Direct Connect

Direct Connect System

Installation Guide

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Installing the Solid State Direct Connect System

The Direct Connect System provides a quick and reliable method of installing a variety of auxiliary functions into the organ. The most common of these are the slider solenoid drivers, although luminous stop drivers for the addition to our capture systems, coupler solenoid drivers and dual registration slider cards are also available.

Power wiring to the Direct Connect.

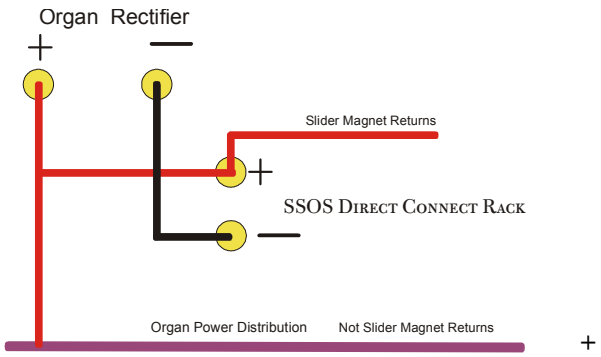
On the rear of the Direct Connect are two brass connectors fitted with suitable crimp terminals.

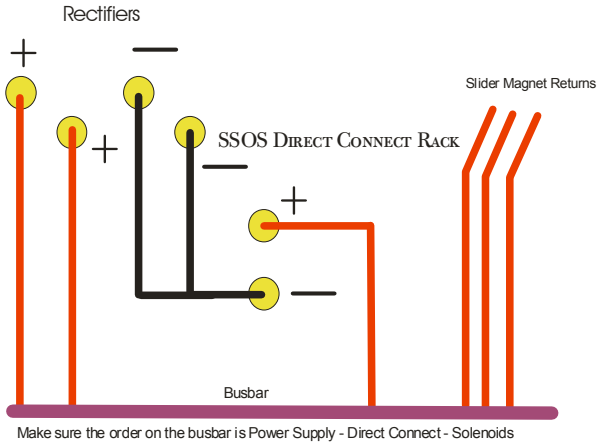
- The connector above connects to rectifier positive.
- The connector nearest the bottom of the box connects to rectifier negative.

When making these connections be sure to avoid stray strands of non-insulated cable being able to short to the soldered traces on the rear of the unit if the system is moved or tampered with later.

Important Note:

The positive feed must be connected exactly as follows to prevent damage to the system during operation. An alternative is shown for systems with a busbar.





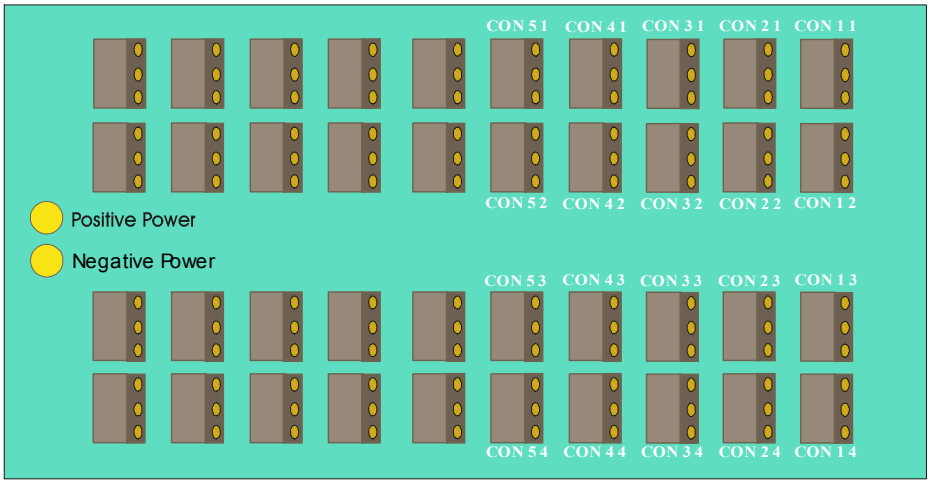
Make sure the order on the busbar is Power Supply - Direct Connect - Solenoids

The Direct Connect System Backplane

The drawing below shows the exterior rear surface of a sample Direct Connect System Box configured for 10 dual slider solenoid cards (20 solenoids). There are 20 vertical card slots on a large system box and 10 on a small system box.

The back of the Direct Connect is fitted with four small connectors for each vertical card slot. These are grouped in pairs, one above the other, with each pair providing connections for one solenoid. Each of the four connectors has three terminals. (The configuration of your box may vary if you have other cards fitted).

For convenience, the connector pairs are marked from the right as "CON (A) (B)" where (A) = the column number and (B) = the connector number from the top.



The exact number of terminals used will vary depending on which card type is installed. Please refer closely to the wiring information for each card type detailed in the following pages.

The interior side of the Direct Connect System backplane is now fitted to receive Type C 64 pin DIN 41612 connectors which are supplied as standard on each of the different card types. These connectors represent a notable improvement on earlier models, allowing a more reliable connection between card and backplane.

When mounting the Direct Connect System in the organ, please remember to allow space in front of the box to be able to remove the cover plate and slide out the cards for service access.

Inbuilt Diagnostics

A new feature available to each of the following card types is the inclusion of diagnostic LED's. These are mounted on each card at the top left-hand corner with the card components visible to you.

There are three colored pairs with each LED in the pair corresponding to a function for each channel.

The LED's are intended to assist by demonstrating that basic information is being received and sent by each solenoid circuit on the card.

Assuming a positive switch input has been set (see "*How to change the switch input polarity*"), the key is as follows.

Red LED	Confirms signal received from the stop switch
Green LED	Confirms signal at ON Coil output of circuit (Y terminal)
Yellow LED	Confirms signal at OFF Coil output of circuit (X terminal)

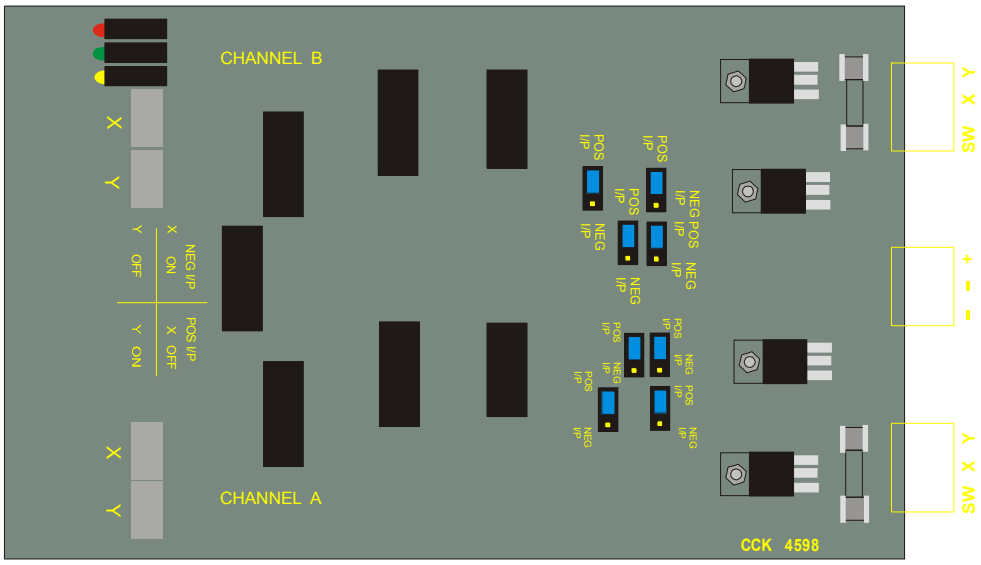
N.B. Should a negative switch input be set, then the ON and OFF LED functions will indicate in reverse to the above.

Dual Slider Solenoid Driver Card 62330350 (red handle)

The Dual Slider Solenoid Driver is supplied for both positive input and negative input options. If you discover that the system has a different polarity to the card, then the card can be easily changed as described below. It is important to decide on this before proceeding with the wiring, as the polarity of the input will affect the way you wire the outputs to the slider solenoids.

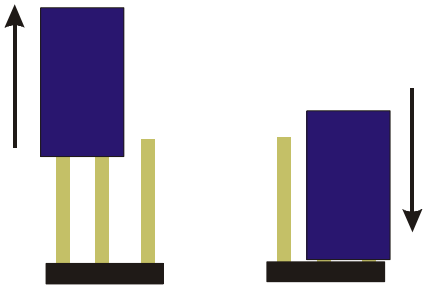
How to change the switch input polarity:

Wearing an anti-static wrist strap, lay the card on a flat surface, (use wood not plastic), taking precautions to protect the card from other possible causes of static damage. The card should appear as follows.



There are four jumpers grouped to the top of the card (Channel A) and an identical four to the bottom (Channel B). Each group of four jumpers will set the input polarity for one channel of the card.

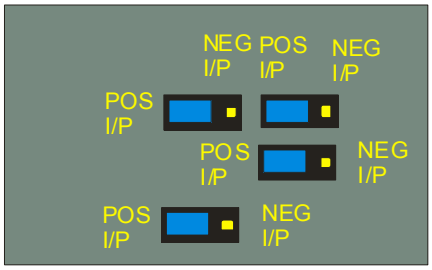
The jumper is fitted over two of the three pins with the third pin remaining un-connected. If the four jumpers are closer to the label "POS I/P" (left and center pins connected) then the corresponding channel will have a positive input. If the four jumpers are closer to the label "NEG I/P" (right and center pins connected) then the corresponding channel will have a negative input.



To change a jumper:

The blue plastic cap of the jumper is removed completely from the pins by pulling upwards with some small pliers or tweezers. It is then repositioned over the other pair of pins and pushed down to the bottom of the pins.

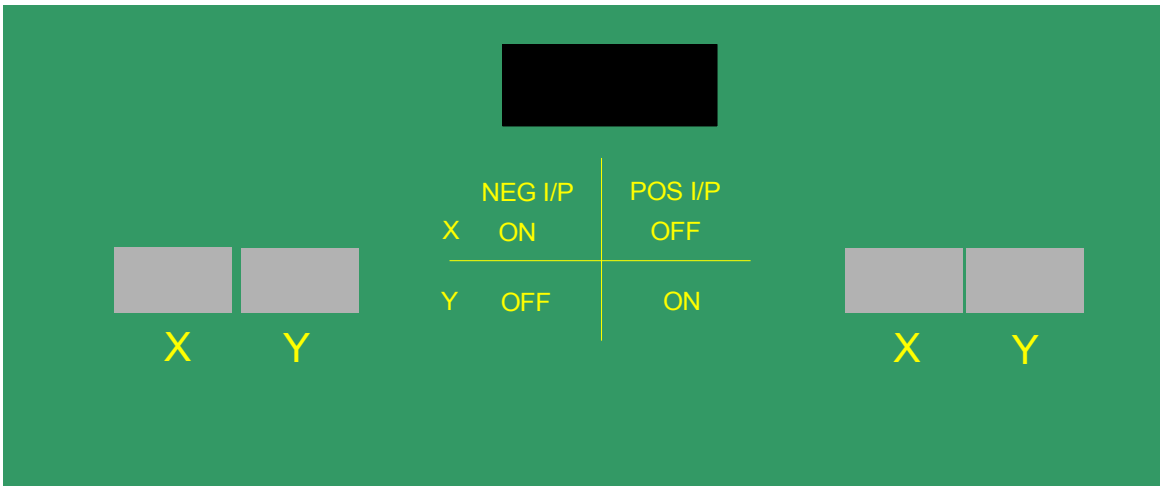
Once you have decided the required polarity, it can be a useful visual check to make sure all jumpers have the same pin exposed before inserting the card into the OB System Box.



Why are the outputs marked X and Y?

When the polarity of the input is changed the function of the two outputs change over, so that the ON driver becomes an OFF driver and vice versa.

To confirm the correct output for each card, there is a table printed close to the handle of the card, a copy of which is shown below.



From this table you can see the following options.

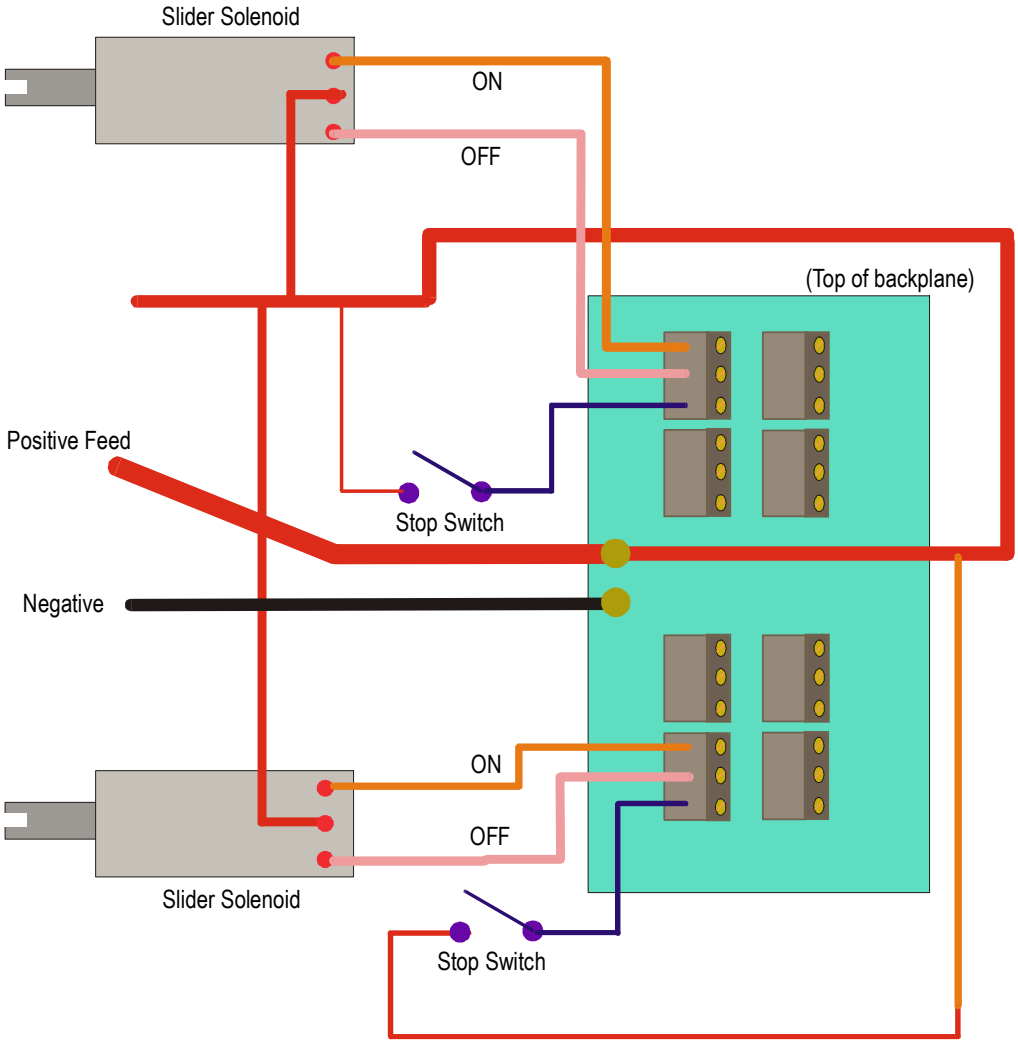
When the four jumpers are set for positive switch inputs	The output marked X is wired to the OFF coil and the power is controlled by the preset control marked X.
	The output marked Y is wired to the ON coil and the power is controlled by the preset control marked Y.

When the four jumpers are set for negative switch inputs	The output marked X is wired to the ON coil and the power is controlled by the preset control marked X.
	The output marked Y is wired to the OFF coil and the power is controlled by the preset control marked Y.

Wiring Information:

Positive Switch Inputs:

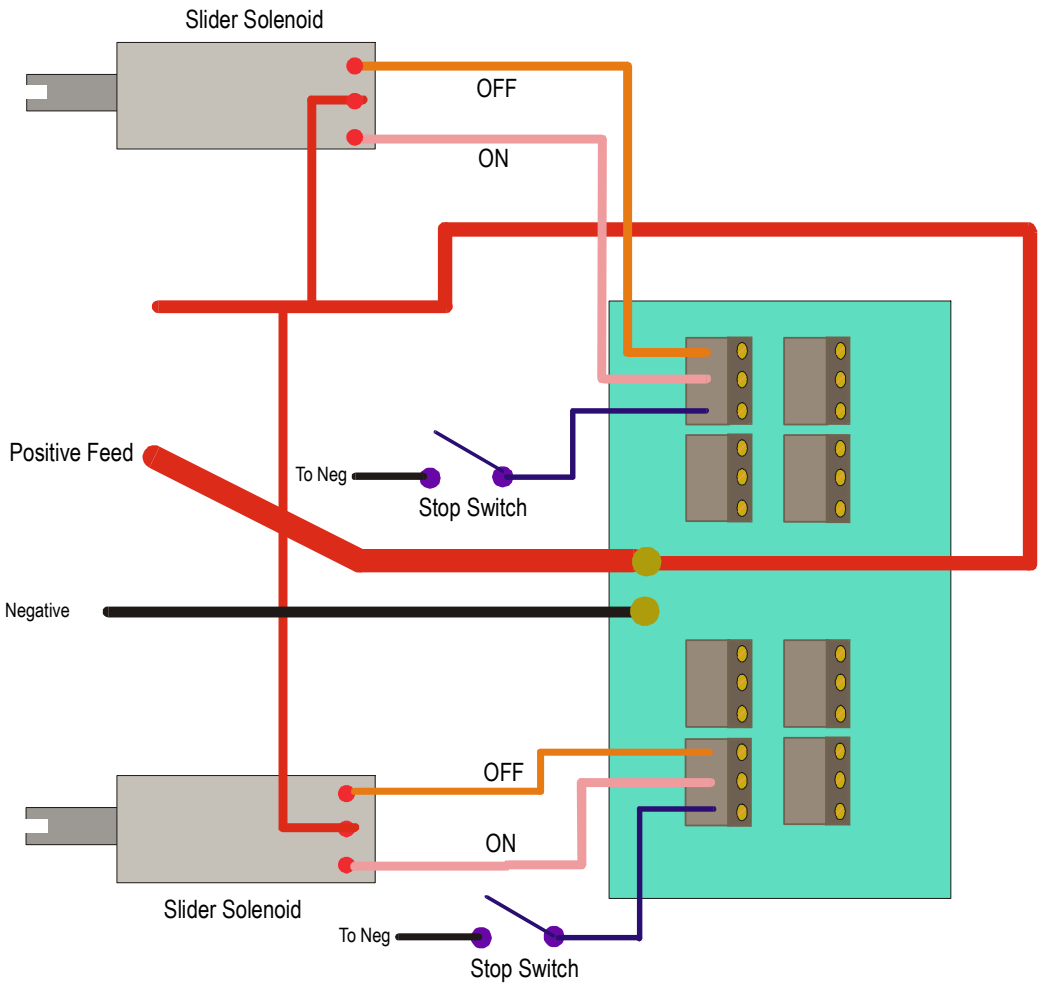
The dual slider solenoid card is wired as follows. There are two sets of circuits to each card, wired through a 3-way connector on the rear of the box as follows.



On the front of the card, close to the handle, are two adjustment controls for each channel. These control the ON and OFF power and are marked on the circuit board as X and Y. In the configuration above X controls the OFF power and Y controls the ON power. They can be adjusted with a small screwdriver.

Negative Switch Inputs:

The dual slider solenoid card is wired as follows. There are two sets of circuits to each card, wired through a 3-way connector on the rear of the box as follows.



On the front of the card are two controls for each circuit. These control the ON and OFF power and are marked on the circuit board as X and Y. In this configuration X controls the ON power and Y controls the OFF power. They can be adjusted with a small screwdriver.

The board is fitted with fuses for each circuit and suppression diodes for the magnets.

Name	Direction	Type	Polarity	Rating
Stop Switch	Input	Momentary	Selectable	
Solenoid	Output		Negative	5 Amps

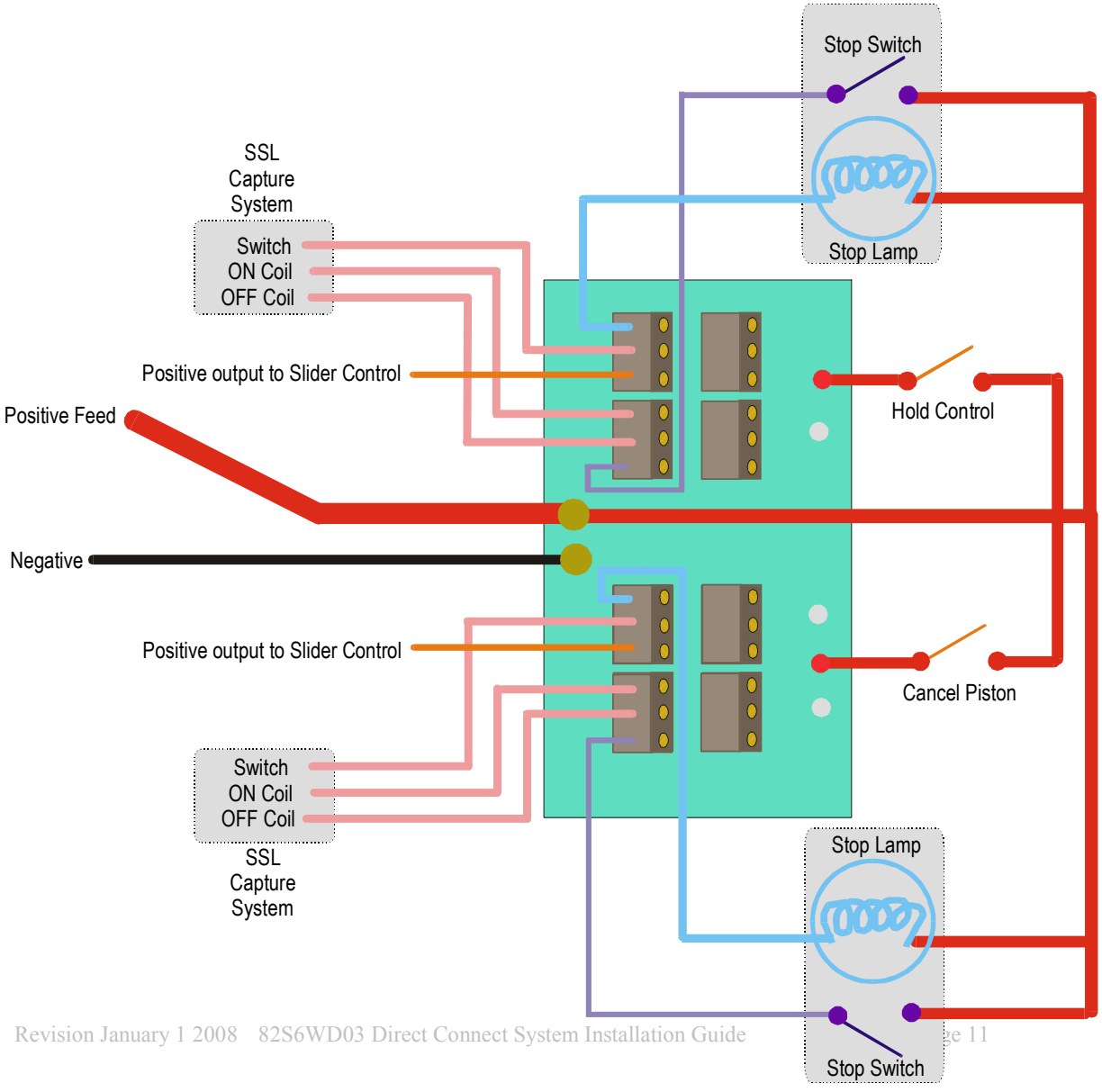
Output				(not continuous)

Dual Solid State Luminous Stopkey Card 62330310 (yellow handle)

The Dual Solid State Stopkey card is used to add additional luminous stop controls to capture systems that do not support luminous stop controls.

The momentary contact for the drawstop unit provided by the capture system is turned into a steady signal that drives the lamp. Without this circuit the lamp would simply flash each time the stop is moved by the capture system.

The feed from the on coil driver of the capture system is used to switch the lamp on and the card holds the lamp lit until the capture system sends an off coil signal. The capture system also requires a switch input to tell it that the stop is on. The switch message is sent from the card to the capture system, and corresponds to the state of the lamp -



lamp on, switch on.

Wiring card directly without the rack.

Pin	Stop #	Polarity	Type	Description
M1	1	Neg	Out	Stop Lamp
M3				
M4				
M5	1	Pos	Out	Stop Out to Capture System or Organ In
M6	1	Neg	In	From Capture System On Coil Driver
M9	1	Neg	In	From Capture System Off Coil Driver
M10	1	Pos	In	From reverser piston
M12	Both		Power	Positive DC
M20	Both		Power	Negative DC (0V)
M21	Both	Pos	In	Cancel
M22	2	Neg	Out	Stop Lamp
M24				
M25				
M26	2	Pos	Out	Stop Out to Capture System or Organ In
M28	2	Neg	In	From Capture System On Coil Driver
M29	2	Neg	In	From Capture System Off Coil Driver
M30	2			
M32	2	Pos	In	From reverser Piston

Additional functions

Lamp and Reverser Switch.

In addition to the lamp a reverser input is provided so that the status of the stop may be changed. This is normally wired to the switch in or next to the luminous stop indicator. Both the lamp and the reverser switch are fed from a positive common.

Hold.

The optional hold facility allows the stop to be isolated from the capture system and allowed to operate independently. This is normally wired as one master control and linked to all the cards in the Direct Connect System.

Hold is a reversible input and requires a positive input.

When hold is operated the stop may be operated from its own control and ignores the changes from the capture system. The stop will reverse on and off in direct relation to

the stop switch lamp. When hold is released the stop actions will again follow the registration set on the capture system.

Cancel.

An optional cancel input is also included and may be used as a divisional or General cancel independent of the capture system.

Cancel requires a momentary positive input.

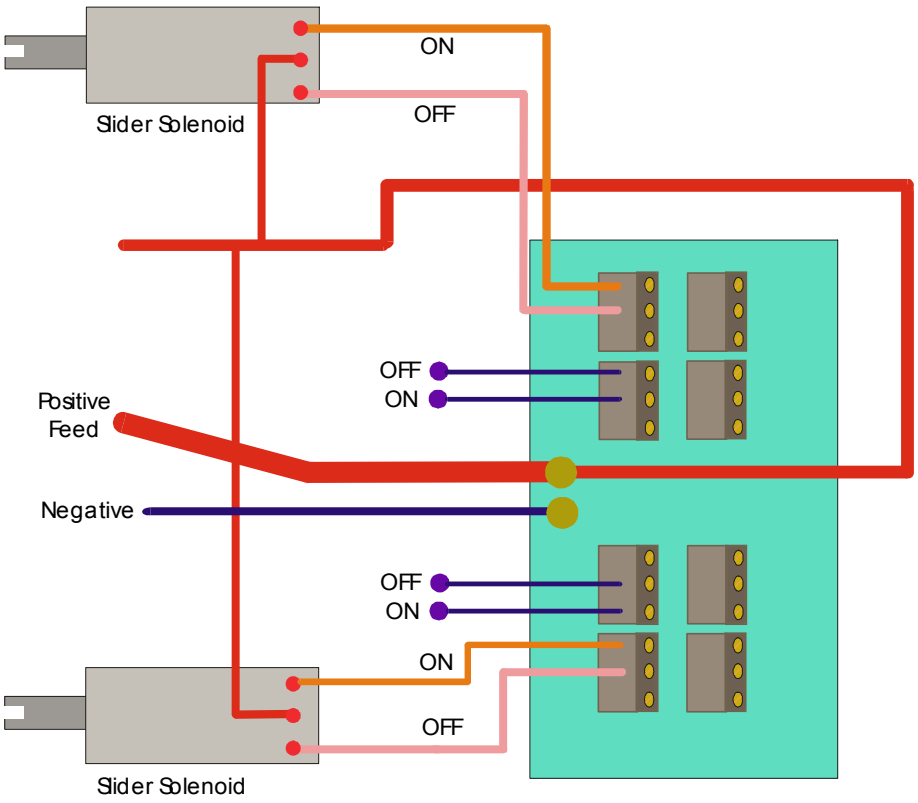
Technical Specifications:

Name	Direction	Type	Polarity	Rating
Stop Control	Input	Reversing	Positive	
ON	Input	Momentary	Positive	
OFF	Input	Momentary	Positive	
Cancel	Input	Momentary	Positive	
Hold	Input	Reversing	Positive	
Stop Action	Output		Positive	750 mA
Lamp	Output		Negative	100 mA
Switch	Output		Positive	

Dual Registration Slider Solenoid Control 62330330 (black handle)

The Dual Registration card is used to enable a SSL Capture system to be used in conjunction with mechanical drawstops. It is a high powered output for the standard ON and OFF coils. This card is suitable for operation between 12 and 18 volts.

Each card is fitted for independent 'Varipull' controls for each stop. This adjustment allows the power fed to the solenoid to varied from full power down to almost zero for each direction of travel, a total of four controls per card. These controls are adjustable by removing the front panel of the Direct Connect System after installation. You will need a small flat-blade screwdriver.



Name	Direction	Type	Polarity	Rating
Stop Switch	Input	Momentary	Negative	

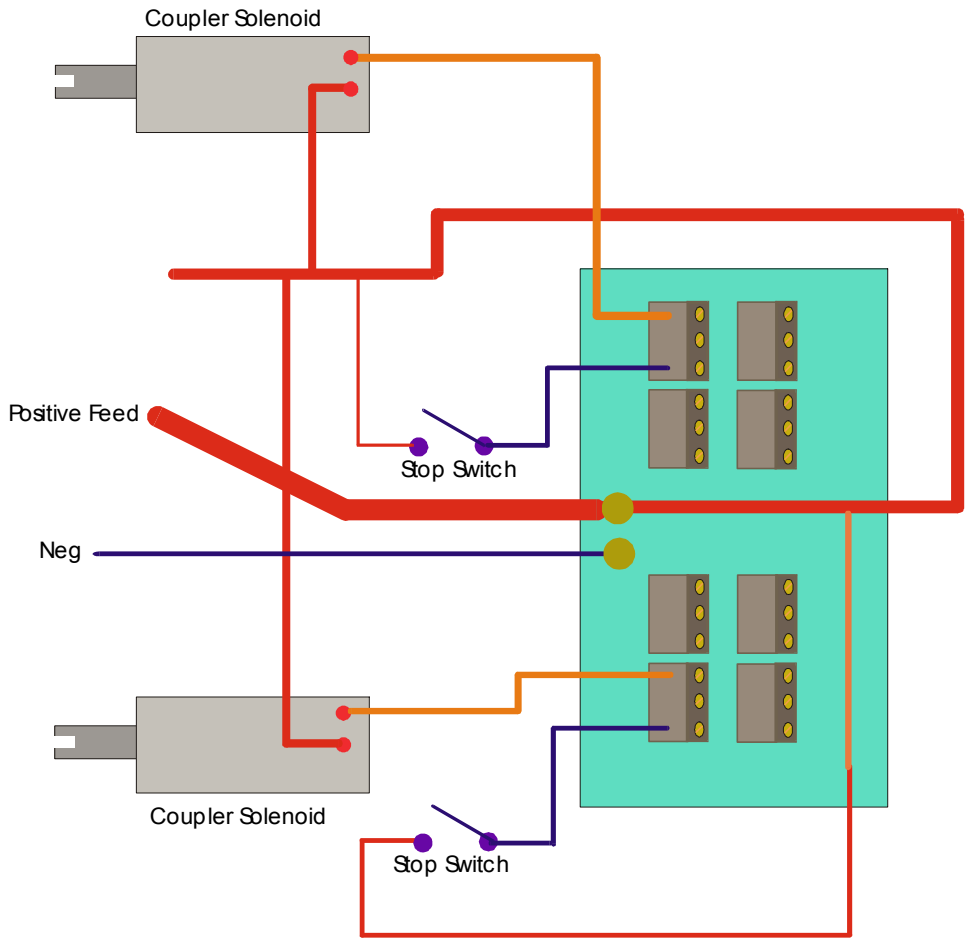
Solenoid Output	Output		Negative	3 Amps

Dual Coupler Solenoid Control 62330320 (blue handle)

This card is used to first push or pull a coupler into place and then hold the position. The current remains on during the hold phase and so this card must only be used with solenoids that are rated for continuous operation. If a standard solenoid is used it may overheat and subsequently fail.

The operating current has two adjustable positions. The first stage of the operation is known as the move stage. Normally, the current required to initially move the coupler is higher than that required to hold the position and so each stage (MOVE and HOLD) is individually adjustable with small screwdriver from the front of the box.

These controls are adjustable by removing the front panel of the Direct Connect System after installation. You will need a small flat-blade screwdriver.



Name	Direction	Type	Polarity	Rating
Stop Switch	Input	Momentar	Positive	

		y		
Solenoid Output	Output		Negative	3 Amps