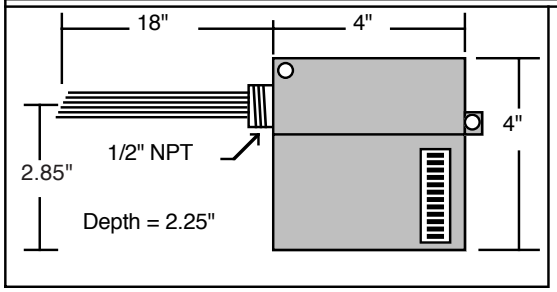
FUNCTIONAL DEVICES, INC

POWER-LINE CARRIER



MODEL RV
RESPONDER (2-WAY)

UL LISTED CSA

DESCRIPTION

RVs are a remote component in the PLC link between the controller and the load being controlled. They carry out, via internal relay(s), the digital out commands given by the controller and send internal relay status (verification) back using the existing ac wires or a dedicated pair as the communication path. They can be programmed by setting the positions of switches to assume a unique digital code or identity (ID).

FEATURES

- Uses existing ac wires or separate dedicated twisted pair for the communication link.
- Field-programmable DIP switch
  - 512 IDs
  - Manual "OVERRIDE ON" switch
  - Communication-loss "TAKE-ACTION" switch
  - "STARTUP-CONDITION" switch
- Easy to install
- Excellent diagnostics
- Internal relay provides digital output
- Digital-in answer is verification of internal relay condition
- Built-in microprocessor with fail-safe circuit
- 120 through 480 Vac power input (also 24 Vac)

OPTIONS

RESPONDER POWER SOURCE							
24 Vac *	120 Vac	240 Vac	347 Vac	480 Vac	RELAY #1	RELAY #2	# OF IDs
RV24C/A	<----------RV41C/A---------->				PILOT		1
RV24H/A	<----------RV41H/A---------->				PILOT	PILOT**	1
	RV01P/A	RV02P/A		RV04P/A	POWER 1		1
				RV04P2/A	POWER 2		1

* See note ② on page 7. All Responders connected to case L of page 4 must have green wire connected to equipment ground at the location of the Responder.

** In RV24H/A and RV41H/A relay #2 follows relay #1 on immediately but delays off for 10 minutes.

Timed manual override-on (1/2, 1 or 2 hours) is available on all RV Responders. In ordering, follow model number by M and the override-on time desired. Initiate override-on by connecting grey / red wire to green wire.

OPERATION

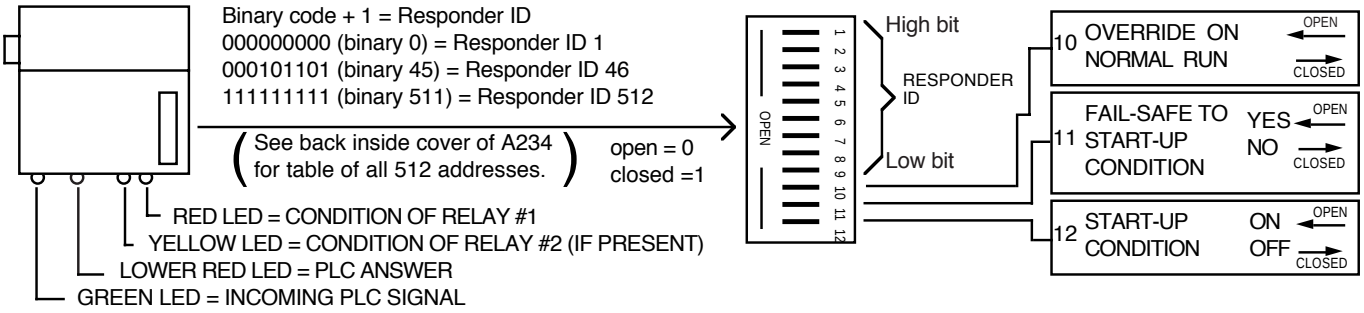
RV Responders receive signals from a two-way Command Synthesizer via the CTR Command Transmitter/Receiver. Relay(s) within RV control the load(s). The PLC answer indicates the status of the internal relay and becomes digital-in to the controller.

Any of 512 IDs is set by position 1-9 of a DIP switch with position 1 = most significant (high) bit. DIP switch 10 overrides on if open (normal operation if closed). DIP switch 12 sets the start condition to start the load on if open (off if closed). DIP switch 11 controls whether or not the Responder goes to the start condition if it receives no good signal for 20 minutes - open = go to start condition, closed = take no action upon loss of signal.

The first red LED indicates operation of the Responder and aids in diagnostics. On = load is on. Blinking slow = load is off. Alternating between off and blinking = load is off and no good signal is now being received. Alternating between on and blinking = load is on and no good signal is now being received. Blinking fast = no good signal has been received to that ID for 20 minutes or more (or since power-up). A yellow LED (if present) is on if load #2 is on and is off if load #2 is off. A second (lower) red LED indicates PLC answer (return transmission). The green LED indicates PLC signal being received - normal is flickering.

The last letter on the model number indicates the channel (carrier frequency) the Responder receives. It is normally Channel A for the first 512 IDs and Channel B for the second 512 IDs.

Only one two-way Responder may be at a given ID. An RV Responder may share the same ID as an RTC or an RTQ if the RTC or RTQ has had its digital-in inhibited. If an RC Responder is being used in a two-way system and if the Command Synthesizer is being run adaptively then the RC may not be at the same ID as an RV Responder.



SPECIFICATIONS

RESPONDERS	POWER INPUT		
RV24C/A, & RV24H/A	24 Vac	60 Hz	1.2 WATTS
RV41C/A, & RV41H/A	120-480 Vac	60 Hz	3.1 WATTS
RV01P/A	120 Vac	60 Hz	3.0 WATTS
RV02P/A	208-277 Vac	60 Hz	3.0 WATTS
RV04P/A & RV04P2/A	480 Vac	60 Hz	3.0 WATTS

- Household-type ground fault interrupters are not allowed in circuits supplying ac power to Responder.
- SPDT pilot relay rated at 10 A resistive, 2 A tungsten, 277 Vac (For highly inductive loads such as 24 Vac contactors, Model TS transient suppressor is recommended to protect contacts.)
- Power 1 relay = SPST power relay rated 30 A at 300 Vac, 10 A at 600 Vac, 0.75 HP at 120 Vac, 1.5 HP at 240 Vac and heavy duty pilot at 600 Vac
- Power 2 relay = DPDT power relay rated 20 A at 300 Vac, 5 A at 600 Vac, 1 HP at 120/480/600 Vac, 1.5 HP at 208/240 Vac, 660 VA at 120 Vac, 915 VA at 208 Vac, 960 VA at 240 Vac, 765 VA at 480/600 Vac and NEMA B600 Pilot Duty rating
- Relay rated life 100,000 cycles minimum at full rated load, 1,000,000 cycles mechanical
- Minimum sensitivity of 10 mV peak-to-peak PLC
- Absolute rejection of all signals outside of + / - 0.8% of channel center
- PLC communication is two-way, has confirmation means, redundancy and continuous refresh
- Operating temperature range = -30° to 150° F, except RV04P2/A, which is -30° to 122° F; storage temperature range = -40° to 185° F
- Humidity range = 5 to 95% (noncondensing)
- Contains externally visible LEDs, which show the presence of ac power, the presence and validity of incoming PLC, the ON/OFF status of the loads(s) and the occurrence of a PLC answer.
- Two-piece housing 4" X 4" X 2.25" of 94-5V flame retardant grey plastic, mountable via attached 1/2" NPT nipple or via screw mounts. Electronics portion is separable from mounting/wiring portion.
- UL listed under standard 916 Energy Management Equipment. CSA Certified.