

DLD16



Alarm Unit for DLD250 Distance to Water Leak Sensor Installation and Operation Manual

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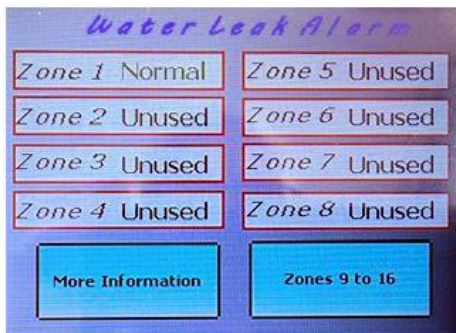
1) System Overview

For a complete description of the system, refer to the DLD250 Manual.

The DLD16 Alarm Unit is designed to monitor up to 16 DLD leak detection sensors. Each sensor continuously reports its status to the alarm unit and can detect:

- Water leaks
- Sensor faults
- Sensor disconnections

When the DLD16 is powered on, it displays a startup screen (see below) while it interrogates all connected DLD250 sensors and checks their current status.



Normal Operation

If no leaks or faults are detected, the display will show all zones as NORMAL (Screen 1).

Water Leak Alarm

If a water leak is detected by any DLD250 sensor, the display changes to the alarm screen (Screen 3). At the same time:

- The internal New Alarm relay changes state.
- The Common Alarm relay changes state.
- The internal audible alarm sounds.
- If fitted, the optional remote sounder/beacon activates.
- If fitted, the optional SMS notification system sends a text message.
- If fitted, the optional individual BMS relay operates.

Muting an Alarm

Pressing the Mute button will:

- Return the display to the normal screen (Screen 1).
- Show ALARM beside the affected zone number.
- Silence the internal audible alarm.
- De-energise the New Alarm relay.
- Leave the Common Alarm relay energised.
- If fitted, stop the remote sounder while leaving the beacon flashing.

The source of the leak can then be located by checking the sensor in alarm. The sensor displays the distance to the leak in metres.

Note: The distance is measured from the sensor itself, not from the DLD16 alarm unit. Refer to the DLD250 Manual for further details.

Once the water has been removed and the alarm has been muted, the system will automatically reset and return to normal operation.

If the alarmed zone is between 9 and 16, press the Zones 9–16 button to view it.

Sensor Faults and Disconnections

The DLD16 continuously monitors all connected sensors for faults and communication failures.

If a fault or sensor disconnection is detected:

- The display changes to the fault screen (Screen 2).
- The internal audible alarm sounds.
- The Common Fault relay energises.
- The New Alarm relay energises.

Muting a Fault

Pressing the Mute button will:

- Return the display to the normal screen.
- Show the fault message next to the affected zone.
- Silence the internal audible alarm.
- De-energise the New Alarm relay.

Once the fault has been corrected, and provided the fault has been muted, the system will automatically return to normal operation.

If the affected zone is between 9 and 16, press the Zones 9–16 button to view it.

Communication Status Indicators

Each DLD250 sensor contains an internal indicator labelled Active. This indicator can be viewed by carefully removing the four screws securing the sensor cover.

The Active indicator confirms communication between the sensor and the DLD16 alarm unit and should flash approximately every 16–20 seconds.

A similar Active indicator is provided inside the DLD16 alarm unit. This flashes at a faster rate and confirms normal communication with connected sensors.

These indicators are intended to assist with fault-finding on the RS485 communication network.

More Information Screen

The alarm unit includes a More Information button (Screen 4).

Pressing this button displays:

- The number of outstations (DLD250 sensors) expected by the system.
- The last zone to enter a Water Detected alarm condition.
- The last zone to report a fault.
- The last outstation that went offline.

Press the **Home** button to return to the main screen.

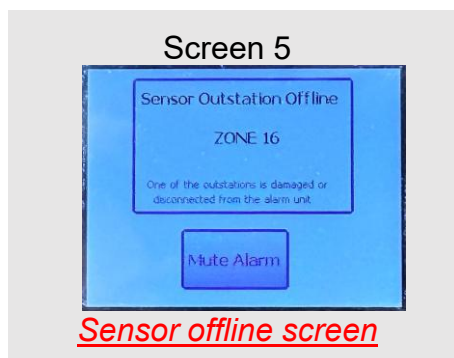
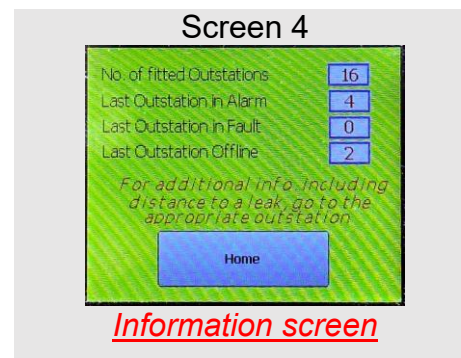
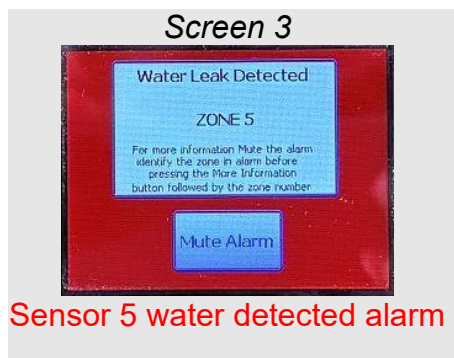
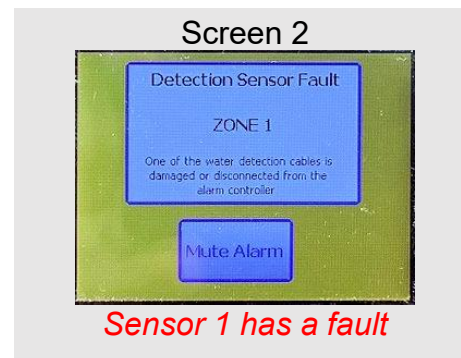
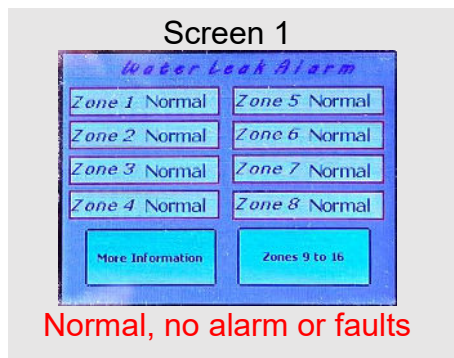
Alarm and Fault Timings

The following figures represent the maximum average response times for a system configured with 16 DLD250 sensors.

Note: These values were correct at the time of publication and may change as a result of future firmware updates.

Water leak detected.....	14 seconds
Cable Fault.....	8 seconds
Sensor offline.....	56 seconds

2) Screen Display



3) Water Detected Alarm

When a sensor detection cable comes into contact with water at any point along its length:

- The audible alarm will sound.
- The New Alarm and Common Alarm relays will energise.
- The display will show the Water Detection Alarm screen (Screen 3 above) and identify the affected zone.

To silence the audible alarm, press Mute Alarm.

After muting:

- The display will return to the normal operating screen (Screen 1 above).
- If the alarm is on Zone 9–16, press the Zones 9–16 button to view the alarmed zone.
- The alarm condition will remain active until the water is removed from the detection cable.

The sensor display will indicate the estimated distance from the sensor to the leak location. Refer to the DLD250 Manual for further details.

4) Offline Alarm

If a sensor loses communication with the alarm unit:

- The audible alarm will sound.
- The Common Fault and New Alarm relays will energise.
- The display will show the Offline Alarm screen (Screen 5 above) and identify the affected zone.

To silence the audible alarm, press Mute Alarm.

After muting:

- The display will return to the normal operating screen (Screen 1 above).
- The New Alarm relay will de-energise.
- If the affected zone is Zone 9–16, press the Zones 9–16 button to view the alarm status.

The fault condition will remain active until communication with the sensor is restored.

5) Sensor Fault Alarm

If a sensor detection cable becomes damaged or disconnected:

- The audible alarm will sound.
- The Common Fault and New Alarm relays will energise.
- The display will show the Sensor Fault screen (Screen2 above) and identify the affected zone.

To silence the audible alarm, press Mute Alarm.

After muting:

- The display will return to the normal operating screen (Screen 1 above).
- If the affected zone is Zone 9–16, press the Zones 9–16 button to view the fault status.

The fault condition will remain active until the cable or sensor fault has been corrected.

6) Relay Outputs

Three sets of volt-free relay contacts are provided on the main PCB:

Common Alarm

Energises whenever any zone detects water.

New Alarm

Energises when a new water alarm, sensor fault, or offline alarm occurs. The relay resets when the alarm is acknowledged by pressing Mute Alarm, ready for the next event.

Common Fault

Energises whenever a sensor or sensing cable fault is detected, including offline conditions.

Relay Summary

Relay	Activates When
Common Alarm	Any zone detects water
New Alarm	A new alarm or fault occurs (turns off when muted)
Common Fault	A sensor or cable fault/Offline condition occurs (see note below)

Note: The Common Fault relay terminal markings (N/O, COM, and N/C) are only valid when the unit is powered down.

7) Beacon and Beacon Sounder

If a beacon or beacon sounder is supplied connect to the three terminals identified as “Beacon” as follows:

7a) Non Mutable Beacon or Beacon Sounder

If the beacon or the beacon sounder is to be active (on all the time) until the water leak alarm has cleared, connect as follows:

Terminal Reference		Connect Beacon / Beacon Sounder terminals to the following terminals
+V		Beacon +V or Strobe /Tone + terminal
BOV		Beacon -V or Strobe /Tone - terminal
SOV		NO connection to this terminal

7b) Mutable Beacon or Beacon Sounder

If the beacon or the beacon sounder is to turn off when the “Mute” push button is pressed, connect as follows:

Terminal Reference			Connect Beacon / Beacon Sounder terminals to the following terminals
+V			Beacon +V or Strobe /Tone + terminal
BOV			NO connection to this terminal
SOV			Beacon -V or Strobe /Tone - terminal

7c) Mutable Sounder Beacon on all the time

If the beacon is to remain alight all the time an alarm is current but the sounder is to be turned off when the “Mute” push button is pressed, connect as follows:

Terminal Reference		Connect Beacon / Beacon Sounder terminals to the following terminals
+V		Strobe and Tone + terminal
BOV		Strobe - terminal
SOV		Tone - terminal

Warning; if the above option “9c” is required, **remove** the electrical link connected between the second (Strobe -) & third terminals (Tone -) terminals within the sounder.

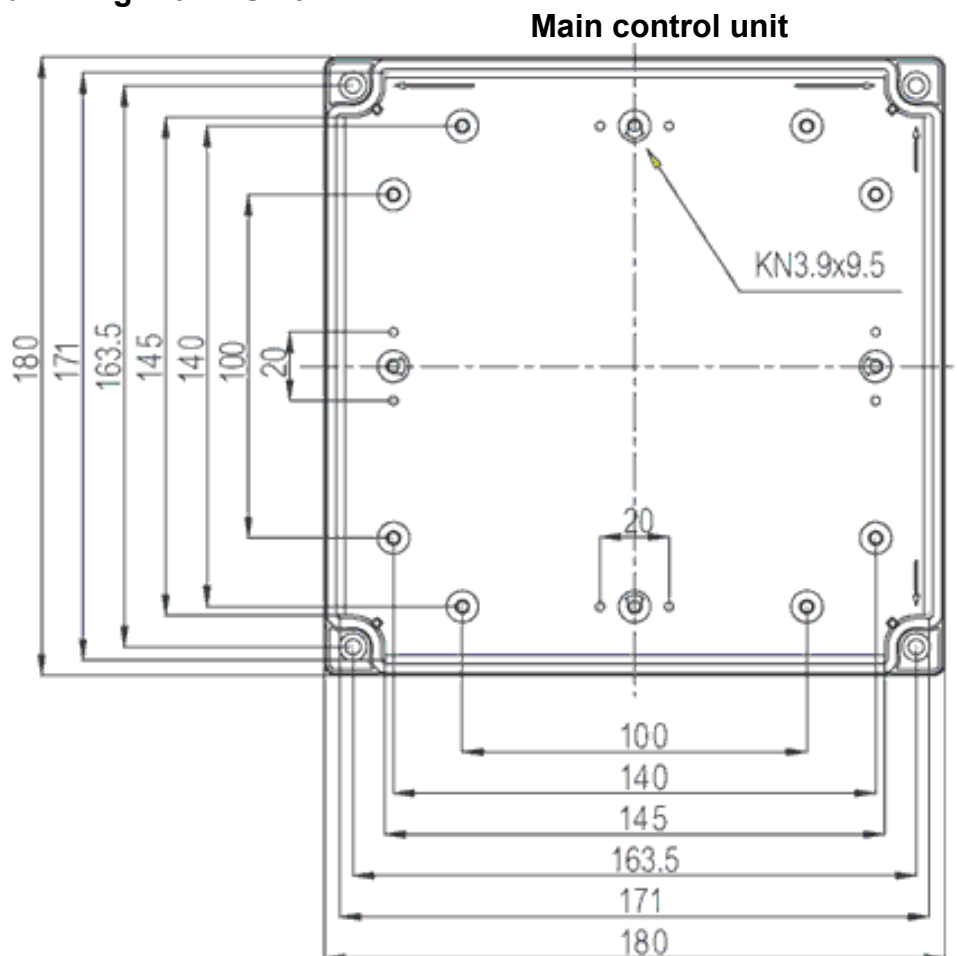
8) Fitting SCA Repeat Alarm or SMS Messaging System



Use the "SMS" terminal block

SCA Terminal No.	SMS Terminal No.	Cable wire colours fitted to the messaging system
+V	DC	RED
Sig	Z1	BLUE
0V	COM	BLACK

9) Fitting and Wiring Alarm Unit



Installation

Warning: This equipment must only be installed, connected, and serviced by a qualified electrician.

To mount the unit:

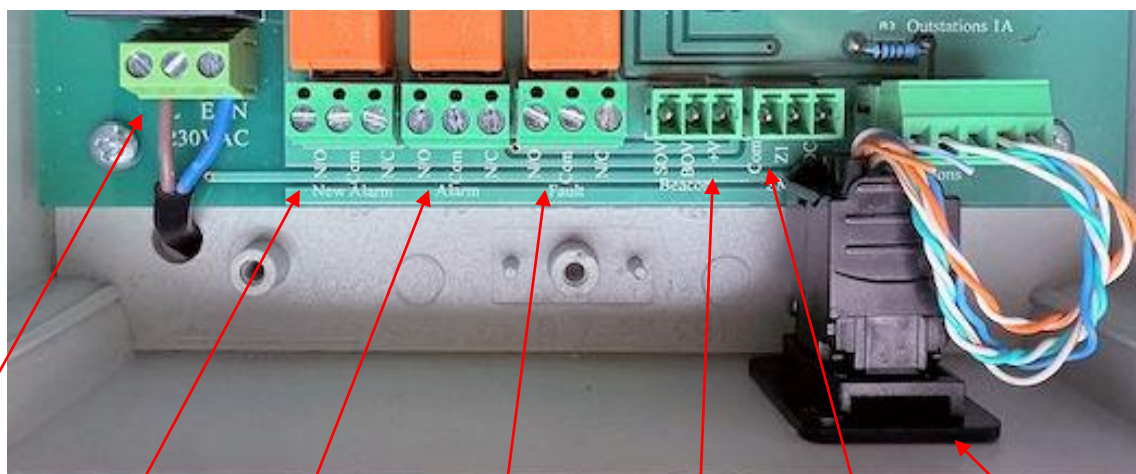
1. Remove the front cover to gain access to the internal components.
2. Locate the mounting holes in each corner of the enclosure.
3. Secure the unit to the wall using suitable fixings.

Important: Take care when drilling or fixing the enclosure to avoid damaging the internal electronic components.

Power Connection

1. Run a suitably rated 230 VAC supply cable from a fused spur to the unit.
2. Terminate the supply conductors at the internal terminal block marked:
 - **L** – Live
 - **N** – Neutral
 - **E** – Earth
3. Fit a 3 A fuse in the fused spur supplying the unit.

Ensure all wiring is installed in accordance with applicable local electrical regulations and site requirements.



230VAC
Mains
Input

New
Alarm/Fault
Contact

Common
Alarm
Volt Free
Contact

Common
Fault
Contact

If Fitted
Beacon/Sounder

If Fitted
SMS Text

RJ45
connector
for RS485
and power
to sensors

Output Volt Free Contacts for use by a Building Management System

Function Required	Function
New Alarm	Operates on each new water leak alarm or sensor fault, reset by muting
Common Alarm	Any zone in water alarm, clears with no water alarms on the system
Common Fault	Operates on disconnected sensor or power fault
Power Fault	See Common Fault

10) RS485 Data Cable End of Line Resistor

To ensure reliable RS485 communications, a **120 Ω end-of-line (EOL) resistor** must be fitted at the end of the data cable run. The resistor should be installed at the device located furthest from the alarm unit in terms of cable length.

A suitable 120 Ω resistor is supplied pre-fitted within the red RJ45 connector provided with the system. This connector should be installed on the final sensor in the RS485 network.

Note: Only one end-of-line resistor should be fitted at the end of the RS485 cable run.

11) Fitting the optional Battery Backup

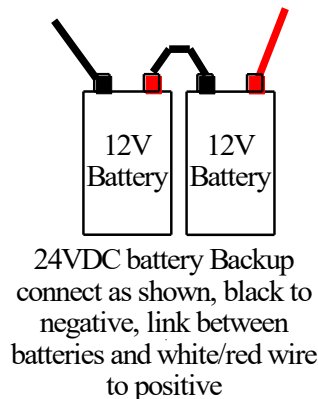
If batteries are supplied, they should only be connected after the system has been fully commissioned.

Connect the batteries as follows:

1. Connect the black cable to the negative (-) terminal of Battery 1.
2. Connect the positive (+) terminal of Battery 1 to the negative (-) terminal of Battery 2 using the interconnecting link.
3. Connect the white/red cable to the positive (+) terminal of Battery 2.

Before applying power, verify that all battery connections are correct and secure.

Important: Incorrect battery polarity or wiring may cause the battery fuse on the main PCB to operate (blow). If this occurs, the fuse must be replaced and the battery wiring corrected before the system is returned to service.



12) Commissioning

See DLD250 Manual

13) Maintenance

The system should be fully tested at least once a year for correct operation. All cables should be inspected at the same time for signs of damage, dirt contamination or mis-placement.

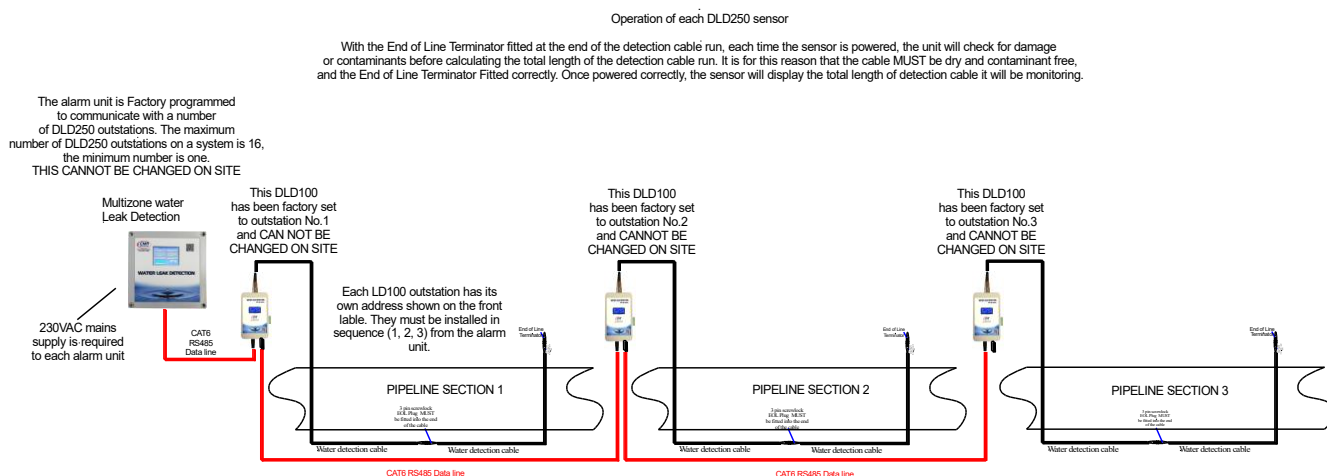
14) Fault Diagnostics

“Active” LEDS are provided on all sensors and the main alarm unit. The lights are provided to help when fault finding the RS485 line.

Fault	Possible Reason
Display is OFF and the unit appears dead	1) No power to the control unit. <i>Test with a meter</i> 2) The power fuse has blown. <i>Test the fuse with a meter</i>
Display not responding to an alarm or fault, see item 1.1 above	1) Power off and on again. <i>If this fails to resolve the problem contact the manufacturer</i>
All zones are displaying “FAULT”	1) Check the “Active” LED located far left on the top PCB. If the LED is not flashing the unit could be faulty. <i>Return to manufacturer</i> 2) Check that all the sensor “Active” LEDS are flashing at approximately 9 second. <i>If one or more are not flashing, disconnected or wrongly connected data cable to that outstation.</i>
The system will not record a water detected alarm, the Display and audible warning device do not react to water on the cable	1) Sensitivity could be too low or a possible system fault. <i>Remove the lid from the small plastic box connected to the detection cable and turn the potentiometer until the system goes into alarm.</i> 2) System fault. <i>Return to manufacturer</i>
Horn not working	1) System fault. <i>Return to manufacturer</i>
The battery will not power the system	1) Battery discharged, disconnect a lead and test with meter. 2) Battery fuse blow 3) Charger fault, disconnect a battery lead & check for 26.5V

15) Installation Drawings

Schematic layout of a DLD250 system with one Alarm unit and three DLD250 outstations



NOTE

The above schematic drawing is typical layout of the DLD250 system. Each system is supplied with one multizone alarm unit and a number (maximum 16) DLD250 outstation. The multizone alarm unit will be factory set with the number of DLD250 outstations fitted on the system. Each DLD250 outstation will be pre-programmed with its address number shown on the front label. Neither the alarm unit or the DLD250 outstation can be re-programmed on site.

The water detection cable has been pre-fitted with a 4 pin male and female connector one at each end. To start the installation, plug the male connector into the top of the first (outstation 1) connect the required number of detection cable lengths to get to the next pit and using a drawrope connected to the male cable end, pull the cable through to the next pit along with the supplied CAT6 cable. Once installed, connect the End of Line Terminator into the end of the detection cable run. We have provided CAT6 cables fitted with RJ45 connectors for inter connection of the alarm unit to all DLD250 sensors.

The system will not work correctly if not installed as shown in the above drawing. The detection cable MUST be screw-locked into the next connector, the DLD100 sensor or the End of Line Terminator.

The maximum water detection cable length for each DLD250 is 250 metres. The maximum CAT6 cable length is 1200 metres.

16) Optional Modbus TCP interface

If the optional Modbus TCP Interface enclosure is supplied, it should be mounted in a convenient location that allows connection of both the DLD16 RS485 network cable and the Building Management System (BMS) Ethernet cable.

Installation

1. Mount the Modbus TCP Interface enclosure in a suitable location.
2. Connect the DLD16 RS485 cable to the designated terminal block, using the same wiring method as the outstation sensors.
3. Connect the BMS network cable to the RJ45 Ethernet port.

Modbus Operation

Modbus communication is provided using one or more Brainboxes ED516 Digital Input to Modbus TCP modules.

Each monitored zone is represented by a digital input:

- 1 (High) = Zone Alarm Active
- 0 (Low) = Zone Clear

Each ED516 module provides 16 digital inputs. The number of modules supplied depends on the total number of monitored zones:

Number of Zones	ED516 Modules Required
1-16	1 Module

As each ED516 module has a single RJ45 Ethernet port, a network switch will be supplied when multiple modules are required. Typically, a 4-port Ethernet switch is provided.

IP Address Configuration

By default, ED516 modules are configured to obtain an IP address automatically using DHCP. On power-up:

- The module will attempt to obtain an IP address from a DHCP server for approximately 30 seconds.
- If no DHCP server is available, the module will assign itself the temporary IP address:

192.168.127.254

If multiple ED516 modules are connected to a network without DHCP, each device will attempt to use this same default address, which may result in IP address conflicts.

Recommended Configuration

For most installations, it is recommended that each ED516 module is assigned a static IP address. Benefits include:

- Immediate network availability after power-up.
- Fixed and predictable IP addressing.
- Elimination of DHCP lease-related address changes.
- Simplified BMS integration and maintenance.

Setting a Static IP Address

There are two methods for configuring a static IP address:

Option 1 – Boost.IO Software

Use the Boost.IO configuration software with the ED516 connected either directly to a PC or via the network. The PC and ED516 must be on the same subnet.

Option 2 – Web Interface

Connect the ED516 to a PC either directly or via the network and access the device through its web interface. The PC and ED516 must be on the same subnet.

Using either method, the device can be configured for static addressing and assigned a valid IP address suitable for the site network.

Further Information

For detailed configuration instructions, diagnostics, and technical support for the Brainboxes ED516, refer to the manufacturer's documentation and support resources.

<https://www.brainboxes.com/files/catalog/product/ED/ED-527/documents/Brainboxes%20Modbus%20TCP%20Manual.pdf>

The following link is the Brainbox Support link

<https://www.brainboxes.com/support>

Or contact Brainbox UK at, Brainboxes Limited, 18 Hurricane Drive, Liverpool International Business Park, Speke, Liverpool, Merseyside, L24 8RL Tel: +44 (0)151 220 2500 Fax: +44 (0)151 252 0446 www.brainboxes.com | sales@brainboxes.com | support@brainboxes.com

Modbus interface housing

