Installation Instructions

Original Instructions

PowerFlex 750-Series I/O, Feedback, and Power Option Modules

Catalog Numbers 20-750-112C-2R, 20-750-1133C-1R2T, 20-750-1132D-2R, 20-750-2262C-2R, 20-750-2263C-1R2T, 20-750-2262D-2R

Overview

Each 750-Series drive has a slot-based architecture. Option modules provide additional analog and digital I/O, feedback, and auxiliary power options. These 750-Series option modules support PowerFlex® 750-Series and PowerFlex 755T drive products with TotalFORCE® control. For instructions on installing the option module in the control pod, see the PowerFlex 750-Series Option Modules Installation Instructions, publication 750-IN002. This publication covers drive compatibility, jumper settings, terminal designations, and wiring examples for the option modules.

Wiring

Important points to remember about I/O wiring:

- Always use copper wire.
- Use wire with an insulation rating of 600V or greater.
- Separate control and signal wires from power wires by at least 0.3 meters (1.0 ft).
- For CE compliance, 115V digital input wiring must be shielded or must not exceed 30 m (98.4 ft) in length.
- Follow these guides to maintain electrical safety for all user-accessible low voltage circuits for I/O terminals that are designated for 24V or lower voltage. Standards are safety extra low voltage (SELV) and protective extra low voltage (PELV). SELV is as defined in IEC 61010-2-201 and PELV is as defined in IEC 61131-2.
  - Do not connect to a circuit of higher voltage.
  - Do not connect to a circuit that is not adequately insulated from dangerous voltages with double or reinforced insulation within other connected equipment or wiring.
- Provide a common earth reference for all equipment that is connected to the drive. This common earth reference is to provide electrical safety for user-accessible low voltage I/O circuits that are referenced to earth (PELV circuits) and that can be touched simultaneously.
- If the wires are short and contained within a cabinet that has no sensitive circuits, the use of shielded wire is not necessary, but is always recommended.

IMPORTANT I/O terminals that are labeled '(–)' or 'Common' are not referenced to earth ground and are designed to reduce common mode interference. Grounding these terminals can cause signal noise.

ATTENTION: Hazard of personal injury or equipment damage exists when using bipolar input sources. Noise and drift in sensitive input circuits can cause unpredictable changes in motor speed and direction. Use speed command parameters to help reduce input source sensitivity.

Table 1 - I/O Wiring Recommendations

Type		Wire Types	Description	Min Insulation Rating
Signal	Standard analog I/O	–	0.750 mm^2 (18 AWG), twisted-pair, 100% shield with drain.	300V, 75…90 °C (167…194 °F)
	Remote potentiometer	–	0.750 mm^2 (18 AWG), 3 conductor, shielded.	
	Encoder/Pulse I/O <30 m (98.4 ft)	Combined	0.196 mm^2 (24 AWG) Individually shielded pairs.	
	Encoder/Pulse I/O 30…152 m (100…500 ft)	Signal	0.196 mm^2 (24 AWG) Individually shielded pairs.	
		Power	0.750 mm^2 (18 AWG) Individually shielded pairs.	
		Combined	0.330 mm^2 (22 AWG), power is 0.500 mm^2 (20 AWG) Individually shielded pairs.	
	Encoder/Pulse I/O 152…259 m (500…850 ft)	Signal	0.196 mm^2 (24 AWG) Individually shielded pairs.	
		Power	0.750 mm^2 (18 AWG) Individually shielded pairs.	
		Combined	0.750 mm^2 (18 AWG) individually shielded pairs.	
Digital I/O Safety Inputs Homing Inputs	Shielded	Multi-conductor shielded cable	0.750 mm^2 (18 AWG), 3 conductor, shielded.	300V, 60 °C (140 °F)
Digital I/O Homing Inputs	Unshielded	–	Per US NEC or applicable national or local code.	

Table 2 - Option Module I/O Terminal Block Specifications

Name	Wire Size Range mm^2 (AWG)		Torque N•m (lb•in)		Strip Length mm (in.)
	Max	Min	Max	Recommended	
22-Series I/O Modules TB1 with Screw Terminals	2.5 (14)	0.3 (28)	0.25 (2.2)	0.2 (1.8)	6 (0.24)
22-Series I/O Modules TB2 with Screw Terminals	4.0 (12)	0.25 (24)	0.5 (4.4)	0.4 3.5)	7 (0.28)
11-Series I/O Module TB1 with Tension Clamp Terminals	2.5 (14)	0.13 (26)	—		10 (0.39)
11-Series I/O Module TB2 with Tension Clamp Terminals	4.0 (12)	0.25 (24)	—		10 (0.39)
Single Incremental Encoder	0.8 (18)	0.3 (28)	—		10 (0.39)
Dual Incremental Encoder	0.8 (18)	0.3 (28)	—		10 (0.39)
Universal Feedback Module	0.8 (18)	0.3 (28)	—		10 (0.39)
Auxiliary Power Supply TB1	2.5 (14)	0.3 (28)	0.25 (2.2)	0.2 (1.8)	6 (0.24)

11-Series I/O Option Module

This section provides a description of the 11-Series I/O option module. Digital inputs can be 24V DC or 120V AC. Analog inputs can be configured for Voltage or Current mode.

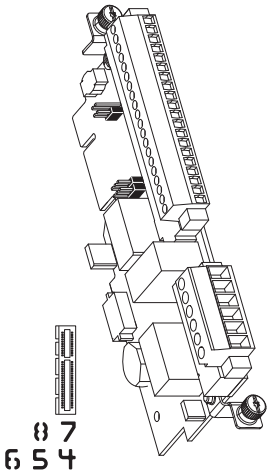
ATTENTION: When used in Integrated Motion on EtherNet/IP™ network applications for firmware, versions 12.xxx and later, the 11-Series module must only be installed in slot (port) 7.

You cannot use the ATEX card with the 11-Series I/O card in slot (port) 7 when used in an Integrated Motion on EtherNet/IP application.

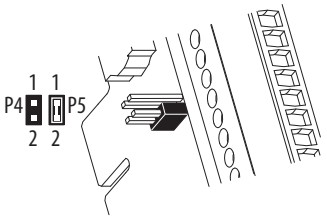
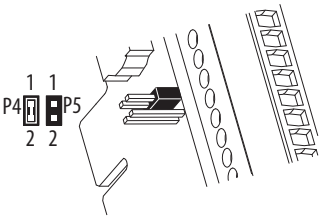
I/O Option Kits for 11-Series I/O Module

Description	Cat. No.	Used with PowerFlex Drive	
		753/755	755TL/755TR
24V DC 11-Series I/O Module with 1 Analog In, 1 Analog Out, 3 Digital In and 2 Relay Outputs	20-750-1132C-2R	X	X
24V DC 11-Series I/O Module with 1 Analog In, 1 Analog Out, 3 Digital In, 1 Relay and 2 Transistor Outputs	20-750-1133C-1R2T	X	X
115V AC 11-Series I/O Module with 1 Analog In, 1 Analog Out, 3 Digital In and 2 Relay Outputs	20-750-1132D-2R	X	X

20-750-1132C-2R *(24 Volts DC)*
20-750-1133C-1R2T *(24 Volts DC)*
20-750-1132D-2R *(120 Volts AC)*



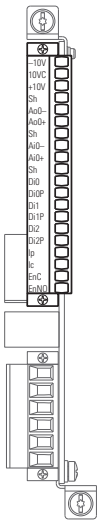
Analog Input Mode Jumpers

Voltage Mode	Current Mode
	

Terminal Designations for 11-Series I/O Option Modules

These tables list terminal designations for 11-Series I/O option modules.

Table 3 - TB1 Terminal Designations for 11-Series I/O Option Modules



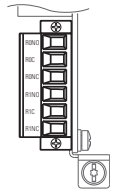
Terminal	Name	Description	Related Parameter [4][5]
–10V	–10V reference	Negative 10V DC for analog inputs. 2 kΩ min.	
10VC	10V common	For (–) and (+) 10V references.	
+10V	+10V reference	Positive 10V DC for analog inputs. 2 kΩ min.	
Sh	Shield	Terminating point for wire shields when an EMC plate or conduit box is not installed.	
Ao0–	Analog out 0 (–)	Bipolar, ±10V, 11 bit, and sign, 2 kΩ min load. 4…20 mA, 11 bit, and sign, 400 Ω max load.	75 On port *nn*
Ao0+	Analog out 0 (+)		
Sh	Shield	Terminating point for wire shields when an EMC plate or conduit box is not installed.	
Ai0–	Analog input 0 (–)	Differential [2], bipolar, 11 bit and sign. Voltage Mode: ±10V at 88 kΩ input impedance. Current Mode: 0…20 mA at 93 Ω input impedance.	50, 70 On port *nn*
Ai0+	Analog input 0 (+)		
Sh	Shield	Terminating point for wire shields when an EMC plate or conduit box is not installed.	
Di0	Digital input 0	24V DC (30V DC Max) – Opto isolated High state: 20…24V DC 11.2 mA DC Low state: 0…5V DC 120V AC (132V AC Max) 50/60 Hz[3] – Opto isolated High state: 100…132V AC Low state: 0…30V AC	1 On port *nn*
Di0P	Digital input 0 power[1]		
Di1	Digital input 1		
Di1P	Digital input 1 power[1]		
Di2	Digital input 2		
Di2P	Digital input 2 power[1]		
Ip	Input power	External 24V DC or 115V AC power supply input connections. Does not power the main control board.	
Ic	Input common		
EnC	Enable output	ATEX fault enable output. Used only when an ATEX option module is installed.	
EnNO			

(1) Digital Inputs are either 24V DC (1132C) or 115V AC (1132D) based on module catalog number. Verify that applied voltage is correct for I/O module.
(2) Differential – External source must be maintained at less than 160V regarding PE. Input provides high common mode immunity.
(3) For CE compliance, use shielded cable. Do not exceed cable length of 30 m (98.4 ft).
(4) I/O Module parameters also have a port designation.
(5) In this table, nn is a variable to denote that this parameter is for whichever port you are using.

ATTENTION: Risk of equipment damage exists. Verify that the correct voltage is applied to the I/O Module digital inputs. See the I/O Module catalog number to determine the voltage rating.

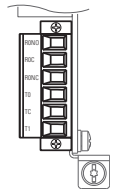
- 20-750-1132**C**-2R is rated 24V DC
- 20-750-1133**C**-1R2T is rated 24V DC
- 20-750-1132**D**-2R is rated 120V AC

Table 4 - TB2 Terminal Designations (Two Relay Outputs: 2R)

Relay Out	Terminal	Name	Description	Related Parameter(1)
	R0NO	Relay 0 N.O.	Relay normally open contact output: 240V AC, 30V DC, 3.5 A max General purpose (inductive)/resistive Relay normally closed contact output: 240V AC, 30V DC, 5 A max Only resistive	10, 100, 101, 105, 106 On port *nn*
	R0C	Relay 0 common		
	R0NC	Relay 0 N.C.		
	R1NO	Relay 1 N.O.		20, 110, 111, 115, 116 On port *nn*
	R1C	Relay 1 common		
	R1NC	Relay 1 N.C.		

(1) In this table, nn is a variable to denote that this parameter is for whichever port you are using.

Table 5 - TB2 Terminal Designations (One Relay and Two Transistor Outputs: 1R2T)

Relay Out	Terminal	Name	Description	Related Parameter(1)
	R0NO	Relay 0 N.O.	Relay normally open contact output: 240V AC, 24V DC, 3.5 A max General purpose (inductive)/resistive Relay normally closed contact output: 240V AC, 24V DC, 5 A max Only resistive	10, 100, 101, 105, 106 On port *nn*
	R0C	Relay 0 common		
	R0NC	Relay 0 N.C.		
	T0	Transistor output 0	Transistor output Rating: 24V DC = 1 A max including U.L. applications Resistive	20 On port *nn*
	TC	Transistor output common		
	T1	Transistor output 1		30 On port *nn*

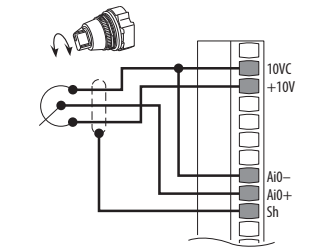
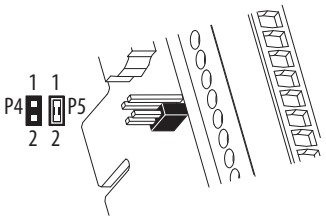
(1) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

11-Series I/O Option Module Wiring Examples

This section provides examples for how to wire the 11-Series I/O option module.

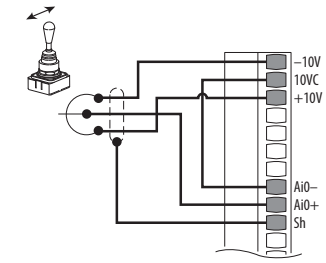
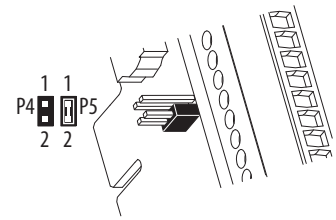
11-Series I/O Module TB1 Wiring Examples

Potentiometer Unipolar Speed Reference (10 K-Ohm Potentiometer Recommended) (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex 755TL and PowerFlex 755TR
 11-Series I/O Module 	Set direction mode	• Port 0:308 [Direction Mode] = 0 'Unipolar'	• Port 10/11:930 [Direction Mode] = 0 'Unipolar'
	Set selection	• Port 0:545 [Spd Ref A Sel] = port *nn*:50 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port *nn*:50 [Anlg In0 Value]
	Adjust scaling	• Port *nn*:51 [Anlg In0 Hi] = 10V • Port *nn*:52 [Anlg In0 Lo] = 0V • Port 0:547 [Spd Ref A AnlgHi]+ 60 Hz • Port 0:548 [Spd Ref A AnlgLo] = 0 Hz	• Port *nn*:51 [Anlg In0 Hi] = 10V • Port *nn*:52 [Anlg In0 Lo] = 0V • Port 10/11:1802 [VRef A AnlgHi] = 60 Hz • Port 10/11:1803 [VRef A AnlgLo] = 0 Hz
	View results	• Port *nn*:50 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port *nn*:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

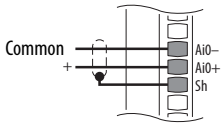
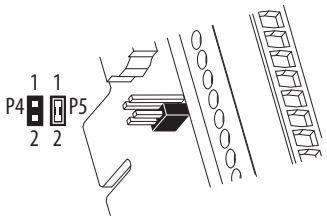
(1) 2 kOhm minimum
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Joystick Bipolar Speed Reference ±10V Input(1)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 11-Series I/O Module 	Set direction mode	• Port 0:308 [Direction Mode] = 1 'Bipolar'	• Port 10/11:930 [Direction Mode] = 1 'Bipolar'
	Set selection	• Port 0:545 [Spd Ref A Sel] = Port *nn*:50 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port *nn*:50 [Anlg In0 Value]
	Adjust scaling	• Port *nn*:51 [Anlg In0 Hi] = +10V • Port *nn*:2 [Anlg In0 Lo] = –10V • Port 0:547 [Spd Ref A AnlgHi] = +60 Hz • Port 0:548 [Spd Ref A AnlgLo] = –60 Hz	• Port *nn*:51 [Anlg In0 Hi] = +10V • Port *nn*:52 [Anlg In0 Lo] = –10 Volts • Port 10/11:1802 [VRef A AnlgHi] = +60 Hz • Port 10/11:1803 [VRef A AnlgLo] = –60 Hz
	View results	• Port *nn*:50 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port *nn*:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

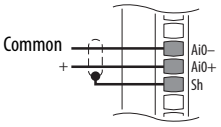
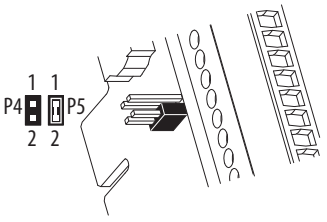
(1) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Analog Input Bipolar Speed Reference (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 11-Series I/O Module 	Set direction mode	• Port 0:308 [Direction Mode] = 1 'Bipolar'	• Port 10/11:930 [Direction Mode] = 1 'Bipolar'
	Set selection	• Port 0:545 [Spd Ref A Sel] = Port *nn*:50 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port *nn*:50 [Anlg In0 Value]
	Adjust scaling	• Port *nn*:51 [Anlg In0 Hi] = +10V • Port *nn*:52 [Anlg In0 Lo] = –10V • Port 0:547 [Spd Ref A AnlgHi] = +60 Hz • Port 0:548 [Spd Ref A AnlgLo] = –60 Hz	• Port *nn*:51 [Anlg In0 Hi] = +10V • Port *nn*:52 [Anlg In0 Lo] = –10 Volts • Port 10/11:1802 [VRef A AnlgHi] = +60 Hz • Port 10/11:1803 [VRef A AnlgLo] = –60 Hz
	View results	• Port *nn*:50 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port *nn*:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

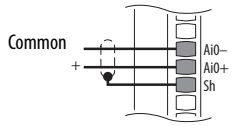
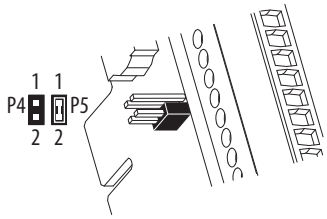
(1) ±10V Input
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Analog Voltage Input Unipolar Speed Reference (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 11-Series I/O Module TB1 	Set direction mode	• Port 0:08 [Direction Mode] = 0 'Unipolar'	• Port 10/11:930 [Direction Mode] = 0 'Unipolar'
	Set selection	• Port 0:545 [Spd Ref A Sel] = Port 0:260 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port *nn*:50 [Anlg In0 Value]
	Adjust scaling	• Port 0:261 [Anlg In0 Hi] = 10V • Port 0:262 [Anlg In0 Lo] = 0V • Port 0:547 [Spd Ref A AnlgHi] = 60 Hz • Port 0:548 [Spd Ref A AnlgLo] = 0 Hz	• Port *nn*:51 [Anlg In1 Hi] = 10 Volts • Port *nn*:52 [Anlg In1 Lo] = 0 Volts • Port 10/11:1802 [VRef A AnlgHi] = 60 Hz • Port 10/11:1803 [VRef A AnlgLo] = 0 Hz
	View results	• Port 0:260 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port *nn*:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

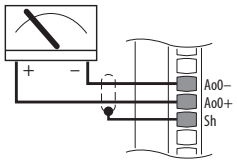
(1) 0…+10V Input
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Analog Current Input Unipolar Speed Reference (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 11- Series I/O Module TB1	Set direction mode	• Port 0:308 [Direction Mode] = 0 'Unipolar'	• Port 10/11:930 [Direction Mode] = 0 'Unipolar'
	Set selection	• Port 0:545 [Spd Ref A Sel] = port *nn*:50 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port *nn*:50 [Anlg In0 Value]
	Adjust scaling	• Port *nn*:51 [Anlg In0 Hi] = 20 mA • Port *nn*:52 [Anlg In0 Lo] = 0 mA or 4 mA • Port 0:547 [Spd Ref A AnlgHi] = 60 Hz • Port 0:548 [Spd Ref A AnlgLo] = 0 Hz	• Port *nn*:51 [Anlg In0 Hi] = 20 mA • Port *nn*:52 [Anlg In0 Lo] = 0 mA • Port 10/11:1802 [VRef A AnlgHi] = 60 Hz • Port 10/11:1803 [VRef A AnlgLo] = 0 Hz
	View results	• Port *nn*:50 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port *nn*:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

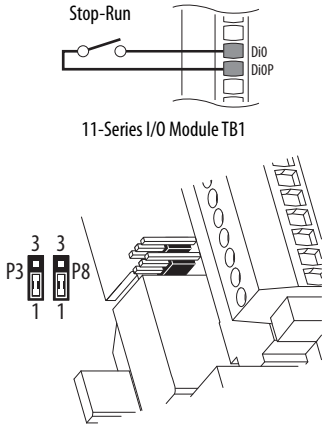
(1) 0…20 mA Input
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Analog Voltage Output (1) (2) (3)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 11-Series I/O Module TB1	Configuration	• Port *nn*:70 [Anlg Out Type], bit 0 = 0	• Port *nn*:70 [Anlg Out Type], bit 0 = 0
	Set selection	• Port *nn*:75 [Anlg Out0 Sel] = Port 0:3 [Mtr Vel Fdbk]	• Port *nn*:75 [Anlg Out0 Sel] = Port 10/11:1044 [Motor Vel Fb]
	Adjust scaling	• Port *nn*:78 [Anlg Out0 DataHi] = 60 Hz • Port *nn*:79 [Anlg Out0 DataLo] = 0 Hz • Port *nn*:80 [Anlg Out0 Hi] =10V/20 mA • Port *nn*:81 [Anlg Out0 Lo] = 0V/0 mA	• Port *nn*:78 [Anlg Out0 DataHi] = 60 Hz • Port *nn*:79 [Anlg Out0 DataLo] = 0 Hz • Port *nn*:80 [Anlg Out0 Hi] =10V/20 mA • Port *nn*:81 [Anlg Out0 Lo] = 0V/0 mA
	View results	• Port *nn*:77 [Anlg Out0 Data] • Port *nn*:82 [Anlg Out0 Val]	• Port *nn*:77 [Anlg Out0 Data] • Port *nn*:82 [Anlg Out0 Val]

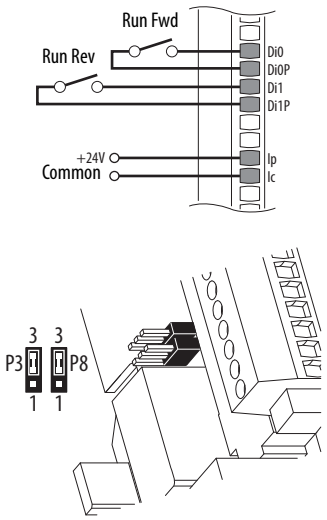
(1) ±10V, 0…20 mA Bipolar
(2) +10V Unipolar
(3) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

2-Wire Control Non-reversing (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
	Set direction mode	• Port 0:308 [Direction Mode] = 2 'Rev Disable	• Port 10/11:930 [Direction Mode] = 2 'Rev Disable'
	Set selection	• Port 0:163 [DI Run] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0	• Port 0:120 [DI M Run] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0
	View results	• Port *nn*:1 [Dig In Sts] Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

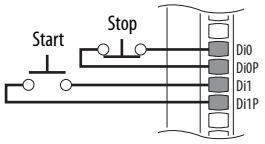
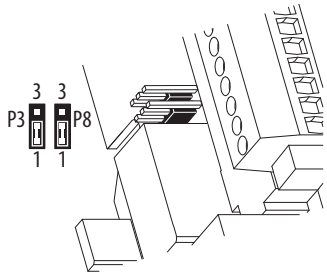
(1) 24V DC internal supply
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

2-Wire Control Reversing (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
	Set direction mode	• Port 0:308 [Direction Mode] = 0 'Unipolar'	• Port 10/11:930 [Direction Mode] = 0 'Unipolar'
	Set selection	• Port 0:164 [DI Run Forward] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:165 [DI Run Reverse] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	• Port 0:121 [DI M Run Forward] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:122 [DI M Run Reverse] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

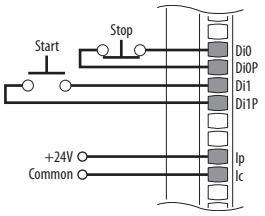
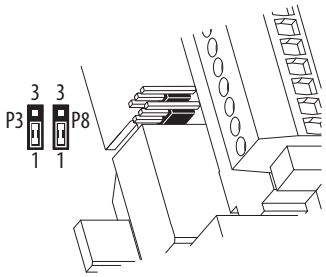
(1) External 24V supply
20-750-1132C-2R
20-750-1133C-1R2T
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

3-Wire Control (Internal Supply) (1)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 11-Series I/O Module TB1 	Set selection	• Port 0:158 [DI Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:161 [DI Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	• Port 0:108 [DI M Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:117 [DI M Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

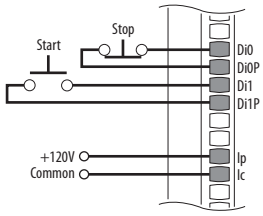
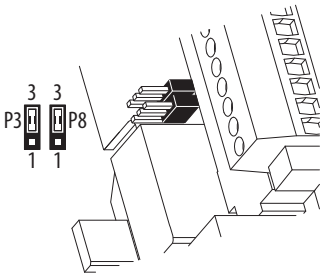
(1) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

3-Wire Control (External 24V Supply) (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 11-Series I/O Module TB1 	Set selection	• Port 0:158 [DI Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:161 [DI Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	• Port 0:108 [DI M Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:117 [DI M Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

(1) External 24V supply
20-750-1132C-2R
20-750-1133C-1R2T
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

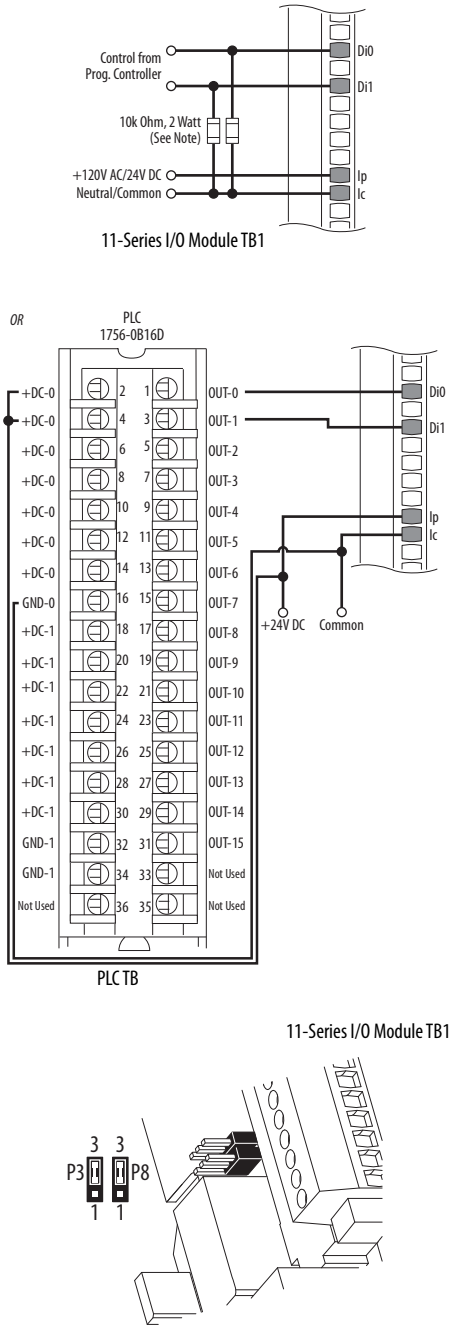
3-Wire Control (External 120V Supply) (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 11-Series I/O Module TB1 	Set selection	• Port 0:158 [DI Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:161 [DI Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	• Port 0:108 [DI M Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:117 [DI M Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

(1) External 120V supply
20-750-1132D-2R

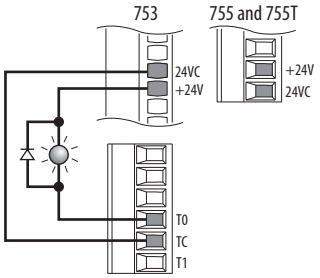
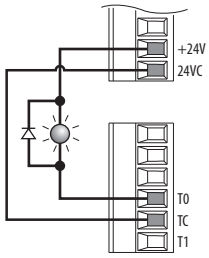
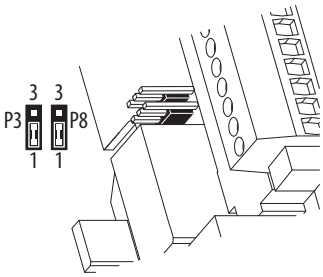
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Digital Input PLC Output Module (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
	Set selection	• Port 0:158 [DI Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:161 [DI Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	• Port 0:108 [DI M Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:117 [DI M Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]
		IMPORTANT: Some PLC interfaces require pull-down resistors.	

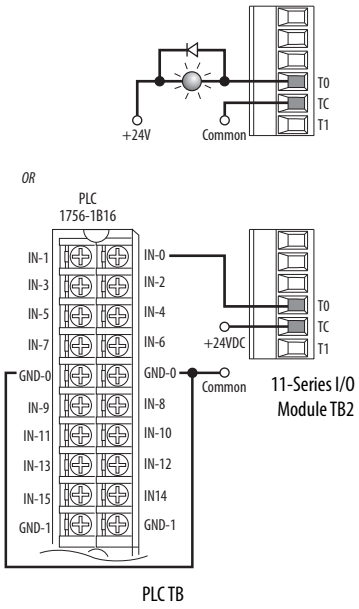
(1) External supply
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Digital Output (Internal Supply) (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 Main Control Board TB1 11-Series I/O Module TB2	Set selection	• Port *nn*:20 [T00 Sel] = Port 0:935 [Drive Status 1], bit 7 = Faulted	• Port *nn*:20 [T00 Sel] = Port 10/11:354 [Motor Side Sts 1], bit 7 = Faulted
 Main Control Board TB1 11-Series I/O Module TB2			
	View results	• Port *nn*:5 [Dig Out Sts]	• Port *nn*:5 [Dig Out Sts]

(1) 20-750-1133C-1R2T
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

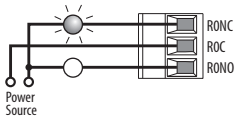
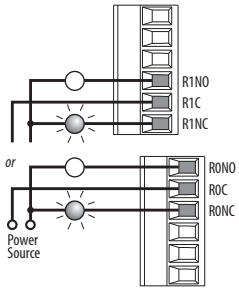
Digital Output External Supply (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
	Set selection	• Port *nn*:20 [T00 Sel] = Port 0:935 [Drive Status 1], bit 7 = Faulted	• Port *nn*:20 [T00 Sel] = Port 10/11:354 [Motor Side Sts 1], bit 7 = Faulted
	View results	• Port *nn*:5 [Dig Out Sts]	• Port *nn*:5 [Dig Out Sts]

(1) 20-750-1133C-1R2T

(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Relay Output (External Supply) (1)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 753 Main Control Board	Set selection	PowerFlex 753 • Port 0:230 [R00 Sel] = Port 0:935 [Drive Status 1], bit 7 = Faulted 11-Series I/O Modules • Port *nn* (11-Series I/O Module):10 [R00 Sel] = Port 0:935 [Drive Status 1], bit 7 = Faulted	• Port *nn*:10 [R00 Sel] = Port 10/11:354 [Motor Side Sts 1], bit 7 = Faulted
 11-Series I/O Module	View results	PowerFlex 753 • Port 0:225 [Dig Out Sts] 11-Series I/O Modules • Port *nn*:5 [Dig Out Sts]	• Port *nn*:5 [Dig Out Sts]

(1) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

22-Series I/O Option Module

Digital inputs can be 24V DC or 120V AC. Analog inputs can be configured for Voltage or Current mode.

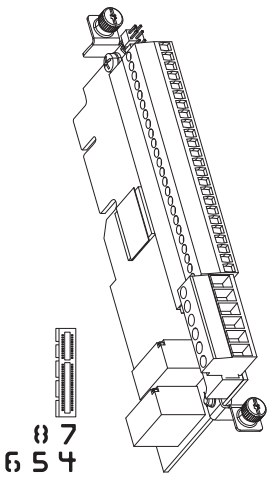
I/O Option Kits for 22-Series I/O Modules

Description	Cat. No.	Used with PowerFlex Drive	
		753/755	755TL/755TR
24V DC 22-Series I/O Module with 2 Analog In, 2 Analog Out, 6 Digital In, and 2 Relay Outputs	20-750-2262C-2R	X (1)	X
115V AC 22-Series I/O Module with 2 Analog In, 2 Analog Out, 6 Digital In, and 2 Relay Outputs	20-750-2262D-2R	X	X
24V DC 22-Series I/O Module with 2 Analog In, 2 Analog Out, 6 Digital In, 3 Digital Out, 1 Relay, and 2 Transistor Outputs	20-750-2263C-1R2T	X	X

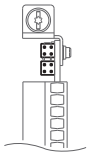
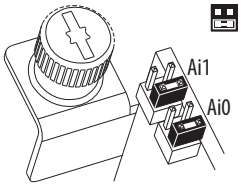
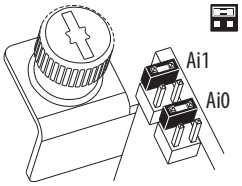
(1) For kits to be used with Integrated Motion on Ethernet/IP instructions, the option module can only be used in slot 7 of the PowerFlex 755 drive. It also requires PowerFlex 755 firmware version 12 and higher, and Studio 5000™ version 28 and higher.

ATTENTION: When used in an Integrated Motion on EtherNet/IP networks application for firmware, versions 12.xxx and later, the 22-Series I/O module must be installed only in slot (port) 7.

20-750-2262C-2R *(24 Volts DC)*
20-750-2263C-1R2T *(24 Volts DC)*
20-750-2262D-2R *(120 Volts AC)*



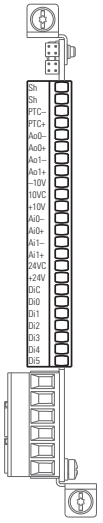
Input Mode Jumpers

Jumper Position	Voltage Mode	Current Mode
		

Terminal Designations for 22-Series I/O Option Modules

These tables list terminal designations for 22-Series I/O option modules.

TB1 Terminal Designations for 22-Series I/O Option Modules



Terminal	Name	Description	Related Parameter [5] [6]
Sh	Shield	Terminating point for wire shields when an EMC plate or conduit box is not installed.	–
Sh			
Ptc–	Motor PTC (–)	Motor protection device (Positive Temperature Coefficient).[2]	40 On port *nn*
Ptc+	Motor PTC (+)		
Ao0–	Analog out 0 (–)	Bipolar, ±10V, 11 bit, and sign, 2 kΩ minimum load. 4…20 mA, 11 bit, and sign, 400 Ω maximum load.	75 On port *nn*
Ao0+	Analog out 0 (+)		
Ao1–	Analog Out 1 (–)		85 On port *nn*
Ao1+	Analog Out 1 (+)		
–10V	–10V reference	2 kΩ minimum.	–
10VC	10V common	For (–) and (+) 10V references.	
+10V	+10V reference	2 kΩ minimum.	
Ai0–	Analog input 0 (–)	Isolated[3], bipolar, differential, 11 bit and sign. Voltage Mode: ±10V at 88 kΩ input impedance. Current Mode: 0…20 mA at 93 Ω input impedance.	50, 70 On port *nn*
Ai0+	Analog input 0 (+)		
Ai1–	Analog Input 1 (–)		60, 70 On port *nn*
Ai1+	Analog Input 1 (+)		
24VC	24V common	Drive supplied logic input power. 200 mA max per I/O module 600 mA max per drive	–
+24V	+24V DC		
Di C	Digital input common	Common for Digital inputs 0…5	–
Di 0	Digital input 0 [1]	24V DC (30V DC max) – Opto isolated High state: 20…24V DC 11.2 mA DC Low state: 0…5V DC 120V AC (132V AC max) 50/60 Hz[4] – Opto isolated High state: 100…132V AC Low state: 0…30V AC	1 On port *nn*
Di 1	Digital input 1 [1]		
Di 2	Digital input 2 [1]		
Di 3	Digital input 3 [1]		
Di 4	Digital input 4 [1]		
Di 5	Digital input 5 [1]		

(1) Digital Inputs are either 24V DC (2262C) or 115V AC (2262D) based on module catalog number. Verify that applied voltage is correct for I/O module.

(2) See HW Input PTC on page 20 for PTC data.

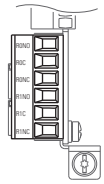
(3) Differential Isolation – External source must be maintained at less than 160V with respect to PE. Input provides high common mode immunity.

(4) For CE compliance, use shielded cable. Do not exceed cable length of 30 m (98.4 ft).

(5) I/O Module parameters also have a port designation.

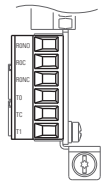
(6) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

TB2 Terminal Designations (Two Relay Outputs: 2R)

Relay Out	Terminal	Name	Description	Related Parameter (1)
	R0NO	Relay 0 N.O.	Relay normally open contact output: 240V AC, 24V DC, 2 A max General-purpose (inductive)/resistive Relay normally closed contact output: 240V AC, 24V DC, 2 A max Only resistive	10, 100, 101, 105, 106 On port *nn*
	R0C	Relay 0 Common		
	R0NC	Relay 0 N.C.		
	R1NO	Relay 1 N.O.		20, 110, 111, 115, 116 On port *nn*
	R1C	Relay 1 Common		
	R1NC	Relay 1 N.C.		

(1) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Table 6 - TB2 Terminal Designations (One Relay and Two Transistor Outputs: 1R2T)

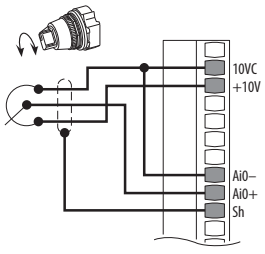
Relay Out	Terminal	Name	Description	Related Parameter(1)
	R0NO	Relay 0 N.O.	Relay normally open contact output: 240V AC, 24V DC, 2 A max General-purpose (inductive)/resistive Relay normally closed contact output: 240V AC, 24V DC, 2 A max Only resistive	10, 100, 101, 105, 106 On port *nn*
	R0C	Relay 0 Common		
	R0NC	Relay 0 N.C.		
	T0	Transistor output 0	Transistor output Rating:24V DC = 1 A max 24V DC = 0.4 A Max for UL applications Resistive	20 On port *nn*
	TC	Transistor output common		
	T1	Transistor output 1		30 On port *nn*

(1) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

22-Series I/O Option Module Wiring Examples

This section provides examples for how to wire the 22-Series I/O option modules.

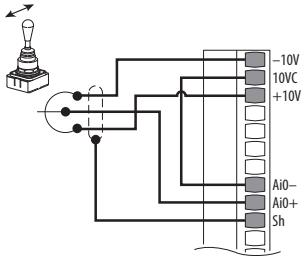
Potentiometer Unipolar Speed Reference (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	Set direction mode	• Port 0:308 [Direction Mode] = 0 'Unipolar'	• Port 10/11:930 [Direction Mode] = 0 'Unipolar'
	Set selection	• Port 0:545 [Spd Ref A Sel] = Port *nn*:50 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port nn:50 [Anlg In0 Value]
	Adjust scaling	• Port *nn*:51 [Anlg In0 Hi] = 10V • Port *nn*:52 [Anlg In0 Lo] = 0V • Port 0:547 [Spd Ref A AnlgHi] = 60 Hz • Port 0:548 [Spd Ref A AnlgLo] = 0 Hz	• Port nn:51 [Anlg In0 Hi] = 10 Volts • Port nn:52 [Anlg In0 Lo] = 0 Volts • Port 10/11:1802 [VRef A AnlgHi] = 60 Hz • Port 10/11:1803 [VRef A AnlgLo] = 0 Hz
	View results	• Port *nn*:50 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port nn:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

(1) 2 kΩ minimum

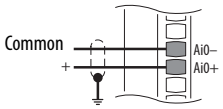
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Joystick Bipolar Speed Reference (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	• Set direction mode	• Port 0:308 [Direction Mode] = 1 'Bipolar'	• Port 10/11:930 [Direction Mode] = 1 'Bipolar'
	• Set selection	• Port 0:545 [Spd Ref A Sel] = Port *nn*:50 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port *nn*:50 [Anlg In0 Value]
	• Adjust scaling	• Port *nn*:51 [Anlg In0 Hi] = +10V • Port *nn*:52 [Anlg In0 Lo] = –10V • Port 0:547 [Spd Ref A AnlgHi] = +60 Hz • Port 0:548 [Spd Ref A AnlgLo] = – 60 Hz	• Port *nn*:51 [Anlg In0 Hi] = +10V • Port *nn*:52 [Anlg In0 Lo] = –10V • Port 10/11:1802 [VRef A AnlgHi] = +60 Hz • Port 10/11:1803 [VRef A AnlgLo] = –60 Hz
	• View results	• Port *nn*:50 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port *nn*:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

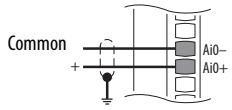
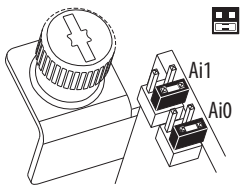
(1) ±10V Input
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Analog Input Bipolar Speed Reference (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
	Set direction mode	• Port 0:308 [Direction Mode] = 1 'Bipolar'	• Port 10/11:930 [Direction Mode] = 1 'Bipolar'
	Set selection	• Port 0:545 [Spd Ref A Sel] = Port *nn*:50 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port *nn*:50 [Anlg In0 Value]
	Adjust scaling	• Port *nn*:51 [Anlg In0 Hi] = +10V • Port *nn*:52 [Anlg In0 Lo] = –10V • Port 0:547 [Spd Ref A AnlgHi] = +60 Hz • Port 0:548 [Spd Ref A AnlgLo] = –60 Hz	• Port *nn*:51 [Anlg In0 Hi] = +10V • Port *nn*:52 [Anlg In0 Lo] = –10V • Port 10/11:1802 [VRef A AnlgHi] = +60 Hz • Port 10/11:1803 [VRef A AnlgLo] = –60 Hz
	View results	• Port *nn*:50 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port *nn*:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

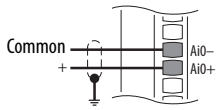
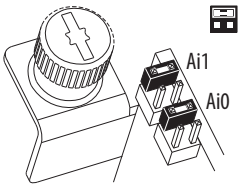
(1) ±10V Input
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Analog Voltage Input Unipolar Speed Reference (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Option Module 	Set direction mode	• Port 0:308 [Direction Mode] = 0 'Unipolar'	• Port 10/11:930 [Direction Mode] = 0 'Unipolar'
	Set selection	• Port 0:545 [Spd Ref A Sel] = Port *nn*:50 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port *nn*:50 [Anlg In0 Value]
	Adjust scaling	• Port *nn*:51 [Anlg In1 Hi] = 10V • Port *nn*:52 [Anlg In1 Lo] = 0V • Port 0:547 [Spd Ref A AnlgHi] = 60 Hz • Port 0:548 [Spd Ref A AnlgLo] = 0 Hz	• Port *nn*:51 [Anlg In1 Hi] = 10 Volts • Port *nn*:52 [Anlg In1 Lo] = 0 Volts • Port 10/11:1802 [VRef A AnlgHi] = 60 Hz • Port 10/11:1803 [VRef A AnlgLo] = 0 Hz
	View results	• Port *nn*:50 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port *nn*:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

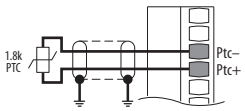
(1) 0V to 10V Input
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Analog Current Input Unipolar Speed Reference (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1 	Set direction mode	• Port 0:308 [Direction Mode] = 0 'Unipolar'	• Port 10/11:930 [Direction Mode] = 0 'Unipolar'
	Set selection	• Port 0:545 [Spd Ref A Sel] = Port *nn*:50 [Anlg In0 Value]	• Port 10/11:1800 [VRef A Sel] = Port *nn*:50 [Anlg In0 Value]
	Adjust scaling	• Port *nn*:51 [Anlg In0 Hi] = 20 mA • Port *nn*:52 [Anlg In0 Lo] = 0 mA • Port 0:547 [Spd Ref A AnlgHi] = 60 Hz • Port 0:548 [Spd Ref A AnlgLo] = 0 Hz	• Port *nn*:51 [Anlg In0 Hi] = 20 mA • Port *nn*:52 [Anlg In0 Lo] = 0 mA • Port 10/11:1802 [VRef A AnlgHi] = 60 Hz • Port 10/11:1803 [VRef A AnlgLo] = 0 Hz
	View results	• Port *nn*:50 [Anlg In0 Value] • Port 0:592 [Selected Spd Ref]	• Port *nn*:50 [Anlg In0 Value] • Port 10/11:1892 [VRef Selected]

(1) 0…20 mA Input
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

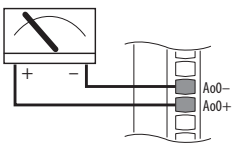
HW Input PTC (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	Configuration	• Port *nn*:40 [PTC Cfg] = 0 'Ignore', 1 'Alarm', 2 'Flt Minor', 3 'Flt CoastStop', 4 'Flt RampStop', or 5 'Flt CL Stop'	• Port *nn*:40 [PTC Cfg] = 0 'Ignore,' 1 'Alarm,' 2 'Flt Minor,' 3 'Flt CoastStop,' 4 'Flt RampStop,' or 5 'Flt CL Stop'
	View results	• Port *nn*:41 [PTC Sts] • Port *nn*:42 [PTC Raw Value]	• Port *nn*:41 [PTC Sts] • Port *nn*:42 [PTC Raw Value]

ATTENTION: To avoid an electric shock hazard, the connection of the motor temperature sensor requires double or reinforced insulation between motor live parts and the PTC.

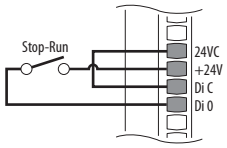
(1) Standard = DIN 44082
PTC Nominal = 1.8 kΩ
PTC Trip = 3.1 kΩ
PTC Reset = 2.2 kΩ
Short Circuit Trip = 300 Ω
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Analog Voltage Output (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	Configuration	• Port *nn*:70 [Anlg Out Type], bit 0 = 0	• Port *nn*:70 [Anlg Out Type], bit 0 = 0
	Set selection	• Port *nn*:75 [Anlg Out0 Sel] = Port 0:3 [Mtr Vel Fdbk]	• Port *nn*:75 [Anlg Out0 Sel] = Port 10/11:1044 [Motor Vel Fb]
	Adjust scaling	• Port *nn*:78 [Anlg Out0 DataHi] = 60 Hz • Port *nn*:79 [Anlg Out0 DataLo] = 0 Hz • Port *nn*:80 [Anlg Out0 Hi] =10V/20 mA • Port *nn*:81 [Anlg Out0 Lo] = 0V/0 mA	• Port *nn*:78 [Anlg Out0 DataHi] = 60 Hz • Port *nn*:79 [Anlg Out0 DataLo] = 0 Hz • Port *nn*:80 [Anlg Out0 Hi] =10V/20 mA • Port *nn*:81 [Anlg Out0 Lo] = 0V/0 mA
	View results	• Port *nn*:77 [Anlg Out0 Data] • Port *nn*:82 [Anlg Out0 Val]	• Port *nn*:77 [Anlg Out0 Data] • Port *nn*:82 [Anlg Out0 Val]

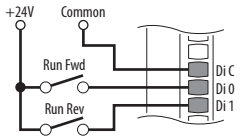
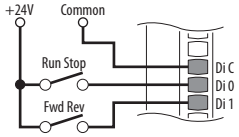
(1) ±10V, 0…20 mA Bipolar
+10V Unipolar
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

2-Wire Control Non-reversing (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	Set direction mode	• Port 0:308 [Direction Mode] = 2 'Rev Disable'	• Port 10/11:930 [Direction Mode] = 2 'Rev Disable'
	Set selection	• Port 0:163 [DI Run] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0	• Port 0:120 [DI M Run] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

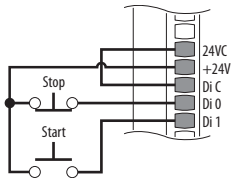
(1) 24V DC internal supply
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

2-Wire Control Reversing (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	Set direction mode	• Port 0:308 [Direction Mode] = 0 'Unipolar'	• Port 10/11:930 [Direction Mode] = 0 'Unipolar'
	Set selection	• Port 0:164 [DI Run Forward] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:165 [DI Run Reverse] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	—
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]
 22-Series I/O Module TB1	Set selection	—	• Port 0:120 [DI M Run] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:130 [DI Fwd Reverse] = Port *nn*:1 [Dig In Sts], bit 0 = Input 1

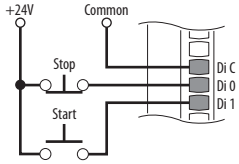
(1) External 24 volt supply
20-750-2262C-2R
20-750-2263C-1R2T
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

3-Wire Control (Internal Supply) (1)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	Set selection	• Port 0:158 [DI Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:161 [DI Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	• Port 0:108 [DI M Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:117 [DI M Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

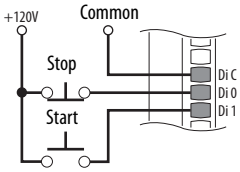
(1) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

3-Wire Control (External 24V Supply) (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	Set selection	• Port 0:158 [DI Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:161 [DI Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	• Port 0:108 [DI M Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:117 [DI M Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

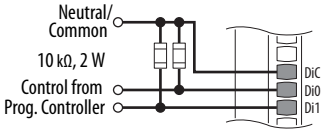
(1) 20-750-2262C-2R
20-750-2263C-1R2T
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

3-Wire Control (External 120V Supply) (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	Set selection	• Port 0:158 [DI Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:161 [DI Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	• Port 0:108 [DI M Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:117 [DI M Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

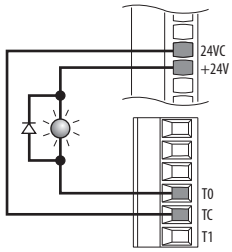
(1) 20-750-2262D-2R
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Digital Input (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1	Set selection	• Port 0:158 [DI Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:161 [DI Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1	• Port 0:108 [DI M Stop] = Port *nn*:1 [Dig In Sts], bit 0 = Input 0 • Port 0:117 [DI M Start] = Port *nn*:1 [Dig In Sts], bit 1 = Input 1
	View results	• Port *nn*:1 [Dig In Sts] • Port 0:935 [Drive Status 1]	• Port *nn*:1 [Dig In Sts] • Port 10/11:354 [Motor Side Sts 1]

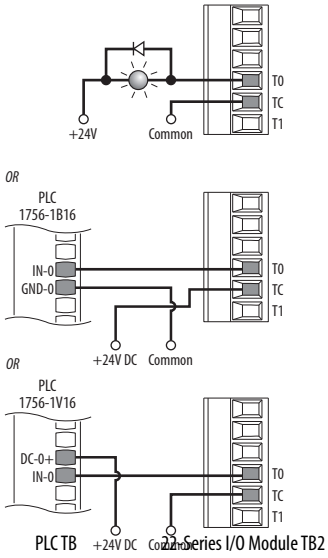
(1) PLC Output Module
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Digital Output (Internal Supply) (1) (2)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB1 22-Series I/O Module TB2	Set selection	• Port *nn*:20 [T00 Sel] = Port 0:935 [Drive Status 1], bit 7 = Faulted	• Port *nn*:20 [T00 Sel] = Port 10/11:354 [Motor Side Sts 1], bit 7 = Faulted
	View results	• Port *nn*:5 [Dig Out Sts]	• Port *nn*:5 [Dig Out Sts]

(1) 20-750-2263C-1R2T
(2) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Digital Output (External Supply) (1)

Connection Example	Required Parameter Changes	PowerFlex 753 and PowerFlex 755	PowerFlex TotalFORCE Drive Products
 22-Series I/O Module TB2	Set selection	• Port *nn*:20 [T00 Sel] = Port 0:935 [Drive Status 1], bit 7 = Faulted	• Port *nn*:20 [T00 Sel] = Port 10/11:354 [Motor Side Sts 1], bit 7 = Faulted
	View results	• Port *nn*:5 [Dig Out Sts]	• Port *nn*:5 [Dig Out Sts]

(1) In this table, *nn* is a variable to denote that this parameter is for whichever port you are using.

Auxiliary Power Supply Option Module (20-750-APS)

This section provides details for the auxiliary power supply option module, number 20-750-APS.

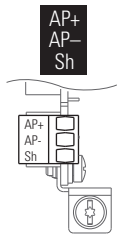
Auxiliary Power Supply Option Kit

Description		Frame Size	Cat. No.	Used with PowerFlex Drive		
				753	755	755T
Auxiliary Power Supply	24V Aux Power Supply	1…7	20-750-APS	X	X(1)	Not used(1)

(1) PowerFlex 755 Frame Size 8 and above and PowerFlex 755T drives have an auxiliary power supply that is built into the drive.

Terminal Designations

Table 7 - TB1 Terminal Designations for the Auxiliary Power Supply Option Module (20-750-APS).



Terminal	Name	Description
AP+	+24V Auxiliary Power	Connections for customer supplied power supply: 24V DC ±10%, 3 A, PELV or SELV.
AP–	Auxiliary Power Common	
Sh	Shield	Terminating point for wire shields when an EMC plate or conduit box is not installed.

IMPORTANT The auxiliary power supply option module can be installed in any option slot (port). Due to its size, the module extends over and blocks the adjacent port. Therefore, installation in slot (port) 8 is recommended.

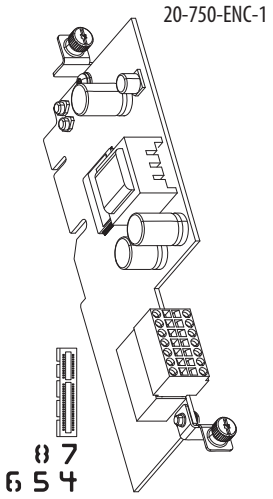
Connector Cable

A connector cable is provided with auxiliary power supply option modules for use in PowerFlex 753 and PowerFlex 755, Frame 1 drives. The cable is used to connect the module to the backplane when installed on the upper control pod brackets.

IMPORTANT The cable is not used with PowerFlex 755 Frame 2 and larger drives.

Single Incremental Encoder Module

This section provides details for the single incremental encoder option module.



Single Incremental Encoder Feedback Option

Description	Cat. No.	Used with PowerFlex Drive	
		753/755	755TL/755TR
Incremental Encoder	20-750-ENC-1	X(1)	X

(1) Homing and registration functions are not supported when using this device with Studio 5000 Logix Designer embedded motion instructions. To use these functions, the Universal Feedback Board (20-750-UFB-1) must be used.

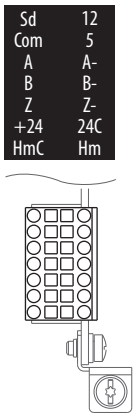
Table 8 - Single Incremental Encoder Specifications

Consideration	Description
Input	Differential or Single Ended operation, Constant Current Sink operation, approx 10 mA
	5V DC min to 15V DC max sourcing 10 mA Minimum high state voltage of 3.5V DC Maximum low state voltage of 0.4V DC
Maximum Cable Length	30 m (100 ft) at 5V, 183 m (600 ft) at 12V
Maximum Input Frequency	250 kHz

Terminal Designations for Single Incremental Encoder Modules

Table 9 lists the terminal designations for the Singe Incremental Encoder module.

Table 9 - TB1 Terminal Designations

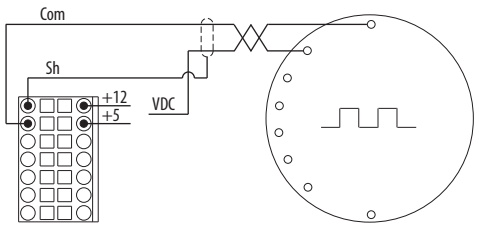
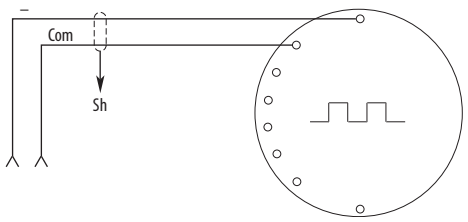
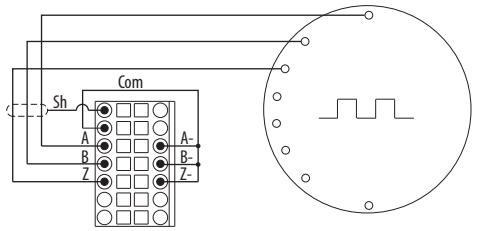


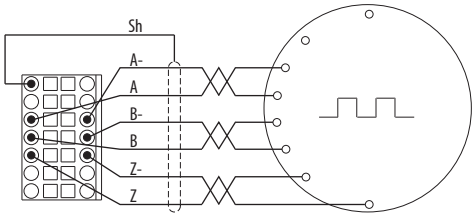
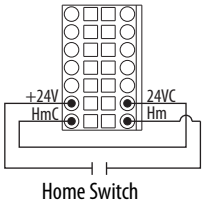
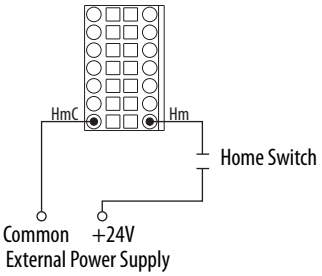
Terminal	Name	Description
Sd	Shield	Terminating point for wire shields when an EMC plate or conduit box is not installed.
12	+12V DC Power	Power supply for encoder 250 mA.
Com	Common	+12V and +5V Common.
5	+5V DC Power	Power supply for encoder 250 mA.
A	Encoder A	Single channel or quadrature A input.
A-	Encoder A (NOT)	
B	Encoder B	Quadrature B input.
B-	Encoder B (NOT)	
Z	Encoder Z	Pulse or marker input.
Z-	Encoder Z (NOT)	
+24	+24V	Power source for homing input.
24C	Common	
HmC	Homing Input Common	Captures the AB edge counter.
Hm	Homing Input	

Wiring Examples for Single Encoder Module

Table 10 shows wiring examples using the Single Encoder Module.

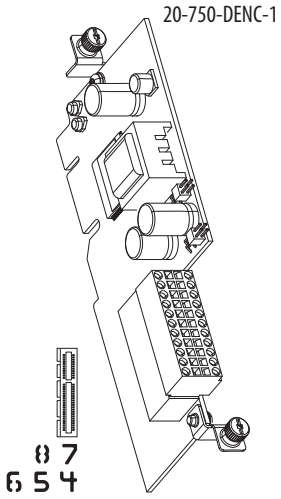
Table 10 - Single Incremental Encoder Sample Wiring

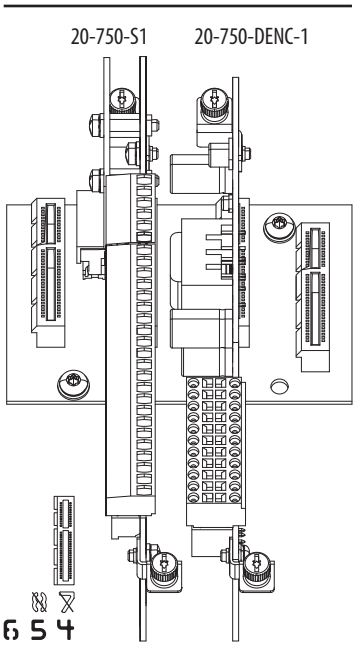
I/O	Connection Example
Encoder Power by Drive 12V DC, 250 mA OR 5V DC, 250 mA	
Separately Powered Encoder	
Encoder Signal – Single-Ended, Dual Channel	

I/O	Connection Example
Encoder Signal – Differential, Dual Channel	
Homing Signal – Internal Drive Power	
Homing Signal – External Power	

Dual Incremental Encoder Option Module

This section provides details for the dual incremental encoder option module.





See the **Important** statements on this page.

Dual Incremental Encoder Feedback Option

Description	Cat. No.	Used with PowerFlex Drive	
		753/755	755TL/755TR
Dual Incremental Encoder	20-750-DENC-1	X(1)	X

(1) Homing and registration functions are not supported when using this device with Studio 5000 Logix Designer embedded motion instructions. To use these functions, the Universal Feedback Board (20-750-UFB-1) must be used.

Table 11 - Dual Incremental Encoder Jumper Settings

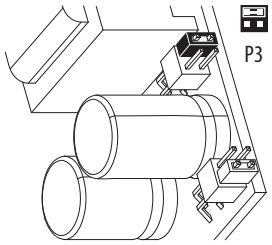
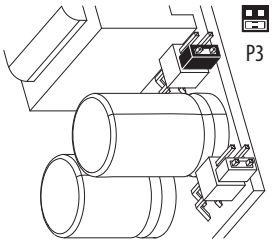
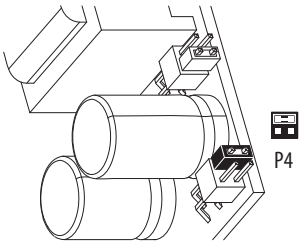
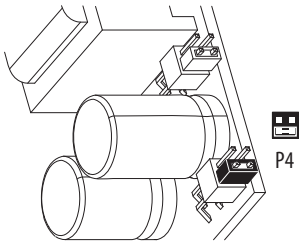
Jumper	Enabled Position	Storage Position
P3 - Safety Jumper Enables use with speed monitoring safety option (20-750-S1).		
P4 -12V Jumper Enables use with 12V supply in 'Enabled' position and 5V supply in 'Storage' position.		

Table 12 - Dual Incremental Encoder Specifications

Consideration	Description
Input	Differential or Single Ended operation, Constant Current Sink operation, approximately 10 mA
	5V DC minimum to 15V DC maximum sourcing 10 mA Minimum high state voltage of 3.5V DC Maximum low state voltage of 0.4V DC
Maximum Cable Length	30 m (100 ft) at 5V, 183 m (600 ft) at 12V
Maximum Input Frequency	250 kHz

IMPORTANT The 20-750-DENC-1 card can function in slot 7 or 8. However, if inserted in these slots the HIM cradle cannot shut all the way.

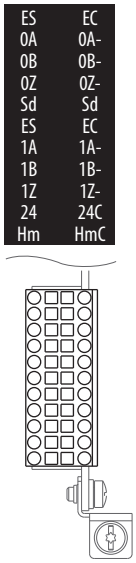
IMPORTANT PowerFlex 753 drives and PowerFlex 755 drives support the use of the Dual Incremental Encoder option module when used with the Safe Speed Monitor option module (catalog number 20-750-S1).

IMPORTANT When used with the Safe Speed Monitor option, both modules must be installed on the same backplane using slots (ports) 4, 5, or 6.

Terminal Designations for the Dual Incremental Encoder

Table 13 lists the terminal designations for the Dual Incremental Encoder.

Table 13 - Dual Incremental Encoder Terminal Designations

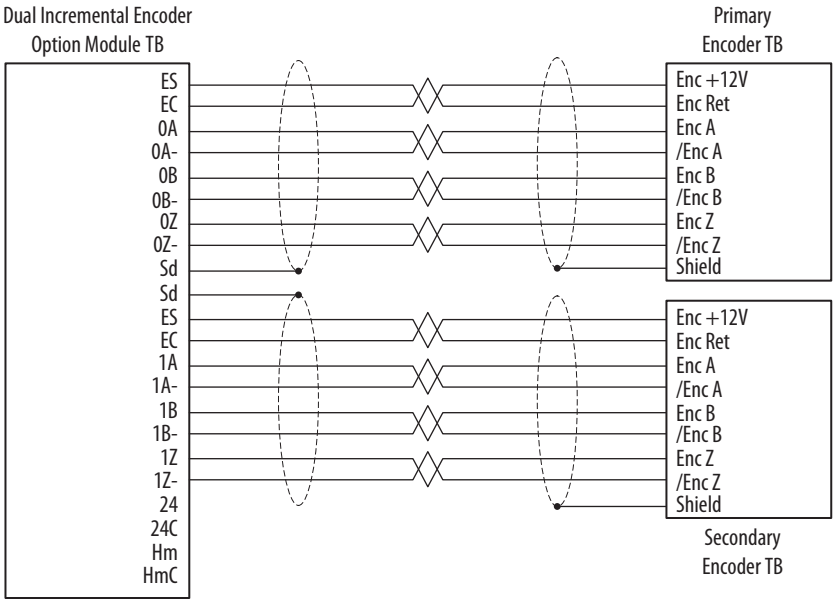


Terminal	Name	Description
ES	+12V or +5V DC Power	Power supply for Encoder 0, 250 mA.
EC	Common	+12V and +5V Encoder 0, common
0A	Encoder 0: A	Single channel or quadrature A input.
0A-	Encoder 0: A (NOT)	
0B	Encoder 0: B	Quadrature B input.
0B-	Encoder 0: B (NOT)	
0Z	Encoder 0: Z	Pulse or marker input.
0Z-	Encoder 0: Z (NOT)	
Sd	Encoder Shield	Terminating point for wire shields when an EMC plate or conduit box is not installed.
Sd	Encoder Shield	
ES	+12V DCor +5V DC Power	Power supply for Encoder 1, 250 mA.
EC	Common	+12V and +5V Encoder 1, common.
1A	Encoder 1: A	Single channel or quadrature A input.
1A-	Encoder 1: A (NOT)	
1B	Encoder 1: B	Quadrature B input.
1B-	Encoder 1: B (NOT)	
1Z	Encoder 1: Z	Pulse or marker input.
1Z-	Encoder 1: Z (NOT)	
24	+24V	Power source for homing input.
24C	Common	
Hm	Homing Input	Captures the AB edge counter.
HmC	Homing Input Common	

Wiring Examples for Dual Incremental Encoder Option Module Connections

This section provides a wiring example for the dual incremental encoder option module.

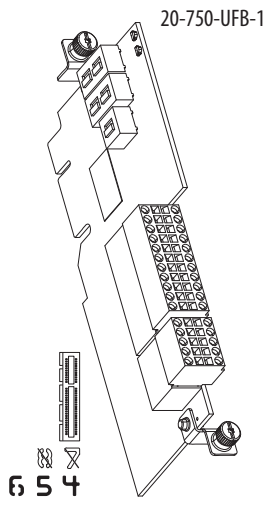
Differential Dual Channel with Z Channel



Universal Feedback Option Module

This section provides details for the universal feedback option module (only for PowerFlex 755 drives).

IMPORTANT Only PowerFlex 755 drives support the use of the Universal Feedback option module when used with the Safe Speed Monitor option module (catalog number 20-750-S1).



Universal Feedback Option Module

Description	Cat. No.	Used with PowerFlex Drive	
		753/755	755TL/755TR
Universal Feedback (includes Stegmann, Heidenhain, SSI, Biss, 5V Incremental)	20-750-UFB-1	X (1)	X

(1) Only for PowerFlex 755 drives.

Table 14 - Universal Feedback Incremental AquadB Encoder

Consideration	Description
Input	Differential or single-ended operation, constant current sink operation, approximately 10 mA
	3.5V DC minimum to 7.5V DC maximum sourcing 10 mA Minimum high state voltage of 3.5V DC Maximum low state voltage of 0.4V DC
Maximum Cable Length	30 m (100 ft) at 5V
Maximum Input Frequency	250 kHz

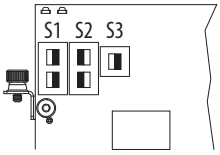
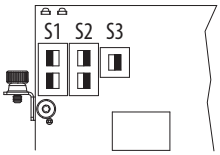
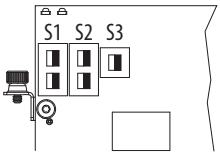
Table 15 - Supported Encoders

Consideration	Heidenhain (EnDat)	SSI	Stegmann (Hiperface)	BiSS	Stahl (Linear)	Temposonics (Linear)
Encoder Voltage Supply	5V at 250 mA	10.5V at 250 mA	10.5V at 250 mA	10.5V at 250 mA	External Supplied 24V	External Supplied 24V
High-resolution Signal	Sine/Cosine 1V P-P	Sine/Cosine 1V P-P	Sine/Cosine 1V P-P	Sine/Cosine 1V P-P	—	—
Maximum Cable length	100 m (328.1 ft)	100 m (328.1 ft)	90 m (295.3 ft)	100 m (328.1 ft)	100 m (328.1 ft)	100 m (328.1 ft)
Update Rate(1)	102.4 µs	102.4 µs	102.4 µs	102.4 µs	0.5/1.0/1.5/2.0 ms	0.5/1.0/1.5/2.0 ms
Maximum Input Frequency	163.8 kHz	163.8 kHz	163.8 kHz	163.8 kHz	—	—

(1) The Universal Feedback encoder option module acquires the position with the update rates displayed.

IMPORTANT Only PowerFlex 755 drives support the use of the Universal Feedback option module when used with the Safe Speed Monitor option module (catalog number 20-750-S1).

Table 16 - Universal Feedback Option Module DIP Switch Settings – Safety Application

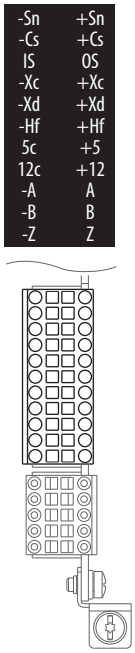
Safety Channel Selection	DIP Switch Settings (1)
Primary Safety Channel To connect feedback signals to the primary safety channel, set: S1 sliders to ON S2 sliders to OFF S3 slider to ON	
Secondary Safety Channel To connect feedback signals to the secondary safety channel, set: S1 sliders to OFF S2 sliders to ON S3 slider to ON	
Primary and Secondary Safety Channels To connect feedback signals to both the primary and secondary safety channels, set: S1 sliders to ON S2 sliders to ON S3 slider to ON	

(1) DIP switches only function when safety channels are used.

Terminal Designations for Universal Feedback Option Module

Table 17 and Table 18 list the terminal designations for TB1 and TB2 of the Universal Feedback Option module.

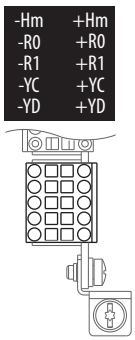
Table 17 - TB1 Terminal Designations



Terminal	Name	Description
–Sn	Sine (–)	Positive and negative terminals for Sine and Cosine signals. For use with 5V incremental encoders only.
+Sn	Sine (+)	
–Cs	Cosine (–)	
+Cs	Cosine (+)	
Is	Inner Shield	Heidenhain inner shield terminal.
Os	Outer Shield	Cable shield terminal.
–Xc	Channel X Clock (–)	Negative clock terminal (channel X).
+Xc	Channel X Clock (+)	Positive clock terminal (channel X).
–Xd	Channel X Data (–)	Negative data terminal (channel X).
+Xd	Channel X Data (+)	Positive data terminal (channel X).
–Hf	Heidenhain Supply Feedback (–)	For incremental feedback applications, tie terminal –Hf to 5c and terminal +Hf to +5 for proper voltage regulation.
+Hf	Heidenhain Supply Feedback (+)	
5c	Common	+5V common.
+5	+5 Volt DC Power	Power supply for encoder 250 mA.
12c	Common	+12V common.
+12	+12V DC Power	Power supply for encoder (10.5V at 250 mA).
–A	Encoder A (NOT)	Single channel or quadrature A input or encoder output.(1)
A	Encoder A	
–B	Encoder B (NOT)	Quadrature B input or encoder output.(1)
B	Encoder B	
–Z	Encoder Z (NOT)	Pulse or marker input or encoder output.(1)
Z	Encoder Z	

(1) Inputs support 5V incremental encoders only. The encoder outputs differential voltage is 3.3V.

Table 18 - TB2 Terminal Designations



Terminal	Name	Description
–Hm	Home Input (–)	12V DC at 9 mA to 24V DC at 40 mA.
+Hm	Home Input (+)	
–R0	Registration Input 0 (–)	Positive and negative encoder registration terminals. 12V DC at 9 mA to 24V DC at 40 mA.
+R0	Registration Input 0 (+)	
–R1	Registration Input 1 (–)	
+R1	Registration Input 1 (+)	
–Yc	Channel Y Clock (–)	Negative clock terminal (channel Y).
+Yc	Channel Y Clock (+)	Positive clock terminal (channel Y).
–Yd	Channel Y Data (–)	Negative data terminal (channel Y).
+Yd	Channel Y Data (+)	Positive data terminal (channel Y).

IMPORTANT Only one linear feedback device can be connected to the option module. Wire the device to either channel X on TB1, or channel Y on TB2.

Motor Feedback Wiring

Motor Power Cables

For detailed information on 2090-Series flying lead motor cables, see the Kinetix® Motion Accessories Specifications Technical Data, publication GMC-TD004.

Feedback Device Resolution

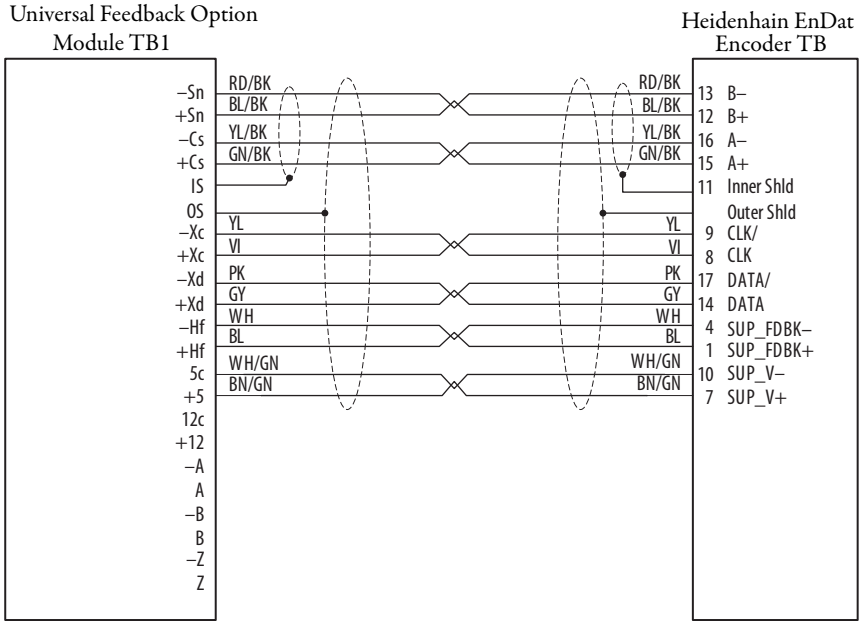
When using a PowerFlex 755 drive to control a permanent magnet motor, the motor feedback device must have a resolution so that the number of pulses per revolution (PPR) is an exponent of 2.

For example: 512, 1024, 2048, 4096, 8192...524288, 1048576...

Motor Feedback Wiring Examples

This section includes motor, feedback device, and cable wiring examples.

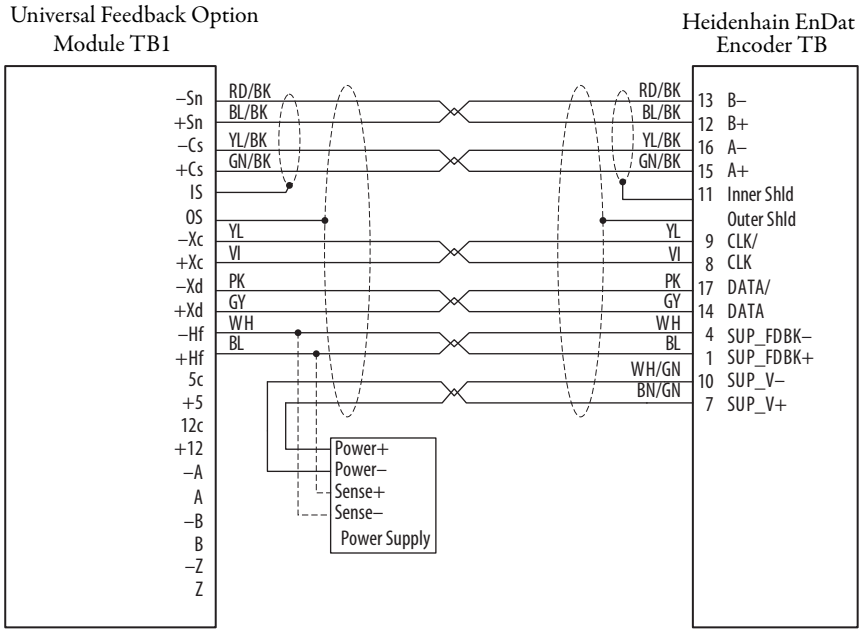
Heidenhain EnDat Angle Encoder with Internal Power Supply



Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 1 'EnDat SC'.

IMPORTANT See the installation instructions that are supplied with encoder for additional information.

Heidenhain EnDat Angle Encoder with External Power Supply

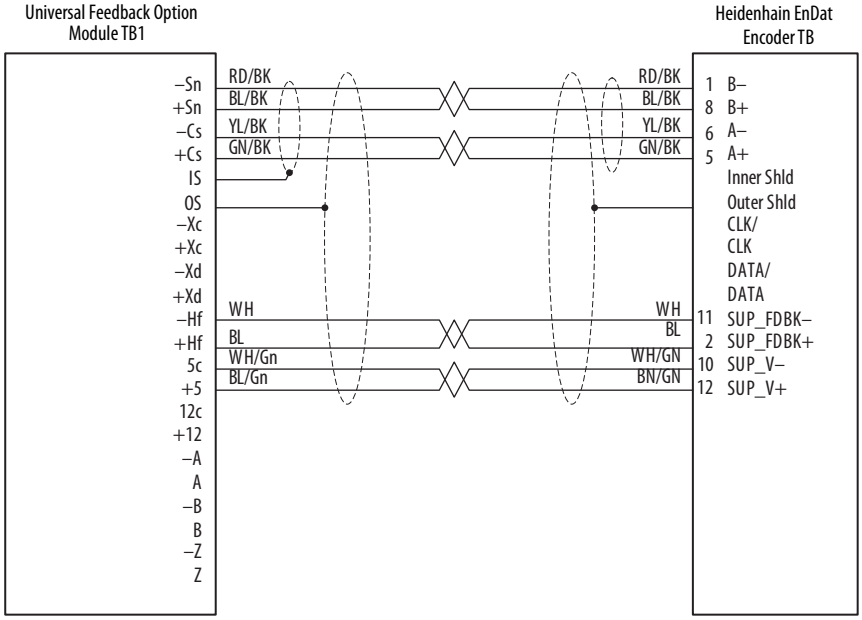


Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 1 'EnDat SC'.

IMPORTANT See the installation instructions that are supplied with encoder for additional information. The external power supply must be 3.6V…5.25V, maximum 350 mA.

TB1-14 (Power+) and TB1-13 (Power–) must not be connected to the encoder. The brown/green and white/green conductors must be connected to the external power supply. If the external power supply does not have sense connections, the supply feedback (sense) connection is still made from the encoder to the universal board (TB1-11, 12).

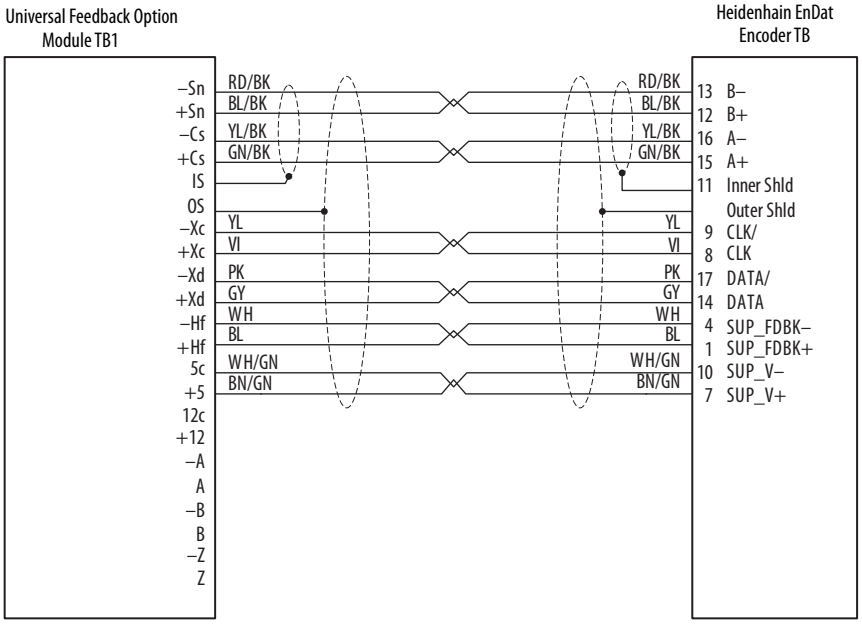
Heidenhain Non-EnDat Rotary Encoder with Internal Power Supply



Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 11 'SinCos Only'.

IMPORTANT See the installation instructions that are supplied with encoder for additional information.

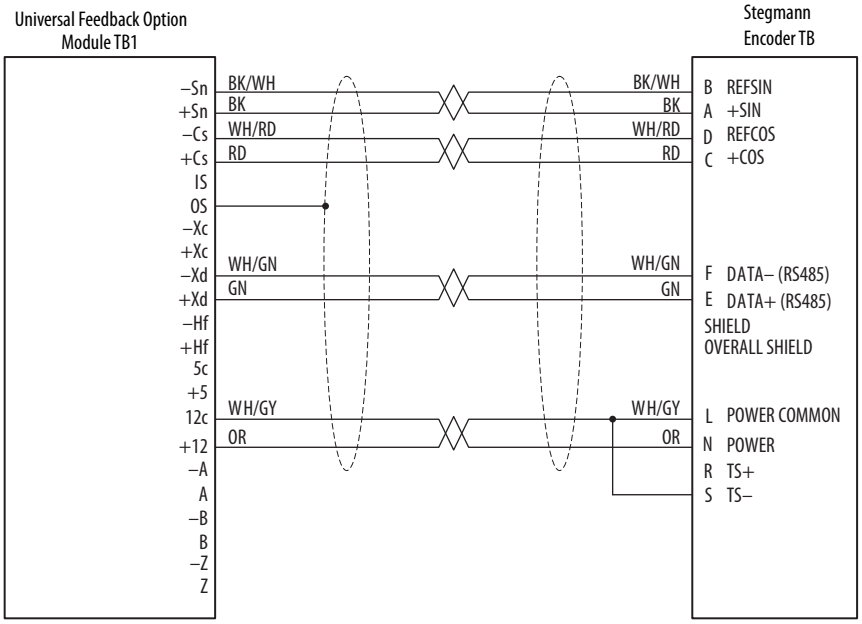
Heidenhain EnDat Rotary Encoder (ECN 412 EnDat01) with Internal Power Supply



Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 1 'EnDat SC'.

IMPORTANT See the installation instructions that are supplied with encoder for additional information.

460V MP-Series™, HPK-Series, or Allen-Bradley® 1326AB-Series Motor and a Stegmann Rotary or Rotary Encoder Connected With a 2090-CFBM7DF-CEAAXX (Non-flex) or -CEAFXX (Flex)

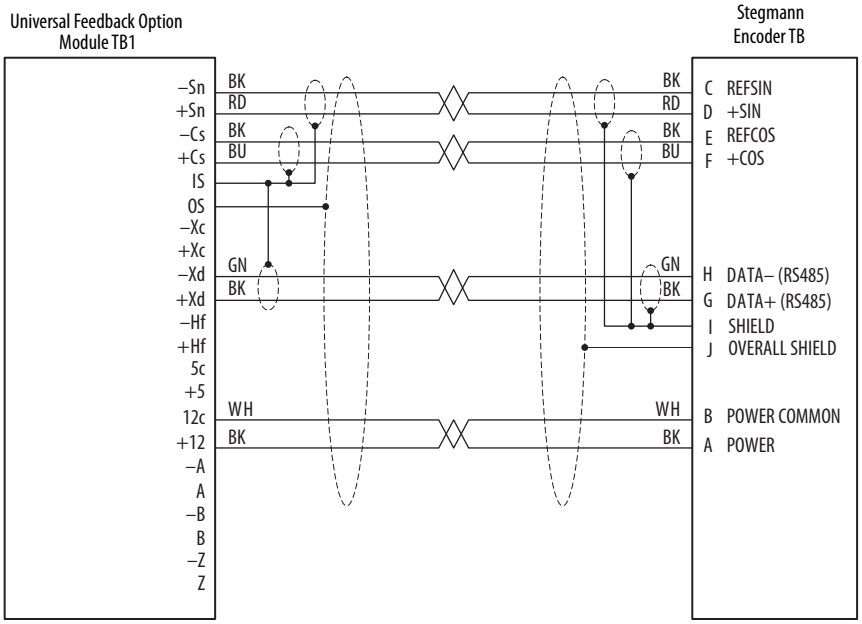


Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 2 'Hiperface SC'.

IMPORTANT Do not use 120 volts with the motor thermostat.

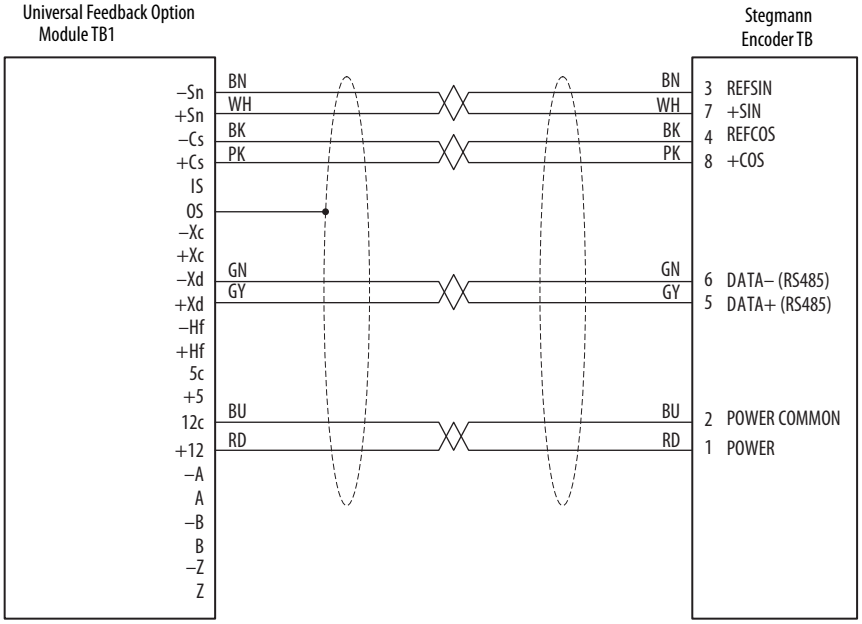
IMPORTANT The Thermal Switch cannot be accessed using 2090-XXNFMP-SXX or 2090-CFBM7XX series cables.

Stegmann Rotary Encoder Connected With a 1326-CECU-XXL-XXX Cable



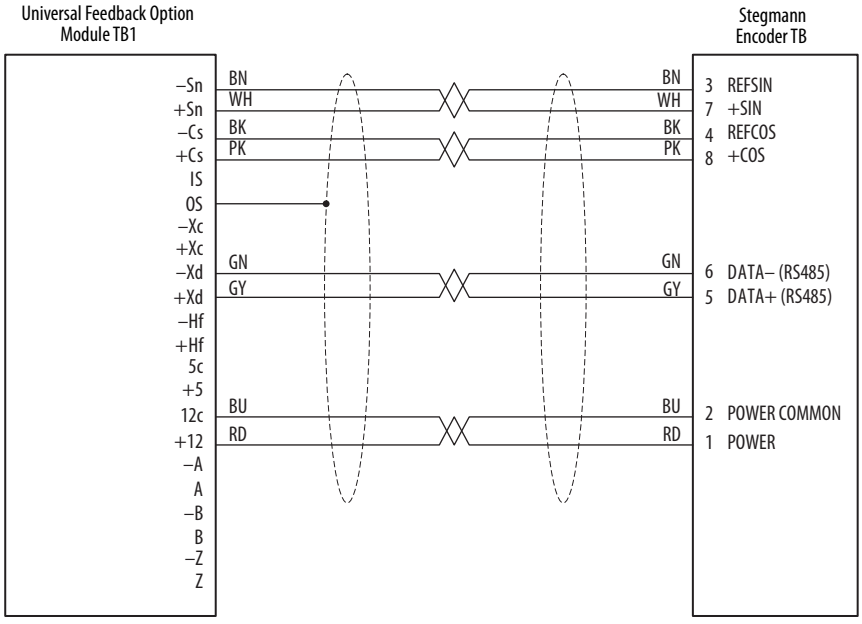
Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 2 'Hiperface SC'.

Stegmann Rotary Encoder Connected With a Pre-attached, Shielded, Twisted-pair Cable



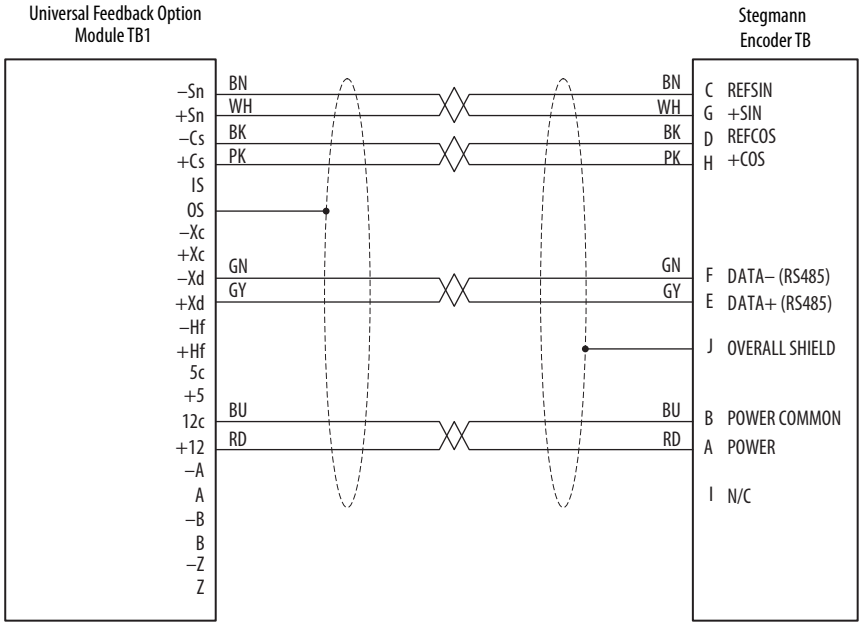
Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 2 'Hiperface SC'.

Stegmann Rotary Encoder Connected With a Shielded, Twisted-pair Cable with an 8-pin Berg Style Connector



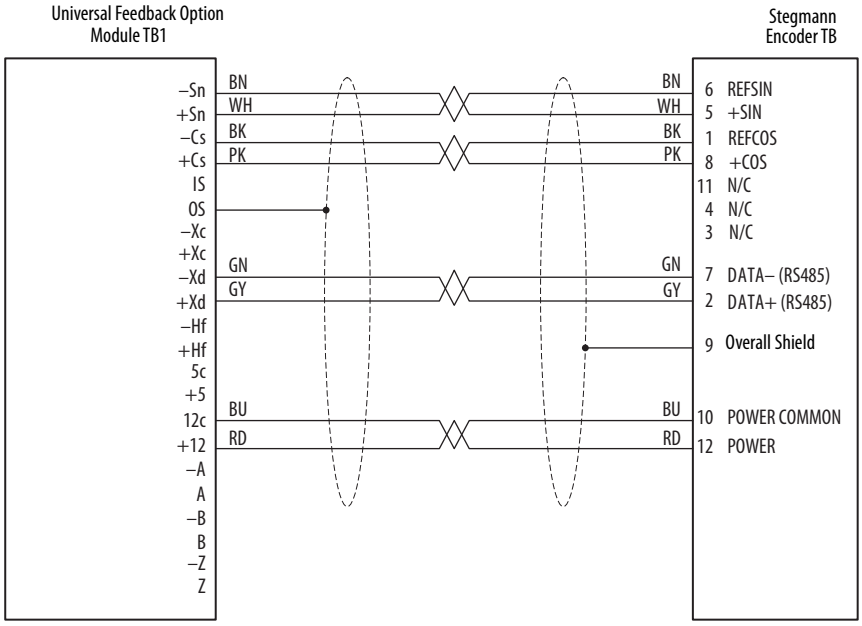
Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 2 'Hiperface SC'.

Stegmann Rotary Encoder Connected With a Shielded, Twisted-pair Cable with a 10-pin MS-Style Connector



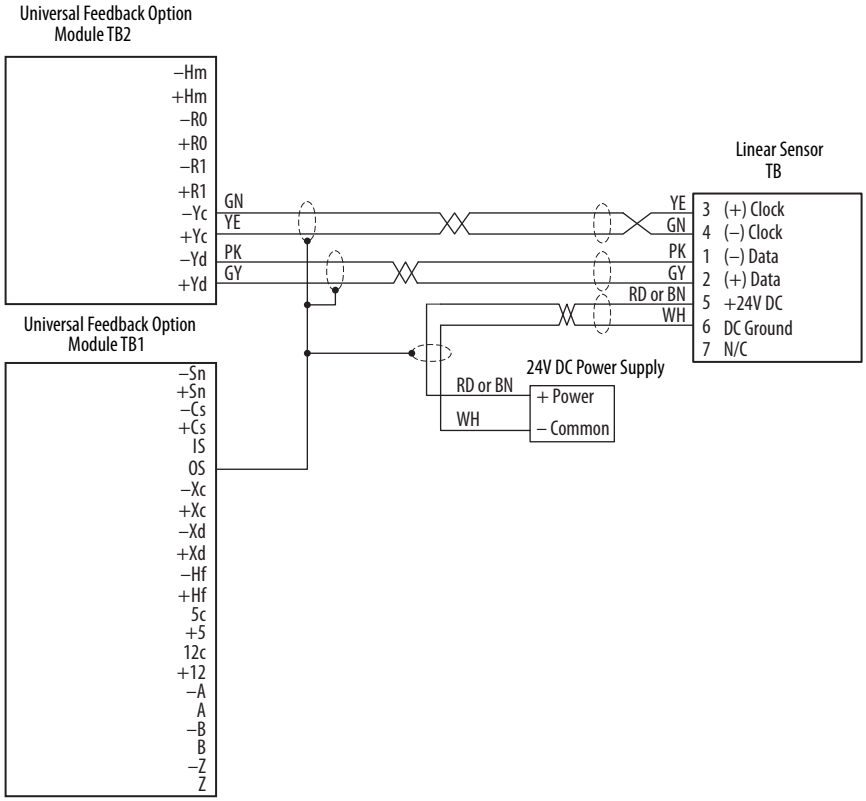
Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 2 'Hiperface SC'.

Stegmann Rotary Encoder Connected With a Shielded, Twisted-pair Cable with a 12-pin DIN Style Connector



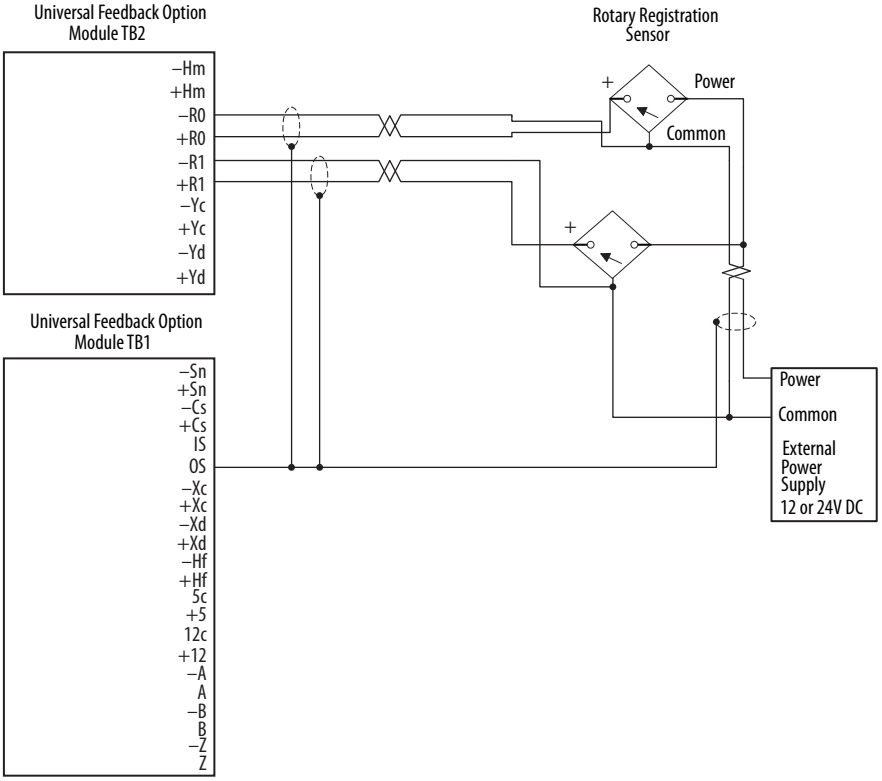
Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 2 'Hiperface SC'.

Linear Sensor with MDI RG Connector or P Integral Cable



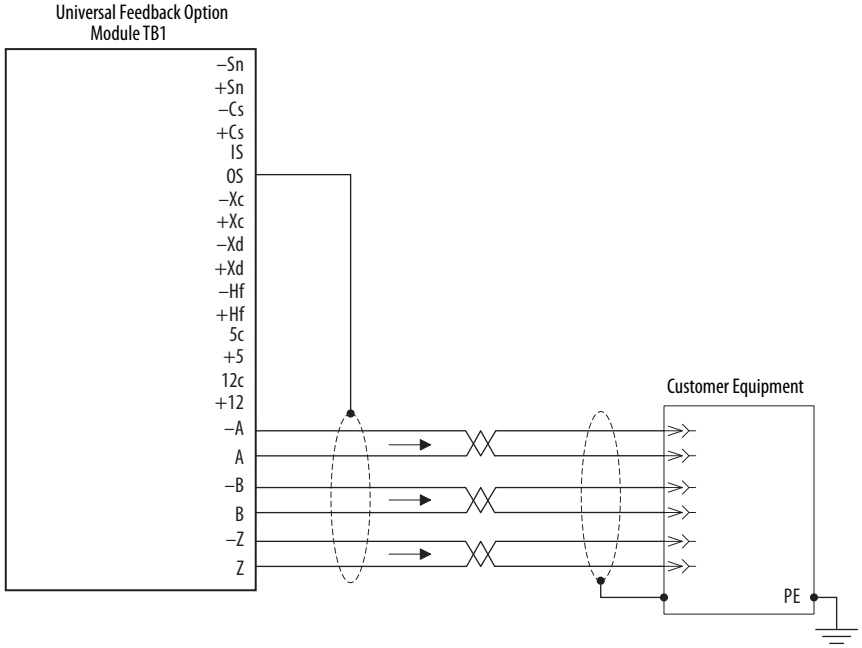
Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 17 'LinStahl ChY' or 19 'LinSSI ChY'.

Registration Sensor



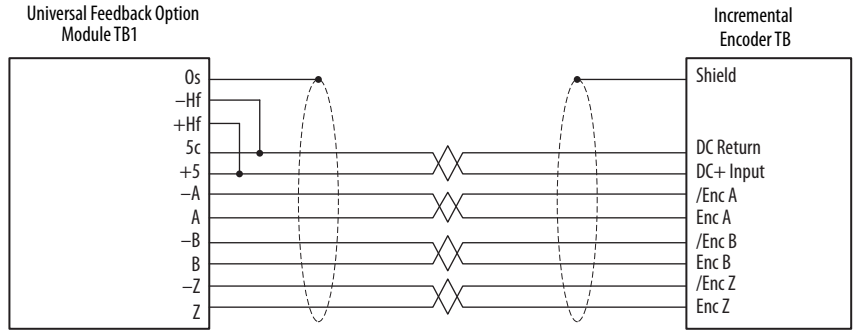
See Universal Feedback parameters 90...129.

Simulated Incremental Encoder Output



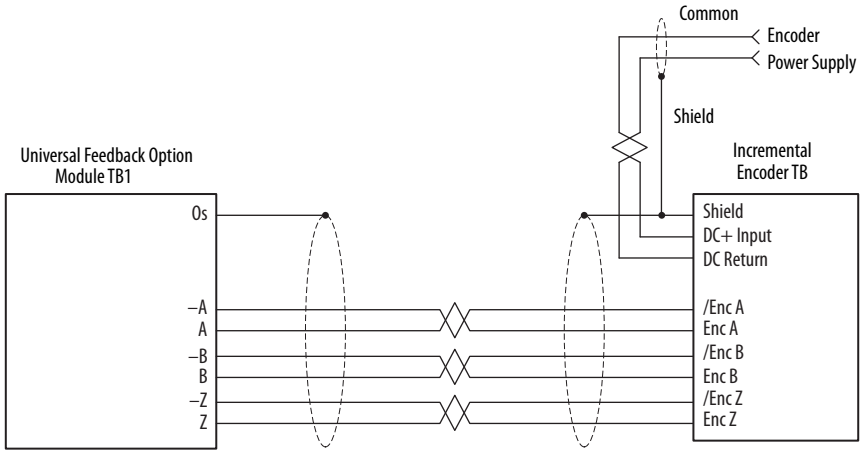
Set Universal Feedback parameter P80 [Enc Out Sel] to 2 'Sine Cosine', 3 'Channel X', or 4 'Channel Y' as needed.

Differential Dual Channel with Z Channel with 5V Internal Supply



Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 12 'Inc A B Z'.

Differential Dual Channel with Z Channel with External Power Supply



Set Universal Feedback parameter P6 [FB0 Device Sel] or P36 [FB1 Device Sel] to 12 'Inc A B Z'.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
PowerFlex 750-Series Option Modules Installation Instructions, publication 750-IN002	Provides information on installing PowerFlex 750-Series Option Modules
PowerFlex 750-Series Products with TotalFORCE Control Installation Instructions, publication 750-IN100	Provides procedures for the mechanical and electrical installation of PowerFlex 750-Series products with TotalFORCE control. This manual includes the basic steps to transport, position, and join the product enclosures, to make internal electrical connections, to connect power and the motor, and to wire basic I/O.
PowerFlex 750-Series AC Drives Installation Instructions, publication 750-IN001	Provides information on the basic steps for mechanical installation and for connecting incoming power, the motor, and basic I/O to the PowerFlex 750- Series Adjustable Frequency AC drive.
Network Communication Option Module Installation Instructions, publication 750COM-IN002	Provides information on the installation of PowerFlex 750-Series Network Communication modules.
PowerFlex 750-Series Safe Speed Monitor Option Module Safety Reference Manual, publication 750-RM001	These publications provide detailed information on installation, set-up, and operation of the 750-Series safety option modules.
PowerFlex 750-Series Safe Torque Off Option Module User Manual, publication 750-UM002	
PowerFlex 750-Series ATEX Option Module User Manual, publication 750-UM003	
PowerFlex 755 Integrated Safety - Safe Torque Off Option Module User Manual, publication 750-UM004	
PowerFlex 755/755T Integrated Safety Functions Option Module, publication 750-UM005	
PowerFlex Drives with TotalFORCE Control Programming Manual, publication 750-100	Provides the basic information that is needed to start up and troubleshoot PowerFlex 750-Series Products with TotalFORCE Control.
PowerFlex 750-Series AC Drives Programming Manual, publication 750-001	Provides the basic information that is needed to start up and troubleshoot PowerFlex 750-Series Adjustable Frequency AC Drives.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation™ industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/global/literature-library/overview.page. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

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Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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