EIA-485 / RS-232
Communications Adapter
Installation and Operation Manual

Model: RSC-1

Morningstar Corporation
1098 Washington Crossing Road
Washington Crossing, PA 18977 USA
www.morningstarcorp.com
Dimensions

![Dimensions Diagram](image)

Figure 1. RSC-1 Dimensions.

Technical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Input Voltage</td>
<td>8V - 16V</td>
</tr>
<tr>
<td>Self Consumption</td>
<td>8 - 16 mA</td>
</tr>
<tr>
<td>Baud Rate</td>
<td>9600 baud</td>
</tr>
<tr>
<td>EIA-485 Network Unit Load</td>
<td>1/4</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40 C to +60 C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-55 C to + 80 C</td>
</tr>
<tr>
<td>Humidity</td>
<td>100% N.C.</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>72 x 35 x 23 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>37 g (1.3 oz)</td>
</tr>
<tr>
<td>DIN Rail Compatibility</td>
<td>35 mm (1-3/8&quot;)</td>
</tr>
<tr>
<td>Certifications</td>
<td>CE, RoHS</td>
</tr>
<tr>
<td>Warranty</td>
<td>2 years</td>
</tr>
</tbody>
</table>

Features

![Features Diagram](image)

Figure 2. RSC-1 features.

- Removable four (4) position EIA-485 terminal
- 9-pin RS-232 connector (male)
- Status LED for monitoring and diagnostics
- Molded tabs for attachment to 35 mm standard DIN rail
- RS-232 ribbon cable (not shown) with low-profile connectors

Mounting

The RSC-1 can be mounted on standard 35 mm DIN rail. Four (4) tabs are molded into the bottom of the case. Slide the RSC-1 onto an open end of the DIN rail.

![Mounting Diagram](image)

Figure 3. Mounting the RSC-1 to DIN rail

Morningstar Corporation
The typical characteristic impedance of select cables are shown in Table 1 below.

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Characteristic Impedance</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-485 single twisted pair</td>
<td>120 ohm</td>
</tr>
<tr>
<td>Category 5 Ethernet</td>
<td>100 ohm</td>
</tr>
</tbody>
</table>

Table 1. Characteristic impedances.

**Step 3 - Serial RS-232 Connections**

Connect a Morningstar controller, inverter, or accessory to the RS-232 port on the RSC-1 using a straight-through serial cable. A low-profile serial ribbon cable is included with the RSC-1.

Use a *Null Modem* serial crossover cable to connect a PC (or other DCE serial device) to the RSC-1. A Null Modem cable is not included.

**Step 4 - EIA-485 Bus Power**

The EIA-485 network requires external power. The source voltage must be between 8-16 Vdc. For 12 Volt systems, the network can be powered directly from the system battery. Use a DC-DC converter for 24, 36, and 48 Volt systems.

*Caution:* Tapping power off of individual batteries in a battery bank can cause a voltage imbalance. Damage to the batteries may result. Always use a DC-DC converter if the nominal system voltage is greater than 12 volts.
Network Rules

- Each Morningstar controller, inverter, and accessory on the network must be programmed with a unique Modbus Address. Addresses can be programmed using Morningstar’s MSView PC software.
- Do not wire more than 128 RSC-1 adapters on a single EIA-485 network (RSC-1 is 1/4 Unit Load)
- Use twisted pair communication cable for the EIA-485 bus.
- Do not run network cables in the same conduit or trough as the system power cables or AC wiring. In general, avoid running network cables in parallel with power cables.
- A MeterBus to Serial Converter (model: MSC) can be used to communicate with Morningstar products that do not have a serial port. See MSC documentation for supported products.

Status LED Indications

The Status LED indicates adapter power and network communication. Table 2 below identifies each of the indication types.

<table>
<thead>
<tr>
<th>Status LED</th>
<th>Indication</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No bus power or reverse polarity</td>
<td>Check EIA-485 bus power &amp; polarity</td>
</tr>
<tr>
<td>Green</td>
<td>Power OK, no data on network</td>
<td>Wiring OK, Ready for transmit / receive</td>
</tr>
<tr>
<td>Green / Red Flicker</td>
<td>Data on network</td>
<td>Network OK</td>
</tr>
<tr>
<td>Orange</td>
<td>Reversed A &amp; B data lines</td>
<td>Check network wiring</td>
</tr>
</tbody>
</table>

Table 2. LED Indications

Inspection and Maintenance

The following inspections and maintenance tasks are recommended at least two times per year for best performance.

- Tighten all terminals. Inspect for loose, broken, or corroded connections.
- Verify that all wire clamps and tie-downs are secure.
- Check that the adapter is mounted in a clean, protected environment; free of dirt, insects, nests, and corrosion.
- Verify LED indication is consistent with the present system conditions.

Figure 5. An example EIA-485 network (termination resistors not shown)
**Warranty**

The EIA-485/RS-232 Communications Adapter (RSC-1) is warranted to be free from defects in material and workmanship for a period of TWO (2) years from the date of shipment to the original end user. Morningstar will, at its option, repair or replace any such defective products.

**CLAIM PROCEDURE**

Before requesting warranty service, check the Operator’s Manual to be certain that there is a problem with the RSC-1. Return the defective product to your authorized Morningstar distributor with shipping charges prepaid. Provide proof of date and place of purchase.

To obtain service under this warranty, the returned products must include the model, serial number and detailed reason for the failure. This information is critical to a rapid disposition of your warranty claim. Morningstar will pay the return shipping charges if the repairs are covered by the warranty.

**WARRANTY EXCLUSIONS AND LIMITATIONS**

This warranty does not apply under the following conditions:
- Damage by accident, negligence, abuse or improper use.
- Voltage or currents exceeding the ratings of the product.
- Unauthorized product modification or attempted repair.
- Damage occurring during shipment.

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