

PowerFlex 750 Series: 20-750sc-8U Setup

This note covers setting up the 20-750sc-8U card. The card provides 8 channels of universal analog input.

Environment

- 20F PowerFlex 753
- 20G PowerFlex 755
- 20F PowerFlex 755G

The 20-750sc-8U 8-Channel Universal Analog Input Module card is manufactured by Spectrum Controls.

The card works with the PowerFlex 753, PowerFlex 755, and PowerFlex 755T products. The card is designed to accept 0-20 mA, 4-20 mA, 0-5 V, 0-10 V, a resistance measurement, or an RTD input.

Spectrum Controls, Inc. also provides a user manual for the card, available from www.spectrumcontrols.com.

This application note provides a quick reference to set up the card.

Installing the Card



WARNING



HAZARD of injury to personnel or damage to equipment.

Do NOT hot swap a 20-750-8U-SC option card.

This may cause injury to personnel and/or damage the option card.

The unit is not designed to be hot swapped. The option card must be plugged into the drive before power is turned on to the drive.

When removing the option card, power must be turned off to the drive before attempting to remove the option card.

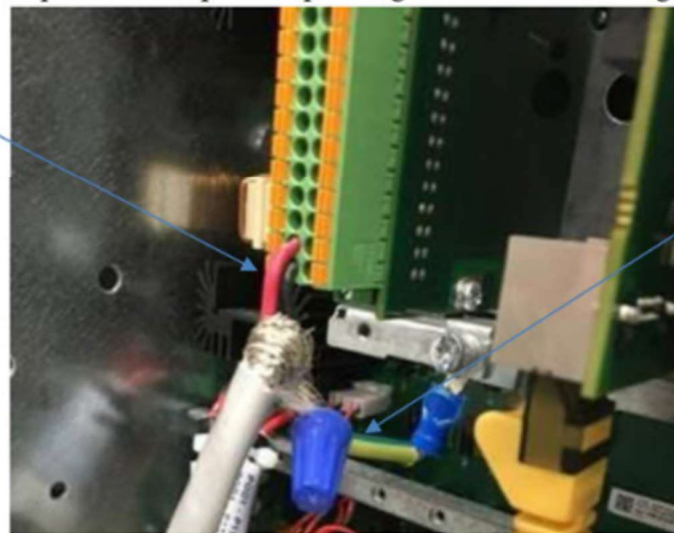
- You can install the card in slots **4**, **5**, or **6**.
- Install the card in one of the supported slots and secure it using the thumb screws at the top and bottom of the option card with a T15 Hex screwdriver.

Wiring the Card

The terminal blocks are removable and are clamp style. Wires should be shielded, twisted pair. The shield should be kept as short as possible and connected to the drive chassis. Strip the wire and push into the appropriate hole while pressing the orange tab next to the hole:



Limited wire
exposed outside of
shield

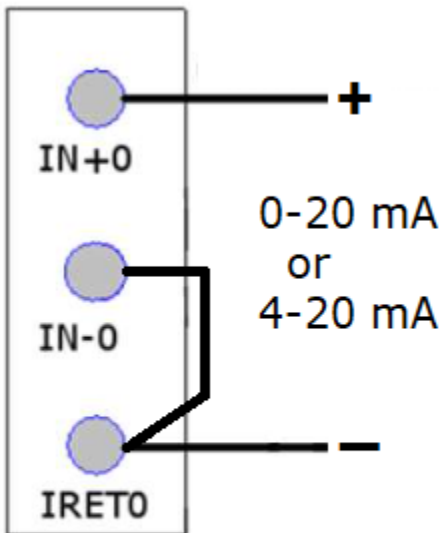


Shield
termination wire
kept short and
terminated close
to the option card

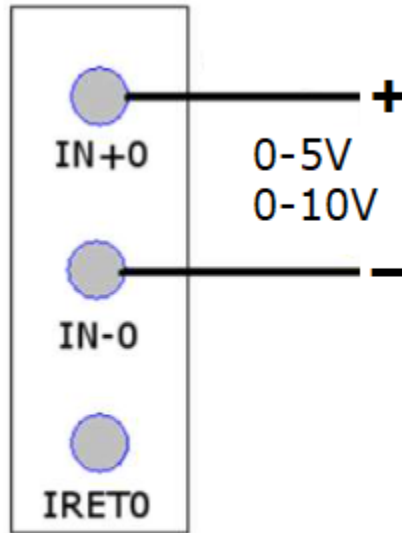
A given input on the card can be wired for any one of the following:

- Current 0-20 mA or 4-20 mA
- Voltage 0-5 V or 0-10 V
- Resistance measurement (0-20, 150, 500, 1000, or 3000 ohms)
- 2-wire RTD input
- 3-wire RTD input
- 4-wire RTD Input

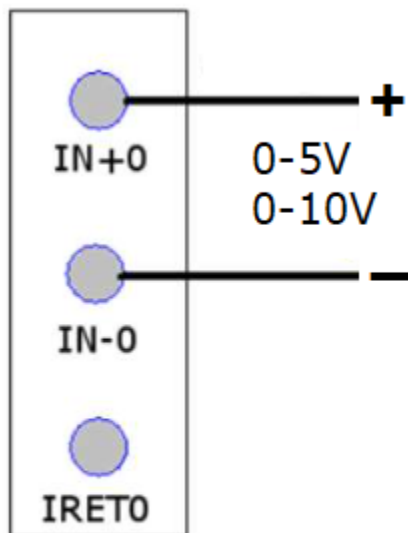
Wiring examples are provided below:



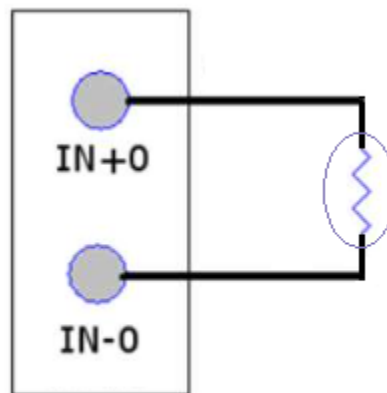
Input Current
Mode Wiring



Input Voltage
Wiring



Input Voltage
Wiring




2 Wire RTD

NOTE



If wiring multiple wires to a single terminal block, the clamp style terminal block can be challenging with these connections. It is highly recommended you solder these wires together before trying to land multiple wires at the same terminal.

NOTE 	There is a slight difference between Even and Odd channels. The 0- to 20-ohm and 10-ohm copper inputs are not available on the Odd Channels.
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Configuring the Card

The card has two types of parameters. They are "Host" and "Device":

- Host parameters reside on the main control board.
- Device Parameters reside on the card itself.

If the card is moved from one drive to another:

- The device parameters will stay as configured.
- The host parameters will reset to default.

Parameter configuration can be done via the HIM or Connected Components Workbench (CCW) V10 or higher. Configure the Device Parameters first.

Configure the Device Parameters first. When configuring the device, it is very important to set Device **Parameter 13 [Config Control]** to "Unlock". Once this parameter is configured to "Unlock" set up Device **Parameters 5- 12 [Channel X Config Word]** (where **X** is a number **1-7**) per the table below:

	Bit Names:	Ignored	Ignored	Wire 1	Wire 0	Tmp Units	OC 1	OC 0	Range 4	Range 3	Range 2	Range 1	Range 0	Filter 2	Filter 1	Filter 0	Disable
Name	Setting	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Disable	Enable (Default)																0
	Disabled																1
Filter	17 Hz (Default)													0	0	0	
	4 Hz													0	0	1	
	60 Hz													0	1	0	
	240 Hz													0	1	1	
	470 Hz													1	0	0	
Range	4-20 mA (Default)								0	0	0	0	0				
	0-20 mA								0	0	0	0	0	1			
	0-5 V								0	0	0	0	1	0			
	0-10 V								0	0	0	0	1	1			
	0 to 20 ohm								0	0	1	0	0				
	0 to 150 ohm								0	0	1	0	1				
	0 to 500 ohm								0	0	1	1	0				
	0 to 1000 ohm								0	0	1	1	1				
	0 to 3000 ohm								0	1	0	0	0				
	10 ohm Copper 426								0	1	0	0	1				
	100 ohm Platinum 385								0	1	0	1	0				
	200 ohm Platinum 385								0	1	0	1	1				
	500 ohm Platinum 385								0	1	1	0	0				
	1000 ohm Platinum 385								0	1	1	0	1				
	100 ohm Platinum 3916								0	1	1	1	0				
	200 ohm Platinum 3916								0	1	1	1	1				
	500 ohm Platinum 3916								1	0	0	0	0				
	1000 ohm Platinum 3916								1	0	0	0	1				
	120 ohm Nickel 672								1	0	0	1	0				
	100 ohm Nickel 618								1	0	0	1	1				
	604 ohm Nickel-Iron 518								1	0	1	0	0				
OC Action	Full Scale (Default)							0	0								
	Minimum Scale							0	1								
	Zero							1	0								
Temp. Units	Deg C (Default)							0									
	Deg F							1									
Wire Mode	3-Wire (Default)			0	0												
	4-Wire			0	1												
	2-Wire			1	0												
Ignored	N/A	X	X														

To optimize performance, it is recommended that unused channels be set to disable (set bit '0' to a '1').

Next configure the Host **Parameters 1-10 [DL From Net X]** (where **X** is a number **1-10**).

Datalink Configuration

Each DL is a datalink. DL1 is Channel 0, DL2 is Channel 1 and so on.

The term "From Net" is sometimes misunderstood. The "From Net" parameters are actually mapping from the card to wherever you point to.

Configure the 'HOST' parameters 'DL From Net' as the table below. Set the datalink parameters in the Spectrum card to the PF750 or PF755T setting based on your drive.

Commonly, Host Parameter **1 [DL From Net 1]** is set to "Port 0 Parameter 1800", Parameter **2 [DL From Net 2]**

is set to "Port 0 Parameter 1801", and so on. Use Parameters 800, 801.... for a PF755T drive. These datalinks could, however, be configured to point to any writable parameter that is a "Real Type" data type.

DL 9 and DL 10 are special datalinks that are used to map the input status of the card and module status respectively, These Datalinks are intended as DINT data types. These parameters are configured as below:

- Parameter **9 [DL From Net 9]** = Port 0 (Parameter 1700 for PF755/753) or (Parameter 700 for PF755T)
- Parameter **10 [DL From Net 10]** = Port 0 (Parameter 1701 for PF755/753) or (Parameter 701 for PF755T)

Function	20-750sc-8U DL From Net	PF750 Setting	PF755T Setting	Port 0 Parameter Name
Chan 0 Data	Port x Parameter 01 [DL From Net 01]	Port 0 Parameter 1800	Port 0 Parameter 800	UserData Real 00
Chan 1 Data	Port x Parameter 02 [DL From Net 02]	Port 0 Parameter 1801	Port 0 Parameter 801	UserData Real 01
Chan 2 Data	Port x Parameter 03 [DL From Net 03]	Port 0 Parameter 1802	Port 0 Parameter 802	UserData Real 02
Chan 3 Data	Port x Parameter 04 [DL From Net 04]	Port 0 Parameter 1803	Port 0 Parameter 803	UserData Real 03
Chan 4 Data	Port x Parameter 05 [DL From Net 05]	Port 0 Parameter 1804	Port 0 Parameter 804	UserData Real 04
Chan 5 Data	Port x Parameter 06 [DL From Net 06]	Port 0 Parameter 1805	Port 0 Parameter 805	UserData Real 05
Chan 6 Data	Port x Parameter 07 [DL From Net 07]	Port 0 Parameter 1806	Port 0 Parameter 806	UserData Real 06
Chan 7 Data	Port x Parameter 08 [DL From Net 08]	Port 0 Parameter 1807	Port 0 Parameter 807	UserData Real 07
Input Status	Port x Parameter 09 [DL From Net 09]	Port 0 Parameter 1700	Port 0 Parameter 700	UserData Int 00
Module Status	Port x Parameter 10 [DL From Net 10]	Port 0 Parameter 1701	Port 0 Parameter 701	UserData Int 01

The module status bit configuration is given below:

Values	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused
Default	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bit[31:16]	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17

Values	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Unused	Firmware	Cal Fault	Watchdog	Comms Fault	ADC Fault
Default	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bit[15:00]	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Bit-0: ADC Fault. Bit set when an error is detected by the analog processor while communicating with the ADC.

Bit-1: Comms Fault. Bit set when communications to the analog processor is disrupted.

Bit-2: Watchdog TO. Watchdog timer has timed out. A critical software error has taken place.

Bit-3: Cal Fault. Calibration data is invalid and the option card is running with uncalibrated measurements. Calibration must be performed at the factory.

Bit-4: Firmware Fault. Firmware mismatch between main CPU and Analog CPU.

Once the card is configured, set Device Parameter 13 [Config Control] to "Lock" to allow data from the wired inputs to update parameters in the drive.

When doing a factory reset on a drive, power down the drive and REMOVE the 20-750sc-8U card. Next, power up the drive, do the fix and complete the reset to defaults for the drive with the card removed.

NOTE



NOTE: For setup help with a 20-750sc-IF4XOF4, please reference the Application Note on the Spectrum Controls, Inc., website product page for this card.