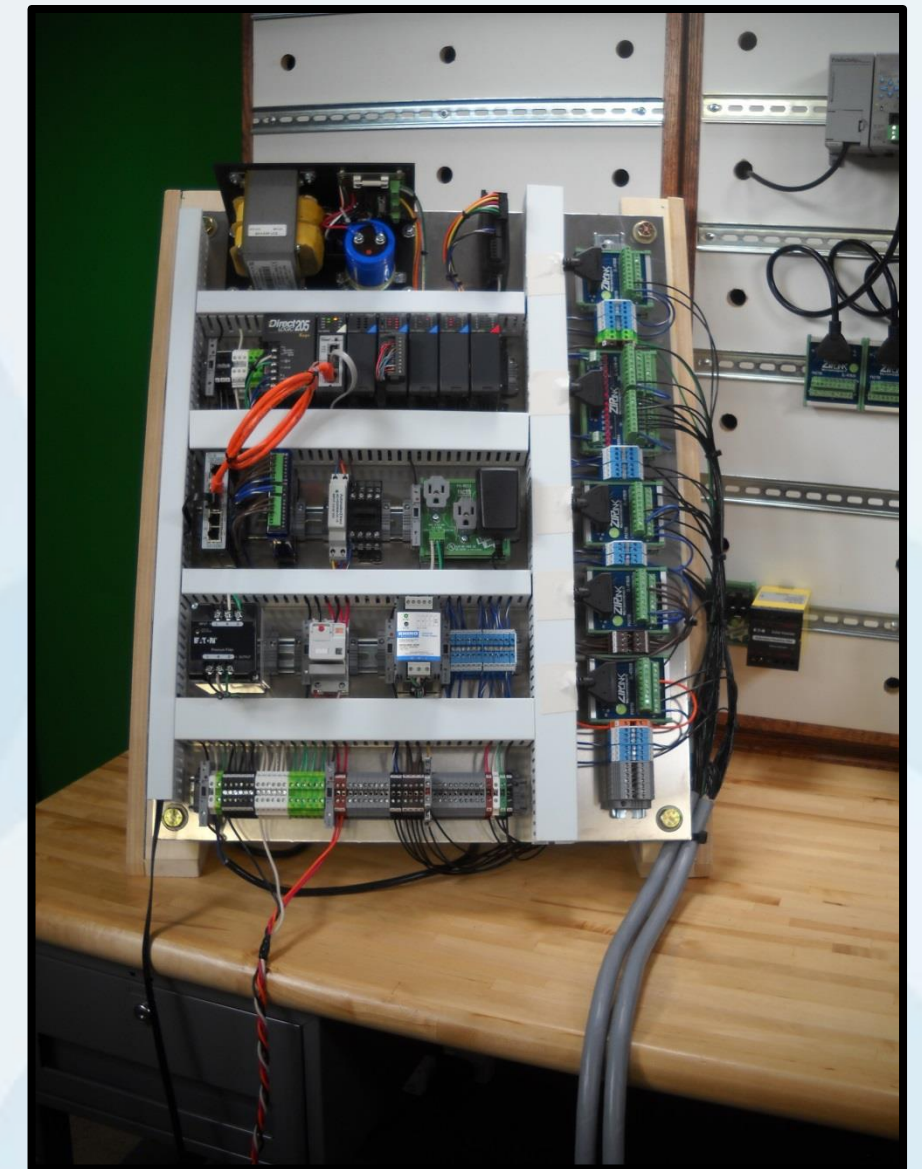# Schematic Diagrams

In this session, the schematic diagrams and control panel layout are covered.

The control panel is 21" wide by 27" tall, and typically it would be housed in a 24" wide by 30" tall enclosure. For our demonstration we have not placed it in an enclosure to make it more easily to view.

All of the various control components that make up our control system, such as the **Do-more** PLC, *SureStep* drive and power supply, power line filter, relays, DC power supply, signal conditioner, and Ethernet hub are secured to the panel, either with the use of 35mm DIN rail, or directly mounted with fasteners.
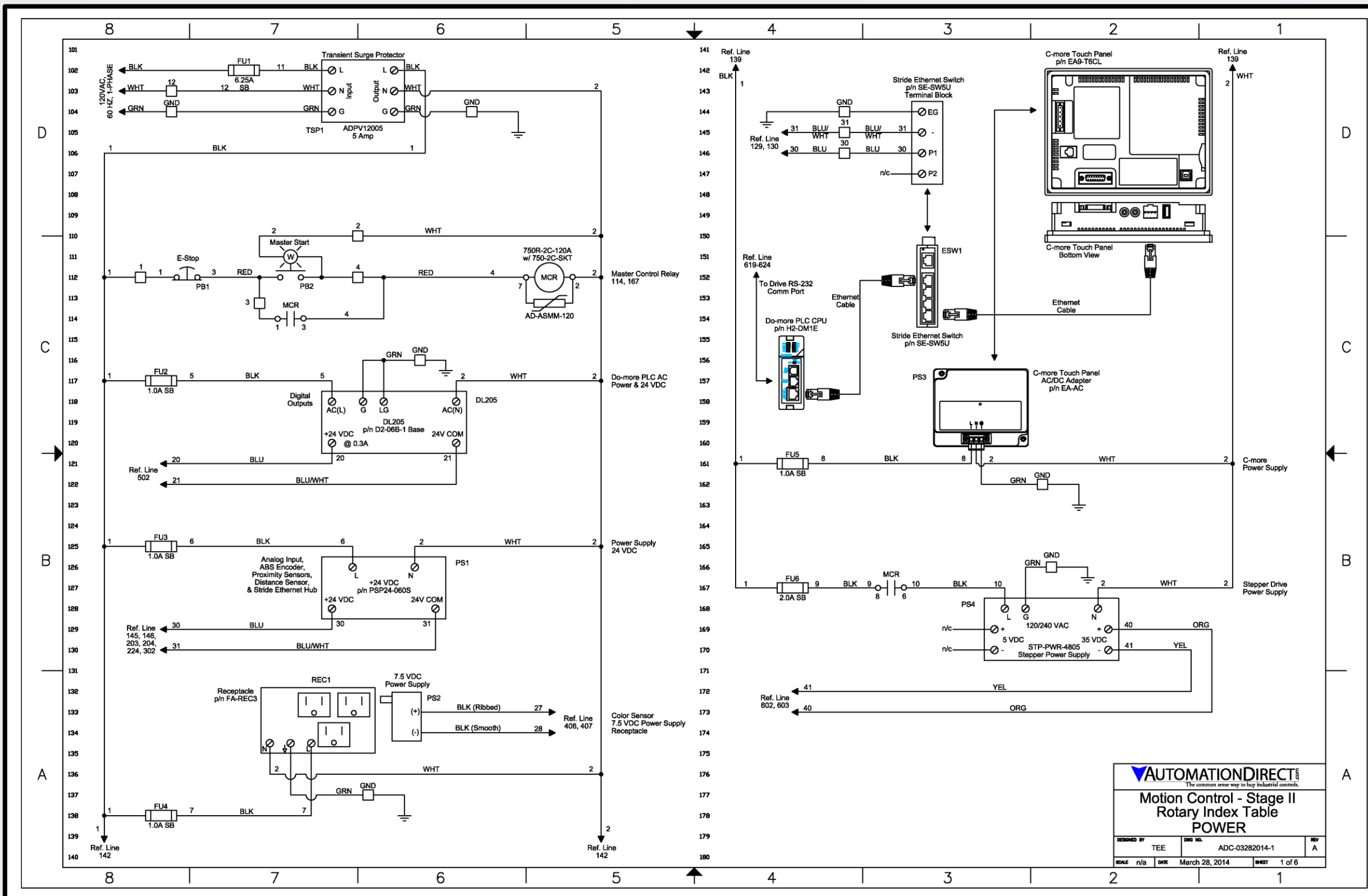
Also located on the control panel are the terminal blocks, fuse holders, DIN rail, wire duct, and to make wiring quicker, the use of *ZipLink* Pre-Wired Connection Cables and modules. An easy choice!

A complete Bill of Materials has been created and is available as a downloadable 'Take Away' PDF file under the video's Related Documents category.
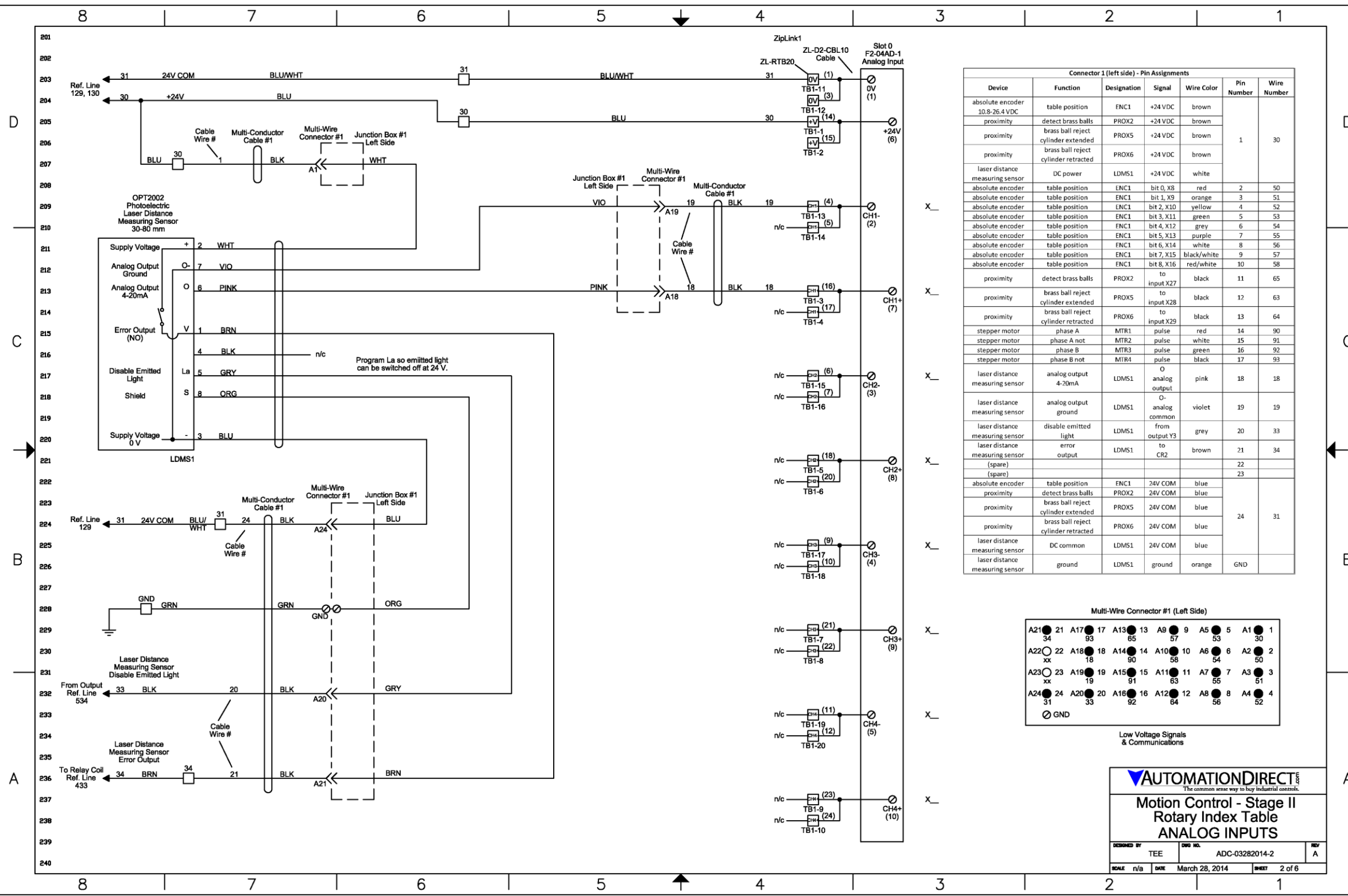
**Schematic Diagram
Rotary Index Table
Sheet 1 of 6**

Sheet 1 shows the wiring for the incoming power, through the transient surge protector, to the Master Control circuit. It shows the Power wiring through the various circuit protector fuses to the PLC, DC power supply, receptacle outlet, C-more, and the stepper system power supply.
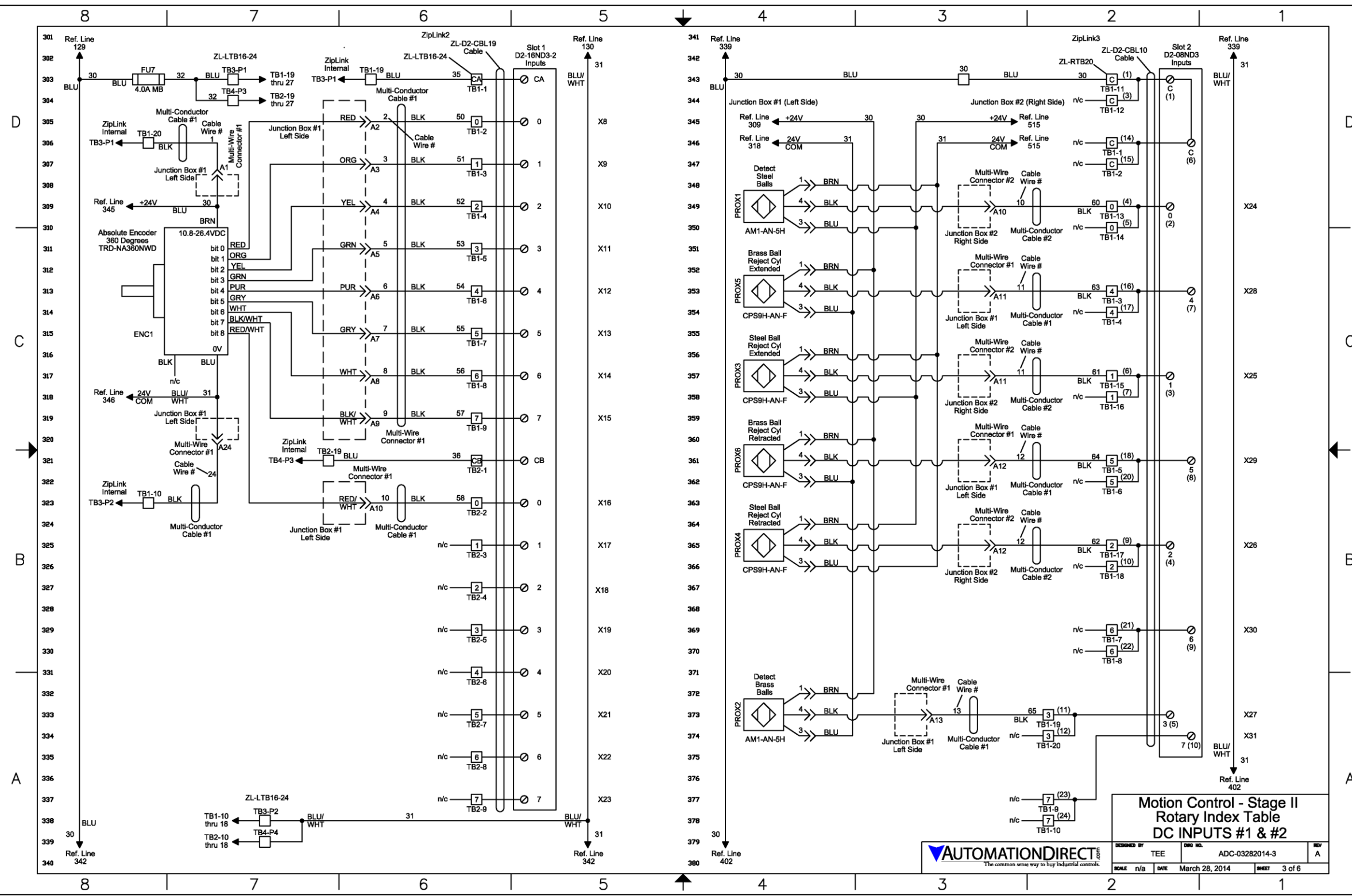
Sheet 2 includes wiring for the 4-20mA analog input module that is used for the Laser Distance Sensor that detects that a part has been loaded. The ZipLink Cable & Connector wiring is also shown. The pin numbers for the Multi-Wire Connectors and Multi-Conductor Cable are also shown.


Connector 1 (left side) - Pin Assignments

Device	Function	Designation	Signal	Wire Color	Pin Number	Wire Number
absolute encoder 10.8-26.4 VDC	table position	ENC1	+24 VDC	brown		
proximity	detect brass balls	PROX2	+24 VDC	brown		
proximity	brass ball reject cylinder extended	PROX5	+24 VDC	brown	1	30
proximity	brass ball reject cylinder retracted	PROX6	+24 VDC	brown		
laser distance measuring sensor	DC power	LDMS1	+24 VDC	white		
absolute encoder	table position	ENC1	bit 0, X8	red	2	50
absolute encoder	table position	ENC1	bit 1, X9	orange	3	51
absolute encoder	table position	ENC1	bit 2, X10	yellow	4	52
absolute encoder	table position	ENC1	bit 3, X11	green	5	53
absolute encoder	table position	ENC1	bit 4, X12	grey	6	54
absolute encoder	table position	ENC1	bit 5, X13	purple	7	55
absolute encoder	table position	ENC1	bit 6, X14	white	8	56
absolute encoder	table position	ENC1	bit 7, X15	black/white	9	57
absolute encoder	table position	ENC1	bit 8, X16	red/white	10	58
proximity	detect brass balls	PROX2	to input X27	black	11	65
proximity	brass ball reject cylinder extended	PROX5	to input X28	black	12	63
proximity	brass ball reject cylinder retracted	PROX6	to input X29	black	13	64
stepper motor	phase A	MTR1	pulse	red	14	90
stepper motor	phase A not	MTR2	pulse	white	15	91
stepper motor	phase B	MTR3	pulse	green	16	92
stepper motor	phase B not	MTR4	pulse	black	17	93
laser distance measuring sensor	analog output 4-20mA	LDMS1	O analog output	pink	18	18
laser distance measuring sensor	analog output ground	LDMS1	O- analog common	violet	19	19
laser distance measuring sensor	disable emitted light	LDMS1	from output Y3	grey	20	33
laser distance measuring sensor	error output	LDMS1	to CR2	brown	21	34
(spare)					22	
(spare)					23	
absolute encoder	table position	ENC1	24V COM	blue		
proximity	detect brass balls	PROX2	24V COM	blue		
proximity	brass ball reject cylinder extended	PROX5	24V COM	blue	24	31
proximity	brass ball reject cylinder retracted	PROX6	24V COM	blue		
laser distance measuring sensor	DC common	LDMS1	24V COM	blue		
laser distance measuring sensor	ground	LDMS1	ground	orange	GND	

Multi-Wire Connector #1 (Left Side)

Low Voltage Signals & Communications

Motion Control - Stage II
Rotary Index Table
ANALOG INPUTS

| DESIGNED BY | TEE | DWG NO. | ADC-03282014-2 | REV A |
| SCALE n/a | DATE March 28, 2014 | | SHEET 2 of 6 | |

Sheet 3 includes the Do-more's 16 point and first 8 point DC input modules. The absolute encoder is wired into the 16 point input module and the various proximity sensors are wired into the shown 8 point input module. Both modules make use of ZipLink Connectors and Cables.

Motion Control - Stage II
Rotary Index Table
DC INPUTS #1 & #2

DESIGNED BY	DWG NO.	REV
TEE	ADC-03282014-3	A
SCALE n/a	DATE March 28, 2014	SHEET 3 of 6

Sheet 4 shows the second 8 point DC input module. It is used primarily as the input for the Color Sensor's 3 bit output that decodes the color detected. The three signals are interfaced from the color sensor through a signal conditioner to the DC inputs. The module is used also for a few other signals.
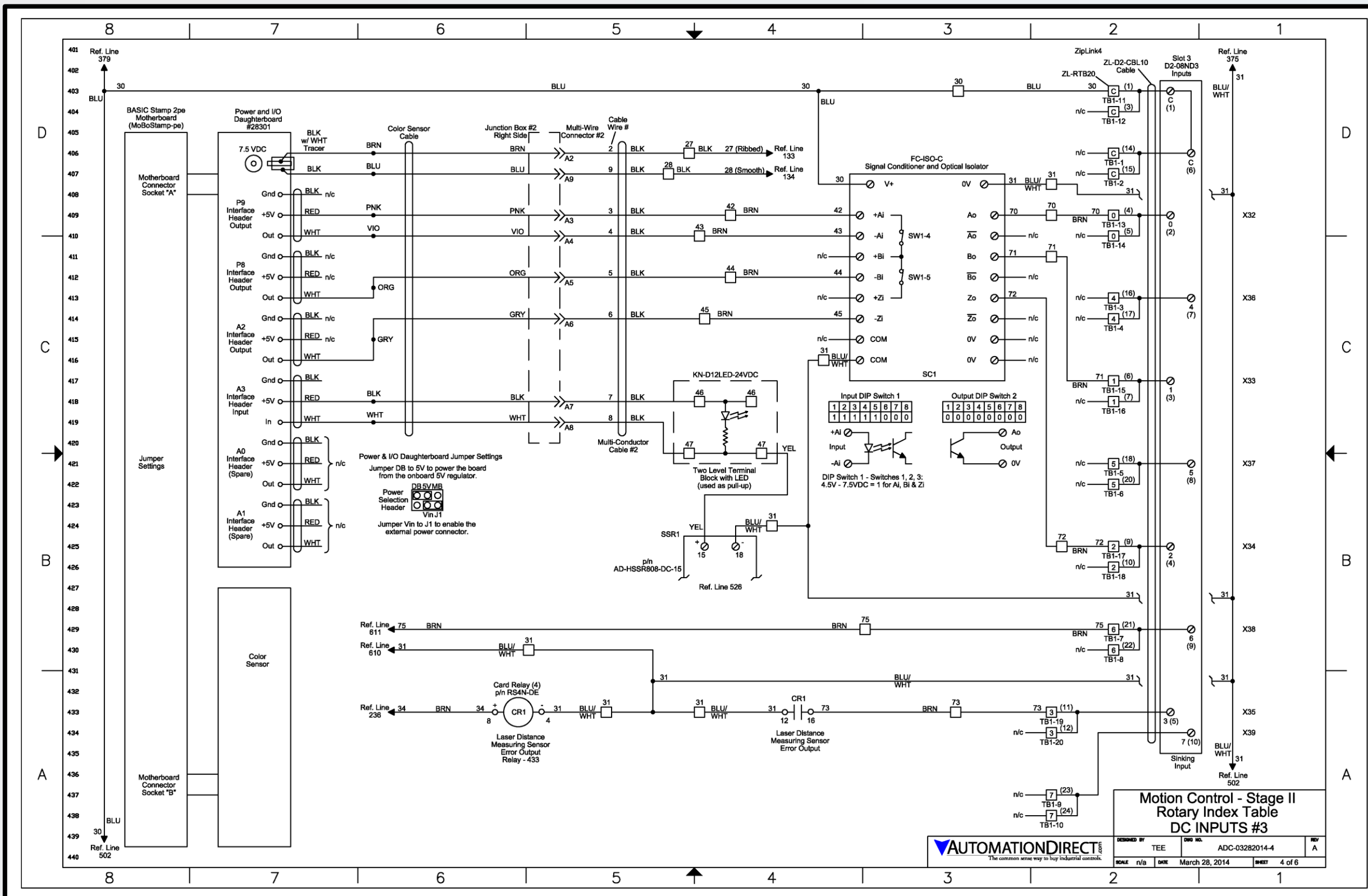
Sheet 5 shows the PLC's 8 point DC output module. It is used to control the two solenoid valves that operate the steel and brass ball reject slide cylinders. It also provides a signal from the ladder logic through an optical isolator that triggers the color sensor to take a reading.
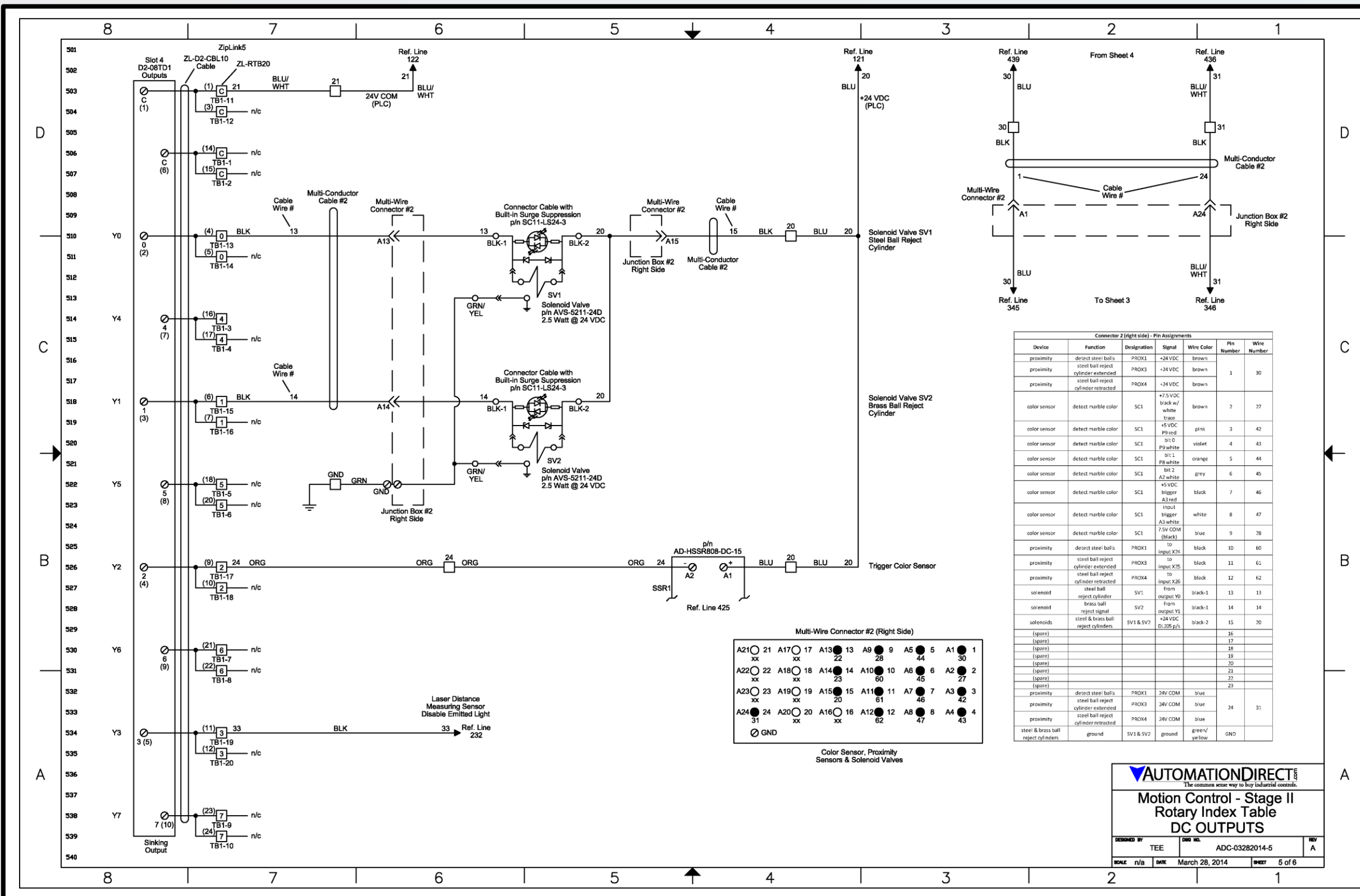
The last schematic, sheet 6, covers the SureStep advanced drive and stepper motor wiring. It also includes details for the serial communications cable that is routed between the serial port on the **Do-more** CPU and the *Sure*Step drive.

Control Panel

Shown here is the scaled drawing of the control panel. All of the components were laid out and located to allow for the easiest wiring between the different components.
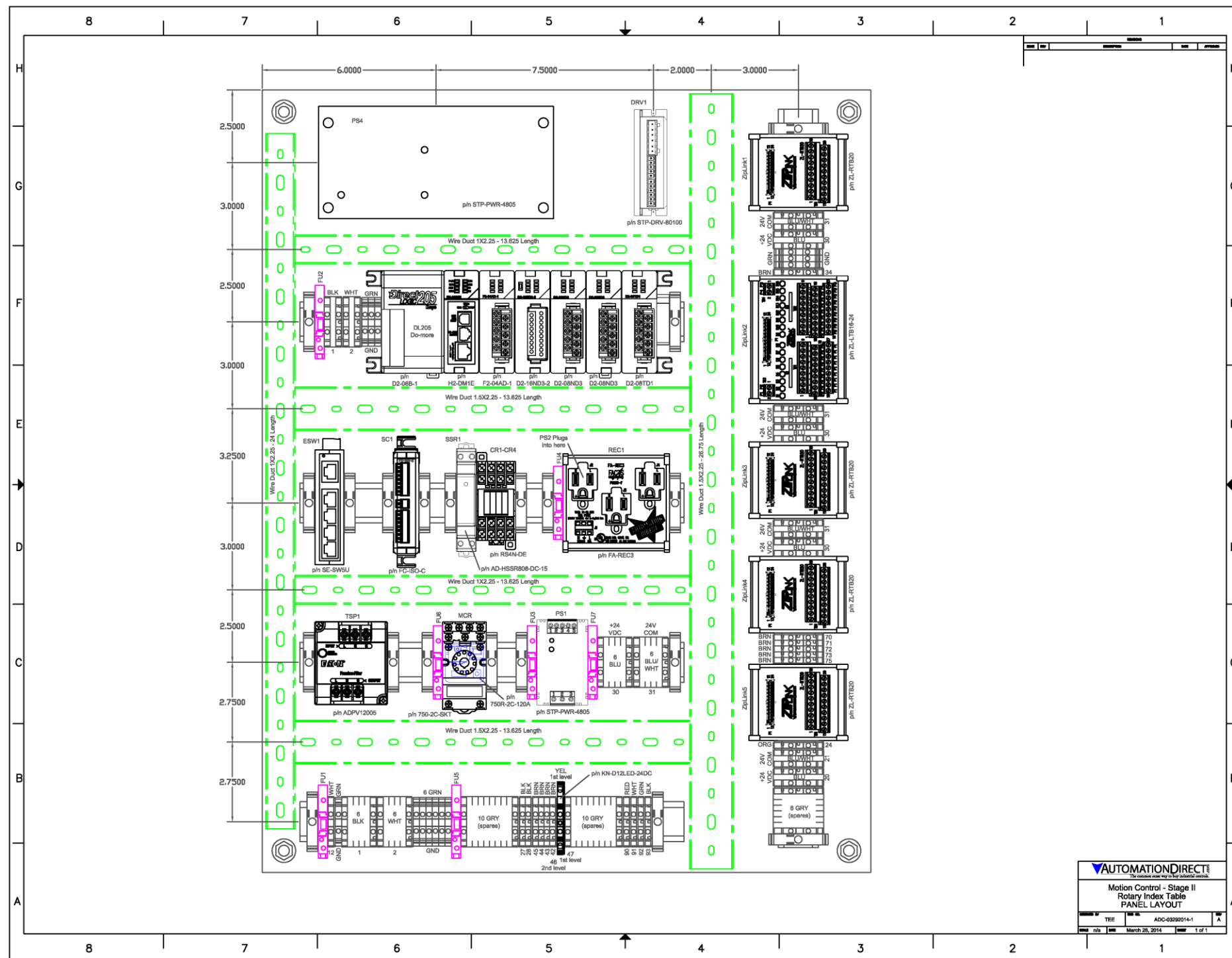
Other available videos in this series on Motion Control.

Title	VID Number
Part 1 of 5 – Control System Overview.	L-PC-DM-STP-CM-001-1
Part 3 of 5 – **Do-more** Ladder Logic Programming.	L-PC-DM-STP-CM-001-3
Part 4 of 5 – *C-more* Touch Panel Programming.	L-PC-DM-STP-CM-001-4
Part 5 of 5 – Operational Demonstration.	L-PC-DM-STP-CM-001-5

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