



Flameproof Diesel Machinery Electrical System DCBR Remote User Manual

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Mining Repairs

151 Industrial Road

Oak Flats NSW 2529

Ph: +61 2 4256 1177

Fax: +61 2 4257 1283

Email: minrep@anderson-group.com.au

1 OVERVIEW

1.1 Introduction

Congratulations on your purchase of a Monduran DCBR Remote unit! To maximise your productivity with this product, please take some time to familiarise yourself with its features and operation by browsing this user manual.

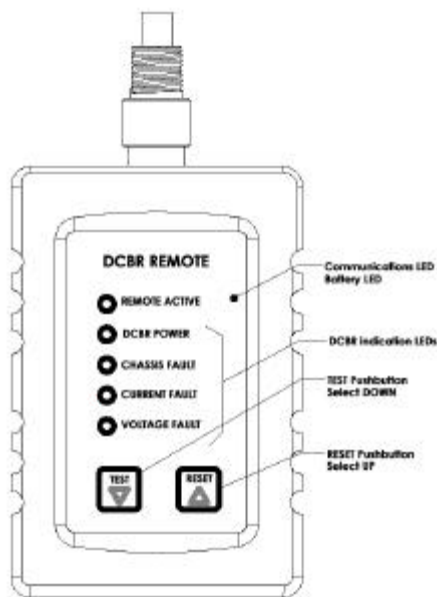


Figure 1 - DCBR Remote (Part M167)

1.2 Scope of this document

This document outlines the installation, operation and maintenance of the DCBR Remote¹.

1.3 Technical Prerequisites

It is assumed that the reader has a good working knowledge and competency with the following components:

- ❑ Mining Repairs MR110 Series flameproof alternator
- ❑ Monduran DCBR 12V Protection regulator

Information on these components is separately available.

1.4 Description

The DCBR REMOTE is an IECEx certified, Ex ia I system to communicate with the DCBR (electronic regulator / protection)

¹ Details of the Windows application, 'DCBRProg', is separately covered

module, that is routinely fitted to the Mining Repairs MR110 series alternators. The REMOTE externalises all of the panel features on the DCBR including <RESET> pushbutton, <TEST> pushbutton and LED indication and makes them accessible without the need to remove the alternator cover (compromising the flameproof integrity of the alternator) or relocation of the vehicle to a non-hazardous zone.

When communications with a DCBR is established, the REMOTE will automatically log data from the DCBR including run hours, alternator voltage and alternator current, which is stored against the DCBR serial number. The data can be logged in the remote from multiple alternators. The analog data is only valid at the time the reading is made and trending is not available.

1.5 Retrofit

The DCBR Remote system can be retrofitted to all except very early DCBR hardware. In some instances a firmware upgrade may also be required.



The DCBR remote is compatible with existing DCBR modules from V1.20 and onwards

1.6 Certification

The DCBR Remote is certified Ex ia I under certificate

- ❑ IECEx ITA 06.0013X

Where 'X' indicates that the batteries shall only be replaced in a non-hazardous area by the manufacturer or a suitably accredited workshop

1.7 Benefits Summary

The DCBR Remote is primarily designed to facilitate resetting and testing of the DCBR protection system in hazardous locations, where the flameproof rating of the alternator is assessed as adequate to meet the explosion risk.



TEST and RESET the DCBR in a hazardous underground environment without the need to relocate the vehicle to a non-hazardous area



Collect operation and performance statistics about the fleet and make this data available other systems

1.8 Parts Inventory

The DCBR Remote product range includes the following items:



Part # M161²
DCBR Remote (Exia)
+ Infrared optical coupling cable
+ Carry Case
+ User Manual
+ Certification documents



Part # M167 (As a spare)
DCBR Remote (Exia)



Part # M166 (as a spare)
Infrared optical coupling cable



Part # M168 (as a spare)
Wooden carry case



Part # M162 (Option)
SIR USB Dongle +
DCBRProg PC software package



Part #M160 (as a spare)
Communications adapter



Part #M164 (Option)
Optical window (Ex d)
+ Cap



Part #M169 (as a spare)
Dust cap

² This is the kit referred to in this manual. Other products are listed for convenient reference only

2 INSTALLATION

2.1 Coupling to an Alternator

The DCBR Remote is principally a portable device which is coupled to an alternator as required. It communicates with the DCBR via a fibre optic cable which mates with the certified infrared window on the alternator end plate as shown in the diagram below.



When making the connection be conscious of other hazards in the form of hot and rotating machinery. Keep loose clothing and cables away from rotating machinery



Figure 2 - Connection of the optical cable to the infrared window

The DCBR remote was designed for portable use. Fixed installations are possible with a suitable mounting bracket for the main housing. (Please enquire about mounting options)

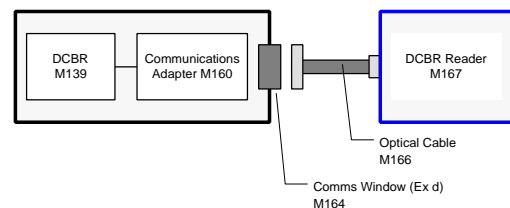


Figure 3 - Connection schematic (alternator)

2.2 Connection to a workstation

The DCBR remote was designed to upload data from the DCBR modules to a workstation via a USB port.

The connection arrangement is depicted in the following photo.



Figure 4 - Connecting to the SIR USB dongle

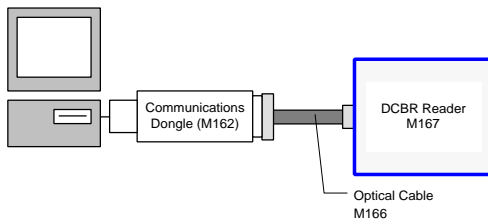


Figure 5 - Connection schematic (Workstation)

3 OPERATION

3.1 Operating Environment

Correct operation of the device is subject to environmental conditions, and as with any electronic apparatus, it is essential to observe normal precautions when using same:



Do not immerse in water or other liquids.



Do not subject to jarring physical shock or vibration.



Do not disassemble – there are no user serviceable components



Do not crush or kink attached cables



Do not subject the unit or attached cables to local sustained temperatures outside the specified operating temperature range – care is required in an engine bay



Do not permit sharp objects to scratch or pierce any part of the assembly

3.2 Basic Operation

The DCBR Remote is certified for underground use and communicates over an optical cable. The unit is battery

operated and to conserve battery life, features automatic timeout and turn-off mechanisms.



To switch the unit on, simply press any switch on the front panel. The unit commences to scan for compatible equipment, flashing the 'REMOTE ACTIVE' LED.



1

Connect to target.



2

Switch on.



3

Evaluate DCBR and reset fault.



optionally...



4

Evaluate logged DCBR data.



3.3 DCBR Remote Scanning Mode

The DCBR Remote may be switched on whilst disconnected from any other devices. In this mode the DCBR Remote scans the optical cable for either:

- a running MR110 alternator fitted with a DCBR, or
- a PC running DCBRProg client application.



To commence the DCBR Remote scanning mode, switch the unit on by simply pressing one of either 'TEST' or 'RESET' switches.



For diagnostic purposes, immediately after switching the unit on, the DCBR Remote will quickly flash each of its indicator LED's in turn in a chasing pattern. The user is able to verify correct operation of all indicators



In scanning mode all indicator LED's remain off, except the 'REMOTE ACTIVE' LED which flashes repeatedly

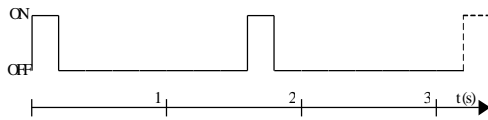


Figure 6 – Remote Active LED - Scanning mode

3.3.1 Automatic Timeout

To reduce needless battery drain, the DCBR Remote features automatic timeout and power-off capability.

Whilst scanning the optical cable for a partner communications device the automatic timeout feature will power off the DCBR Remote if no activity is detected in a 30 second timeframe.

As there is no 'off' switch, this is the customary way to power off the DCBR Remote.



The timeout window can be extended by pressing either of the 'TEST' or the 'RESET' switches on the DCBR Remote during the timeout period. This action grants at least another full 30 seconds of operation.

The DCBR Remote will indicate that the power-off procedure has commenced by flashing each of the indicator LED's once in a chasing pattern very quickly in turn. The unit will then switch off.



If the unit powers off automatically by virtue of the timeout mechanism, it may be switched back on again in the regular fashion by pressing either of the 'TEST' or the 'RESET' switches.



The automatic timeout feature cannot be circumvented.

For automatic timeout inactivity periods in other operating modes, please consult the device specifications.

During the active scanning period, if the DCBR Remote scans successfully and 'discovers' a partner device, the automatic timeout and shutdown is averted and the timeout mechanism for the new operating mode;

- Mimic Panel, or
- Data Logger applies.

3.4 DCBR Remote Mimic Panel Mode

When the DCBR Remote is optically connected to a MR110 alternator which is fitted with a DCBR, the DCBR Remote functions as a:

- mimic panel for DCBR indicators
- DCBR trip reset capability
- DCBR chassis test facility
- DCBR data collector

In mimic panel mode, the DCBR Remote's 'REMOTE ACTIVE' LED changes its flashing pattern from that of scan mode, now to that shown below:

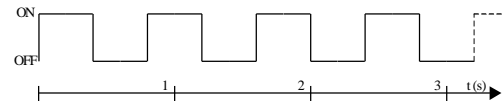


Figure 7 - Remote Active LED - Mimic mode

The DCBR Remote will automatically timeout and power off after 30 seconds in this mode. Prior to shutting down, information from the DCBR is automatically logged.



The user can extend this timeout period by pressing either the 'TEST' or 'RESET' switch on the DCBR Remote.



If the DCBR Remote times out and switches off, simply switch the unit back on by pressing either of the 'TEST' or 'RESET' switches.



When attaching or detaching the optical communications cable to a alternator, take care to avoid local hazards including hot surfaces, transmission belts or other potentially dangerous circumstances.



When uncoupling the optical communications cable from a MR110 Series alternator, be sure to replace the screw cap cover over the optical interface, ensuring that the sealing washer is serviceable.

3.4.1 Obtaining DCBR Status

In mimic mode, the indicator LED's on the DCBR Remote accurately replicate the status of the DCBR's panel LED's, inside the alternator.



To read DCBR status, simply connect and activate one of the keys on the DCBR remote. When communications is established, the DCBR status will be mimicked on the DCBR remote.

The user is advised to check that:

- the communications cable remains optically coupled to the alternator, and
- the 'REMOTE ACTIVE' LED flashes the 'mimic panel' pattern

Then the remaining four indicator lights will mimic the DCBR indicator lights.³

3.4.2 Resetting faults and performing chassis fault test

The DCBR Remote facilitates remote access to the two switches, 'TEST' and 'RESET,' on the DCBR inside the flameproof alternator.

For the DCBR Remote switches to be effective it is essential that:

- ❑ the communications cable remains optically coupled to the alternator, and
- ❑ the 'REMOTE ACTIVE' LED flashes the 'mimic panel' pattern.



To perform the DCBR 'test' function, press the switch labelled 'TEST.'



To perform a DCBR 'Reset', press the switch labelled 'RESET.'⁴



While the DCBR remote is rated for Zone 0 (ie continuously gassy) conditions, the alternator is only rated Zone 1 (ie occasionally gassy) and no attempt should be made to operate the alternator outside of its certification



Resetting of electrical protection devices should only be performed by authorised persons following examination and repair of any fault condition. In fixed installations in particular, local procedures should be instituted to ensure that resetting is only performed by authorised persons.

3.4.3 Collecting DCBR Log Data

DCBR data is uniquely tagged with the DCBR's serial number enabling the DCBR Remote to store records from multiple sources. The DCBR Remote cannot collect multiple record sets from a single DCBR.



Each time the DCBR Remote enters 'mimic panel' mode in response to recognising a connection to a DCBR, it automatically collects the most recent data from that DCBR.

At the time when the DCBR Remote is optically disconnected from a DCBR the data is most current and this data replaces any data already logged from that individual DCBR.

When updating an internal DCBR record, the DCBR Remote will simultaneously flash

³ Please consult DCBR documentation for interpretation of these indicator signals

⁴ Please consult DCBR documentation for information pertaining to the purpose and usage of these switches

all indicator LED's once. This will usually occur in response to the following conditions:

- ❑ timeout period or inactivity expires while connected to the same DCBR – DCBR Remote saves DCBR data and powers down.
- ❑ optical communications connection is terminated (optical coupling is removed) – DCBR Remote waits for approximately 5 seconds during which time the communications session may be recommenced, otherwise the DCBR Remote reverts to 'scanning mode.'



If the user couples the DCBR Remote to a different DCBR prior to any of the above conditions being met, then the most recent DCBR data for the disconnected DCBR will not be recorded.



The DCBR Remote has a limited number of records available for storage of card data. Please consult the specifications page for the maximum number of concurrent records that the DCBR Remote retains (page Error! Bookmark not defined.).

If the allotted number of records is full, additional DCBR records continue to be logged at the expense of the oldest DCBR records, which are automatically overwritten.

3.5 DCBR Remote Data Logger Mode

When the DCBR Remote is optically connected to a PC which is running DCBRProg software, the DCBR Remote reports alternator data it has collected from the field, including:

- ❑ Alternator runtime hours
- ❑ Fault Status
- ❑ Alternator voltage
- ❑ Alternator current readings
- ❑ Alternator temperature

3.5.1 DCBR Data Collection

The DCBR Remote automatically stores data from MR110 Series alternators into which it comes in contact. The DCBR inside these alternators are individually identifiable by serial number, and the DCBR Remote retains one data record for each DCBR.

When collecting data it is important not to exceed the memory capacity of the DCBR remote.

If the maximum number of individual records is exceeded, the DCBR Remote will overwrite the oldest record in its memory. That record will be irretrievably lost to the user.

3.6 DCBR Remote Software

Full details of the DCRProg application are separately covered. A brief description of the features follows.

The DCBRProg Windows application interrogates and displays data from a DCBR Remote. It facilitates:

- ❑ reviewing logged DCBR data from a DCBR Remote
- ❑ writing logged DCBR data to a database file
- ❑ clearing DCBR Remote records.

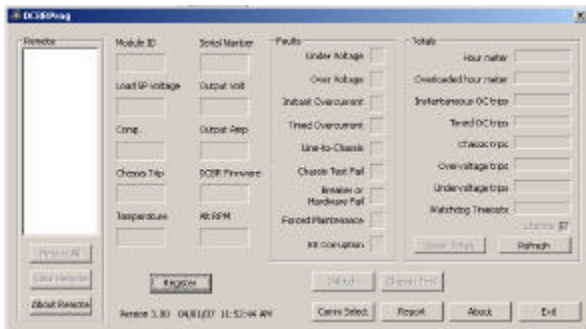


Figure 8 - DCBRProg V3.0 (Part #M162)



Use the DCBR Remote's ▲ and ▼ buttons to 'scroll' and loop through all available DCBR records that are stored in the DCBR Remote. Monitor the serial number to detect looping back to the newest record. Records are scrolled in order from newest to oldest.



Earlier versions of DCBRProg, V2.2x will also interrogate the DCBR Remote, however this application reports only one DCBR record at a time.

4 MAINTENANCE

4.1 Batteries

The internal batteries that power the DCBR Remote are non-rechargeable. They are type tested to provide a large but limited number of cycles as set out in the specification.

4.2 Low Battery Indication

Low-battery condition is signalled by the DCBR Remote on the 'REMOTE ACTIVE' LED as shown:

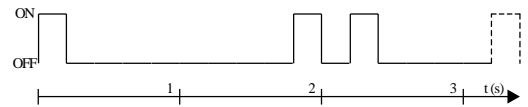


Figure 9 - Remote Active LED - Battery low

The DCBR Remote will continue to function normally even when a low-battery condition is signalled, however the user is advised to initiate enquiries for battery replacement at the time a low-battery condition is first indicated.

4.3 Battery replacement

Current legislation prohibits the replacement of batteries by unauthorised or unaccredited persons or laboratories.

4.4 Important Care Items

The DCBR Remote should be cared for as follows:



Protect the remote by stowing it in its wooden carry-case.



Keep components clean by wiping with a damp cloth.



Keep free from grime and other contamination.



Ensure ends of the optical fibre remain uncontaminated, and clear for the projection of optical signals. If cleaning is necessary, use either a damp cloth or an alcohol wipe. Avoid stronger solvents or abrasive cleaners.



The inner optical fibre is sensitive to moisture and will absorb water and other contaminants – keep the fibre ends dry. In permanent installations ensure seals are serviceable.



To avoid unintended battery depletion, avoid storage with any of the pushbuttons held in the activated position

5 SPECIFICATION

5.1 Mechanical

DCBR Remote dimensions	approx. 108 × 73 × 24 mm
Optical Cable length	2m (nominal) ⁵
Optical Cable diameter	20mm nominal including spring sheath
Minimum optical cable bend radius	40mm
Optical cable, maximum working temperature	100°C

5.2 Environmental

Operating Temperature	-20°C to 40°C
Storage Temperature	-20°C to 70°C
Altitude	< 2000m

5.3 Electrical

Warm up time	0s
Communications Interface	Serial infrared (IrDA-phy) 19.2kbps
Communications Protocol	Monduran proprietary
Maximum optical transmission distance	400mm free air 25m optical cable
Infrared transmission wavelength	890nm nominal
Infrared transmission spectrum	45nm

5.4 Memory

Maximum number of DCBR's for which records can be stored	10
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5.5 Battery Lifetime

Number of power on/off cycles	> 10000 × 60s operations
Low battery indication number of power cycles remaining	< 100 × 60s operations

⁵ Other lengths available on request

Refer battery replacement to your local distributor – this part is not user serviceable.

5.6 DCBR Remote Carry Case

Case Dimensions	approx. 307 × 260 × 73 mm
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The DCBR Remote case is constructed of non-assessable materials and is safe for underground use.

5.7 DCBR Reader Software Compatibility

V2.20 and later	Compatible
V2.19 and earlier	Not compatible

6 TROUBLESHOOTING

In case the DCBR Remote fails to work in the specified manner, kindly observe the following checklist to resolve the problem:

- ❑ Ensure the unit has power by observing the 'REMOTE ACTIVE' LED – discharged batteries will require replacement in a specialised quality assured laboratory where the correct part must be fitted – please consult your local distributor for further assistance. The DCBR Remote signals a low-battery condition by flashing the 'REMOTE ACTIVE' LED in a particular pattern (see page 8), only if there is sufficient battery power to drive the indicator.
- ❑ To save battery power, indicator LED's glow dimly so ensure that ambient light is not obscuring the indicator LED's.
- ❑ Ensure the optical cable is correctly aligned with the target device.
- ❑ Ensure that there are no severe kinks in the optical cable.
- ❑ Ensure that if PC software DCBRProg is being used along with the USB SIR Dongle, that the package is properly installed and is properly licensed and activated. The user manual for this software package provides further troubleshooting details pertaining to its use.
- ❑ Any other questions or comments are welcomed at support@monduran.com.

7 GLOSSARY

Term	Meaning
DCBR	Electronic protection and regulating module suited to MR110 flameproof alternators
DCBRProg	Windows application for interrogating and reporting logged DCBR data.
LED	Light-emitting diode; DCBR Remote indicator
PC	IBM-compatible Personal Computer or laptop
SIR	Serial Infrared, or raw serial infrared. The Windows drivers for conventional PC IrDA dongles do not support this communications mode. The Monduran SIR USB Dongle must be used.

8 WARRANTY

Monduran warrants the DCBR Remote to be free of defects for one year from the date of purchase. Monduran warrants this product to perform the work intended for it, as described in the accompanying documentation.

If for some reason the unit malfunctions during the period of warranty, Monduran at its sole discretion will replace or repair the defective unit. Monduran's maximum liability under this warranty is to the replacement value of a defective DCBR Remote unit.

Abuse of this product, or use of it outside the specified operating parameters disclosed in this User Manual, or disassembling the unit will automatically void warranty.

Please record your warranty details:

DCBR Remote Serial #: _____

Date of Purchase: _____

Supplier: _____

This warranty does not impinge on your statutory rights relating to consumer protection as embodied by State law. To claim warranty work, please call your distribution agent who will make the necessary arrangements for the problem to be investigated.

9 REFERENCE PUBLICATIONS

Reference	Title
UM_2062_DCBR_x	DCBR User Manual
UM_2084_DCBRProg_x	DCBRProg User Manual
DS_2052_855_Cable Assbly_x	Fibre Optic Cable assembly datasheet
DS_2081_SIR USB Dongle_x	SIR Dongle Datasheet
DS_2082_DCBR IR Adapter_x	DCBR Communications Adapter datasheet

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