

User Manual

Very Low Power DAB/DMB Repeater VLP-DR1



IMPORTANT!

Do not misconstrue any Information as our recommendation to use any product, process, or equipment in conflict with any regulatory authority or patent. **NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE WITH RESPECT TO ANY PRODUCT.**

Ensure compliance with all applicable safety requirements when installing or using this equipment, and operate in accordance with local laws governing the use of radio transmission equipment.

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1. Safety Warnings

IMPORTANT!

To reduce the risk of electrical shock, do not remove the cover, or any screws. NO user serviceable parts inside; refer servicing to qualified personnel.

To reduce the risk of fire or electrical shock, do not expose this appliance to rain or moisture.

To reduce the risk of fire, always replace fuses with the same type and rating.

These instructions should be read in full before the Very Low Power DAB/DMB Repeater is operated. The safety and operating instructions should be retained for future reference. All warnings on the products, and in the operating instructions, should be adhered to. All operation and user instructions should be followed. The equipment should not be used near water.

It should be situated so that its location or position does not interfere with its proper ventilation. And placed on, or fixed to, a flat surface away from heat sources.

The Very Low Power DAB/DMB Repeater should be connected to a power supply only of the type described in the operating instructions or as marked on the unit. Precautions should be taken so that the grounding or polarisation means of any appliance is not defeated. Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs and the point where they exit from the Very Low Power DAB/DMB Repeater. The unit should be cleaned only as recommended by the manufacturer. The power cord of the Very Low Power DAB/DMB Repeater should be unplugged from the outlet when left unused for a long period of time. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

The Very Low Power DAB/DMB Repeater should be serviced by qualified service personnel when: - The power supply cord or the plug has been damaged; or - Objects have fallen, or liquid has been spilled into it; or - The product has been exposed to rain; or - The Very Low Power DAB/DMB Repeater does not appear to operate normally or exhibits a marked change in performance; or has been dropped, or damaged.

The user should not attempt to servicing beyond that which is described in the Operating Instructions. All other servicing should be referred to qualified service personnel. There are no user serviceable parts inside any part of the Very Low Power DAB/DMB Repeater. Opening the product could interfere with the correct functioning of the electronic parts. Such damage is not covered by any warranty.

2. Introduction

As the consumer demand for DAB and DMB digital radio sets accelerates, there is a need for effective demonstration of these radios in typical retail environments, especially in regard to advanced features such as data services, EPG, advanced PAD features and so on. Often, sales floors are less than ideal for these demonstrations due to the nature of the building construction and their location.

An inexpensive repeater system has been designed to allow a very low power DAB signal to be relayed to the immediate area of the retail store that wishes to demonstrate the features of portable DAB and DMB.

The power level used is approximately one thousand times lower than a typical cellular phone.

Average system installation should take a similar time to a typical satellite dish installation and requires a similar level of competence.

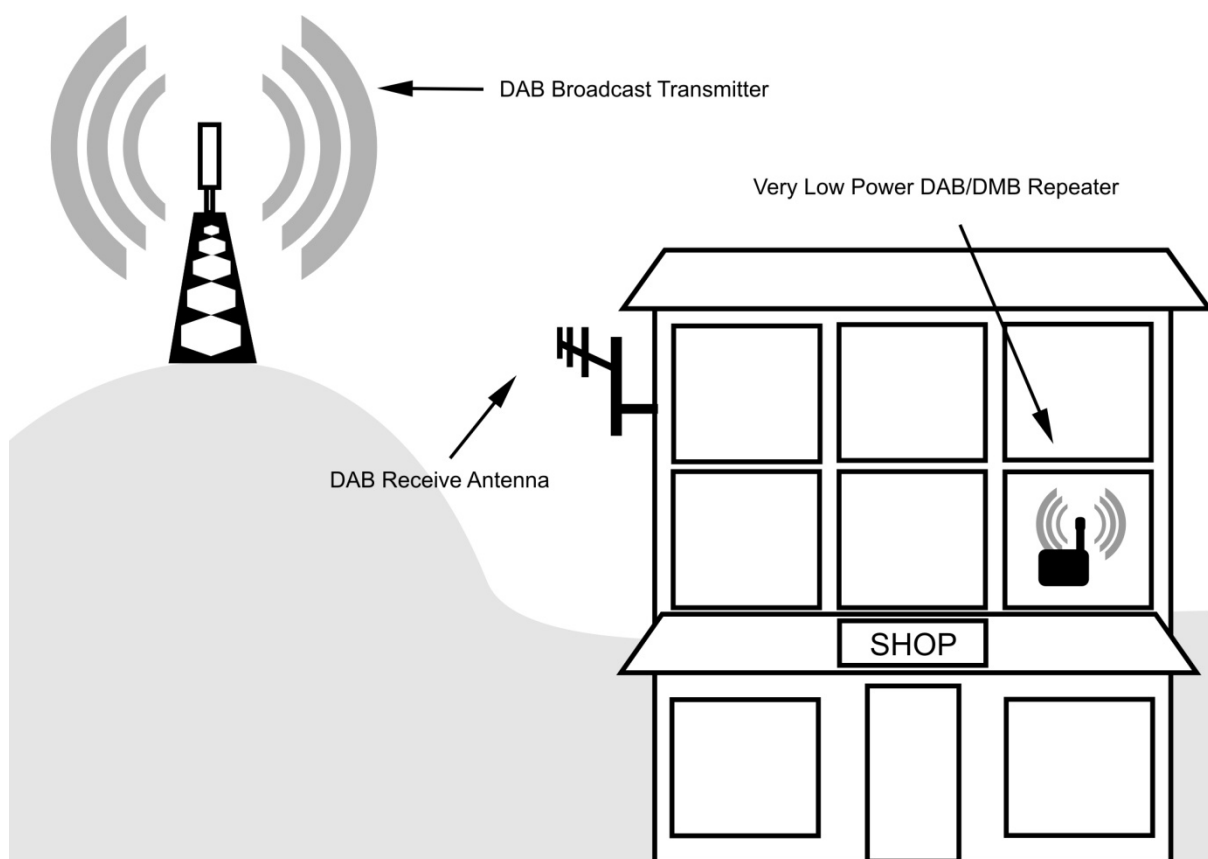
3. Features

- Automatic gain stabilisation
- Bandpass filters prevent re-transmission of unwanted input signals
- Highly linear variable gain amplifier (30-50dB typical)
- BNC Output connector
- Supplied with AC Adaptor for indoor use
- Integral Helical Coil ("Rubber Duck") type transmitting antenna or external antenna options
- Easy to install

4. Installation Instructions

For installation, you will additionally require the following:

- Directional DAB receiving antenna (eg. 4-element Yagi type)
- Antenna mounting hardware
- CT100 (or better performance) coaxial cable
- Installation tools, as required



IMPORTANT:

- The Very Low Power DAB/DMB Repeater is designed to receive a DAB broadcast signal, amplify it, and re-radiate it within a building. It is therefore essential that the re-radiated (boosted) signal does not reach the external DAB Receiving Antenna, otherwise feedback will occur and the repeater will not function correctly.
- Similarly, the coaxial cable run from the external DAB Receiving Antenna could pick up the boosted signal, causing feedback.

CT100 cable is highly recommended. It is vitally important that the cable used is very well screened. CT100 cable is specified as it has a near 100% screen and is low loss (9dB/100m @ 200MHz). Contract grade "Low loss TV Coax" without a foil screen must NOT be used.

The supplied 'F'-Type screw on connector is suitable for CT100. Other types can be supplied upon request. If you use other types of cable or connectors, please ensure they have a good shielding characteristic.

Ensure that the input coaxial cable is not routed in close proximity to Very Low Power DAB/DMB Repeater Antenna. Keep it as far away as possible.

If using the external Magnetic Mount Antenna option, ensure that input coaxial cable does not cross over the output cable. Under no circumstance should they be tied together using cable ties, or similar.

Where an existing distribution system provides a DAB signal from an external antenna, this can often be used, otherwise a dedicated directional 4-Element DAB Receive Yagi antenna (for example Antiference Model DAB2304, or similar) is recommended for reception.

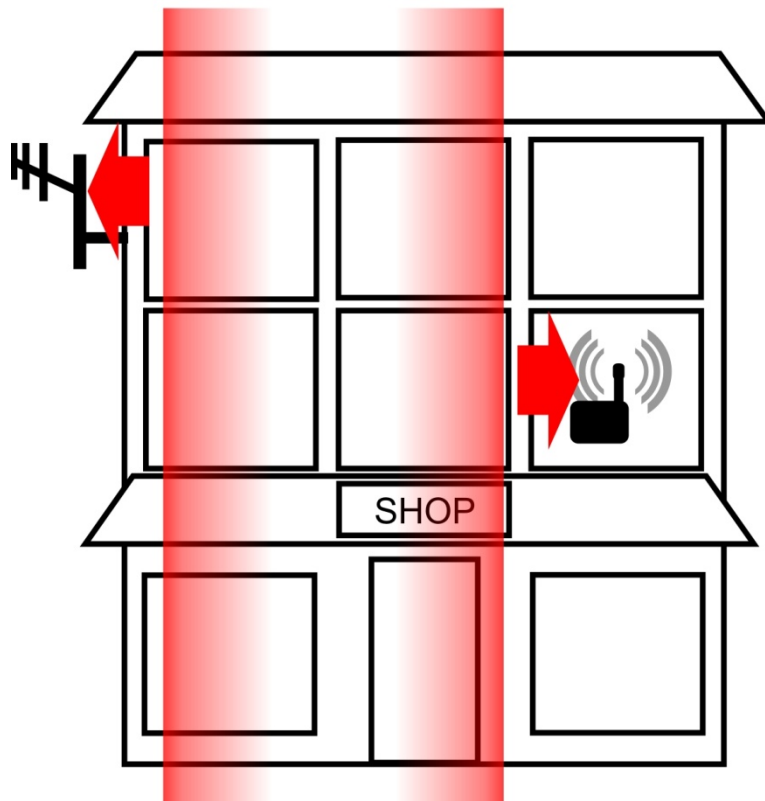
The receiving antenna should be installed with the following points complied with:

- The external DAB Receive Antenna should be pointed at the most appropriate transmitter site designed to serve the local area.
- The external DAB Receive Antenna should be mounted vertically with cable entering from below
- The rear reflector element of the DAB Receive Antenna must be orientated towards the shop floor area where the Very Low Power DAB/DMB Repeater is located.
- The external DAB Receive Antenna should be roof or wall mounted and as far as possible from the area in which the Very Low Power DAB/DMB Repeater radiates.
- Try to use no more than 50m of CT100 (or better type) cable if possible.

WARNING!

IT IS ABSOLUTELY CRITICAL THAT THESE INSTRUCTIONS ARE FULLY COMPLIED WITH, OR ELSE THE VERY LOW POWER DAB/DMB REPEATER WILL RECEIVE ITS OWN OUTPUT (FEEDBACK) AND BECOME UNSTABLE. IT WILL AUTOMATICALLY REDUCE ITS OUTPUT IN AN ATTEMPT TO CORRECT THE FEEDBACK OSCILLATION AND TO PREVENT POSSIBLE INTERFERENCE RISK, BUT IT WILL NOT FUNCTION PROPERLY UNTIL THE FEEDBACK PATH IS CORRECTED.

ENSURE MAXIMUM POSSIBLE
SCREENING BETWEEN RECEIVE
ANTENNA AND REPEATER



The Very Low Power DAB/DMB Repeater's output antenna is a simple Helical Coil ("Rubber Duck") type that facilitates wall mounting, ideally above the retail receiver demonstration area. It has a reduced range compared to the external Magnetic Mount (whip) Antenna option.

The latter $\frac{1}{4}$ wave whip is preferred when ceiling mounting is required, or when maximum range must be achieved. It can, for example, be mounted vertically (even upside down, if convenient) from a suitable steel beam, using the integral magnetic base. This permits attachment to metal ceiling trunk/conduit or areas of steel cladding. Alternatively it can be placed on a shelf or ceiling tile. If a magnetic surface cannot be found and there is any danger of the antenna falling please ensure it is also secured using cable ties or other additional method for safety.

Also ensure that there is a clear area around the whip so that the signal can clearly radiate without excessive signal reflection.

5. Operation

Check that the Very Low Power DAB/DMB Repeater is installed according to the site requirements and the instructions given herein. Ensure that the external DAB Receiving Antenna is connected to the 'RF INPUT' socket – and the Helical or 'Whip' is also connected to the 'ANTENNA' socket.

Connect the mains AC Adaptor power source to the 'DC INPUT' socket.

The Very Low Power DAB/DMB Repeater is now operational.

'STATUS' LED	Indication
Green	RF Input signal strength is acceptable and output is functioning as intended
Orange	RF Input signal strength is too low
Red	RF Input signal strength is too high – or feedback is present. Do not allow the unit to continue operating under this condition.

The output of the Very Low Power DAB/DMB Repeater is normally supplied preset at the factory for the number of multiplexes in use. So, for example, if it is required to repeat 4 multiplexes then it will be preset for 4mW output.

6. Troubleshooting

The Very Low Power DAB/DMB Repeater features highly reliable technology and is unlikely to fail in normal use.

The system reliability is critically related to the quality of the installation and, in particular, the separation of the outdoor receiving antenna and the indoor transmitting antenna.

Fault	Suggested solution
STATUS LED is not illuminated and no output	Connect the supplied AC Adaptor. Check the mains power supply to the AC Adaptor. Only use the recommended power source, to avoid damage not covered by warranty.
STATUS LED is red	RF Input signal strength is too high. Try fitting a coaxial attenuator to the RF input. Feedback is present. Increase the isolation between the signal area re-radiated (boosted) by the Very Low Power DAB/DMB Repeater and the DAB Receive Antenna. See instructions.
STATUS LED is orange	RF Input signal strength is too low. Re-orientate the DAB Receive Antenna to improve reception, or use an antenna with a stronger gain specification. As a last resort, an external aerial amplifier may be added, but is not recommended (as this can significantly increase the likelihood of feedback).

6. Certificate of Compliance

EC Declaration of Conformity

The undersigned, representing the manufacturer:

TX Digicast
Unit 19
Richmond Crescent
Mossley
Lancashire
OL5 9LQ

Herewith declares that the product:

VLP-DR1 Very Low Power Repeater

is in conformity with the provisions of the following EC Directive(s) when installed in accordance with the installation instructions contained in the product documentation 73/23/EEC Low Voltage Directive as amended by 93/68/EEC:

Electromagnetic Compatibility (EMC) Directive:

EN302077

Low Voltage Directive (LVD):

BS EN 60950-1:2006+A2:2013

Subject to the conditions:

Mains power related tests performed by OEM power supply manufacturer

Signature:



Name: Neil Luckham

Position: Engineer

4. Specifications

Power	12V DC 300mA
RF Input Connector	BNC socket ('F'-type adaptor supplied)
RF Input Level	-50 to -30dBm per MUX
Compliance	ETSI 302 077
Bandwidth	8 to 60 MHz (Customer specified)
Output RF (BNC)	10mW Total maximum
Gain	Over 50dB
Frequency Range	174 to 240 MHz (Other ranges upon request)
Accessories	In-line attenuator, BNC adaptor, 'F'-type connector

Specifications subject to change without notice.

TX Digicast
Unit 19
Richmond Crescent
Mossley
Lancashire
OL5 9LQ

Telephone +44 7880 785784

sales@txdigicast.com