FX07 Terminal Unit Field Controller

The FX07 is a terminal unit controller in the Facility Explorer range of products. The controller is designed specifically for commercial Heating, Ventilating, Air Conditioning, and Refrigeration (HVACR) applications.

The controller has 17 physical inputs and outputs and supports a wide range of temperature sensors and actuating devices. Active sensors for the measurement of humidity, pressure, and other variables are also supported. The FX07 also includes an onboard real-time clock to support the start-stop scheduling of equipment and real-time based control sequences.

The FX07 has an optional attractive Liquid Crystal Display (LCD) with a set of graphic status icons used in the most common HVACR applications. The controller also supports a remote panel or wall mounted Medium User Interface (MUI).

Communication cards are available to enable the controller to be integrated into an N2 Open or LONWORKS® network of a building automation system.

For stand-alone applications, the FX07 Field Controller also features communications services to transmit event notification messages via Short Messaging Service (SMS).

Using the FX Tools software package, the FX07 terminal unit controller is fully configurable for a wide range of commercial HVACR applications. These applications include small refrigeration compressors, close control units, roof-top air handlers, fan coil units, unit ventilators, and chilling or heating ceiling beam installations.

Figure 1: FX07 Controller and Display

Features and Benefits	
❑ **Freely Programmable Controller**	Works with a wide range of HVACR control applications using the extensive programming features of the FX Tools software package
❑ **Network Communication Card Options**	Provide cost effective solutions for both stand-alone and network applications
❑ **Remote Communication Services**	Enable automatic reporting of events and alarms by SMS for stand-alone applications
❑ **Optional Integral Liquid Crystal Display User Interface with Four Control Buttons**	Provides onboard user access to the controlled system parameters and clear representation of the application status using alphanumeric display characters and graphic icons
❑ **Analog Outputs with Pulse Width Modulated (PWM) Option**	Interface to a wide range of actuators and drives
❑ **Models with Various Output Configurations of Solid-State Triacs and Line Voltage Relays**	Provide cost effective control of refrigeration, unitary, and small air handling unit equipment

Onboard Inputs and Outputs

You can connect up to 17 physical inputs and outputs to the FX07, including:

- four Analog Inputs (AIs) (software configurable)
  - A99 temperature
  - Ni 1000 temperature
  - PT1000 temperature
  - NTC 10 K temperature
  - Ratiometric (0.5-4.5 VDC)
  - 0-10 VDC
- five Digital (Binary) Inputs (DIs)
  - voltage free contacts
  - with a pulse counter on DI1
- six Digital (Binary) Outputs (DOs) (model dependent)
  - six relays (line voltage contacts)
  - two triacs (24 V), three interlocked relays, one free (high power) relay
  - two triacs (24 V), four free relays
- two Analog Outputs (AOs) (model dependent)
  - 2 x 0-10 VDC
  - 1 x 0-10 VDC and 1 x Pulse Width Modulation (PWM) (100 Hz)

Integral LCD User Interface

The optional integral LCD user interface (Figure 2) for the FX07 features:

- two display rows with four alphanumeric characters (13 segment)
- blue or red colored background
- graphic status icons: compressor, alarm, high pressure, low pressure, maintenance, heat, cool, defrost, and electric heat symbols
- key pad with four buttons for user commands
- navigation menu for user guidance

The integral user interface is fully configurable within the application design and typically provides:

- display of status information
- display and modification of setpoints
- display and modification of configuration parameters
- display for clearing and acknowledging of active alarms
- background lighting with red color when an alarm condition exists

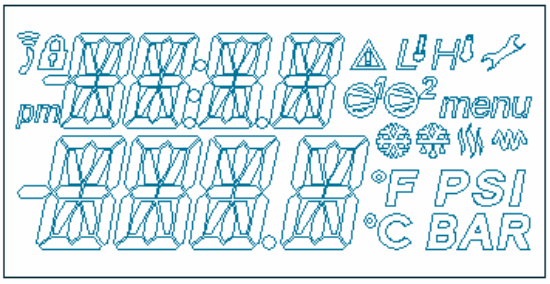

Figure 2: Detail of the LCD

Remote User Interface

The FX07 also supports a remote user interface called an MUI. The MUI (Version 3) has a 4 x 26 character, backlit LCD screen, 6 push buttons and 10 status Light-Emitting Diodes (LEDs). The display, including its navigation menu, is completely configurable within the FX07 application design. See Figure 3. The following mounting styles are available:

- **Panel Mount**: Mounts up to 3 m (10 ft) from the FX07 controller. This user interface is powered at 24 VAC or 18 VDC through the FX07. A flat telephone cable is available for the connection of the power supply and data communications to the FX07 controller.
- **Wall Mount**: Mounts up to 300 m (1,000 ft) from the FX07. The wall mount user interface must be independently powered. The data communication requires a 3-wire shielded cable (not provided) for the connection to the remote display to the FX07 controller.

Figure 3: Panel or Wall Mount User Interface

Communication Card Options

You can operate the FX07 as a stand-alone controller, or you can fit the controller with communication modules to allow connection and integration into a supervisory system. Controller models are available that are already fitted with the communication cards. (See *Ordering Codes*.)

N2 Open Network

When fitted with an N2 Open communication card, the FX07 controller connects to the N2 Open bus of a building automation system, allowing access to its control system variables and parameters.

LONWORKS Network

When fitted with a LONWORKS communication card, the FX07 integrates into a LONWORKS compatible building automation system, allowing peer-to-peer communication with other LONWORKS compatible devices and access to system parameters.

Communication Services

RS-232C Serial Card

The RS-232C serial communication card enables the FX07 controller to connect to a Global System for Mobile (GSM) communications modem for event and alarm notification.

Short Message Service (SMS)

You can program the FX07 Field Controller to send out text messages in SMS format (when connected to a GSM modem with an appropriate transmitter and antenna). Then FX07 can send SMS messages to a telephone service center or directly to a mobile telephone. Messages are sent when an event goes into the active or alarm state and can be directed to a prioritized list of destinations.

Real-Time Clock

The FX07 controller has an embedded real-time clock that supports all real-time functions. These functions include the display of time and date on the user interface and the time stamping of events.

The real-time clock also enables the time scheduling of start and stop commands and occupancy mode changes to the plant being monitored and controlled. You can configure scheduled commands to execute on one or more days of the week. An exception day calendar allows for alternative time schedules on holidays or during special periods in the year. You can also display and edit time schedules on a remote user interface.

The real-time clock continues to run for at least 10 days without power at room temperature.

Event Management

The FX07 controller detects and displays events and alarms associated with up to 20 data points or variables in the control application.

Application events indicate to users that the controlled equipment requires attention or that the controlled conditions are not within the expected limits. Examples of alarms include:

- analog value is outside of a desired range
- status value represents a condition that is not normal

You can view, acknowledge, or clear active alarms via the integral or remote user interface. The event logs may be viewed on the remote user interface and are available to be read by a supervisory system.

Trend Log

You can configure the FX07 to record the values of up to four data points at intervals between 1 minute and 1 day. You can view the value on the remote user interface.

Room Command Modules

Two series of room command modules are available for use with the FX07 controllers: TM Series modules and the Network Room Module (NRM) Series modules.

Models in the TM Series (Figure 4) feature an internal temperature sensor and an optional dial allowing the occupant to adjust the temperature setpoint value or request a warmer or cooler setpoint. Certain models also have a dial to enable the occupant to override the speed of a three-speed fan.

The functions of the push button and LED indicator are configurable within the application. Typically the push button is configured to initiate a temporary occupancy period (at night or weekends, for example) and the LED provides occupancy status indication.

The push button and LED indicator are configurable within the application. A typical application configures the push button to allow initiation of a temporary occupancy period (at night or weekends, for example) and the LED to provide occupancy status indication.

Figure 4: TM Series Room Command Module

The TM Series room command module for North America has the 120 x 80 mm (4.72 x 3.15 in.) enclosure and is marked with dual temperature units (°F and °C).

The NRM Series (Figure 5) are intelligent devices and communicate with the FX07 via the serial display bus port. Models in the NRM Series feature an internal temperature sensor and optionally an LCD display and dial allowing the occupant to adjust the temperature setpoint value. Certain models also have a fan button, which allows the occupant to override the speed of a three-speed fan. The override status of the fan appears on the LCD display.

The NRM also has a feature that enables the initiation of a temporary occupancy period (at night or weekends, for example), and you can configure the LCD to blink when the controller is not in the occupied mode.

Figure 5: NRM European Room Command Module

The NRM Series room command modules for North America (Figure 6) have an additional button for the selection of the units on the temperature display (°F or °C). These modules are available in the 120 x 80 mm (4.72 x 3.15 in.) enclosure.

Figure 6: NRM Series of Room Command Modules for North America

FX Tools

FX Tools is a software suite used to program, download, test, and commission the Facility Explorer devices, including the FX07 Field Controller. FX Tools software is available in two versions: FX Tools Express and FX Tools Pro. They comprise one or more of the following, depending on the version:

- **FX Builder Express**: Used to select a standard application and configure it using a graphical user interface.
- **FX Builder**: Used to program an FX07 controller. FX Builder provides complete flexibility in programming the FX07 controller.
- **FX CommPro N2**: Used to download, test, and commission an FX07 controller on an N2 Open bus.
- **FX CommPro LON**: Used to download, test, and commission an FX07 controller on a LONWORKS network.

Programming Key

The FX07 is a fully programmable controller. You can download the application to the controller via a computer with FX CommPro. You can also upload or download the application via the FX Programming Key (Figure 7). If the FX07 has an integral display, plug the FX Programming Key directly into a socket behind the user keypad.

Figure 7: Programming Key

IMPORTANT: Use this FX07 controller only as an operating control. Where failure or malfunction of the FX07 could lead to personal injury or damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices such as supervisory or alarm systems or safety or limit controls that are intended to warn of, or protect against, failure or malfunction of the FX07 controller.

FX07 Terminal Unit Controller Dimensions

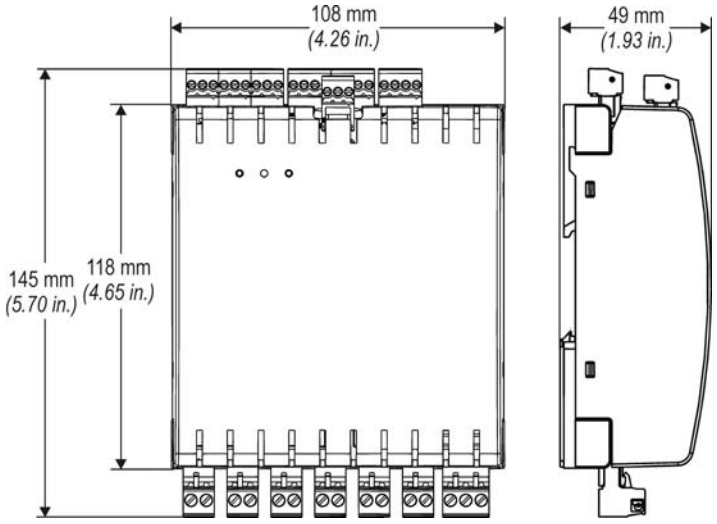

Figure 8: FX07 Controller Dimensions

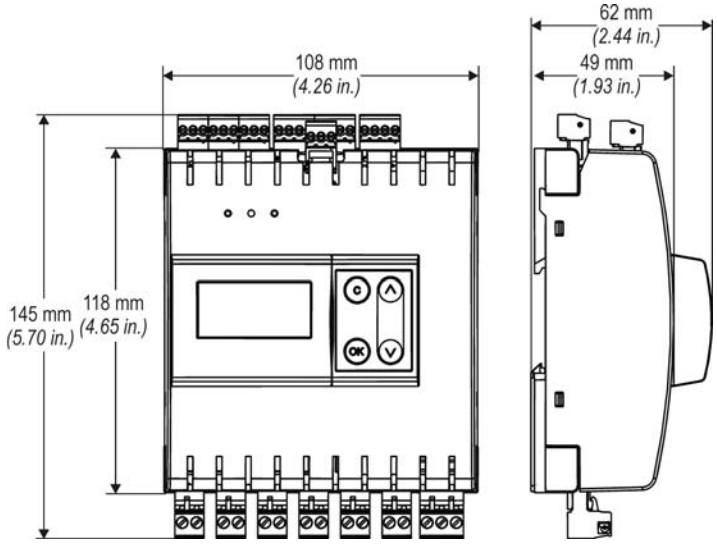

Figure 9: FX07 Controller with Display Dimensions

NRM Network Room Module Dimensions

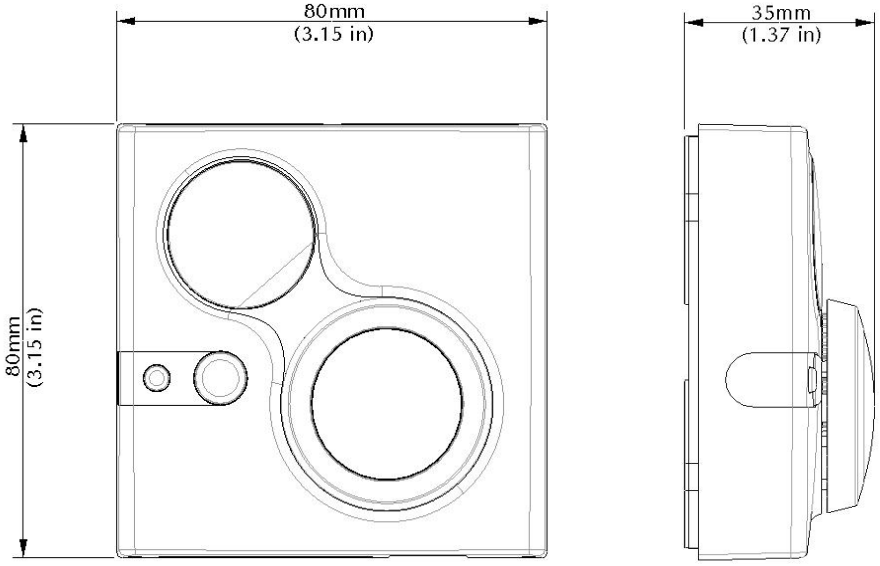

Figure 10: Network Room Module Dimensions

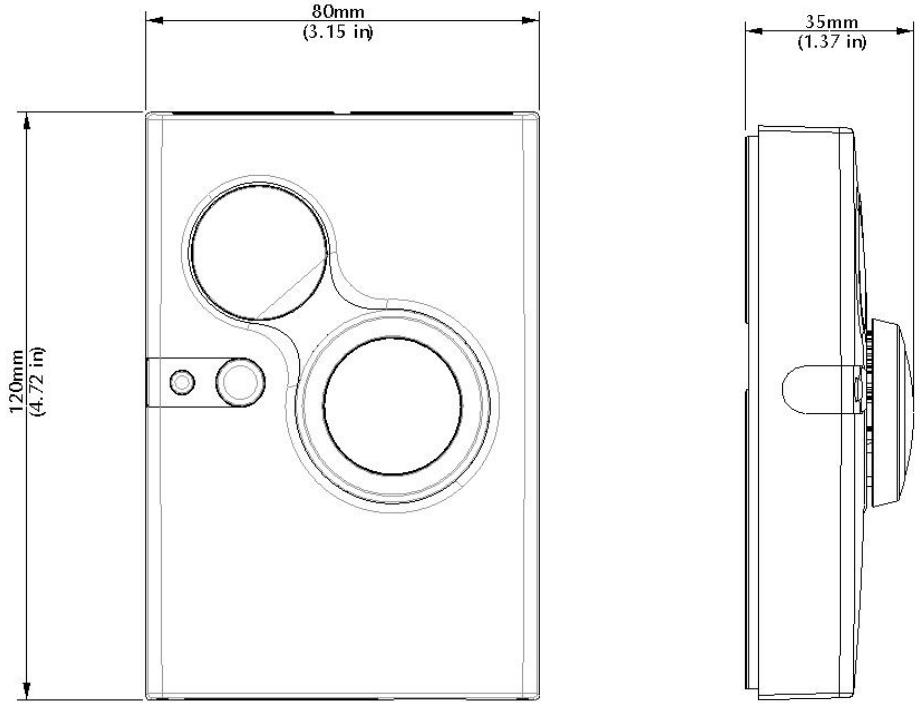

Figure 11: Network Room Module Dimensions (North America Models)

Ordering Codes

Tables 1 through 12 give ordering information for the FX07 Controllers, FX07 Accessories, Room Command Modules, and Configuration Software.

Table 1: FX07 Controller (24 VAC Power Supply, without Integral Display) Ordering Information

Product Code Number	Description
LP-FX07D00-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), no communication card
LP-FX07D01-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), N2 Open card
LP-FX07D02-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), LONWORKS card
LP-FX07D03-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), RS-232C card
LP-FX07D20-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), no communication card
LP-FX07D21-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), N2 Open card
LP-FX07D22-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), LONWORKS card
LP-FX07D23-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), RS-232C card
LP-FX07D30-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), no communication card
LP-FX07D31-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), N2 Open card
LP-FX07D32-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), LONWORKS card
LP-FX07D33-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs) RS-232C card

Table 2: FX07 Controller (24 VAC Power Supply, with Integral Display) Ordering Information

Product Code Number	Description
LP-FX07D50-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), no communication card
LP-FX07D51-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), N2 Open card
LP-FX07D52-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), LONWORKS card
LP-FX07D53-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), RS-232C card
LP-FX07D70-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), no communication card
LP-FX07D71-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), N2 Open card
Continued on next page . . .	

Product Code Number (Cont.)	Description
LP-FX07D72-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), LONWORKS card
LP-FX07D73-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), RS-232C card
LP-FX07D80-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), no communication card
LP-FX07D81-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), N2 Open card
LP-FX07D82-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), LONWORKS card
LP-FX07D83-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs) RS-232C card

Table 3: FX07 Controller (90 to 240 VAC Power Supply, without Integral Display) Ordering Information - Not Available in North America

Product Code Number	Description
LP-FX07A00-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), no communication card
LP-FX07A01-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), N2 Open card
LP-FX07A02-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), LONWORKS card
LP-FX07A03-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), RS-232C card
LP-FX07A20-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), no communication card
LP-FX07A21-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), N2 Open card
LP-FX07A22-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), LONWORKS card
LP-FX07A23-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), RS-232C card
LP-FX07A30-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), no communication card
LP-FX07A31-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), N2 Open card
LP-FX07A32-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), LONWORKS card
LP-FX07A33-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs) RS-232C card

Table 4: FX07 Controller (90 to 240 VAC Power Supply, with Integral Display) - Not Available in North America

Product Code Number	Description
LP-FX07A50-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), no communication card
LP-FX07A51-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), N2 Open card
LP-FX07A52-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), LONWORKS card
LP-FX07A53-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V or PWM), 6 DOs (Relays), RS-232C card
LP-FX07A70-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), no communication card
LP-FX07A71-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), N2 Open card
LP-FX07A72-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), LONWORKS card
LP-FX07A73-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (4 Relays, 2 Triacs), RS-232C card
LP-FX07A80-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), no communication card
LP-FX07A81-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), N2 Open card
LP-FX07A82-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs), LONWORKS card
LP-FX07A83-000C	FX07 Controller: 4 AIs, 5 DIs, 2 AOs (0-10 V), 6 DOs (3 Interlocked Relays, 1 Free Relay, 2 Triacs) RS-232C card

Table 5: Communication Card Ordering Information

Product Code Number	Description
LP-NET071-000C	N2 Open communication card for FX07
LP-NET072-000C	LONWORKS communication card for FX07
LP-NET073-000C	RS-232C communication card for FX07

Table 6: Accessories Ordering Information

Product Code Number	Description
LP-KIT100-000C	FX Programming Key
DT-9100-8901	Power Supply Adapter for Programming Key: 230 VAC/12 VDC (Europe Only)
LP-KIT007-001C	Interface Cable for standard land-line modem, 1.5 m (4.9 ft)
LP-KIT007-013C	Null modem cable for computer connection, 3 m (9.8 ft)
LP-KIT007-014C	Null modem cable for computer connection, 15 m (49.2 ft)

Table 7: Room Command Modules - Available in Europe
(Room Sensor Modules – 80 x 80 mm [3.15 x 3.15 in.], °C [TM Series without Display])

Product Code Number	Description
TM-2140-0000	Room Sensor Module, temperature sensor only
TM-2150-0000	Room Sensor Module, occupancy button and LED
TM-2160-0000	Room Sensor Module, 12-28°C setpoint dial, occupancy button and LED
TM-2160-0002	Room Sensor Module, 12-28°C setpoint dial, occupancy button and LED, fan speed override
TM-2160-0005	Room Sensor Module, +/- setpoint dial, occupancy button and LED
TM-2160-0007	Room Sensor Module, +/- setpoint dial, occupancy button and LED, fan speed override
TM-2190-0000	Room Sensor Module, 12-28°C setpoint dial
TM-2190-0005	Room Sensor Module, +/- setpoint dial

Table 8: Room Command Modules - Available in Europe
(Network Room Modules with Serial Bus Connection to FX07 – 80 x 80 mm [3.15 x 3.15 in.], °C)

Product Code Number	Description
LP-NRM001-000C	Network Room Module, temperature sensor only, no display, no setpoint dial
LP-NRM002-000C	Network Room Module with LCD display, temperature sensor, setpoint dial, occupancy function
LP-NRM003-000C	Network Room Module with LCD display, temperature sensor, setpoint dial, fan speed override button, occupancy function

Table 9: Room Command Modules - Available in North America
(Room Sensor Modules - 120 x 80 mm [4.72 x 3.15 in.], °F/°C [TM Series without Display])

Product Code Number	Description
TM-2141-0000	Room Sensor Module, temperature sensor only
TM-2151-0000	Room Sensor Module, occupancy button and LED
TM-2161-0000	Room Sensor Module, 54-82°F/12-28°C setpoint dial, occupancy button and LED
TM-2161-0002	Room Sensor Module, 54-82°F/12-28°C setpoint dial, occupancy button and LED, fan speed override
TM-2161-0005	Room Sensor Module, +/- setpoint dial, occupancy button and LED
TM-2161-0007	Room Sensor Module, +/- setpoint dial, occupancy button and LED, fan speed override
TM-2191-0000	Room Sensor Module, 54-82°F/12-28°C setpoint dial
TM-2191-0005	Room Sensor Module, +/- setpoint dial

Table 10: Room Command Modules - Available in North America (Network Room Modules with Serial Bus Connection to FX07)

Product Code Number	Description
LP-NRM001-000C	Network Room Module, temperature sensor only, no display, no setpoint dial - 80 x 80 mm (3.15 x 3.15 in.)
LP-NRM052-000C	Network Room Module with display, temperature sensor, setpoint dial, °C/°F button, occupancy function - 80 x 80 mm (3.15 x 3.15 in.)
LP-NRM053-000C	Network Room Module with display, temperature sensor, setpoint dial, fan speed override button, °C/°F button, occupancy function - 80 x 80 mm (3.15 x 3.15 in.)
LP-NRM101-000C	Network Room Module, temperature sensor only, no display, no setpoint dial - 120 x 80 mm (4.72 x 3.15 in.)
LP-NRM152-000C	Network Room Module with display, temperature sensor, setpoint dial, °C/°F button, occupancy function - 120 x 80 mm (4.72 x 3.15 in.)
LP-NRM153-000C	Network Room Module with display, temperature sensor, setpoint dial, fan speed override button, °C/°F button, occupancy function - 120 x 80 mm (4.72 x 3.15 in.)

Table 11: User Interfaces Ordering Information

Product Code Number	Description
LP-DIS60P20-0C	Remote Medium User Interface (MUI Version 3) - Panel Mount
LP-DIS60P21-0C	Remote Medium User Interface (MUI Version 3) - Wall Mount
LP-KIT007-000C	Link cable for the connection of the FX07 to the Panel Mount MUI display - 3 m (9.8 ft)

Table 12: Software Ordering Information

Product Code Number	Description
LP-FXTPRO-0	FX Tools Pro CD-Rom (FX Builder, FX Builder Express, FX CommPro N2, FX CommPro Lon)
LP-FXTEXP-0	FX Tools Express CD-Rom (FX Builder Express, FX CommPro N2)

Technical Specifications

Table 13: FX07 Terminal Unit Field Controller (Part 1 of 3)

Product Codes	LP-FX07xxx-xxx		
Power Requirements	LP-FX07Dxx-xxx: 24 VAC/DC ±15%, 50/60 Hz – SELV (Europe) – Class 2 North America LP-FX07Axx-xxx: 90 to 240 VAC, 50/60 Hz (Not available in North America)		
Power Consumption	LP-FX07Dxx-xxx: 9 VA maximum LP-FX07Axx-xxx: 17 VA maximum		
Housing Material	ABS + polycarbonate, self-extinguishing: UL 94-V0 flammability rating.		
Protection Class	IP20 CEI/EN60529		
Ambient Operating Conditions	-40 to 50°C (-40 to 122°F), 10 to 95% RH (noncondensing) Note that the integral user interface does not operate below -20°C (-4°F).		
Ambient Storage Conditions	-40 to +70°C (-40 to 158°F) 10 to 95% RH (noncondensing)		
Power Supply for Panel Mount MUI	15 VDC on Remote Display connector at 100 mA maximum		
Power Supply Outputs for AIs	15 VDC 20 mA power supply for active sensors (also used for PWM outputs) 5 VDC 15 mA power supply for ratiometric sensors		
Analog Inputs	16-bit resolution – not isolated		
	Sensor Type	**Full Linearization Range**	**Accuracy at 20°C (68°F) Ambient (Sensor Accuracy Not Included)**
	A99	-50 to 100°C (-58 to 212°F)	±0.5°C (±1°F)
	NTC 10K	-40 to 150°C (-40 to 300°F)	±0.5°C (±1°F)
	PT1000 Extended	-50 to 160°C (-58 to 320°F)	±0.5°C (±1°F)
	Ni1000 (JCI)	-45 to 120°C (-49 to 248°F)	±0.5°C (±1°F)
	Active Voltage	0-10 VDC	±0.05 VDC
	Active Ratio-metric	0.5-4.5 VDC	±0.05 VDC
Display Range and Resolution	-999 to 999 or -99.9 to 99.9		
Digital (Binary) Inputs:	Voltage free contacts Transition counter function at 50 Hz (minimum 10 ms ON and minimum 10 ms OFF)		
Analog Outputs:	0-10 VDC, max. 3 mA, 13-bit resolution - not isolated, accuracy ±0.1 VDC	For actuating and control devices	
	Pulse Width Modulation (PWM) output at 100 Hz cycle frequency with 10 mA sink from 15 VDC reference power source	For fan speed controllers with PWM input	
Continued on next page . . .			

FX07 Field Controller Technical Specifications (Part 2 of 3)

Relay Outputs	Dielectric test voltage on open relay contact: 1,000 VAC RMS Maximum relay switching rate at maximum load: 6 operations per minute Average relay contact life: 30,000 operations at maximum load.			
Digital (Binary) Outputs for Specific Models	**Model**	**Channel**	**Type**	**Remark/Application**
	FX07D0x-xxx FX07D5x-xxx FX07A0x-xxx FX07A5x-xxx	DO1, DO2, DO3	SPST 8(3)A, 250 VAC relay (Max. 24 VAC in North America)	Heavy duty relays that can be used to switch electric heater up to 2 kW at 230 VAC. (Europe only) Each relay contact is independent with its own common terminal.
		DO4, DO5, DO6	SPST 3(1)A, 250 VAC relay. (Max. 24 VAC in North America)	Each relay contact is independent with its own common terminal.
	FX07D2x-xxx FX07D3x-xxx FX07D7x-xxx FX07D8x-xxx	DO1, DO2	0.5A/24 VAC triacs	Low voltage 3-point incremental actuators and thermal actuators
	FX07A2x-xxx FX07A3x-xxx FX07A7x-xxx FX07A8x-xxx	DO1, DO2	0.5A / 250 VAC triacs. (Max. 24VAC in North America)	Line voltage 3-point incremental actuators and thermal actuators. Can also be used to switch 24 VAC low voltage devices.
	FX07D2x-xxx FX07D3x-xxx FX07D7x-xxx FX07D8x-xxx FX07A2x-xxx FX07A3x-xxx FX07A7x-xxx FX07A8x-xxx	DO3	SPST 8(3)A, 250 VAC relay. (Max. 24 VAC in North America)	Heavy duty relays that can be used to switch electric heater up to 2 kW at 230 VAC (Europe only).
		DO4 – DO6	SPST 3(1)A, 250 VAC relay. (Max. 24 VAC in North America)	On the **FX07x2x-xxx** and **FX07x7-xxx** models, each relay contact is independent with its own common terminal. On the **FX07x3x-xxx** and **FX07x8-xxx** model, **DO4, DO5, DO6** relays are physically interlocked such that only one output can be closed at one time. Application: 3-speed fan motors.
Connection for outputs and power	Screw terminals for max. 2 x 1.5 mm^2 (16 AWG) wires, included in the package			
Connection for inputs and LON/N2 Open Bus	Screw terminals for max. 1 x 1.5 mm^2 (16 AWG) wires or 2 x Belden® cable, 2-core twisted pair with shield ≥0.8 mm (20 AWG), included in the package			
Dimensions (H x W x D)	145 (including terminals) x 108 x 49 mm (62 mm with display) 5.71 (including terminals) x 4.26 x 1.93 in. (2.45 in. with display)			
Continued on next page . . .				

FX07 Field Controller Technical Specifications (Part 3 of 3)

Compliance	**Europe (all models)**	– 89/336/EEC, EMC Directive: EN 61000-6-3, EN 61000-6-2 – 72/23/EEC, Low Voltage Directive: EN 60730
	Canada (LP-FX07Dxx-xxx models only)	– UL Listed (PAZX7), C22.2 No. 205, Signal Equipment – UL Recognized (XAPX8), CAN/CSA C22.2 No. 24, Temperature Indicating and Regulating Equipment – Industry Canada, ICES-003
	United States (LP-FX07Dxx-xxx models only)	– UL Listed (PAZX), UL 916, Energy Management Equipment – UL Recognized (XAPX2), UL 873, Temperature Indicating and Regulating Equipment – FCC compliant to CFR 47, Part 15, Subpart B, Class A

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

JOHNSON CONTROLS

Controls Group Global Headquarters
507 E. Michigan Street
P.O. Box 423
Milwaukee, WI 53201

Published in U.S.A. and Europe