

OPTIONS FOR ABB DRIVES AND CONVERTERS

# FEA-03 F-series extension adapter

## User's manual





# FEA-03 F-series extension adapter

User's manual

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# 1

## Safety instructions

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### Contents of this chapter

This chapter contains the safety instructions which you must obey when you install and operate the drive and do maintenance on the adapter. If you ignore the safety instructions, injury, death or damage can occur.

In addition to these safety instructions, read the complete safety instructions of the specific drive you are working on.

### Use of warnings and notes

Warnings tell you about conditions which can cause injury or death, or damage to the equipment. They also tell you how to prevent the danger. Notes draw attention to a particular condition or fact, or give information on a subject.

The manual uses these warning symbols:

**WARNING!**

Electricity warning tells about hazards from electricity which can cause injury or death, or damage to the equipment.

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**WARNING!**

General warning tells about conditions other than those caused by electricity, which can cause injury or death, or damage to the equipment.

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**WARNING!**

Electrostatic sensitive devices warning tells you about the risk of electrostatic discharge which can cause damage to the equipment.

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## General safety instructions

These warnings are intended for all who work on the drive, motor cable or motor.

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### **WARNING!**

Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur.

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- If you are not a qualified electrician, do not do grounding work.
- Always ground the drive, the motor and adjoining equipment. This is necessary for the personnel safety. Proper grounding also reduces electromagnetic emission and interference.
- Do not work on a powered drive. After switching off the input power, always allow the intermediate circuit capacitors 5 minutes to discharge before working on the drive, the motor or the motor cable.
- The motor cable terminals of the drive are at a dangerously high voltage when input power is applied, regardless of motor operation.
- There can be dangerous voltages inside the drive from external control circuits even when the drive input power is shut off. Exercise appropriate care when working on the unit.





# 2

## Introduction to the manual

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### Contents of this chapter

This chapter introduces this manual.

### Applicability

This manual applies to the FEA-03 F-series extension adapter.

### Compatibility

The FEA-03 F-series extension adapter is compatible with FIO-01, FIO-11, FAIO-01, FDIO-01, FEN-01, FEN-11, FEN-21 and FEN-31 option modules only. For drive compatibility, see the ordering information or the appropriate hardware manual.

### Target audience

This manual is intended for people who plan the installation, install, commission, use and service the extension module. Before you do work on the module, read this manual and the applicable drive, converter or inverter manual that contains the hardware and safety instructions for the product in question.

You are expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.

The manual is written for readers worldwide. Both SI and imperial units are shown.

### Purpose of the manual

The manual gives information on how to install and use the FEA-03 F-series extension adapter.

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## Before you start

The drive must be installed and ready to operate before you start the installation of the adapter. In addition to conventional installation tools, have the drive manuals available during the installation as they contain important information not included in this manual.

## Terms and abbreviations

Term	Description
BCU	Type of control unit
DDCS	Distributed drives communication system protocol
EMC	Electromagnetic compatibility
FAIO-01	Optional analog I/O extension module
FDCO	Optical DDCS communication module
FDIO-01	Optional digital I/O extension module
FEA-03	Optional I/O extension adapter
FEN-01	Optional TTL incremental encoder interface module
FEN-11	Optional TTL absolute encoder interface module
FEN-21	Optional resolver interface module
FEN-31	Optional HTL incremental encoder interface module
FIO-01	Optional digital I/O extension module
FIO-11	Optional analog I/O extension module
HCS	Hard Clad Silica. A type of fiber optic cable.
POF	Plastic Optical Fibre. A type of fiber optic cable.
RDCO	Optical DDCS communication module
ZCU	Type of control unit

## Related documents

Option manuals and guides	Code (EN)
<i>FEA-03 F-series extension adapter user's manual</i>	<a href="#">3AUA0000115811</a>
<i>FDCO-01/02 DDCS communication modules user's guide</i>	<a href="#">3AUA0000114058</a>
<i>RDCO-01/02/03/04 DDCS Communication option modules</i>	<a href="#">3AFE64492209</a>
<i>Manuals and quick guides for I/O extension modules, fieldbus adapters, etc.</i>	

You can find manuals and other product documents in PDF format on the Internet at [www.abb.com/drives/documents](http://www.abb.com/drives/documents).

# 3

## Hardware description

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### Contents of this chapter

This chapter contains a short description of the FEA-03 F-series extension adapter and the optical component types.

### Overview

The FEA-03 is an extension adapter that is used to install I/O extension modules and encoder interface modules outside the drive unit.

The FEA-03 extension adapter increases the number of F-series option modules that can be connected to the control unit of the drive. One or two option modules can be installed on one extension adapter.

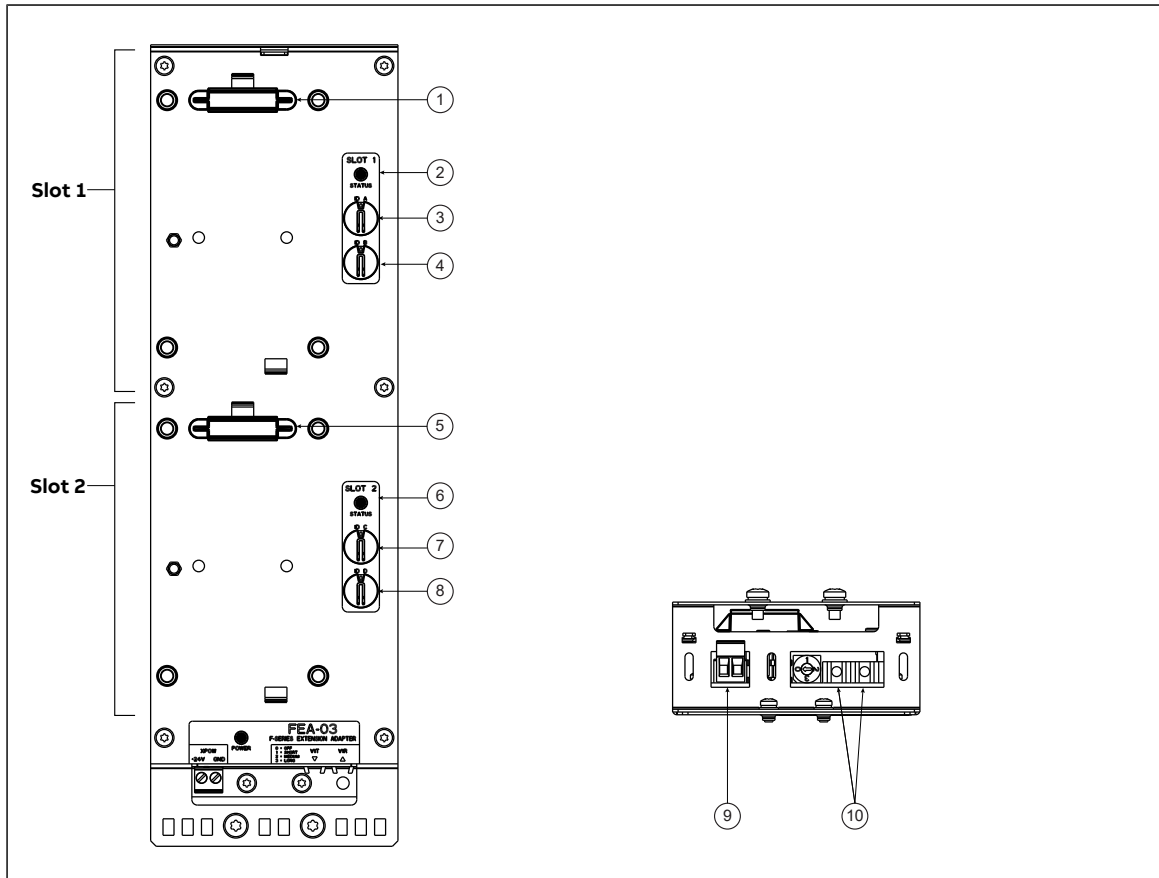
The extension adapter is connected to the drive via a fiber-optic link using the DDCS protocol.

### Layout

This figure shows the layout of the FEA-03 F-series extension adapter. The F-series module connectors and front components such as the diagnostic LEDs, the fiber-optic transmitter (V1T) and receiver (V1R), and the power supply connector are shown.

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## 12 Hardware description



1	Module connector 1
2	Status LED for Slot 1
3	Node address switch A
4	Node address switch B
5	Module connector 2
6	Status LED for Slot 2
7	Node address switch C
8	Node address switch D
9	Power supply connector (XPOW)
10	Transmitter V1T and receiver V1R
11	Transmitter current selector

You can connect several FEA-03 extension adapters in a ring topology with a fibre-optic cable. See section [Connecting the adapter to the drive control unit \(page 21\)](#).

## Optical component types

The FEA-03 F-series extension adapter has a 10 MBd fiber-optic link. The drive must also have a 10 MBd DDCS fiber-optic connection. These optical cable types can be used:

- Plastic optical fibre (POF) cables (max. length 30 m [98 ft]) and
- Hard Clad Silica (HCS<sup>®</sup>) cables (max. length 200 m [656 ft]).

HCS cables allow longer connection distances because of their lower attenuation.

**Note:** The optical components (transmitter and receiver) on a fibre-optic link must be of the same type.

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# 4

## Mechanical installation

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### Contents of this chapter

This chapter contains a delivery checklist and instructions on how to install the extension adapter.



### Examining the delivery

The package contains:

- FEA-03 F-series extension adapter
- fastening screws and latches for DIN rail installation
- support bracket for vertical DIN rail installation
- this document.

### Installing the extension adapter

The housing of the extension adapter has two spring-loaded latches for vertical or horizontal 35 x 7.5 mm DIN rail installation. Install the DIN rail on a correctly grounded base. If this is not possible, use a separate grounding conductor. Keep the grounding conductor as short as possible. The cross-sectional area must be at least 6 mm<sup>2</sup>.

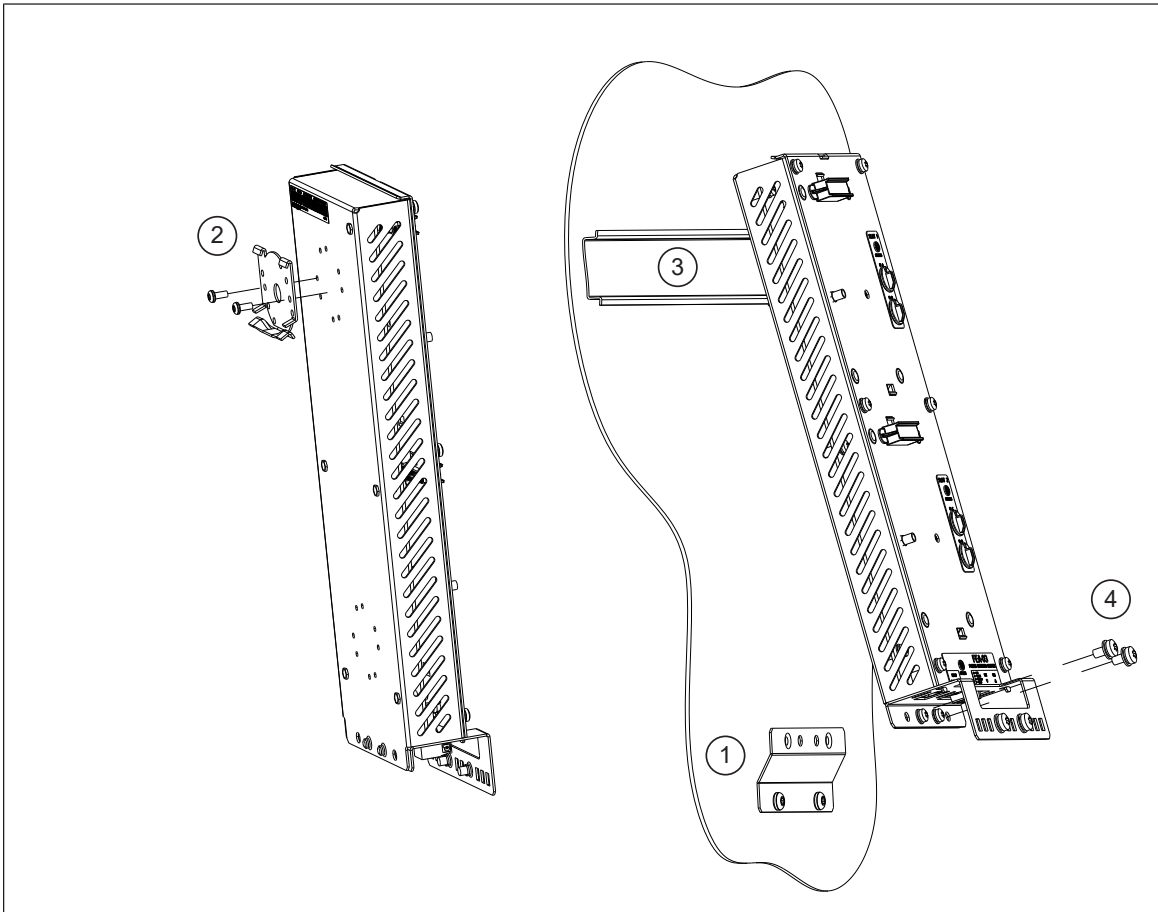
**WARNING!**

Install the adapter so that air can pass freely through the ventilation holes in the housing. Do not install the adapter directly above heat generating equipment.

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■ **Installing the adapter vertically on a DIN rail**

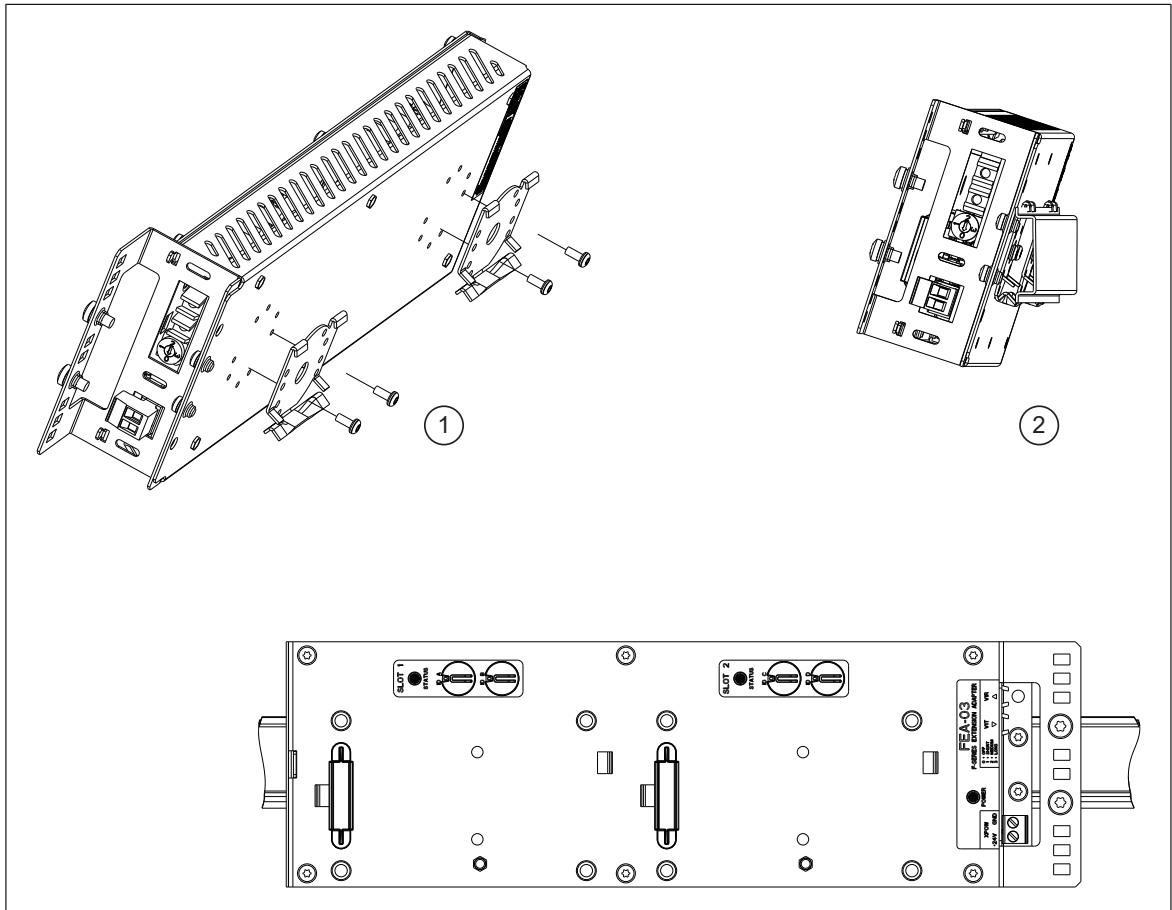
1. Attach the support bracket in the correct position on the wall.
2. Attach the latch to the back side of the adapter.
3. Click the adapter to the DIN rail.
4. Attach the adapter to the support bracket with two screws.





■ **Installing the adapter horizontally on a DIN rail**

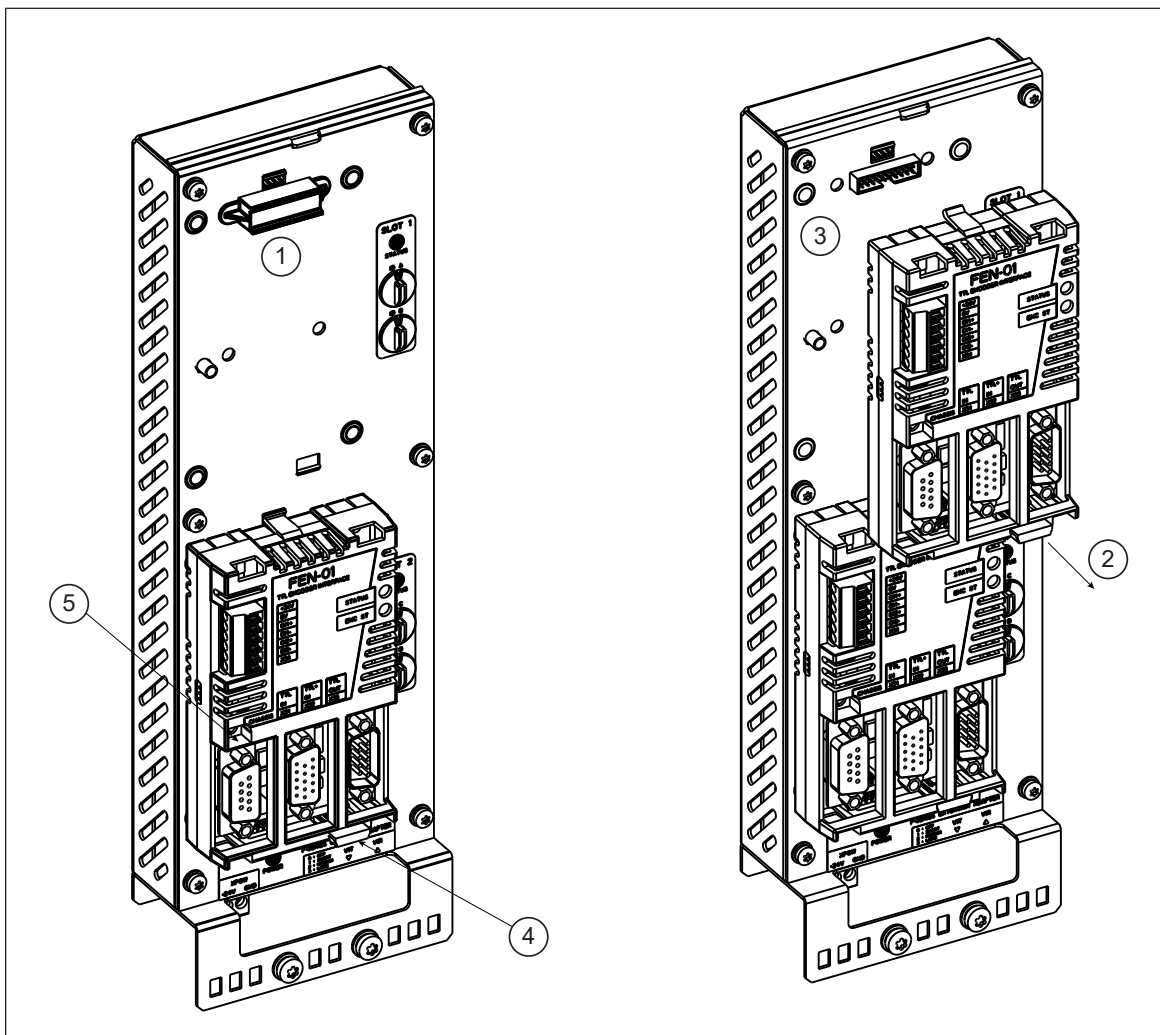
1. Attach the latches to the back side of the adapter.
2. Click the adapter to the DIN rail.



## Installing an option module on the adapter

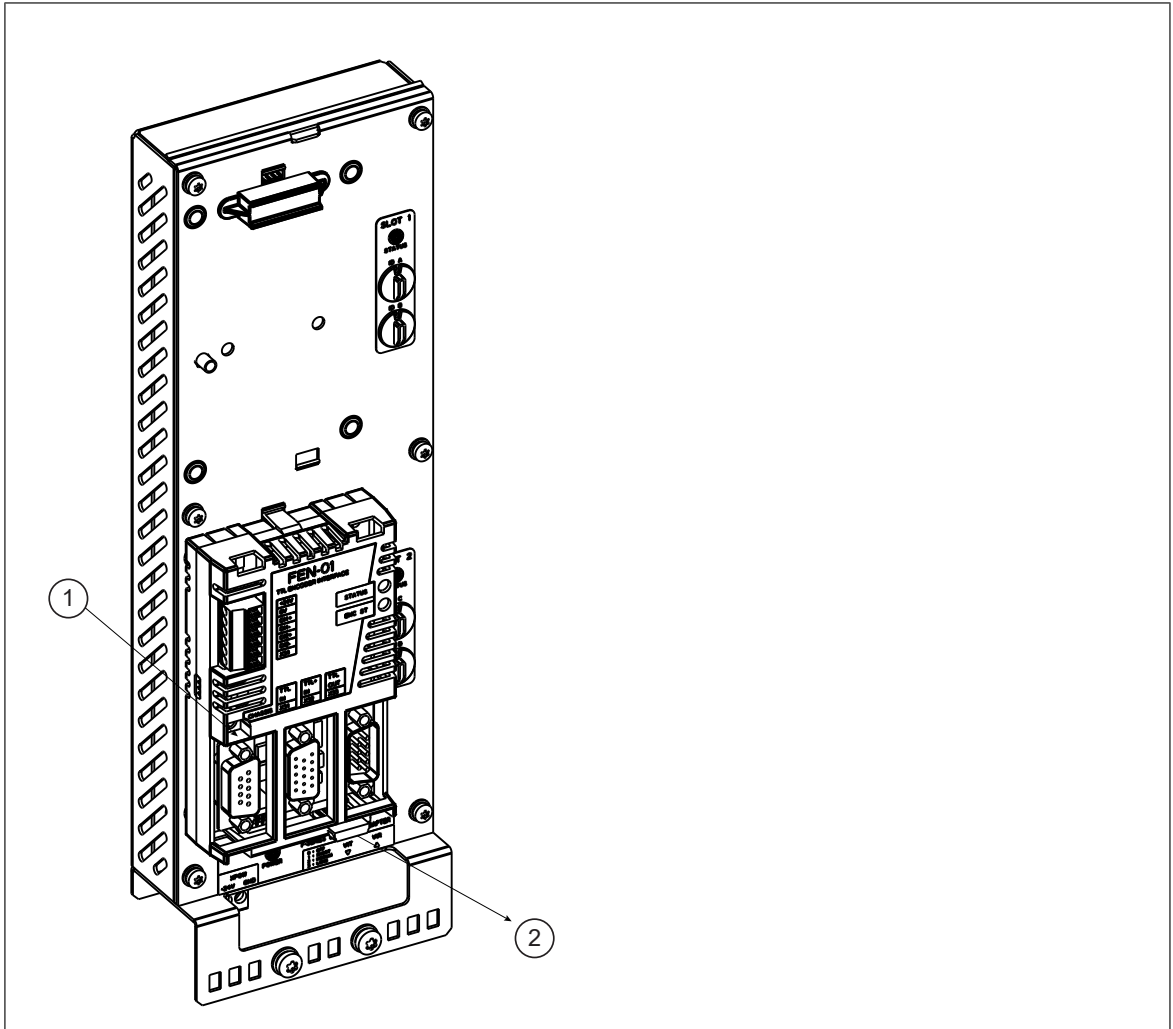
1. Remove the cover from the module connector.
2. Pull out the lock on the option module.
3. Put the top edge of the option module into its position and push the module carefully into its position until the retaining clips lock it into position.
4. Push in the lock.
5. Fasten the screw.

**Note:** The screw tightens the connections and grounds the module. It is essential for fulfilling the EMC requirements and for correct operation of the module.



## Removing an option module from the adapter

1. Remove the screw.
2. Pull out the lock and remove the module.





# 5

## Electrical installation

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### Contents of this chapter

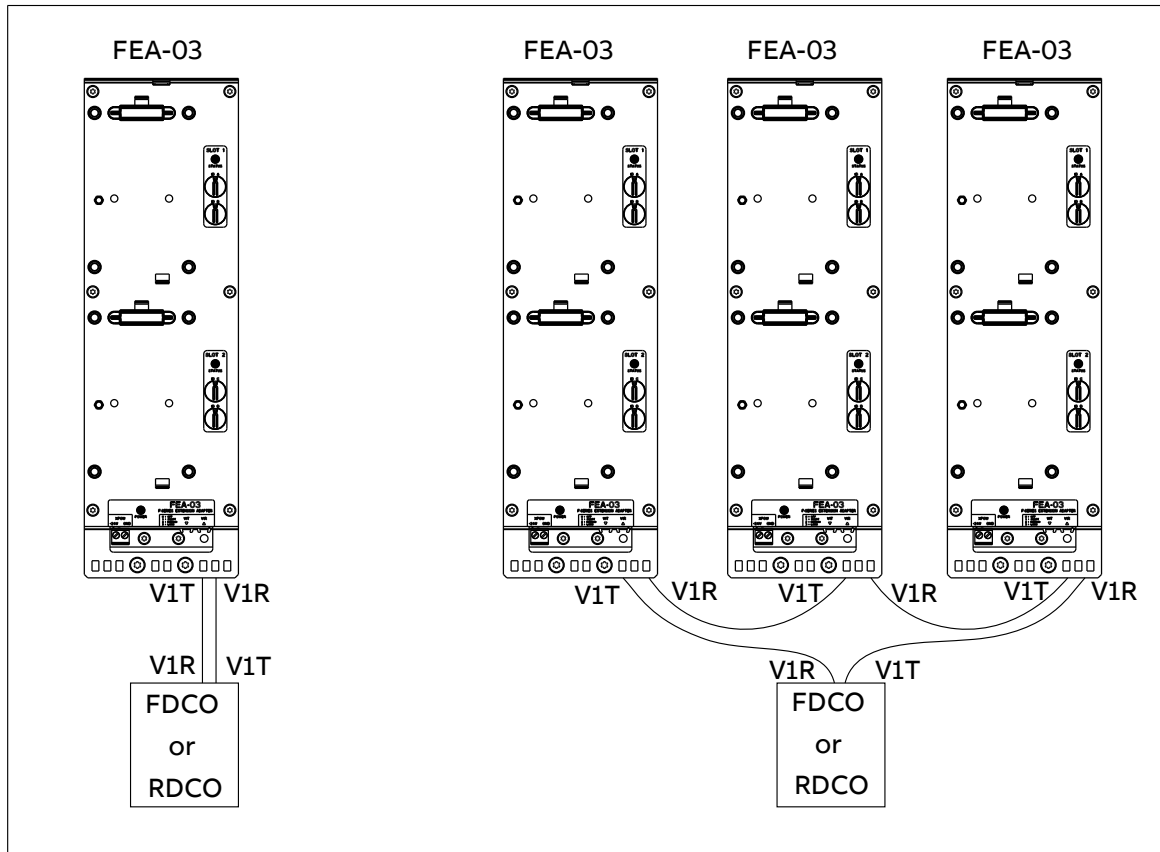
This chapter tells how to connect the FEA-03 F-series extension adapter to the drive.

### Connecting the adapter to the drive control unit

Connect the adapter to the drive control unit through a DDCS communication module. With the BCU control unit, you can use an RDCO or FDCO communication module. With the ZCU control unit, you can use an FDCO communication module. The FDCO reserves one option slot. See the user's manual of the communication module for installation instructions.

This connection diagram shows how to connect the adapter to the communication module.





1. If you use an FDCO module, set the current selector switch to agree with the cable length as shown in the table below.

Switch position	Cable length	
	POF, 1 mm	HCS, 200 µm
0 - OFF	Disabled	
1 - SHORT	0.1...20 m	0.1...50 m
2 - MEDIUM	20...25 m	50...100 m
3 - LONG	25...30 m	100...200 m

2. If you use an RDCO module, set the channel parameter values in the drive control program. Use RDCO channel 3. See the applicable drive firmware manual for more information.
3. Set the FDCO or RDCO channel that is used to connect the FEA-03 module in the drive control program (parameter *60.41 Extension adapter com port* in ACS880 primary control program).
4. Connect the power supply cable to the power supply connector (XPOW) at the base of the adapter.

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## Start-up

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### Contents of this chapter

This chapter contains the start-up instructions for the extension adapter.

### Defining node IDs for option modules

You must define a node ID for each option module connected to the FEA-03 F-series extension adapter. The node ID is a two-digit decimal number that must be unique for each option module connected to the drive. It is possible to set 96 different node IDs (04...99). Values 00, 01, 02, and 03 are reserved. Define the node IDs using the mechanical switches A and B (Slot 1) and/or C and D (Slot 2). Switches A and C define the first digit and switches B and D the second digit of the node ID.

### Setting the drive parameters

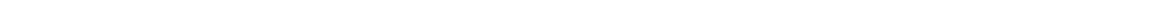
Set the node IDs in the drive control program according to the option module type.

For example, in ACS880 primary control program the parameters are:

- I/O extension modules: parameters *14.02 Module 1 location*, *15.02 Module 2 location* or *16.02. Module 3 location*
- FEN encoder interface modules: parameters *91.12 Module 1 location* or *91.14 Module 2 location*.

See the applicable drive firmware manual for more information.

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## Diagnostics

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### Contents of this chapter

This chapter explains how to trace faults with the status LEDs on the extension adapter.

### General

See the applicable drive firmware manual for fault and warning messages.

### Diagnostic LEDs

LED	Color	Description
PWR OK	Green	Is lit when power applied to the extension adapter is OK.
SLOT 1 STATUS	Green	Is lit when the initialization of the option module connected to Slot 1 is OK.
SLOT 2 STATUS	Green	Is lit when the initialization of the option module connected to Slot 2 is OK.

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## Technical data

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### Housing

Painted and zinc-plated sheet steel.

### Mounting

Onto 35 x 7.5 DIN rail.

### Power supply connection

- Voltage: 24 V DC  $\pm 10\%$
- Current consumption: Refer to I/O extension module's User's manual.

### Connectors

- Fiber-optic link connection: Avago Versatile Link (10 MBd)
- Power supply connection: Detachable screw terminal block (Phoenix Contact MSTBA 2.5/2-G-5.08).

### LED

See the diagnostics.

### Ambient conditions

The applicable ambient conditions specified for the drive in its hardware manual are in effect.

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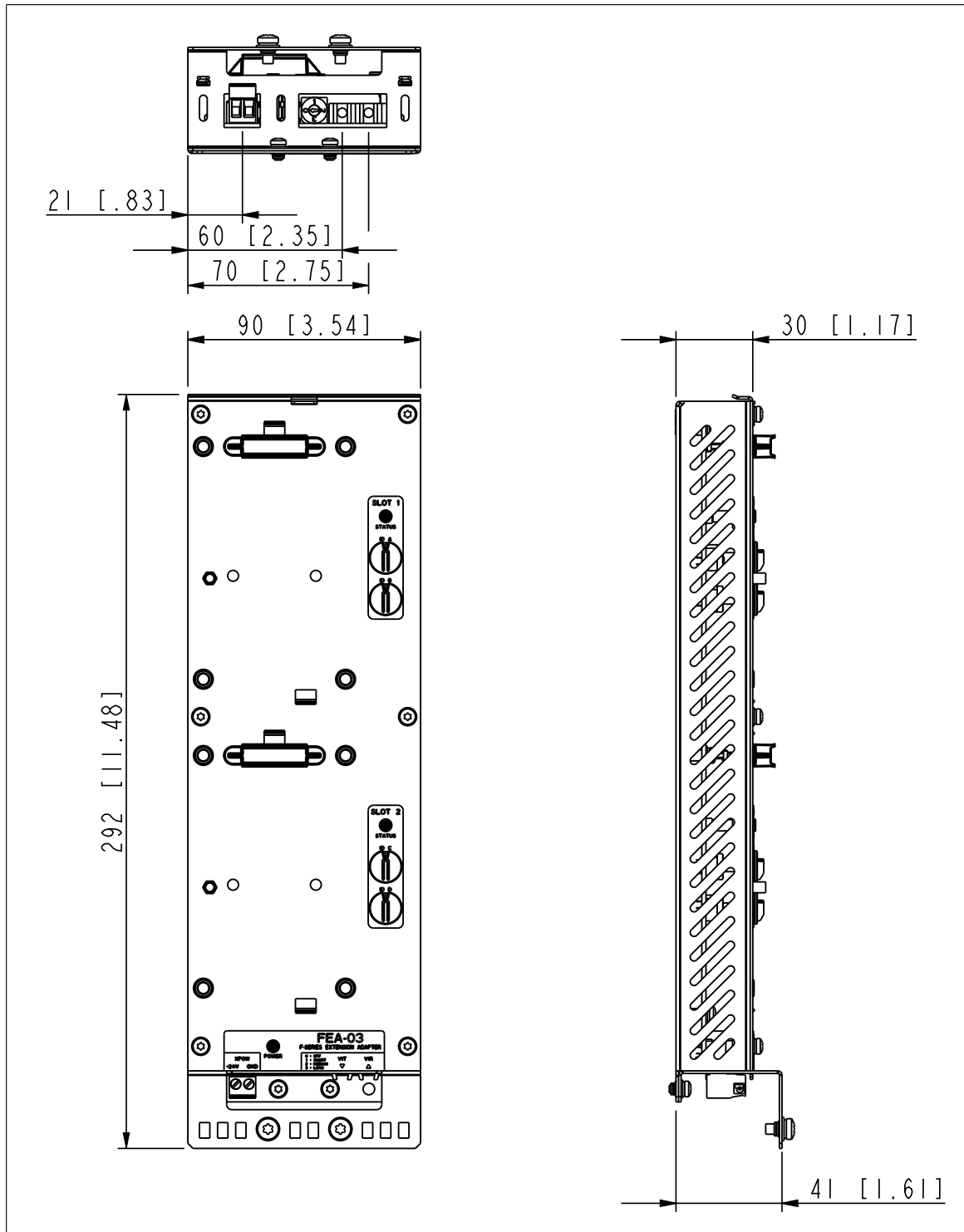
## Degree of protection

IP20

## Standards

Complies with the safety standard IEC 61800-5-1 and EMC standard IEC 61800-3.

## Dimensions



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# Further information

## **Product and service inquiries**

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to [www.abb.com/searchchannels](http://www.abb.com/searchchannels).

## **Product training**

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