

This document is intended as a reference guide for installing and using a BENDER IRDH575 ground fault detector. This document includes installation, setup, and usage instructions. For complete details, including installation, setup, settings, and troubleshooting, refer to the IRDH575 user manual, document number TGH1364en. This document is intended as a supplement and not a replacement to the complete user manual.

Only qualified maintenance personnel shall operate or service this equipment. These instructions should not be viewed as sufficient for those who are not otherwise qualified to operate or service this equipment. This document is intended to provide accurate information only. No responsibility is assumed by BENDER for any consequences arising from use of this document.



Installation

System Requirements

Properly implementing an installed ground fault location system requires multiple components. The types of components used vary depending on the type of system. Ensure that you have the correct components in one of the combinations listed below:

Type 1: Standard distribution systems

- IRDH575 series ground fault detector, with location signal set between 10 mA and 25 mA, qty. 1
- EDS460 / EDS490 series ground fault location module, qty. dependent on number of monitored branches
- One BENDER current transformer per branch of these types: W20, W35, W60, W120, W210

Type 2: Small distribution systems

- IRDH575 series ground fault detector, with location signal set no higher than 2.5 mA; Qty. 1
- EDS461 / EDS491 series ground fault location module, qty. dependent on number of monitored branches
- One of the following BENDER current transformers per branch: W20-8000, W35-8000, W60-8000

Alternatively, EDS3090 series portable location systems may be used with the IRDH575. Refer to EDS3090 series documentation for more information.

Mounting

The IRDH575 is a panel-mounted device. When mounting, use a cutout of 5.4" x 3.5" (138 mm x 90 mm).

Wiring

See figure 1 for basic wiring schematic. The IRDH575 uses plug-in terminals located on the back of the device. See section "Wiring - RS-485" on additional requirements for wiring to EDS series ground fault location modules. Use minimum AWG 24, maximum AWG 12 wire. For more information, refer to the IRDH575 user manual and EDS series user manual.

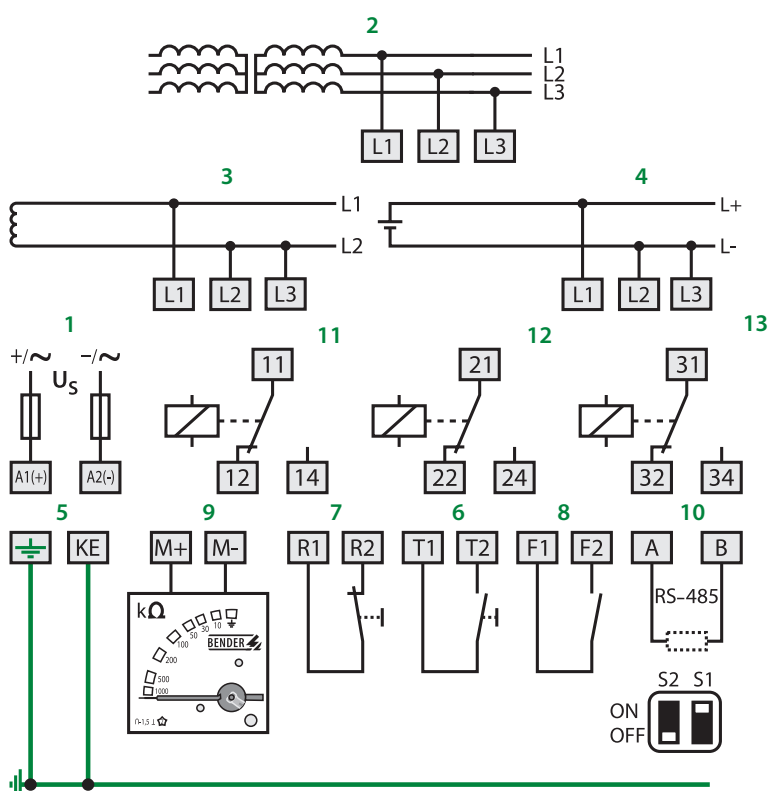
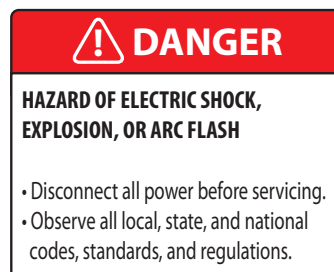


Figure 1 - IRDH575 wiring diagram

- | | |
|--|--|
| 1. External supply voltage; 6A fuse recommended for internal device protection | 9. Analog outputs: 0... 400 μ A on standard version, 0/4... 20 mA on "B" version |
| 2. Connection to three-phase AC system | 10. RS-485 interface |
| 3. Connection to single-phase AC system | 11. Alarm relay K1: SPDT contact |
| 4. Connection to DC system | 12. Alarm relay K2: SPDT contact |
| 5. Equipment ground connection | 13. Alarm relay K3: SPDT contact |
| 6. External TEST terminal, N/O contact | |
| 7. External RESET terminal, N/O contact | |
| 8. STANDBY terminals: Closing F1/F2 will stop measurements | |

Wiring - EDS modules

EDS460 and EDS490 series ground fault location devices work with the IRDH575 to locate ground faults on ungrounded systems. Refer to EDS series user manual (document TGH-1420en) and EDS series installation bulletin (document NAE1018070) for information on installing EDS series modules.

Wiring - RS-485

Minimum RS-485 Requirements

For proper operation of automatic ground fault location, an RS-485 connection is required between the ground fault detector and the EDS module(s). All devices shall be wired in series with each other via each device's "A" and "B" terminals. Devices at the beginning and end of the chain require a 120 Ω termination resistor. Most devices have a switch to activate the termination resistor. Refer to the respective device's user manual for more information. Refer to figure 2 for a sample diagram.

Communication Bus Address Settings

Each device must be set with a unique communication bus address. Refer to the reverse side of this document for setting the address on EDS modules. Refer to the respective device's documentation for setting the address on other devices.

Expanding Communication Bus

Multiple BENDER ground fault location systems, along with other select BENDER equipment, may be interconnected via RS-485. Only the first and last devices in the completed communication bus require termination resistors.

Repeater Requirements

For every 3900 ft (1200 m) OR for every 32 connected devices (whichever comes first), an RS-485 repeater (mfr. P/N DI-1PSM) is required to be installed.

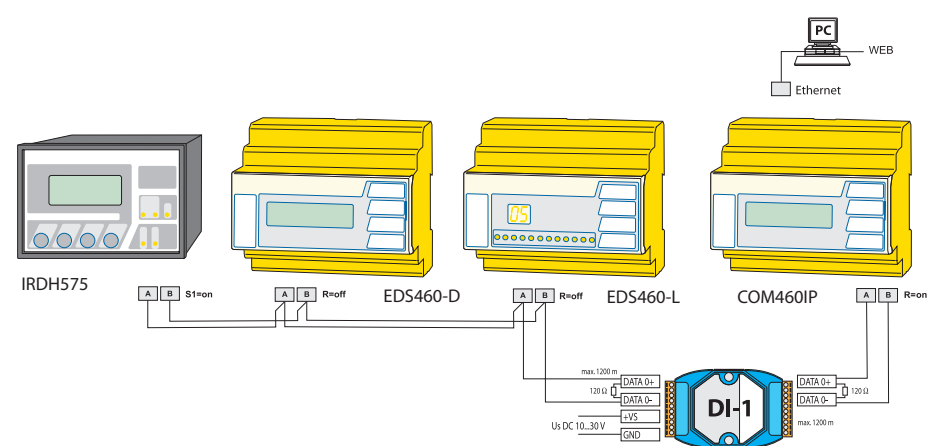
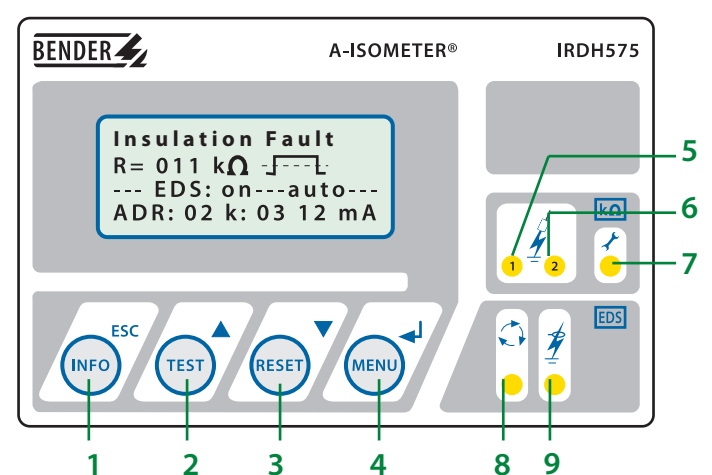


Figure 2 - Sample RS-485 wiring with IRDH575, EDS modules, and COM460IP Ethernet gateway

Front Panel Display



- | | |
|--|---|
| 1. INFO / ESC key: Displays system information / goes back a step in menu | 5. LED "ALARM 1": Illuminates when alarm 1 is active. |
| 2. TEST / UP key: Initiates self-test / moves up in menu | 6. LED "ALARM 2": Illuminates when alarm 2 is active. |
| 3. RESET / DOWN key: Resets device when latching mode is active / moves down in menu | 7. LED "ERROR": Illuminates when a device error has occurred. |
| 4. MENU / ENTER key: Opens the main menu / confirms changes in menu | 8. LED "EDS ACTIVE": Indicates when fault location has been activated. |
| 5. LED "ALARM 1": Illuminates when alarm | 9. LED "EDS ALARM": Indicates when an alarm is active on a connected EDS. |

Menu Structure Flow Chart

Figure 5 shows the structure of the menu built into the IRDH575. The menu is used for viewing alarms, viewing the status of the system, and making any necessary settings changes. Use the supplied gray boxes to take note of applied settings for future reference.

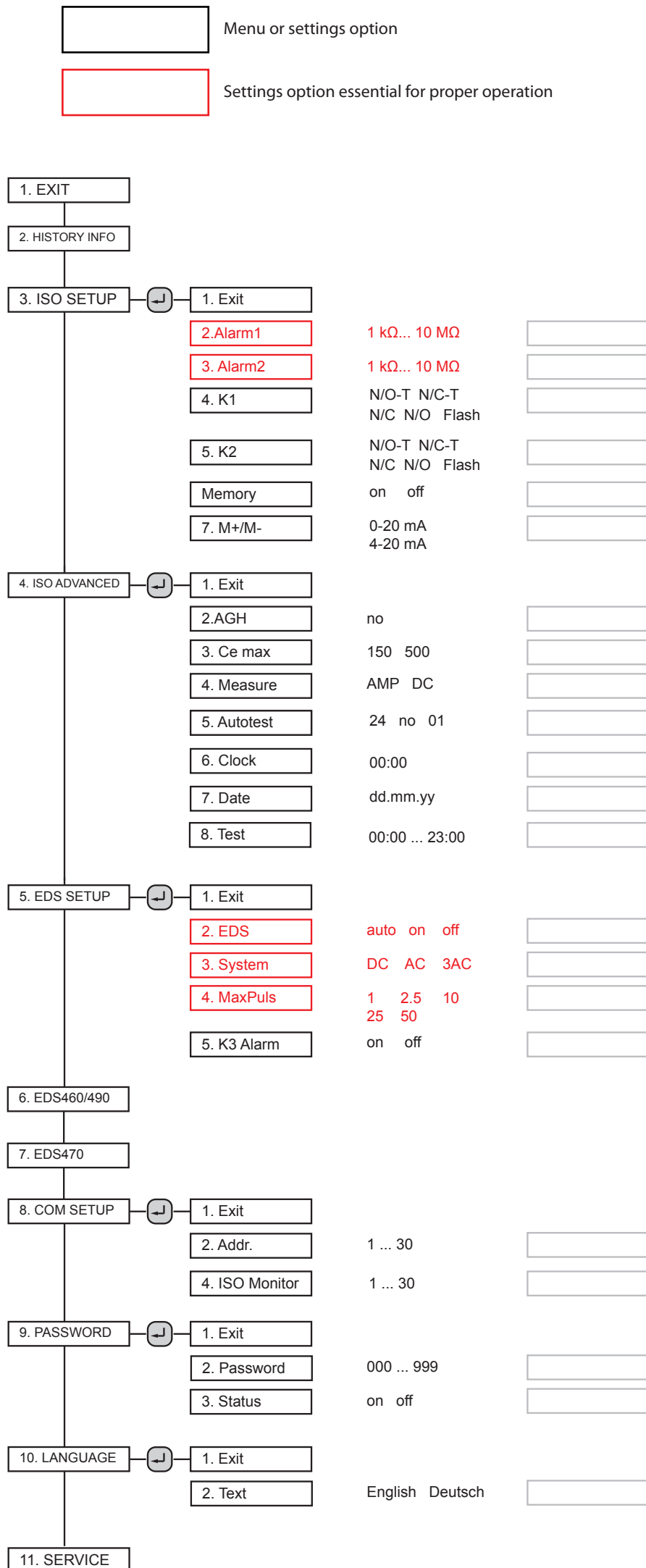


Figure 5 - IRDH575 menu flow chart

Using the Fault Location System

Using EDS460 / EDS490 Location Devices (Installed System)

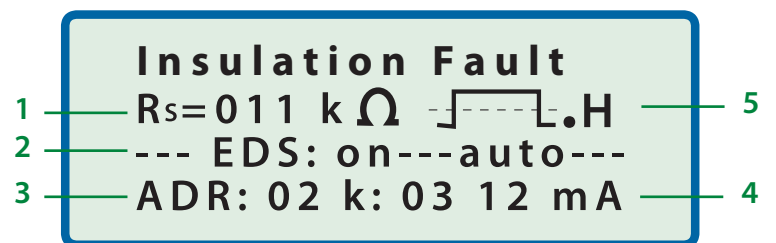
Most ground fault location processes will be automated when connecting the IRDH575 and supported EDS modules via RS-485. When the IRDH575 detects a ground fault in the system, the location system will automatically activate. The IRDH575 will superimpose a tracer signal onto the circuit. This tracer signal naturally flows through the ground fault, back to the IRDH575. Connected EDS modules will monitor each branch of the circuit for this tracer signal, and alarm when it is found.

The address and location of the faulty branch will be reported on the screens of both the EDS module(s) ("D" versions only) and the IRDH575. The mA value shown indicates the strength of the tracer signal found. Refer to EDS460 / EDS490 series user manual and installation bulletin for more information.

Using EDS3090 Location Kit (Portable System)

Refer to EDS3090 series user manual and installation bulletin for general procedures on using the portable location system.

IRDH575 Display During Fault Location



- Insulation resistance reading: "s" is displayed when a new reading is acquired
- Status of fault location: "On" indicates fault location is currently active.
- Displays when EDS has located fault. "ADR" indicates address of EDS device. "k" indicates branch number in alarm.
- Magnitude of tracer signal located
- "H" displays when a new record has been added to the IRDH575's history memory

Device Setup Tips

- Ensure that all menu options in red in the menu structure flow chart are set correctly. Incorrect settings may lead to improper readings.
- Menu options "EDS460/490" and "EDS470" may be used to remotely configure EDS modules connected via RS-485. This is optional for "D" models but mandatory for configuring "L" models. Consult the EDS series user manual for more information.
- When connected to EDS modules via RS-485, menu option EDS SETUP > EDS must be set to "auto" for proper automatic ground fault location.
- Setting EDS SETUP > MaxPuls MUST be set correctly for the corresponding connected EDS modules. See below:
 - When using EDS460 or EDS490 modules, set MaxPuls to 10 or 25 mA.
 - When using EDS461 or EDS491 modules, set MaxPuls to 1 or 2.5 mA.

Analog Outputs

IRDH575 models feature a 0 - 20 mA or 4 - 20 mA output, selectable in the main menu under ISO SETUP > M+/M-. For integrating the analog outputs into control systems, refer to the equations below for the type of analog output being used.

0 - 20 mA output

$$R_F = \frac{20 \text{ mA} \times 120 \text{ k}\Omega}{I} - 120 \text{ k}\Omega$$

R_F Insulation resistance in kΩ
 I Current output in mA

4 - 20 mA output

$$R_F = \frac{16 \text{ mA} \times 120 \text{ k}\Omega}{I - 4 \text{ mA}} - 120 \text{ k}\Omega$$

R_F Insulation resistance in kΩ
 I Current output in mA

Technical Data

Refer to IRDH575 series user manual (document TGH1364en) or IRDH575 series datasheet (document NAE1012050) for detailed technical information.