

# RM100S

*ROUTE-MASTER™ Fieldbus System  
Intrinsically-Safe Fieldbus Device Coupler*

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## Introduction

**ROUTE-MASTER™** RM100S Series is a fieldbus device coupler for Foundation Fieldbus and PROFIBUS-PA segments. It offers a complete assembly of spur wiring points, passive field-replaceable spur short-circuit protection and field-selectable segment termination, in an IP66 enclosure ready fitted with cable glands and seals. It is approved for use in conjunction with other manufacturers' intrinsically-safe fieldbus power supplies. I.S. approvals are by Sira for IEC applications, FM for NEC applications and GOST for Russian applications\*. Only intrinsically-safe devices may be connected via these device couplers, themselves approved for the appropriate Zone/Division of use and the appropriate Gas/Dust hazard. Power supplies may be either ENTITY or FISCO-approved, but within any single segment, only one OR other concept may be used.

MooreHawke Device Couplers are available in 4- or 8-way size in a variety of materials or as an 8-way DIN-rail mountable card. Field device spur cables are either connected directly to terminals using a variety of cable gland options, or through proprietary plug and socket connectors (*Eurofact™* or *MiniFast™*).

Each device coupler incorporates a built-in terminator activated by a link, and should be left in the circuit unless the fieldbus trunk is going to be continued on through that device coupler to another device coupler. In that case, the terminator should be active in only the last device coupler and de-activated in all others.

Segment capacity is entirely dependant upon the I.S power supply selected. The MooreHawke RM100S Device Coupler has no impact on segment performance.

To calculate how many devices may be supported in the segment, contact the I.S. power supply manufacturer.

Alternatively, the MooreHawke RM100 System may be considered. It offers 350mA per segment in I.S. applications for any Gas Group and any Zone/Division.

Refer to the latest product Data Sheet for full technical information. Visit our website at <http://www.miinet.com/moorehawke>.

## Installation

### Device Couplers

Field-mounting enclosures should be securely mounted onto a flat surface vertically or horizontally, or with a 2 inch pipe mounting bracket (optional). The mounting surface should be flat and free from sharp or raised areas which may damage the IP rating of the enclosure. The device coupler position should be selected to protect the unit from falling debris, erosion from (for example) wind-blown sand and continuous high vibration levels.

Positions with cables coming from above the enclosure mounting should have the cables brought down below the enclosure and then returned upwards to minimize the possibility of water or other fluid entry.

Where cable glands are used, please follow the separate instructions for cable gland installation.

#### **Note:**

*For unused ports, the MooreHawke cable glands supplied (where applicable) have entry seals in place and no further action is required to maintain the IP rating of the enclosure. However, if proprietary plug/socket connectors are specified, no entry seals for unused ports are provided. Unused ports may be brought into service at any time.*

\*Contact MooreHawke for details of latest approvals.

## Essential Health and Safety Requirements

### Device Couplers

1. Parts of Device Couplers are non-conducting and care should be taken to prevent undue build-up of static electricity which may represent a danger under some circumstances.
2. RM134S/138S and RM144S/148S Device Couplers use GRP enclosures. Static electricity hazards should be avoided e.g. DO NOT clean with dry cloth.
3. RM124S/RM128S and RM144S/148S Device Couplers use stainless steel enclosures.
4. Standard cable glands/connectors fitted to all types are nickel-plated brass with neoprene seals and nylon or fiber washers.
5. RM118S-DIN and RM108S-DIN Device Couplers are PCBs on a DIN-carrier made from polyamide and polycarbonate plastics, and must be installed in an external enclosure to a minimum of IP54.

### Fuse Replacement

1. FUSES: 62mA Littelfuse Part 0259.062T

**Note:**

*When replacing fuses, ensure that the fault giving rise to the fuse failure has been corrected.*

### Materials of Construction

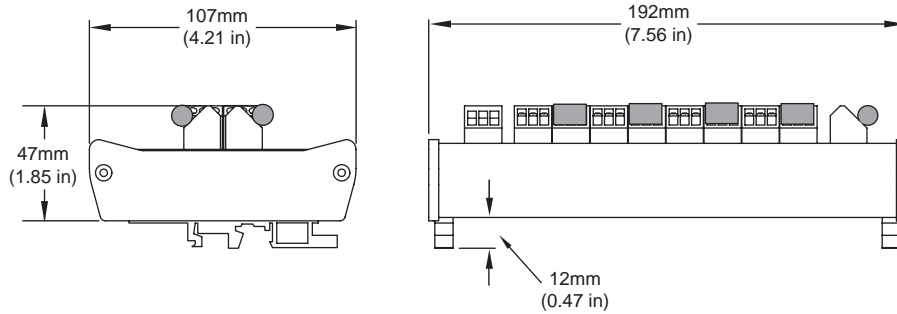
1. Materials and components that form parts of the intrinsically-safe protection must not be exposed to, and must be protected from, corrosion, dilution, erosion and mechanical damage. Any damaged system components must be immediately replaced.
2. The intrinsically-safe nature of the RM100S Device Coupler means that NO on-site repair or modification is permissible. Return all suspect, failed or damaged items to Moore Industries.
3. The user and installer should take the performance of materials listed above into account with regard to possible attack by aggressive substances in any specific installation.

# RM100S

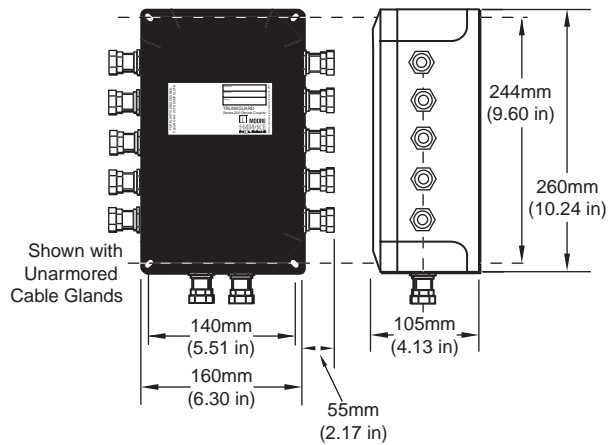
**ROUTE-MASTER™** Fieldbus System  
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**Figure 1.** Dimensions of the RM100S Series and Available Enclosures

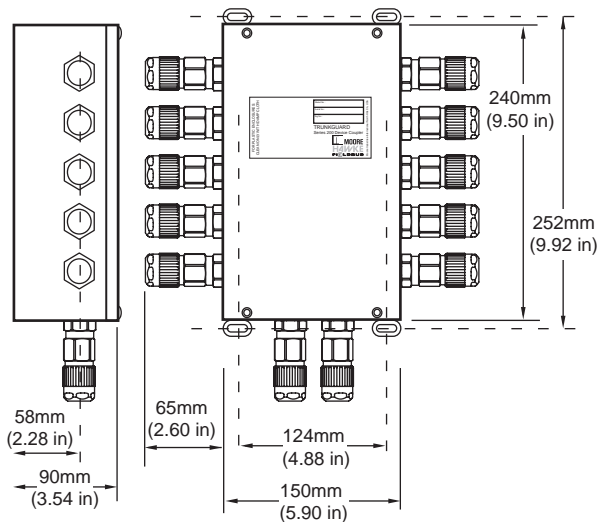
### RM108S-DIN/RM118S-DIN Device Coupler



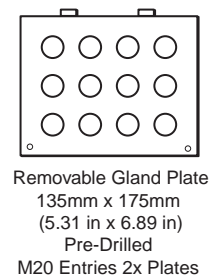
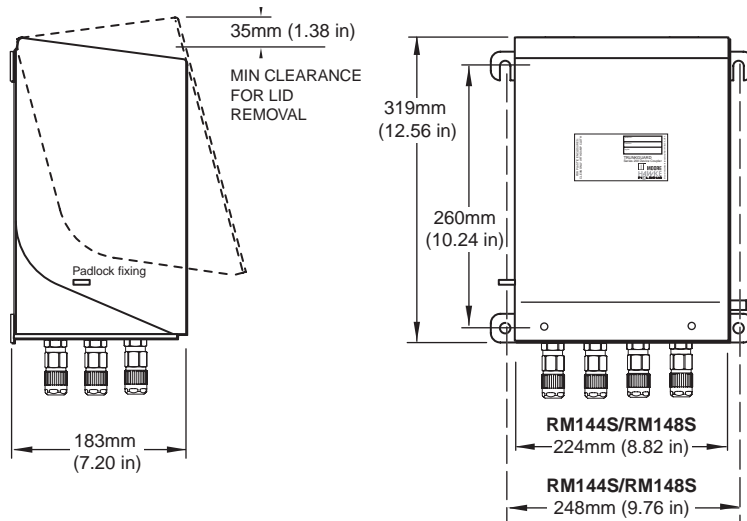
### GRP Enclosure



### Stainless Steel Enclosure



### E-Z Lid Enclosure



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## Terminal Designations

Device Coupler					
Terminal	Function	Terminal	Function	Terminal	Function
1	Fuse	21	Fuse	41	N/C
2	N/C	22	Device Positive +	42	Fuse
3	Fuse	23	Device Negative -	43	Device Screen/Shield
4	Device Positive +	24	Device Screen/Shield	44	Device Negative -
5	Device Negative -	25	Device Screen/Shield	45	Device Positive +
6	Device Screen/Shield	26	Device Negative -	46	Fuse
7	Fuse	27	Device Positive +	47	N/C
8	N/C	28	Fuse	48	Fuse
9	Fuse	29	N/C	49	TRUNK Positive +
10	Device Positive +	30	Fuse	50	TRUNK Negative -
11	Device Negative -	31	Device Screen/Shield	51	TRUNK Screen/Shield
12	Device Screen/Shield	32	Device Negative -	52	TRUNK Screen/Shield
13	Fuse	33	Device Positive +	53	TRUNK Negative -
14	N/C	34	Fuse	54	TRUNK Positive +
15	Fuse	35	N/C	55	Fuse
16	Device Positive +	36	Fuse	56	N/C
17	Device Negative -	37	Device Screen/Shield	57	Fuse
18	Device Screen/Shield	38	Device Negative -	58	N/C
19	Fuse	39	Device Positive +	59	Terminator Link
20	N/C	40	Fuse	60	Terminator Link

**INDICATES TERMINALS  
NOT FITTED ON 4-WAY**

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## Commissioning

**Caution:**

*DO NOT fit spur fuses until wiring is installed and checks have been completed. Some wiring test equipment (i.e. Meggers and Earth Loop Impedance meters) will blow the spur protection fuses if wiring faults are present.*

**Caution:**

*Use I.S. test equipment for all testing in the hazardous area, unless the plant is known to be non-hazardous.*

1. Ensure TRUNK(s) are NOT connected to Device Couplers and NO fuses are installed in Device Couplers.
2. At the Device Coupler, measure DC Resistance between terminals on each Spur. Pass if resistance >10kohms. Reconnect all TRUNK wiring. DO NOT install fuses yet.
3. Measure DC Voltage being received at Device Coupler at TRUNK IN terminals. Pass if voltage >10V. Voltage <10V should be investigated as minimum device operating voltage is 9V. 1V is an acceptable safety margin.

4. For Device Couplers with Termination, use a DC meter set for current (200mA, maximum) and measure current between terminator terminals. Pass if current <180mA (momentarily), falling to 0mA.
5. Fit fuses into each spur as required.
6. Close enclosure (where applicable) and secure.

## Troubleshooting

For Troubleshooting tips, refer to Table 1, below.

### Fuse Replacement

Fuses can be replaced in RM100S series Device Couplers under load and without disconnecting segment power.

**Note:**

*Remove the fault condition before replacing fuse, otherwise replacement fuses will immediately blow.*

Only the same fuse type is permitted (Littelfuse Part No. 0259.062T), available from Moore Industries or independent electrical distributors.

**Table 1.** Troubleshooting Guide

If	Then
Spur fuses are blown	Verify SPUR wiring is not short-circuited or faulty. Verify that DEVICE is operational (by moving to another spur).
There is intermittent communication with a single segment	Verify that the correct number of terminators are fitted, one at each end of the segment. Only the last Device Coupler in the segment should have its terminator activated (link fitted). Remove all other links in other Device Couplers. Additionally, check all TRUNK cable and connections for damage or water entry at equipment.
There are no communications with any devices on a segment	Check TRUNK cable and connections. Measure DC voltage received at Device Coupler >9V (minimum device operating voltage).
There are no communications with any devices on any segment	Check I.S. power supply operation.

## Recommended Ground Wiring Practices

Moore Industries recommends the following ground wiring practices:

- Any MooreHawke product in a metal case or housing should be grounded.
- The protective earth conductor must be connected to a system safety earth ground before making any other connections.
- All input signals to, and output signals from, MooreHawke's products should be wired using a shielded, twisted pair technique. Shields are to be connected to an earth or safety ground at the unit itself.
- The maximum length of unshielded input and output signal wiring should be 2 inches.

Fieldbus cable shields are "carried through" the Carrier's input/output terminals and require a suitable, noise-free ground connection point.

MooreHawke Device Couplers provide terminals per Spur and per Trunk for ground continuity. Screens and shields should be connected to these terminals at the Device Coupler. Field devices should have the screen/shield left open and insulated to prevent shorting to the device enclosure.

External protective grounds (structural earth) should be connected to the external ground stud on the Device Coupler.

## Operation

Once configured, installed and supplied with the correct power, ROUTE-MASTER Device Couplers begin to operate immediately. Depending upon environmental conditions, they can be expected to operate unattended for extended periods of time.

## Maintenance

Moore Industries suggests a quick check for terminal tightness and general unit condition every 6-8 months. Always adhere to any site requirements for programmed maintenance.

ROUTE-MASTER Device Couplers contains no user serviceable parts. Non-functioning units should be returned to Moore Industries for replacement or repair.

Device Coupler enclosures have weatherproof seals; these should be periodically inspected to verify correct operation. Any significant water entry should be investigated and corrected in order to prevent malfunction.

In high humidity environments, it may be appropriate to have enclosure breathers fitted so that internal condensation does not lead to equipment malfunction. These are available from MooreHawke distributors worldwide.

## Customer Support

If service assistance is ever required for an device in your application, refer to the back cover of this manual for the telephone numbers to Moore Industries' customer service department.

If possible, make a note of the model number of the unit before calling. For fastest assistance, have the following information available: serial number, the job number and purchase order number under which it was shipped.

# RETURN PROCEDURES

To return equipment to Moore Industries for repair, follow these four steps:

1. Call Moore Industries and request a Returned Material Authorization (RMA) number.

## Warranty Repair –

If you are unsure if your unit is still under warranty, we can use the unit's serial number to verify the warranty status for you over the phone. Be sure to include the RMA number on all documentation.

## Non-Warranty Repair –

If your unit is out of warranty, be prepared to give us a Purchase Order number when you call. In most cases, we will be able to quote you the repair costs at that time. The repair price you are quoted will be a "Not To Exceed" price, which means that the actual repair costs may be less than the quote. Be sure to include the RMA number on all documentation.

2. Provide us with the following documentation:
  - a) A note listing the symptoms that indicate the unit needs repair
  - b) Complete shipping information for return of the equipment after repair
  - c) The name and phone number of the person to contact if questions arise at the factory
3. Use sufficient packing material and carefully pack the equipment in a sturdy shipping container.
4. Ship the equipment to the Moore Industries location nearest you.

The returned equipment will be inspected and tested at the factory. A Moore Industries representative will contact the person designated on your documentation if more information is needed. The repaired equipment, or its replacement, will be returned to you in accordance with the shipping instructions furnished in your documentation.

### WARRANTY DISCLAIMER

THE COMPANY MAKES NO EXPRESS, IMPLIED OR STATUTORY WARRANTIES (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY GOODS OR SERVICES SOLD BY THE COMPANY. THE COMPANY DISCLAIMS ALL WARRANTIES ARISING FROM ANY COURSE OF DEALING OR TRADE USAGE, AND ANY BUYER OF GOODS OR SERVICES FROM THE COMPANY ACKNOWLEDGES THAT THERE ARE NO WARRANTIES IMPLIED BY CUSTOM OR USAGE IN THE TRADE OF THE BUYER AND OF THE COMPANY, AND THAT ANY PRIOR DEALINGS OF THE BUYER WITH THE COMPANY DO NOT IMPLY THAT THE COMPANY WARRANTS THE GOODS OR SERVICES IN ANY WAY.

ANY BUYER OF GOODS OR SERVICES FROM THE COMPANY AGREES WITH THE COMPANY THAT THE SOLE AND EXCLUSIVE REMEDIES FOR BREACH OF ANY WARRANTY CONCERNING THE GOODS OR SERVICES SHALL BE FOR THE COMPANY, AT ITS OPTION, TO REPAIR OR REPLACE THE GOODS OR SERVICES OR REFUND THE PURCHASE PRICE. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES EVEN IF THE COMPANY FAILS IN ANY ATTEMPT TO REMEDY DEFECTS IN THE GOODS OR SERVICES, BUT IN SUCH CASE THE BUYER SHALL BE ENTITLED TO NO MORE THAN A REFUND OF ALL MONIES PAID TO THE COMPANY BY THE BUYER FOR PURCHASE OF THE GOODS OR SERVICES.

ANY CAUSE OF ACTION FOR BREACH OF ANY WARRANTY BY THE COMPANY SHALL BE BARRED UNLESS THE COMPANY RECEIVES FROM THE BUYER A WRITTEN NOTICE OF THE ALLEGED DEFECT OR BREACH WITHIN TEN DAYS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH, AND NO ACTION FOR THE BREACH OF ANY WARRANTY SHALL BE COMMENCED BY THE BUYER ANY LATER THAN TWELVE MONTHS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH.

### RETURN POLICY

For a period of thirty-six (36) months from the date of shipment, and under normal conditions of use and service, Moore Industries ("The Company") will at its option replace, repair or refund the purchase price for any of its manufactured products found, upon return to the Company (transportation charges prepaid and otherwise in accordance with the return procedures established by The Company), to be defective in material or workmanship. This policy extends to the original Buyer only and not to Buyer's customers or the users of Buyer's products, unless Buyer is an engineering contractor in which case the policy shall extend to Buyer's immediate customer only. This policy shall not apply if the product has been subject to alteration, misuse, accident, neglect or improper application, installation, or operation. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.



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