



INITIAL INFORMATION 06-10-06

Model PF8RMC
SOFTWARE VERSION 20060923-PELCO

**4-AXIS CAMERA CONTROL with
Pan, Tilt, Zoom, Focus/Iris
Via RS232/RS485 Interface**

Table Of Contents

<u>OVERVIEW.....</u>	<u>2</u>
<u>COMMAND STRUCTURE.....</u>	<u>2</u>
<u>PELCO PAN/TILT/ZOOM COMMAND</u>	<u>2</u>
<u>R.E.SMITH COMMANDS.....</u>	<u>3</u>
<u>COMMAND = * CAM(0FH,XY,TTTTH)</u>	<u>3</u>
<u>COMMAND STRUCTURE (CONTINUED):</u>	<u>4</u>
<u>SAMPLE “*CAM” COMMANDS</u>	<u>4</u>
<u>COMMAND = *GET (0FH) GET I/O STATUS COMMAND.....</u>	<u>4</u>
<u>USER SELECTABLE JUMPER SETTINGS.....</u>	<u>5</u>
<u>UNIT ADDRESS</u>	<u>5</u>
<u>BAUD RATE</u>	<u>5</u>
<u>FIG. 1: PF8RMC BOARD LAYOUT DIAGRAM</u>	<u>6</u>

Overview

The **PF8RMC** is a microprocessor controlled 4-axis (8 relays) camera control unit that can drive small DC motors by applying power from a relay “H” bridge. The unit can be used to pan, tilt, zoom, and control the focus or iris of the lens. In the idle position both sides of a motor in the bridge are connect to +V (9-28VDC). When a relay is activated on one side of the “H” bridge the motor is connected to common on that side. The Voltage across the motor will cause it to run in either a CW (clock wise) or CCW (counter clock wise) direction. Starting from the “Home” position (both relays off and no LED's except uP/PWR), when the other relay of the “H” bridge is activated, the Voltage across the motor will cause it to run in the opposite direction. By reversing the motor leads, complete control of motor direction is provided. Commands are sent to the PF8RMC through an RS232/RS485 serial interface.

Command Structure

The PF8RMC unit contains two command sets, the R.E.Smith command set and the PELCO compatibility command set.

PELCO PAN/TILT/ZOOM COMMAND

The PF8RMC will decode the PELCO Pan/Tilt/Zoom/Focus or Iris command from the PELCO “D” Protocol Manual, the data bytes of the command are ignored. The Pan and Tilt speed are fixed.

Three R.E.Smith option commands exist to configure the function of the PELCO command for Pan/Tilt/Zoom.

Option Command *OPT(0FH,PAD=XXH), this command sets the address for comparison with the second byte of the PELCO command.

*Example: *OPT(0FH,PAD=0FH) set address to ASCII character position (15).*

Option Command *OPT(0FH,PTO=XXXXH), this command sets the time out for camera axis control relays. The value is specified in hexadecimal and is in increments of 0.1 seconds.

*Example: *OPT(0FH,PTO=64H) set timeout to 10.0 seconds.*

Option Command *OPT(0FH,PCE=[Y|N]), this command enables or disables the PELCO checksum. If enabled the received PELCO commands compare the calculated and stored checksum.

R.E.SMITH COMMANDS

All commands begin with the command start character '*' next is a three character opcode followed by the parameter list encased in parentheses. The first parameter will always be the unit address, which for this unit is fixed to "0FH".

In general only one relay of the 5-axis camera control will be active at any given time. When a new "*CAM" command is issued the previous command will be terminated (all relays off). For Pan and Tilt operation the full power mode should be used. The command structure is typical of many of the R. E. Smith, "PF" serial commands. New commands have been added specifically to allow easier control for typical camera control applications. Use capital letters for all commands and data.

COMMAND = * CAM(0FH,XY,TTTTH)

***CAM = Camera Axis control command**

0FH = TARGET UNIT ADDRESS (Fixed on the PF10RMC)

X = MOTOR COMMAND SELECTION:

P = PAN

T = TILT

Z = ZOOM

I = IRIS

F = FOCUS

STOP=STOP (Home position, all relays off, and no LEDs except uP/PWR)

Y = MOTOR DIRECTION:

P = POSITIVE (EVEN # RELAY ON)

N = NEGATIVE (ODD # RELAY ON)

TTTTH = TIMER VALUE IN HEX (0.1 second resolution):

TTTTH = 0000H = TURN OFF

TTTTH = 0001H THRU FFFE H = turn off after "TTTT" delay

TTTTH = FFFFH TURN ON and STAY ON (until NEXT COMMAND)

NOTE: If TTTTH argument is omitted = TURN ON and STAY ON

NOTE: Valid arguments TH, TTH, TTTH, TTTTH

NOTE: T represents an ASCII Hex Character

LED INDICATORS:

1. Yellow Power indicator (uP/PWR) is on and will turn off for 0.25 sec. when a new command is issued.
2. Green Run indicator (MOTOR RUN) is on when any relay is active.
3. Green below the red and yellow LED's indicates serial data is being received.
4. Red serial data is being transmitted.

Command Structure (continued):

SAMPLE “*CAM” COMMANDS

- *CAM (0FH,PP) = Relay K2 is on with no timeout
- *CAM (0FH,TN,AH) = Relay K3 is on for 1.0 second
- *CAM (0FH,ZP,32H) = Relay K6 is on for 5.0 seconds
- *CAM (0FH,IN,12CH) = Relay K7 is on for 30.0 seconds
- *CAM (0FH,FP,64H) = Relay K10 is on for 10.0 seconds
- *CAM (0FH,STOP) = All relays off

COMMAND = *GET (0FH) Get I/O Status command

This command will read the state of the outputs and inputs of the device.

***GET = GET STATUS OF INPUTS/OUTPUTS/CAMERA CONTROL**

FORMAT: *GET(0FH)

*GET(0FH) returns GUNIT(0FH,I,O,J)-0000-00XX_a-0X_b0X_c#

XX_a = Hex encoded state of the relay outputs also Hex encoded state of camera control functions see table below.

	FUNCTIONS (GET Command Return Values)			
OFFSET	PAN	TILT	ZOOM	IRIS/FOCUS
POS.	20	80	02	08
NEG.	10	40	01	04

X_b = Hex encoded state of the baud rate jumpers (J1-J4)

X_c = Hex encoded state of the unit address jumpers (J7-J10)

User Selectable Jumper Settings

UNIT ADDRESS

The R.E.Smith Commands require an address which can be set on jumpers J7-J10. The address can be set to 16 values by either installing or removing jumpers from the range J7-J10. The address value is calculated by the following weighting of the jumpers, J7 installed equals +8, J8 installed equals +4, J9 installed equals +2, and J10 installed equals +1.

To set the board address to 0Fhex which equals 15 decimal, install J7⁺⁸, J8⁺⁴, J9⁺², and J10⁺¹.

Examples

Address (0Fh) = J7+J8+J9+J10 installed

Address (09h) = J8+J9 removed and J7+J10 installed

Address (01h) = J7+J8+J9 removed and J10 installed

Address (00h) = J7+J8+J9+J10 removed

BAUD RATE

The PF8RMC baud rate can be set to several different settings using JP1 - JP4. The operating serial communications specification is N,8,1.

Table 2: RS-232 BAUD RATE SETUP					
Baud Rate Selection in any MODE (J1 – J4)					
Note: Sampled on power-up only!					
HEX	J1	J2	J3	J4	Baud
F	I*	I*	I*	I*	9600
E	I	I	I	R	115.2K
D	I	I	R	I	9600
C	I	I	R	R	57.6K
B	I	R	I	I	38.4K
A	I	R	I	R	28.8K
9	I	R	R	I	19.2K
8	I	R	R	R	14.4K
7	R	I	I	I	9600
6	R	I	I	R	4800
5	R	I	R	I	2400
4	R	I	R	R	9600
3	R	R	I	I	9600
2	R	R	I	R	9600
1	R	R	R	I	9600
0	R	R	R	R	9600

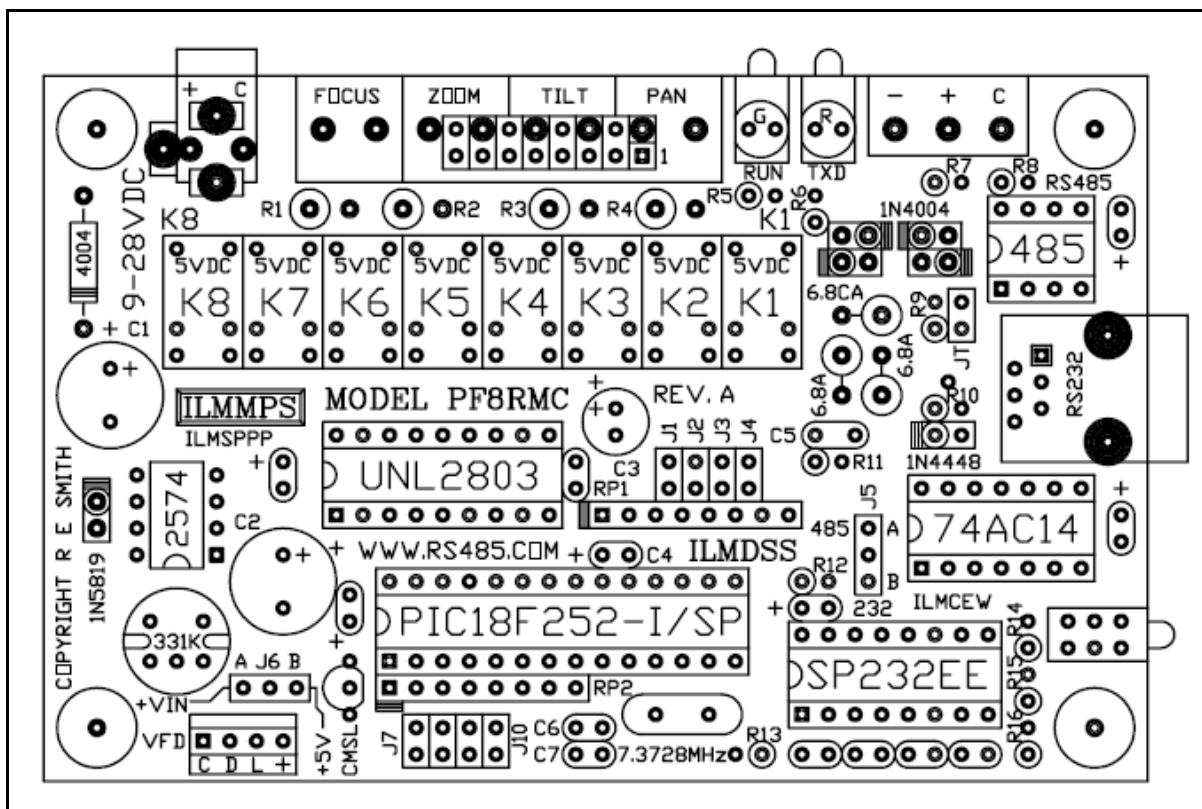


Fig. 1: PF8RMC Board Layout Diagram