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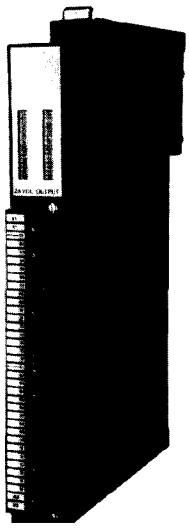
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Instruction Bulletin

Subject: SY/MAX®

CLASS 8030 TYPE ROM-441
24 VDC 32 FUNCTION OUTPUT MODULE



DESCRIPTION

The Type ROM-441 24 VDC Output Module contains 32 optically isolated outputs, each of which is capable of driving loads such as pilot lights, solenoids, and solid state logic circuits. The module may be inserted into any slot of a register rack (except slot 1) or the register slot of a digital rack.

Each of the 32 outputs has a red LED indicator on the front of the module which illuminates when the processor issues a command to energize the output.

A marking area is provided next to the user terminals for output identification by the user.

SPECIFICATIONS

Outputs per Module 32
Type and Rated Isolation Between Output Terminal and Logic ..... Optical: 2500 VRMS
Voltage and Current Characteristics:

	VOLTAGE	CURRENT
Voltage Range	21-29 VDC	
Maximum Current	—	0.5 Amp output (12 Amp module*)
Minimum Load Current		*
Maximum On State Voltage Drop Across Output	1.5 VDC	—
Maximum Off State Leakage Current	—	0.1 mA Maximum
Maximum Surge Current	—	3 Amp for 300 μsec. Duty Cycle ≤ 2%

Turn On Time ..... 100 μsec. maximum at 24 V
Turn Off Time ..... 100 μsec. maximum with 0.5 A inductive load
Output LED Operation ..... Red LED illuminated when receiving "ON" signal from processor.
Rated Module Current Draw on SY/MAX Power Supply . 880 mA per Module at 75% Duty Cycle. 980 mA per Module at 100% Duty Cycle.
Ambient Temperature Rating ..... 0-60°C
Humidity Rating ..... 5-95% non-condensing
Weight (unpackaged) ..... 4.4 lb/2 kg
Dimensions (H x W x D)* ... 12.0 x 1.5 x 9.5 inches (304.8 x 38.1 x 241.3 mm)

* See application considerations.

Used with these Rack Assemblies RRK-100, RRK-200, RRK-300, HRK-100, HRK-150, HRK-200, CRK-210, CRK-300, DRK-210, DRK-300, GRK-110, GRK-210
Compatibility with Input Modules RIM-331

TYPICAL WIRING

Output devices are wired to the two terminal blocks on the front of the module. The upper terminal block corresponds to the first 16 outputs and terminals "1VDC+" and "1VDC-". The "1VDC+" terminal is the source terminal for the first 16 outputs on the module. The lower terminal block corresponds to the second 16 outputs and terminals "2VDC-" and "2VDC+". The "2VDC+" terminal is the source terminal for the second 16 outputs on the module. If a single voltage supply is used for both groups of 16 outputs, the "VDC+" terminal for each group may be connected together. To obtain proper operation of the module the "VDC+" and "VDC-" terminals must be wired as shown in Figure 1.

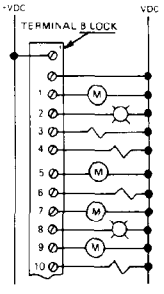


Figure 1 — Typical Wiring

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The portion of the terminal block which plugs into the module connectors is labeled either "1V 08" or "09 2V" to correspond to either the first or second group of 16 outputs.

Thirty-two LED indicators, in groups of 16, are located on the front of the module. The group labeled "1V" corresponds to the first 16 outputs (running top to bottom). The group labeled "2V" corresponds to the second group of 16 outputs.

TERMINAL BLOCKS

The terminal block areas of the ROM-441 Output Module have been modified in series E1 and later devices. The differences are indicated here.

On *pre-series E1 output modules* the terminal blocks have been color coded to ensure proper alignment for insertion. The top group of sixteen outputs is colored blue to match a blue coded area on the module, and the bottom group of sixteen outputs is colored white to match a white coded area on the module. Alignment markings and color coding on the terminal blocks *must* match with color coded areas on the module.

On *series E1 and later output modules* the terminal blocks are keyed for proper alignment, and therefore, no color coded alignment marking is necessary.

APPLICATION CONSIDERATIONS

CAUTION: *Bits 17-23 in the register status field of the* module are not cleared upon power up of the module. These bits are used to indicate the execution condition of the register (carry, set, overflow, borrow, etc. . .) and therefore should not be used in the ladder program.

- Observe proper polarity of output. See Figure 1.
- Before removing either of the terminal blocks from the module, remove all power to the module and the terminal blocks. Next, remove the top and bottom screws from the terminal retaining bar, remove the terminal retaining bar and then slide the terminal blocks to the right.

WARNING: Personal injury or property damage may result if terminal strips are not properly aligned.

- Although the output module does not require a minimum load current, be sure the maximum leakage current (given in the SPECIFICATIONS) will not turn on the load. Contact Square D for application assistance.
- The Type ROM-441 Output Module is *not* fused and therefore the output current specifications must be carefully observed to avoid damage to the module or output devices. The customer may choose to externally fuse the circuit to provide additional protection. *It is recommended that each* output be protected by an 800 mA fuse mounted external to the module.

NOTE: The maximum current rating of each output is 0.5 amps from 0°C to 60°C. However, the maximum current for a group of 16 outputs which have a single common return is 6 amps. Total module output current rating is 12 amps from 0°C to 60°C., with the 12 amps equally distributed between the two groups of 16 outputs.

- When the Type ROM-441 Output Module is located in the same rack as the processor, the only processors which will allow the outputs to be forced ON and OFF are the Models 300, 400 and 600. The Model 500 and 700 processors do not support the forcing function. Instead, they rely on the forcing capability in the Local Interface Module to provide this function. Therefore, when the output module is mounted in a remote rack the outputs may be forced ON and OFF by *any* processor.
- Each terminal will accept one #14 or two #20 gage wires.
- When using the DISPLAY mode of the Class 8010 Type SPR-2XX and SPR-3XX CRT Programmers or SY/MATE*, all contacts and coils associated with register slot mounted digital I/O modules will be shown with the prefix (R) in front of the address. These (R) designated contacts and coils are associated with actual inputs and outputs and should not be confused with contacts and coils associated with internal relays.

*NOTE: When using SYM-323 Series B and SYM-324 Series A or later, all contacts and coils associated with digital I/O modules will be shown with the prefix (I) in front of the address if it is an input or (O) if it is an output or a contact of an external output.

- The ROM-441 Output Module is an over-sized output module and extends approximately three inches beyond the front edge of the rack when properly installed.
- Spare labels and terminal blocks may be purchased separately from Square D Company. For extra labels, order a Class 8030 Type CBP-133 Label Kit. This kit will provide you with ten additional labels. For extra terminal blocks, order a Class 8030 Type CBP-131 Terminal Kit. This kit provides two additional terminal blocks.

MODULE KEYING

Each socket on the rack assembly may be keyed to accept only one type of module. A keying pin kit, Class 8030 Type CBP-104, is available for this purpose. The correct pin location for the Type ROM-441 Output Module is between pins 17, 18 and 19, 20 (see Figure 2). The keying pin is simply inserted manually into the appropriate slot in the rack connector using the keying pin insertion tool provided with the kit. See Figure 3.

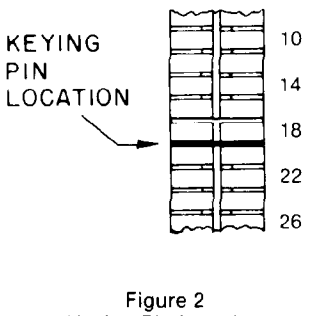


Figure 2
Keying Pin Location

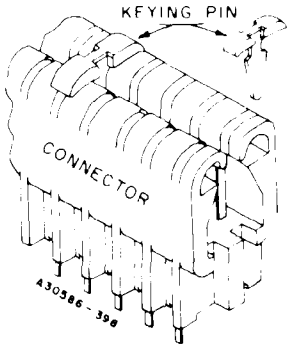


Figure 3
Keying Pin Insertion

CAUTION: When inserting or removing the keying pins, use care to avoid touching the contact fingers within the connector. Improper insertion/removal may damage the connector.

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INSTALLATION INSTRUCTIONS

If it is desired to use the keying feature, insert the key mentioned at module keying into the appropriate I/O rack slot. The Type ROM-441 Output Module may be installed in any register slot of a Class 8030 Type CRK, DRK, GRK, HRK, or RRK rack assembly. The module receives 5 VDC power and ground from the edge connector at the back of the rack.

To install the module in a rack assembly, use the following procedure:

1) Remove all power from the rack assembly.

2) Insert the module into the register slot until firmly seated against the stud (the middle post above the socket in that slot).

3) Tighten the captive screw to assure that the module is secured.

To remove the module from the rack assembly, use the following procedure:

1) Turn the processor keyswitch to "HALT" or "DISABLE OUTPUTS" position, and remove power from the power supply feeding the rack assembly.

2) Because voltages can be present at the terminal strips on the module even when the module is unpowered, all power to the terminal block should also be shut off before the module is handled. Remove the terminal strips from the module by removing the screws from the terminal retaining bar, removing the terminal retaining bar, and then sliding the terminal strips to the right.

3) Finally, remove the module from the rack by raising the latching clamp, loosening the module mounting screw, and pulling the module from the rack assembly.

REGISTER USAGE FOR RACK ADDRESSING

Each Type ROM-441 Output Module will occupy two registers in the system. When located in a register slot to the right of a Model 500 or Model 700 processor, the ROM-441 must be assigned four registers even though only the first two of the four registers are used. The remaining two registers cannot be used.

When mounted in the same rack as a Model 300 processor a minimum of two registers must be assigned to each ROM-441 Output Module. When the Model 300 processor is mounted in an RRK-200 register rack, slot 9 may not be used for any digital I/O modules. Slot 9 cannot be addressed by the Model 300 and therefore may be used to power any register module which requires only power and which does not require registers, such as the D-LOG or SY/NET module.

The ROM-441 may not be used in slots 17 and 18 of an RRK-300 register rack. These two, lower right-most slots are non-addressable by any SY/MAX processor.

SIMPLIFIED SCHEMATIC OF MODULE

Figure 4 illustrates one of the 32 output circuits within the module.

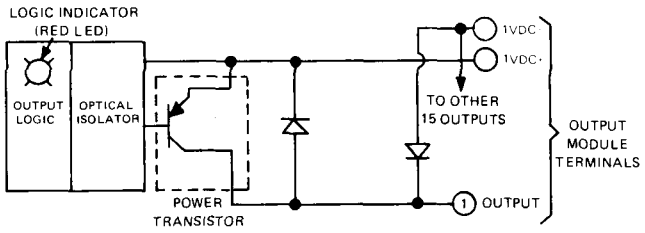


Figure 4
Simplified Schematic of One Output Module Circuit

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