DRSP-I
DRSP-I-DC
4-20 mA Isolated Signal Splitters
M-5244/0818

<table>
<thead>
<tr>
<th>Model</th>
<th>Module Power</th>
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</thead>
<tbody>
<tr>
<td>DRSP-I</td>
<td>85–265 VAC, 50/60 Hz or 60–300 VDC</td>
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<tr>
<td>DRSP-I-DC</td>
<td>9–30 VDC or 10–32 VAC</td>
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Description
The DRSP-I series accepts a 4-20 mA current input and provides two optically isolated 4-20 mA current outputs that are linearly related to the input. Typical applications include isolation, output splitting, output device separation, and redundancy (i.e. to prevent failure of the entire loop if one device fails), or a combination of these.

Full 4-way isolation makes this module useful for ground loop elimination, common mode signal rejection, or noise pickup reduction.

Sink/Source I/O
Standard is a 15 VDC loop excitation supply for the input and a 20 VDC loop excitation supply for each output. These power supplies can be selectively wired for sinking or sourcing allowing use with any combination of powered or unpowered milliamp I/O devices.

I/O Status LEDs
A green input LED and two red output LEDs vary in intensity with changes in the process input and output signals. These provide a quick visual picture of your process loop at all times.

Output Test
An output test button provides a fixed output (independent of the input) when held depressed. The test output level is potentiometer adjustable from 0 to 100% of output span. Terminals are provided to operate the test functions remotely for each channel. This also allows use as a remote manual override to provide a temporary fixed output.

DC Input Range
Factory ranged, please specify
Voltage: 0–10 mVDC to 0–100 VDC
Bipolar voltage: ±50 mVDC to ±10 VDC
Current: 0–1 mAADC to 0–50 mAADC, 4–20 mAADC

Input Impedance and Burden
Voltage: 200 kΩ minimum
Current: 50 Ω typical
Voltage burden: 1.25 VDC max. at 20 mA current input

Input Loop Power Supply
15 VDC ±10%, regulated, 25 mAADC
May be selectively wired for sinking or sourcing mA input

Output Calibration
Multi-turn zero and span potentiometers for each output channel ±15% of span adjustment range typical

Output Loop Power Supplies
20 VDC nominal, regulated, 25 mAADC for each output channel
May be selectively wired for sinking or sourcing mA output

Output Test/Override
Front momentary buttons or external contact closures for each channel to set output test levels. Each output test level potentiometer adjustable 0–100% of span

Output Ripple and Noise
Less than 10 mVrms

Linearity
Better than ±0.1% of span

Ambient Temperature Range and Stability
−10°C to +60°C operating ambient
Better than ±0.04% of span per °C stability

Response Time
70 milliseconds typical
Fast response time option DF, 10 milliseconds typical

Housing and Connectors
IP 40, requires installation in panel or enclosure
For use in Pollution Degree 2 Environment
Mount vertically to a 35 mm DIN rail
Eight 4-terminal removable connectors, 14 AWG max wire size

Power
85–265 VAC, 50/60 Hz or 60–300 VDC, 6 W maximum
D versions: 9–30 VDC or 10–32 VAC 50/60 Hz, 6 W maximum

WARNING: This product can expose you to chemicals including nickel, which are known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
Electrical Connections
WARNING! All wiring must be performed by a qualified electrician or instrumentation engineer. See wiring diagrams. Avoid shock hazards! Turn signal input, output, and power off before connecting or disconnecting wiring. The DRSP-I is factory configured for one 4-20 mA input and two 4-20 mA outputs as indicated on the serial number label. To maintain full isolation, avoid combining power supplies in common with inputs, outputs, or unit power. The power supplies are fuse protected and the unit may be returned for fuse replacement.

Signal Input Terminals
Polarity must be observed when connecting the signal inputs. The DRSP-I may be wired for a sinking or sourcing input. Determine if your input device provides power to the current loop or if the loop must be powered by the DRSP-I. Typical voltage may be 9-24 VDC at your device’s terminals if it provides power to the loop.

Signal Output Terminals
Polarity must be observed when connecting the signal outputs. The two DRSP-I output channels may be individually wired for a sinking or sourcing output as needed. For each channel determine if your output device provides power to the current loop or if the loop must be powered by the DRSP-I. Typical voltage may be 9-24 VDC at your device’s terminals if it provides power to the loop.

Type of Device for Output Channel 1
<table>
<thead>
<tr>
<th>Type of Device</th>
<th>- Terminal</th>
<th>+ Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring/recording device accepts a mA (current) input and the input is unpowered or passive, DRSP-I provides loop power.</td>
<td>3 (-)</td>
<td>4 (+20 V)</td>
</tr>
<tr>
<td>Measuring or recording device accepts a mA (current) input and provides power to the current loop.</td>
<td>2 (-)</td>
<td>3 (+)</td>
</tr>
</tbody>
</table>

Type of Device for Output Channel 2
<table>
<thead>
<tr>
<th>Type of Device</th>
<th>- Terminal</th>
<th>+ Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring/recording device accepts a mA (current) input and the input is unpowered or passive, DRSP-I provides loop power.</td>
<td>7 (-)</td>
<td>8 (+20 V)</td>
</tr>
<tr>
<td>Measuring or recording device accepts a mA (current) input and provides power to the current loop.</td>
<td>6 (-)</td>
<td>7 (+)</td>
</tr>
</tbody>
</table>

Module Power Terminals
Check white model/serial number label for module operating voltage to make sure it matches available power. Connect power last. When using DC power, either polarity is acceptable, but for consistency with similar products, positive (+) can be wired to terminal 13 and negative (-) can be wired to terminal 16.

Current Sinking Outputs
Typical of some PLCs that have current sourcing inputs.

Current Sinking Outputs with Separate Power Supplies
Typical of a system using loop powered displays with external loop supplies.

Current Sourcing Outputs
DRSP-I provides power to each loop. Typical of a system or PLC using current sinking inputs.

Current Sourcing Outputs
DRSP-I provides power to each loop. Typical of a system or PLC using current sinking inputs.

External Contacts For Test Function
Closing the contact provides the same function as pressing the Test button for each channel. May be used as a manual override.

Output LEDs: Variable brightness red LED indicates output level for each channel
Test Cal.: Output test level adjustment
Test: Push to test output, sets each output to level determined by Test Cal. potentiometer.
Span: Output span calibration for each channel
Input LED: Variable brightness green LED indicates input level
Zero: Output zero calibration for each channel

Current Sinking Input
Typical of a system using a transmitter that is externally powered and provides power to the loop.

Current Sinking Input
Typical of a system using a passive transmitter that uses a loop power supply to power to the loop.

Module Power
DRSP-I: 685-265 VAC, 50/60 Hz or 60-300 VDC
DRSP-I-DC: 9-30 VDC or 10-32 VAC 50/60 Hz
Power wiring: Cu 60/75°C conductors 14 AWG max.
**Mounting to a DIN Rail**
Install module vertically on a 35 mm DIN rail in a protective enclosure away from heat sources.
Do not block air flow. Allow 1" (25 mm) above and below housing vents for air circulation. Avoid shock hazards! Turn signal input, output, and power off before installing or removing module.
1. Tilt front of module downward and position the lower mounts and spring clips against the bottom edge of DIN rail.
2. Push front of module upward until upper mount snaps into place.

**Removal**
1. Push up on bottom back of module.
2. Tilt front of module downward to release upper mount from top edge of DIN rail.
3. The module can now be removed from the DIN rail.

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**Calibration**
Front-mounted Zero and Span potentiometers for each channel can be used to compensate for load and lead variations.
1. Apply power to the module and allow a minimum 30 minute warm up time.
2. Using an accurate calibration source, provide an input to the module equal to the minimum input required for the application.
3. Using an accurate measurement device for the output, adjust the Zero potentiometer for the exact minimum output desired. The Zero control should only be adjusted when the input signal is at its minimum. This will produce the corresponding minimum output signal. The Zero control will provide adjustment for the 4 mA or low end of the signal.
4. Set the input at maximum, and then adjust the Span pot for the exact maximum output desired. The Span control should only be adjusted when the input signal is at its maximum. This will produce the corresponding maximum output signal. The Span control will provide adjustment for the 20 mA or high end of the signal.
5. Repeat adjustments for maximum accuracy.
6. Repeat adjustments for second channel.

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**Operation**
The DRSP-I accepts a 4-20 mA current input and provides two optically isolated 4-20 mA current outputs that are linearly related to the input. The green input LED provides a visual indication that a signal is being sensed by the input circuitry of the module. It also indicates the input signal strength by changing in intensity as the process changes from minimum to maximum.
If the LED fails to illuminate, or fails to change in intensity as the process changes, check the module power or signal input wiring.
The two red output LEDs provide a visual indication that the output signals are functioning. They become brighter as the input and each corresponding output change from minimum to maximum.
The red LED will only light if the output loop current path is complete. Failure to illuminate or a failure to change in intensity as the process changes may indicate a problem with the module power or signal output wiring.
Note that it may be difficult to see the LEDs under bright lighting conditions and low I/O levels.

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**Output Test Function**
When the Test button is depressed it will drive the output with a known good signal that can be used as a diagnostic aid during initial start-up or troubleshooting. When released, the output will return to normal.
The Test Cal. potentiometer is factory set to approximately 50% output. It can be adjusted to set the test output from 0 to 100% of the output span.
Press and hold the Test button and adjust the Test Cal. potentiometer for the desired output level.
The output test function for each channel may be externally wired for remote test operation or a manual override. See wiring diagram.

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**Wire terminal torque**
0.5 to 0.6 Nm or 4.4 to 5.3 in-lbs

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**Diagram**
![Diagram showing the layout of the DRSP-I and DRSP-I-DC 4-20 mA Isolated Signal Splitters](image-url)
WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of 13 months from date of purchase. OMEGA’s WARRANTY adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that OMEGA’s customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA’s Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA’s WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA’s control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a “Basic Component” under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA’S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA’s policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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