

Setup Examples

The following procedures are examples of setting up the EC-3000 or EC-3400 unit when various methods of wiring are used. The examples include multiple pulse, multiple pulses within a window, and product changeover using an external switch.

WARNING

Injury hazard due to accidental starting of machine. Put machine control in a safe mode and keep all personnel away from machine during setup, when adjusting cams, rotating the shaft, or setting DIP switches.

Multiple Pulse Example

The following procedure is an example of an adjustment to a typical EC-3000 or EC-3400 Series unit. In this procedure, the objective is to obtain two pulses, one from 45° to 90° and the second one from 225° to 270°. The two outputs will be wired in parallel to accomplish the multiple pulse setup.

Figure 13—Wiring for Multiple Pulse.

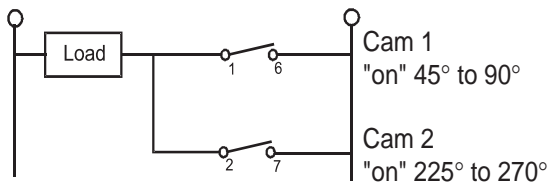


Figure 14—Unit with Parallel Wiring.

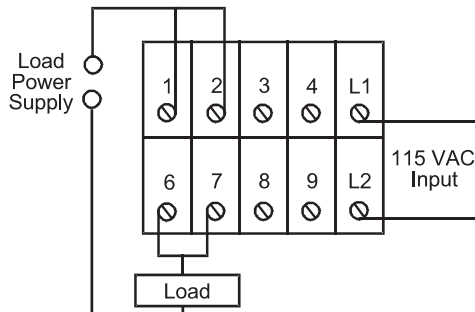
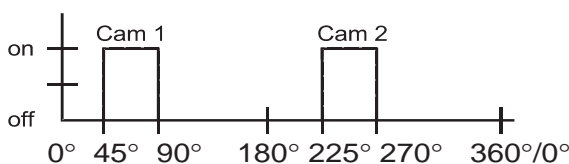


Figure 15—Output Timing Results of Multiple Pulse.



1. Install appropriate AC or DC output modules in Positions 1 and 2 of your unit.

Note: Positions 1 and 2 are used in the example, but the procedure may apply to any two positions.

2. Set the first two DIP switches in the 0° to 180° position or Light Energizing mode, because both pulses are less than 180°. When the photocoupler light passes through the opening, the switch and the LED will turn “on”.
3. Wire the voltage supply and load as indicated in Figure 13 and Figure 14.
4. With the provided wrench, set Cam 1 to be “on” from 45° to 90°. This will illuminate the corresponding LED from 45° to 90°.
5. Set Cam 2 to be “on” from 225° to 270°. This will illuminate the corresponding LED from 225° to 270°.
6. Since the outputs are wired in parallel (ORed), the current will flow through the load when Cam 1 or Cam 2 is “on”. Figure 15 shows the output timing results for Cam 1 and Cam 2.

Setup Examples

Multiple Pulses within a Window Example

The following procedure is an example of setting up a unit for multiple actions per machine cycle on an EC-3000 and EC-3400 Series unit. In this procedure, the objective is to obtain eight, equally-spaced pulses between 45° to 135°, using an interrupter disc in Position 3 and a 32-slot pulse generating disc in Position 4.

Figure 16—Wiring for Multiple Pulses within a Window.

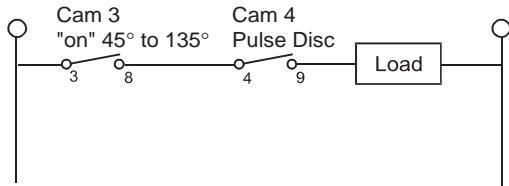


Figure 17—Unit with Series Wiring.

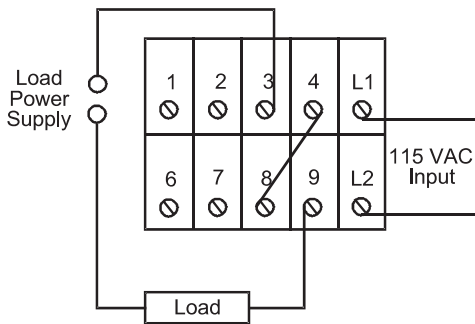
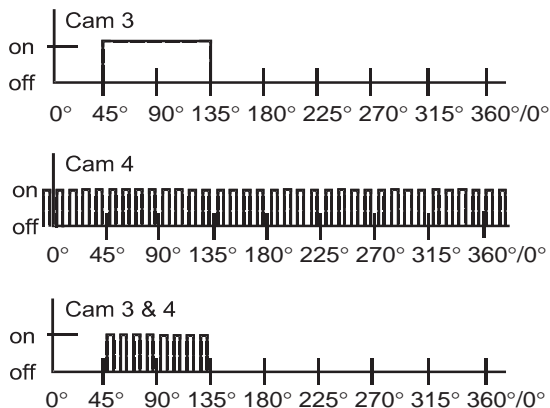


Figure 18—Output Timing Results of Multiple Pulses in a Window.



1. Install output modules in Positions 3 and 4, based on current and voltage requirements.

Note: Positions 3 and 4 are used, but the procedure may apply to any two positions.

2. Set the corresponding DIP switches in the 0° to 180° position or Light Energizing mode. This mode is used when the timing window is less than 180°. In this example, the timing window is 90° in duration.

3. Wire the voltage supply and load as indicated in Figure 16 and Figure 17.

4. With the provided wrench, set Cam 3 to turn “on” at 45° and turn “off” at 135°.

5. The 32-slot pulse generating disc in Position 4 may be adjusted to center the pulses within the “on” period of Cam 3.

6. Since Cam 3 and Cam 4 are wired in series (ANDed), the pulsed output of Cam 4 will be “on” during the period Cam 3 is “on”. Figure 18 shows the output timing results of Cam 3 and Cam 4 individually, and the output timing results of both cams when wired in series (ANDed).

7. With simple wiring, the signals can be ANDed or ORed with other cam outputs to give various stitching patterns for multi-pulse signal applications. For instance, these signals can be switched externally by a rotary switch to change patterns for different sizes or shapes of containers in a gluing application. This allows quick changeover without physically changing any of the cams.

Setup Examples

Changeover Example

The following section describes the setup of the unit for rapid changeover. This procedure eliminates the need to make internal cam adjustments by presetting several cams, one for each product.

Once preset, an external switch selects the proper cam for each specific product. This procedure can apply to carton and case sealing equipment, form, fill and seal machines, or assembly equipment. In this example, an AC solenoid valve controls a glue gun.

Figure 19—Cam with External Switching.

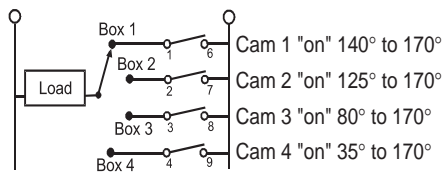


Figure 20—Preset each Cam.

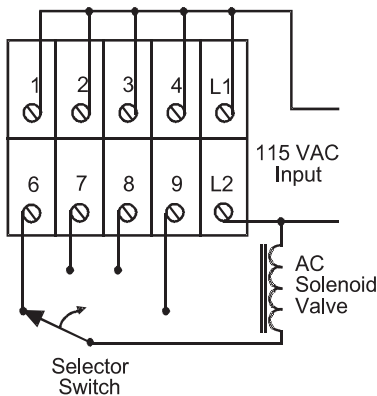
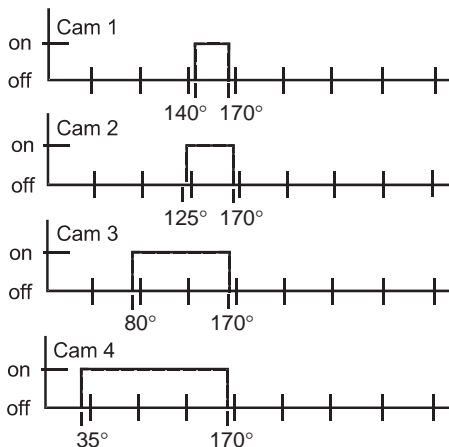


Figure 21—Output Timing Results.



1. Install output modules in Positions 1 through 4.
2. Set all DIP switches in the 0° to 180° position or Light Energizing mode, because all of the timing gaps of the cams in this example are less than 180°.
3. Wire the AC voltage supply, solenoid valve, and switch as indicated in Figure 19 and Figure 20. In this configuration, the four-position rotary switch produces four different output signals, generating four different glue patterns.

Cam 1	on at 140°	off at 170°
Cam 2	on at 125°	off at 170°
Cam 3	on at 80°	off at 170°
Cam 4	on at 35°	off at 170°
4. With the wrench provided, set the four interrupter discs as follows. The corresponding LED will illuminate when the cam is "on".
5. Refer to Figure 21 for the output timing results for all four cams. Once all cams are set, the external selector switch is the only change that needs to be made.

Troubleshooting

The following section describes problems that may occur with your EC-3000 or EC-3400 Series unit, and the procedures to resolve those problems.



WARNING

Injury hazard due to accidental starting of machine. Put machine control in a safe mode and keep all personnel away from machine during setup, when adjusting cams, rotating the shaft, or setting DIP switches.

1. Outputs and LED's are not actuating on your unit.

- a. Check the input power.
 - Ensure that terminal L1 and L2 are the correct input voltage.
- b. If the power at terminals L1 and L2 is correct, but no outputs and LED's actuate, conduct the following procedure.
 - Remove all power, unplug the input fuse, and check it with an ohmmeter.

2. An output and its corresponding LED are not cycling on or off.

- a. Check the corresponding photocoupler. Ensure that the photocoupler is not damaged and remove any debris, metal chips, or dirt from its surface.
- b. Operate the corresponding DIP switch, ensuring it is properly seated into position.

3. An output is not turning on, but its corresponding LED is turning on and off properly.

- a. Check the output fuse.
 - If the fuse is blown, replace the fuse and check all circuitry before reapplying power.
- b. The output module may not be working. Replace the output module with a new one.
- c. If the fuses and modules are okay, but the unit still does not operate properly, consult Electro Cam Corp. Customer Service for analysis and repair.

4. An output is not turning off, but its corresponding LED is turning on and off properly.

- a. If it is an AC output module, a load resistor may be needed. Refer to Page 13 for output wiring assistance.
- b. If it is a DC output module, ensure that the polarity is not wired backwards. Or, refer to Page 12 for output wiring sourcing or sinking assistance.
- c. The output module may be shorted or defective. Replace the output module with a new one.
- d. If the modules and wiring are okay, but the unit still does not operate properly, consult Electro Cam Corp. Customer Service for analysis and repair.

Options

Pulse Generating Discs

Multi-output pulse generating discs can be used with the EC-3000 or EC-3400 units. The EC-8003 Series pulse generating discs are often needed for applications requiring multiple outputs per revolution. These discs can generate timing pulses for tachometers, motion detection, glue stitching, or wherever multi-pulse signals are required. Glue stitching patterns on carton and case sealing equipment is an example of an application that benefits from pulse generating discs. Standard pulse discs 1, 2, 3, 4, 6, 8, 10, 16, 20, 32, 60, and 64 slots per revolution are available, allowing for quick changeover. Pulse generating discs are factory mounted on the cam shaft, replacing one set of adjustable cams.

Sprocket Disengagement Clutch

The sprocket disengagement clutch may be used wherever a shaft needs to be easily disconnected from a sprocket without removing the chain. The clutch not only allows for disengagement of one station of the machine to check operation without jogging the entire machine, but it simplifies the adjustment of the rotary cam limit switch. In other instances, it can disengage a portion of a machine to back a section up to clear a jam. It automatically locks back in the home position after one revolution. Tight tolerance bore lengths secure the device to the shaft with snap rings. The clutch has a 3/4" bore with the provision for a #606 Woodruff key. Models available with A.S.A. No. 35, 40, and 41 sprockets.

External Degree Wheel and Pointer

In addition to the internal degree wheel and pointer included with each EC-3000 and EC-3400 unit, an optional external degree wheel and pointer is available to visually determine shaft position without removing the cover of the switch. It must be ordered with the unit, and requires a double-ended shaft for mounting. It may be mounted to the left- or right-hand shaft, and may have a clockwise or counterclockwise rotation.

CFX for High Shock or Vibration

For extremely high shock or vibration, such as punch press applications, a CFX may be needed on the EC-3000 or EC-3400 unit. The CFX adds clear conformal coating on both sides of the printed circuit board, and removable jumpers replace the DIP switch. The jumpers eliminate the possibility of intermittent connection to the DIP switch or the accidental changing of the DIP switch setting through shock or vibration.

CF for Highly Contaminating Environments

For highly contaminating environments, the CF option may be ordered with the EC-3000 units. The CF adds clear conformal coating to both sides of the printed circuit board. This option is standard on EC-3400 units.

SINKING or SOURCING (as pertaining to Electro Cam Corp. products)

Sinking means that when the logic is true and the output (or input device) is ON, the output (or input device) is providing a DC common or ground to the connected device.

Sourcing means that when the logic is true and the output (or input device) is ON, the output (or input device) is providing a +DC voltage to the connected device.

This information is important when interfacing an Electro Cam Corp. product with another electronic device. If you are using an Electro Cam Corp. product input to an Allen-Bradley 1746-IN16 "sinking" input card* or similar A-B device, you have to supply a +DC voltage (Electro Cam Corp. **Sourcing** output) to this card, NOT a DC common or ground. In these cases, **Sinking** is what the card does with the input voltage; sinks it to common or ground.

*Other manufacturers include, but not limited to: Koyo (formerly GE Series 1, Texas Instruments, or Siemens SIMATIC PLS's) that use descriptions similar to Allen-Bradley.