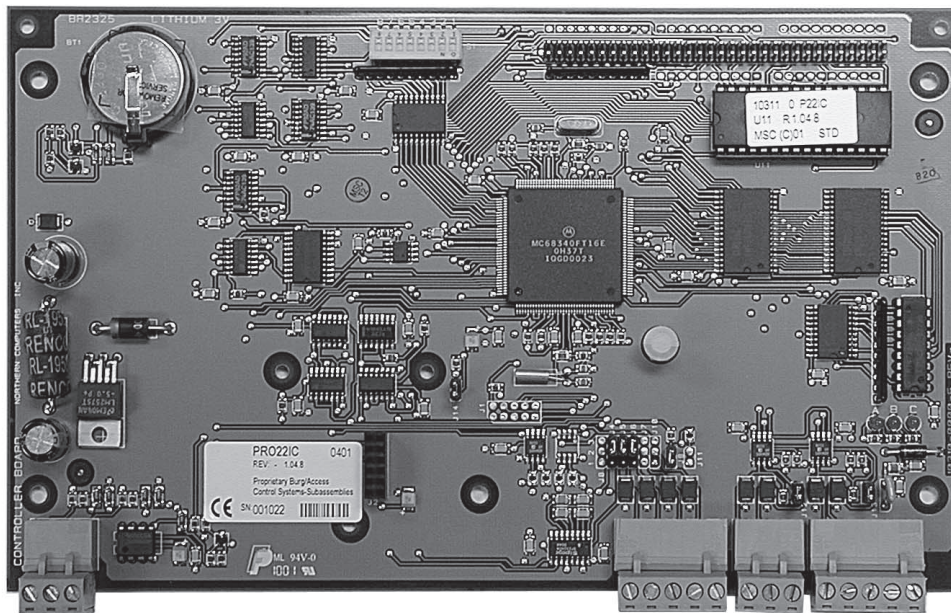

PRO-2200 Intelligent Controller Installation Manual

Part Number: PRO22IC



Honeywell

TD1146 rev0501

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Warnings and Cautions

WARNING



Before installation, **TURN OFF** the external circuit breaker which supplies power to the system.

Before connecting the device to the power supply, verify that the output voltage is within specifications of the power supply.

Do not apply power to the system until **after** the installation has been completed.

Personal injury or death could occur, and the equipment could be damaged beyond repair, if these WARNINGS are not observed!

WARNING



Fire Safety and Liability Notice

Never connect card readers to any critical entry, exit door, barrier, elevator or gate without providing **an alternative exit** in accordance with all fire and life safety codes pertinent to the installation. These fire and safety codes vary from city to city and you must get approval from local fire officials whenever using an electronic product to control a door or other barrier. Use of egress buttons, for example, may be illegal in some cities. In most applications, single action exit without prior knowledge of what to do is a life safety requirement. Always make certain that any required approvals are obtained in writing. **DO NOT ACCEPT VERBAL APPROVALS, THEY ARE NOT VALID.**

Engineered Systems never recommends using the PRO-2200 or related products for use as a primary warning or monitoring system. Primary warning or monitoring systems should always meet local fire and safety code requirements. The installer must also test the system on a regular basis by instructing the end user in appropriate daily testing procedures. Failure to test a system regularly could make installer liable for damages to the end user if a problem occurs.

WARNING



EARTH ground all enclosures, for proper installation.

WARNING



Use suppressors on all door strikes. Use S-4 suppressors for installation. Engineered Systems Group recommends only DC strikes.

CAUTION

IF ANY DAMAGE TO THE SHIPMENT IS NOTICED, A CLAIM MUST BE FILED WITH THE COMMERCIAL CARRIER RESPONSIBLE.

CAUTION

Electro-static discharge can damage CMOS integrated circuits and modules.

To prevent damage always follow these procedures:

Use static shield packaging and containers to transport all electronic components, including completed reader assemblies.

Handle all ESD sensitive components at an approved static controlled workstation. These workstations consist of a desk mat, floor mat and an ESD wrist strap. Workstations are available from various vendors.

NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTICE

This document and the data in it shall not be duplicated, used or disclosed to others for procurement or manufacture, except as authorized by and with the written permission of, Engineering Systems. The information contained in this document or in the product itself is considered the exclusive property and trade secrets of Engineering Systems. Copyright laws of the United States protect all information in this document or in the software product itself.

NOTICE

Any use of this product is subject to the terms and acceptance of the Engineering Systems Software Agreement. Please request a copy from Engineering Systems, and review the agreement carefully.

Disclaimer

Product Liability; Mutual Indemnification

In the event that a Customer receives a claim that a Product or any component thereof has caused personal injury or damage to property of others, Customer shall immediately notify Engineering Systems in writing of all such claims. Engineering Systems shall defend or settle such claims and shall indemnify and hold Customer harmless for any costs or damages including reasonable attorneys' fees which Customer may be required to pay as a result of the defective Product or the negligence of Engineering Systems, its agents, or its employees.

Customer shall hold harmless and indemnify Engineering Systems from and against all claims, demands, losses and liability arising out of damage to property or injury to persons occasioned by or in connection with the acts or omissions of Customer and its agents and employees, and from and against all claims, demands, losses and liability for costs of fees, including reasonable attorneys' fees, in connection therewith.

Unpacking Procedure

CAUTION

If any damage to the shipment is noticed before unpacking, a claim must be filed with the commercial carrier.

All containers should be opened and unpacked carefully in order to prevent damage to the contents.

The following steps are used to unpack equipment in preparation for installation:

1. Open the container and remove the unit(s) and all packing material. Retain the container and all packing materials. They may be used again for reshipment of the equipment, if needed.
2. Inspect the contents for shortage. If items are missing items, contact the order entry department at 800-323-4576.
3. Visually check contents. If damage is discovered, perform the following:

If shipping caused damage to the unit, a claim must be filed with the commercial carrier.

If any other defect is apparent, call 800-323-4576 for a return authorization.

Shipping Instructions

To ship equipment back to Engineering Systems:

1. Contact the customer service department before returning equipment at 800-323-4576. When calling please have available:
 - A description of the problem or reason for returning the equipment.
 - Original purchase order number, invoice number and if the unit is under warranty.
 - A new purchase order number if the unit is not under warranty.
2. Obtain the Return Authorization Number (RMA) from the customer service department at 800-323-4576.
3. Show the RMA number on all packages shipped. Packages, which are not marked with an RMA number will be refused at the factory and returned **COD**.
4. Carefully pack the equipment for shipment. Use the original packing material whenever possible.

Limited Warranty

All Products sold or licensed by Engineering Systems include a warranty registration card which must be completed and returned to Engineering Systems by or on behalf of the end user in order for Engineering Systems to provide warranty service, repair, credit or exchange. All warranty work shall be handled through the Customer which shall notify Engineering Systems and apply for a Return Merchandise Authorization (RMA) number prior to returning any Product for service, repair, credit or exchange. Engineering Systems warrants that its Products shall be free from defects in materials and workmanship for a period of two years from date of shipment of the Product to Customer. The warranty on Terminals, Printers, Communications Products and Upgrade kits is 90 days from date of shipment. Satisfaction of this warranty shall be limited to repair or replacement of Products which are defective or defective under normal use. Engineering Systems' warranty shall not extend to any Product which, upon examination, is determined to be defective as a result of misuse, improper storage, incorrect installation, operation or maintenance, alteration, modification, accident or unusual deterioration of the Product due to physical environments in excess of the limits set forth in Product manuals. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THIS PROVISION. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. NO REPRESENTATION OR WARRANTY OF THE DISTRIBUTOR SHALL EXTEND THE LIABILITY OR RESPONSIBILITY OF THE MANUFACTURER BEYOND THE TERMS OF THIS PROVISION. IN NO EVENT SHALL ENGINEERING SYSTEMS BE LIABLE FOR ANY RE-PROCUREMENT COSTS, LOSS OF PROFITS, LOSS OF USE, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES TO ANY PERSON RESULTING FROM THE USE OF ENGINEERING SYSTEMS' PRODUCTS.

Confidentiality

All software, drawings, diagrams, specifications, catalogs, literature, manuals and other materials furnished by Engineering Systems relating to the design, use and service of the Products shall remain confidential and shall constitute proprietary rights of Engineering Systems and Customer agrees to treat such information as confidential. Customer shall acquire no rights in the design of the Products or the related materials except to use such information solely for the purpose of and only during the time it sells the Products.

Customer shall not copy the design of any of the Products or use or cause to be used any Product design or related materials for its own benefit or for the benefit of any other party.

The covenants contained in this section shall remain effective throughout the term of this Agreement and thereafter unless specifically waived by Engineering Systems in writing.

Description

The Intelligent Controller is the heart of the PRO-2200 and provides the real time processing for the connected I/O interfaces. It holds the database for the subsystem configuration and card holders, and the event log buffer in battery-backed memory.

Port 1 provides the standard connection to the host computer.

1. **Port 1** may be set up as an RS-232 interface or an RS-485 interface. An optional interface board (PRO22EN) converts the RS-232 output of port 1 into an Ethernet port capable of supporting TCP/IP. If this interface board is present, this port must be set up as an RS-232 interface and Jumper J-14 must be removed.

2. **Ports 2 & 3** are RS-485 interfaces.

An on-board real time clock maintains the date and time, taking into account leap year and accounting for global time zones and daylight savings time changes. The program is stored in FLASH memory and may be downloaded through a serial port, allowing the program to be changed without physically changing board components.

Set Up

The controller hardware is configured with jumpers and a set of eight switches. These jumpers/switches setup the memory chip size, port interface, end of line termination, controller address, and baud rate. Please refer to the tables.

Jumper Settings:

JUMPERS	SET AT	SELECTED
J4,5,6	2-3	PORT 1 IS RS-232
	1-2	PORT 1 IS RS-485
J14	OFF	PORT 1 IS ETHERNET, COBOX MICRO
	ON	PORT 1 IS RS-232 OR RS-485
J9	OFF	PORT 1 RS-485 EOL TERMINATOR IS NOT ON
	ON	PORT 1 RS-485 EOL TERMINATOR IS ON
J12	OFF	PORT 2 RS-485 EOL TERMINATOR IS NOT ON
	ON	PORT 2 RS-485 EOL TERMINATOR IS ON
J13	OFF	PORT 3 RS-485 EOL TERMINATOR IS NOT ON
	ON	PORT 3 RS-485 EOL TERMINATOR IS ON

DIP Switch Settings:

S8	S7	S6	S5	S4	S3	S2	S1	SELECTION
				OFF	OFF	OFF	ON	ADDRESS 1
				OFF	OFF	ON	OFF	ADDRESS 2
				OFF	OFF	ON	ON	ADDRESS 3
				OFF	ON	OFF	OFF	ADDRESS 4
				OFF	ON	OFF	ON	ADDRESS 5
				OFF	ON	ON	OFF	ADDRESS 6
				OFF	ON	ON	ON	ADDRESS 7
				OFF	OFF	OFF	OFF	ADDRESS 8
			OFF					PORT 1: NO HARDWARE FLOW CONTROL
			ON					PORT 1: HARDWARE FLOW CONTROL
	OFF	OFF						115.2K BPS
	OFF	ON						9,600 BPS
	ON	OFF						19,200 BPS
	ON	ON						38,400 BPS
OFF								NO PASSWORD
ON								PASSWORD LOGON REQUIRED

LED Operation

The controller uses three on-board LEDs to provide status information during its power-up sequence and normal operation.

MODE	LED A	LED B	LED C	DESCRIPTION
Power-up Sequence	ON	OFF	OFF	Start Power-up, hardware setup
	OFF	ON	ON	Testing RAM and Clearing Database (approx. 5 sec./MB)
	OFF	ON	OFF	Testing RAM and NOT Clearing Database (approx. 5 sec./MB) database is O.K.
	ON	ON	ON	Power-up complete, held for 1 second
Normal Operation	FLASH			This LED has a faint flicker and should flash once every second when system is active.
		FLASH		Flash when there is activity on Host Port 1
			FLASH	Flash when there is activity on I/O Port. (Ports 2 & 3)

Power

The controller accepts 12 VDC with an operating range of 10 to 16 VDC and consumes 400mA of current.

Locate power source as close to this board as possible. Connect power with minimum of 18AWG wires.

The addition of the PRO22EN consumes an extra 150 mA of current.

The addition of the PRO22M4 consumes less than 1 mA of extra current.

NOTE: *POLARITY for 12 VDC power is important. Make sure the +12 VDC is connected to the terminal labeled +12V and the return is connected to the terminal labeled GND.*

Communications

The controller communicates to the host through port 1.

Port 1 may use one of three communications specifications:

RS-232—When this port is selected as an RS-232 interface, the communication is a direct point to point connection to a host computer port (only one PRO22IC per computer port), via direct connection or modem and this device acts as Data Terminal Equipment (DTE).

RS-485—When this port is selected as an RS-485 interface, up to eight controller boards can share one host computer port.

Ethernet—When the Ethernet option board is present, the port is set to the RS-232 setting and DIP switch 5 must be set to ON (handshaking enabled, along with JP14 removed).

The default selection for port 1 is RS-485. The default speed of this port is 38.4Kbps but it can be downgraded to 19.2Kbps or 9.6Kbps if the line conditions or receiving equipment require it (see jumper and DIP switch settings).

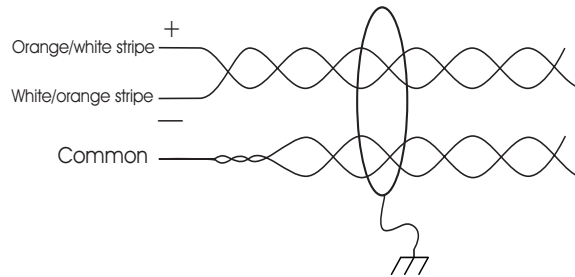
Ports 2 & 3 are RS-485 interfaces. These interfaces allow multi-drop communication up to 4,000 feet (1,250 m total per port). Use two twisted pairs (120Ω, 23pF minimum 24 AWG) with shield for the communication. Install termination jumper only for end of line unit. The default speed of each port is 38.4Kbps but can be downgraded to 19.2Kbps or 9.6Kbps if the line conditions or receiving equipment require it (see jumper and DIP switch settings). Up to eight boards can be connected in any combination to ports 2 and 3.

For Wiring to an RS-232 port:

1. TXD indicates Transmit and is the conductor of data from PRO22IC to another device.
2. RXD indicates Receive and is the conductor of data from another device to the PRO22IC.
3. RTS indicates Request To Send and conducts the signal that the PRO22IC has data to send.
4. CTS indicates Clear To Send and conducts the signal that another device is ready for data.
5. GND is the signal ground. The wiring for this signal is required and **NOT** optional. This signal must **NOT** be tied to Chassis Ground.
6. Use 24 AWG shielded cable up to 25 feet.

For Wiring to an RS-485 port:

1. TR+ is the plus side of the transmit and receive differential signal.
2. TR– is the negative side of the transmit and receive differential signal.
3. GND is the signal ground. The wiring for this signal is required and **NOT** optional. This signal must **NOT** be tied to Chassis Ground.
4. Use 24 AWG low capacitance, two twisted-pair, shielded cable (Belden 9842 or equivalent).



Note: For N-485 Communication Connections, twist the blue pair together and use as the common; use the orange pair as your data pair, observing polarity. Connect the external drain shield to the appropriate earth ground on one end.

5. When daisy-chaining RS-485 ports together connect the TR+ wires from the upstream and downstream boards to the TR+ terminal and likewise, connect the TR– wires from the upstream and downstream boards to the TR– terminal.

The Ethernet adapter board provides an RJ-45 connection for the network. See the installation guide for the PRO22EN for instructions on mounting and connecting the board to the PRO22IC

Alarm Inputs

The two alarm inputs on this board are dedicated to the detection of cabinet tamper and power fault monitoring. The normal (non-alarm) condition is closed contact. If these inputs are not used, install a shorting wire between the signal terminal and the GND terminal to simulate the non-alarm state. As the wiring between the alarm sensor and the input terminals is typically contained within one enclosure, these inputs are not supervised.

Memory Backup Battery

A 3V Lithium battery backs up the configuration data and the event buffer. This battery should be replaced annually or sooner if the cabinet is subjected to unusually high temperatures.

Mounting Options

This board can be mounted on-edge in the rack-mount enclosure provided by Engineering Systems or it can be mounted flat against any surface using standoffs under the mounting holes provided in each of the four corners of this board. The functionality of this board does not change with the mounting selection.

Suggested Installation Sequence

1. Set Jumpers and the DIP-switch per this installation guide.
2. Install the PRO22EN and/or PRO22M4 option boards per the appropriate installation guide.
3. Mount this board in the appropriate enclosure—If this board is being mounted in a rack the component side of the board is on right when facing the rack.
4. Connect the communications and power supply to the circuit boards with the Power Supply Harness.

WARNING: DO NOT CONNECT THE POWER SUPPLY TO THE AC SOCKET UNTIL ALL WIRING HAS BEEN INSTALLED AND RECHECKED.

5. Connect wiring to alarm input sensors or install jumper wire as appropriate.
6. Connect communications wiring to I/O boards as appropriate.
7. Recheck wiring for correct connections and continuity.
8. Run communication wiring to PC, central station, modem or printer.
9. Recheck communication wiring for correct connections and continuity.
10. Connect the Power Supply Cord for proper connections and power.
11. Setup the panel controls using the host software.

Note: You may install a map of eight boards per Intelligent Controller. It is recommended for maximum performance, that the I/O Reader boards be installed in a configuration that doesn't exceed eight boards per port.

Specification Summary

The controller is for use in low voltage, class 2 circuit only.

Primary power:

DC input 12 VDC $\pm 10\%$, 400mA (550mA with PRO22EN)(401mA with PRO22M4)

Memory and Clock Backup:

3 V Lithium, type BR2325

Data memory:

1Mb standard (4Mb with optional memory module, J3)

Ports:

- | | |
|-----|--|
| 1 | RS-232 or RS-485 (9,600 to 38,400 BPS, asynchronous) – optional Ethernet board |
| 2-3 | RS-485 (9,600 to 38,400 BPS, asynchronous) |

Inputs:

two non-supervised, dedicated function (Tamper and Power Fail Detect)

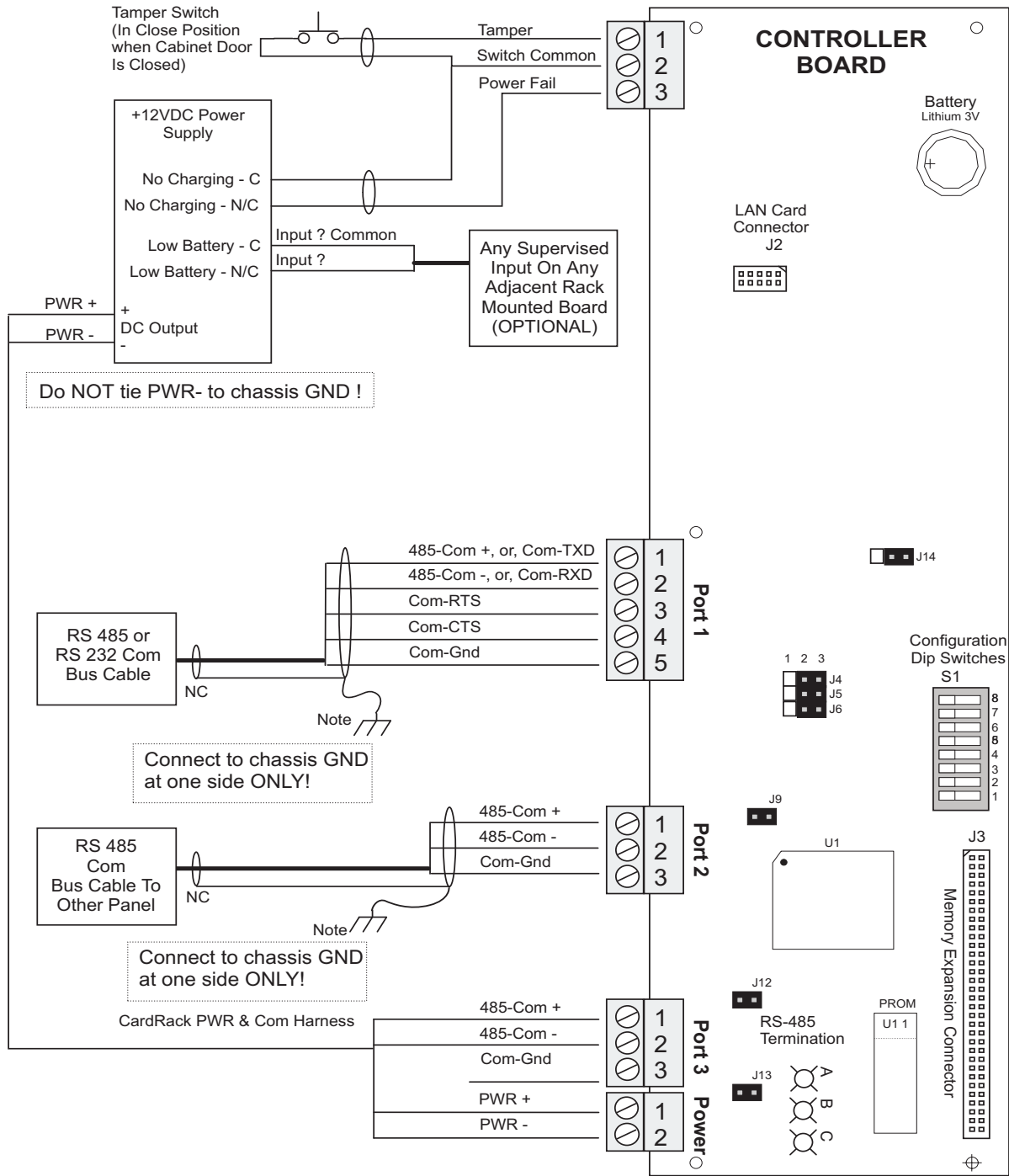
Wire requirements:

Power	1 twisted pair, 18 AWG
RS-485 24 AWG	4,000 ft (1,200m) max, 2 twisted pair(s) with shield (120 Ω , 23pF, Belden 9842 or equivalent)
RS-232 24 AWG	25 ft (7.6m) max.
Alarm Input	1 twisted pair, 30 ohms max.

Environmental:

Temperature	0 to 49 °C, operating -55 to +85 °C, storage
Humidity	0 to 85% RHNC

Wiring Diagram



Note: For N-485 Communication Connections, twist the blue pair together and use as the common; use the orange pair as your data pair, observing polarity. Connect the external drain shield to the appropriate earth ground on one end.

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