



## SSI STANDARD

# DPR-2 PROGRAMMABLE DIVIDING PULSE RELAY

## DESCRIPTION

The DPR-2 is a programmable microcontroller-based, high-speed dividing pulse relay designed to provide two independent “dry” 2-wire Form A contacts (K & Y) from a 2-wire Form A pulse input. An output pulse occurs when a specified number of input pulses have been received. The divider’s ratio of input to output pulses may be set between .00001 and 100,000. Using floating point math, the DPR-2 can be configured to scale input to output pulses to an exact ratio desired.



### FUNCTIONAL SUMMARY

#

TYPE

FORM

IN	OUT
1	2
2 Wire	2 Wire
A	A

The DPR-2 has two modes of operation, Pulse Divider mode and Pulse Conversion mode. In the Pulse Divider mode, the number of input pulses is specified to produce an output pulse, without regard to the specific value of the pulse, only the number of pulses. In Pulse Conversion mode, the value of a pulse is entered into the system. Upon a pulse being received, the exact units of accumulated water, electricity or gas consumed are added to an accumulator register. Units are programmable are either gallons, kilowatt-hours or CCF’s (hundred cubic feet). An output pulse value is programmed into the DPR-2 to the desired value in the same units as the input units. Once the accumulator register reaches the desired value of units, an output pulse is generated. Extremely precise conversions of values can be accomplished using the pulse conversion mode.

Output pulses may be set in length from 5 mS to 100mS. In addition, the minimum-off time between pulses is also be set. This keeps pulses from being outputted too rapidly to the receiving equipment. In the event that power is lost while there is a pulse count in the accumulator register, the pulse count is stored in non-volatile EEPROM memory. Upon power-up, the pulse count is entered into the register and operation resumed.

If the number of output pulses exceeds the timing constraints of the pulse on time and minimum-off time, the microcontroller will store up to 65,383 output pulses in a cue waiting to be output. This output pulse number is also stored in EEPROM memory, so that no pulses are lost.

The DPR-2 microcontroller checks the input pulse for valid timing or “debounce” to make sure that pulses are of sufficient length to be legitimate pulses. Thus, input pulses are counted only when valid pulses occur, assuring a high degree of noise rejection. Bright red and green LED lamps indicate the input and output status, respectively, all times thus allowing a rapid visual check-out of the system’s performance without requiring any additional test equipment.

The DPR-2 can be programmed using a USB A-B Programming cable with either a terminal program, like TeraTerm, Puddy or HyperTerminal, or with SSI’s Universal Programmer software available on the website.

The input and output circuits’ terminal strip are “Euro” type connectors. The K leads of each of the DPR-2’s isolated outputs are fused to prevent damage to the relays under almost any condition a user might subject it to such as excessive current, voltage, or incorrect wiring. The DPR-4 provides a “pulled up” sense voltage of approximately +13 VDC on the Yin terminal of the input to the external sending contacts. The K terminal is system ground allowing the use of standard electro-mechanical, dry contact switches or solid-state open-collector transistor or MOS-FET pulse initiators. The DPR-2 has built-in MOV transient protection for the solid-state relay contacts that eliminates the need for external or off-the-board transient suppressors. All component parts of the DPR-2, which have power applied to them with the exception of the input/output terminal strips and the USB programming port connector, are enclosed in a polycarbonate cover for maximum user protection. The mounting base is also made of polycarbonate and offers excellent electrical insulation. Mounting tabs on the base plate allow the DPR-2 to be mounted in an appropriate enclosure for the application and the operating environment.

# DPR-2