MPT-4C

Standard Solid State

METER PULSE TOTALIZER INSTRUCTION SHEET

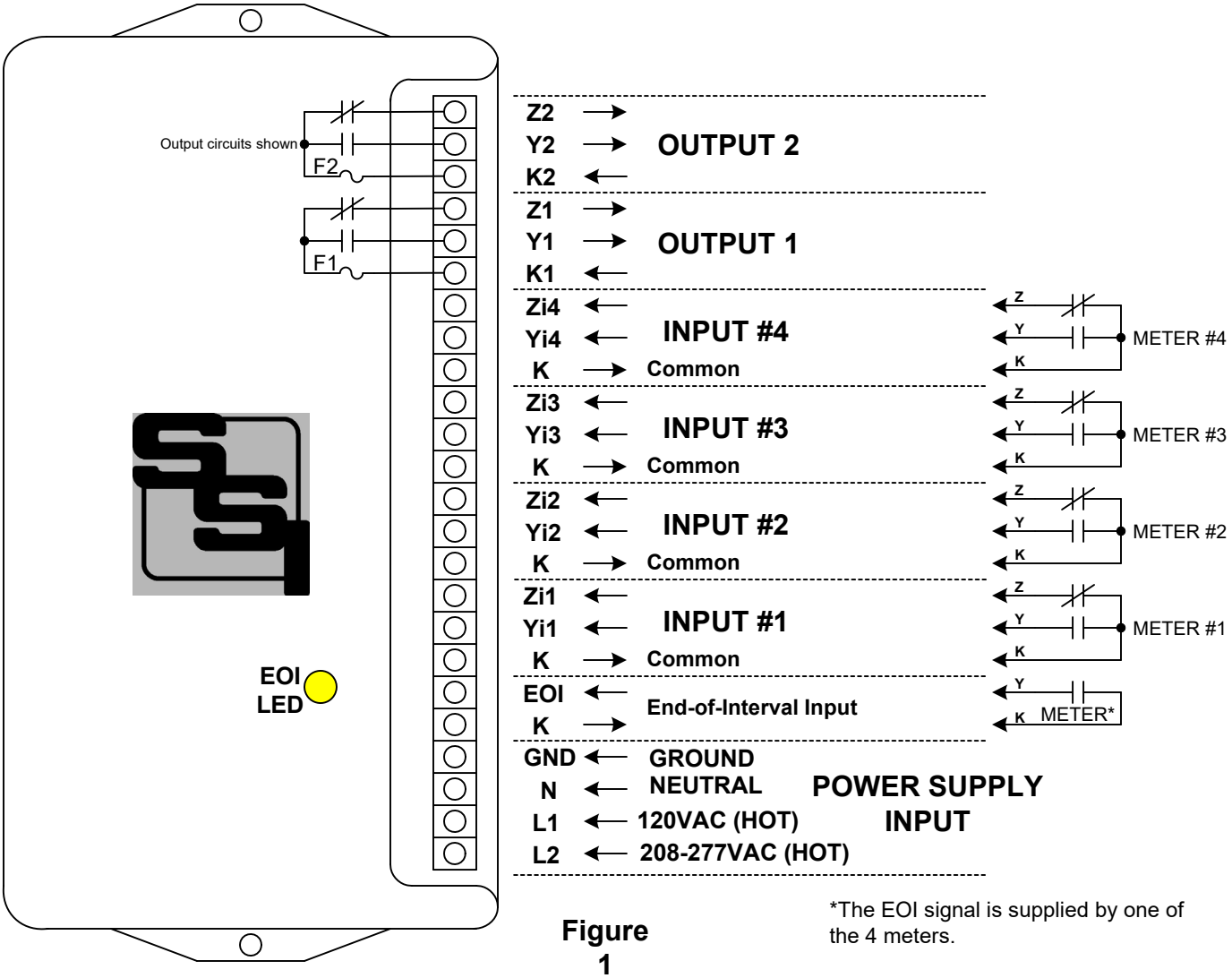

Figure 1

*The EOI signal is supplied by one of the 4 meters.

POWER INPUT - To power the MPT-4C with a 120VAC power supply, connect the "hot" 120VAC lead to the **L1** terminals. Connect the neutral lead to the **N** terminal. For 208, 240 or 277 VAC operation, connect the "hot" lead to the **L2** terminal. Connect the **GND** terminal to the electrical system ground. If a true Neutral does not exist at the mounting location, connect both **N** and **GND** to ground.

METER CONNECTIONS - The MPT-4C's K terminals provide the common return for all of the meters' K terminals. One is provided for each pulse input. The MPT-4C can accept either 2-Wire or 3-Wire inputs. Connect each meter's Y and Z outputs to the desired Yi and Zi input channel terminals. Each Yi and Zi input provides its own wetting (sense) voltage to the meter's Y and Z terminals. The meters' pulse outputs can be dry-contact, solid state or electro-mechanical.

SOLID STATE INSTRUMENTS

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OUTPUTS - Two 3-Wire isolated outputs are provided on the MPT-4C. MOV Transient suppression for the contacts of the solid-state relays is provided internally. The output loads are limited to 1/10 Amp by F1 & F2. Two 1/10 Amp fuses are supplied standard with the unit unless otherwise specified. The fuse is a 3AG (AGC) fast blow type.

OUTPUT CONFIGURATION - Each output channel of the MPT-4C may be configured as one Form C (3-Wire) output or two independent Form A (2-Wire) outputs. The outputs' configuration is configured in the OUT MODE display of the programming loop. If the Form C output mode is selected, Outputs 1 and 2 operate in tandem, that is, both operate in Form C mode and use a "toggle" pulse operation. In this mode, K1-Y1 and K2-Y2, for example, are both closed at the same time and K1-Z1 and K2-Z2 are open.

USING THE OUTPUT IN 3-WIRE MODE - When the MPT-4C is operated in the Form C (3-Wire) mode, each output channel "toggles" to the opposite state --back and forth like a single-pole, double throw switch -- upon each pulse being outputted. For one pulse there is continuity between K and Y (a closure) while there is no continuity between K and Z (an open). Upon the next pulse being received from the meter they reverse positions, K-Z closes and K-Y opens. In Form C mode, Y and Z are always opposite of each other. When one is closed and the other is open. There is logic in the MPT-4C's software that disallows two FORM C pulses of the same type in a row. They MUST alternate KY, KZ, KY, KZ, KY etc.

Each KYZ output is an isolated dry contact, meaning there is no voltage applied to it internally. The wetting voltage for each KYZ output of the MPT-4C output must be supplied by the receiving ("downstream") device or by an auxiliary power supply. The outputs are solid state and are non-polarized. They may be used for AC or DC voltages. The output is limited to 100mA@ 250VAC, 800mW maximum. Fuses are sized at 1/10th amp (100mA). Do not exceed this rating as the solid state MOS-FET switching device may be destroyed. Internal current limiting of the solid state devices is also employed to protect them from over current or high dissipation situations. In the Form C mode, it is perfectly acceptable to use only two wires on the MPT-4C's output to the downstream device. Remember to double the Form C pulse constant if your receiving device does not automatically adjust the pulse value. Most energy management systems actually prefer a "toggle" pulse because it is generally a 50/50 duty cycle.

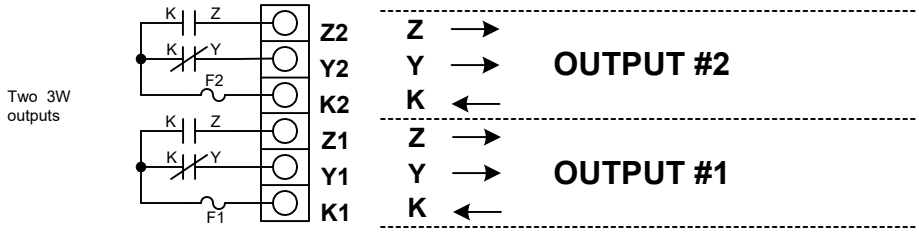

Figure 2

USING THE OUTPUT IN 2-WIRE MODE -

The MPT-4C's two KYZ outputs contain four solid state Form A dry-contacts and may be used independently as four Form A outputs in two KY and KZ pairs. In this case instead of Y and Z of each output being opposite of each other, they are independently used. (See Figure 3). These outputs operate in the momentary mode, meaning they close for a fixed period of time then reset to an open state. Even though the devices are operated independently in Form A mode, each set (Y1A-Z1A and Y2A-Z2B) must be operated at the same voltage, from the same voltage source since they have a shared common.

When the Output Mode display is set to "A", the two output channels each have a unique Output Pulse Value that can be individually set so different pulse output values are possible. To use the two output mode a clear understanding is necessary by the installer or user. There is a difference between the Hardware Outputs and the Software Channels. Output #1 (Hardware) consists of a 3-Wire pulse output consisting of K1, Y1 and Z1 output terminals. (Continued on next page)

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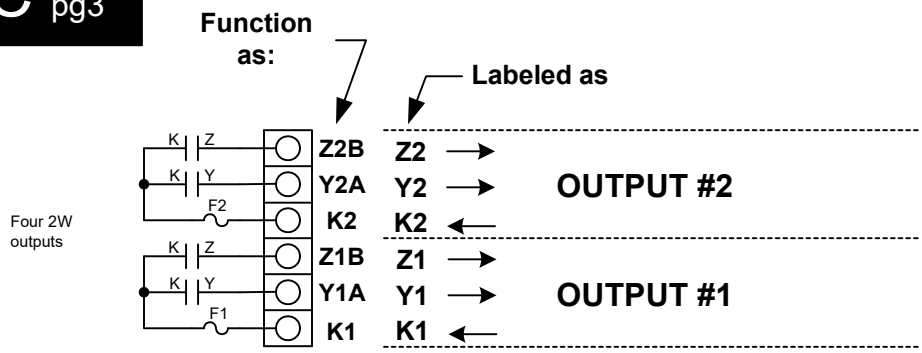

Figure 3

(Continued from Page 2:)
Output #2 (Hardware) consists of a second 3-Wire pulse output consisting of K2, Y2 and Z2 output terminals (See Figure 3 on Page 3.) In the Form A (2-Wire) output mode, the MPT-4C has two software output "Channels" that operate the hardware outputs individually. Channel 1, denoted by the suffix "A" operates the two outputs designated as Y1A and Y2A. Channel B is denoted by the suffix "B" and operates the two outputs designated as Z1B and Z2B. Each software output operates its two hardware outputs in tandem, meaning that both hardware outputs close and open togeher. For example, whenever a pulse is outputted on Software output Channel #1, both Y1A and Y2A close (connect to) to their respective K terminals. In other words, upon a closure of this channel, K1 and Y1A have continuity; K2 and Y2A have continuity. Likewise, when a pulse is outputted on Software output Channel #2, K1 and Z1B have continuity; K2 and Z2B will have continuity.
Note: YxB and ZxA do not exist in this numbering scheme.The second digit (numerical) denotes the Hardware output, either 1 or 2. The third digit (alpha) denotes the software channel, either A or B.

In the Form A output mode, there are several other differences.
Output Pulse Width Setting: The outputs' dwell or closure time is controlled by the AOUT1_TMS and AOUT2_TMS settings. See the MPT-4C programming manual for more information on this setting. These settings range from 100mS to 1000mS in 100mS increments. It is important to know the minimum pulse width specification of the receiving equipment. The output pulse width time must be set so that pulses will be reliably "seen" by the pulse receiving equipment. If pulses are too short, they will either not be counted at all or may be intermittently received. Most equipment will see pulses down to 50 mS, so 100 mS is a good default value. This value should be kept as short as possible (so as not to skew demand information in the event that pulses are outputted rapidly) but long enough to be reliable.

End-of-Interval (EOI) pulse Input: If the demand function of the MPT-4C is used, an end-of-interval signal must be provided by one of the meters supplying energy pulses to the MPT-4C. A Form A (2-Wire) dry-contact relay output can be directly connected to the EOI and K terminals. The MPT-4C -provides its own +13VDC wetting voltage to this dry-contact so no other voltage source is needed.

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