

# Rick Hance Engineering Note

**Date:** 11/7/96  
**Rev Date:** 11/19/96

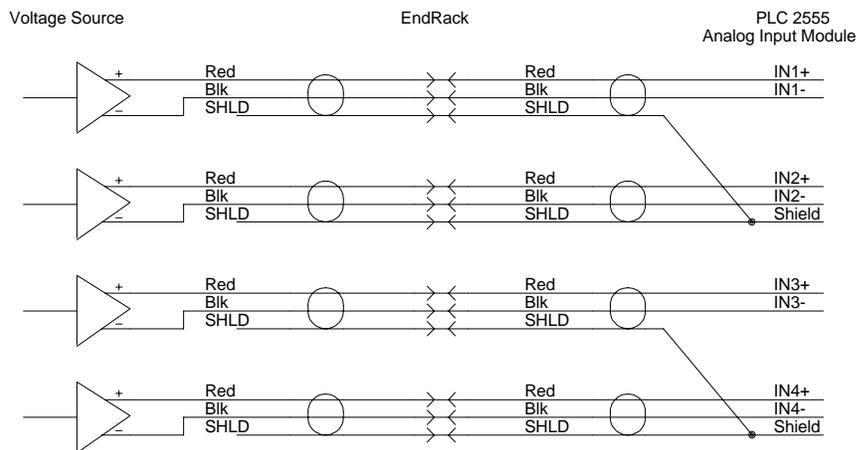
**Project:** Solenoid Energization, Controls, Interlocks and Quench Protection  
**Doc. No:** H961107A

**Subject:** Solenoid EndRack Wiring Standard

All control signals in the solenoid system shall be routed through the controls endrack. The following standards regarding wire and shield connections shall be followed. Refer to the system schematic (Dwg. # 3823-111-ED-330052) and the signal data base (SOLCTRLS.MDB) for the end rack pin assignments and cable numbering.

### Analog Inputs From Devices to the PLC Control System:

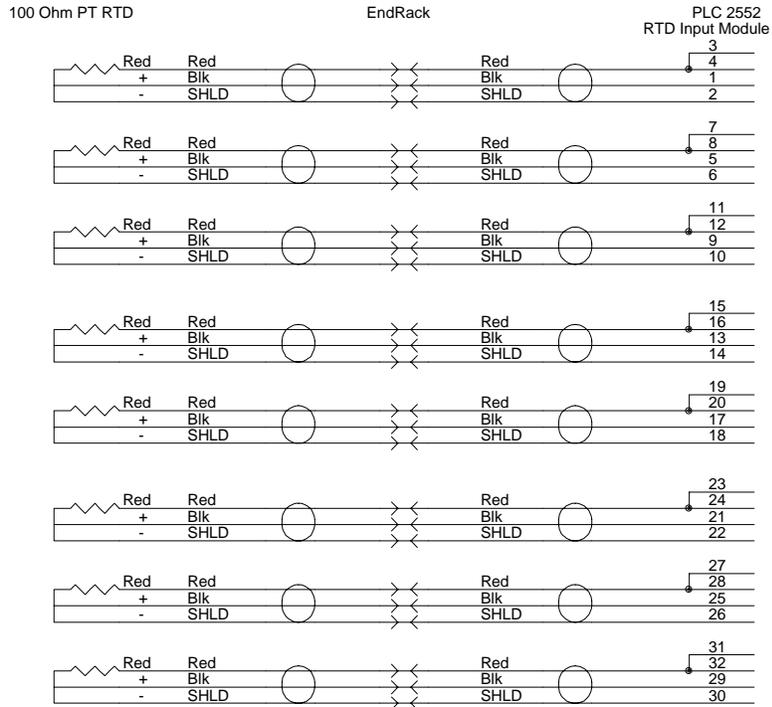
1. Analog signals are brought into the control system via 2555 sixteen channel differential analog modules.
2. Each channel uses three endrack terminals
3. The example shows four channels. Repeat for each group of four.
4. Shields shall be grounded at the 2555 module only. Do not ground the shields at any other place.
5. All cables shall be AWG 22 shielded twisted pair.



Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin
IN1+	AC	IN5+	BC	IN9+	CC	IN13+	DC
IN1-	AR	IN5-	BR	IN9-	CR	IN13-	DR
IN2+	A5	IN6+	B5	IN10+	C5	IN14+	D5
IN2-	A1	IN6-	B1	IN10-	C1	IN14-	D1
IN3+	A6	IN7+	B6	IN11+	C6	IN15+	D6
IN3-	A2	IN7-	B2	IN11-	C2	IN15-	D2
IN4+	A7	IN8+	B7	IN12+	C7	IN16+	D7
IN4-	A3	IN8-	B3	IN12-	C3	IN16-	D3
SHIELD	A8	SHIELD	B8	SHIELD	C8	SHIELD	D8
SHIELD	A4	SHIELD	B4	SHIELD	C4	SHIELD	D4

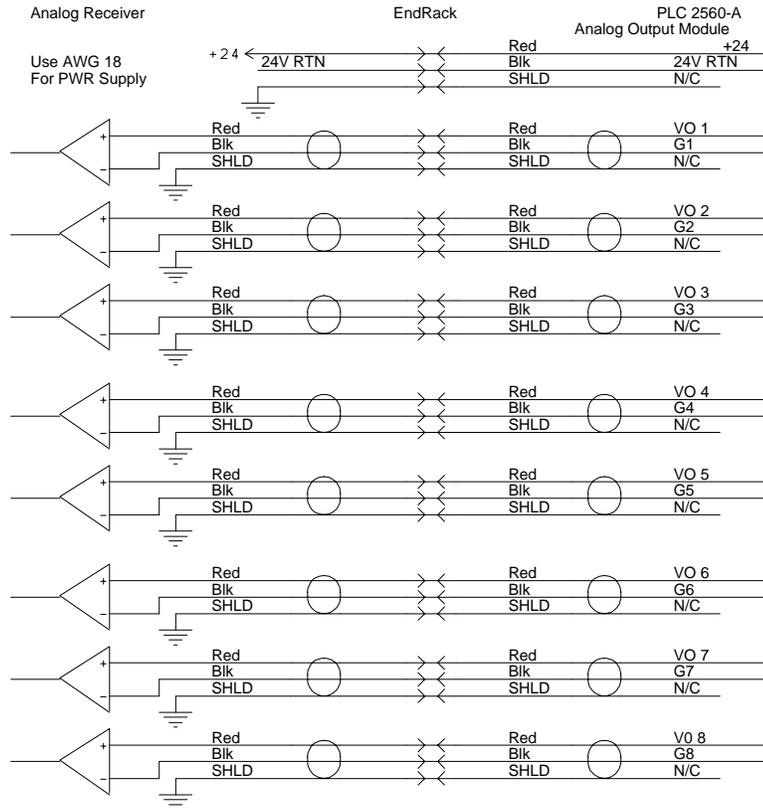
### RTD Inputs to the the PLD Control System:

1. RTD inputs (temperatures) are brought into the PLC control system via 2552 eight channel isolated RTD input modules.
2. Each channel uses 3 endrack connections
3. All cables shall be AWG 22 shielded twisted pair except for those going from the end rack to outside the power supply room. Those cables shall be AWG 18 shielded twisted pair.
4. Shields shall be grounded ONLY at the 2552 module as shown and nowhere else.



**Analog Outputs from the PLC Control System to Controlled Devices:**

1. Analog outputs from the PLC control system to controlled devices shall be via 2560-A eight isolated, differential analog output modules.
2. Each channel uses 3 endrack terminals; and each eight channel module requires 3 additional endrack terminals to attach to a power supply.
3. Cable shields shall be grounded at the destination receiver only, not at the 2560-A module.
4. All cables shall be AWG 22 shielded twisted pair.

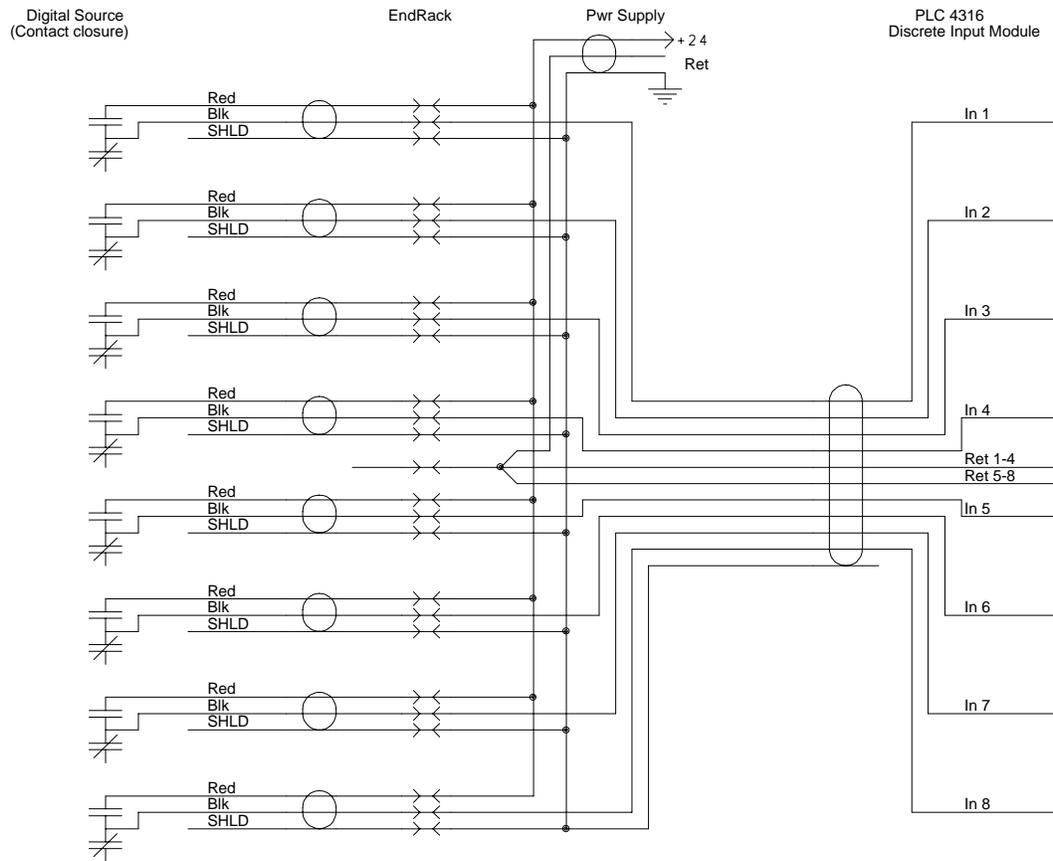


2560-A Module Signal Connections

Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin
VO 1	A5	VO 3	BR	VO 5	CR	VO 7	DR
G1	A1	G3	B5	G5	C5	G7	D5
VO 2	A7	VO 4	B7	VO 6	C7	VO 8	D7
G2	A3	G4	B3	G6	C3	G8	D3
						+24V	AC
						24V Ret	AR

### Digital Inputs from Devices to the PLC Control System:

1. Digital inputs from devices are brought into the PLC control system via 4316 sixteen input modules which have one ground for each 4 inputs. The grounds are connected to the power supply return conductor at the endrack as shown.
2. Each channel uses three endrack terminals; and an extra terminal is used for the RET line of each group of 8.
3. The schematic shows 8-channels (1/2 module). Repeat for each group of 8-channels.
4. The shields shall be connected at the end rack and grounded at the power supply earth ground as shown. Shields shall be carried to but not connected at the digital sources and at the PLC module.
5. Wires from single devices to the end rack shall be AWG 22 shielded twisted pair. Groups of signals may use shielded multiconductor cable as specified in the data base.
6. Wire from the PLC to the end rack shall be AWG 22 shielded 10-conductor cable.

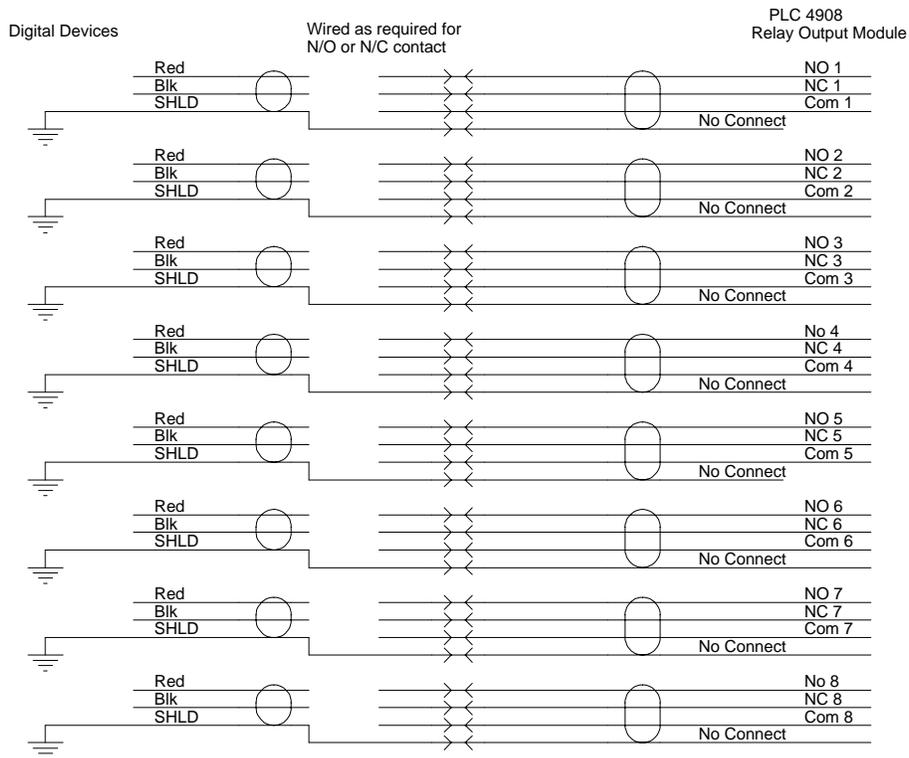


4316A Discrete Input Module Pin Connections

Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin
In 1	A1	In 5	B1	In 9	C1	In 13	D1
In 2	A2	In 6	B2	In 10	C2	In 14	D2
In 3	A3	In 7	B3	In 11	C3	In 15	D3
In 4	A4	In 8	B4	In 12	C4	In 16	D4
Ret 1-4	AR	Ret 5-8	BR	Ret 9-12	CR	Ret 13-16	DR

**Relay Outputs from the Control System:**

1. The 4908 module has 8 isolated relay outputs; both normally open (NO) and normally closed (NC).
2. Four end rack terminals are used for each channel.
3. The schematic shows 8-channels. Repeat for each module.
4. The shields shall be grounded at the digital device only and carried through the end rack to the 4908 module. The shields shall not be grounded anywhere except the at the destination digital device .
5. Wire from the devices to the end rack shall be AWG 22 shielded twisted pair.
6. Wire from the PLC to the end rack shall be AWG 22 shielded 3-conductor cable.



4908 relay Module Pin Connections

Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin
Com 1	AR	Com 3	BR	Com 5	C2	Com 7	D2
NO 1	A1	NO 3	B1	NO 5	CR	NO 7	DR
NC 1	A2	NC 3	B2	NC 5	C1	NC 7	D1
Com 2	AC	Com 4	BC	Com 6	C6	Com 8	D6
NO 2	A5	NO 4	B5	NO 6	CC	NO 8	DC
NC 2	A6	NC 4	B6	NC 6	C5	NC 8	D5