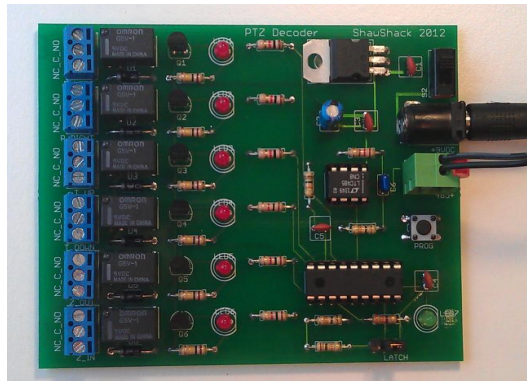


Surveillance Camera Pan/Tilt Decoder
PART NO. 2169475



Would you like to do more with your security camera or DVR system? If your security camera system's Pan/Tilt/Zoom (PTZ) capability uses RS485 and the Pelco-D or Pelco-P standard, then this kit could help provide up to 6 relay outputs with your current system. This kit acts as an interface between your camera system and other things you want to control, like playing a recorded message, turning on a light or controlling motors, you decide.

The unit can be set to a possible 255 address combinations, so multiple units can be used together. Each relay output can switch a maximum 500mA load and provides a visible red LED indicator. The outputs can be configured to operate as momentary or latching outputs.

Time Required: 1-2 hours depending on experience

Experience Level: Intermediate

Required tools and parts:

PICAXE 18M2 Microcontroller (NEEDS a PIC programmer AND to be programmed with a Pelco-P or Pelco-D decoder software)
Connector
Soldering iron and solder
Masking tape (optional)
Wire cutters
Digital Multimeter (optional)
Needle nose pliers

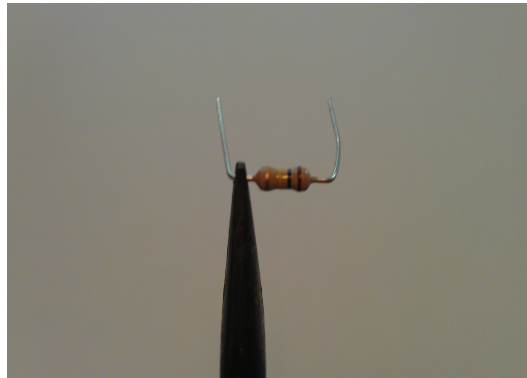
Bill of Materials:

Qty	Jameco SKU	Component Name
6	187240	RELAY,G5V-1-DC5
1	299807	IC,LTC485CN8(ADM485JN),DIP-8
1	526213	SOCKET,IC,18 PIN,390261-5
1	526299	SOCKET,IC,8 PIN,390261-2
6	2156084	Resistor, CF,100K OHM,1/4 WATT,5%
1	2158910	Resistor, CF,330 OHM,1/4 WATT,5%
1	2159031	Resistor, CF,120 OHM,1/4 WATT,5%
6	35991	DIODE,SIL REC,1N4004,1A
7	2006730	LED,5MM,HI-EFF RED,DIFFUSED
6	178597	TRANSISTOR,2N3904,NPN
4	151116	Capacitor, CERM,DISC,.1uF,25V,20%
1	101178	JACK,DC PWR,MALE,2.1mm,SOLDER
6	2094514	HEADER,3.5mm,TERM BLOCK,3 POS
1	51262	IC,7805T,TO-220FP
6	2157159	Resistor, CF,1K OHM,1/4 WATT,5%
1	31000	Capacitor, RADIAL,4.7uF,50V,20%,85C
1	119011	SWITCH,PB,TACT,SPST,OFF-(ON)
4	2157167	Resistor, CF,10K OHM,1/4 WATT,5%
1	109171	SWITCH,SLD,MIN,SPDT,ON-ON
1	109576	HEADER,.1"ST MALE,1RW,3PIN

1	15341	Capacitor, CERM,DISC,100pF,50V,20%
---	-------	------------------------------------

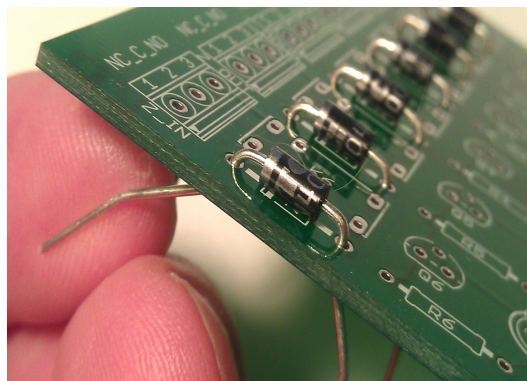
Step 1 - Bending of component leads

- Using the needle-nose pliers, grab the lead of the part close to the body and bend the lead 90 degrees to the part.
- Repeat the step above with the other lead, making sure to bend the lead in the same direction.



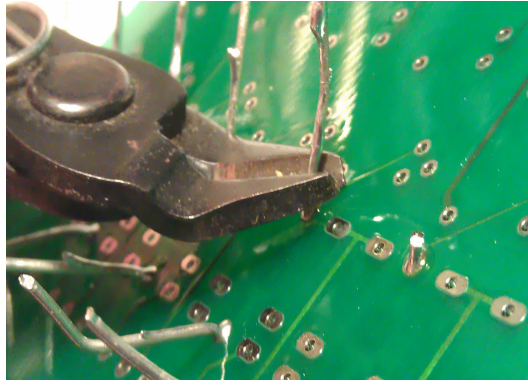
Step 2 - Diode assembly

- Locate six of the 1N4004 diodes and form them according to the technique in step 1.
- Insert a diode into the holes of the PC board for the D1 diode. Make sure to align the band of the diode with the band of the silk screened image on the PC board.
- Once inserted flush with the PC board, slightly bend the leads outward to hold the diode in place.
- Repeat the steps above for the remaining diodes D2-D6.
- Turn the PC board over and solder the leads of each diode to the PC board.



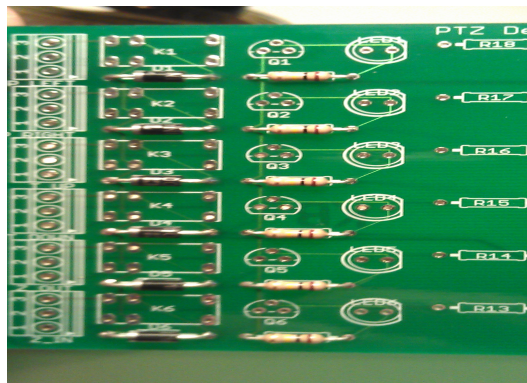
Step 3 - Proper lead trimming

- Cut the component lead just above the solder fillet.
- Do not cut into the solder joint when cutting the lead.
- Follow this process when cutting other component leads.



Step 4 - Resistor assembly 1

- Locate six of the 100K ohm resistors (Brown,Black,Yellow,Gold bands) and form them according to the technique in step 1.
- Insert the 6 resistors through the holes of the PC board for R1 through R6. Once inserted flush with the PC board, slightly bend the leads outward to hold the resistor in place.
- Solder each resistor lead and trim them using the technique in step 3.



Step 5 - Resistor assembly 2

- Locate six of the 1K ohm resistors (Brown,Black,Red,Gold bands) and form them using to the technique in step 1.
- Insert the six resistors through the holes of the PC board for R13 through R18. Once inserted flush with the PC board, slightly bend the leads outward to hold the resistor in place.
- Solder each resistor lead and trim them using the technique in step 3.

Step 6 - Resistor assembly 3

- Locate four of the 10K ohm resistors (Brown,Black,Orange,Gold bands) and form them using to the technique in step 1.
- Insert the resistors through the holes of the PC board for R8 through R11. Once inserted flush with the PC board, slightly bend the leads outward to hold the resistor in place.
- Solder each resistor lead and trim them using the technique in step 3.

Step 7 - Resistor assembly 4

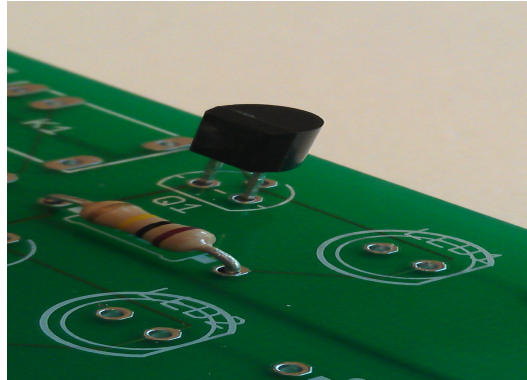
- Locate the 330 ohm resistor (Orange,Orange,Brown,Gold bands) and form it using to the technique in step 1.
- Insert the resistor through the holes of the PC board for R7. Once inserted flush with the PC board, slightly bend the leads outward to hold the resistor in place.
- Solder the resistor leads and trim them using the technique in step 3.

Step 8 - Resistor assembly 5

- Locate the 120 ohm resistor (Brown,Red,Brown,Gold bands) and form it using the technique in step 1.
- Insert the resistor through the holes of the PC board for R12. Once inserted flush with the PC board, slightly bend the leads outward to hold the resistor in place.
- Solder the resistor leads and trim them using the technique in step 3.

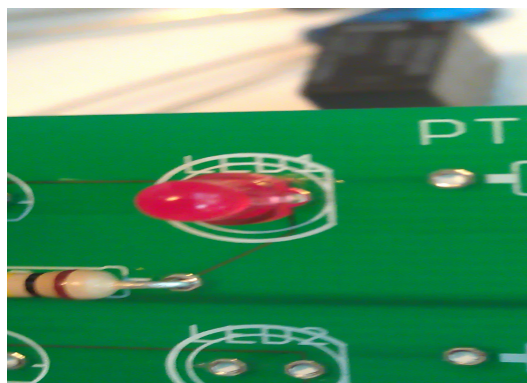
Step 9 - Transistor assembly

- Locate six of the 2N3904 transistors.
- Bend the middle pin of the transistor back a little to make it line up with the holes in the board.
- Align the flat part of the transistor with the silk screen outline on the PC board.
- Insert transistors through the holes of the PC board for Q1 through Q6.
- Solder each transistor lead and trim them using to the technique in step 3.



Step 10 - LED assembly

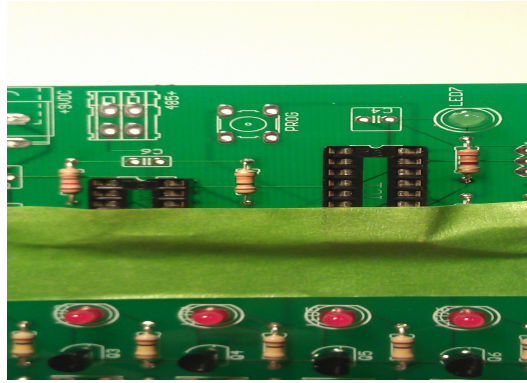
- Locate the seven red LEDs
- Align the flat part of the LED with the flat part of the silk screen outline on the PC board.
- Insert LEDs through the holes of the PC board for LED1 through LED7.
- Solder each LED lead and trim them using the technique in step 3.



Step 11 - IC socket assembly

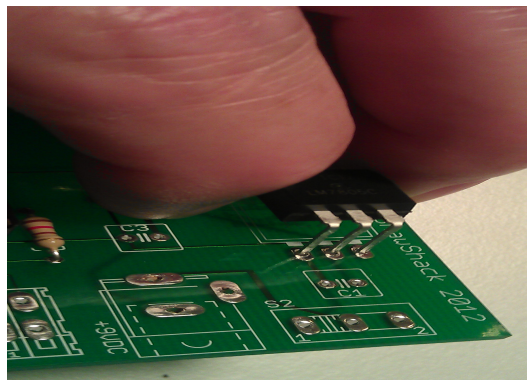
- Locate the 18 pin DIP chip socket and align the notch on the socket so it aligns with the notch on the silk screen outline on the PC board.
- Gently guide the pins through the holes in the board verifying each pin goes through to the other side of the board.
- As a way to hold the IC socket in place until it can be soldered, tape the socket in place using a small piece of masking tape.

- Solder each leg of the IC into place.
- Repeat the above step for the 8-pin IC3 DIP chip socket.



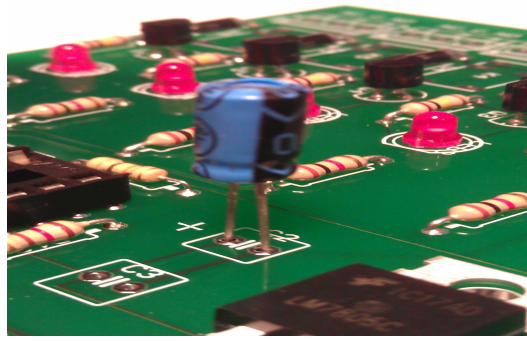
Step 12 - IC2 assembly

- Bend the leads of the 5V regulator at the tapered part of the lead 90 degrees back towards the back of the part.
- Insert the regulator into the holes of the PC board for IC2. Make sure to align the 5V regulator with the silk screened image on the PC board. Once inserted flush with the PC board, slightly bend the leads of the 5V regulator outward to hold the part in place.
- Turn the PC board over and solder the leads of 5V regulator to the PC board.



Step 13 - C2 assembly

- Locate the 4.7uF capacitor and insert it through the holes of the PC board for C2 making use to align the black negative (-) opposite to the (+) marking on the PC board.
- Once inserted flush with the PC board, slightly bend the leads outward to hold the capacitor in place.
- Solder the capacitor leads and trim them using to the technique in step 3.



Step 14 - Capacitor assembly

- Locate four of the 0.1uF capacitors and insert them through the holes of the PC board for C1, C3, C4 and C5.
- Once inserted flush with the PC board, slightly bend the leads outward to hold the capacitors in place.
- Solder each capacitor lead and trim them using the technique in step 3.

Step 15 - C6 Capacitor assembly

- Locate the 100pF capacitor and insert it through the holes of the PC board for C6.
- Once inserted flush with the PC board, slightly bend the leads outward to hold the part in place.
- Solder each capacitor lead and trim them using the technique in step 3.

Step 16 - Switch and Connector assembly

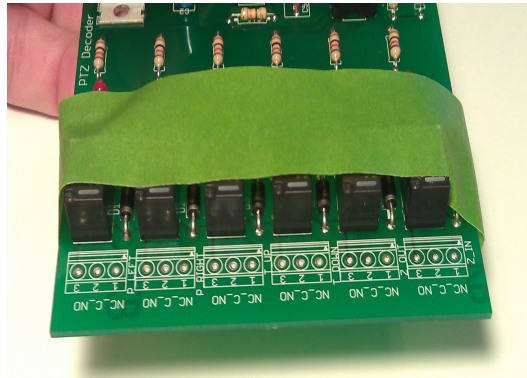
- Locate the S1,S2, DCIN, 3pin header (LATCH) and CON1 parts and align them with the silkscreen outline on the board.
- Make sure that the orange tabs on CON1 are located towards the back of the board.
- If needed, place a small piece of masking tape over top of CON1 and the 3pin header to help hold it into the place.
- Turn the PC board over and solder each lead of the parts into place.



Step 17 - Relay and relay terminal block assembly

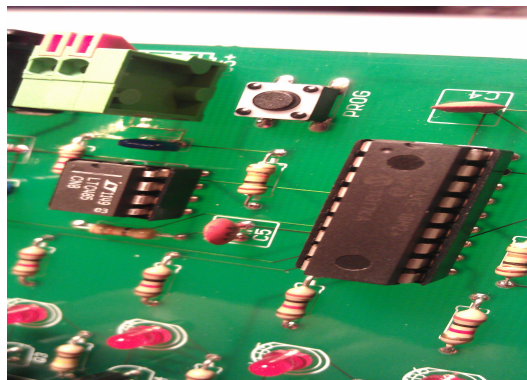
- Locate six of the G5V-1 relays and align them to the K1-K6 silk screen outlines on the PC board.
- Gently guide the pins through the holes in the board verifying each pin goes through to the other side.
- As a way to hold the relays in place until they can be soldered, place masking tape across the top of the relays and wrap it around the edges of the PC board.
- Solder each lead of the relays into place.
- Locate 6 of the 3 position term blocks and align them to the SK1-SK6 silkscreen outlines on the PC board. Make sure the openings of the term blocks are pointed towards the edge of the PC board.

- As a way to hold the term blocks in place until it can be soldered, place masking tape across the top and wrap it around the edges of the PC board.
- Solder each leg of the term block into place.
- Locate 5 of the G5V-1 relays and align them to the silk screen outline on the PC board.
- Gently guide the pins through the holes in the board verifying each pin goes through to the other side of the board.
- To hold the term blocks in place until it can be soldered, place masking tape across the top of the term blocks and secure at the edges of the PC board.



Step 18 - IC insertion

- Align the notch of IC1 with the notch on the socket on the PC board.
- Guide the pins of IC1 into the socket making sure all pins are aligned in the socket and then push the chip into place.
- Repeat the step above with IC3.



Step 19 - Initial check-out

Check assembly:

- Verify that all parts are assembled and all the leads are soldered.
- Make sure there are no solder shorts.
- Verify that parts with polarity are properly installed.
- Verify that the IC's are correctly aligned and all pins are in the sockets.
- (optional) Take a DMM and measure the resistance from the center pin to the other two pins of IC2. All the readings should be higher than 1K.
- Plug the 9V DC wall wart into the DCIN jack and switch S2 to the ON position. The relays and LED1-LED6 should be OFF and LED7 should be ON.
- Use the PROG button to program a known address into the unit.
- Connect the PTZ output from the security system to the RS485 connector on the PTZ decoder making sure wire "A" from the security system connects to the "A" wire on the connector and the "B" wire from the security system connects to the "B" connector.

-Test the unit by using the PTZ controls on the security system to send test messages to the PTZ decoder. Check for relay activity.

PTZ Decoder Instructions

PTZ Decoder Settings

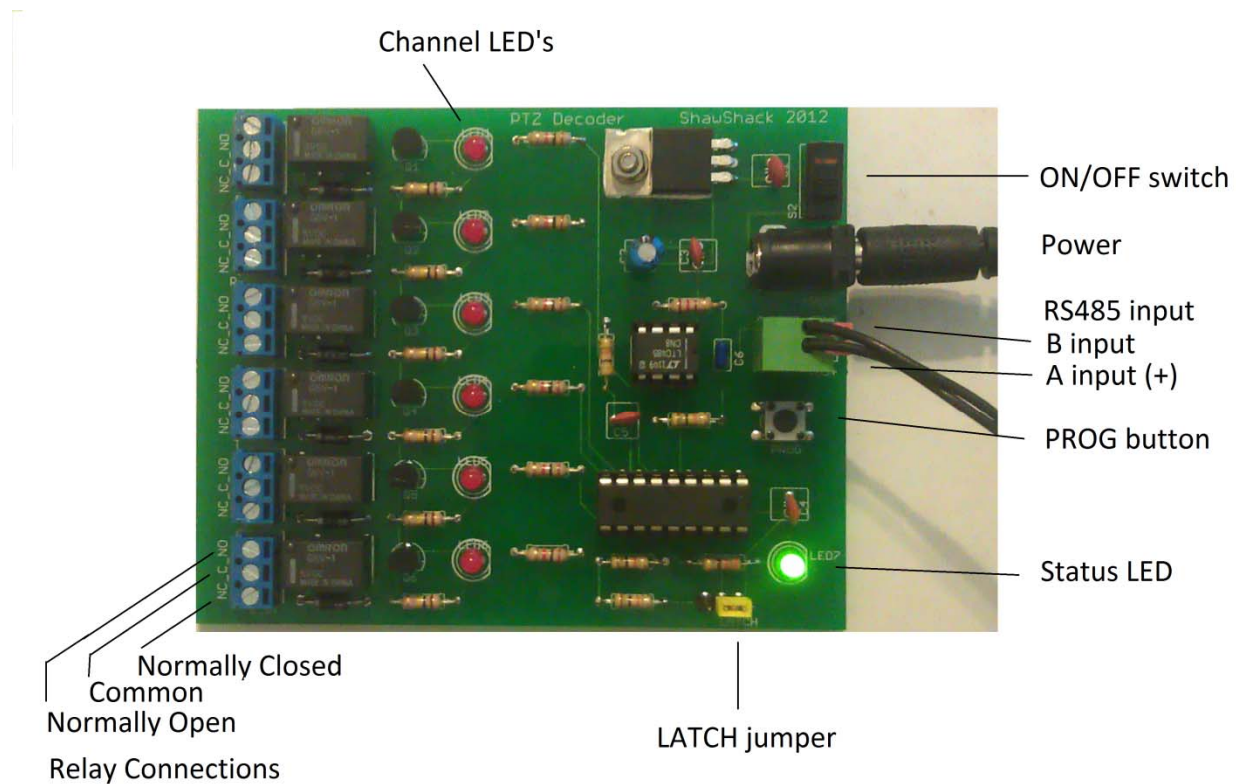
BAUD: 4800

Data: 8

Stop: 1

Input Power: 9VDC regulated, 500mA (use Jameco #1953639)

Please refer to the illustration below:



Unit Address Programming

The unit addresses can range from 1 to 255. It is set by holding down the **PROG** button while turning the **ON/OFF** switch **ON** and holding it until the **Status LED** goes off.

- ✓ When the **Status LED** goes off, press the **PROG** button the desired number of times for the corresponding address.

- ✓ **For Pelco-D**, if the desired unit address is 3, after the **Status LED** goes off press the **PROG** button 3 times. The **Status LED** will flash for each **PROG** button press.
- ✓ **For Pelco-P**, if the desired unit address is 3, after the **Status LED** goes off press the **PROG** button 4 times. (This is because Pelco-P addressing starts at 0). The Status LED will flash for each **PROG** button press.
- ✓ Wait for the **Status LED** to come back on. The unit address is now programmed.

LATCH Jumper Setting

- ✓ Set the Jumper to the **LATCH** position for relay latching operation and in the opposite direction for relay momentary operation.