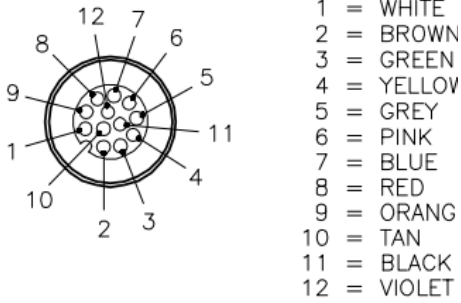


The SCU5 MD controller can be configured to have digital dry contact inputs for remote operation and NPN outputs. An additional M12 12-pin male connector is provided for this application with the SCU5 MDIO option. A standard M12 12-pin A coded female connector cable can be used for the connection. The pin functions for the connector are shown in the table below.



Pin Number	Function
1	CGND: Digital Input common
2	IN1: Digital Input 1-Auto Actuator Inhibit
3	IN2: Digital Input 2-Jog Left/GP-
4	IN3: Digital Input 3-Jog Right/GP+
5	IN4: Digital Input 4-RemoteEn
6	NC
7	VDD: Digital Output VDD
8	GND: Digital Output GND
9	DO1: Digital Output 1
10	DO2: Digital Output 2
11	DO3: Digital Output 3 <sup>1</sup>
12	DO4: Digital Output 4 <sup>2</sup>

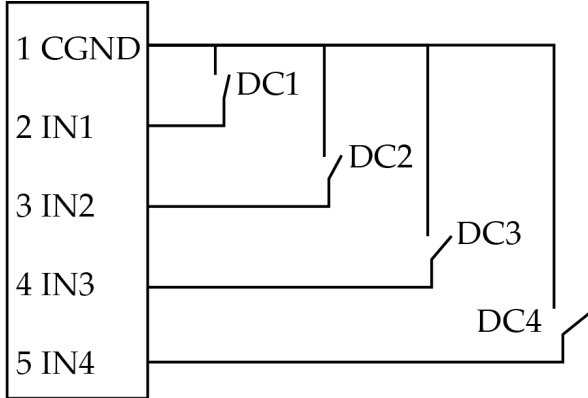
<sup>1</sup> Not available on all hardware.

<sup>2</sup> Not available on all hardware.

## Digital Inputs

The general wiring for the four dry contact inputs are shown below:

### M12 12-pin Male Connector Input Wiring



The dry contacts can be created with a physical or electronic switch by the end user.

Function	Description
IN1	<p>IN1 input state can block or prevent the actuator from moving while the web guide is in automatic control mode. The input essentially adds another intermediate state called “waiting for auto” which will prevent the actuator from moving in the auto mode. While in “waiting for auto” the auto/manual button will blink between red and green indicating that the controller is looking for an external signal to enable the automatic guiding functionality.</p> <p>When remote control is enabled, using IN4, and the automatic controller button on the SCU5 controller is pressed the following happens based on DC1 state:</p> <ul style="list-style-type: none"> <li>• DC1 Closed: Web guide goes directly to automatic guiding mode.</li> <li>• DC1 Open: Web guide goes to an intermediate state called “waiting for auto”.</li> </ul> <p>When the web guide controller is in “waiting for auto” then the following happens based on the DC1 state:</p> <ul style="list-style-type: none"> <li>• DC1 Closed: Web guide goes to automatic guiding mode.</li> <li>• DC1 Open: No effect</li> </ul> <p>When the web guide controller is in automatic guiding mode then the following happens based on the DC1 state:</p> <ul style="list-style-type: none"> <li>• DC1 Closed: No effect</li> <li>• DC1 Open: The web guide controller goes to the “waiting for auto” state and will prevent the actuator from moving in response to an error at the sensor.</li> </ul>
IN2	<p>IN2 can be used to manually Jog the web guide to the left (same as pressing the left Jog arrow on the controller) or to reduce the guide point offset remotely using the dry contact switch DC2.</p> <ul style="list-style-type: none"> <li>• When the web guide controller is in manual mode, closing the switch will jog the web guide actuator to the left. Note that holding the switch closed will continuously jog the actuator until the actuator electronic stroke limit is reached.</li> <li>• When the web guide controller is in automatic guiding mode or “waiting for auto”,</li> </ul>

	closing the switch will reduce the guide point offset by 0.01" or 0.254 mm. Note that this functionality is momentary. Every toggle of the switch state from open to close will reduce the guide point offset by 0.01" or 0.254 mm.
IN3	<p>IN3 can be used to manually Jog the web guide to the right (same as pressing the right Jog arrow on the controller) or to reduce the guide point offset remotely using the dry contact switch DC3.</p> <ul style="list-style-type: none"> <li>• When the web guide controller is in manual mode, closing the switch will jog the web guide actuator to the right. Note that holding the switch closed will continuously jog the actuator until the actuator electronic stroke limit is reached.</li> <li>• When the web guide controller is in automatic guiding mode or "waiting for auto", closing the switch will increase the guide point offset by 0.01" or 0.254 mm. Note that this functionality is momentary. Every toggle of the switch state from open to close will increase the guide point offset by 0.01" or 0.254 mm.</li> </ul>
IN4	When the dry contact switch (DC4) is closed the remote control of the controller via digital input functionality is enabled. If this switch is open, the state of the dry contact switches (DC1, DC2, DC3) will have no effect and will disable the digital input functionality completely.

DC1 inputs can be used to prevent the need for the operator to set the web guide in manual (from auto) every time the line speed goes down. DC1 can be connected to a digital speed signal so that the web guide can be prevented from actuating in the auto mode when the line speed goes down. And to start actuating in auto mode as soon as the line speed goes back up again. Additionally, the operator can also set the web guide into "waiting for auto" state from the manual before the line speed goes up. This allows the controller to transition into the auto state based on the digital input rather than a manual push of the button on the touch screen.

**Note:** *The inputs are dry contact inputs and should not be tied to any digital current source or sink.*

**Note:** *IN1 functionality will have an effect only when the web guide controller is in automatic mode or when the web guide controller transitions from a manual to auto mode (when the user presses the auto/manual button on the SCU5 controller screen). It will have no effect when the web guide controller is in manual mode.*

**Note:** *The digital input cannot put the web guide in manual mode. It can only change from "waiting for auto" to auto and vice versa. The web guide controller can be set to manual only via the operator interface.*

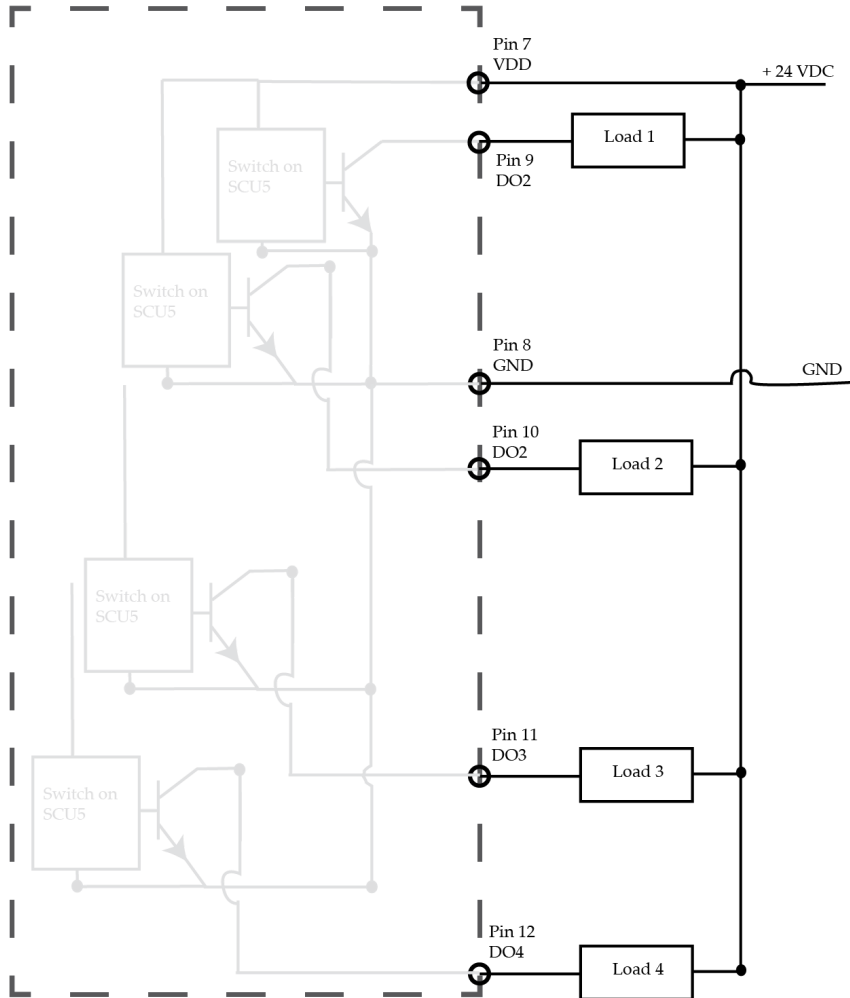
**Note:** *The state "waiting for auto" only prevents the automatic control of the web guide. In this state the operators can still jog the web guide left or right manually.*

**Note:** *To enable remote control using the digital inputs, DC4 should be closed. If not the remote control functionality will be completely disabled and none of the other switches have any effect.*

## Digital Outputs

The outputs can be used as NPN output by providing a VDD (5 - 24 VDC) and GND from a PLC and the signal through the two outputs OUT1 and OUT2. Custom programming can be done to provide a GO/NO GO type of output or a digital ON/OFF signal.

### NPN Normally Closed Output



When the respective output signal is enabled then that signal would go low. And normally the signal would be high if wired as shown in the schematic on the left. Note that the outputs are normally closed. If wiring a relay, wire to the NC side of the circuit so that the appropriate output from the relay is provided to the device.

**Note:** Some controllers will not have DO3 and DO4 enabled. This depends on the hardware version and firmware version on the SCU5 controller.

**Note:** The digital output functionality depends on the firmware version and the parameters on the SCU5 controller. These outputs can be configured in the factory to provide different functionalities based on the application.