



**SSI Standard**

# RTR-2+ WATER & GAS METER RELAYS

## DESCRIPTIONS



**FUNCTIONAL SUMMARY**

IN	OUT
1	2
2 Wire	2 Wire
A	A

• Up to 200 pulses/second  
• Open Collector transistor or dry contact switch input

#

TYPE

FORM

SPECIAL FEATURES

The RTR-2+ High Speed Repeating Pulse Relay is designed to interface with water or gas meters and provides two sets of isolated solid-state Form A (K & Y) dry contacts for interfacing to other systems. The RTR-2+ interfaces with Badger's Record-All Transmitter Register (RTR) water meters, Hersey's ER-1 and ER-2 water meters as well as most other makes and models equipped with standard pulse outputs. The RTR-2+ will also interface to most gas meters equipped with a pulse output. The RTR-2+'s input is designed for an open-collector transistor, open drain FET or a dry-contact relay. The input is activated when the input (Y) is switched to ground (K) for at least a minimum pulse time. Four input filter times are field-selectable: 50 microseconds, 5, 10 or 20 milliseconds.

When the RTR-2+ relay is inserted in the two-conductor cable between the water or gas meter and the remote equipment, the RTR-2+ provides a replicated signal to the remote equipment, provides a separate isolated (dry contact) Form A contact closure for use with customer-owned monitoring equipment.

Typical applications involve pulse counting, monitoring and recording of water or gas usage. Other applications include interfaces between utility metering devices and customer-owned building automation systems, control and monitoring systems, usage recorders, automated meter reading systems and supervisory control and data acquisition systems (SCADA). A bright yellow LED lamp indicates the system's status at all times thus allowing a rapid check of the system's performance without requiring any additional test equipment.

The microcontroller-based RTR-2+ checks each incoming pulse for its duration. If the incoming pulse is less than the input filter time selected, the RTR-2+ assumes the incoming pulse to be noise and it is rejected. Thus, any valid pulse rate of 200 pulses per second (50 on-50 off form factor) or less is accepted while static and induced high frequency noise is rejected. If used in a very noisy environment this "pulse acceptance window" may be lengthened or shortened as needed to reject noise by selecting a different input filter time.

The RTR-2+'s output closure time is selectable for 100, 300, 500 or 1000 milliseconds, regardless of the input pulse's duration. The output duration time may be easily selected by moving jumper locations. In the event that the input pulse rate exceeds the output time such that input pulses are arriving from the meter faster than the output can handle, the microcontroller stores these pulses and outputs them as soon as possible, so that no pulses are lost. The RTR-2+ therefore provides a contact closure of sufficient and fixed length to the remote equipment & allows the revenue water or gas meter display to operate normally. The input and output terminal strip is a "Euro" type connector for easy field wiring and excellent isolation. The "K" lead of the RTR-2+'s outputs are fused to prevent damage to the relay under almost any conditions a user might cause such as excessive current, incorrect wiring, etc. RTR-2+ models have built-in transient protection for the solid-state relay's contacts that eliminates the need for external or off-the-board transient suppressors.

All component parts that have power applied to them, with the exception of the input/output terminal strip are enclosed in a polycarbonate cover for maximum user protection. The mounting base plate is made of polycarbonate and offers excellent electrical insulation between the circuit and the mounting surface. The RTR-2 models are designed for mounting in an electrical enclosure appropriate for the application and operating environment.

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## **SPECIFICATIONS**

### **ELECTRICAL**

Power Input:	90 to 300 VAC. Burden: <10 mA at 120 VAC
Output:	Two sets of dry Form A (K & Y) contacts. Outputs are activated (closed) for a nominal 100, 300, 500 or 1000mS following a valid input pulse as selected. The contacts are solid state "no bounce" relays rated at 250 VAC/VDC @ 1/10 Amp. The maximum rating of the contacts is 800mW. Factory fused at 1/10 amp. (3AG)
Contact On-State Resistance:	25 ohms maximum, 18 ohms typical
Operate and Release Time:	Turn On: 5 mS maximum, 2-3 mS typical Turn Off: 5 mS maximum, 2-3 mS typical
Input/Output Isolation Voltage:	2500 Vrms

### **MECHANICAL**

Mounting:	Any position
Size:	3.27" wide, 5.65" high, 1.50" deep
Weight:	13 ounces

### **TEMPERATURE**

Temperature Range:	-38° C to +70° C, -36.4° F to +158° F
Humidity:	0 to 98% non-condensing

### **OPTIONS**

Input Voltages:	125 VDC input using the DSC-1 Power Supply. Contact factory for other input voltages.
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