FX Supervisory Controllers

Description

FX Supervisory Controllers are web-based supervisory-class controllers in the Facility Explorer product family. FX Supervisory Controllers manage networks of field controllers using open communication protocols, such as such as BACnet®, LONWORKS®, and N2 protocols. FX Supervisory Controllers support a full set of building automation features, such as scheduling, alarming, histories, data sharing, energy management, totalization, and customized control routines, which are specifically designed for commercial facilities.

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

FX Supervisory Controllers are a family of controllers similar in function and overall capabilities. The FX30E, FX60E, and FX70 are compact DIN rail mountable controllers with the capability for external input and output points.

In addition, the FX Supervisory Controllers' hardware and software design is modular, so you can add accessories, such as communications cards, input and output modules, and software options, if needed. This design allows you to select the controller most appropriate for the size of your facility and those options best needed to control it.

Refer to the *FX Supervisory Controller Product Bulletin (LIT-12011406)* for important product application information.

Repair Information

If the FX Supervisory Controller fails to operate within its specifications, replace the unit. For a replacement controller, contact the nearest Johnson Controls® representative.

FX Supervisory Controllers

Features

- Web-based user interface
- Adoption of industry standard communication protocols
- Embedded configuration tool
- Modular design
- Small, compact design
- FX Workbench

Selection Charts

FX Supervisory Controller Ordering Information

Product Code Number	Description
LP-FX3011E-1	FX30E: Includes 256 MB RAM/128 MB flash, 2 10/100 Mbps Ethernet ports, 1 non-isolated RS-485 port, 1 RS-232 port, 1 Niagara Direct Input/Output (NDIO) port, 2 communication card option slots, embedded FX Workbench, Web User Interface, Data Recovery Services with SRAM, Niagara driver, oBIX driver, and N2 driver.
LP-FX3021E-1	FX30E with BACnet MS/TP Protocol: Includes 256 MB RAM/128 MB flash, 2 10/100 Mbps Ethernet ports, 1 non-isolated RS-485 port, 1 RS-232 port, 1 NDIO port, 2 communication card option slots, embedded FX Workbench, Web User Interface, Data Recovery Services with SRAM, Niagara driver, oBIX driver, N2 driver, and BACnet MS/TP driver.
LP-FX6011E-1	FX60E: Includes 256 MB RAM/128 MB Flash, 2 10/100 Mbps Ethernet ports, 1 non-isolated RS-485 port, 1 RS-232 port, 1 NDIO port, 2 communication card option slots, embedded FX Workbench, Web User Interface, Data Recovery Services with SRAM, Niagara driver, oBIX driver, and N2 driver.
LP-FX6021E-1	FX60E with BACnet MS/TP Protocol: Includes 256 MB RAM/128 MB Flash, 2 10/100 Mbps Ethernet ports, 1 non-isolated RS-485 port, 1 RS-232 port, 1 NDIO port, 2 communication card option slots, embedded FX Workbench, Web User Interface, Data Recovery Services with SRAM Niagara driver, oBIX driver, N2 driver, and BACnet MS/TP driver.
LP-FX7011N-0	FX70: Includes 1 GB RAM/1 GB Flash, 1 RS-232 port, 1 RS-485 port, 2 1 Gbps Ethernet ports, 1 NRIO port, 2 communication card option slots, embedded Niagara driver, oBIX driver, N2 driver, FX Workbench, and Web User Interface.
LP-FX7021N-0	FX70 with BACnet MS/TP Protocol: Includes 1 GB RAM/1 GB Flash, 2 1 Gbps Ethernet ports, 1 RS-485 port, 1 RS-232 port, 1 NRIO port, 2 communication card option slots, embedded FX Workbench, Web User Interface, Niagara driver, oBIX driver, N2 driver, and BACnet MS/TP driver.
LP-FX30BDEM-1	Demo version of FX30E: Includes all software modules and drivers. Intended for engineering and/or demonstration purposes only (not allowed for actual project installations). You must also purchase office support and renewal fees to activate this FX30E. License expires yearly on October 31 and must be renewed yearly to continue operation.
LP-FX60BDEM-2	Demo version of FX60E: Includes all software modules and drivers. Intended for engineering and demonstration purposes only (not allowed for actual project installations). Office support and renewal fee must also be purchased to activate this FX60E. License expires yearly on October 31 and must be renewed yearly to continue operation.

FX Workbench Ordering Information (Release 6.x and Earlier) (Part 1 of 2)

Product Code Number	Description
LP-FXWB-COPY	FX Supervisory Controller family software, delivered on DVD. Includes latest installation images for FX Server, FX Workbench, and FX Alarm Portal Client. Licenses not included—order licenses separately.
LP-FXWBDEM-0	Engineering/demo license for FX Workbench client software. 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.
LP-FXWBE-0	End user license for FX Workbench client software. Enables those features needed to operate and reconfigure FX Supervisory Controllers and FX Server stations only through an online connection (cannot create new stations offline). Intended for end users (operators). Never expires.

FX Supervisory Controllers (Continued)

FX Workbench Ordering Information (Release 6.x and Earlier) (Part 2 of 2)

Product Code Number	Description
LP-FXWBALM-0	FX Alarm Portal Client license. Enables only FX Alarm Portal and Alarm Console features. Intended for end users. Never expires.
LP-FXSWUPG-0	License file enabling a one-time software upgrade for one copy of FX Server or FX Tools Supervisor Pro-End User Client. Software not included (order LP-FXWB-COPY to obtain latest copy of software).

FX Supervisory Controller Software Accessories Ordering Information (Release 6.x and Earlier)

Product Code Number	Description
LP-FX60EX256-0	License enabling Java® heap memory expansion to 96 MB for one FX30E/FX60/FX60E.
LP-FXBACIPC-0	License enabling BACnet IP client (import) driver for one FX Supervisory Controller.
LP-FXBACIPS-0	License enabling BACnet IP server (export) driver for one FX Supervisory Controller.
LP-FXBACMS-0	License enabling BACnet MS/TP driver for one FX Supervisory Controller.
LP-FXLONIP-0	License enabling LONWORKS IP driver for one FX Supervisory Controller.
LP-FXLON-0	License enabling LONWORKS twisted pair driver license for one FX Supervisory Controller.
LP-FXMBUS-0	License enabling M-Bus driver for one FX Supervisory Controller.
LP-FXMDBRTU-0	License enabling Modbus RTU client (import) driver for one FX Supervisory Controller.
LP-FXMDBRTUS-0	License enabling Modbus RTU server (export) driver for one FX Supervisory Controller.
LP-FXFLEX-0	License enabling Flex serial Driver over RS-232 or RS-485.
LP-FXMDBTCP-0	License enabling Modbus TCP client (import) driver for one FX Supervisory Controller.
LP-FXMDBTCPS-0	License enabling Modbus TCP server (export) driver for one FX Supervisory Controller.
LP-FXSNMP-0	License enabling Simple Network Management Protocol (SNMP) driver for one FX Supervisory Controller.
LP-FXCCN-0	License enabling Carrier® Communication/Comfort Network (CCN) driver for one FX Supervisory Controller
LP-FXMCQU-0	License enabling McQuay® OPM driver for one FX Supervisory Controller
LP-FXAINF-0	License enabling Andover™ Infinity driver for one FX Supervisory Controller
LP-FXSMS-0	License enabling Simple Messaging Service (SMS) driver for one FX Supervisory Controller.
LP-FX40UPG-0	License enabling one-time, new release software upgrade for one FX Supervisory Controller.
LP-FXAPHP-0	License enabling the American Auto-Matrix Public Host Protocol (PHP) driver for one FX Supervisory Controller.
LP-FXAPUP-0	License enabling the American Auto-Matrix Public Unitary Protocol (PUP) driver for one FX Supervisory Controller.
LP-FXAC-0	License enabling the Andover AC 256 driver for one FX Supervisory Controller.
LP-FXGLOB-0	License enabling the Global Cache driver for one FX Supervisory Controller. Enables control of IR controlled AV equipment through an RS-232 connection to a Global Cache FC module.
LP-FXHELV-0	License enabling the Helvar Lighting Control driver for one FX Supervisory Controller.
LP-FXHORT-0	License enabling the European Hortsmann meter driver for one FX Supervisory Controller.
LP-FXJOS-0	License enabling the Josam Grease Trap Sensor driver for one FX Supervisory Controller.
LP-FXLANG-0	License enabling the Lang Oven (over RS-232 or RS-485) driver for one FX Supervisory Controller.
LP-FXVDRT-0	License enabling the Veeder-Root driver for one FX Supervisory Controller.
LP-FXEIB-0	License enabling the EIB/Konnex IP Driver for one FX Supervisory Controller.
LP-FXSADR-0	License enabling Simple OpenADR driver for communication between FX Supervisory Controller and Akuacom DRAS. Limited to one client connection. Includes CRYPTO license for the SSL connection.
LP-FXSADR1-0	License enabling one additional connection to OpenADR compliant DRAS.

FX Workbench Ordering Information (Release 14.x)

Product Code Number	Description
FX-DVD-COPY	FX Supervisory Controller family software, delivered on DVD. Includes latest installation images for FX Server and FX Workbench. Licenses not included—order licenses separately.[1]
FX-SLDEMO-0	Engineering/demo license for FX Workbench client software. 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.
FX-SL001M1-0	License enabling FX Server with one Niagara network connection. Includes 1 year of software maintenance. May be used to provide end customers with client FX Workbench.
FX-SL001M3-0	License enabling FX Server with one Niagara network connection. Includes 3 years of software maintenance. May be used to provide end customers with client FX Workbench.
FX-SL001M5-0	License enabling FX Server with one Niagara network connection. Includes 5 years of software maintenance. May be used to provide end customers with client FX Workbench.
FX-SL001M1-6[2]	License enabling 1 additional year of software maintenance to FX Server with 1 Niagara network connection.
FX-SL001M3-6[2]	License enabling 3 additional years of software maintenance to FX Server with 1 Niagara network connection.
FX-SL001M5-6[2]	License enabling 5 additional years of software maintenance to FX Server with 1 Niagara network connection.

1. At Facility Explorer 14.0, there is no equivalent to the Alarm Console. However, the Facility Explorer Alarm Console Release 6.x still communicates with and displays alarms from Facility Explorer servers and supervisory controllers running Facility Explorer 14.0.
2. Order these software maintenance parts to migrate a Facility Explorer Workbench 6.x to 14.0.

FX Supervisory Controllers (Continued)

FX Workbench Ordering Information (Release 6.x and Earlier)

Product Code Number	Description
LP-FXBACIPC-0	License enabling BACnet IP client (import) driver for one FX Supervisory Controller
LP-FXBACIPS-0	License enabling BACnet IP server (export) driver for one FX Supervisory Controller
LP-FXBACMS-0	License enabling BACnet MS/TP driver for one FX Supervisory Controller
LP-FXLONIP-0	License enabling LONWORKS IP driver for one FX Supervisory Controller
LP-FXLON-0	License enabling LONWORKS twisted pair driver license for one FX Supervisory Controller
LP-FXMBUS-0	License enabling M-Bus driver for one FX Supervisory Controller
LP-FXMDBRTU-0	License enabling Modbus RTU client (import) driver for one FX Supervisory Controller
LP-FXMDBRTUS-0	License enabling Modbus RTU server (export) driver for one FX Supervisory Controller
LP-FXMDBTCP-0	License enabling Modbus TCP client (import) driver for one FX Supervisory Controller
LP-FXMDBTCPS-0	License enabling Modbus TCP server (export) driver for one FX Supervisory Controller
LP-FXSNMP-0	License enabling Simple Network Management Protocol (SNMP) driver for one FX Supervisory Controller
LP-FXCCN-0	License enabling Carrier® Communication/Comfort Network (CCN) driver for one FX Supervisory Controller

FX Supervisory Controller Software Maintenance Ordering Information (Release 14.x)

Product Code Number[1]	Description
FX-SC3EM1-6	License enabling 1 year of software license for FX30E
FX-SC3EM3-6	License enabling 3 years of software license for FX30E
FX-SC3EM5-6	License enabling 5 years of software license for FX30E
FX-SC6EM1-6	License enabling 1 year of software license for FX60E
FX-SC6EM3-6	License enabling 3 year of software license for FX60E
FX-SC6EM5-6	License enabling 5 year of software license for FX60E
FX-SC7EM1-6	License enabling 1 year of software license for FX70
FX-SC7EM3-6	License enabling 3 years of software license for FX70
FX-SC7EM5-6	License enabling 5 years of software license for FX70

1. You order these part numbers when migrating and FX30E, FX60, FX60E, and FX70 to FX Supervisory Software Version 14.

Before you migrate an FX30E, FX60, FX60E, or FX70 to FX Supervisory Software 14 and later, you must first upgrade your FX Supervisory Controller to FX Supervisory Software 6.x (using LP-FXUPG-0). Any FX Servers would also need to be upgraded as well.

Before you upgrade to FX Supervisory Software 14, review the *FX Supervisory Controller Upgrade and Migration Technical Bulletin (LIT-12011441)* to determine if migration is right for your application. If you determine that migration is a viable path for your application, you must purchase the appropriate software maintenance part. Software maintenance is available in 1, 3, or 5 years. The purchase of software maintenance allows the installation of FX software releases during the time of the software maintenance license. When the software maintenance license time has expired, new FX software releases are not allowed. In addition, if you miss a software maintenance period and want it later, you must purchase the missed software maintenance period in addition to the new requested period.

FX Supervisory Controller Hardware Accessories Ordering Information (Release 6.x and 14.x) (Part 1 of 2)

Product Code Number	Description
LP-FXNDIO16-0	16 channel input/output module for the FX20/FX60 Supervisory Controllers: Includes 8 universal inputs, 4 relay outputs, and 4 0 10 V analog outputs, maximum of 4 per FX20/FX60 Supervisory Controller, or 2 if combined with NDIO34.
LP-FXNDIO34-0	34 channel input/output module for the FX20/FX60/FX70 Supervisory Controllers: Includes 16 universal inputs, 10 relay outputs, and 8 0–10 V analog outputs, maximum of 1 per FX20/FX60/FX70 Supervisory Controller. Also provides power to the FX20/FX60/FX70 Supervisory Controller using externally connected 24 VAC transformer or 24 VDC power supply.
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.
LP-FXLONFTT-1	LONWORKS communication card for the FX Supervisory Controllers: 78 kbps, FTT-10A, 2-position removable screw-terminal connector plug. Order LONWORKS driver separately (LP-FXLON-0).
LP-FXRS485-0	Dual port RS-485 communication card for the FX Supervisory Controllers: electrically isolated, two 3-position removable screw-terminal connector plugs.
LP-FXWTC-0	Wireless TEC Option Card includes option card, mounting bracket, and direct-mount antenna.
TEC20-A-1	Replacement antenna for Wireless TEC Option Card. **(Release 6.x and earlier)**
TEC20-RA-1	Remote antenna for Wireless TEC Option Card when it is installed inside a metal cabinet or when remote antenna mounting is required by physical installation. Includes 0.53 m (1.75 ft) cable. **(Release 6.x and earlier)**
LP-FXRS232-0	Single port RS-232 communication card for the FX Supervisory Controller: 115,200 max baud rate, DB-9M connector.
LP-FXPMUS-0	Power module for FX Supervisory Controller: 90–240 VAC, 50/60 Hz, U.S. wall adapter.
LP-FXPMEU-0	Power module for FX Supervisory Controller: 90–240 VAC, 50/60 Hz, European wall adapter.
LP-FXPMUK-0	Power module for FX Supervisory Controller: 90–240 VAC, 50/60 Hz, U.K. wall adapter.
LP-FXPM24-0	Power module for FX Supervisory Controller: 24 VAC/DC, DIN rail mountable.
LP-FXPM263-0	Power module for FX Supervisory Controller: 90–263 VAC/DC, 50/60 Hz DIN rail mountable.
LP-KITFX2BAT-0	NiMH replacement backup battery assembly for FX20 and FX60.

FX Supervisory Controllers (Continued)

FX Supervisory Controller Hardware Accessories Ordering Information (Release 6.x and 14.x) (Part 2 of 2)

Product Code Number	Description
LP-KITFX7BAT-0	FX70 replacement backup battery assembly.
LP-KITFX7HW-0	Hardware Bag for FX70, containing screw terminal connector plugs (two 6-position, one 2-position, earth grounding wire).
LP-KITGPRSA-0	Replacement right-angle GSM/GPRS quad-band SMA coax-mounted stub antenna.
LP-KITSEDAT-0	Replacement adjustable-angle 2.4 GHz RP-SMA coax-mounted stub antenna.
LP-KITSED3T-0	3-terminal wiring plug for RS-485.
LP-KIT7MEM-0	1 GB DDR-2 333 MHz Small Outline Dual In-line Memory Module (SODIMM) memory module (standard replacement for FX70).
LP-FXGPRSW-0	GPRS Modem option card for FX20, FX60, FX70 with Wyless SIM card.
LP-FXGPRSE-0	External mounting for GPRS modem antenna. Included is a 6.56 ft (2 m) SMA-type coax extension cable and steel bracket for wall or panel mounting.
LP-FXGPRSS-0	GPRS Modem SIM card replacement provisioned by Wyless.
LP-FXSED-0	Sedona Framework option card with both wireless 6LoWPAN and wired RS-485 port, based on the Jennic JN5139 wireless microcontroller. Includes stub antenna.
LP-FXSEDEXT-0	External mounting for Sedona Framework antenna. Includes a 6.56 ft (2 m) RP-SMA type, coax extension cable and mounting bracket.
LP-FXSRAM-0	Static RAM option card for battery-less FX supervisory controllers.

Technical Specifications

FX Supervisory Controller (Part 1 of 2)			
	FX30E	**FX60E**	**FX70**
Enclosure/ Mounting	Plastic/DIN Rail		
Dimension	6.313 x 4.820 x 2.438 in. (158.75 x 101.6 x 60.325 mm)		8.5 x 6 x 2.625 in. (216 x 152 x 68 mm)
Power Supply	DIN Rail Power modules		
Battery Backup	Data Recovery Services with SRAM (Static Random Access Memory) (optional Battery available for extended run time)		5-minute internal, optional external
Processor	Power PC 405EX at 400 MHz	PowerPC 440EP at 524 MHz	PowerPC 440EPx at 652 MHz
RAM Memory	256 MB RAM	256 MB RAM	1 GB RAM
JAVA Heap Memory	24 MB Heap (upgradeable to 96 MB)	48 MB Heap (upgradeable to 96 MB)	384 MB Heap
Flash Memory	128 MB Flash	128 MB Flash	1 GB Flash
Environment	Operating Temperature: 0 to 50°C (32 to 122°F), Storage Temperature: 0 to 60°C (32 to 140°F), Relative Humidity: 5 to 95%, noncondensing		
Communication Ports			
Onboard	2 Ethernet 10/100 Mbps 1 RS-485 non-isolated 1 RS-232 2 option slots		Ethernet 1 Gbps 1 RS-485 (Isolated) 1 RS-232 2 option slots Mini PCI express slot
Optional	Two options slots (any 2 of the following, except where noted): • Dual port RS-485 • LON FT/TP-10 • RS-232 • Wireless TEC (maximum of one and disables onboard RS-232) **(Release 6.x and earlier)** • GPRS modem (maximum of one) • Battery-less Option Card		
Network Drivers			
Embedded	N2, Niagara, oBIX		
Optional	See *FX Supervisory Controller Software Accessories Ordering Information (Release 6.x and Earlier)* for a complete list of optional network drivers		
Direct I/O			
Onboard	None		
Optional	Up to 66 (by using NDIO modules)		Up to 256 by using 16 Remote I/O Modules FXRIO16
Local (NDIO)	Up to 66 total I/O (through optional NDIO modules)		None
Remote I/O	Up to 64 I/O by using 4 Remote I/O Modules (FXRIO16)		Up to 256 I/O by using 16 Remote I/O Modules (FXRIO16)

FX Supervisory Controllers (Continued)

FX Supervisory Controller (Part 2 of 2)		
	FX30E	**FX60E**	**FX70**

Compliance	**United States** UL Listed, File E107041, CCN PAZX, under UL 916, Energy Management Equipment FCC compliant to CFR 47, part 15, subpart B, class A
	Canada UL Listed, File E107041, CCN PAZX7, under CSA C22.2 No. 205, Signal Equipment Industry Canada compliant to ICES-003
	Europe CE Mark– Johnson Controls, Inc., declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC. FX60E controllers used in conjunction with the LP-FXPM263-0 power module require the addition of a ferrite ring around a shielded power cord.
	BACnet International: BACnet Testing Laboratories® (BTL) 135-2004 Listed BACnet Building Controller (B-BC)

Local Input Output Modules	
Product Codes	LP-FXNDIO34-0: 16 universal inputs, 10 relay outputs, 8 analog outputs LP-FXNDIO16-0: 8 universal inputs, 4 relay outputs, 4 analog outputs
Dimensions	NDIO34: 6.313 x 4.820 x 2.438 in. (16.04 x 12.24 x 6.19 cm) NDIO16: 3.2 x 4.828 x 2.437 in. (8.2 x 12.24 x 6.19 cm)
Universal Input Types Supported	10k ohm Type 3 thermistors. Thermistor Sensor Range: -23.3 to 115.5°C (-10 to 240°F). 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, Max voltage 30 volts AC or DC, 0.5 A max current rating
Analog Outputs	0-10 VDC, Minimum load supported per output is 2,500 ohms minimum or 4 mA drain maximum

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: -23.3 to 115.5°C (-10 to 240°F). 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, Max voltage 30 volts AC or DC, 0.5 A max current rating
Analog Outputs	0-10 VDC, Minimum load supported per output is 2,500 ohms minimum or 4 mA drain maximum

FX Workbench Requirements	
Processor	Intel® Pentium® 4, 1 GHz or higher
Operating System	**32-bit**: Windows® 8 Pro or Enterprise, Windows 7 Professional, Enterprise, or Ultimate, or Windows XP® Professional **64-bit**: 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
Web Browser	Windows Internet Explorer® version 5 or later or Mozilla® Firefox®
Memory	512 MB minimum
Hard Disk	1 GB minimum, 5 GB recommended
Network Support	Ethernet 10/100 Mbps with RJ-45 connector