



Multi-Function Display

Installation Manual

Panel Mounted MFDp

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Introduction

This document provides guidance to technicians installing a panel-mounted DigiTrak Multi-Function Display (MFDp). Please read this entire document before beginning installation. If you have questions, contact our 24/7 customer service department at the numbers listed on page ii or via email at dcj@digital-control.com.

Consult the Operator's Manual for this product for safety precautions and warnings regarding its use.



Panel-Mounted DigiTrak Multi-Function Display (MFDp)

The DigiTrak MFDp can receive signals from these families of DigiTrak receivers: F5, F2, SE, Eclipse, Mark V, and Mark III.



Power and Antenna Connections on Back of DigiTrak MFDp

Important Installation Guidelines

For best telemetry performance of the DigiTrak system, observe the following important installation guidelines:

1. Install the shortest coaxial cable length possible between the MFDp and antenna mount. Longer cable results in greater signal loss.
2. Include a small service loop if there is any possibility of strain or tension at any point along the coaxial cable. Any loops of extra coaxial cable must be compressed so they do not act as an antenna for interference. Do not bundle the cable with any other cabling. Ensure the cable does not kink after the MFDp is installed in the panel.
3. Every coaxial connection increases signal loss to some degree. Do not create any intermediate connections, such as an adapter or bulkhead pass-through, unless absolutely necessary.
4. The antenna *must* be mounted vertically (up or down) on a horizontal ground plane that is isolated from the drill rig's metal framework (see [Antenna Ground Plane Mounting Requirements](#) on page 7).
5. Install the antenna base such that the whip is at least 24" away from adjacent vertical metal structures or other RF antennas.
6. Secure the coaxial cable with zip ties or other means to prevent unnecessary vibration, chaffing, or possible loosening of connections.
7. To prevent potential damage to the antenna or connector, avoid locations where the operator's normal range of motion may bring him or her in contact with the antenna.
8. For drill rigs with no cab, mounting the antenna inside a nonmetallic cabinet provides excellent protection for the antenna and also eliminates unnecessary wind vibration during highway transit, but it is still imperative to maintain a clear line between the cabinet and the DigiTrak receiver.
9. It is acceptable to mount the 13" whip antenna upside down, but maintain the clearances mentioned in step 5 above.
10. Mount the antenna BNC fitting in a location that is fairly easily accessible, since users may need to remove the antenna at the end of every workday, especially when using the optional long whip antenna (PN 610-2520-00) for ranges beyond 1800 ft.
11. Test the mounting configuration to ensure the MFDp and DigiTrak receiver achieve a minimum line-of-sight range of 1800 ft. Note that an environmental interference such as power lines can compromise test results.



Compressed Coaxial Cable Loops



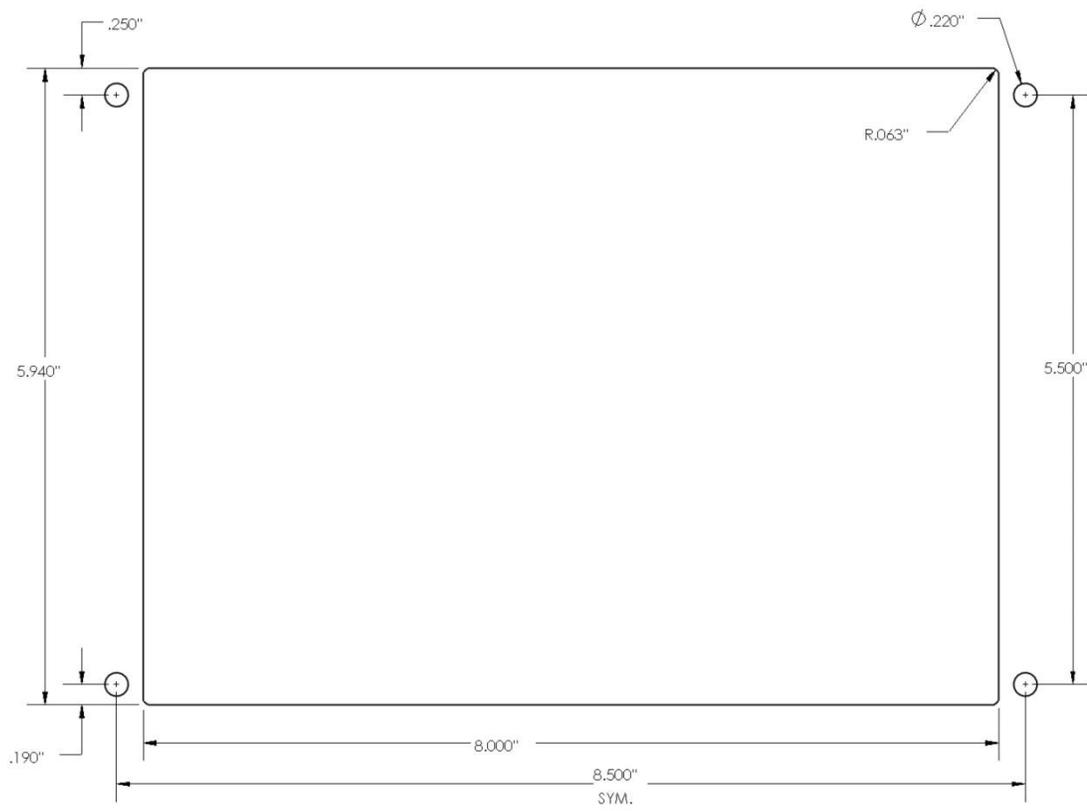
Long whip antenna



13" whip antenna

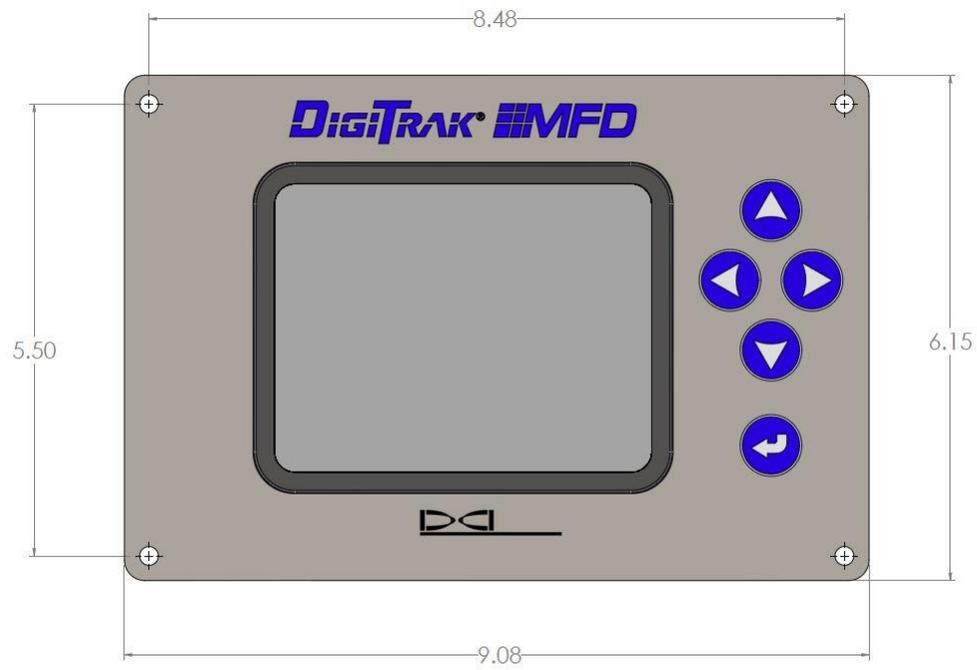
Dimensions

Panel Cutout

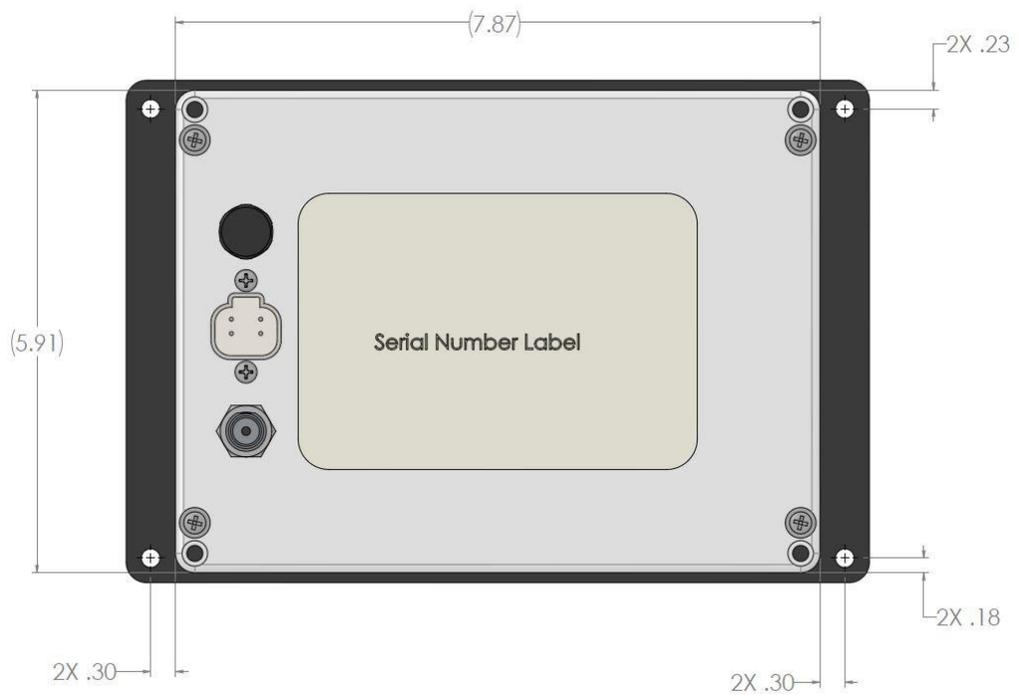


**Cutout and Fastener Holes for MFDp Mounting
(this image is not to scale)**

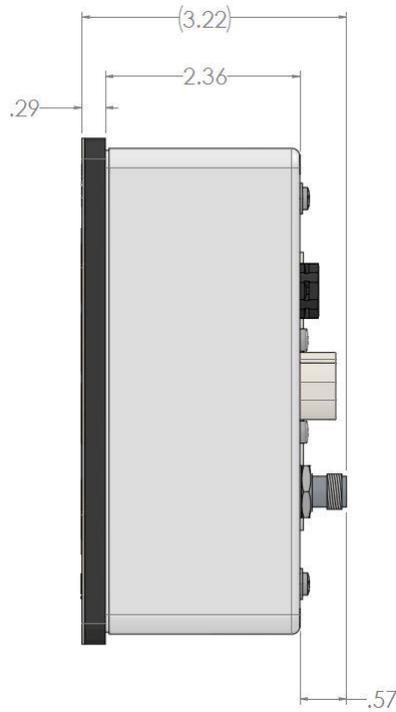
MFDp Dimensions



MFDp Dimensions, Front (in.)

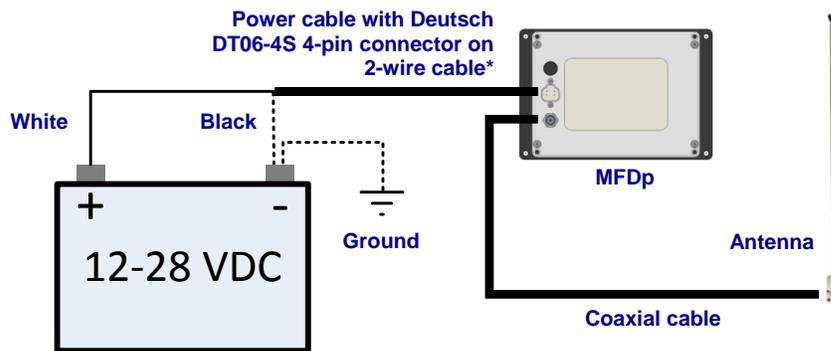


MFDp Dimensions, Rear (in.)



MFDp Dimensions, Side (in.)

Connections



Power and Antenna Connections

* This cable is available as part number 460-3825-00.

The diagram on page 9 shows how to wire the MFDp with a Multi-Function Cable Box.

Power Connections

A properly fitted 10 ft. 2-wire DC power cable (PN 460-3825-00) is available for the MFDp. If building a custom cable, take note of the following requirements.

Input Requirements

Use a male Deutsch DT06-4S 4-pin connector for the MFDp connection:



Deutsch DT06-4S 4-pin Connector on 2-Wire Cable

The power connector pin numbers molded into the cavity and printed on the back of the connector correspond to the following functions:

- Pin 1 – MFDp PWR (input power from 10-28 VDC, 3.2 W max; white wire)
- Pin 2 – MFDp GND (common ground for power and serial RS-232; black wire)
- Pin 3 – MFDp RS-232 RX
- Pin 4 – MFDp RS-232 TX

Contacts 3 and 4 are used only in conjunction with the optional [DigiTrak Multi-Function Cable Box \(MFCB\)](#) (see page 9), which is supplied with the required 4-wire power and data cable.

Power Cable Specifications

Connect directly from the MFDp to the drill rig power supply, white (+), black (-).

Minimum cable specifications are:

- 18 AWG tinned copper stranded wire
- Rated for outdoor service: resistant to oil, sunlight, and water
- Temperature rated at -40 to 105° C

DCI recommends shielded twisted pair wire for best performance. Shielding must be connected to ground at both ends.

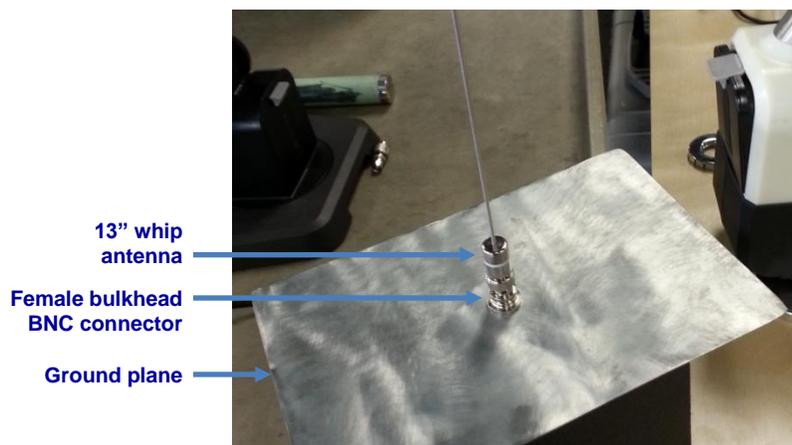
Antenna Connections

Antenna Ground Plane Mounting Requirements

Prior to installing the antenna ground plane, review the [Important Installation Guidelines](#) on page 2.

A relatively small ground plane of 10" x 12" steel or aluminum will work well. The ground plane must be electrically isolated from the drill rig's metal framework.

For drill rigs with a cab, mount the ground plane on top and near the front edge of the cab roof to ensure the best telemetry performance. Install the 50 Ohm female bulkhead BNC connector in the center of the ground plane in a manufacturer-recommended mounting hole.



50 Ohm Female Bulkhead BNC Connector Mounted in Ground Plane

The ground plane must be horizontal and the antenna must be vertical to receive the best signal from the DigiTrak receiver. Install the ground plane where the antenna will be prominent, not surrounded by other metal, and has a clear line of site to the receiver.

If using a long whip antenna, place the magnetic base as near to the center of the ground plane as possible.

Coaxial Cable Requirements

Prior to installing the coaxial cable, review the [Important Installation Guidelines](#) on page 2.

A properly fitted 3 ft. cable (PN 460-0020-00) is available for the MFDp. If building a longer cable, take note of the following requirements.



Caution Every coaxial connection increases signal loss to some degree. Do not create any intermediate connections, such as an adapter or bulkhead pass-through, unless absolutely necessary.

Install a single continuous length of RG58A/U 50 Ohm coaxial cable directly between the MFDp coaxial connector and antenna base.

Physical Characteristic	Specification
Type	RG-58A/U
Impedance Z0	50 Ω
Dielectric	Solid polyethylene
Time Delay	1.54 ns/ft
Propagation velocity	65.9% of c
Capacitance	29.6 pF/foot
Outside dimensions	0.195 in.
dB/100ft @ 400 MHz	13.2
Maximum voltage	1900 Vrms
Shield	Braid

The recommended maximum cable length is 12 feet. However, since a shorter cable length results in less signal loss, use only enough to comfortably route from the MFDp to the antenna base. Test the finished installation assembly to ensure the MFDp and DigiTrak receiver achieve a minimum line-of-sight range of 1800 ft. Note that an environmental interference such as power lines can compromise test results.



Note The coaxial cable shield must touch only the MFDp and the ground plane.

RG58A/U Coaxial Cable Assembly



Antenna Bulkhead Port Termination	MFDp Port Termination
Amphenol Connex 112202, 50 Ohm Female BNC Bulkhead (or equivalent)	Amphenol Connex 122108, 50 Ohm male TNC (or equivalent)

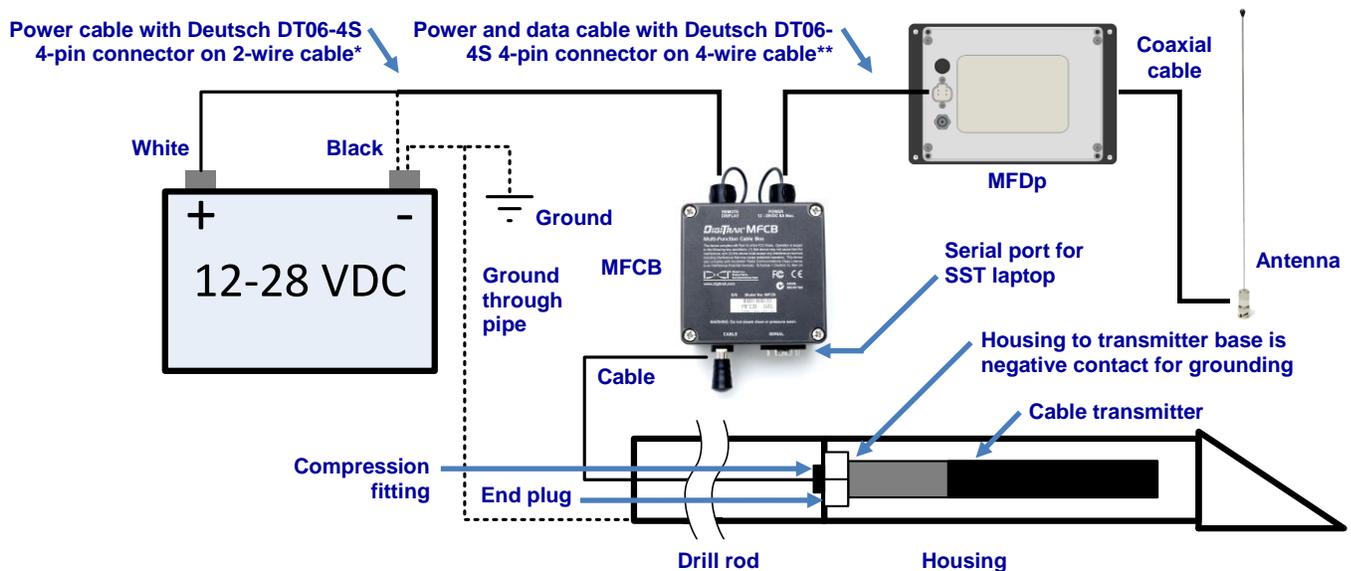
The bulkhead BNC termination accepts both the 13 in. wire whip antenna and optional long whip antenna BNC plug connectors.

DigiTrak Multi-Function Cable Box (MFCB)

Using the MFDp with an optional cable transmitter is not possible with the 2-wire power cable shown in [Power Connections](#) on page 6. The DigiTrak Multi-Function Cable Box (MFCB) includes a 4-wire power and data cable (PN 460-0002-00) with Souriau and Deutsch fittings for connecting the DigiTrak MFDp directly to the MFCB, which provides both the data signal and power to the MFDp. For more information, download the MFCB manual from the DigiTrak [website](#).



Multi-Function Cable Box (MFCB) and 4-Wire Cable



MFDp Connections When Using the MFCB

* This cable is available as part number 460-3825-00.

** This cable, part number 460-0002-00, is supplied with the MFCB.