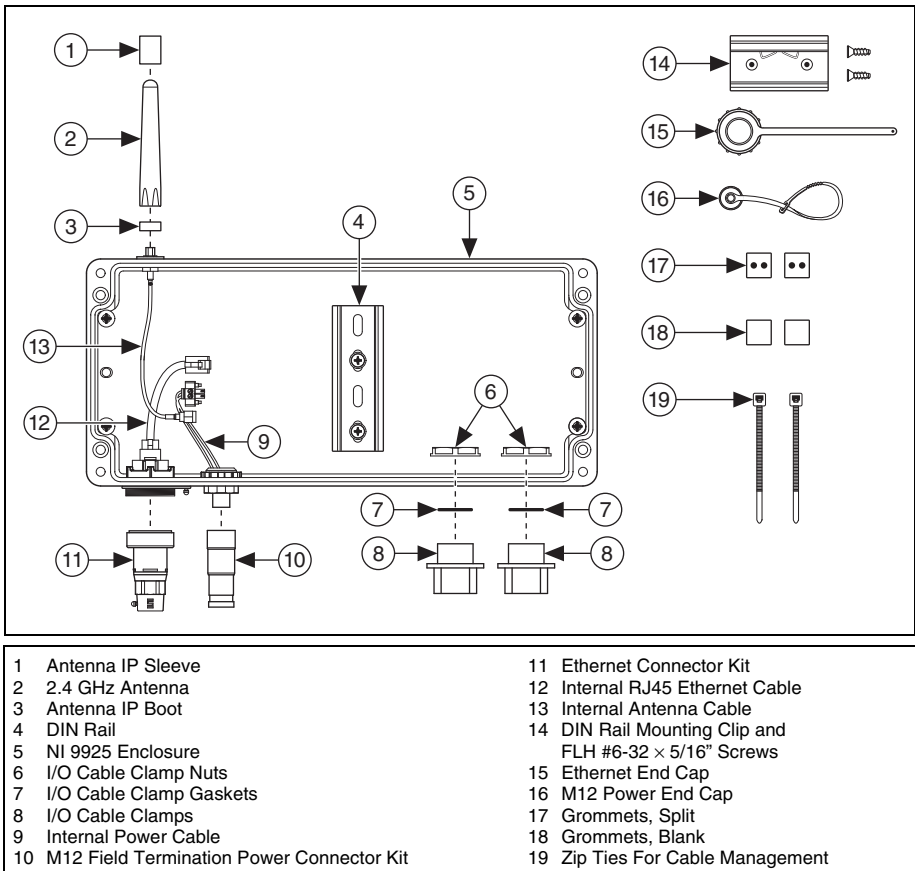# INSTALLATION GUIDE
NI 9925 Outdoor IP54 Enclosure
## Wireless/Ethernet Enclosure for NI cDAQ-9181/9191 Chassis

This guide describes how to install and use the National Instruments 9925 outdoor IP54 enclosure with the NI cDAQ-9181/9191 chassis. The NI 9925 provides a minimum ingress protection (IP) of IP54 against dust and water for outdoor or industrial environments when installed according to these instructions with the connectors provided. Figure 1 shows the components in the NI 9925 kit.

1	Antenna IP Sleeve
2	2.4 GHz Antenna
3	Antenna IP Boot
4	DIN Rail
5	NI 9925 Enclosure
6	I/O Cable Clamp Nuts
7	I/O Cable Clamp Gaskets
8	I/O Cable Clamps
9	Internal Power Cable
10	M12 Field Termination Power Connector Kit
11	Ethernet Connector Kit
12	Internal RJ45 Ethernet Cable
13	Internal Antenna Cable
14	DIN Rail Mounting Clip and FLH #6-32 × 5/16" Screws
15	Ethernet End Cap
16	M12 Power End Cap
17	Grommets, Split
18	Grommets, Blank
19	Zip Ties For Cable Management

Figure 1. NI 9925 Outdoor IP54 Enclosure Kit Components

![NATIONAL INSTRUMENTS]

For more information about IP ratings, refer to the *Understanding IP Ratings* section. For NI cDAQ-9181/9191 chassis specifications, refer to the *NI cDAQ-918x/919x User Manual*, available from ni.com/manuals.

Figure 2 shows the NI 9925 dimensions.
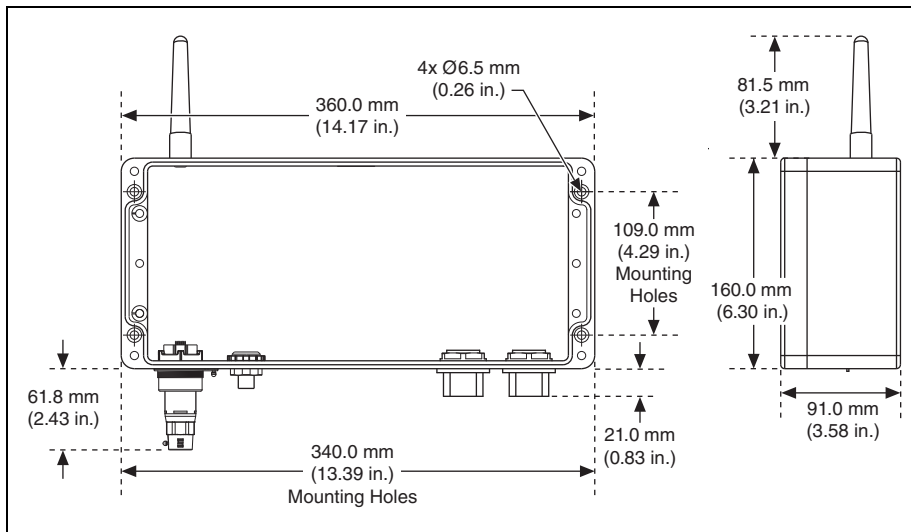
Figure 2. NI 9925 Dimensions and Mounting Hole Locations

Setting Up and Installing the NI 9925

You need a number 2 Phillips screwdriver and a 0.125 in. flathead screwdriver to install the NI 9925. Complete the following steps to set up and install the NI 9925.

1. Remove the NI 9925 from the package and inspect it and the kit contents. Contact NI if the enclosure appears damaged. Do *not* install a damaged enclosure or use kit contents that appear damaged.

2. Use a number 2 Phillips screwdriver to loosen the captive screws and remove the enclosure cover.

3. (Optional) Mount the NI 9925. Refer to Figure 2 for the NI 9925 mounting hole dimensions.

4. If you are using an NI cDAQ-9191, remove the antenna from the chassis.

5. Fasten the DIN rail clip to the cDAQ chassis using two FLH #6-32 × 5/16" screws (included in the kit) with a number 2 Phillips screwdriver, as shown in Figure 3.
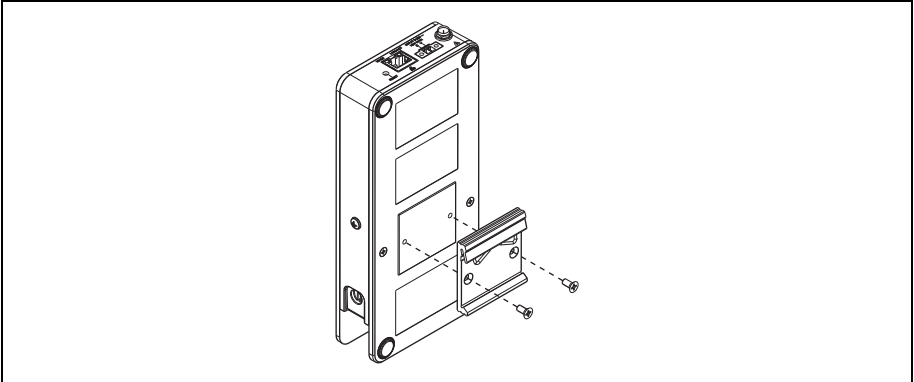
**Figure 3.** Attaching DIN Rail Clip to NI cDAQ-9181/9191 Chassis

6. Insert your C Series I/O module into the NI cDAQ-9181/9191 chassis.

7. Connect the internal power cable from the NI 9925 to the cDAQ chassis as shown in Figure 4.

8. Connect the internal RJ45 Ethernet cable to the NI 9925 and the cDAQ chassis, as shown in Figure 4.
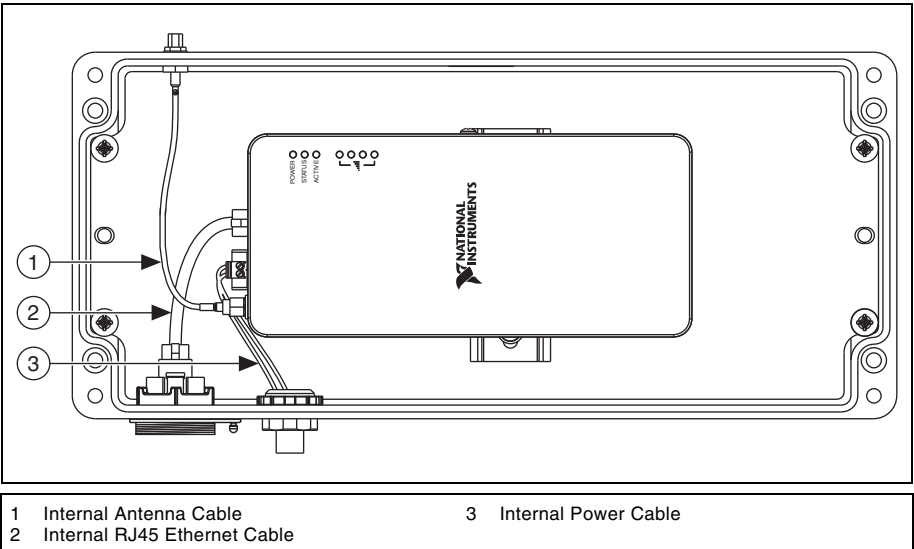
| 1	Internal Antenna Cable	3	Internal Power Cable
2	Internal RJ45 Ethernet Cable		

Figure 4. Connecting Internal Cables

9. Clip the cDAQ chassis onto the DIN rail in the NI 9925 as shown in Figure 5.

1	DIN Rail Clip	2	DIN Rail Spring	3	DIN Rail
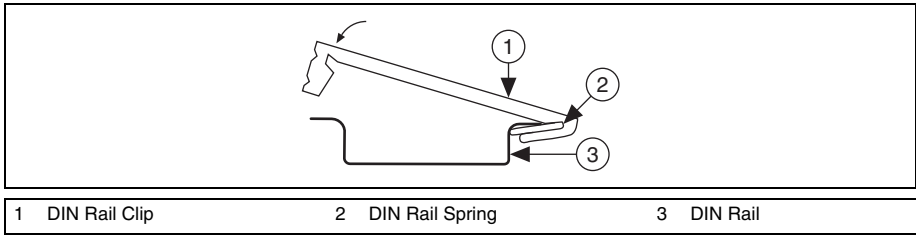
Figure 5. DIN Rail Clip Parts Locator Diagram

10. If you are using an NI cDAQ-9191, connect the internal antenna cable from the NI 9925 to the cDAQ chassis as shown in Figure 4.

11. On the outside of the enclosure, place the antenna IP boot onto the external antenna connector with the smaller diameter hole out, as shown in Figure 6A.

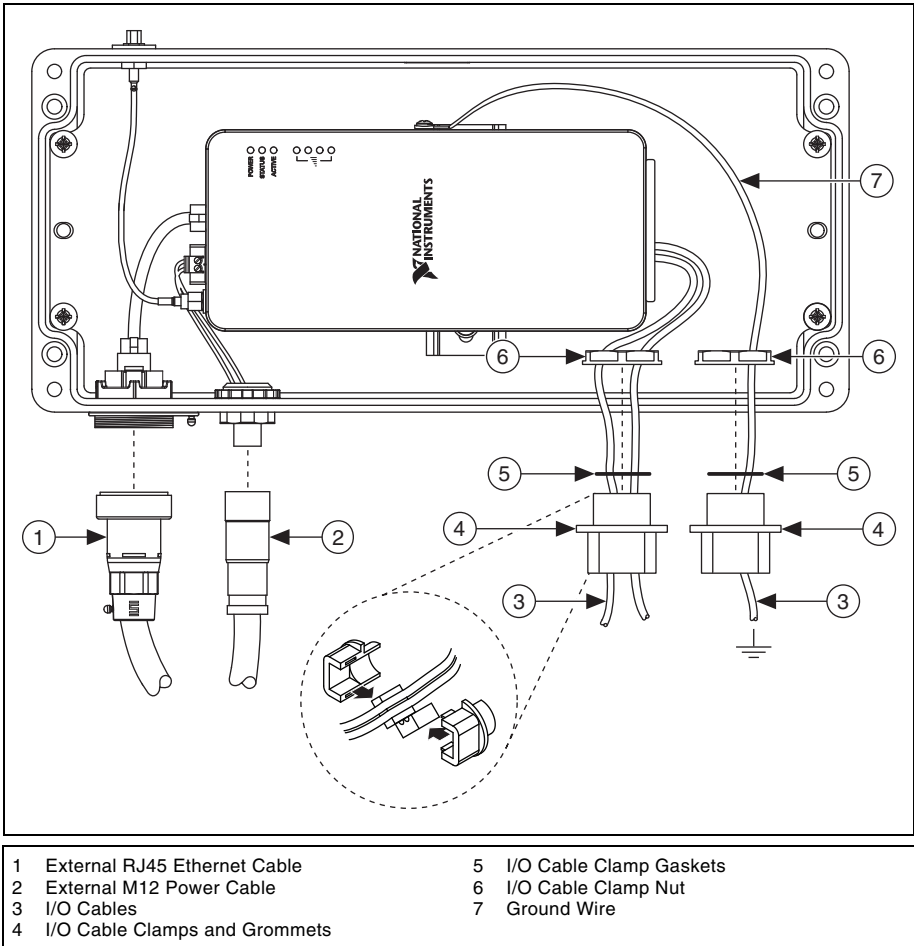| 1	Antenna IP Boot	3	Antenna
2	External Antenna Connector	4	Antenna IP Sleeve
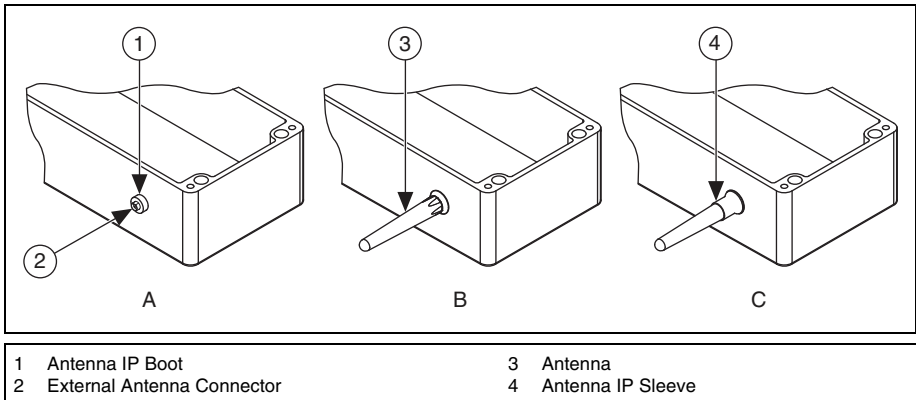
Figure 6. Antenna Assembly Installation

Note For Ethernet-only use, attaching the antenna on the NI 9925 is optional; it does not affect IP rating. However, attaching the antenna does offer protection to the antenna connector on the enclosure.

12. Screw the antenna onto the external antenna connector until it bottoms out as shown in Figure 6B.

13. Slide the antenna IP sleeve down the antenna and over the antenna IP boot until the antenna IP sleeve touches the enclosure as shown in Figure 6C.

14. Connect an external IP rated RJ45 Ethernet cable to the external Ethernet connector on the NI 9925 as shown in Figure 7. Refer to the *IP Rated Cables* section for information about ordering and making custom IP rated RJ45 Ethernet cables.

1	External RJ45 Ethernet Cable	5	I/O Cable Clamp Gaskets
2	External M12 Power Cable	6	I/O Cable Clamp Nut
3	I/O Cables	7	Ground Wire
4	I/O Cable Clamps and Grommets		

Figure 7. Connecting External Cables/Components

15. Connect an external IP rated M12 power cable to the external M12 power connector on the NI 9925 as shown in Figure 7. Refer to the *IP Rated Cables* section for information about ordering and making custom IP rated M12 power cables.

📝 **Note** When either the external M12 power connector or external Ethernet connector on the NI 9925 is not in use, cover that connector with the compatible end cap.

16. Connect the I/O cable(s) from the C Series module and route through one or both of the I/O openings. Refer to the *IP Rated Cables* section for information about making and connecting IP rated I/O cables.

17. Connect a ground wire to the chassis ground screw on the cDAQ chassis as described in the *NI cDAQ-918x/919x User Manual*. Route the ground wire through one of the I/O openings,

as described in the *Building IP Rated I/O Cables* section. Terminate the ground wire to the nearest earth ground or grounded structure.

⚠️ **Caution** For I/O openings on the NI 9925 that are not in use, use the blank grommets in the cable clamps to seal the openings and maintain an IP54 rating.

18. Reattach the enclosure cover by tightening the captive screws with a number 2 Phillips screwdriver.

IP Rated Cables

This section contains information about using the field termination connectors that are shipped in the NI 9925 outdoor IP enclosure kit to make your own cable lengths. You can order IP rated cables and accessories from NI.

Building an IP Rated M12 Power Field Termination Cable

One M12 power female field termination connector kit is included in the NI 9925 kit for creating a custom M12 power cable. To build an M12 field termination cable, complete the following steps.

⚠️ **Caution** Only use the connectors provided with the NI 9925 to build your cables.

📝 **Note** Be sure to route the wires through the plastic and rubber sealing grommets and the backshell before connecting to the screw terminals on the M12 field termination connector.

1. Build the M12 power female field termination connector by connecting the positive lead of the primary power supply to Pin 4. The pin number is marked on the inside of the field termination connector, next to the respective terminal, as shown in Figure 8.
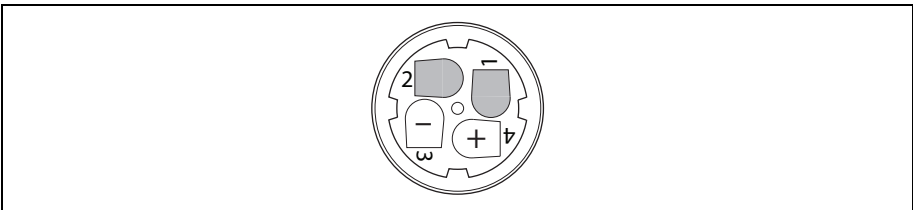
Figure 8. M12 Power Female Field Termination Connector Pinout

2. Connect the negative lead to Pin 3, as shown in Figure 8.

📝 **Note** When the external M12 power connector on the NI 9925 is not in use, cover the connector with the M12 power end cap.

Building an IP Rated RJ45 Ethernet Cable

The Ethernet field termination connector kit is included in the NI 9925 kit for creating a custom IP rated RJ45 Ethernet cable. Refer to the *SCPFE Wiring/Assembly Instructions* document included in the field termination connector kit for instructions about how to build an IP rated Ethernet cable.

⚠️ **Caution**   Only use the connectors provided with the NI 9925 to build your cables.

📝 **Note**   When the external Ethernet connector on the NI 9925 is not in use, cover the connector with the Ethernet end cap.

Building IP Rated I/O Cables

The two-piece clamp system, consisting of a cable clamp and a grommet, allows prefabricated cables to route I/O out of the NI 9925. When the proper grommet is selected, the clamp system meets a minimum IP rating of IP54. Grommets with two holes route two cables at once. Blank grommets are also provided, allowing for custom cable configuration. For more information about IP ratings, refer to the *Understanding IP Ratings* section.

⚠️ **Caution**   Only use the connectors provided with the NI 9925 to build your cables.

📝 **Note**   To ensure that the NI cDAQ-9181/9191 chassis meets specified requirements, use one of the clamps to route ground outside of the NI 9925 outdoor IP enclosure.

⚠️ **Caution**   For I/O openings on the NI 9925 that are not in use, use the blank grommets in the cable clamps to seal the openings and maintain an IP54 rating.

To use the clamp system, complete the following steps:

1. Choose the appropriately sized grommet for the cable diameter width. Blank grommets are provided for use with custom cable sizes and to seal unused I/O openings.
2. Place the grommet around the cable(s) leaving enough length to go through the enclosure hole and into the C Series I/O module, as shown in Figure 7.
3. Open the cable clamp. You may need to pry it open with a 0.125 in. flathead screwdriver.
4. Press the grommet containing the cable into the open cable clamp.
5. Press the two halves of the cable clamp together until they lock together.
6. Place the gasket over the clamp thread, thread the cable(s) through the enclosure hole, and insert the clamp into the enclosure hole.
7. Secure the clamp system with the provided nut.

Ordering NI IP Rated Cables

Table 1 lists the optional cable accessories for use with the NI 9925. Go to `ni.com` for more information about these accessories.

Table 1. Optional Cable Accessories

NI Part Number	Description
196648-05	IP rated, 5 meter M12 power cable, pigtail
196650-05	IP rated, 5 meter Ethernet cable
196647-01	Cable clamp replacements: two solid grommets and four assorted two-hole split grommets

Understanding IP Ratings

Proper use and installation of an NI cDAQ-9181/9191 chassis in an NI 9925 outdoor IP54 enclosure provides a minimum IP rating of IP54 from outdoor and industrial environments. An IP rating of IP54 protects against entry by dust particles and splashing water from all directions.

The two-digit ingress protection (IP) rating is defined by the IEC 60529 standard and specifies the degree to which the enclosures protects against entry of dust (represented by the first digit) and splashing water (represented by the second digit), as shown in Table 2.

Table 2. IP Ratings

1st No.	Protection Against Solid Objects	2nd No.	Protection Against Water
0	No protection	0	No protection
1	Protects against objects greater than 50 mm	1	Protects against vertically dripping water
2	Protects against objects greater than 12.5 mm	2	Protects against direct sprays up to 15° from vertical
3	Protects against objects greater than 2.5 mm	3	Protects against direct sprays up to 60° from vertical
4	Protects against objects greater than 1 mm	**4**	**Protects against direct sprays from all angles**
5	**Dust-protected (no harmful deposit)**	5	Protects against low pressure water jets
6	Dust-tight	6	Protects against high pressure water jets
		7	Immersible in water up to 1 m
		8	Immersible in water beyond 1 m

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *NI and the Environment* Web page at `ni.com/environment`. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste and Electronic Equipment, visit `ni.com/environment/weee`.

电子信息产品污染控制管理办法 （中国 RoHS）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 `ni.com/environment/rohs_china`。(For information about China RoHS compliance, go to `ni.com/environment/rohs_china`.)