

Honeywell

**Experion
Control Firewall
User's Guide**

EP-DCX574

R300.1

5/06

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About This Document

This document describes the installation, operation and maintenance of the Series C Control Firewall (CF9).

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References

The following list identifies all documents that may be sources of reference for material discussed in this publication.

Document Title

Contacts

World Wide Web

The following Honeywell web sites may be of interest to Process Solutions customers.

Honeywell Organization	WWW Address (URL)
Corporate	http://www.honeywell.com
Honeywell Process Solutions	http://hpsweb.honeywell.com

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Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user, often in terms of performing a task.
	REFERENCE -EXTERNAL: Identifies an additional source of information outside of the bookset.
	REFERENCE - INTERNAL: Identifies an additional source of information within the bookset.
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. CAUTION symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING: Indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death. WARNING symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.

About This Document
Symbol Definitions

Symbol	Definition
	WARNING, Risk of electrical shock: Potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 VDC may be accessible.
	ESD HAZARD: Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices.
	Protective Earth (PE) terminal: Provided for connection of the protective earth (green or green/yellow) supply system conductor.
	Functional earth terminal: Used for non-safety purposes such as noise immunity improvement. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national local electrical code requirements.
	Earth Ground: Functional earth connection. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	Chassis Ground: Identifies a connection to the chassis or frame of the equipment shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.

Contents

INTRODUCTION	1
About this guide.....	1
Intended audience.....	1
Prerequisite skills	1
How to use this guide.....	1
Related Documents.....	1
CONTROL FIREWALL OVERVIEW	3
About CF9	3
CONTROL FIREWALL PLANNING AND DESIGN	5
General Planning References	5
Identifying Control Firewall Components	5
CONTROL FIREWALL INSTALLATION AND UPGRADES	7
Installation Declarations	7
Installing CF9 Input/Output Termination Assembly CC-TCF901	8
Prerequisites	8
Considerations	8
Fiber media reference specifications.....	10
To mount CF9 IOTA.....	11
To wire CF9 IOTA	12
Installing Control Firewall CC- PCF901	15
Prerequisites	15
Considerations	15
To install CF9	15
Installing Optional Fiber Optic Module CC-FSMC01 or CC-FMMC01	16
Prerequisites	16
Considerations	16
To install optional fiber optic module	16
Upgrading Control Firewall Firmware.....	18

Contents

CONTROL FIREWALL CONFIGURATION.....	19
Adding CF9 to network	19
CONTROL FIREWALL OPERATION.....	21
Control Firewall Startup.....	21
CF9 LED Descriptions.....	22
CONTROL FIREWALL MAINTENANCE	25
Periodic Checks.....	25
Recommended Spare Parts.....	25
Replacing Failed Control Firewall.....	26

Tables

Contents
Figures

Figures

Figure 1 Control Firewall (CF9) and IOTA3
Figure 2 Typical Cable Connections in Series C Cabinet for CF9s, C300s and Series C
I/O Modules.....9
Figure 3 Mounting Dimensions for CF9 IOTA CC-TCF901 12
Figure 4 Typical Connector Locations on CF9 IOTA 14
Figure 5 LEDs on CF9 22

Introduction

About this guide

Intended audience

Personnel who are responsible for integrating Series C form-factor components with the Experion system.

Prerequisite skills

- Basic mechanical skills.
- Familiar with using this Experion application:
 - Configuration Studio

How to use this guide

This guide is primarily a hardware reference for installing the Control Firewall in a Series C cabinet and interpreting the light emitting diode (LED) indications.

Related Documents

For information about related functions and tasks, see:

- Configuration Studio Overview
- Fault Tolerant Ethernet Status Display User's Guide
- Control Hardware Planning Guide

Introduction
About this guide

Control Firewall Overview

About CF9

The nine-port, Control Firewall (CF9) serves as the Fault Tolerant Ethernet (FTE) communications center for a given Series C control network. It consists of a Control Firewall module that plugs into its associated CF9 input/output termination assembly (IOTA) as shown in the following figure.



Figure 1 Control Firewall (CF9) and IOTA

Control Firewall Overview

About CF9

The CF9 provides eight ports for FTE connections to C300s and Series C FIMs within a Series C cabinet as well as FTE Bridge modules (FTEB) in a Series A Chassis I/O chassis. It has a ninth port for an uplink connection to the supervisory FTE network and level 2 control area. It provides network security by

- Rejecting all Ethernet messages not needed for control,
- Giving priority to traffic on downlink ports over ingress traffic on the uplink port, if the fabric becomes saturated, and
- Allowing only valid C300-compliant messages to pass on to the C300 domain.

Control Firewall Planning and Design

General Planning References

Please refer to the following Knowledge Builder publications for planning and design details for the Experion system in general and the Fault Tolerant Ethernet supervisory network. For the sake of brevity, this Guide does not repeat the applicable general guidelines, considerations, cautions, and so on that are covered in these other Guides.

- Control Hardware Planning Guide
- Server and Client Planning Guide
- Fault Tolerant Ethernet Overview and Implementation Guide

Identifying Control Firewall Components

The following table identifies the Control Firewall components that will be needed to provide a FTE interface with a Series C control system. The **CC** prefix in a model number means the component's printed wiring boards are coated to provide additional protection from the environment and the **CU** prefix means the boards are uncoated.

Component	Description	Honeywell Model Number
Control Firewall Module (CF9)	Module mounts on CF9 Input/Output Termination Assembly (IOTA).	CC-PCF901
CF9 Input/Output Termination Assembly (IOTA)	Provides physical connection to Control Firewall module and FTE cables. Mounts on carrier in Series C cabinet.	CC-TCF901
Ethernet Cables	Please see <i>Planning Your Series C Control System In Control Hardware Planning Guide</i> for information about Ethernet cables.	
Single Mode Fiber Module (SMFIO)	FTE Single-Mode Fiber Module that plugs into one port of IOTA.	CC-FSMC01
Multi-Mode Fiber Module (MMFIO)	FTE Multi-Mode Fiber Module that plugs into one port of IOTA.	CC-FMMC01

Control Firewall Planning and Design
Identifying Control Firewall Components

Control Firewall Installation and Upgrades

Installation Declarations



ATTENTION

This equipment shall be installed in accordance with the requirements of the National Electrical Code (NEC), ANSI/NFPA 70, or the Canadian Electrical Code (CEC), C22.1. It is intended to be mounted within an enclosure or suitable environment acceptable to the local *authority having jurisdiction*, as defined in the NEC, or *authorized person* as defined in the CEC.



ESD HAZARD

Electrostatic discharge can damage integrated circuits or semiconductors if you touch connector pins or tracks on a printed wiring board. Follow these guidelines when you handle any electronic component:

- Touch a grounded object to discharge static potential,
 - Wear an approved wrist-strap grounding device,
 - Do not touch the wire connector or connector pins,
 - Do not touch circuit components inside a component,
 - If available, use a static safe workstation,
 - When not in use, keep the component in its static shield box or bag.
-



WARNING

Unless the location is known to be non-hazardous, do **not**:

- connect or disconnect cables,
 - install or remove fuses, terminal blocks, and so on,
- while the component is powered.
-



CAUTION

Do **not** connect Control Firewalls to interfaces configured for uplinks. Configure all Control Firewall interfaces for **portfast** before attaching the Control Firewall. Otherwise, interfaces connected to Control Firewalls will be blocked and cause **loss of view** upon recovery of a root switch in a network, which causes recalculation of the switch spanning tree topology. Control Firewalls do **not** use spanning tree.

Installing CF9 Input/Output Termination Assembly CC-TCF901

Prerequisites

- Carrier channel assembly (CCA) for mounting IOTA is installed in a cabinet.
- Series C power supply is installed.
- All wiring and pre-fabricated cables are available and labeled as applicable.
- You have the mounting hardware supplied with the components.

Considerations

- Connect Control Firewalls to switch interfaces configured for Level 2 host nodes, as you would connect interfaces for a computer. Configure the interface as follows:
 - Type: portfast
 - Type speed: 100
 - Type duplex: full
- If you do connect a Control Firewall to a top-level switch such as a 3750 or 3650 configured for all uplink ports, be sure the Control Firewall switch interface is configured for **portfast**.
- Be sure only connections used for Control Firewall switches are configured for **portfast** and no other connections of Cisco to Cisco switches are configured for **portfast**.
- Be sure the enclosure is connected to a protective earth ground using #8 AWG solid copper wire. There should be metal to metal contact between the grounding bus bar and the enclosure as well as the carrier.

- You are responsible for observing all local ordinances governing the wiring and installation of electrical equipment.
- The default location for the two (redundant) Control Firewalls is the top two locations on the left most carrier channel assembly (CCA) in the Series C cabinet, as shown in the following figure. It is more convenient to make Ethernet connections to vertically adjacent CF9 IOTAs.

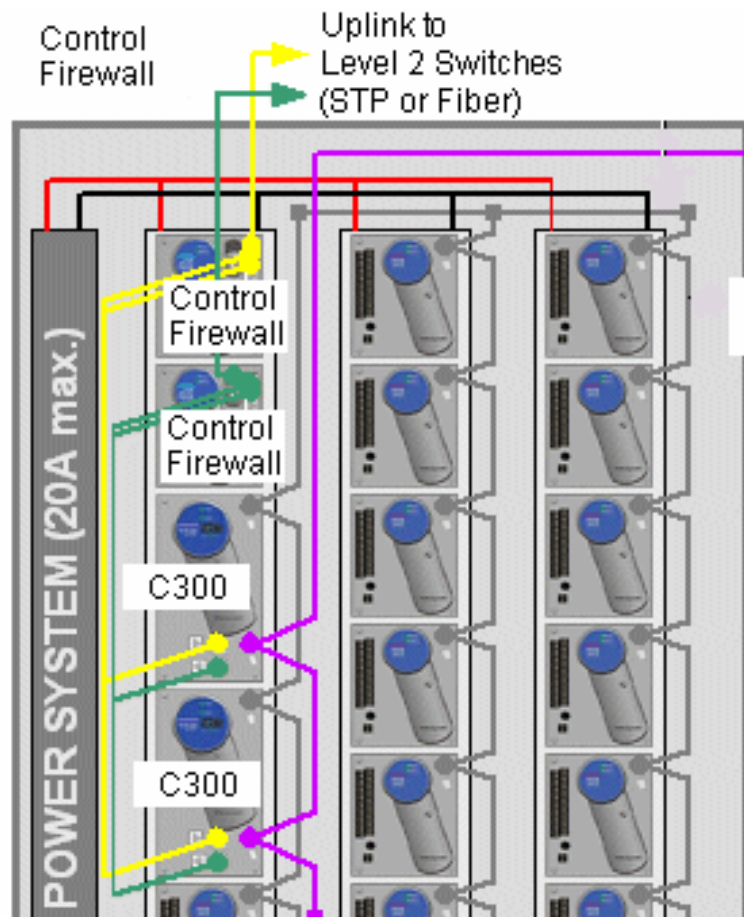


Figure 2 Typical Cable Connections in Series C Cabinet for CF9s, C300s and Series C I/O Modules

Control Firewall Installation and Upgrades

Installing CF9 Input/Output Termination Assembly CC-TCF901

- **Do not mix FTE A link cables (yellow) and FTE B link cables (green) on the same IOTA**, since this will cause erroneous communications
- The nine FTE ports on the CF9 IOTA are standard RJ-45 type jacks, each of which accepts an 8-pin Ethernet shielded twisted pair (STP) cable with an RJ-45 plug.
- Do **not** use the 30-pin connector on the IOTA. It is for factory use only.

Fiber media reference specifications

Single-Mode Fiber Optic module CC-FSMC01

This module uses a dual-jacketed, dual-fiber cable (yellow) with an LC connector. Its applicable specifications are as follows.

Medium	Single-Mode Glass Fiber 9/125
Wavelength	1300 nm
Maximum Distance	15 km (9 miles)
Connector	LC
Voltage	3.3 V
Temperature	Industrial -40 C to +85 C (-40 F to +185 F)
Form Factor	SFP
Power	1 W Approximately

Multi-Mode Fiber Optic modules CC-FMMC01

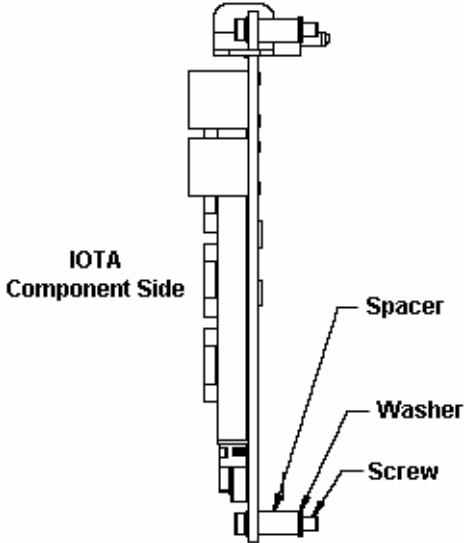
This module uses a single-jacketed, dual-fiber cable (Orange) with an MT-RJ connector. Its applicable specifications are as follows.

Medium	Multimode Dielectric Fiber 62.5/125
Wavelength	1300 nm
Maximum Distance	2 km (1 mile)
Connector	MT-RJ
Voltage	3.3 V
Temperature	Industrial -40 C to +85 C (-40 F to +185 F)

Control Firewall Installation and Upgrades
Installing CF9 Input/Output Termination Assembly CC-TCF901

Form Factor	SFF
Power	1 W Approximately

To mount CF9 IOTA

Step	Action
1	Select desired mounting location on carrier and align mounting holes in IOTA with screw hole locations on the carrier. See the following dimension drawing for details.
2	<p>Be sure component side of IOTA is facing up. Secure IOTA to carrier using screws, washers and spacers provided. Insert spacers and washers between bottom of IOTA and top of carrier.</p> <div style="text-align: center;">  </div>
3	Repeat Steps 1 and 2 to mount the second CF9 IOTA immediately below the one that was just installed.
4	This completes the procedure. Go to <i>Wiring IOTA</i> for connection details.

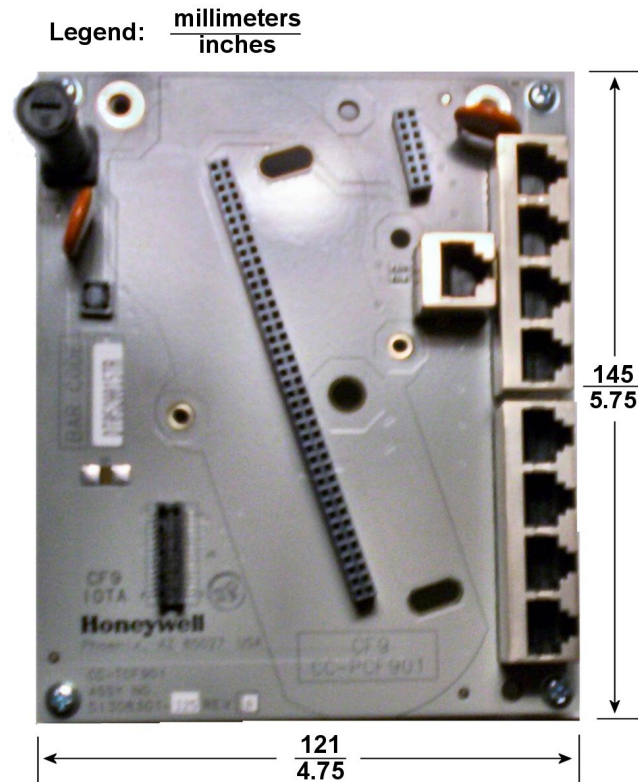


Figure 3 Mounting Dimensions for CF9 IOTA CC-TCF901

To wire CF9 IOTA

CF9 connection requirements

- You must always connect the Control Firewall uplink port to a Cisco switch.
- You must not stack the Control Firewall.
- You must connect the Control Firewall to an interface configured for **portfast**.
- You must connect All Series C FIMs and C300s to a Control Firewall
- You must connect any FTE Bridge (FTEB) module communicating to a C300 to the same Control Firewall as the C300.

Control Firewall Installation and Upgrades
Installing CF9 Input/Output Termination Assembly CC-TCF901

- You may connect FTEB/C200 and FTEB/Series A FIM to Level 1 configured switches according to the established best practices or to Control Firewall.

Step	Action
1	<ul style="list-style-type: none">• Connect yellow FTE cable from FTE A link, L1/L2 Ethernet switch to the J3 connector on the Control Firewall (CF9) to be used as the FTE A link (yellow cable)• Connect green FTE cable from FTE B link, L1/L2 Ethernet switch to the J3 connector on another Control Firewall (CF9) to be used as the FTE B link (green cable)redundant IOTA.
2	Route yellow cables from four J4 and four J5 connectors on the CF9 for FTE A links to corresponding FTE A ports on C300s, Series C FIMs, and FTE Bridge modules, as required.
3	Route green cables from four J4 and four J5 connectors on the other redundant CF9 IOTA for FTE B links to corresponding FTE B ports on C300s, Series C FIMs, and FTE Bridge modules, as required.
4	Tighten the screws in terminals 24 Vdc + and COM (logic ground) to the vertical bus bar to connect to the cabinet resident 24 Vdc power supply to both CF9s.
9	This completes the procedure. Go to the next section.

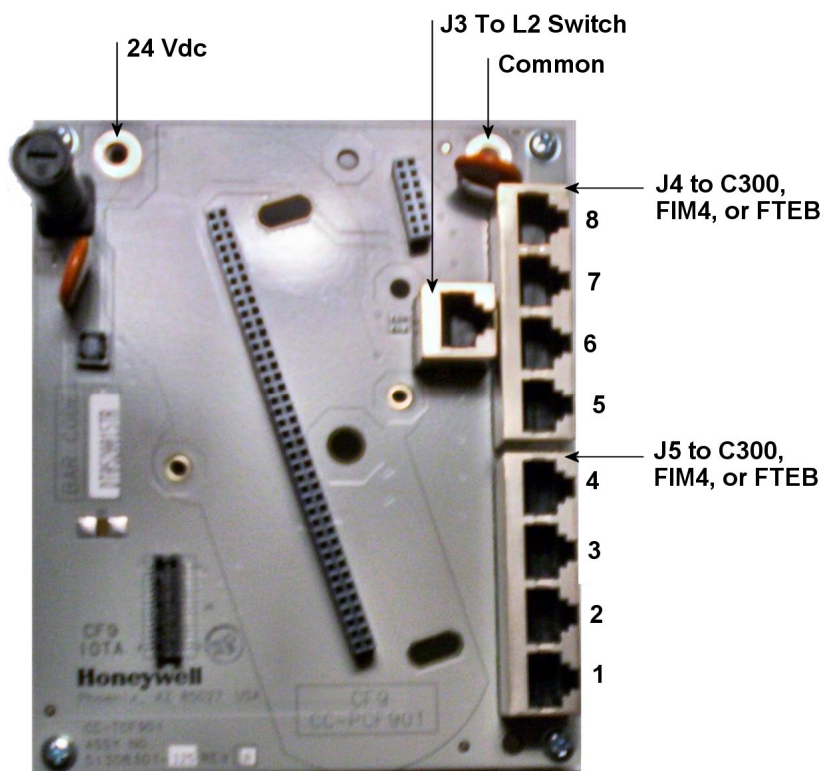


Figure 4 Typical Connector Locations on CF9 IOTA

Installing Control Firewall CC- PCF901

Prerequisites

You have installed CF9 IOTA on carrier channel assembly in a cabinet.

Considerations

The IOTA and CF9 module are keyed, so you cannot install any other Series C module on a CF9 IOTA.

To install CF9

Step	Action
1	Align CF9 connector pins over connector/slot on IOTA.
2	Carefully press down on the CF9 module until it is fully seated in the connector.
3	Use the three screws provided to secure the CF9 module to the IOTA.
4	Repeat Steps 1 to 3 to install other CF9s on their IOTAs, as required
5	This completes the procedure. Go to the next Section.

Installing Optional Fiber Optic Module CC-FSMC01 or CC-FMMC01

Prerequisites

- You have ordered and received the model CC-FSMC01 or CC-FMMC01 fiber optic module.
- You have a CF9 IOTA.

Considerations

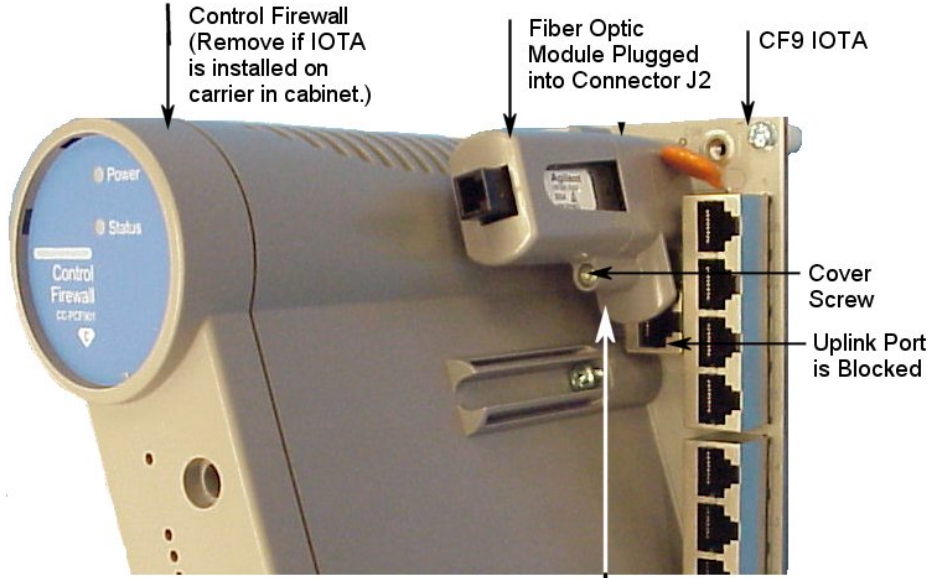
- Be sure you observe the previous [ESD Hazard](#) guidelines whenever handling electronic components.
- After you install the fiber optic module, the uplink (RJ-45) port is blocked to prevent simultaneous connection of both media types.
- You have single mode 9/125 fiber optic cable for connection to the LC connector included with the model CC-FSMC01 fiber optic module, or multimode 62.5/125 fiber optic cable for connection to the MTRJ connector included with the model CC-FMMC01 fiber optic module.
- The Control Firewall automatically detects the presence of the fiber optic module upon power up.

To install optional fiber optic module

Use the following procedure to install an optional fiber optic module on a CF9 IOTA. This procedure assumes that this is an initial installation for the CF9 IOTA and no prior uplink RJ-45 plug connection has been made.

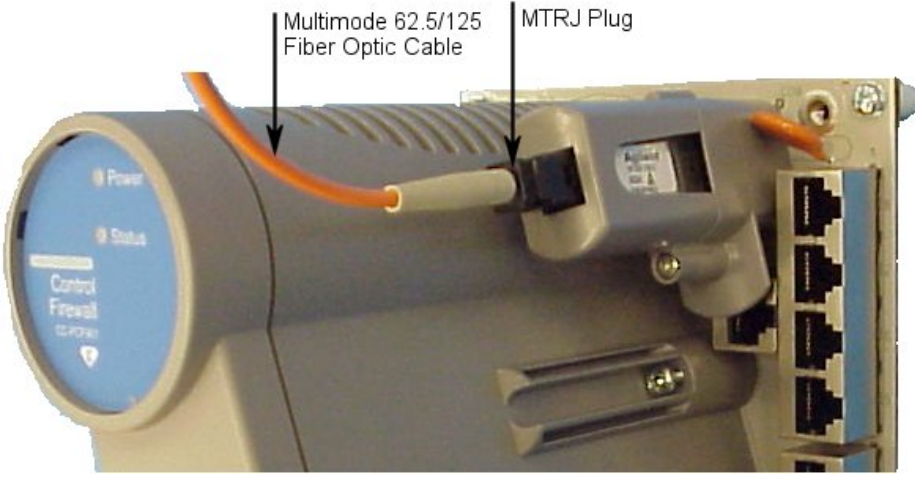
Step	Action
1	If the CF9 IOTA is installed on a carrier in a cabinet, loosen the screws holding the Control Firewall module to the IOTA and remove the module from the IOTA so power is removed from the J2 connector on the IOTA.
2	<ul style="list-style-type: none">• Carefully align the pins in the bottom of the fiber optic module with the sockets in the J2 connector on the IOTA and gently push down on the module until it is fully seated.• Tighten the two screws in the base of the module to secure it to the IOTA as shown in the following example illustration.

Control Firewall Installation and Upgrades
Installing Optional Fiber Optic Module CC-FSMC01 or CC-FMMC01

Step	Action
	 <p>The diagram shows a side view of a Control Firewall module. A fiber optic module is plugged into connector J2. A cover screw is visible, and the uplink port is blocked. Two screws on the left side of the module base are used to secure it to the IOTA carrier, though they are not visible in this view.</p>
4	Connect appropriate fiber optic cable to the LC or MTRJ plug provided with the fiber optic module.
5	Plug the cable plug into the fiber optic module port as shown in the example illustration below

Control Firewall Installation and Upgrades

Upgrading Control Firewall Firmware

Step	Action
	
6	If applicable, install the Control Firewall module on the IOTA.
7	This completes the procedure.

Upgrading Control Firewall Firmware

You can update the Control Firewall firmware using the Control Firewall Update tool. You can launch the tool from the Configuration Studio or as a stand-alone tool. Refer to the *About the Control Firewall Update tool* topic in the *System Definition and Configuration* online help for information on launching the tool.

Refer to the Software Change Notice (SCN) supplied with your Experion system for the latest firmware version and file location details.

Control Firewall Configuration

Adding CF9 to network

You can add a Control Firewall (CF9) to be visible on the Network Tree in Configuration Studio. Please refer to the *Adding and Configuring Switches and Control Firewall* topic in the *System Definition and Configuration* help in Configuration Studio for details.

Control Firewall Configuration
Adding CF9 to network

Control Firewall Operation

Control Firewall Startup

The following table summarizes the stages the CF9 goes through after power is applied to its IOTA during startup. The CF9 repeats these stages every time power is cycled Off/On or the pins on its reset pad are shorted.

Stage	Description
1	Power Light Emitting Diode (LED) lights (green)
2	Status LED is red while the CF9 runs its power-on self test (POST).
3	When the CF9 POST completes, the Status LED turns green and the FTE port LEDs blink green and off for all connected ports when there is traffic, and remain steady green for connected ports when there is no traffic. The LEDs for unconnected FTE ports are off.

CF9 LED Descriptions

The following illustration and table identify and describe the indications associated with the LEDs on the CF9.

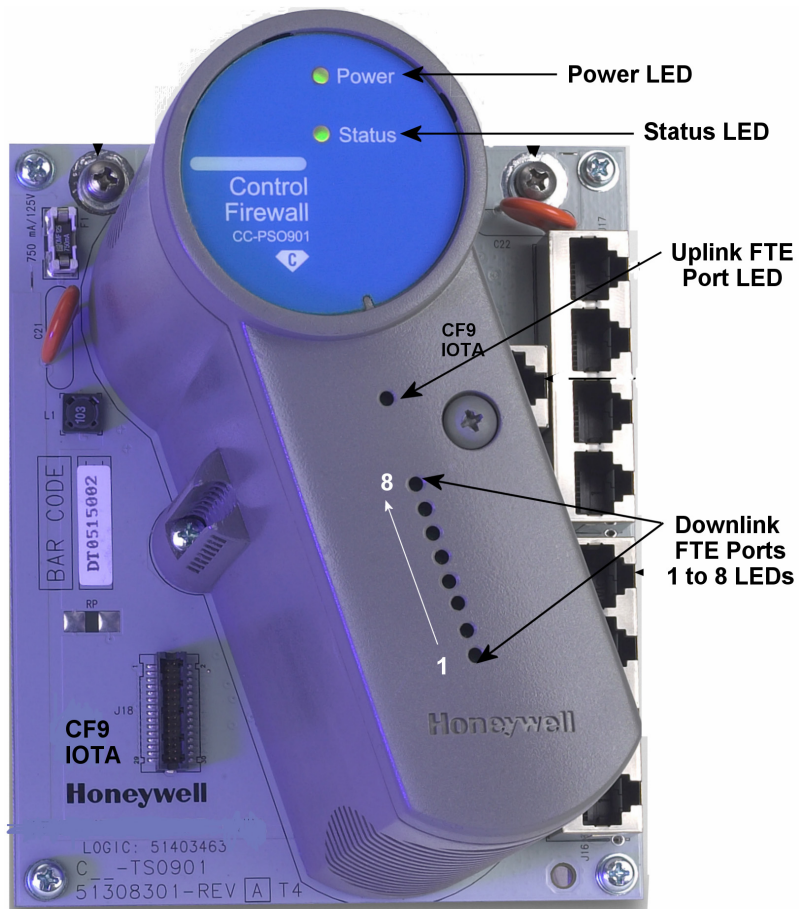


Figure 5 LEDs on CF9

LED	State			
	<i>Off</i>	<i>Green</i>	<i>Red</i>	<i>Blinking Green</i>
Power	No Power	Power On	- See Note 1	-
Status	No Power or Fault	Normal Operation	Running POST	See Note 2
Downlink Ports 1 to 8	No Power or No Cable Connected	Link Present, No Traffic	-	Link Present, Traffic
Uplink Port	No Power or No Cable Connected	Link Present, No Traffic	-	Link Present, Traffic
<p>Notes:</p> <p>1. The - indicates the LED is never in this state.</p> <p>2. The CF9 has detected a soft failure and is working in a diminished state. The typical cause is a disconnected uplink port cable.</p>				

Control Firewall Operation
CF9 LED Descriptions

Control Firewall Maintenance

Periodic Checks

The following table identifies checks that you should make periodically (every 3 to 6 months) to keep the CF9 in good working condition.

Check . . .	Possible Corrective Action . . .
That all light emitting diodes (LED) are working.	If LED is not lit or has dimmed, you must replace the CF9 module, since LEDs are not field replaceable.
That all connections are secure.	Secure connections, as needed.
That cable insulation is not worn or cracked.	Replace cables, as required.
That IOTA is secure.	Tighten mounting screws.

Recommended Spare Parts

The following table provides a list of parts that you may want to keep on hand for backup.

Part Name	Part Number	Description	Quantity per 10/100
Control Firewall	CC- or CU-PFB401	Series C Control Firewall Module	1/5
CF9 IOTA	CC- or CU-TFB401	Nine-Port Ethernet Input/Output Terminal Assembly	1/2
Fuse	51506348-341	800 mA, quick-acting fuse on Input Output Terminal Assembly	4/25
SMFIO	CC-FSMC01	Single-Mode Fiber Optic Module	Optional
MMFIO	CC-FMMC01	Multi-Mode Fiber Optic Module	Optional

Replacing Failed Control Firewall

Just reverse the steps in the previous installation procedures for mounting and wiring the CF9 and its associated IOTA, as required. You can replace the CF9 module without removing the IOTA. Please observe the following cautions and warnings.



CAUTION

We recommend that you proceed with **extreme caution** whenever replacing any component in a control system. Be sure the system is offline or in a safe operating mode.

Component replacements may also require corresponding changes in the control strategy configuration through Control Builder, as well as downloading appropriate data to the replaced component.



WARNING

Unless the location is known to be non-hazardous, do **not**:

- connect or disconnect cables,
 - install or remove fuses, terminal blocks, and so on,
- while the component is powered.
-

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