# DR400 Series

## DMR / Analogue repeaters

**Quick Start User Guide**


Designed in the United Kingdom

Entel

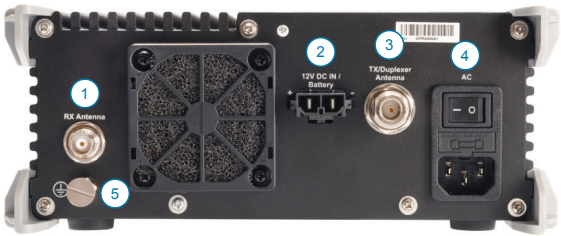
# DR400 Series

## DMR / Analogue repeaters

| PACKING LIST |
|---|
| DR400 Series Repeater |
| AC Mains Lead (UK, EU or US) |
| USB Programming Lead |
| Quick start user guide |

### CONNECTORS AND INDICATORS

**Rear panel connectors** (with optional dust filter fitted)




1. Receiver input (dual antenna port configuration only / not present when the optional internal duplexer has been fitted).
2. DC Power / Backup Battery Connector. Replacement inline fuse for optional DC cable: Littlefuse 0297015._
3. Transmitter output (dual antenna port configuration / TX & RX connector when the optional internal duplexer has been fitted).
4. AC Mains input / Mains On/Off switch / Fuse holder. Replacement fuse part number:
   220VAC model: Littlefuse 021301.6_
   110VAC model: Littlefuse 023903.2_
5. Grounding stud


Mains switch ON


Mains switch OFF

### Front Panel Connector and Indicators


1. Power LED
2. TX DMR Slot 1 / Analogue LED
3. RX DMR Slot 1 / Analogue LED
4. TX DMR Slot 2 LED*
5. RX DMR Slot 2 LED*
6. USB engineering socket

* Not operational on Analogue-only models

### LED Indicator patterns

| | |
|---|---|
| All extinguished | No power applied / switched off |
| All Amber | Switched on & booting up |
| **Power LED** | |
| Solid Green | Operational using primary power (AC or DC) |
| Flashing Green | Operational using DC revert (AC mains failed, Tx Power="Low") |
| Alternating Amber / Red | Bootloader mode |
| Alternating Green / Red | Programming mode |
| Flashing Red | Repeater disabled |
| Solid Red | Major alarm |
| Solid Amber | Minor Alarm |
| **TX1 or TX2** | |
| Extinguished | Idle |
| Steady Red | Transmitting normally |
| Flashing Red | Transmitting in 'limp' mode (Tx Power=1W) |
| **RX1 or RX2** | |
| Extinguished | Idle |
| Steady Green | Receiving normally |
| Steady Amber | Receiving invalid signal (interference) |

## SAFETY

**WARNING: Risk of Serious Injury, Death, or Equipment Damage**

- Read and strictly follow all safety precautions in this Quick Start Guide and related documents before installing, operating, or maintaining this Entel DR400 Series repeater.
- Installation, maintenance, and service must only be performed by trained and qualified engineers in accordance with all applicable local safety codes, standards, and regulations.

### Electrical Safety

**WARNING: Hazardous Voltage**

- Disconnect all power sources before installation or maintenance.
- Ensure the repeater is properly grounded according to local electrical codes and manufacturer instructions.
- Use only a mains supply with RCD (Residual Current Device) protection.
- Ground all antenna cable shields per the cable manufacturer's recommendations.
- If using an outdoor antenna, fit and properly ground an appropriate surge protection (correct RF bandwidth/power rating).
- Use only power cords and connectors supplied or specified by Entel. Do not open the repeater casing or insert objects into openings.

### Thermal Safety

**WARNING: Hot Surfaces & Airflow Requirements**

- Ensure adequate clearance around the unit for airflow.
- Do not block or cover ventilation openings. Proper airflow is essential for cooling.
- Components can become very hot during operation:
  - Exercise caution when near an operating repeater.
  - Allow the unit to cool down sufficiently before performing maintenance.
  - Never store combustible materials near the repeater.
- Only operate the repeater within its specified environmental limits (temperature: 30°C to +60°C; humidity: <95% non-condensing).

### RF Exposure Safety

**WARNING: Hazardous Radio Frequency Energy**

- This equipment generates significant Radio Frequency (RF) energy.
- Installers and users are responsible for ensuring compliance with all local and international regulations regarding human exposure to Electro-Magnetic Fields (EMF). Consult your frequency regulator for details.
- Install antennas in locations that ensure minimum safe separation distances are maintained according to RF exposure regulations.
- Never operate the repeater without a correctly connected antenna or dummy load. The primary RF burn risk comes from the antenna:
  - Touching or being within 2-3 cm of the antenna during transmission can cause RF burns.
  - Maintain a minimum distance of 5 metres (preferably 10 metres) from a transmitting antenna to minimise RF exposure.
- Disconnect repeater power before connecting or disconnecting antennas to prevent equipment damage and reduce injury risk.
- UK Specific Guidance:
  - HSE: https://www.hse.gov.uk/pubns/books/hsg281.htm
  - Ofcom: https://www.ofcom.org.uk/spectrum/electromagnetic-fields/compliance-and-enforcement-guidance

## DISCLAIMER

Entel has prepared this manual with care but provides no warranty regarding its accuracy or reliability. While the information herein is believed to be reliable, Entel cannot assume responsibility for inaccuracies, often arising because Entel reserves the right to make changes without notice to any product herein to improve reliability, function, or design.

## POWER SUPPLY REQUIREMENTS

AC: UK/Euro model: 230VAC±10%, 50Hz @ 1A max
Americas model: 110VAC±10%, 60Hz @ 2A max

**WARNING: Before connecting AC power, check the label on the rear of the repeater to confirm its AC voltage configuration (110 or 230VAC).**

DC: 12.0-15.0VDC @ 10A max
(for external DC power supply or backup battery connection)

**WARNING: When operating from AC, NEVER connect an external DC power supply or charger to the DC connector as it may cause permanent damage. When using AC, the DC connector is for a backup battery only.**

## PROGRAMMING AND INSTALLATION

**WARNING: Improper installation risks death, injury and/or damage to the repeater. Only use suitably trained and qualified personnel to program, install, commission, service and/or repair the repeater.**

- Consult Entel's **DR400 Series Repeater Installation Guide** for installation and commissioning details.
- Dealers have access to Entel's **DR400 Series Repeater Programming Guide** via the Dealer Portal.

https://entel.co.uk/qr/dr400

## OPTIONAL ACCESSORIES

| Model | Description |
|---|---|
| DUP/380-450MHz/5-7MHz | Internal Duplexer kit, 380-450MHz (5-7MHz Tx/Rx separation) |
| DUP/380-450MHz/7-12MHz | Internal Duplexer kit, 380-450MHz (7-12MHz Tx/Rx separation) |
| DUP/380-450MHz/12-20MHz | Internal Duplexer kit, 380-450MHz (12-20MHz Tx/Rx separation) |
| DUP/450-520MHz/5-7MHz | Internal Duplexer kit, 450-520MHz (5-7MHz Tx/Rx separation) |
| DUP/450-520MHz/7-12MHz | Internal Duplexer kit, 450-520MHz (7-12MHz Tx/Rx separation) |
| DUP/450-520MHz/12-20MHz | Internal Duplexer kit, 450-520MHz (12-20MHz Tx/Rx separation) |
| DR/DCL | Repeater DC Lead |
| DR/WMK | Repeater Wall Mount Kit |
| DR/DF | Repeater Dust Filter* |
| DR/ACFILTER | AC Mains Filter for Ship Installations |

* Reduces max temperature to +55°C



## UK & EU DECLARATIONS OF CONFORMITY

Hereby, Entel UK Limited declares that the DR400 Series DMR / Analogue repeater is in compliance with:

- UK Radio Equipment Regulations 2017 (SI 2017/1206).
- EU Radio Equipment Directive 2014/53/EU
- UK Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (SI 2012/3032)
- EU Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU

The full text of the relevant declarations of conformity are available at the following internet addresses:

EU: www.entel.co.uk/RED
UK: www.entel.co.uk/UKCA

| | | |
|---|---|---|
| Frequency Range | VHF | 136-174MHz |
| | UHF | 400-470MHz |
| Power Output | VHF | Up to 25W |
| | UHF | Up to 25W |

The product shall only be put into service after it has been professionally configured by a specialist radio communications dealer for the EU member state or geographical area it is intended to be operated within.

**Intended countries of use:**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | AT | BE | BG | CH | CY | CZ | DE | DK | EE | |
| | ES | FI | FR | EL | HR | HU | IE | IS | IT | |
| | LI | LT | LU | LV | MT | NL | NO | PL | PT | |
| | RO | SE | SI | SK | TR | UK(NI) | | | | |

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