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DATASHEET

NI REM-11178

Digital Output Module for Remote I/O



- Short circuit and overload protection
- Drives up to 500 mA per channel (up to 8A per module)
- Spring-terminal connectors allow fast wiring without tools
- Communication to the higher-level system via EtherCAT
- -25 °C to 60 °C temperature range to meet a variety of application and environmental needs

Remote I/O Overview

Remote I/O is a low-cost, modular system for simple machine control and measurements. A Remote I/O system consists of an EtherCAT bus coupler and individual modules mounted on a DIN rail and is controlled from a Real-Time controller such as a CompactRIO Controller or Industrial Controller.

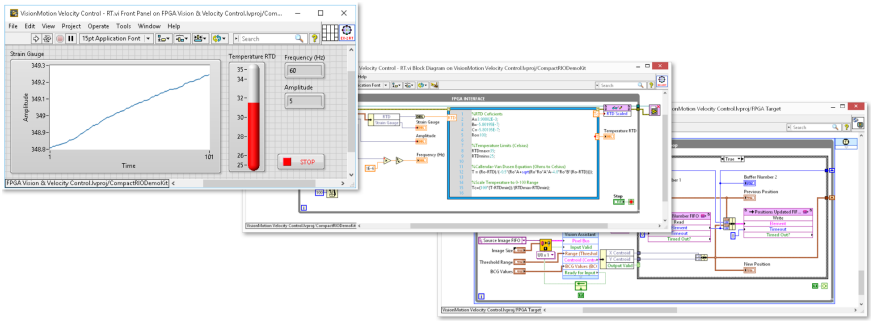
- Round out your system with low-cost I/O for simple tasks while your controller handles advanced tasks such as image processing and high-speed or specialty measurements.
- Add only the I/O you need where you need it with the modular, distributed system.
- Connect multiple Remote I/O systems and EtherCAT chassis to meet your I/O needs.

NATIONAL INSTRUMENTS

Figure 1. NI Remote I/O System

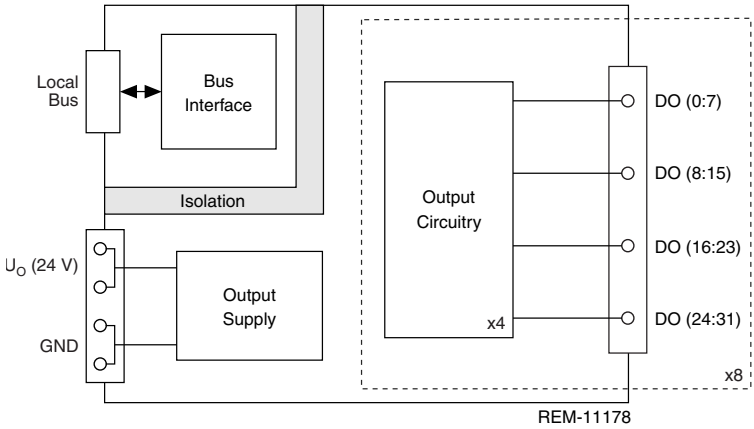


NI Embedded Control and Monitoring Suite



- Use a single toolchain for every phase of your design cycle – from modeling and simulation, to prototyping and validation, to deployment and beyond.
- NI ECM Suite combines LabVIEW Professional Development System with add-on software for programming Real-Time, FPGA, SoftMotion and Vision Acquisition devices.
- Combine LabVIEW with your expertise to efficiently design a system by integrating graphical, C code, .m files, and state-based simulations in one environment.
- Reduce development time with built-in constructs to manage low-level tasks such as timing and memory in an intuitive programming environment.
- Accelerate your development with over 950 available signal processing, analysis, control, and mathematics functions.
- Get to solutions faster with extensive support and training that scale with the complexity of your systems.

REM-11178 Output Circuitry



REM-11178 Specifications

The following specifications are typical for the range -25 °C to 60 °C unless otherwise noted.

Output Characteristics

Number of outputs	32
Nominal output voltage	24 VDC
Maximum output current	
Per channel	500 mA
Per device	8 A (external fuse)
Nominal load	
Ohmic	12 W, maximum (48 Ω; with nominal voltage)
Inductive	12 VA, maximum (1.2 H; 48 Ω; with nominal voltage)
Lamp	12 W, maximum (at nominal voltage)
Signal delay	150 µs, maximum (when switched on), 200 µs, maximum (during switching off with ohmic nominal load)

Switching frequency	
With ohmic load	5500 per second, maximum
With inductive load	1 per second, maximum
With nominal lamp load	16 per second, maximum
Load minimum	10 kΩ
Limitation of the voltage induced on circuit interruption	-32.8 V to -15 V
Output voltage when switched off	1 V, maximum
Output current when switched off	300 µA, maximum
Behavior	
With overload	Shutdown with automatic restart
With inductive overload	Output can be destroyed
Reverse voltage resistance to short pulses	Limited protection up to 0.5 A for 1 s

Caution If there is a faulty external voltage (reverse voltage) at one of the outputs, the output may be destroyed. This may cause unintentional setting of further outputs.

Overcurrent shut-down	as of 0.7 A
Output current with ground connection interrupt when switched off	< 1 mA
Short-circuit protection, overload protection of the outputs	Electronic

Power Requirements

Communications power from U_{Bus}	5 VDC, via bus connector
Current consumption from U_{Bus}	120 mA, maximum
Power consumption from U_{Bus}	600 mW, maximum

I/O Supply

Supply of digital output modules U_O	24 VDC
Maximum permissible voltage range	19.2 VDC to 30 VDC (including all tolerances, including ripple)
Current consumption from U_O	8 A, maximum (external fuse)
Power consumption at U_O	
Typical	800 mW, without actuators
Maximum	240 W with 1.5 W internal losses

Surge protection of the supply voltage	Electronic (35 V, 0.5 s)
Polarity reversal protection of the supply voltage	Parallel diode; with external 5 A fuse (for startup only)
External fuse rating	5 A

Caution Connect an external fuse to the 24 V U_O supply to protect against polarity reversal. The power supply must provide four times the nominal current of the external fuse. This rating ensures that the fuse trips in the event of an error.

Note Connect the module to a 5 A fuse. If all modules in the Remote I/O system are connected correctly, you can replace the 5 A fuse with an 8 A fuse. Do not connect the module to loads over 8 A.

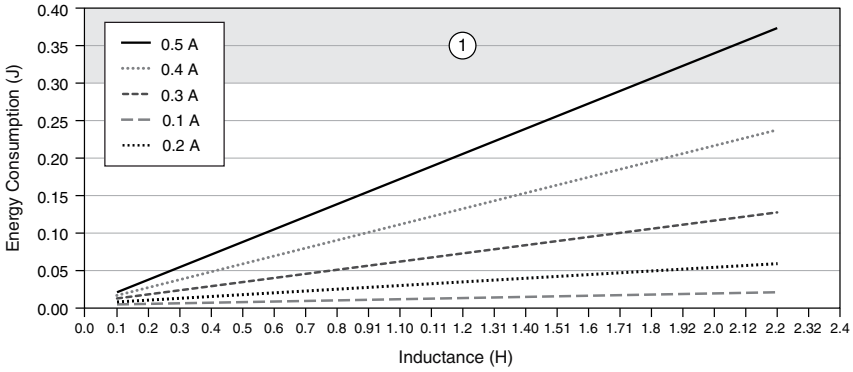
Remote I/O Local Bus

Connection method	Bus connector
Transmission speed	100 MBit/s

Maximum Output Power Consumption

Caution When you use an external freewheel limit, you must limit the free-wheeling voltage to a maximum of -15 V. The value must be above -15 V, so -12 V, for example. The external freewheel limit has no function with a higher negative voltage.

Figure 2. Maximum Output Power Consumption



1. This range requires an external free-wheeling limit circuit.

- These specifications refer to a maximum switching frequency of 1 Hz.
- The figure shows the maximum power that can be fed back for every switch-off operation in the respective output groups (outputs 0 to 7, 8 to 15, 16 to 23, 24 to 31) when an inductive load is switched off without an external freewheel.
- The current data refers to the ohmic DC voltage component of the inductive load.

Physical Characteristics

Note For more information about connecting your device, refer to the device getting started guide on *ni.com/manuals*

Spring-terminal wiring	
Gauge	0.2 mm^2 to 1.5 mm^2 (24 AWG to 16 AWG), solid or stranded
Wire strip length	8.0 mm (0.31 in.) of insulation stripped from the end
Wires per connection	One wire per spring terminal
Dimensions[1]	126.1 mm (4.96 in.) × 53.6 mm (2.11 in.) × 54.0 mm (2.13 in.)
Weight[2]	191.0 g (6.74 oz)

Note For dimensional drawings of the REM-11178, visit *ni.com/dimensions* and search by module number.

Isolation Withstand Voltages

Test section	Test voltage
5 V communications power (logic), 24 V supply (I/O)	500 VAC, 50 Hz, 1 min.
5 V supply (logic)/functional earth ground	500 VAC, 50 Hz, 1 min.
24 V supply (I/O)/functional earth ground	500 VAC, 50 Hz, 1 min.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment.

- EN 61000-4-2 (IEC 61000-4-2): Electrostatic discharge (ESD); Criterion B; 6 kV contact discharge, 8 kV air discharge
- EN 61000-4-3 (IEC 61000-4-3): Electromagnetic fields; Criterion A; Field intensity: 10 V/m
- EN 61000-4-4 (IEC 61000-4-4): Fast transients (burst); Criterion B, 2 kV
- EN 61000-4-5 (IEC 61000-4-5): Transient surge voltage (surge); Criterion B; DC supply lines: ±0.5 kV/±0.5 kV (symmetrical/asymmetrical)
- EN 61000-4-6 (IEC 61000-4-6): Conducted interference; Criterion A; Test voltage 10 V
- EN 61000-6-2: Noise immunity

[1] The depth is valid when a TH 35-7.5 DIN rail is used (according to EN 60715).
[2] With connectors and bus connector.

- EN 61000-6-3: Noise emission
- EN 55022: Radio interference properties; Class B

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

Shock and Vibration

Vibration resistance (EN/IEC 60068-2-6)	5 g
Shock (EN/IEC 60068-2-27)	30 g
Continuous shock (EN/IEC 60068-2-27)	10 g

Environmental

Operating temperature	-25 °C to 60 °C
Storage temperature	-40 °C to 85 °C
Ingress protection	IP20
Protection class	III, EN/IEC 61140, VDE 0140-1
Operating humidity	5% to 95%, non-condensing
Storage humidity	5% to 95%, non-condensing
Maximum altitude	3,000 m
Air pressure	70 kPa to 106 kPa

Indoor use only.

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