

Installation

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At a Glance

Introduction

This chapter provides dimensions, installation, and mounting instructions for the controllers, digital and analog expansion I/O modules, and options.

**What's in this
Chapter?**

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Dimensions of the Compact Controllers

Introduction The following section shows the dimensions for all Compact controllers.

TWDLCA10-DRF and TWDLCA16-DRF The following diagrams show the dimensions for the TWDLCA10DRF and TWDLCA16DRF series Compact controllers.
Illustration showing TWDLCA10DRF series controller:

80.0 mm (3.17 in)

70.0 mm (2.78 in)

90.0 mm
(3.54 in)4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

TWDLCA24-DRF The following diagrams show the dimensions for the TWDLCA24DRF series Compact controller.

95.0 mm (3.74 in)

70.0 mm (2.78 in)

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

TWDLCA•40-DRF

The following diagrams show the dimensions for the TWDLCA•40DRF series Compact controller.

157.0 mm (6.18 in)

70.0 mm (2.78 in)

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

Dimensions for the Modular Controllers

Introduction

The following section shows the dimensions for all Modular controllers.

TWDLMDA20-DRT Dimensions

The following diagrams show the dimensions for the TWDLMDA20DRT Modular controller.

47.5 mm (1.87 in)

14.6 mm
(0.57 in) 70.0 mm (2.76 in)

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

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**TWDLMDA20-
DUK and
TWDLMDA20-
DTK Dimensions**

The following diagrams show the dimensions for the TWDLMDA20DUK and TWDLMDA20DTK Modular controllers.

35.4 mm (1.39 in) 11.3 mm
(0.44 in) 70.0 mm (2.76 in)

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

**TWDLMDA40-
DUK and
TWDLMDA40-
DTK Dimensions**

The following diagrams show the dimensions for the TWDLMDA40DUK and TWDLMDA40DTK Modular controllers.

47.5 mm (1.87 in) 11.3 mm
(0.44 in) 70.0 mm (2.76 in)

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

Dimensions for the Digital and Analog I/O Modules

Introduction

The following section shows the dimensions for all digital and analog I/O modules.

Digital I/O Modules (8 In and/or Out) and Analog Modules

The following diagrams show the dimensions for the 8 inputs and/or outputs digital modules: TWDDDI8DT, TWDDAI8DT, TWDDRA8RT, TWDDDO8TT, TWDDDO8UT, TWDDMM8DRT and for all the analog I/O modules.

Illustrations showing a TWDDDI8DT or a TWDDAI8DT module:

3.8 mm (0.15 in)	23.5 mm (0.93 in)	14.6 mm (0.57 in)	70.0 mm (2.76 in)
---------------------	----------------------	----------------------	-------------------

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

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**Digital I/O
Modules (16 In or
Out with a
Terminal Block)**

The following diagrams show the dimensions for the TWDDDI16DT and TWDDRA16RT digital I/O modules.

Illustrations showing a TWDDDI16DT module:

3.8 mm (0.15 in)	23.5 mm (0.93 in)	14.6 mm (0.57 in)	70.0 mm (2.76 in)
---------------------	----------------------	----------------------	-------------------

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

**Digital I/O
Module (16 In
and 8 Out)**

The following diagrams show the dimensions for the TWDDMM24DRF digital I/O module.

3.8 mm (0.15 in)	39.1 mm (1.54 in)	1.0 mm (0.04 in)	70.0 mm (2.76 in)
---------------------	----------------------	---------------------	-------------------

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

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**Digital I/O
Modules (16 In or
Out with a
Connector)**

The following diagrams show the dimensions for the TWDDDI16DK, TWDDDO16TK, and TWDDDO16UK digital I/O modules. Illustrations showing a TWDDDI16DK module:

3.8 mm 17.6 mm 11.3 mm
(0.15 in) (0.69 in) (0.44 in) 70.0 mm (2.76 in)

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

**Digital I/O
Modules (32 In or
Out)**

The following diagrams show the dimensions for the TWDDDI32DK, TWDDDO32TK, and TWDDDO32UK digital I/O modules. Illustrations showing a TWDDDI32DK module:

3.8 mm 29.7 mm 11.3 mm
(0.15 in) (1.17 in) (0.44 in) 70.0 mm (2.76 in)

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

Dimensions of AS-Interface V2 bus master module: TWDNOI10M3

**AS-Interface
Master Module
Dimensions**

The following diagram shows the dimensions of the AS-Interface Master module TWDNOI10M3:

3.8 mm 23.5 mm 9.4 mm 70.0 mm

10 mm 90.0
 mm

37.5
mm
17.7
mm

4.5*mm

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

Dimensions for the Operator Display Module, Operator Display Expansion Module, and Communication Expansion Modules

Introduction

The following section shows the dimensions for the operator display module (TWDXCPODC), operator display expansion module (TWDXCPODM), and for all communication expansion modules (TWDNOZ232D, TWDNOZ485T, and **TWDNOZ485D**).

Operator Display Module Dimensions

The following diagram shows the dimensions for the operator display module (TWDXCPODC).

35.0 mm
(1.38 in)

42.0 mm
(1.65 in)

Operator Display Expansion Module Dimensions

The following diagram shows the dimensions for the operator display expansion module (TWDXCPODM).

38.0 mm 13.9 mm 71.0 mm
(1.38 in) (0.55 in) (2.80 in)

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

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**Communication
Expansion
Module
Dimensions**

The following diagram shows the dimensions for all communication expansion modules (TWDNOZ232D, TWDNOZ485T, and **TWDNOZ485D**).

Illustration of the TWDNOZ485T module:

38.0 mm	13.9 mm	71.0 mm
(1.38 in)	(0.55 in)	(2.80 in)

90.0 mm
(3.54 in)

4.5 mm*
(0.18 in)

Note: * 8.5 mm (0.33 in) when the clamp is pulled out.

Dimensions of the Telefast® Bases

Introduction

The following section shows the dimensions for the Telefast® bases.

ABE7B20MPN20
ABE7B20MPN22
ABE7B20MRM20
ABE7E16SPN22
ABE7E16SRM20

The following diagrams show the dimensions for the ABE7B20MPN20, ABE7B20MPN22, ABE7B20MRM20, ABE7E16SPN22 and ABE7E16SRM20 Telefast® bases.

Mounting on 35 mm

rail

Screw fixing (retractable lugs)

130 mm
5.12 in

113 mm
4.45 in

41.5 mm^{1.63 in}

83 mm^{3.27 in}

93 mm^{3.66 in}

(1)

62.5 mm
2.46 in

67.5 mm
2.66 in

(1) ABE 7BV20, ABE 7BV20TB

2xØ4 mm

2xØ11/64" (0.171 in)

13.5 mm^{0.53 in}

ABE7E16EPN20
ABE7E16SPN20

The following diagrams show the dimensions the dimensions for the ABE7E16EPN20 and ABE7E16SPN20 Telefast® bases.

Mounting on 35 mm

rail

106 mm

4.17 in

24^{0.95} mm49^{1.93} in

(1)

60 mm
2.36 in64 mm
2.52 in13.5^{0.53} in

(1) ABE 7BV20, ABE 7BV20TB

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Installation Preparation

Introduction

The following section provides information on preparation for all Twido controllers, expansion I/O modules, AS-Interface bus and CANopen fieldbus interface modules.

Before Starting

Before installing any of the Twido products read the Safety Information at the beginning of this book.

CAUTION

EQUIPMENT DAMAGE

Before adding/removing any module or adapter, turn off the power to the controller. Otherwise, the module, adapter, or controller may be damaged, or the controller may not operate correctly.

Failure to follow this instruction can result in injury or equipment damage.

Note: All options, expansion I/O, AS-Interface bus and CANopen fieldbus interface modules should be assembled before installing a Twido system on a DIN rail, onto a mounting plate, or in a control panel. The Twido system should be removed from a DIN rail, a mounting plate, or a control panel before disassembling the modules.

Controller, Expansion I/O Module, AS-Interface Bus Master Module and CANopen Fieldbus Master Module Mounting Positions

Introduction

This section shows the correct and incorrect mounting positions for all controllers, expansion I/O modules, AS-Interface bus master modules and CANopen fieldbus master module.

Note: Keep adequate spacing for proper ventilation and to maintain an ambient temperature between 0°C (32°F) and 55°C (131°F).

Correct Mounting Position for all Controllers, Expansion I/O Modules, AS-Interface Bus Master Modules and CANopen Fieldbus Master Module

Controllers, expansion I/O modules, AS-Interface bus and CANopen fieldbus interface modules must be mounted horizontally on a vertical plane as shown in the figures below.

Compact controller with an expansion I/O module

Modular controller with an expansion I/O module

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**Correct and
 Incorrect
 Mounting
 Positions for the
 Compact
 Controller**

A Compact controller should only be positioned as shown in "Correct Mounting Position for all Controllers, Expansion I/O Modules, AS-Interface Bus Master Modules and CANopen Fieldbus Master Module" figure. When the ambient temperature is 35°C (95°F) or below, the Compact controller can also be mounted upright on a horizontal plane as shown in (1). When the ambient temperature is 40°C (113°F) or below, the Compact controller can also be mounted sideways on a vertical place as shown in figure (2). Figure (3) shows an incorrect mounting position.

1

2

3

**Incorrect
 Mounting
 Positions for the
 Modular
 Controllers**

A Modular controller should only be positioned as shown in "Correct Mounting Position for all Controllers, Expansion I/O Modules, AS-Interface Bus Master Modules and CANopen Fieldbus Master Module" figure. The figures below show the incorrect mounting positions for all Modular controllers.

CAUTION

PLACING HEAT GENERATING DEVICES NEAR THE CONTROLLER SYSTEM

Do not place heat generating devices such as transformers and power supplies underneath the controllers or expansion I/O modules.

Failure to follow this instruction can result in injury or equipment damage.

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Assembling an expansion I/O, an AS-Interface bus master module or a CANopen fieldbus master module to a controller

Introduction

This section shows how to assemble an expansion I/O, an AS-Interface bus master module or a CANopen fieldbus master module to a controller. This procedure is for both Compact and Modular controllers. Your controller, expansion I/O module, or AS-Interface bus master module may differ from the illustrations in this procedure.

CAUTION

UNEXPECTED EQUIPMENT OPERATION

If you change the hardware configuration of the I/O expansion bus, AS-Interface bus master module or CANopen fieldbus master module and do not update the software to reflect that change, the expansion bus will no longer operate.

Be advised that the local base inputs and outputs will continue to operate.

Failure to follow this instruction can result in injury or equipment damage.

**Assembling an
Expansion I/O,
an AS-Interface
Bus Master
Module or a
CANopen
Fieldbus Master
Module to a
Controller.**

The following procedure shows how to assemble a controller and an expansion I/O, an AS-Interface bus master module or a CANopen fieldbus master module together.

Step	Action
1	Remove the expansion connector cover from the controller.
2	Make sure the black latch button on the I/O, AS-Interface or CANopen module is in the up position.
3	Align the connector on the left side of the Expansion I/O module, the AS-Interface master module or the CANopen fieldbus master module with the connector on the right side of the controller.

- 4 Press the expansion I/O, the AS-Interface bus master module or the CANopen fieldbus master module to the controller until it "clicks" into place.
- 5 Push down the black latch button on the top of the expansion I/O, the AS-Interface bus master module or the CANopen fieldbus master module to lock the module to the controller.

Disassembling an Expansion I/O, an AS-Interface Bus Master Module or a CANopen Fieldbus Master Module from a Controller.

Introduction

This section shows how to disassemble an expansion I/O, an AS-Interface bus master module or a CANopen fieldbus master module from a controller. This procedure is for both Compact and Modular controllers. Your controller, expansion I/O module, AS-Interface bus master module or CANopen fieldbus master module may differ from the illustrations in these procedures but the basic mechanism procedures are still applicable.

**Disassembling
an Expansion I/O,
an AS-Interface
Bus Master
Module or a
CANopen
Fieldbus Master
Module from a
Controller.**

The following procedure shows how to disassemble an expansion I/O, an AS-Interface bus master module or a CANopen fieldbus master module from a controller.

Step	Action
1	Remove the assembled controller and module from the DIN rail before disassembling them. See How to Install and Remove a Controller, an Expansion I/O Module, an AS-Interface Bus Interface Module or a CANopen Fieldbus Master Module from a DIN Rail , p. 229
2	Push up the black latch from the bottom of the expansion I/O module, the AS-Interface bus master module or the CANopen fieldbus master module to disengage it from the controller.
3	Pull apart the controller and module.

How to Install the Operator Display Module and Operator Display Expansion Module

Introduction

This section describes installation of the operator display module TWDXCPODC, as well as installation and removal of the operator display expansion module TWDXCPODM.

Installing the Operator Display Module into a Compact Controller

The following procedure shows how to install the TWDXCPODC operator display module into a Compact controller.

Step	Action
1	Remove the operator display connector cover on the Compact controller.
2	Locate the operator display connector inside the Compact controller.

Step

3

Action

Push the operator display module into the operator display connector in the Compact controller until it "clicks".

**Assembling the
Operator Display
Expansion
Module to a
Modular
Controller**

The following procedure shows how to assemble the TWDXCPODM operator display expansion module to a Modular controller.

- | Step | Action |
|-------------|---|
| 1 | Remove the communication connector cover on the left side of the Modular controller. |
| 2 | Make sure the black latch button on the operator display expansion module is in the up position. |
| 3 | Align the connector opening on the left side of the Modular controller to the connector on the right side of the operator display expansion module. |

- 4 Press the operator display expansion module to the Modular controller until it "clicks" into place.
- 5 Push down the black latch button on the top of the operator display expansion module to lock the module to the Modular controller.

**Disassembling
an Operator
Display
Expansion
Module from a
Modular
Controller**

To remove the TWDXCPODM operator display expansion module from a Modular controller, see *Disassembling an Expansion I/O, an AS-Interface Bus Master Module or a CANopen Fieldbus Master Module from a Controller.*, p. [213](#).

Installing a Communication Adapter and an Expansion Module

Introduction

This section shows how to install the TWDNAC232D, TWDNAC485D, or TWDNAC485T communication adapter into a Compact controller's port 2 and in a TWDXCPODM operator display expansion module. This section also shows how to assemble and disassemble the TWDNOZ232D, **TWDNOZ485D**, and TWDNOZ485T communication expansion module to a Modular controller. Your controller may differ from the illustrations in these procedures but the basic mechanism procedures are applicable.

Installing the Communication Adapter into a Compact Controller's Port 2

The following procedure shows how to install the TWDNAC232D, TWDNAC485D, or TWDNAC485T communication adapter into a Compact controller's port 2.

Step	Action
1	Open the hinged lid.
2	Remove the cartridge cover located on the bottom of the Compact controller.
3	Push the communication adapter's connector into the Compact controller's port 2 connector until it "clicks".

or

- 4 Look in the opening at the bottom of the Compact controller where the cartridge cover resided and make sure the communication adapter's connector is seated in the Compact controller's port 2 connector. Adjust the adapter if it is not seated correctly.
- 5 Attach the cartridge cover.

**Installing a
Communication
Adapter in the
Operator Display
Expansion
Module**

The following procedure shows how to install the TWDNAC232D, TWDNAC485D, or TWDNAC485T communication adapter in a TWDXCPODM operator display expansion module.

Step	Action
1	Open the hinged lid.
2	Push the communication adapter's connector into the operator display expansion module's connector until it "clicks".

or

- 3 Close the hinged lid.

**Assembling a
Communication
Expansion
Module to a
Modular
Controller**

The following procedure shows how to assemble the **TWDNOZ485D**, TWDNOZ232D, or TWDNOZ485T communication expansion module to a Modular controller.

- | Step | Action |
|------|--|
| 1 | Remove the communication connector cover on the left side of the Modular controller. |
| 2 | Make sure the black latch button on the communication expansion module is in the up position. |
| 3 | Align the connector opening on the left side of the Modular controller to the connector on the right side of the communication expansion module. |

- 4 Press the communication expansion module to the Modular controller until it "clicks" into place.
- 5 Push down the black latch button on the top of the communication expansion module to lock the module to the Modular controller.

**Disassembling a
Communication
Expansion
Module from a
Modular
Controller**

To disassemble a communication expansion module from a Modular controller, see Disassembling an Expansion I/O, an AS-Interface Bus Master Module or a CANopen Fieldbus Master Module from a Controller., p. [213](#).

How to Install the TwidoPort Ethernet Interface Module

Introduction This section shows how to install the TwidoPort Ethernet interface module and connect it to a Twido controller.

Foreword The equipment is delivered in ready-to-operate condition. The following procedure is appropriate for installation.

Proper Grounding

WARNING

RISK OF ELECTRIC SHOCK

The grounding screw terminal (PE) must be used to provide protective earth at all times. Make sure that PE is attached before connecting or disconnecting any Ethernet shielded cables to the device.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Ground Cable

The PE ground must be capable of supporting 30 A of current for 2 minutes and have no more than 50 mΩ of resistance. The recommended PE wire size is AWG #12 (3.2 mm²) through #18 (0.87 mm²). The maximum allowable length of the wire at AWG # 8 is less than 2 meters (6.56 ft).

The TwidoPort-to-Twido Controller Connecting Cable

The supplied TwidoPort-to-Twido cable is 50 cm (1.64 ft) long. It has a mini-din connector at one end and a modular plug at the other:

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Mounting Instructions

Usually, TwidoPort is mounted on a DIN rail or a panel with the Twido panel mount kit (TWDXMT5).

Note: Before installing a TwidoPort module, read the Safety Information at the beginning of this guide as well as the instructions for Proper Grounding (See Proper Grounding, p. [223](#)) in this section.

To connect TwidoPort to the DIN rail, take the following steps (as shown in the diagram below):

Step	Action	Comment
1	Attach the hinges on the back of TwidoPort to the DIN rail, then press down to the open position. down to align TwidoPort vertically with the rail.	Make sure the DIN rail latch is pulled down to the open position.
2	Lock TwidoPort to the DIN rail.	Push up the plastic DIN rail clip on the bottom.

The following figure shows TwidoPort being mounted on a DIN rail:

TwidoPort
Dimensions

The following diagram shows the dimensions of TwidoPort:

How to Install a Memory or RTC Cartridge

Introduction

This section shows how to install the TWDXCPMFK32 memory cartridge in a Compact controller, the TWDXCPMFK32 or TWDXCPMFK64 memory cartridge in a Modular controller, and the TWDXCPRTC RTC cartridge in a Compact controller and Modular controller.

Installing a Cartridge in a Compact Controller

The following procedure shows how to install the TWDXCPMFK32 memory or the TWDXCPRTC RTC cartridge in a Compact controller. Only one of these cartridges can be installed in the Compact controller.

CAUTION

EQUIPMENT DAMAGE

When handling the cartridges, do not touch the pins. The cartridge's electrical elements are sensitive to static electricity. Use proper ESD procedures when handling a cartridge.

Failure to follow this instruction can result in injury or equipment damage.

Step	Action
1	Open bottom terminal cover.
2	Remove the cartridge cover.

3 Push the cartridge into the cartridge connector until it "clicks".

4 Close the terminal cover.

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Installing a Cartridge in a Modular Controller

The following procedure shows how to install the TWDXCPMFK32 or TWDXCPMFK64 memory cartridge or the TWDXCPRTC RTC cartridge in a Modular controller. Only one RTC cartridge can be installed. A memory cartridge and an RTC cartridge can be installed at the same time.

Step	Action
1	Open the hinged door.
2	Remove the cartridge cover by holding and pulling the opposite edges of the cover until it is out.
3	Push the cartridge into the Modular controller's connector until it "clicks".

4 Close the hinged door.

Removing a Terminal Block

Introduction

This section shows how to remove a terminal block from the TWDLMDA20DRT Modular controller.

Removing a Terminal Block

The following procedure shows how to remove a terminal block from the TWDLMDA20DRT Modular controller.

Step	Action
1	Power off to the Modular controller and disconnect all wires. Note: The terminal block on the left (1) must be removed before the terminal block on the right (2).

1

2

- 2 Remove the terminal block by holding the center of the terminal block and pulling it out straight.

CAUTION

TERMINAL BLOCK DAMAGE

Do not pull the terminal block out from the top or bottom of the block.

Failure to follow this instruction can result in injury or equipment damage.

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How to Install and Remove a Controller, an Expansion I/O Module, an AS-Interface Bus Interface Module or a CANopen Fieldbus Master Module from a DIN Rail

Introduction

This section describes how to install and remove controllers, expansion I/O modules, AS-Interface bus master modules or CANopen fieldbus master module from a DIN rail. The device you want to install or remove may differ from the illustrations in these procedures but the basic mechanism procedures are applicable.

Note: When mounting controllers on a DIN rail, use two end stops, type AB1-AB8P35 or equivalent.

**How to Install a
Controller,
Expansion I/O
Module, AS-
Interface Bus
Interface Module
or CANopen
Fieldbus Master
Module on a DIN
Rail**

The following procedure shows how to install a controller, expansion I/O module, AS-Interface bus master module or CANopen fieldbus master module on a DIN rail.

Step	Action
1	Fasten the DIN rail to a panel using screws.
2	Pull out the clamp at the bottom of the controller and module assembly.
3	Put the top groove of the controller and module on the DIN rail and press the modules toward the DIN rail.

Groove

35 mm wide DIN rail

Clamp

- 4 Push the clamp into the DIN rail.
- 5 Place mounting clips on both sides of the modules to prevent the system from moving sideways.

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**How to Remove a
Controller,
Expansion I/O
Module, AS-
Interface Bus
Interface Module
or CANopen
Fieldbus Master
Module from a
DIN Rail**

The following procedure shows how to remove a controller, an expansion I/O module, an AS-Interface bus master module or a CANopen fieldbus master module from a DIN rail.

Step	Action
1	Insert a flat screwdriver into the slot in the clamp.

Clamp

- 2 Pull out the clamp.
- 3 Pull the controller and the associated module off the DIN rail from the bottom.

How to Direct Mount on a Panel Surface

Introduction

This section shows how to install mounting strips directly on modular controllers, expansion I/O modules, AS-Interface bus interface modules, the CANopen fieldbus interface module, the operator display expansion module, and communication expansion modules. This section also provides mounting hole layouts for each controller and module. Your controller or module may differ from the illustrations in these procedures but the basic mechanism procedures are applicable.

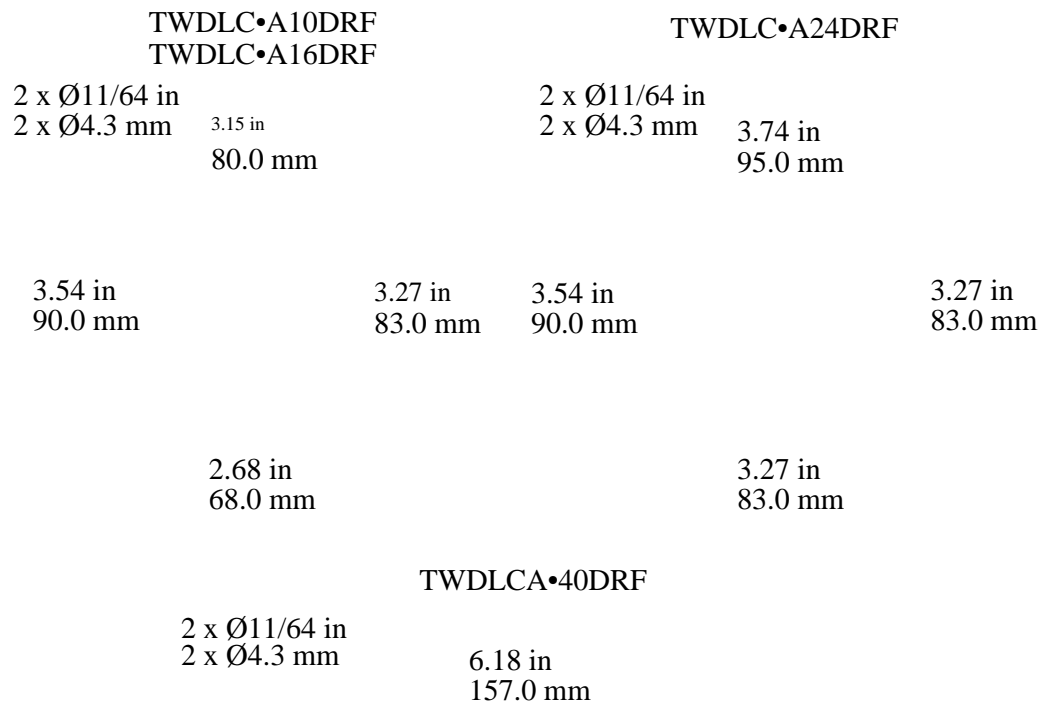
Installing a Mounting Strip

The following procedure shows how to install a mounting strip.

Step	Action
1	Remove the clamp from the back side of the module by pushing the clamp inward.
2	Insert the mounting strip, with the hook entering last, into the slot where the clamp was removed.
3	Slide the mounting strip into the slot until the hook enters into the recess in the module.

**Mounting Hole
Layout for
Compact
Controllers**

The following diagram shows the mounting hole layout for all the Compact controllers.



3.54 in
90.0 mm

3.27 in
83.0 mm

5.71 in
145.0 mm

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**Mounting Hole
Layout for
Modular
Controllers**

The following diagram shows the mounting hole layout for all the Modular controllers.

TWDLMDA20DUK
TWDLMDA20DTK

TWDLMDA20DRT
TWDLMDA40DUK
TWDLMDA40DUK

1.39 in
35.4 mm

1.87 in
47.5 mm

0.95 in
24.1 mm

2 x Ø11/64 in
2 x Ø4.3 mm

0.95 in
24.1 mm

2 x Ø11/64 in
2 x Ø4.3 mm

3.54 in
90.0 mm

4.06 in
103.0 mm

3.54 in
90.0 mm

4.06 in
103.0 mm

0.118 in
3.0 mm

0.118 in
3.0 mm

**Mounting Hole
Layout for
Expansion I/O
Modules**

The following diagram shows the mounting hole layout for the expansion I/O modules.

TWDDDI8DT TWDALM3LT
 TWDDAI8DT TWDAMM3HT
 TWDDDI16DT TWDAMI2HT
 TWDDRA8RT TWDAMO1HT
 TWDDRA16RT TWDAMO2HT
 TWDDDO8UT TWDAMI4LT
 TWDDDO8TT TWDAMI8HT
 TWDDMM8DR TWDARI8HT

TWDDDI16DK
 TWDDDO16TK
 TWDDDO16UK

0.93 in
23.5 mm

0.69 in
17.6 mm

0.25 in 2 x Ø11/64 in
6.3 mm 2 x Ø4.3 mm

0.25 in 2 x Ø11/64 in
6.3 mm 2 x Ø4.3 mm

3.54 in 4.06 in
90.0 mm 103.0 mm

3.54 in 4.06 in
90.0 mm 103.0 mm

0.118 in
3.0 mm

0.118 in
3.0 mm

TWDDDI32DK
TWDDDO32TK
TWDDDO32UK

TWDDMM24DRF

0.25 in
6.3 mm

1.17 in
29.7 mm

2 x Ø11/64 in
2 x Ø4.3 mm

0.25 in
6.3 mm

1.54 in
39.1 mm

2 x Ø11/64 in
2 x Ø4.3 mm

3.54 in
90.0 mm

4.06 in
103.0 mm

3.54 in
90.0 mm

4.06 in
103.0 mm

0.118 in
3.0 mm

0.118 in
3.0 mm

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Installation

**Mounting Hole
Layout for the
AS-Interface Bus
Interface Module**

The following diagram shows the mounting hole layout for the TWDNOI10M3 AS-Interface bus interface module:

0.25 in
6.3 mm

1.07 in
27.3 mm

2 x Ø11/64 in
2 x Ø4.3 mm

3.54 in
90.0 mm

4.06 in
103.0 mm

0.118 in
3.0 mm

**Mounting Hole
Layout for the
CANopen
Fieldbus Master
Module**

The following diagram shows the mounting hole layout for the TWDNCO1M CANopen fieldbus master module:

0.25 in
6.3 mm

1.17 in
29.7 mm

2 x Ø11/64 in
2 x Ø4.3 mm

3.54 in
90.0 mm

4.06 in
103.0 mm

0.118 in
3.0 mm

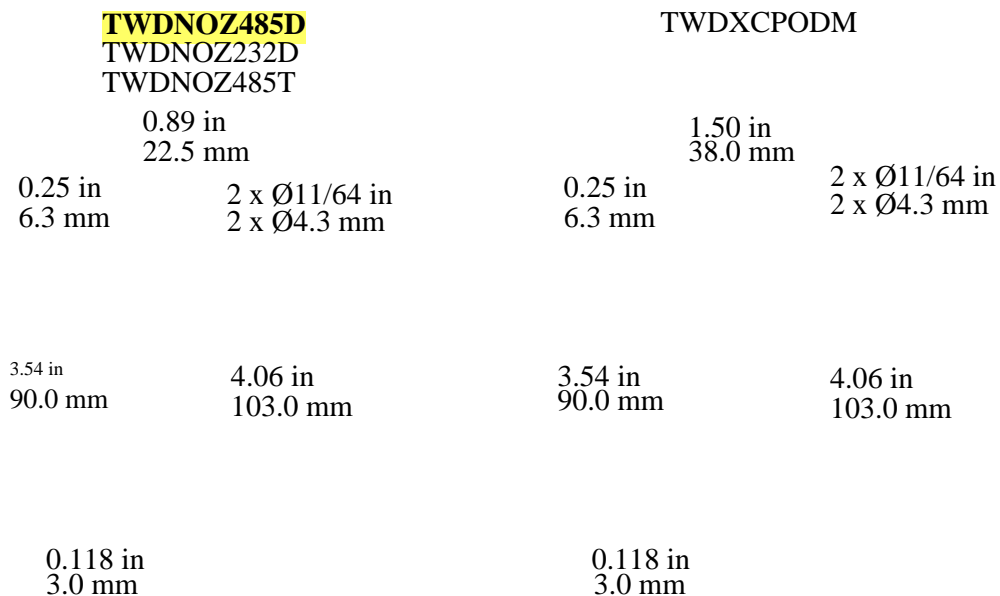
236

TWD USE 10AE

Installation

**Mounting Hole
Layout for
Communication
Expansion and
Operator Display
Expansion
Modules**

The following diagram shows the mounting hole layout for the communication expansion and operator display expansion modules.



Minimum Clearances for Controllers and Expansion I/O Modules in a Control Panel

Introduction

This section provides the minimum clearances for controllers and expansion I/O modules in a control panel.

Minimum Clearances for a Compact Controller and Expansion I/O Modules

In order to maintain a natural circulation of air around the Compact controller and expansion I/O modules in a control panel, observe the minimum clearances shown in the figures below.

Front Panel

20 mm (0.79 in)

20 mm (0.79 in)

80 mm
(3.15 in)

40 mm
(1.57 in)

40 mm
(1.57 in)

20 mm (0.79 in)

20 mm (0.79 in)

Wiring Duct

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Installation

**Minimum
Clearances for a
Modular
Controller and
Expansion I/O
Modules**

In order to maintain a natural circulation of air around the Modular controller and expansion I/O modules in a control panel, observe the minimum clearances shown in the figures below.

Front Panel

20 mm (0.79 in)

20 mm (0.79 in)

40 mm
(1.57 in)

40 mm
(1.57 in)

80 mm
(3.15 in)

20 mm (0.79 in)

20 mm (0.79 in)

Wiring Duct

How to Connect the Power Supply

Introduction

This section describes how to connect the power supply to the Compact and Modular controllers.

Note: When operating outside of the specified voltage range, outputs may not switch accordingly. Use appropriate safety interlocks and voltage monitoring circuits.

CAUTION

MAKE PROPER POWER SUPPLY CONNECTIONS

Make sure that proper voltage and frequency is applied to the device. Verify that you have made proper lead connections to the power supply terminal block.

Failure to follow this instruction can result in injury or equipment damage.

Connect an AC Power Supply to a Compact Controller

The following diagram shows how to connect an AC power supply to a TWDLCA•••DRF series Compact Controller.

100-240 VAC

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TWD USE 10AE

Installation

Connect a DC Power Supply to a Compact Controller

The following diagram shows how to connect a DC power supply to a TWDLCD•••DRF series Compact Controller.

+
-
24 VDC

Compact Controller Power Supply Specifications

The following table provides power supply information for the Compact controller.

Item	AC Specifications	DC Specifications
Power supply voltage	Rated power voltage: from 100 to 240 VAC Allowable range: from 85 to 264 VAC	Rated power voltage: 24 VDC Allowable range: from 19.2 to 30 VDC
	The detection of the absence of a	The detection of the absence of a

<p>power supply depends on the number of inputs and outputs used. Usually the absence of a power supply is detected when voltage drops to less than 85 VAC, stopping the current operation to prevent malfunction.</p>	<p>power supply depends on the number of inputs and outputs used. Usually the absence of a power supply is detected when voltage drops to below 14 VDC, stopping the current operation to prevent malfunction.</p>
--	--

<p>Note: Momentary power interruption for 20 ms or less at 100 to 240 VAC is not recognized as power failure.</p>	<p>Note: Momentary power interruption for 10 ms or less at 24 VDC is not recognized as failure.</p>
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<p>Inrush current flow at power-up</p>	<p>TWDLCAA10DRF and TWDLCAA16DRF: 35 A maximum TWDLCAA24DRF: 40 A maximum</p>
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<p>Power supply wiring</p>	<p>0.64 mm² (UL1015 AWG22) or 1.02 mm² (UL1007 AWG18) Make the power supply wiring as short as possible.</p>
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<p>Ground wiring</p>	<p>1.30 mm² (UL1007 AWG16) Do not connect ground wire in common with ground wire of motor equipment.</p>
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Connect a Power Supply to a Modular Controller

The following diagram shows how to connect a power supply to a Modular Controller.



Modular Controller Power Supply Specifications

The following table provides power supply information for the Modular controller.

Item	Specifications
<p>Power supply voltage</p>	<p>Rated power voltage: 24 VDC Allowable range: from 20.4 to 26.4 VDC The detection of the absence of a power supply depends on the number of inputs and outputs used. Usually the absence of a power supply is detected when voltage drops to below 20.4 VDC, stopping the current operation to</p>

prevent malfunction.

Note: Momentary power interruption for 10 ms or less at 24 VDC is not recognized as failure.

Inrush current flow at power-up 50 A maximum

Power supply wiring 0.64 mm^2 (UL1015 AWG22) or 1.02 mm^2 (UL1007 AWG18)
Make the power supply wiring as short as possible.

Ground wiring 0.64 mm^2 (UL1015 AWG22) or 1.02 mm^2 (UL1007 AWG18)
Do not connect ground wire in common with ground wire of motor equipment.

How to Install and Replace an External Battery

Note: The following information about the external battery applies to TWDLCAA40DRF and TWDLCAE40DRF series compact base controllers only. If you own another model of compact or modular controller, you may skip this section.

Introduction

In addition to the built-in internal battery used for RAM backup, each of the TWDLCAA40DRF and TWDLCAE40DRF compact base controllers is equipped with a battery compartment that can host a user-replaceable external battery. Note that for most applications, no external battery is required.

The external battery option provides extended backup duration to meet the needs for long-term backup for specific applications, such as HAVC applications.

Battery Type

Your compact base controller uses one 1/2 AA, 3.6 V, lithium battery to provide optional extended data storage duration of up to 3 years.

Note: The external battery is not included with your Twido controller; you must purchase it separately. Please use part number TSXPLP01 to order a single battery or TSXPLP101 to order a 10 pack.

Battery Power Status

The BAT LED indicator located on the front panel of your Twido compact controller serves as an indicator for low battery warning. The BAT LED state is described in the following table:

LED State	Description
Extinguished	Indicates that either: the external battery is functioning normally, or the BAT LED has been disabled by user by setting the %S66 system bit to 1.
Steady red	Indicates that either: the power of the external battery is low (voltage below 2.5V) (The external battery must be replaced within two weeks from the date the BAT LED was first lit.), or there is no external battery installed in the battery compartment.

Battery Installation Requirements

When installing or replacing the external battery, make sure the following two conditions are both met:

1. The internal battery of your Twido compact base must be fully charged.
2. After installing the external battery, you must power up your Twido controller immediately.

Note: Failure to meet any of the above two conditions will result in a significantly shorter battery life. The external battery life can be rapidly reduced to less than one month.

**Installing and
Replacing an
External Battery**

The battery compartment is located on the lower-panel of the Twido compact controller case. To install or replace an external battery, follow these steps:

WARNING

EXPLOSION AND FIRE HAZARD

Replace cell with part number TSXPLP01 (Tadiran, TL-5902) only.
Use of another cell or battery may present a risk of fire or explosion.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Step	Action
1	Before installing or replacing the external battery, you must first make sure that the internal battery of your Twido controller is fully charged. This precaution is to ensure that the data stored in RAM memory are not lost when the external battery is removed from its compartment.
2	Press sideways on the small latch protruding from the compartment cover to

- 3 unlock the door of the battery compartment.
Pull to open the compartment door, as shown in the figure below:

- 4 Remove the used battery from the compartment, if any.
- 5 Insert the new battery in the compartment, observing the correct polarity, as indicated by the polarity marking located inside the battery compartment.
- 6 Close the door of the battery compartment (make sure the latch clicks into place to lock the compartment door).
- 7 Power up your Twido controller immediately to preserve battery life.

**Safe Battery
Disposal**

The TWDLCA•40DRF compact bases use an optional external lithium battery for longer duration of data backup. (Note: The lithium battery is not supplied with the compact bases; you must purchase it separately.)

WARNING

EXPLOSION AND TOXIC HAZARD

Do not incinerate a lithium battery for it may explode and release toxic substances.

Do not handle damaged or leaking lithium battery.

Dead batteries shall be disposed of properly, for improper disposal of unused batteries can cause harm, as well as environmental damage.

In some areas, the disposal of lithium batteries with household or business trash collection may be prohibited. In any case, it is your responsibility to always conform to local regulations in your area, as regard to battery disposal.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Battery Status Monitoring and Control via System Bits

The following information describes how the battery status can be monitored and how the battery LED management can be controlled via two system bits %S75 and %S66, respectively:

System Bit Description

- %S75** This is a read-only system bit that indicates the current battery status:
%S75 = 0: external battery is operating normally.
%S75 = 1: external battery power is low, or battery is absent from compartment.
- %S66** This system bit is writable and allows you to turn on/off the BAT LED:
Set this bit to 1 to disable the BAT LED (LED is always off even if there is no battery inside the compartment).
Set this bit to 0 to enable the BAT LED indicator. Note that the %S66 system bit is reset to 0 as default at system start-up.