

Medium User Interface (MUI) Version 3

Introduction to MUI.....	3
<i>Introduction</i>	<i>3</i>
<i>Key Concepts</i>	<i>4</i>
MUI Features	4
Installation.....	7
<i>Introduction</i>	<i>7</i>
North American Emissions Compliance	8
<i>Key Concepts</i>	<i>9</i>
MUI Dimensions	9
<i>Detailed Procedures</i>	<i>10</i>
Mounting the MUI on a Wall or Surface	10
Mounting the MUI in a Panel	12
Connecting the MUI to the FX Controller	14
Connecting the MUI to an FXVMA Controller	16
Operation.....	17
<i>Introduction</i>	<i>17</i>
<i>Key Concepts</i>	<i>18</i>
<i>Detailed Procedures</i>	<i>19</i>
Page Navigation	19
Accounts	22
Data Points	25
System Data	26
Event Notification and Management.....	27
Trend	31

Scheduler and Calendar	33
Communication Resources.....	37
FXVMA Support.....	41
Downloading the Display Configuration to the MUI	42
<i>Troubleshooting</i>	44
Technical Specifications	45
<i>Ordering Codes</i>	45
<i>Technical Specifications</i>	46

Introduction to MUI

Introduction



Figure 1: MUI

The MUI is a remote user interface device for the FX Platform that supports FX06, FX07, FX14, FX15, FX16, and FXVMA controllers. You can use the MUI as a portable hand held unit, or permanently mount it in a panel or on the wall.

The MUI provides an easy way for the building operator or maintenance engineer to monitor and adjust the operation of the FX field controller. You can configure the MUI to receive event and alarm messages, to change time schedules, and to display event and trend log data. Access to data and operating commands are controlled by passwords.

With the FXVMA, the MUI functions as an airflow balancing tool to support the commissioning of Variable Air Volume (VAV) units.

The MUI presents data in a text format on a 4-line x 26-character backlit Liquid Crystal Display (LCD) and on an array of Light-Emitting Diodes (LEDs) for quick recognition of equipment operating status.

The format of the MUI is fully configurable using the FX Builder software package.

The MUI is a cost-effective solution for monitoring, commissioning, and servicing your building control system installation.

Key Concepts

MUI Features

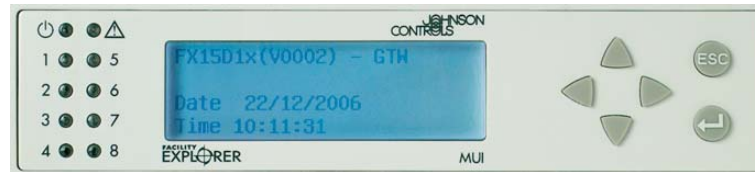


Figure 2: MUI Features

Features

The MUI has the following features:

- Provides a configurable user interface with a 4-line x 26-character LCD backlit display, 10 status LEDs, 6 control keys, and an integral buzzer.
- Manages passwords for up to eight user profiles and three levels of access to provide protection against unauthorized use.
- Uses menu-driven navigation for easy and intuitive operation – select from a list of functions and data point names to monitor and control the system.
- Allows the customization of the control key functions to create short-cut access to the most commonly viewed pages or control and system parameters, and to set key combinations for frequently used actions such as alarm acknowledge.
- Provides ten configurable front panel LEDs that indicate status of equipment, alarms, and operating modes.
- Provides access to the time schedulers and calendars in the FX controller, and allows you to modify start and stop times, associated days of the week, exception days, and holidays.
- Sends immediate notification of events and alarms on the LCD screen with a dedicated LED alarm indicator and buzzer. Press any key to clear the screen and silence the buzzer. Access to the acknowledgement function for events and alarms normally requires password clearance.
- Maintains an Event Summary of data points currently in the active or alarm state, or inactive but not acknowledged.
- Maintains an Event History of the events, both to the active or alarm state and to the inactive state, with a record of the acknowledgement details.

- Shows the Trend data that the controller is collecting for monitoring, trouble-shooting, and diagnostic purposes.
- Allows you to view and modify parameters and destinations for remote communication functions of the FX controller.
- Allows you to view and modify parameters for the airflow balancing feature of the FXVMA controller.
- Allows customization of the menus, pages, and display format of the data using the FX Builder software.

Connection to FX Controller

The MUI connects to the FX controller through the Remote Display port of the FX controller, or the Remote Sensor Port on the FXVMA controller. In FXVMA applications, you can also connect the MUI to a Network Room Module (NRM) with a MUI type service port connection.

The MUI is a slave network display unit of the FX controller and receives its configuration database and active control data directly from the controller over the remote display or sensor bus.

Use the keypads and menu navigation system on the LCD display to access the data stored locally on the MUI, such as the Event History, and the active data and configuration parameters that are available in the connected FX controller.

Display Configuration

You can configure the MUI's display layout for the specific control application in the controller.

The display configuration is built using a set of dedicated windows and templates (commonly called plug-ins) in the FX Builder software.

With the display configuration plug-in, the user:

- creates and formats the display pages
- associates the pages to items on the entry menu for easy navigation and control
- defines the keypad button tasks used as short-cut access paths to pages, or to acknowledge alarms
- defines the use of the LED indicators
- maps controller data points and parameters to the display pages describing them by point names (or tags), units of measure (numeric) or logical (binary), or multi-state state names

- defines which specific points can be commanded (adjusted or overridden) by the user with specific editing ranges and password levels
- configures events and alarms by defining the alarm messages, triggering conditions, setting priority levels, and defining the events that require acknowledgement before an active event or alarm can be reset
- defines the names of schedulers and calendars
- defines the trend logs that are displayed
- defines user account profiles for password entry and authorization to acknowledge events, change parameters, and issue commands

The FX controller stores the display configuration database. When you connect a MUI to an FX controller, the controller downloads the display configuration part of the control application to the display unit.

FX Builder designs the FX control application, including the MUI's display configuration. The control application and display configuration are then downloaded to the FX controller through its network communication interface, which may use the N2 Open, LON, or BACnet® protocol.

When you download a pre-configured standard application for the FXVMA, the MUI display application is already built-in; therefore, the MUI provides the airflow balancing data and command functions when it is connected to the FXVMA controller. Refer to the *Single Duct Variable Air Volume (VAV-SD) Box Controller Application Note (LIT-12011436)* for information on using the MUI to monitor and commission the FXVMA controller, and air balance the VAV box.

Installation

Introduction

IMPORTANT: Use this Medium User Interface only as an operating control. Where failure or malfunction of the MUI could lead to personal injury or property 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, intended to warn of or protect against failure or malfunction of the MUI.

IMPORTANT: The installation of electrical wiring must conform to local codes and should be carried out by authorized personnel only. Users should ensure that all Johnson Controls® products are used safely and without risk to health or property.

IMPORTANT: Cables and wiring at Safety Extra-Low Voltage (SELV) and Class 2 wiring (North America) must be separated from power line voltage wiring. A minimum separation distance of 30 cm (12 in.) is recommended. Do not run extra low voltage cables parallel to power line voltage cables for long distances greater than 3 m (9.8 ft). Do not run extra low voltage wiring close to transformers or high frequency generating equipment.

The MUI connects to the FX06, FX07, FX14, FX15, FX16, and FXVMA controllers. An FX Controller with an integral display (2 X 4 LCD or integral MUI) supports one additional MUI—either the local panel mount version, or the remote mount version. An FX controller without an integral display supports one or two MUI units. One of the MUIs can be the local panel version and be powered by the controller.

The **local** panel mount MUI has the ordering code **LP-DIS60P20-0C** and mounts in a panel up to 3 m (9.8 ft) from the controller using one of the pre-assembled cable kits:

- **LP-KIT007-005C** – for the FX06 controller
- **LP-KIT007-000C** – for the other FX controllers
- **For FXVMA** – see *Connecting the MUI to an FXVMA Controller*

The cable provides power and communication from the controller to the MUI.

The **remote** wall mount MUI has the ordering code **LP-DIS60P21-0C** and mounts on the wall or in a panel up to 300 m (1,000 ft) from the controller. The remote MUI requires a local power supply; the communications cable must be supplied by the installer. For this MUI, the communication interface is isolated from the power supply to provide reliable operation at the remote location.

This chapter describes how to:

- mount the MUI on a wall
- mount the MUI in a panel
- install the cable and connect the panel and wall mount versions of the MUI

North American Emissions Compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user is required to correct the interference at his/her own expense.

Canada

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Key Concepts

MUI Dimensions

Figure 3 shows the overall dimensions of the MUI. For panel cut-out dimensions or wall bracket drill hole spacing, see *Detailed Procedures* in this chapter.

Minimum Required Mounting Clearance

Wall mounting requires a minimum of 45 mm (1.8 in.) free space in front of the mounting surface for clearance from nearby objects, such as sliding doors or movable panels, or for clearance within a protective enclosure or cover.

Panel mounting requires a minimum of 45 mm (1.8 in.) free depth behind the panel for the plug-in connectors at the rear.

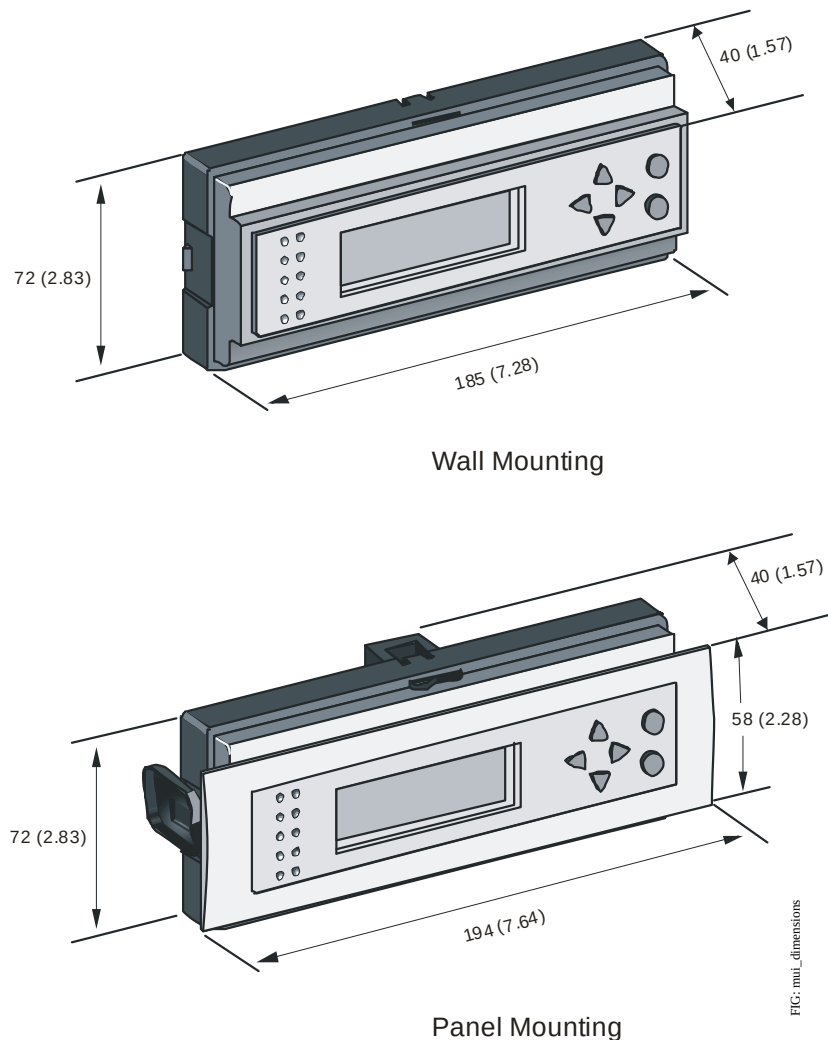


Figure 3: MUI Dimensions, mm (in.)

Detailed Procedures

Mounting the MUI on a Wall or Surface

The MUI remote wall mount version has the ordering code **LP-DIS60P21-0C**. This version has an isolated power supply and can be mounted up to 300 m (1,000 ft) from the controller. The MUI requires an independent power supply of 12 to 24 VAC at 3.5 VA, or 9 to 48 VDC at 200 mA maximum.

1. Carefully remove the MUI panel mount bezel (if fitted): release the **b** tabs (see Figure 8) and pull the bezel away from the MUI unit.
2. To open the MUI, press the two retaining lugs (indicated by the arrows in Figure 4) and pull the MUI cover away from the base.

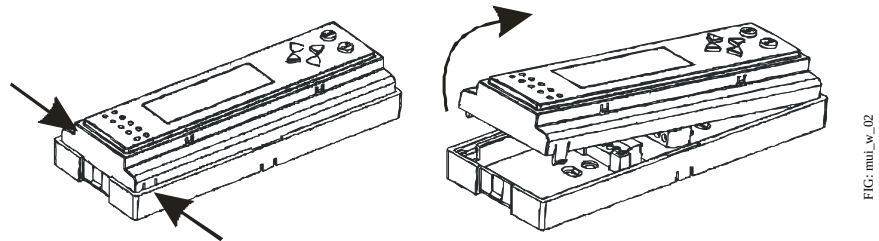


FIG: mui_w_02

Figure 4: Opening the MUI

3. Drill holes and insert plugs (anchors) as necessary, and mount the base to the wall or surface with a minimum of two screws located on opposite sides of the center of the base. Ensure that the base is correctly positioned over the cable entry. The mounting hole locations and dimensions are shown in Figure 5.

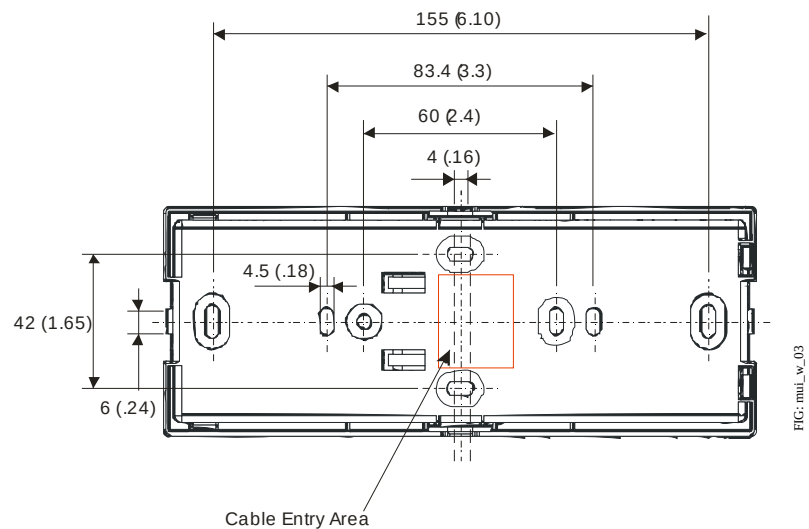


FIG: mui_w_03

Figure 5: MUI Wall Mount Dimensions, mm (in.)



CAUTION: Risk of Electric Shock. Disconnect power supply before making electrical connections to avoid electric shock.

4. Connect the power and communication cables to the terminal block as shown in Figure 6.
5. Replace the MUI cover on the base by first inserting the two lugs on the right side of the cover below the corresponding lips of the base. Then close the MUI pushing on the left side as indicated by the arrow in Figure 6. Make sure that the pins on the circuit board in the cover engage correctly into the terminal block in the base.

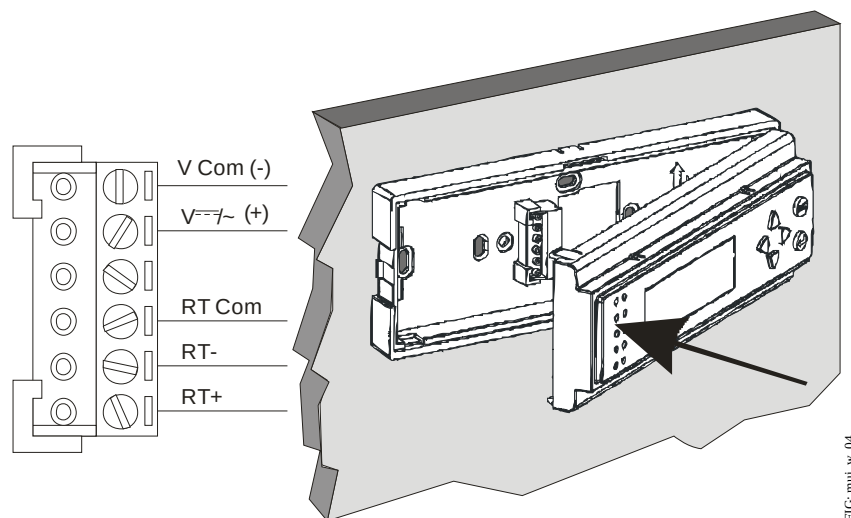


FIG: mul_w_04

Figure 6: Wiring and Reassembly Details

Mounting the MUI in a Panel

The panel mounting kit is supplied with both the panel mount version with ordering code **LP-DIS60P20-0C**, and the remote wall mount version with ordering code **LP-DIS60P21-0C**.

The panel mount version is non-isolated and can be mounted up to 3 m (9.8 ft) from the controller. Available to order are cables that connect power and communications from the controller. See *Ordering Codes*.

The remote wall mount version can also be mounted in a panel up to 300 m (1,000 ft) from the controller. The MUI has an isolated power supply and requires an independent power supply of 12 to 24 VAC at 3.5 VA, or 9 to 48 VDC at 200 mA maximum.

Note: When mounting the remote wall mount version in a panel, the wiring must be completed before fixing the display in the panel. Follow the instructions for *Mounting the MUI on a Wall or Surface*, but omit step 3.

1. Carefully remove the panel mount bezel: release the **b** tabs (see Figure 8) and pull the bezel away from the MUI unit. Fit the two gaskets into the bezel (if not already installed).
2. Use the cut-out dimensions shown in Figure 7 and insert the panel mount bezel from the front side of the panel, and the MUI unit from the other side.

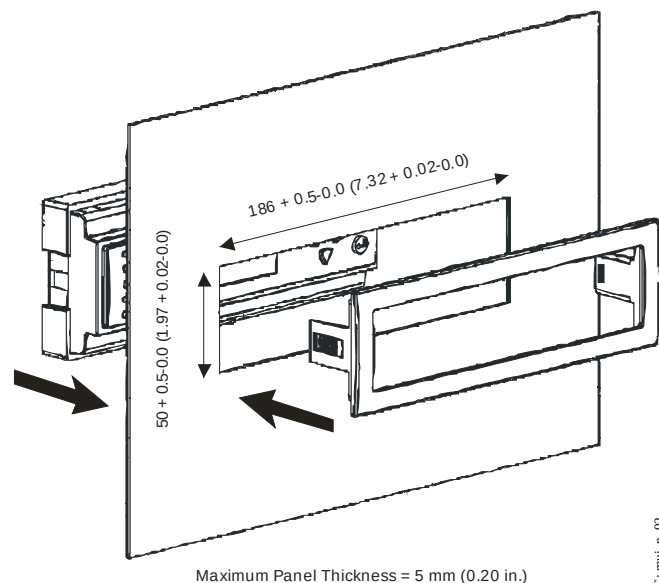


Figure 7: Panel Cut-out Dimensions, mm (in.)

3. Hold the MUI firmly against the back of the panel and press the bezel until it clicks into place at the six points (**a** and **b**) indicated by the arrows in Figure 8. Ensure that the **b** tabs are engaged with the lugs on the display base.

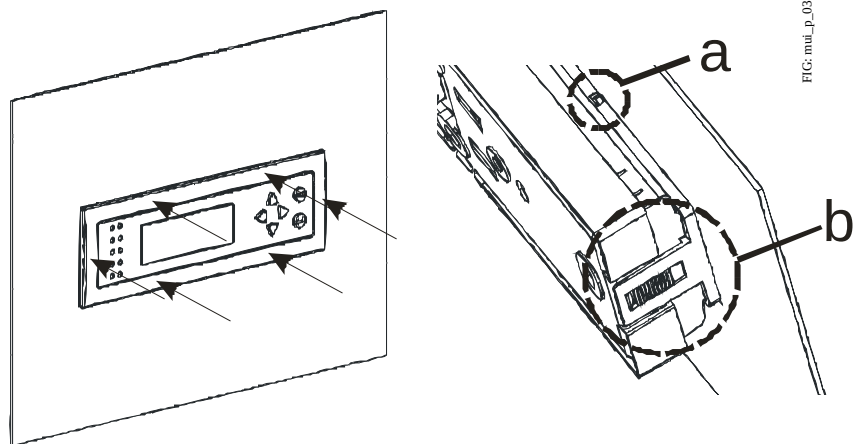


Figure 8: Fitting the MUI in a Panel

4. Hold the panel mount bezel of the MUI firmly against the front of the panel and insert the four locking clips as indicated in Figure 9. Ensure that the side clips are pressed firmly against the panel.

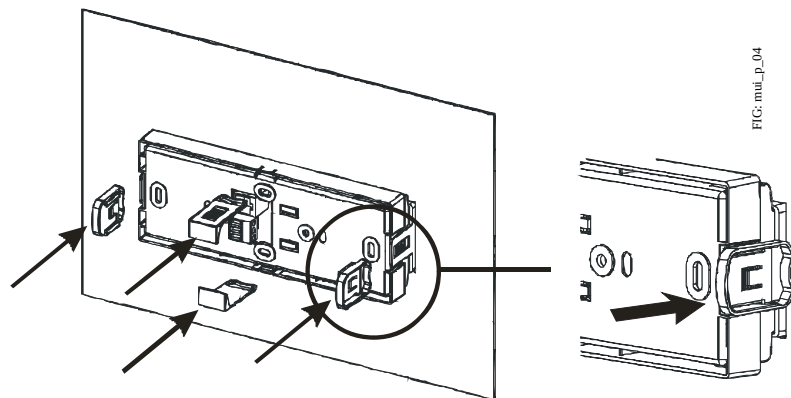


Figure 9: Securing the MUI in a Panel

To assure IP54 enclosure protection, verify that:

- The cut-out dimensions are within tolerances.
- The panel surface is clean and flat.
- The two gaskets are properly fitted to the MUI panel mount bezel.

For the local panel mount version, use the appropriate cable kit to connect the MUI to the FX controller (see Table 5).

For the remote mount version, wire the MUI to the controller as described in *Connecting the MUI to the FX Controller*.

Connecting the MUI to the FX Controller



CAUTION: **Risk of Electric Shock.** Disconnect power supply before making electrical connections to avoid electric shock.

An FX Controller **with** an integral display (2X4 LCD or integral MUI) supports one additional MUI. An FX controller **without** an integral display supports one or two MUIs, but only one panel mount MUI. Two MUIs operate in parallel with the same data presentation format.

Figure 10 shows the cabling of a panel mount MUI with the cable kit, and the cabling of a second remote MUI with field prepared cables.

Figure 11 shows the cabling of two remote wall mount MUIs with field prepared cables.

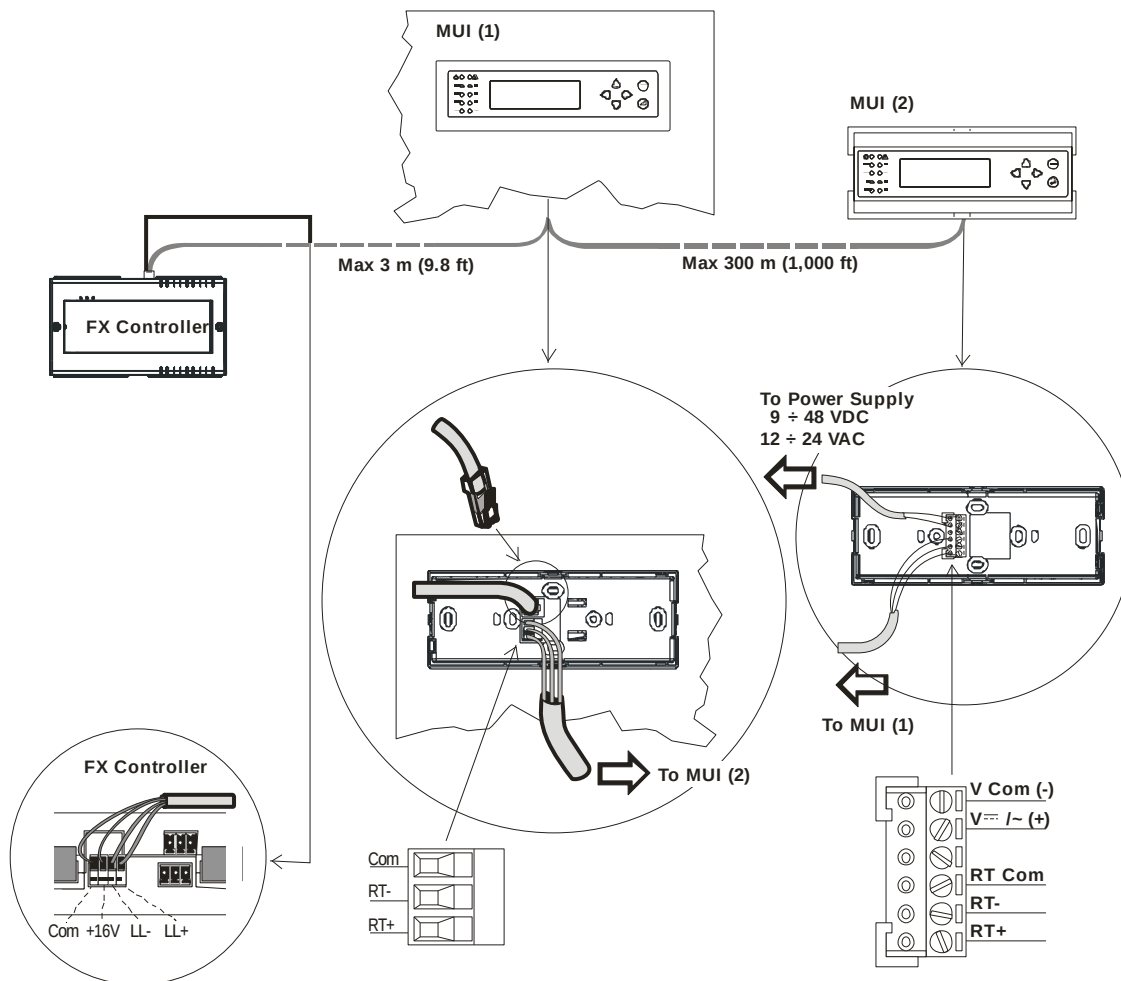


FIG: mui_007_remote_wall

Figure 10: Installation of a Local Panel Mount and a Remote Wall Mount MUI



CAUTION: **Risk of Electric Shock.** Disconnect power supply before making electrical connections to avoid electric shock.

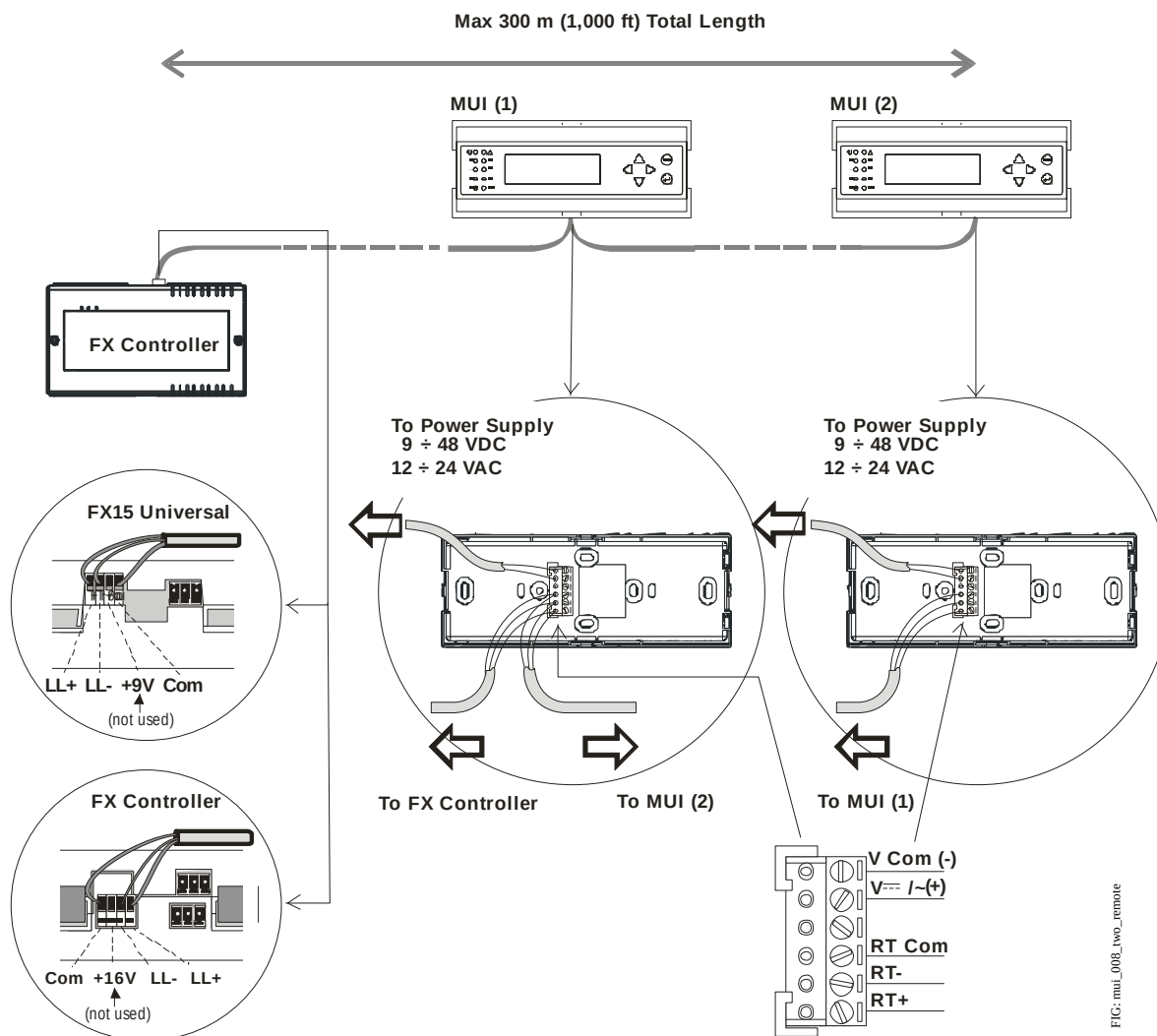


Figure 11: Installation of Two Remote Wall Mount MUIs

Connecting the MUI to an FXVMA Controller

The MUI connects to the Remote Sensor Port on the FXVMA controller. You can purchase a cable, or assemble field-prepared cables. Use a 6-conductor (26-28 AWG stranded copper wire) cable with 6-position modular plugs (RJ-12) at each end wired according to Figure 13.

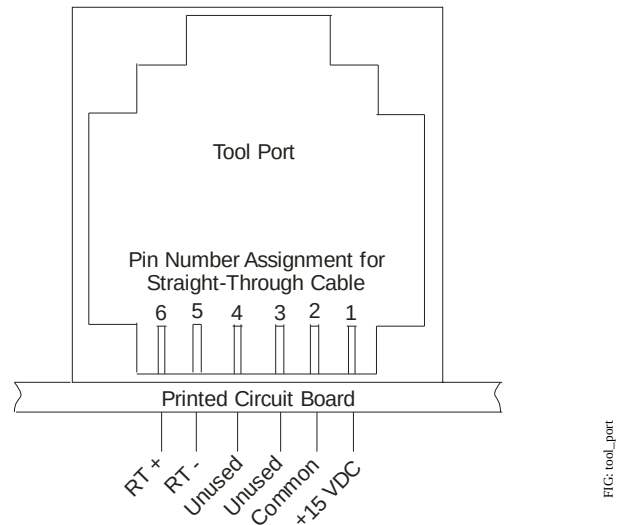


Figure 12: MUI Tool Port Socket (6-pin Modular Jack Connector)

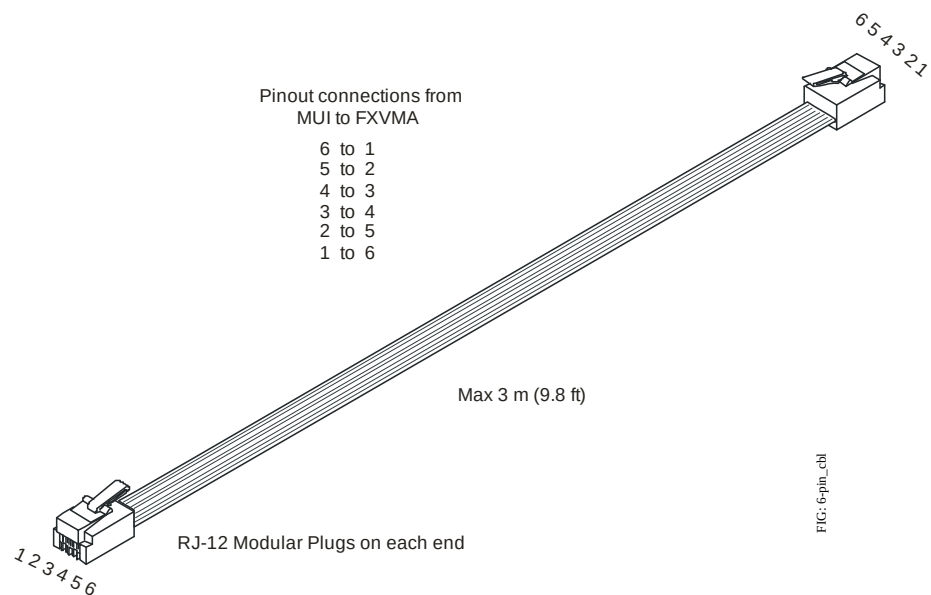


Figure 13: 6-conductor (26-28 AWG stranded copper wire) Cable with 6-position Modular Plugs (RJ-12) at Each End

Operation

Introduction

The MUI uses a simple menu system interface on its LCD screen, and six control keys to provide easy, intuitive access to the data and parameters stored in the FX controller. The MUI provides password protection for changing data or for operating functions in the FX controller, such as acknowledging events, overriding outputs, modifying setpoints, and editing trend data collection or communication parameters.

This section describes how to:

- establish communication with an FX controller
- display the Home Page
- navigate the Menu
- enter a password
- view application and system points
- adjust configuration parameters
- view the Event Summary
- view the Event History
- view Trend data
- work with communication resource editing options
- refer to the *Single Duct Variable Air Volume (VAV-SD) Box Controller Application Note (LIT-12011436)* for information on how to use the FXVMA functions

Key Concepts

- page navigation: display screen, control keys, home page, and menu page
- password entry
- data point display: adjusting and overriding
- system data
- event notification and management
- trend display and settings
- scheduler and calendar display and modification
- communication resources configuration: modem, Short Message Service (SMS), e-mail, and Web page
- monitor and commission the FXVMA controller, and air balance the VAV box

Detailed Procedures

Page Navigation

The MUI front panel is a 4-line x 26-character backlit LCD display, with 10 status LEDs, and 6 control keys (or buttons).

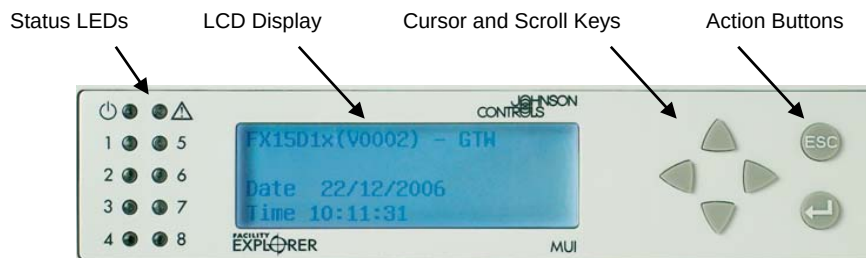


Figure 14: MUI Front Panel

Status LEDs

The status LEDs indicate important information from the controller and the control application (see Table 1).

Table 1: Status LEDs

Name	Symbol	Description
Power Supply LED		Normally configured in FX Builder to indicate the power supply status of the FX controller. The Power Supply LED is ON when the FX controller is connected to its power supply and properly powered up.
Alarm Active LED		Normally configured in FX Builder to blink when an active event (alarm) condition is present in the FX controller, and steady ON when all active events have been acknowledged. The OFF condition indicates that there are no active events in the FX controller, and that all events have been acknowledged.
Status LEDs	1 – 8	Configurable in FX Builder to indicate the status of any value or parameter in the control application in the FX controller. The LEDs can be configured to blink or be steady ON for any one or more of the states of the selected value or parameter.

Keypad

The control keys , , , , , and  have fixed functions that are related to the contents and selected items on the displayed page.

Table 2: Control Key Actions

Name	Symbol	Description
Left/Right	 	Moves the cursor between menu items and between pages horizontally.
Up/Down	 	Moves the cursor between menu items and between pages vertically. When in EDIT mode, changes the value of the selected parameter.
Escape		Toggles between the Home Page and the Main Menu, or aborts the selection of a menu/submenu or adjust/command procedure.
Enter		Confirms an action or command when selecting a menu option, or commanding or adjusting a value.

In FX Builder you configure each key, or a combination of keys, to create customized short-cut access to commonly viewed pages or parameters, or to perform system tasks such as the acknowledgement of alarms and events. You can also configure a key action to perform the auto-repeat function on continued pressure for faster navigation.

Home Page

When you connect the MUI to an FX controller, the user interface configuration automatically downloads from the controller to the MUI. The download operation can take a few minutes and a progress bar appears on the MUI screen. When complete, the Home Page automatically appears as the default screen.

The Home Page is also shown when the Menu Page times out, or if you press the  key when the Menu Page is displayed.

You can configure the Home Page to show fixed text (such as Welcome, or the job name) or selected active information (such as time and date), or the value of special data points from the FX controller with descriptive text and units of measure. If you map more information to the Home Page than can be shown in four lines, you can scroll up to 16 lines using the  and  keys, and select points using the  key. Use the Home Page to display the most important parameters of the connected FX. From the Menu Page, press the  key to select the Home Page.



Figure 15: Home Page Shown on the MUI

Press the  key when the Home Page displays to view the Menu Page.

This section describes the Data Points and System Data that can appear on the Home Page.

Menu Page

To access the Menu Page from the Home Page, press the  key.

If you press the  key when the Menu page is displayed, or if the page timeout expires, the Home page appears.

Use FX Builder to configure the Menu Page. The Menu Page contains the menu links that makes the MUI pages accessible. Access to some pages are via sub-menu pages under a Main Menu page.

Each menu link opens a MUI page (such as Event Summary, Event History, or Accounts management), or opens user defined pages containing data points from the control application in the FX controller. You can limit access to pages by account passwords. If the user does not have the required level of access to a linked page, the Menu link item is hidden and access is denied.

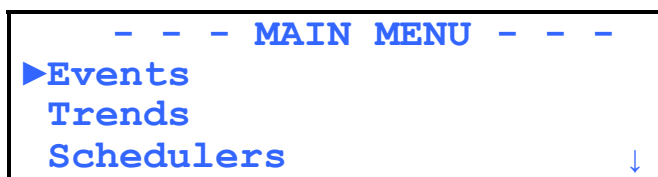


Figure 16: Main Menu Page Shown on the MUI

The navigation keys , , , , , and  have specific functions that are independent from the application downloaded into the MUI. The function of the keys is related to the operational mode of the page shown.

For example, when the Main Menu Page is in IDLE mode, the arrow keys  and  allow you to scroll through the displayed menu tags.

When you press the enter key , the page goes to ACTIVE mode and the cursor appears as a reverse video character.

Press the enter key again to view the page associated with the menu tag where the cursor is positioned.

When a page appears, the keys are used as follows:

- Press  key to set page from IDLE mode to ACTIVE mode and display the cursor.
- Use the arrow keys , , , and  to move the cursor through the modifiable parameter values.
- Press the  key to set the selected parameter into EDIT mode as shown by the blinking parameter value.
- Use the up and down arrow keys  and  to edit (modify) the value. Numeric values increase and decrease within the allowable range, logic (binary) values toggle, and multistate values show the possible states.
- Press  key to confirm the change, or  to restore the original value.
- Press the  key to open the previous page in IDLE mode.

Arrow symbols ↓ ↑ on the right side of a page indicate additional information exists outside the area currently displayed. Use the Up/Down control keys to scroll through the additional information.

If a page is configured without tags that you can select, or values that you can edit, the page can only remain in IDLE mode.

A page may appear directly in EDIT mode where you can immediately adjust the single value field which is blinking.

Accounts

The MUI implements an Accounts (password) system, definable in FX Builder, to control access to pages and data points, to limit the editing and event acknowledgement functions, and to limit the use of key or multiple-key associations. To access a page or modify a parameter that is account protected, you must log-in with a password at the same or higher access level than the account access level required.

By default, FX Builder provides a link to the Accounts page in the Main Menu structure. This Main Menu page must be set with the lowest user access priority level. If you do not have the required privilege to access a linked page or parameter, the link is hidden and access is denied.

If you modify a password from one of two MUIs connected to the same controller, this action is notified to the other MUI with the following message that appears on the display: **Pwd Updated by Net.**

Three Account password levels are defined as follows:

- A **Level 3** password has the maximum priority, is allowed to access pages or parameters protected by any other password of the system, and is allowed to change passwords.
- A **Level 2** password can access pages or parameters protected by passwords of Level 2 or Level 1.
- A **Level 1** password can only access pages or parameters protected by a password of Level 1.

An additional level is defined as **Level 0** and means that a password is not required.

Define the passwords with a 4-digit number, where each digit is a numeric character (0-9). The passwords are defined in FX Builder during the MUI user interface design process, and stored in the display configuration within the control application.

Through the MUI you can enter and, if allowed by configuration, modify your password. These actions are done using the Log-In and User Account pages.

Account Entry Pages

The Accounts page is accessible either through the Accounts tag in the Main Menu, or via special key combination shortcuts.



Figure 17: Password Page

Press the enter key  to login with your password. The Log-In page also appears when you attempt an action which requires a valid password.

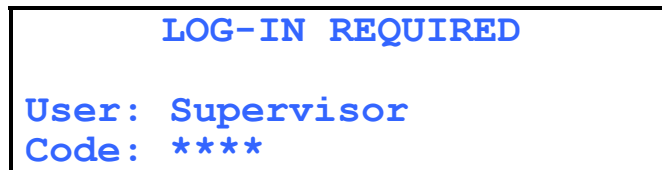


Figure 18: Log-In Page

Scroll using the  and  keys to select your user name and then press the enter key . Then enter your password code.

The blinking cursor is positioned on the first digit to edit with a 0 default value. Select the correct number (0 – 9) using the  and  keys, and confirm with the enter key .

The blinking cursor moves to the next digit. Enter all the required digits. When you confirm the last required digit, if the password is valid, the MUI allows you to proceed. If no action is in progress, the Main Menu page appears again with the appropriate menu links for your password level.

If the password is not valid, the Wrong Password message appears and any other active access level is cancelled.

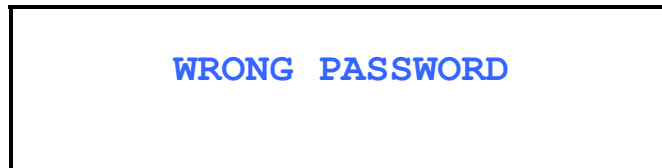


Figure 19: Wrong Password Message

Press the  key to return to the previous Log-In Required page.

User Account Page

If configured through FX Builder, the MUI allows you to change passwords directly from the user interface unit without having to modify the control application.

To open the User Account page to modify passwords you have to map the Change the Password feature to the Main Menu, or to a key or multiple key combination during the control application configuration. The User Account page contains the list of the configured password users (maximum eight users).

USER_ID	Password Code (hidden)	Password Level
USER ACCOUNT		
▶Administrator	****	3
Supervisor	****	2
Operator	****	1
UserName4	****	2
UserName5	****	1

Figure 20: User Account Page, User Password Level 1 – 3

Navigate the User Account list using the  and  keys. When the desired user name appears, press the enter key  to access the password change session. This feature is normally protected by the **Level 3** password.

The password entering procedure is the same as the account entry (see *Account Entry Pages*). When you confirm the last digit, the Confirm Password screen appears (Figure 21).



Figure 21: Confirm Password Page

Enter the password again using the same procedure and press the enter key  to confirm.

If the passwords entered match, the message Password Saved appears, and the password is modified.

If the passwords entered do not match, the Wrong Password message (Figure 19) appears on the screen. Press the  key to return to the previous page.

Log-Off

There are two ways to log off:

- Open the Accounts page, select Log-Off, and press the enter key.
- Press the specific key combination defined at design time in FX Builder, as the log-off shortcut.

As a security feature, password access automatically expires after 15 minutes of inactivity, and the User Logged-Off message appears. Press any key to remove this message and return to the Main Menu.

Data Points

You can map application data points to the MUI screen for monitoring, adjusting, commanding, or overriding purposes. The display configuration is defined during the control application configuration using FX Builder.

These data points represent variables (Network Variable Inputs, Network Variable Outputs, and Application Points), and working parameters and setpoints (Configuration Parameters) that are defined for the specific control application. Data points can represent numeric, logic (binary), and multistate values.

All the fields of structured variables and configuration parameters can be mapped to the display application.

Each Data Point page and each data point on the page has a name (tag) to relate the data information to the monitored application.

SETPOINTS	
▶ Entrance Hall	19.0°C
Conference Room	20.5°C
Offices Floor 1	21.0°C ↓
Offices Floor 2	20.5°C
Offices Floor 3	21.5°C

Figure 22: Setpoints Data Point Page

Depending on the source of the point represented, the data is read-only or can be adjusted or modified (write-enabled). Write-enabled points have a defined Edit Range to limit the adjustment range.

To view, adjust, or override a data point:

1. Go to the Data Point screen using the page navigation with menu pages.
2. To adjust or override a data value, press the  key to set the page into the ACTIVE mode. The cursor appears.
3. Use the  and  keys to select the data point that you want to modify, and press the  key again to enter the EDIT mode. A blinking cursor highlights the value to be changed.
4. Use the  and  keys to modify the value. For numeric values,  increases the value and  decreases the value. For logic and multistate points, the keys step through the possible states of the value.
5. Press the  key to confirm the change or  to restore the original value. The cursor returns to the data point description field.

System Data

The Data Point pages may contain System Data as well as Data Points. System Data relates to the internal controller operating system and includes Real-Time Clock information (date and time), Unit of Measure (SI or U.S.), Language of display, and others.

Event Notification and Management

When an event with an alarm condition occurs, the Event Notification page pops-up and displays the details of the event. This pop-up page shows only the message for the first event in a series of events.

When the event pop-up appears, press the  key to access the Event Summary Point Detail and view details, such as the date and time when the event occurred or the event priority level (see Figure 26).

Press the  key to cancel the pop-up page and silence the buzzer (if it sounds), and the next new active event in a series appears (if any). Otherwise, the previous page is shown again.

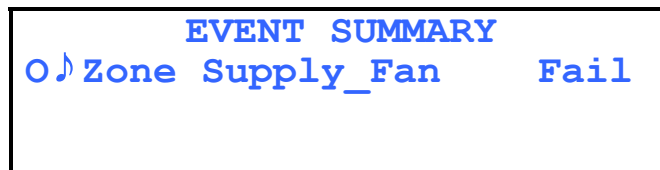


Figure 23: Event Notification Pop-up Page

The maximum of number of Events that can be managed by the MUI is dependent on the FX controller. The FX06, FX07, FX14, and FX15 controllers handle up to **20 events**, while the FX16 Master Controller handles up to **250 events**. Refer to the Technical Bulletin of the relevant controller for details.

Events and alarms are stored in the Event History and are viewed in the Event Summary as long as they are active or not acknowledged.

To acknowledge an event, press and hold the specific key or key combination defined at design time in FX Builder, until the event is acknowledged (see Figure 25 and Table 3).

Use the page navigation from the Events tag in the Main Menu page (default configuration) to view the Event History and Event Summary pages.

The default Events Menu page (Figure 24) enables you to select the Event History or Event Summary pages using the , , and  keys to select the page that you want to view.

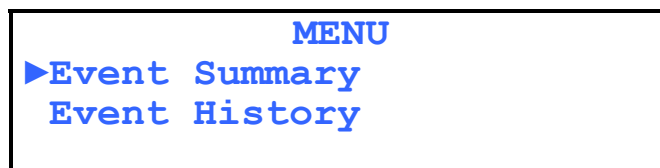


Figure 24: Events Menu Page

Event Summary

The event with the highest priority displays at the top of the list. System events are included in the summary, but are shown only once. When you close the Event Summary page, all the system events are erased from the list, but are still available to view in the Event History page. The Power Up system event is seen only on the Event History page.

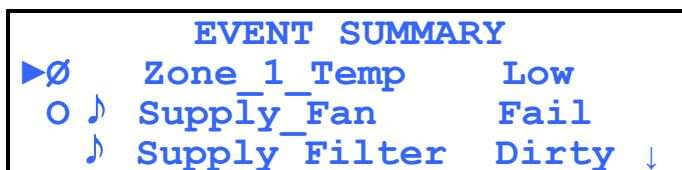


Figure 25: Event Summary Page

The symbols shown in the Event pages are described in Table 3.

Table 3: Event Symbol Details

Symbol	Description
	Event is active (normally indicates an alarm state).
	Event requires acknowledgement by user.
	Event already acknowledged by user.

The Event Summary shows active events, and events that are no longer active but have not been acknowledged.

While viewing the events in the Event Summary, the Alarm Status LED may be configured to indicate the status of the selected event (alarm) as follows:

- The Alarm Status LED **blinks** when the event is active and requires an acknowledgement.
- The Alarm Status LED is **steady ON** when the event is active and does not require an acknowledgement, or has already been acknowledged.
- The OFF status of the Alarm Status LED indicates that the event is no longer active and has been acknowledged.

An event that is no longer active and has been acknowledged is removed from the list when you close the Event Summary page.

Press the  key to shown more detail for the selected event. Scroll down with the  key to see the acknowledgement information, if available.

Event time stamp >	12/10/2009 16:06:00
Data point name >	Zone_Supply_Fan
Data point status >	Ø ♪ Fail
Event priority >	Event Priority: 3 ↓
Acknowledge time stamp >	12/10/2009 16:15:34
Fixed Text >	Event Acknowledged
Acknowledged by >	Supervisor

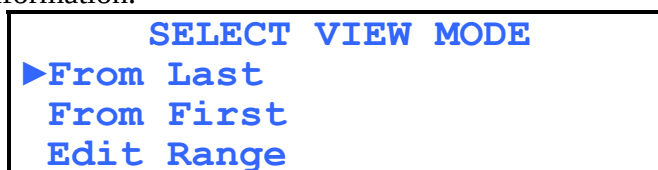
Figure 26: Event Summary Point Detail

If the event is acknowledged by another source (for example, a network command to the controller), the screen shows acknowledged by: **External ACK.**

Event History

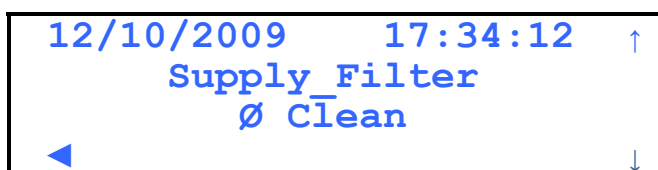
The Event History log is stored in non-volatile memory. If a power failure of the controller occurs, the Event History log is restored at the next powerup, so the historical record is not lost. Events that occur during the power failure are not reported or recorded.

The Event History page shows the events triggered within the controlled system for record purposes. When the Event History page is selected, the Select View Mode page appears and allows you to sort and filter the event information.

**Figure 27: Event History Select View Mode Page**

- **From Last:** list is sorted with the latest event at the top.
- **From First:** list is sorted with the earliest event at the top.
- **Edit Range:** you can enter a date range for the selection.

Scroll through the list using the ▲ and ▼ keys. An event record displays (Figure 28).

**Figure 28: Event Record Detail**

If the event has been acknowledged, press the ◀ key for additional acknowledgement information.

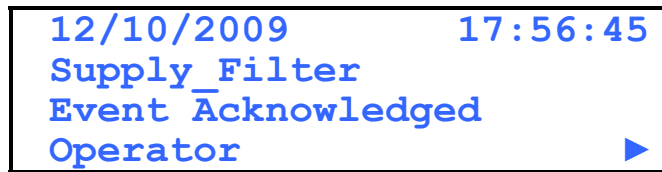


Figure 29: Event Record with more Details

See Figure 26 for a description of each line.

To edit the range of Events:

1. Select Edit Range and press the  key.
2. Use the , , , and  keys to move the cursor to the time or date that you want to edit, and press the  key to enter EDIT mode.
3. Use the , , , and  keys to edit the date or time values and press the  key to set the new value.
4. Repeat steps 2 and 3 for each date or time value you want to edit.
5. Use the  key to select the » symbol and press the  key to filter the events and display only the events that occurred within the edit range.

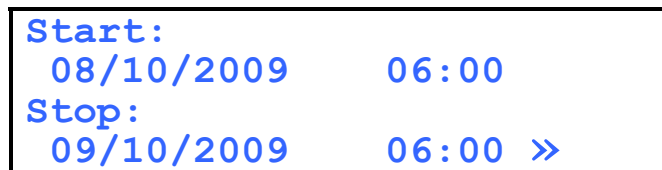


Figure 30: Edit Range Page

Trend

You can show trend data on the MUI when the trend feature is configured in the control application. Use the page navigation from the Trend tag in the Main Menu page (default configuration) to view the Trend page.



Figure 31: Trend Page

Trend Values Page

The Trend Values page allows you to select one of the data point variables that are configured for trending in the connected FX controller.

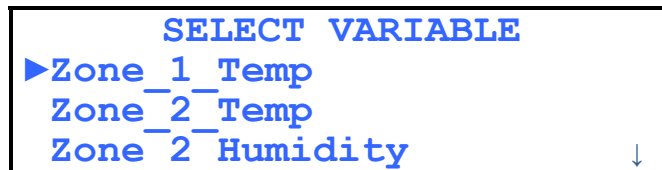


Figure 32: Trend Values Page

Use the  and  keys to select a variable and press the  key to view the Trend Select View Mode page.

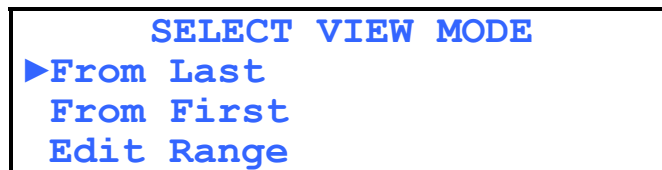


Figure 33: Trend Select View Mode Page

- **Show Last:** values are sorted with the latest value at the top.
- **Show First:** values are sorted with the earliest value at the top.
- **Edit Range:** you can enter a date range for the variables.

Figure 34 shows the Trend page format for a logic variable.

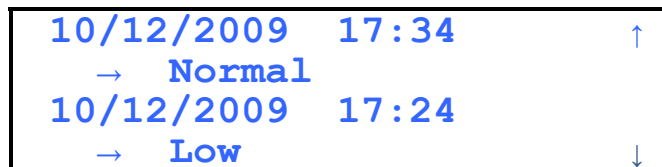


Figure 34: Logic Variable Trend Page

Figure 35 shows the Trend page format for a numeric variable.

10/12/2009	17:34	↑
→	20.7 °C	
10/12/2009	17:24	
→	20.9 °C	↓

Figure 35: Numeric variable Trend Page

Press the  key to return to the Trend Menu page.

To edit the range of Trends:

1. Select Edit Range and press the  key.
2. Use the , , , and  keys to move the cursor to the time or date that you want to edit, and press the  key to enter EDIT mode.
3. Use the , , , and  keys to edit the date or time values and press the  key to set the new value.
4. Repeat steps 2 and 3 for each date or time value you want to edit.
5. Use the  key to select the » symbol and press the  key to filter the trends and display only the trends that occurred within the edit range.

Start:		
08/10/2009	06:00	
Stop:		
09/10/2009	06:00	»

Figure 36: Edit Range Page

Trend Setting Page

The Trend Setting page allows you to modify the trend configuration parameters created in FX Builder.

Percentage	80	%
Offload Period	24	
- - - - -		
Zone 1 Temp	20	min ↓
Zone 2 Temp	60	min
Zone 2 Humidity	120	min
Return Pressure	1	

Figure 37: Trend Setting Page

The meaning of each line of the Trend Setting Page is explained here:

- **Percentage:** The percentage of buffer limit for notification. When the Buffer Full Notification option is enabled in the control application, the FX controller automatically sends a message to the configured contacts after the used trend memory reaches this limit. The range is 1 to 100%.
- **OffLoad Period:** The time between automatic transmission of trend data to configured contacts. When the Periodic OffLoad Notification option is enabled in the control application, the FX controller sends an e-mail with the trended data to configured contacts at the end of this OffLoad Period. The range is 0 to 24 hours, where 0 means disabled.
- **Numeric Data Points:** Numeric data points are trended according to the Sample Period. The range is 0 to 1440 minutes, where 0 means disabled. For example, Zone 1 (Temp) Sample Period (60 min).
- **Logic/Multistate Data Points:** Logic and multistate data points are trended on a change of state. With a sample period of 1, every change in the state of a data point is logged. The value in this line can be 0 or 1: 0 means trend disable, 1 means trend enable. For example, Return Pressure 1 (Enable).

Press the  key to return to the Trend Menu page.

Trend Buffer Reset

This option allows you to reset the Trend Buffer which clears the memory space allotted for Trend data.

IMPORTANT: We strongly recommend using a high-level password to protect the Trend page against a possible mistake in selecting the Trend Buffer Reset option.

Use the  and  keys to select Trend Buffer Reset. Press the  key to clear the buffer and return to the Main Menu page.

Scheduler and Calendar

You can show scheduler data on the MUI when it is configured in the control application. Use the page navigation from the Schedulers tag in the Main Menu page to view the Scheduling data pages. Depending on the configuration, the following pages may be available:

- On Off Schedulers
- Weekly Occupancy Schedulers
- Exception Days Calendar

Press the  key to return to the previously selected page.

Daily On Off Schedulers Page

Figure 38 shows the daily On Off Schedulers created in FX Builder.



Figure 38: Daily On Off Time Schedulers Page

Scroll through the list using the  and  keys and press the  key to select a scheduler. The schedulers marked Alternate are only active on days of the week that are scheduled as Alternate in the Exception Days Calendar. The selected scheduler appears as shown in Figure 39.

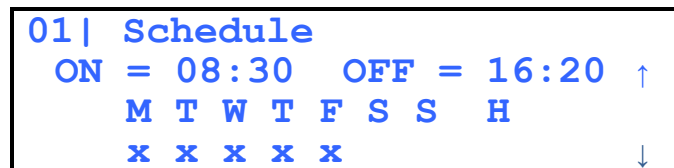


Figure 39: Daily On Off Schedule Details

1. If the scheduler has more than one On-Off entry, scroll through the list using the  and  keys and press the  key to enter ACTIVE mode.
2. Move the cursor to the time or day that you want to edit and press the  key again to enter EDIT mode.
3. Use the  and  keys to modify the value and press the  key to confirm the change or  to restore the original value.
4. Press the  key to return to the On Off Time Schedulers page.

Weekly Occupancy Schedulers Page

The Weekly Occupancy Schedulers configured in FX Builder are listed as shown in Figure 40.

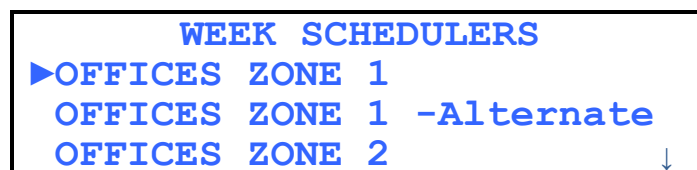


Figure 40: Weekly Occupancy Schedulers Page

Scroll through the list using the  and  keys and press the  key to select a weekly scheduler. The schedulers marked Alternate are only active on days of the week that are scheduled as Alternate in the Exception Days Calendar. The Day Programming page for the selected weekly scheduler appears (Figure 41).

OFFICES	ZONE	1	MTWTF	SS	H
►Weekday			xxxxx		↑
Weekend				xx	
Holiday					x ↓

Figure 41: Weekly Scheduler Day Programming Page

1. If the scheduler has more than one line entry for a sequence of days, scroll through the list using the  and  keys and press the  key to enter ACTIVE mode.
2. Move the cursor to the day sequence (right side of the screen) that you want to edit and press the  key to enter EDIT mode.
3. Use the  and  keys to modify the day selection and press the  key to confirm the change or  to restore the original selection.

Note: Each day can only be assigned to one line entry.

4. Move the cursor to the name of the line entry (left side) and press the  key to enter the Time Programming page (Figure 42).
5. Press the  key to return to the Weekly Occupancy Schedulers page.

OFFICES	ZONE	1 - Weekday
►08:00	Occupied	
12:30	Standby	
18:00	Unoccupied	

Figure 42: Weekly Scheduler Time Programming Page

The Time Programming page enables you to modify the time of day and occupancy mode that begins at this time for the selected sequence of days.

1. Scroll through the list of times using the  and  keys and press the  key to enter ACTIVE mode.
2. Move the cursor to the time or occupancy state that you want to edit and press the  key again to enter EDIT mode.
3. Use the  and  keys to modify the selected value and press the  key to confirm the change or  to restore the original selection.
4. Press the  key to return to the Weekly Occupancy Schedulers Day Programming page.

Exception Days Calendar Page

When the Exception Days Calendar page is selected, the Exception Days Calendar detail page appears (Figure 43). The horizontal scroll selects the current month and 11 future months. The vertical scroll selects the day of the month and displays the day type as Normal, Holiday, or Alternate.

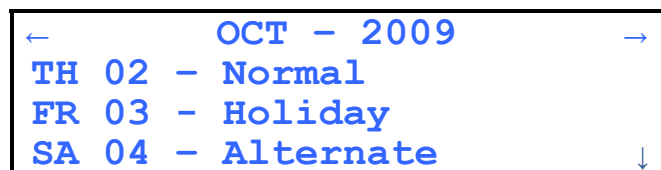


Figure 43: Exception Days Calendar Page

1. Press the  key to enter the ACTIVE mode and use the , , , and  keys to move the cursor to the month and day to be modified.
2. Press the  key again to enter the EDIT mode and use the  and  keys to modify the day type.
3. Press the  key to confirm the change or  to restore the original selection.

Communication Resources

The Communication Resources Menu page enables you to enter the information required for the communication services of the FX controller.

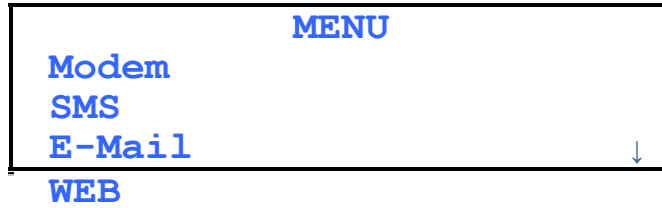


Figure 44: Communication Resources Menu Page

The FX controllers can be connected to a standard land-line or Global System for Mobile communications (GSM) modem for sending e-mail messages, and a GSM modem for Short Message Service (SMS) messages.

The FX16 Master Controller also features an embedded Web server that allows a remote user, running Microsoft® Windows® Internet Explorer® Web browser, to dial in and establish point-to-point communication with the controller, allowing you to browse Web pages containing information about the running application.

The necessary communication configuration parameters, such as e-mail addresses, phone numbers, and Internet Service Provider (ISP) parameters are entered through the Communication Resources Menu page.

Scroll through the menu using the  and  keys to see all the communication media, and press the  key to select a page.

Modem Page

The Modem page appears when you select Modem in the Communication Resources Menu page and a modem has been configured in the control application in FX Builder. Enter or modify the GSM modem card Personal Identification Number (PIN) of the Subscriber Identity Module (SIM) through the Modem page.

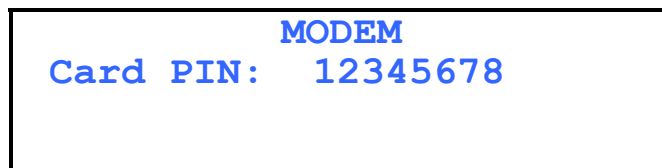


Figure 45: Modem Page with GSM SIM Card PIN

To edit the card number:

1. Press the  key to enter EDIT mode and use the  and  keys to set each digit, confirming each digit with the  key.
2. Press the  key to return to the Communication Resources Menu page.

SMS Page

The SMS page appears when you select SMS in the Communication Resources Menu page and SMS has been configured in the control application in FX Builder.

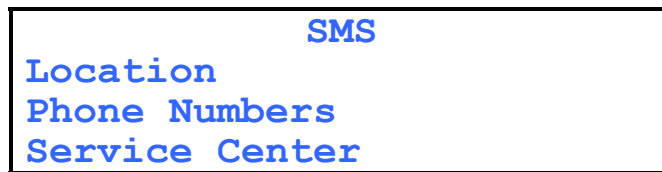


Figure 46: SMS Page

The meaning of each line of the SMS page is explained here:

- **Location:** The text used as the source of the SMS text report. Press the  key and use the  and  keys to edit the location text.

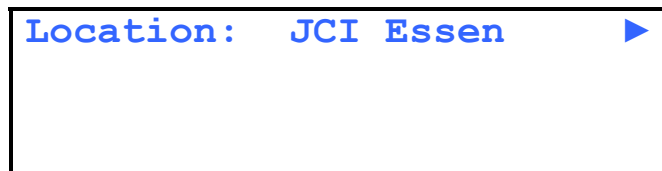


Figure 47: Edit SMS Source Location

- **Phone Numbers:** The GSM phone numbers that the SMS messages are sent to. The page allows you to edit the contacts list previously created at design time. Press the  key and use the  and  keys to edit the page.

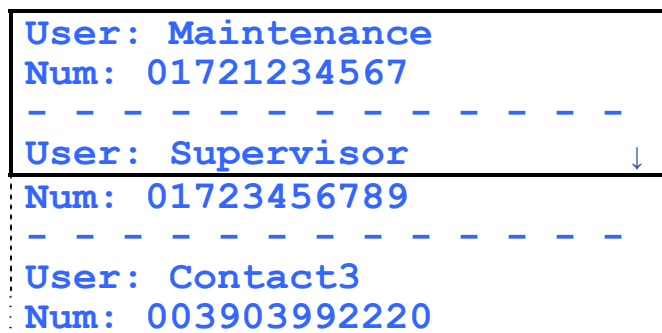


Figure 48: SMS Phone Numbers Contacts List

- **Service Center:** The Service Center number needed to send SMS messages. This number is read from the SIM card used in the GSM Modem; normally there is no need to edit the Service Center number.

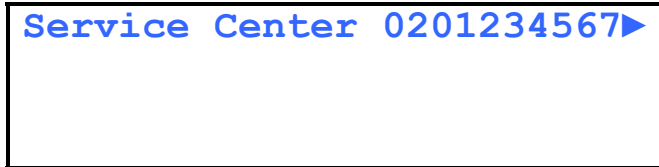


Figure 49: Service Center Number

Press the  key to return to the Communication Resources Menu page.

E-mail Page

The e-mail page appears when you select e-mail in the Communication Resources Menu page and e-mail has been configured in the control application in FX Builder.

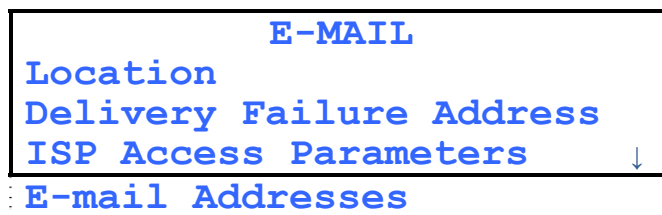


Figure 50: E-mail Page

The meaning of each line of the e-mail page is explained here:

- **Location:** The text used as the source of the e-mail message. Press the  key and use the  and  keys to edit the location text.
- **Delivery Failure Address:** The return e-mail address in case of e-mail delivery failure. (Note: the FX controller cannot receive e-mail messages.) Press the  key and use the  and  keys to edit the address.
- **ISP Access Parameters:** The Internet Service Provider (ISP) parameters required by the FX controller to connect to the Internet. The Simple Mail Transfer Protocol (SMTP) Server, Telephone number, User ID, and Password are required for the remote connection.

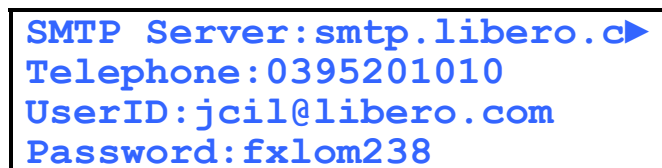


Figure 51: Edit ISP Access Parameters

- **E-mail Addresses:** The list of e-mail addresses to where the FX controller sends the e-mails. This page allows you to view and edit the e-mail contacts list created in FX Builder. Press the  key and use the  and  keys to edit this page.

```

E-mail: maintenance@mtc.i▶
E-mail: service.it@jci.co▶
E-mail: roc.europe@jci.co▶

```

Figure 52: E-mail Contacts List

Press the  key to return to the Communication Resources Menu page.

WEB Page

The WEB page appears when you select WEB in the Communication Resources Menu page and a Web page has been configured in the control application in FX Builder.

```

      WEB
  PPP Authentication

```

Figure 53: WEB Page

The Web page allows you to enter or modify the Point-to-Point Protocol (PPP) parameters for the authentication of users. A User ID and a Password are required to connect to the Web site configured in the FX control application. Press the  key and use the  and  keys to edit the page.

```

UserID: RemoteOperator
Password: athome51
- - - - -
UserID: ServiceCo
Password: johnson

```

Figure 54: WEB PPP Authentication Parameters

Press the  key to return to the Communication Resources Menu page.

FXVMA Support

When connected to the FXVMA controller, the MUI provides information and command capabilities needed for monitoring and commissioning the FXVMA controller, and air balancing the VAV box.

The point data, command capabilities, and navigation structures are defined in the FXVMA application software using FX Builder.

Flow Calibration	
Flow Override	Auto
Flow Hood Value	800#
Supply Flow	0# ↓
Calculate Gain	No
Calculate Gain Status	---
Calc Pickup Gain	0.0#
Supply Area	0.50#
Damper Position	0%
Altitude	0#
Gain Settle Time	10S

Figure 55: FXVMA Flow Calibration Details

Refer to the *Single Duct Variable Air Volume (VAV-SD) Box Controller Application Note (LIT-12011436)* for information on using the MUI to monitor and commission the FXVMA controller, and air balance the VAV box.

Downloading the Display Configuration to the MUI

The display configuration is stored in the FX controller. When you connect the MUI to the FX controller through its Remote Display bus, the FX controller automatically loads the user interface configuration into the MUI. Figure 56 shows the sequence of display screens during the download process.

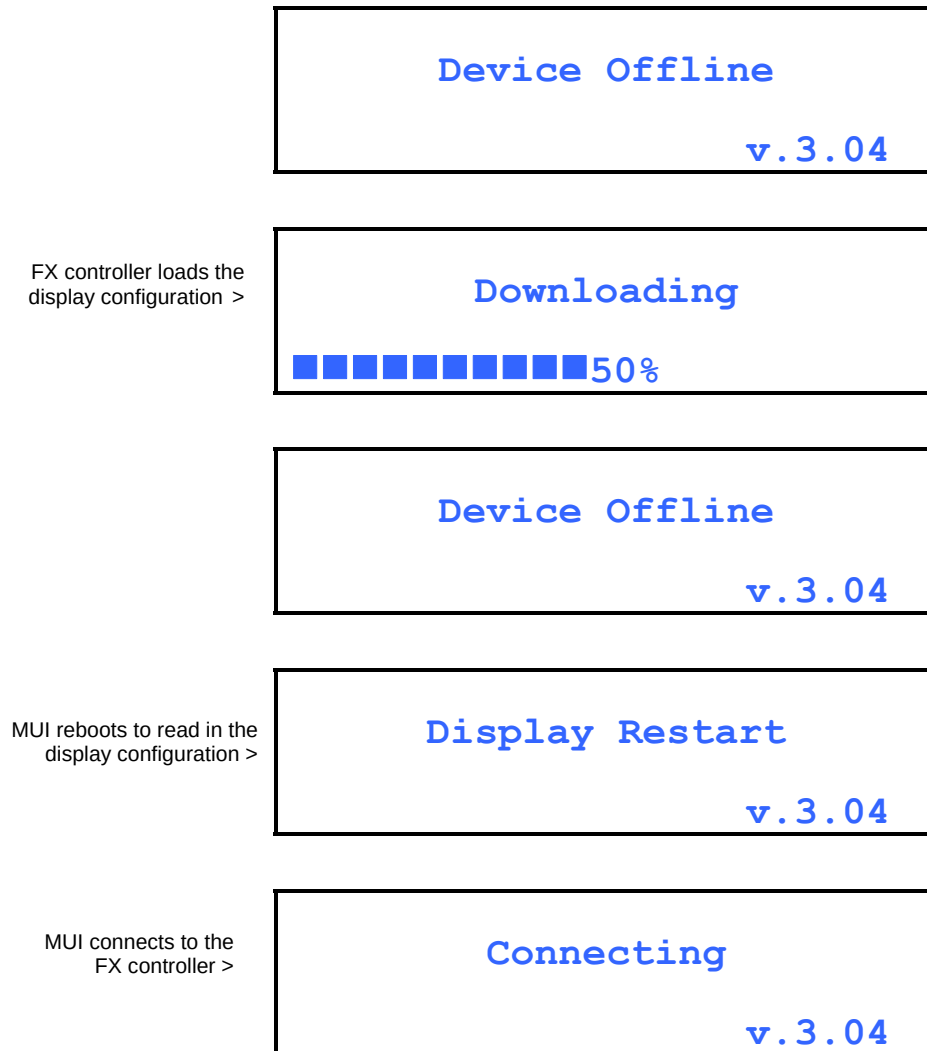


Figure 56: Display Configuration Downloading Process

Assigning the MUI Address for Multiple Connections

At first powerup, a remote MUI automatically has a default Remote Display N2 bus address of **1**.

If you connect two remote MUIs to a single FX controller, then you must change the Remote Display N2 address of the second MUI to avoid communication conflicts.

Wait for the second MUI to display **Device Offline** (as shown in Figure 57).

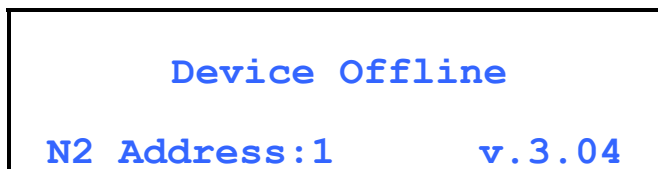


Figure 57: MUI N2 Address Display

When the second MUI displays Device Offline, then press the  and  keys simultaneously to switch the N2 address to 2.

See Figure 58.

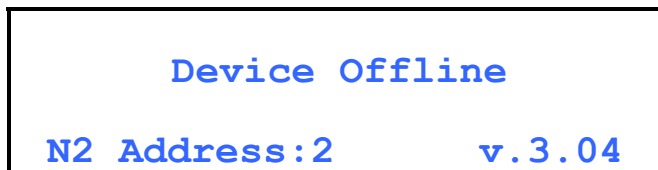


Figure 58: MUI N2 Address Change

The MUI then displays the Home Page as configured in the control application of the connected FX controller.

Troubleshooting

Table 4: Troubleshooting

Error/Condition	Problem	Solution
Device is Offline The MUI is not communicating with the FX controller.	Cable installed incorrectly or faulty.	Check the cable and connection between the FX controller and the MUI.
	The FX control application does not include the display configuration.	Make sure the application file (.apd) downloaded into the FX controller includes a display configuration.
	The application file has not successfully downloaded into the MUI.	Download the file to the FX controller again and re-connect the MUI.
	The N2 address is not unique on the Remote Display bus (and on the Local Link bus of the FX16 Master Controller).	If you have two MUIs on the Remote Display bus, change the address of the second MUI to 2 . If you have connected other devices to the Local Link bus of the same FX16 Master Controller, make sure that you are not using N2 addresses 1 and 2 for these devices. Use N2 addresses 3 to 255. See <i>Assigning the MUI Address for Multiple Connections</i> .

Technical Specifications

Ordering Codes

Table 5: Ordering Codes

Item Code	Description
LP-DIS60P20-0C	Medium User Interface (MUI) Version 3 (non-isolated version); can be mounted up to 3 m (9.8 ft) from the FX controller and includes panel mounting hardware.
LP-DIS60P21-0C	Medium User Interface (MUI) Version 3 (isolated version); can be mounted up to 300 m (1,000 ft) from the FX controller and includes panel and wall mounting hardware.
LP-KIT007-000C	Link cable for the connection of the MUI Version 3 LP-DIS60P20-0C (non-isolated panel mount version) to the FX07, FX14, FX15, and FX16 controller – 3 m (9.8 ft).
LP-KIT007-005C	Link cable for the connection of the MUI Version 3 LP-DIS60P20-0C (non-isolated panel mount version) to the FX06 controller – 3 m (9.8 ft).
LP-KIT060-000C	MUI Panel Mount Kit. Contains the mounting hardware (bezel, gaskets, clips, and connector) for one MUI as spare parts. All parts included with MUI Version 3.

Technical Specifications

Table 6: Technical Specifications

Product	Medium User Interface (MUI) Version 3	
Power Requirements	LP-DIS60P20-0C — Powered from the FX controller LP-DIS60P21-0C — Universal power supply: 9 to 48 VDC, or 12 to 24 VAC Safety Extra-Low Voltage — SELV (Europe) or Class 2 supply (North America)	
Power Consumption	200 mA or 2.5 W maximum at 9 to 48 VDC 3.5 VA maximum at 12 to 24 VAC	
Ambient Operating Conditions	-20 to +60°C (-4 to +140°F) 10 to 90%; RH (noncondensing)	
Ambient Storage Conditions	-20 to +70°C (-4 to +158°F) 10 to 90%; RH (noncondensing)	
Display and Keypad	LCD: 4 lines x 26 characters backlit Keypad: 6 buttons LEDs: 2 x 5 array	
Shipping Weight	0.4 kg (0.9 lb)	
Housing Protection	IP30 for hand-held and wall mounting applications IP54 for panel mounting applications	
Housing Material	Polycarbonate + ABS (GE CYCOLOY), self-extinguishing UL94V-0	
Dimensions (H x W x D)	72 x 194 x 40 mm (2.83 x 7.64 x 1.57 in.) Width = 185 mm (7.28 in.) without panel mount bezel	
CE and UL Compliance	Europe	– 2004/108/EC, EMC Directive: EN 61000-6-3, EN 61000-6-1
	Canada	– UL Listed (PAZX7), CAN/CSA C22.2 No. 205, Signal Equipment – Industry Canada, ICES-003
	United States	– UL Listed (PAZX), UL 916, Energy Management 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.



Building Efficiency
507 E. Michigan Street, Milwaukee, WI 53202

*Johnson Controls® is a registered trademark of Johnson Controls, Inc.
All other marks herein are the marks of their respective owners. © 2009 Johnson Controls, Inc.*