

Prime Controls ET210

(Turck BLCEN-5M12LT-1RS232-8XSG-P)
OPERATING INSTRUCTIONS Rev. B
2017-02-16

Prime Controls DS210 EthernetIP Gateway Using Turck
BLCEN-5M12LT-1RS232-8XSG-P and RSLogix5000



Description

The Prime Controls ET210 enables a PLC with EthernetIP to select up to eight previously stored DS210 calibrations as different thickness metals are run on the same line. The **DS210 Operating Instructions** manual is a companion document to define the DS210 operation, interface, IO, and serial port. The PRIME CONTROLS RSLOGIX5000 REFERENCE DESIGN section of this document demonstrates how to copy the reference design supplied by Prime Controls into a compatible PLC controller design. For designs not compatible with the Prime Controls Reference design, Turck data sheets, L5X files, and installation instructions may also be used to instantiate and define the BLCEN-5M12LT-1RS232-8XSG-P. See Turck documentation “BLCEN-5M12LT-1RS232-8XSG-P Data Sheet (6811509)” for general specifications and “How to Use Catalog Files 2016” for .L5X import instructions.

Supporting documents, .ACD files, and .L5X files are available for download from our website at www.primecontrols.com/ET210 or by contacting customer support vip@primecontrols.com or by calling 937.435.8659.

Document Applicability

This Document applies to DS210 software V5.6 and higher.

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OVERVIEW

The Model DS210 Double Metal Sheet Detector, together with one of 4 available probes, is designed to determine a double sheet condition for ferrous metal ranging in thickness from approximately 0.020" to 0.220" (single thickness). The DS210 has a RS232 serial port and digital IO that is connected to a Prime Controls ET210 gateway to enable a PLC with EthernetIP to communicate, control, and monitor the Prime Control's DS210 as shown in figure 1.

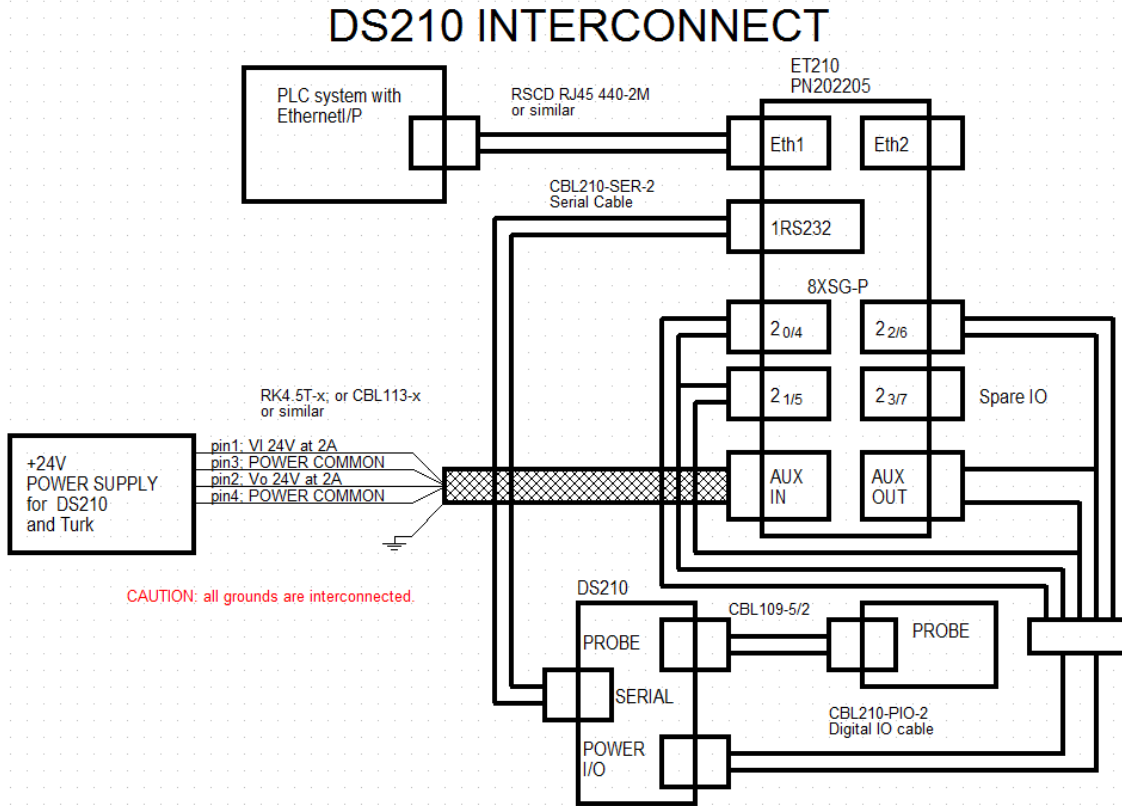


Figure1

SYSTEM CONFIGURATION

Parts in a DS210 EthernetIP system:

- 1) PLC system with EthernetIP and +24V power supply
- 2) Ethernet cable RSCD RJ45 440-2M or similar
- 3) Power cable CBL113-x or similar
- 4) DS210, Probe, CBL109-2/-5 cable
- 5) Turck BLCEN-5M12LT-1RS232-8XSG-P
- 6) CBL210-SER-2 SERIAL CABLE
- 7) CBL210-PIO-2 Digital IO cable (option)

Interconnect the system as shown in Figure1. **Caution: The DS210 controller is not hot swappable. Power must be turned off when plugging in or unplugging power or probes to the DS210 controller.**

Note: Dip Switch 3 on the DS210 unit must be set to OFF (Down) for PNP inputs/output to function properly with the Turck Module's 8XSG-P inputs/outputs.

Cable details for the CBL210-PIO-2 and CBL210-SER-2 are shown in figures 2 & 3.

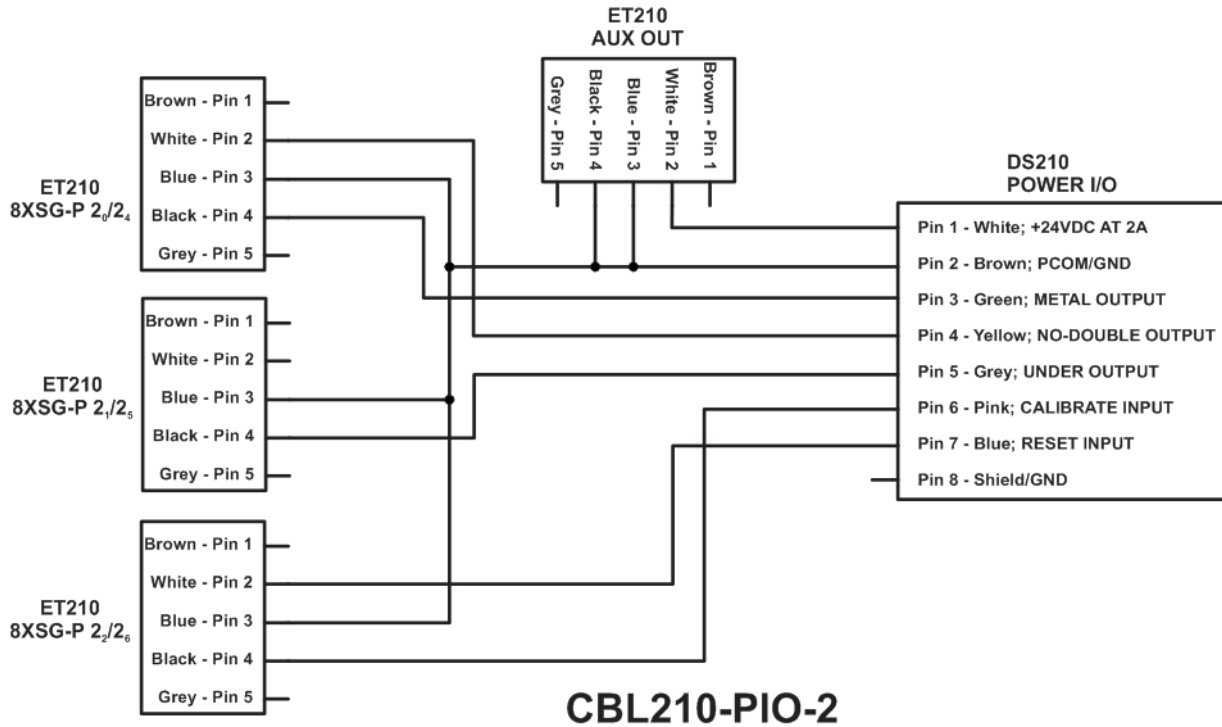


Figure2

Wiring Table		
1RS232 Pin	Wire Color	DS210 SERIAL Pin/Name
1	White	2; RXD
2	Brown	3; TXD
3	Green	N/C
4	Yellow	N/C
5	Grey	5; GND
6	Pink	N/C
7	Blue	N/C
8	Shield Drain Wire	5; GND

CBL210-SER-2

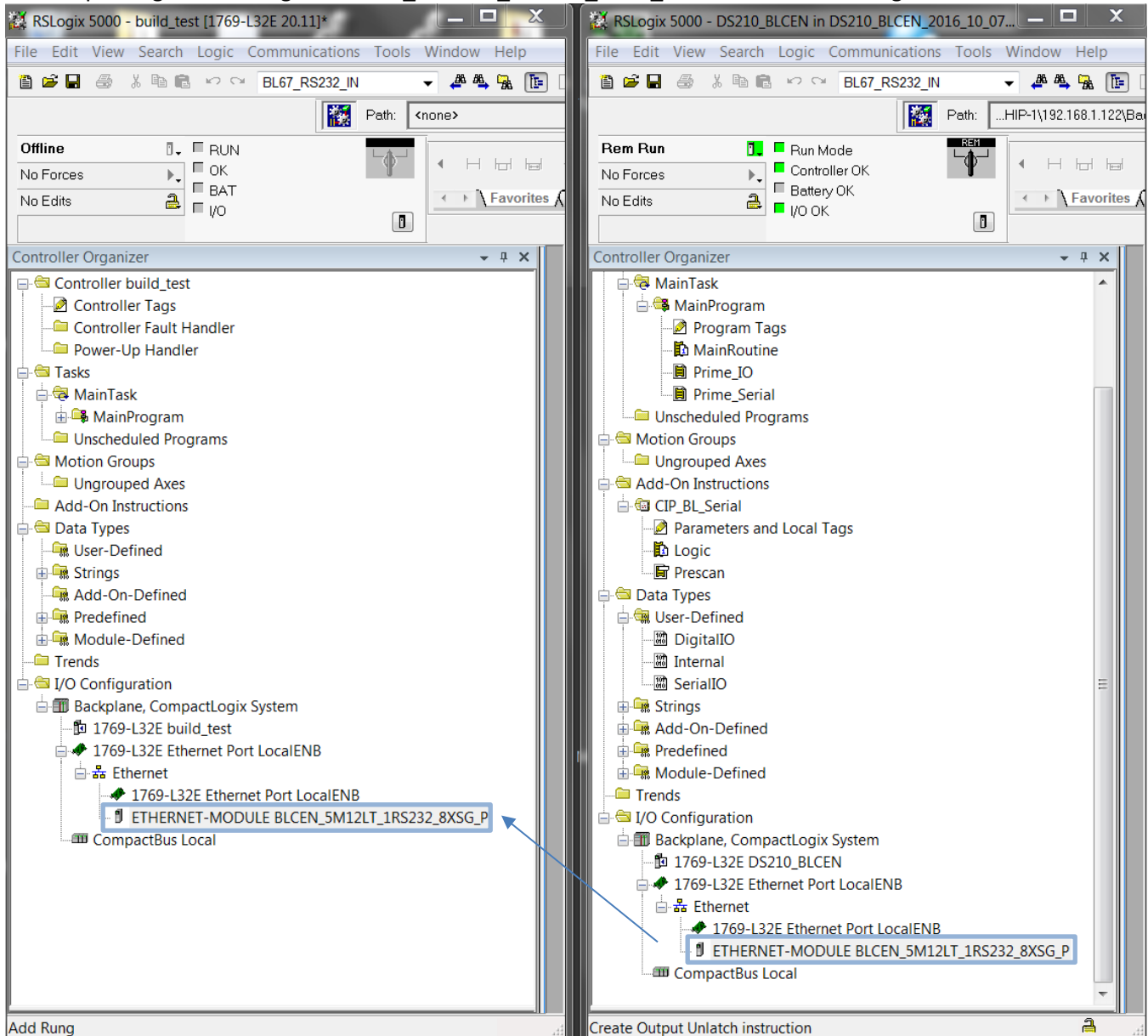
Figure3

PRIME CONTROLS RSLOGIX5000 REFERENCE DESIGN

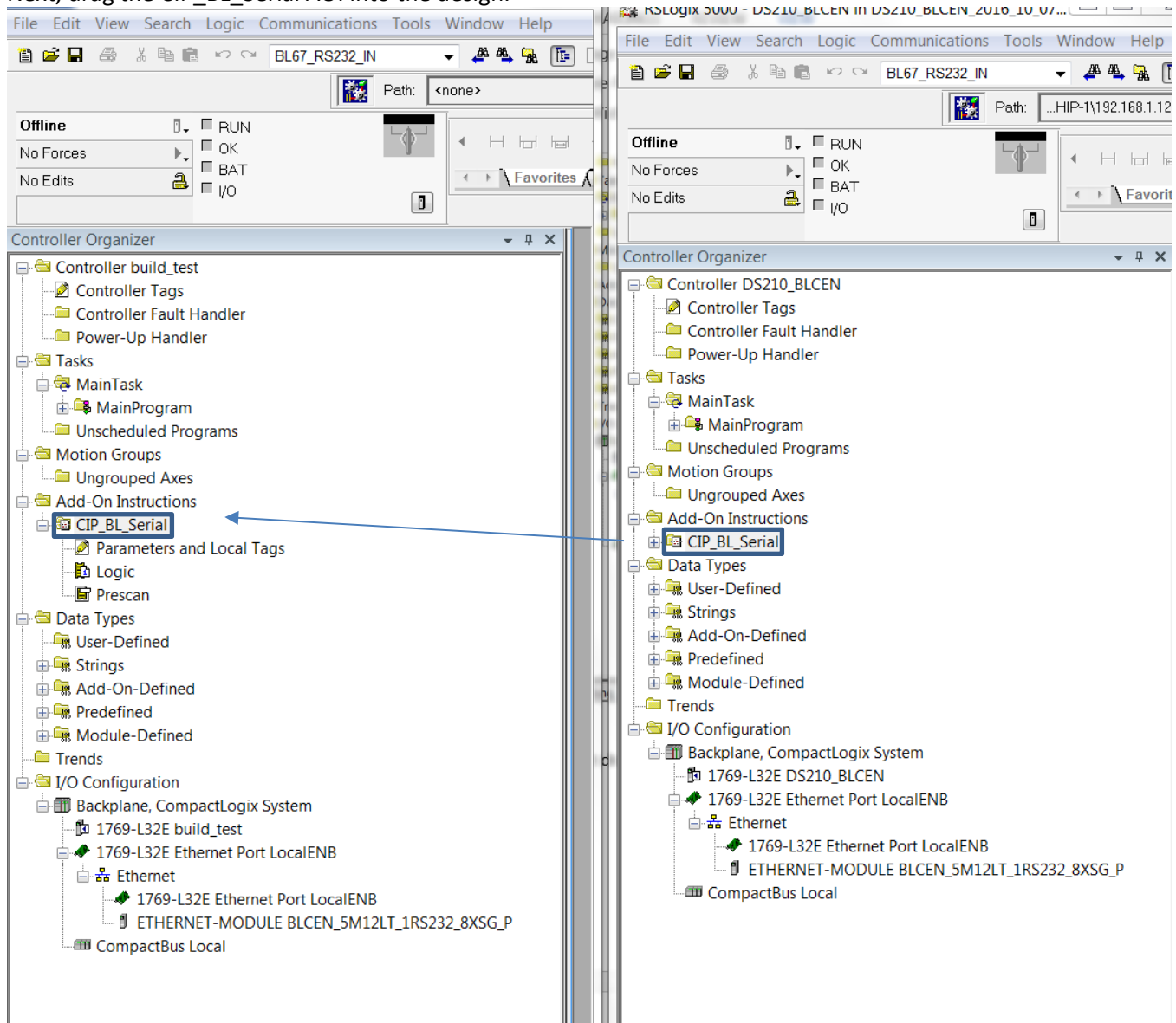
This section demonstrates how to copy the reference design supplied by Prime Controls into a compatible PLC controller design by opening 2 RSLogix5000 windows. For designs not compatible with the Prime Controls Reference design, use the Turck data sheets, L5X files, and installation instructions to instantiate and define the BLCEN-5M12LT-1RS232-8XSG-P. See Turck documentation “BLCEN-5M12LT-1RS232-8XSG-P Data Sheet (6811509)” for general specifications and “How to Use Catalog Files 2016” for .L5X import instructions.

The **DS210 Operating Instructions** manual is a companion document to define the DS210 operation, interface, IO, and serial port.

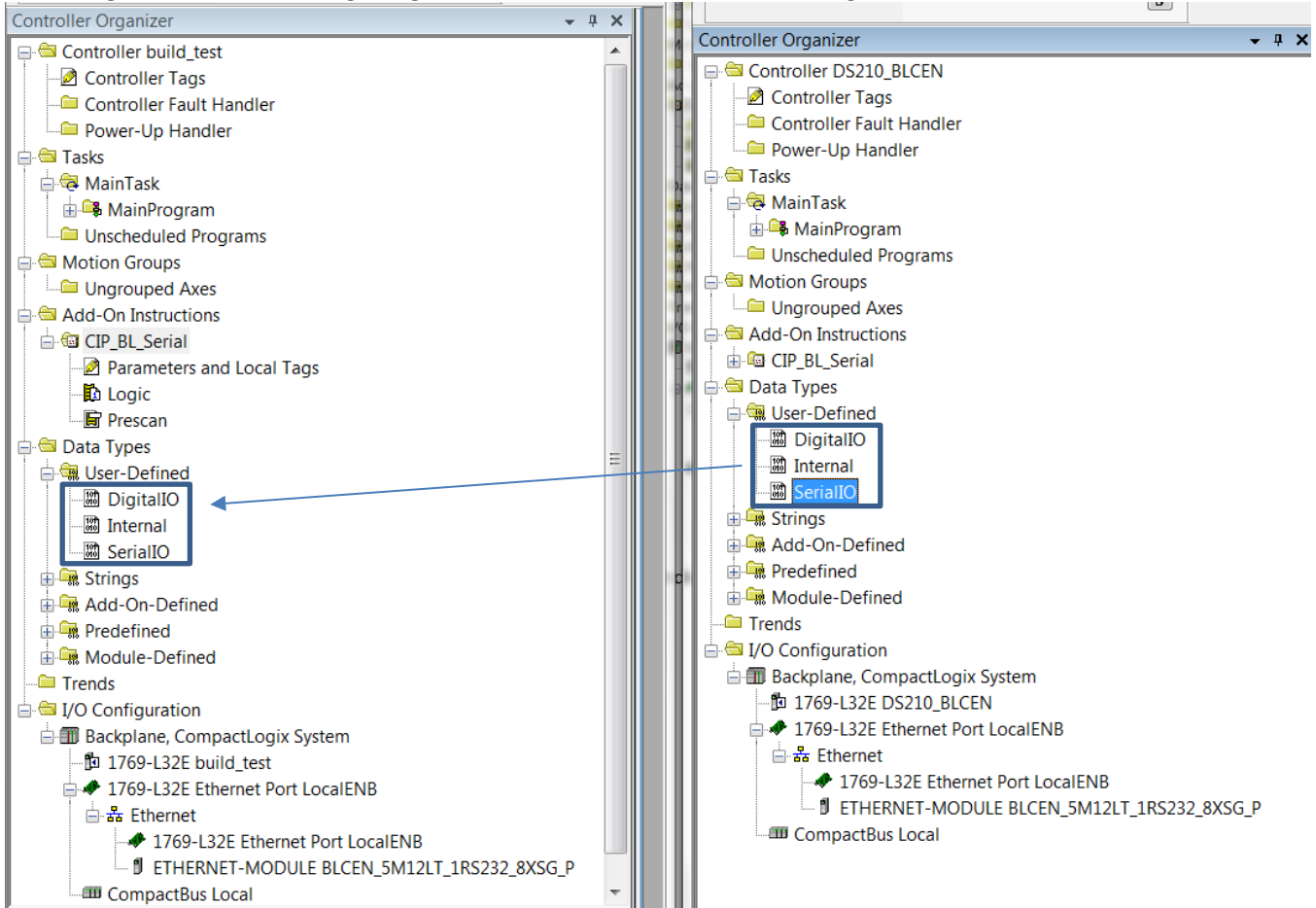
First step is to grab and drag the BLCEN_5M12LT_1RS232_8XSG_P module into the design.



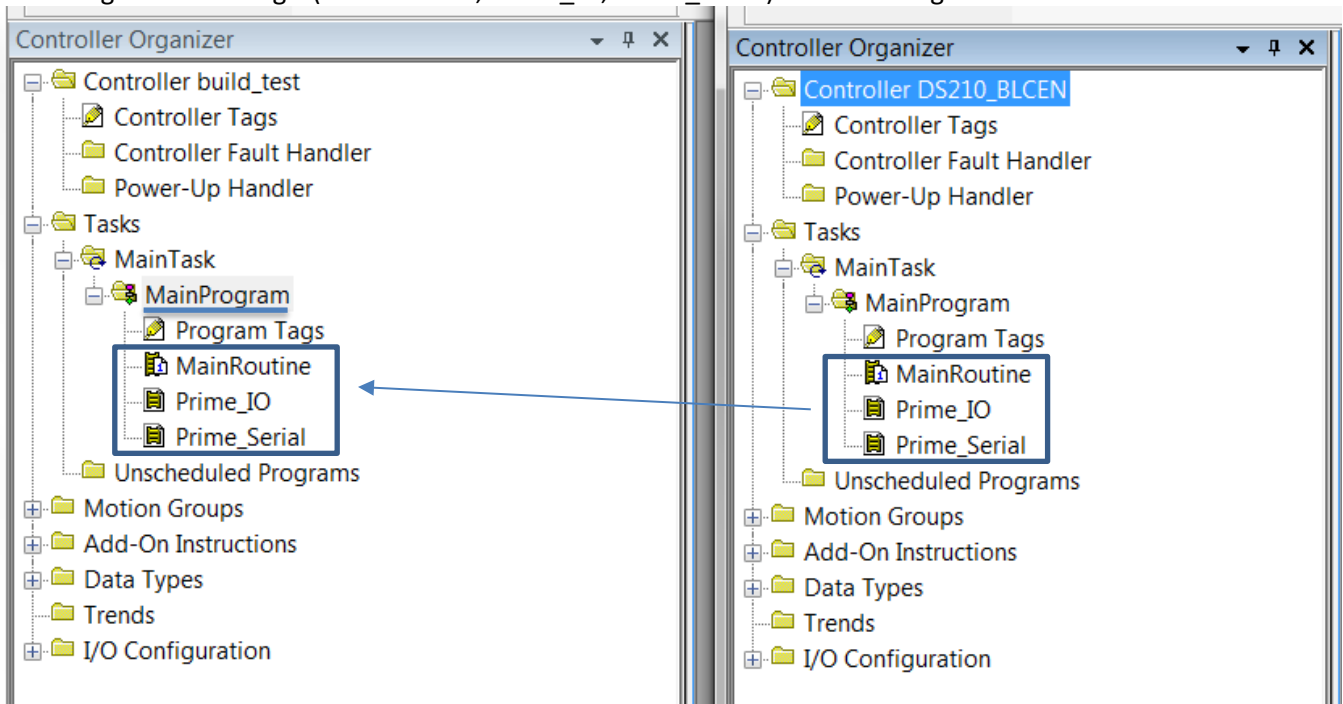
Next, drag the CIP_BL_Serial AOI into the design.



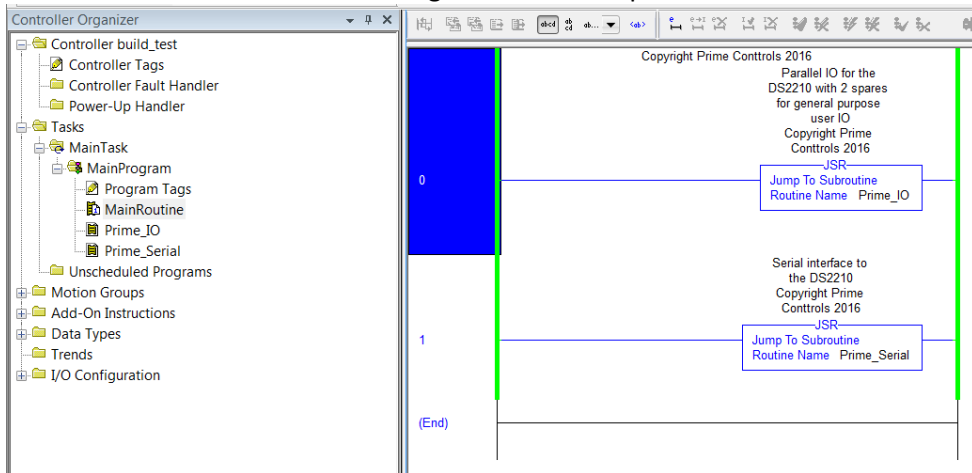
Next drag the user defined tags (DigitalIO Internal, SerialIO) into the design.



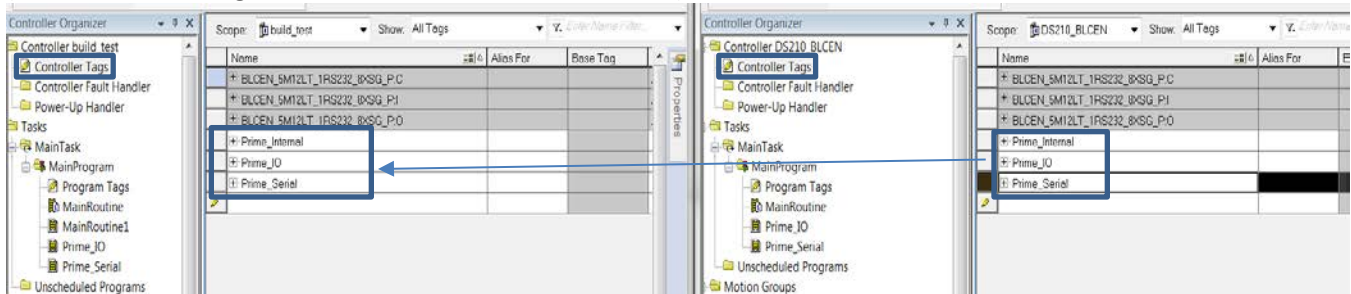
Next drag the ladder logic (MainRoutine, Prime_IO, Prime_Serial) into the design.



Be sure to have a MainRoutine designated and incorporate the calls to the Prime subroutines.



Next drag the Controller tags for the ladder logic (Prime_Internal, Prime_IO, Prime_Serial) into the design. (Select the "Edit Tags" tab at the bottom of the window.)



The BLCEN-5M12LT-1RS232-8XSG-P serial port configuration tags must be set to 9600 baud, No parity, 8 data bits, 1 stop bit for communication with the DS210. Most of the 400 configuration tag bytes will be predefined as zero. Set the non-zero configuration tags with the values shown below (“Monitor Tags” tab selected):

Name	Value	Format	Style	Data Type	Description
BLCEN_5M12LT_1RS232_8XSG_P:C	{...}	{..}		AB:ETHE...	
BLCEN_5M12LT_1RS232_8XSG_P:C.Data	{...}	{..}	Hex	SINT[400]	
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[0]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[1]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[2]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[3]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[4]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[5]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[6]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[7]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[8]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[9]	16#00		Hex	SINT	Quick Connect Eth Custom Setup
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[10]	16#06		Hex	SINT	Slot 1 - RS232 0 - Data rate
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[11]	16#01		Hex	SINT	Slot 1 - RS232 0 - Extended status/control mode
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[12]	16#01		Hex	SINT	Slot 1 - RS232 0 - Deactivate diagnostics
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[13]	16#00		Hex	SINT	Slot 1 - RS232 0 - Stop bits
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[14]	16#11		Hex	SINT	Slot 1 - RS232 0 - XON character
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[15]	16#13		Hex	SINT	Slot 1 - RS232 0 - XOFF character
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[16]	16#00		Hex	SINT	Slot 1 - RS232 0 - Parity bit
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[17]	16#01		Hex	SINT	Slot 1 - RS232 0 - Data bits
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[18]	16#00		Hex	SINT	Slot 1 - RS232 0 - Data flow control
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[19]	16#00		Hex	SINT	Reserved
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[20]	16#00		Hex	SINT	Slot 2 - Activate input filter
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[21]	16#00		Hex	SINT	Slot 2 - Activate input filter
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[22]	16#00		Hex	SINT	Slot 2 - Activate input filter
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[43]	16#00		Hex	SINT	Slot 2 - Manual reset after overcurr.
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[44]	16#01		Hex	SINT	Slot 2 - Activate output
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[45]	16#01		Hex	SINT	Slot 2 - Activate output
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[46]	16#01		Hex	SINT	Slot 2 - Activate output
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[47]	16#01		Hex	SINT	Slot 2 - Activate output
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[48]	16#01		Hex	SINT	Slot 2 - Activate output
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[49]	16#01		Hex	SINT	Slot 2 - Activate output
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[50]	16#01		Hex	SINT	Slot 2 - Activate output
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[51]	16#01		Hex	SINT	Slot 2 - Activate output
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[52]	16#00		Hex	SINT	
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[53]	16#00		Hex	SINT	
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[54]	16#00		Hex	SINT	
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[55]	16#00		Hex	SINT	
BLCEN_5M12LT_1RS232_8XSG_P:C.Data[56]	16#00		Hex	SINT	

ETHERNET GATEWAY BASE IP ADDRESS SELECTION

The Prime Controls RSLogix5000 reference design uses a BLCEN-5M12LT-1RS232-8XSG-P IP base address (IPADDRESS) of 192.168.1.12 with a Subnet Mask of 255.255.255.0 and a CompactLogix L32E PLC IPADDRESS of 192.168.1.122 with a Subnet Mask of 255.255.255.0. The Input size is 7x16b and the Output is 5x16b.

Module Properties Report: LocalENB (ETHERNET-MODULE 1.1)

General | Connection | Module Info

Type: ETHERNET-MODULE Generic Ethernet Module
 Vendor: Allen-Bradley
 Parent: LocalENB
 Name: BLCEN_5M12LT_1RS232_8XSG_P
 Description:
 Comm Format: Data - INT
 Address / Host Name
 IP Address: 192 . 168 . 1 . 12
 Host Name:
 Connection Parameters
 Input: 103 Assembly Instance: 7 Size: 7 (16-bit)
 Output: 104 Assembly Instance: 5 Size: 5 (16-bit)
 Configuration: 106 Assembly Instance: 54 Size: 54 (8-bit)
 Status Input:
 Status Output:
 Status: Offline
 OK Cancel Apply Help

ETHERNETIP RSLOGIX 5000 TAGS

All of the reference design's tags are under Controller Tags.

Scope: DS210_BLCEN Show: All Tags

Name	Value	For	Style	Data Type	Description
BLCEN_5M12LT_1RS232_8XSG_P:C	{...}	{..}		AB:ETHE...	
BLCEN_5M12LT_1RS232_8XSG_P:I	{...}	{..}		AB:ETHE...	
BLCEN_5M12LT_1RS232_8XSG_P:O	{...}	{..}		AB:ETHE...	
Prime_Internal	{...}	{..}		Internal	
Prime_IO	{...}	{..}		DigitalIO	User TAGs for the DS210 digital IO
Prime_Serial	{...}	{..}		SerialIO	User TAGs for the DS210serial port

The DS210 digital IO may be read or written to by using the BLCEN-5M12LT-1RS232-8XSG-8 digital IO and the tags under Prime_IO. The description section of the Tags describe the functionality of each I/O.

Name	Value	For	Style	Data Type	Description
BLCEN_5M12LT_1RS232_8XSG_PC	{...}	{..}		AB:ETHE...	
BLCEN_5M12LT_1RS232_8XSG_P-I	{...}	{..}		AB:ETHE...	
BLCEN_5M12LT_1RS232_8XSG_P-O	{...}	{..}		AB:ETHE...	
Prime_Internal	{...}	{..}		Internal	
Prime_IO	{...}	{..}		DigitalIO	User TAGs for the DS210 digital IO
Prime_IO.b0_R_METAL	1		Dec...	BOOL	User TAGs for the DS210 digital IO USER READ TAG from DS210 IO
Prime_IO.b0_W	0		Dec...	BOOL	User TAGs for the DS210 digital IO Leave at "0" for Valid METAL reads
Prime_IO.b1_R_UNDER	0		Dec...	BOOL	User TAGs for the DS210 digital IO USER READ TAG from DS210 IO
Prime_IO.b1_W	0		Dec...	BOOL	User TAGs for the DS210 digital IO Leave at "0" for valid UNDER reads
Prime_IO.b2_R	0		Dec...	BOOL	User TAGs for the DS210 digital IO Could be used for diagnostic readback
Prime_IO.b2_W_CALIBRATE	0		Dec...	BOOL	User TAGs for the DS210 digital IO USER WRITE TAG to DS210 IO; Calibration occurs with a write high then a write low transition.
Prime_IO.b3_R_SPARE	0		Dec...	BOOL	User TAGs for the DS210 digital IO USER READ TAG for Spare IO available on BLCEN bit7
Prime_IO.b3_W_SPARE	0		Dec...	BOOL	User TAGs for the DS210 digital IO USER WRITE TAG to Spare IO available on BLCEN bit7
Prime_IO.b4_R_NODOUBLE	1		Dec...	BOOL	User TAGs for the DS210 digital IO USER READ TAG from DS210 IO
Prime_IO.b4_W	0		Dec...	BOOL	User TAGs for the DS210 digital IO Leave at "0" for valid NODOUBLE read
Prime_IO.b5_R	0		Dec...	BOOL	User TAGs for the DS210 digital IO No Connect
Prime_IO.b5_W	0		Dec...	BOOL	User TAGs for the DS210 digital IO No Connect
Prime_IO.b6_R	0		Dec...	BOOL	User TAGs for the DS210 digital IO Could be used for diagnostic readback
Prime_IO.b6_W_RESET	0		Dec...	BOOL	User TAGs for the DS210 digital IO USER WRITE TAG to the DS210 IO; RESET occurs when high
Prime_IO.b7_R_SPARE	0		Dec...	BOOL	User TAGs for the DS210 digital IO USER READ TAG for Spare IO available on BLCEN bit7
Prime_IO.b7_W_SPARE	0		Dec...	BOOL	User TAGs for the DS210 digital IO USER WRITE TAG to Spare IO available on BLCEN bit7
Prime_Serial	{...}	{..}		SerialIO	User TAGs for the DS210 serial port

- METAL (Turck I/OA 2₀) : The proximity sensor in the probe is sensing metal.
- NO DOUBLE (Turck I/OA 2₄): Indicates that NO double sheet has been sensed.
- SINGLE (DS210 LED only): Indicates that a single has been sensed.
- UNDER (Turck I/OA 2₁): Indicates that an under has been sensed.

The Turck BLCEN-5M12LT-1RS232-8XSG-P will normally have all green lights. The reference system had its rotary switches set to "9" and "6".

The DS210 RS232 Serial commands and data may be written by using the tags under Prime_Serial.

Name	Value	For	Style	Data Type	Description
BLCEN_5M12LT_1RS232_8XSG_P-C	{...}	{..}		AB:ETHE...	
BLCEN_5M12LT_1RS232_8XSG_P-I	{...}	{..}		AB:ETHE...	
BLCEN_5M12LT_1RS232_8XSG_P-O	{...}	{..}		AB:ETHE...	
Prime_Internal	{...}	{..}		Internal	
Prime_IO	{...}	{..}		DigitalIO	User TAGs for the DS210 digital IO
Prime_Serial	{...}	{..}		SerialIO	User TAGs for the DS210 serial port
Prime_Serial.M0	0		Dec...	BOOL	User TAGs for the DS210 serial port Load command to select DS210 calibration stored in memory 0
Prime_Serial.M1	0		Dec...	BOOL	User TAGs for the DS210 serial port Load command to select DS210 calibration stored in memory 1
Prime_Serial.M2	1		Dec...	BOOL	User TAGs for the DS210 serial port Load command to select DS210 calibration stored in memory 2
Prime_Serial.M3	0		Dec...	BOOL	User TAGs for the DS210 serial port Load command to select DS210 calibration stored in memory 3
Prime_Serial.M4	0		Dec...	BOOL	User TAGs for the DS210 serial port Load command to select DS210 calibration stored in memory 4
Prime_Serial.M5	0		Dec...	BOOL	User TAGs for the DS210 serial port Load command to select DS210 calibration stored in memory 5
Prime_Serial.M6	0		Dec...	BOOL	User TAGs for the DS210 serial port Load command to select DS210 calibration stored in memory 6
Prime_Serial.M7	0		Dec...	BOOL	User TAGs for the DS210 serial port Load command to select DS210 calibration stored in memory 7
Prime_Serial.R	0		Dec...	BOOL	User TAGs for the DS210 serial port Load command to RESET the DS210
Prime_Serial.SendCommand	1		Dec...	BOOL	User TAGs for the DS210 serial port The rising edge will send the loaded serial command to the S210

Only a single command (ASCII string to send) may be selected, then the Prime_Serial.SendCommand tag is toggled from a 0 to a 1 to transmit the command (ASCII string) to the DS210. See the DS210 Operating Instructions for definitions of commands.

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