

## Relay Guide

A TM2, TM450J & TM470 the PTO uses the Orange INPUT (3) in the harness to sense a positive trigger.

A TM2, TM450J & TM470 the PTO uses the Gray INPUT (1) in the harness to sense a negative trigger.

\* If the truck switches POSITIVE when PTO goes active, simply wire directly into the circuit.

\* If the truck switches NEGATIVE when PTO goes active, simply wire directly into the circuit.

A TM2J the PTO uses the Orange INPUT (2) in the harness to sense a positive trigger or negative trigger.

\* If the truck switches POSITIVE when PTO goes active, simply wire directly into the circuit.

\* If the truck switches NEGATIVE when PTO goes active, you will need to wire a relay into the circuit  
As example Negative Input for Positive PTO.

Negative Input for Positive PTO (TM2, TM450, TM2J)	
Relay Pin	Description
87	Ground
87a	Not Used
86	Ground
85	PTO
30	Prism (Gray Wire TM2, TM450 & TM470 Orange on TM2J)

Positive Input for Negative PTO	
Relay Pin	Description
87	12 Volts
87a	Not Used
85	PTO
86	12 Volts
30	Prism (Orange Wire TM2, TM450 & TM470)

Negative Input for Negative PTO	
Relay Pin	Description
87	Ground
87a	Not Used
86	12Volts (If PTO is wired to Ignition hook 86 to ignition side of the light)
85	PTO
30	Prism (Gray Wire TM2, TM450, TM470, Orange TM2J)

Positive Input for Positive PTO	
Relay Pin	Description
87	12 Volts
87a	Ground
86	Ground
85	PTO
30	Prism (Orange Wire TM2, TM450 & TM470) TM2J N/A

If you have a PTO that cuts off and on with the ignition and the PTO is a negative trigger you can use 2 Relays to eliminate the false PTO on message when you crank the truck or go to other side of the light with pin 86.

Relay Pin	Description
Relay 1	1
87	Pin 30 of Relay 2
87a	Not Used
86	Ignition
85	Ground
30	Ground
Relay 2	2
87	Prism (Gray Wire TM2, TM450 & TM470; Orange Wire TM2J)
87a	Not Used
86	PTO
85	12 Volts
30	87 of Relay1

## POWER SAVINGS VIA POWER MANAGEMENT

**Default Power Management's** default values are;

- 10 hours in Active Mode after the ignition is OFF (draw 240 mA with MDT and OBDII)
- 4 hours Sleep Mode after the ignition is OFF (draw 60 mA)
- Hour intervals in Deep Sleep once entered (draw 4 mA)

The Power Management algorithm can be disabled if the wiring in the vehicle is not correct. The most common problems are caused by improper ignition connections, bad external switches or PTO. The transceiver could remain in **Awake** mode always if these external inputs are active for any reason.

State	Transceiver	MDT	OBDII	JBUS	TOTAL
System ON –awake-, engine running	160 mA	80 mA	30 mA	4 mA	270 mA OBDII 244 mA JBUS
System ON –awake-, Engine OFF (4 to 10 hours depending of config)	160 mA	10 mA	10 mA	0 mA	180 mA OBDII 170 mA JBUS
System Sleep	60 mA	10 mA	6 mA	0 mA	76 Ma
System Deep Sleep	4 mA	10 mA	6 mA	0 mA	20 mA

**A GOOD WAY TO ENSURE THAT THE TM2/TM2J/TM450 IS NOT BEING AFFECTED BY A FAULTY EXTERNAL INPUT (SWITCH), IS TO REMOVE THE EXTERNAL INPUT PLUG. THIS WILL REMOVE ALL INPUTS (INCLUDING JBUS AND OBDII) INTO THE TRANSCEIVER AND SIMPLIFY SYSTEM TROUBLESHOOTING.**

### POWER USAGE EXAMPLE

- 1) 235 mA is roughly the same power draw used by a single dome light (full ON).
- 2) 20 mA is approximately the same draw that 2 LEDs.
- 3) 4 mA (Deep Sleep) is the same as a mini LED –car alarm type-.

**Typical power utilization of a truck in deep sleep with OBDII and MDT or CTO is 20 mA.**

20 mA equals nearly 0.5 Amp per day, i.e. **.020 Amp X 24 hours = 480 mA**, then **x 7** will yield **3.36 Amps** per week.

A standard Ford F150 has a battery that is roughly 80 Amp, if we consider that the engine will start with 40% of its battery capacity, then the truck will start after nearly 50 amps have been drained. This is approximately 8.9 weeks.

This calculation assumes a good battery and charging system and does NOT take into account 20% to 40% capacity (Amp) losses due to low temperature (below 30°F).