Supervisory Controller core device license, 200 field devices, 10,000 points
FX-SC8CLDEMO-0	FX80 Supervisory Controller demo license, 500 field devices, 25,000 points. 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.

(2X)

1   Each FX80 controller requires the purchase of a single core device license.
2   Device licenses are also dependent on point (proxy) counts. For each device that is licensed, 50 points are licensed. A 5-device core license also licenses 250 points. This could satisfy five devices with 25 points each or three devices with 80 points each. For three devices with 90 points each, you need to purchase the 10-device core license (or add a 5-device additional license to the 5-device core license).

Table 4: New FX80 Controller Software Maintenance Ordering Information

Product Code Number	Description[1]
FX-SC8D005M1-0	Initial 1 year software maintenance for FX80 Supervisory Controller with 5–9 field device capacity
FX-SC8D005M3-0	Initial 3 year software maintenance for FX80 Supervisory Controller with 5–9 field device capacity
FX-SC8D005M5-0	Initial 5 year software maintenance for FX80 Supervisory Controller with 5–9 field device capacity
FX-SC8D010M1-0	Initial 1 year software maintenance for FX80 Supervisory Controller with 10–24 field device capacity
FX-SC8D010M3-0	Initial 3 year software maintenance for FX80 Supervisory Controller with 10–24 field device capacity
FX-SC8D010M5-0	Initial 5 year software maintenance for FX80 Supervisory Controller with 10–24 field device capacity
FX-SC8D025M1-0	Initial 1 year software maintenance for FX80 Supervisory Controller with 25–99 field device capacity
FX-SC8D025M3-0	Initial 3 year software maintenance for FX80 Supervisory Controller with 25–99 field device capacity
FX-SC8D025M5-0	Initial 5 year software maintenance for FX80 Supervisory Controller with 25–99 field device capacity
FX-SC8D100M1-0	Initial 1 year software maintenance for FX80 Supervisory Controller with 100–199 field device capacity
FX-SC8D100M3-0	Initial 3 year software maintenance for FX80 Supervisory Controller with 100–199 field device capacity
FX-SC8D100M5-0	Initial 5 year software maintenance for FX80 Supervisory Controller with 100–199 field device capacity
FX-SC8D200M1-0	Initial 1 year software maintenance for FX80 Supervisory Controller with 200 and up field device capacity

Table 4: New FX80 Controller Software Maintenance Ordering Information

Product Code Number	Description[1]
FX-SC8D200M3-0	Initial 3 year software maintenance for FX80 Supervisory Controller with 200 and up field device capacity
FX-SC8D200M5-0	Initial 5 year software maintenance for FX80 Supervisory Controller with 200 and up field device capacity

1   Device capacity is equal to the sum of the **core device license** and **any additional device license** applied to the FX80 controller. Select the device capacity that is equal or lesser than the sum.

Table 5: FX80 Controller Software Maintenance (Post Initial) Ordering Information

Product Code Number	Description[1]
FX-SC8D005M1-6	1 year software maintenance for FX80 Supervisory Controller with 5–9 field device capacity
FX-SC8D005M3-6	3 year software maintenance for FX80 Supervisory Controller with 5–9 field device capacity
FX-SC8D005M5-6	5 year software maintenance for FX80 Supervisory Controller with 5–9 field device capacity
FX-SC8D010M1-6	1 year software maintenance for FX80 Supervisory Controller with 10–24 field device capacity
FX-SC8D010M3-6	3 year software maintenance for FX80 Supervisory Controller with 10–24 field device capacity
FX-SC8D010M5-6	5 year software maintenance for FX80 Supervisory Controller with 10–24 field device capacity
FX-SC8D025M1-6	1 year software maintenance for FX80 Supervisory Controller with 25–99 field device capacity
FX-SC8D025M3-6	3 year software maintenance for FX80 Supervisory Controller with 25–99 field device capacity
FX-SC8D025M5-6	5 year software maintenance for FX80 Supervisory Controller with 25–99 field device capacity
FX-SC8D100M1-6	1 year software maintenance for FX80 Supervisory Controller with 100–199 field device capacity
FX-SC8D100M3-6	3 year software maintenance for FX80 Supervisory Controller with 100–199 field device capacity
FX-SC8D100M5-6	5 year software maintenance for FX80 Supervisory Controller with 100–199 field device capacity
FX-SC8D200M1-6	1 year software maintenance for FX80 Supervisory Controller with 200 and up field device capacity
FX-SC8D200M3-6	3 year software mintenance for FX80 Supervisory Controller with 200 and up field device capacity
FX-SC8D200M5-6	5 year software maintenance for FX80 Supervisory Controller with 200 and up field device capacity

1   Device capacity is equal to the sum of the **core device license** and **any additional device license** applied to the FX80 controller. Select the device capacity that is equal or lesser than the sum.

Table 6: FX80 Controller Additional Field Device Licenses Ordering Information

Product Code Number [1]	Description
Initial Purchase	
FX-SC8DL10-0	License enabling an additional 10 field devices, 500 points for one FX80, initial purchase only
FX-SC8DL25-0	License enabling an additional 25 field devices, 1,250 points for one FX80, initial purchase only
FX-SC8DL50-0	License enabling an additional 50 field devices, 2,500 points for one FX80, initial purchase only
After Initial Purchase	
FX-SC8DL10-6	License enabling an additional 10 field devices, 500 points for one FX80. Upgrade after initial purchase.
FX-SC8DL25-6	License enabling an additional 25 field devices, 1,250 points for one FX80. Upgrade after initial purchase.
FX-SC8DL50-6	License enabling an additional 50 field devices, 2,500 points for one FX80. Upgrade after initial purchase.

1   Additional devices are used to expand capacity from the core device license. For example, you can order the FX-SC8DL25-0 with the FX-SC8CL025-0 for a total of 50 devices, 2500 points.

Table 7: Niagara Analytics Licenses Ordering Information

Product Code Number[1]	Description
FX-ASCL100-0	License enabling 100 analytic points for Niagara Analytics on an FX80 Supervisory Controller at FX Supervisory Family Software Release 14.2 or greater
FX-ASCL250-0	License enabling 250 analytic points for Niagara Analytics on an FX80 Supervisory Controller at FX Supervisory Family Software Release 14.2 or greater
FX-ASCL500-0	License enabling 500 analytic points for Niagara Analytics on an FX80 Supervisory Controller at FX Supervisory Family Software Release 14.2 or greater
FX-ASCL1000-0	License enabling 1,000 analytic points for Niagara Analytics on an FX80 Supervisory Controller at FX Supervisory Family Software Release 14.2 or greater

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

Table 8: FX80 Supporting Software Ordering Information

Product Code Number	Description
FX-WBALM-0	License enabling Alarm Portal Client for FX Supervisory Family Software Release 14.2 or greater

Table 9: FX80 Controller Software Accessories Ordering Information

Product Code Number	Description
FX-SC8LCCN-0	License enabling Carrier® Communication/Comfort Network (CCN) driver for one FX80 Supervisory Controller; initial purchase
FX-SC8LAX-0	License enabling AX 3.8 downgrade for one FX80; initial purchase
FX-SC8LCCN-6	License enabling Carrier CCN driver for one FX80; upgrade after initial purchase
FX-SC8LAX-6	License enabling AX 3.8 downgrade for one FX80; upgrade after initial purchase
FX-SC8LAC-6[1]	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-SC8LGLOB-6[2]	License enabling control of IR AV equipment through an RS-232 to Global Cache FC module
FX-SC8LHELV-6[2]	License enabling Helvar lighting control driver
FX-SC8LHORT-6[2]	License enabling European Hortsmann meter driver
FX-SC8LJOS-6[2]	License enabling Josam® grease trap sensor driver
FX-SC8LLANG-6[2]	License enabling Lang™ oven RS-232 or RS-485 driver
FX-SC8LMCQ-6	License enabling McQuay® driver to OPM driver
FX-SC8LSMS-6[2]	License enabling SMS alarms through Global System for Mobile Communication (GSM)/General Packet Radio Services (GPRS) modem to RS-232 serial port driver
FX-SC8LVDRT-6[2]	License enabling Veeder-Root® RS-232 or RS-485 driver

1   Available in Beta version only.
2   Drivers supported at **FX Supervisory Family Software Release 6.3 only**. These drivers are **not** supported at FX Supervisory Family Software Release 14.x.

Table 10: FX80 Controller Hardware Accessories Ordering Information

Product Code Number	Description
FX-SC8SD-700	FX80 micro SD replacement (micro SD only); no licenses
FX-SC8XLON-0	LONWORKS FX80 expansion module for the FX80 Supervisory Controller
FX-SC8XD485-0	Dual port isolated RS-485 expansion module for the FX80 Supervisory Controller
FX-SC8X232-0	RS-232 expansion module for the FX80 Supervisory Controller
LP-FXRIO16-0	Remote input/output module for the FX Supervisory Controllers; includes 8 universal inputs, 4 relay outputs, and four 0-10 V analog outputs
FX-SC8AKIT-700	FX80 accessory kit including replacement connectors
FX-SC8XKIT-700	FX80 expansion module kit including one-size-fits-all replacement connector
FX-SC8XPS-0	FX80 universal wall mount power supply 100–240 VAC/24 V includes United States, Europe, United Kingdom, and Australia style plugs
FX-SC8WKIT-700	Extension cable and bracket for FX80 WLAN

Global Shipping

This section lists the FX80 parts that are used for each country.

Notes:
- Part number configuration cannot be changed after leaving the factory. For example, FX-SC8BDWIFI-0 (Wi-Fi disabled) is not field upgradeable to FX-SC8BWW-0 (World Wide Wi-Fi).
- Each part number referenced for a specific country complies with local safety regulations.

Table 11: Wi-Fi/WLAN Operation and Safety Certification Have Been Approved

Country	Country Code	Wi-Fi Enabled by FX Release[1]	FX80 Part Number with Wi-Fi	FX80 Part Number with Wi-Fi Disabled[2]
Argentina	AR	14.3	FX-SC8BWW-0	FX-SC8BDWIFI-0
Australia	AU	14.2	FX-SC8BWW-0	FX-SC8BDWIFI-0
Austria	AT	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Belgium	BE	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Bulgaria	BG	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Canada	CA	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Chile	CL	14.3	FX-SC8BWW-0	FX-SC8BDWIFI-0
China	CN	14.2	Not Available	FX-SC8BDWIFI-0
Croatia	HR	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Cyprus	CY	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Czech Republic	CZ	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Denmark	DK	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Estonia	EE	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Finland	FI	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
France	FR	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Germany	DE	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Greece	GR	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Hong Kong	HK	14.2	FX-SC8BWW-0	FX-SC8BDWIFI-0
Hungary	HU	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Iceland	IS	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Ireland	IE	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Italy	IT	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Kuwait	KW	14.3	FX-SC8BWW-0	FX-SC8BDWIFI-0
Liechtenstein	LI	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Lithuania	LT	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Luxembourg	LU	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Malta	MT	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Netherlands	NL	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
New Zealand	NZ	14.2	FX-SC8BWW-0	FX-SC8BDWIFI-0
Norway	NO	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Poland	PL	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Portugal	PT	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Puerto Rico	PR	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0

Table 11: Wi-Fi/WLAN Operation and Safety Certification Have Been Approved

Country	Country Code	Wi-Fi Enabled by FX Release[1]	FX80 Part Number with Wi-Fi	FX80 Part Number with Wi-Fi Disabled[2]
Romania	RO	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Singapore	SG	14.2	FX-SC8BWW-0	FX-SC8BDWIFI-0
Slovakia	SK	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Slovenia	SI	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Spain	ES	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Saudi Arabia	SA	14.3	FX-SC8BWW-0	FX-SC8BDWIFI-0
Switzerland	CH	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Thailand	TH	14.3	FX-SC8BWW-0	FX-SC8BDWIFI-0
United States	US	14.1	FX-SC8BASE-0	FX-SC8BDWIFI-0
United Kingdom	UK	14.1	FX-SC8BWW-0	FX-SC8BDWIFI-0
Vietnam	VN	14.3	FX-SC8BWW-0	FX-SC8BDWIFI-0

1   Wi-Fi Enabled by FX Release lists the minimum software version to support Wi-Fi.
2   Part numbers are not dependent on the FX Supervisory Software Release.

Table 12: Wi-Fi/WLAN Operation is Pending and Safety Certification is Approved

Country	Country Code	Wi-Fi Enabled by FX Release[1]	FX80 Part Number with Wi-Fi	FX80 Part Number with Wi-Fi Disabled[1]
Brazil	BR	14.3	Not Available	FX-SC8BDWIFI-0
Dominican Republic	DO	14.3	Not Available	FX-SC8BDWIFI-0
Egypt	EG	14.3	Not Available	FX-SC8BDWIFI-0
India	IN	14.3	Not Available	FX-SC8BDWIFI-0
Indonesia	ID	14.3	Not Available	FX-SC8BDWIFI-0
Iraq	IQ	14.3	Not Available	FX-SC8BDWIFI-0
Jordan	JO	14.3	Not Available	FX-SC8BDWIFI-0
Lebanon	LB	14.3	Not Available	FX-SC8BDWIFI-0
Malaysia	MY	14.3	Not Available	FX-SC8BDWIFI-0
Mexico	MX	14.3	Not Available	FX-SC8BDWIFI-0
Panama	PA	14.3	Not Available	FX-SC8BDWIFI-0
Peru	PE	14.3	Not Available	FX-SC8BDWIFI-0
Philippines	PH	14.3	Not Available	FX-SC8BDWIFI-0
Qatar	QA	14.3	Not Available	FX-SC8BDWIFI-0
South Africa	ZA	14.3	Not Available	FX-SC8BDWIFI-0
Taiwan	TW	14.3	Not Available	FX-SC8BDWIFI-0
Tunisia	TN	14.3	Not Available	FX-SC8BDWIFI-0
Turkey	TR	14.3	Not Available	FX-SC8BDWIFI-0
United Arab Emirates	AE	14.3	Not Available	FX-SC8BDWIFI-0
Israel IL	IL	14.3	Not Available	FX-SC8BDWIFI-0

Table 12: Wi-Fi/WLAN Operation is Pending and Safety Certification is Approved

Country	Country Code	Wi-Fi Enabled by FX Release[1]	FX80 Part Number with Wi-Fi	FX80 Part Number with Wi-Fi Disabled[1]
Russian Federation	RU	14.3	Not Available	FX-SC8BDWIFI-0
Ukraine	UA	14.3	Not Available	FX-SC8BDWIFI-0

1   Wi-Fi Enabled by FX Release lists the minimum software version to support Wi-Fi.
2   Part numbers are not dependent on the FX Supervisory Software Release.

Table 13: Wi-Fi/WLAN Operation and Safety Certification is Pending

Country	Country Code	Wi-Fi Enabled by FX Release	FX80 Part Number with Wi-Fi	FX80 Part Number with Wi-Fi Disabled
Algeria	DZ	TBD	Not Available	Not Available
Azerbaijan	AZ	TBD	Not Available	Not Available
Bahrain	BH	TBD	Not Available	Not Available
Belarus	BY	TBD	Not Available	Not Available
Georgia	JP	TBD	Not Available	Not Available
Japan	IQ	TBD	Not Available	Not Available
Kazakhstan	KZ	TBD	Not Available	Not Available
Korea (South)	KR	TBD	Not Available	Not Available
Morocco MA	MA	TBD	Not Available	Not Available
Uzbekistan	TT	TBD	Not Available	Not Available
Not Otherwise Classified (NOC)	—	TBD	Not Available	Not Available

Table 14: FX80 is Restricted from Being Sold

Country	Country Code	FX80 Part Number with Wi-Fi	FX80 Part Number with Wi-Fi Disabled
Cuba	—	Restricted from Sale	Restricted from Sale
Iran	—	Restricted from Sale	Restricted from Sale
North Korea	—	Restricted from Sale	Restricted from Sale
Sudan	—	Restricted from Sale	Restricted from Sale
Syria	—	Restricted from Sale	Restricted from Sale

Technical Specifications

Table 15: FX80 Supervisory Controller

Enclosure/ Mounting	Plastic/DIN Rail
Dimension	8.5 x 6 x 2.625 in. (216 x 152 x 68 mm)
Power Supply	24 VAC/DC
Processor	TI AM3352: 1000MHz ARM® Cortex™ A8
RAM Memory	1 GB DDR3 SD RAM
Flash Memory	Removable micro-SD card with 4GB flash total storage, 2 GB user storage
Environment	Operating Temperature: -4 to 140ºF (-20 to 60ºC)
	Storage Temperature: -40 to 185ºF (-40 to 85ºC)
	Relative Humidity: 5 to 95%, noncondensing
Onboard	2 Ethernet 10/100 Mbps; 2 RS-485 (Isolated); 1 USB, 1 Micro USB, Fast USB Bus; Wi-Fi
	Plug-in options: Dual port RS-485 (Isolated); LON FT/TP-10; RS-232
Network Drivers	
Embedded	N2, BACnet, Niagara
Direct I/O	
Onboard	None
Optional	Up to 256 by using 16 Remote I/O Modules (FXRIO16)
Local (NDIO)	None
Remote I/O	Up to 256 I/O by using 16 Remote I/O Modules (FXRIO16)
Compliance	**United States**
	UL Listed, File E107041, CCN PAZX, under UL 916, Energy Management Equipment
	FCC compliant to CFR 47, part 15, subpart C, Class B
	Canada
	UL Listed, File E107041, CCN PAZX7, under CSA C22.2 No. 205, Signal Equipment
	Industry Canada compliant to ICES-003
CE	**Europe**
	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.

United States Emissions Compliance

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.*

Canadian Emissions Compliance

This Class (B) digital apparatus meets all the 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.

Table 16: Remote Input Output Modules

Product Codes	LP-FXRIO16-0: 8 universal inputs, 4 relay outputs, 4 analog outputs
Dimensions	4 x 3.625 x 2.625 in. (10.16 x 9.2 x 6.7 cm)
Universal Input Types Supported	10k ohm Type 3 thermistors. Thermistor Sensor Range: -10 to 240º F (-23.3 to 115.5º C). Input accuracy is in the range of ±1% of span. Characteristic curve is customizable.
	0–10 V; accuracy is ±2% of span, without user calibration; uses an external resistor for current input (four provided, mounted by installer on terminal connections)
	4–20 mA current loop; accuracy is ±2% of span, without user calibration; self-powered or board-powered sensors accepted
	Dry contact: V open circuit, 300- µA short-circuit current
	Pulsing dry contact at a rate of up to 20 Hz; 50% duty cycle
Digital Outputs	Form A relay contacts suitable for on/off control only; floating control not supported
	Maximum voltage 30 volts AC or DC, 1/2 A maximum current rating
Analog Outputs	0–10 V DC
	Minimum load supported per output is 2,500 ohms minimum or 4 mA drain maximum

Table 17: FX Workbench Requirements

Processor[1]	Intel® Pentium® 4, 1 GHz or higher
	4 x 3.625 x 2.625 in. (10.16 x 9.2 x 6.7 cm)
Operating System	**32-bit**: Windows® 10 Pro or Enterprise, Windows 8 Pro or Enterprise, Windows 7 Professional, Enterprise, or Ultimate, or Windows XP® Professional
	64-bit: Windows® 10 Pro or Enterprise, Windows 8.1 Pro or Enterprise, Windows 8 Pro or Enterprise, Windows 7 Professional, Enterprise, or Ultimate, Windows Server 2012 Standard or Enterprise with SP2, or Windows Server® 2012 R2 Standard or Enterprise with SP2
Memory	1 GB minimum, 4 GB or more recommended for larger systems
Hard Disk	4 GB minimum, more recommended depending on archiving requirements
Network Support	Ethernet 10/100 Mbps with RJ-45 connector

1   The information in this table applies to both the FX Supervisory Software Release 14.1 and FX Supervisory Software Release 6.x **if** using the AX license