

### Supplied by Customer

Fused External +24VDC  
Isolated Power Supply  
Typical 2 Amp

Connections made to male 4-pin  
Weidmuller connector located on  
top edge of ACR8020 board.

Power consumption of  
one ACR8020 board  
without analog output,  
encoder output power,  
or Digital I/O usage.

+3.3VDC @ 2 Amp  
+5VDC @ 2 Amp  
+12VDC @ 0.13 Amp  
-12VDC @ 0.12 Amp

**THE ACR8020 BOARD REQUIRES THAT THE PC HAS BOTH 3.3VDC AND 5VDC AVAILABLE ON THE BACKPLANE. ATX STYLE POWER SUPPLIES AND BACKPLANES ARE RECOMMENDED FOR USE. POWERING UP WITHOUT BOTH 3.3VDC AND 5VDC AVAILABLE ON THE BACKPLANE WILL PERMANENTLY DAMAGE THE ACR8020 BOARD.**

+24 VDC  
+24 VDC COM

### SERIAL COMMUNICATION

RS-232 Serial Connection  
for COM1 and COM2

Autobaud detects the following formats

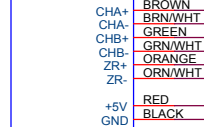
Parity	Data	Stop Bit
Even	8	1
Odd	7	1
No	8	1

Baud Rates from 300 to 38400  
XON/XOFF Control must be used

### ENCODER INPUT

Encoder Inputs to the ACR8020 are capable  
of handling various types of  
open-collector and line driver encoders  
DO NOT USE WITH CMOS DRIVERS

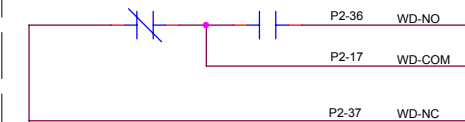
#### TYPICAL ENCODER



CAUTION: Before hook-up consult manual for  
jumper settings required on ACR8020  
Improper settings may cause PERMANENT  
DAMAGE to encoder

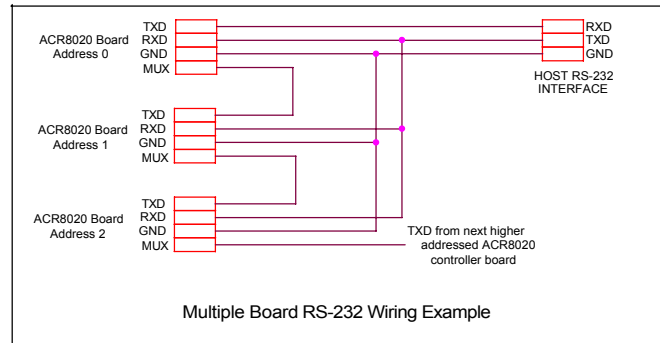
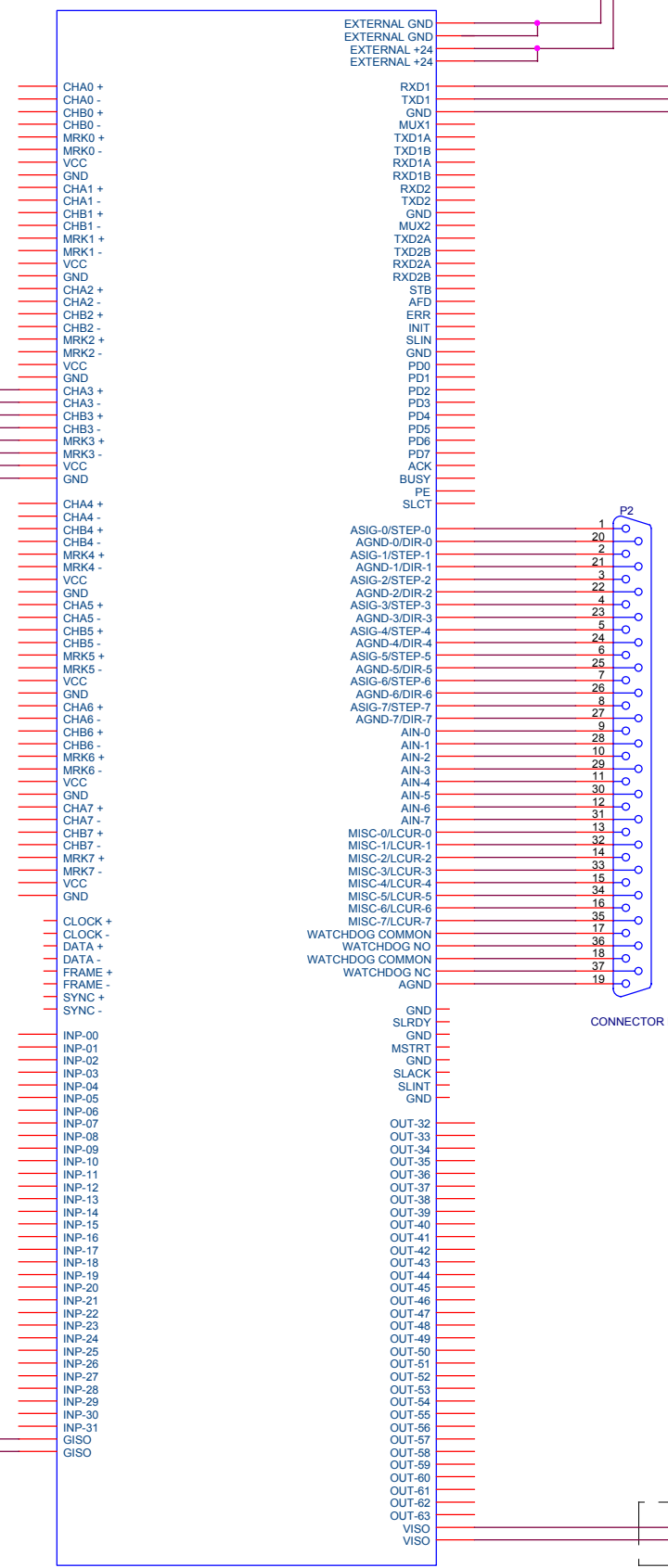
### WATCHDOG CIRCUIT

Relay contacts shown is state when  
ACR8020 is without power, or in  
a processor fault condition.



Watchdog Relay contact rating

1.0 Amp @ 30 VDC



Multiple Board RS-232 Wiring Example

See sheet 2 for Digital I/O  
wiring examples

P3-33,34 for test purpose only.  
Not for customer use.

P4-33,34 for test purpose only.  
Not for customer use.

ACROLOOP MOTION CONTROL SYSTEMS, INC.  
3650 Chestnut Street, North  
Chaska, MN  
USA 55318

Title: ACR8020 WIRING EXAMPLE

Size: C Document Number: ACR81KID1.SCH Rev: A

Date: Saturday, December 08, 2001 Sheet: 1 of 6

# Digital I/O Wiring

**WARNING:**

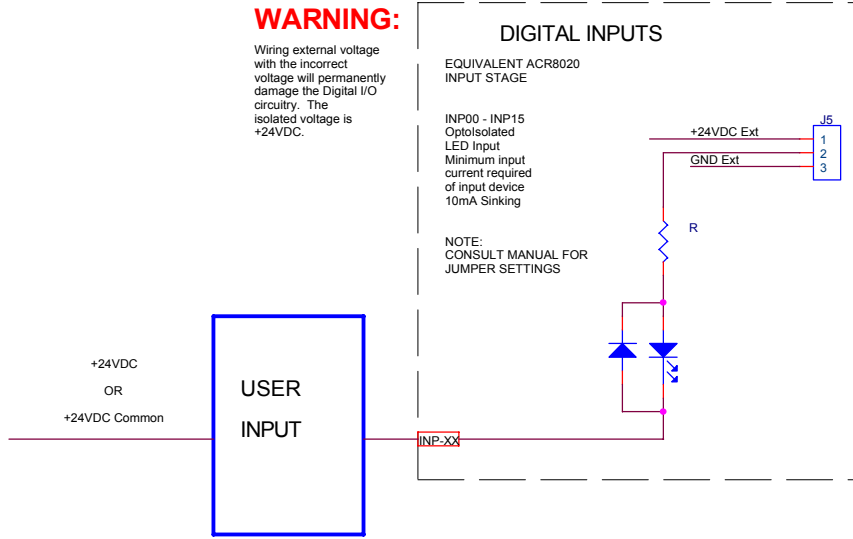
Wiring external voltage with the incorrect voltage will permanently damage the Digital I/O circuitry. The isolated voltage is +24VDC.

## DIGITAL INPUTS

EQUIVALENT ACR8020 INPUT STAGE

INP00 - INP15  
Optoisolated LED Input  
Minimum input current required of input device  
10mA Sinking

NOTE:  
CONSULT MANUAL FOR JUMPER SETTINGS



## DIGITAL OUTPUTS

EQUIVALENT ACR8020 SINKING OUTPUT STAGE  
(Part No. ULN2803)

NOTE:  
CONSULT MANUAL FOR JUMPER SETTINGS

Ext. Gnd

OUT32 - OUT47  
Optoisolated Open Collector

Maximum current 125mA per output if total number of outputs used does not exceed 7.

Maximum current 50mA per output if all outputs are used.

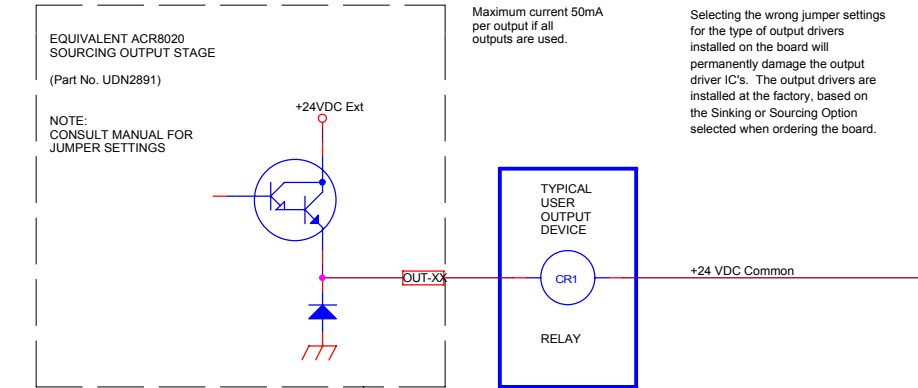
**WARNING:**

Wiring VEXT with the incorrect voltage will permanently damage the Digital I/O circuitry. The isolated voltage (VEXT) is +24VDC.

Selecting the wrong jumper settings for the type of output drivers installed on the board will permanently damage the output driver IC's. The output drivers are installed at the factory, based on the Sinking or Sourcing Option selected when ordering the board.

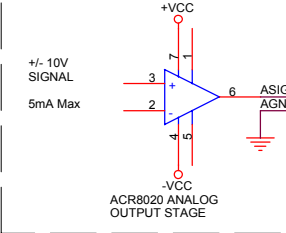
EQUIVALENT ACR8020 SOURCING OUTPUT STAGE  
(Part No. UDN2891)

NOTE:  
CONSULT MANUAL FOR JUMPER SETTINGS

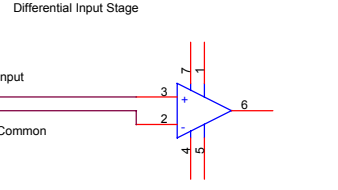


# Analog/Stepper Wiring

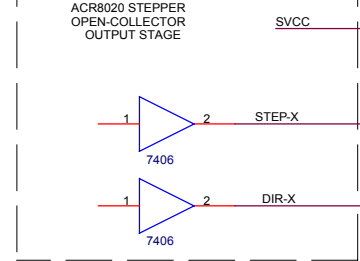
## ANALOG OUTPUTS



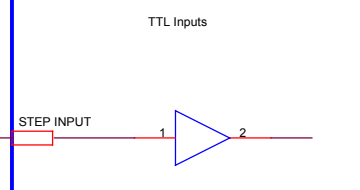
## SERVO AMPLIFIER



## STEPPER OUTPUTS

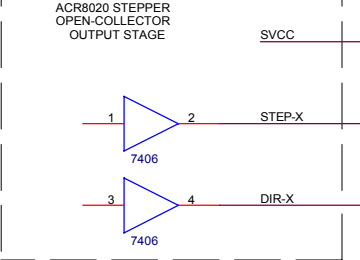


## STEPPER DRIVE

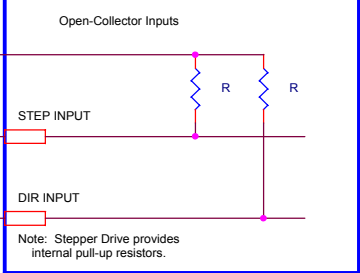


Note: For Stepper Drive with TTL inputs, external pull-up resistors are required.

## STEPPER OUTPUTS

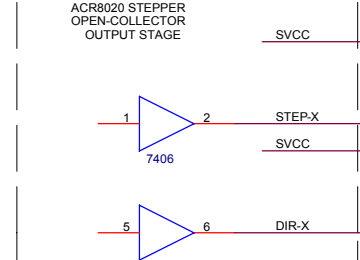


## STEPPER DRIVE

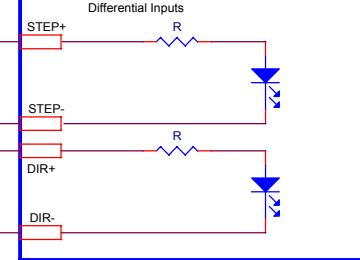


Note: Stepper Drive provides internal pull-up resistors.

## STEPPER OUTPUTS

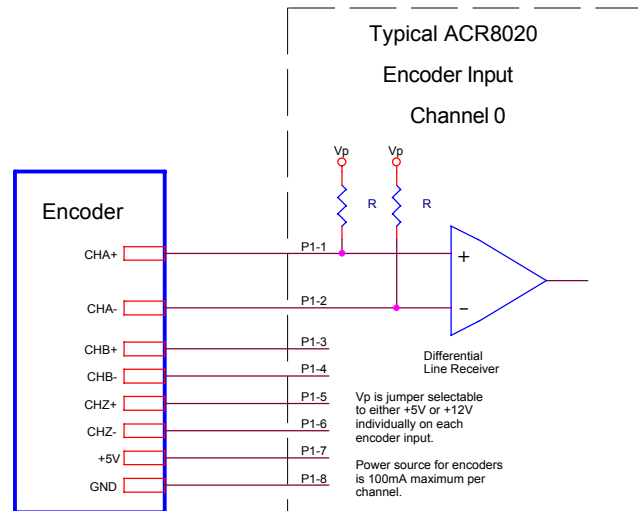


## STEPPER DRIVE

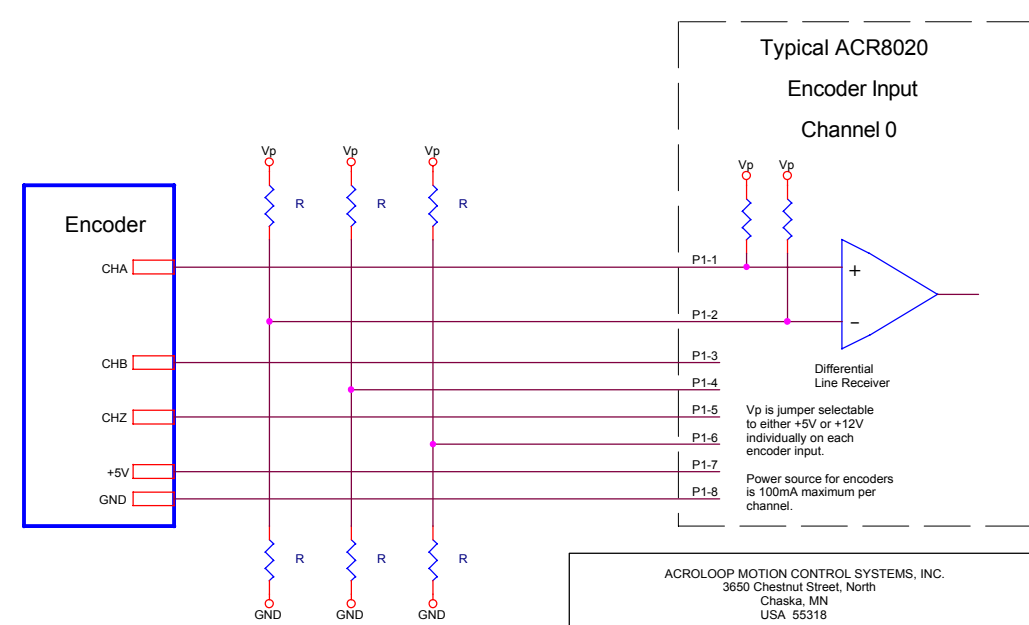


# Encoder Wiring

## Differential Input



## Single-Ended Input



NOTE: External resistor (R) value is:  
Vp @ 5V, R = 1K ohm  
Vp @ 12V, R = 2K ohm

ANALOG P2 CONNECTOR OUTPUT WIRING EXAMPLE

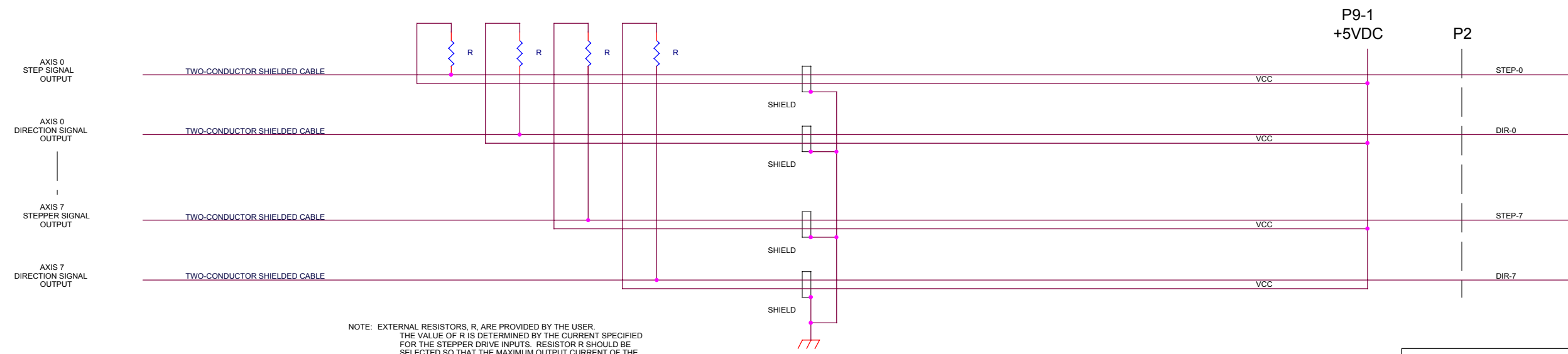


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Title ACR8020 ANALOG OUTPUT WIRING EXAMPLE		
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STEPPER P2 CONNECTOR DIFFERENTIAL OUTPUT WIRING EXAMPLE (OPEN-COLLECTOR OUTPUTS PULLED-UP THRU STEPPER DRIVE INPUTS)



STEPPER P2 CONNECTOR SINGLE-ENDED OUTPUT WIRING EXAMPLE (OPEN-COLLECTOR OUTPUTS PULLED-UP TO +5V THRU EXTERNAL RESISTORS)



NOTE: EXTERNAL RESISTORS, R, ARE PROVIDED BY THE USER.  
 THE VALUE OF R IS DETERMINED BY THE CURRENT SPECIFIED  
 FOR THE STEPPER DRIVE INPUTS. RESISTOR R SHOULD BE  
 SELECTED SO THAT THE MAXIMUM OUTPUT CURRENT OF THE  
 STEPPER BOARD DOES NOT EXCEED 30mA PER OUTPUT.

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Title ACR8020 STEPPER WIRING EXAMPLE		
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# ANALOG P2 CONNECTOR INPUT WIRING

## DIFFERENTIAL WIRING EXAMPLE

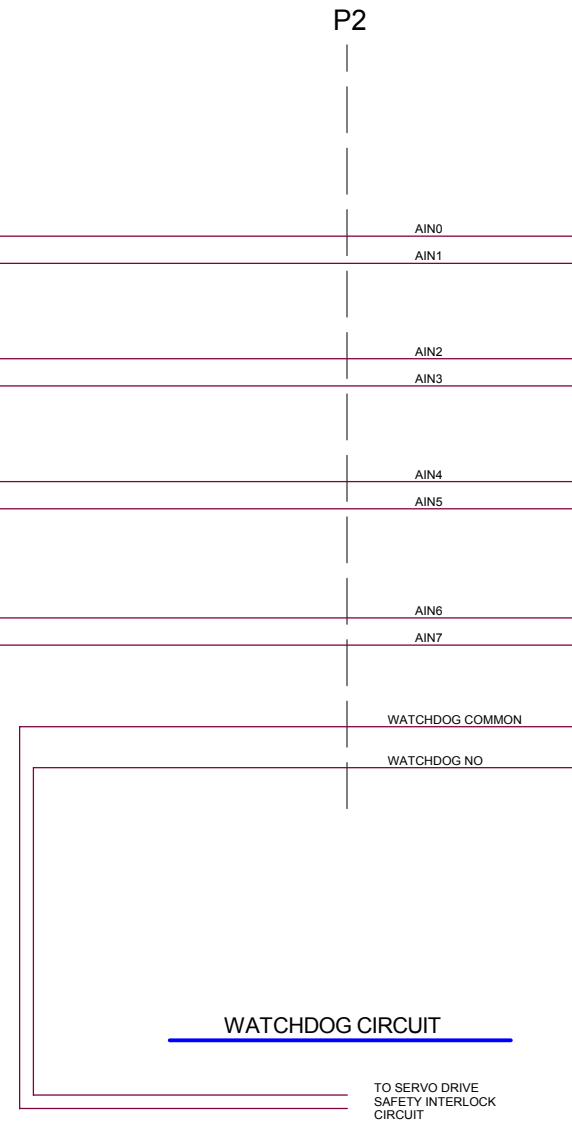
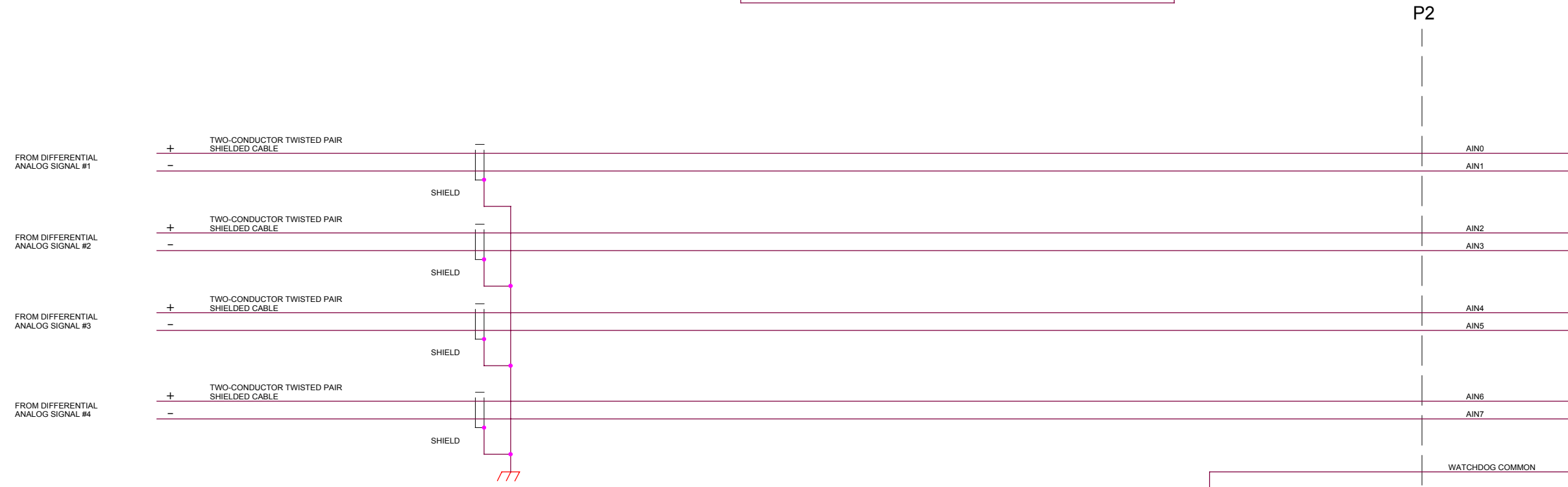
### ANALOG TO DIGITAL INPUTS (ADC)

ANALOG TO DIGITAL INPUTS (AIN0 - AIN7) CAN BE USED AS DIFFERENTIAL OR SINGLE-ENDED INPUTS. ANY COMBINATION MAY BE USED.

IF USED AS DIFFERENTIAL INPUTS, TWO INPUTS ARE USED AS SHOWN USING AIN0-AIN1 & AIN2-AIN3. FOUR DIFFERENTIAL INPUT SIGNALS MAY BE USED WITH AN ACR8020.

IF USED AS SINGLE-ENDED INPUTS, ONE INPUT IS USED IN CONJUNCTION WITH AIN-COM. EIGHT SINGLE-ENDED INPUT SIGNALS MAY BE USED WITH AN ACR8020. SEE SHEET 4 FOR SINGLE ENDED WIRING EXAMPLE.

DIFFERENTIAL INPUT PAIRS	
+	-
AIN0	- AIN1
AIN2	- AIN3
AIN4	- AIN5
AIN6	- AIN7

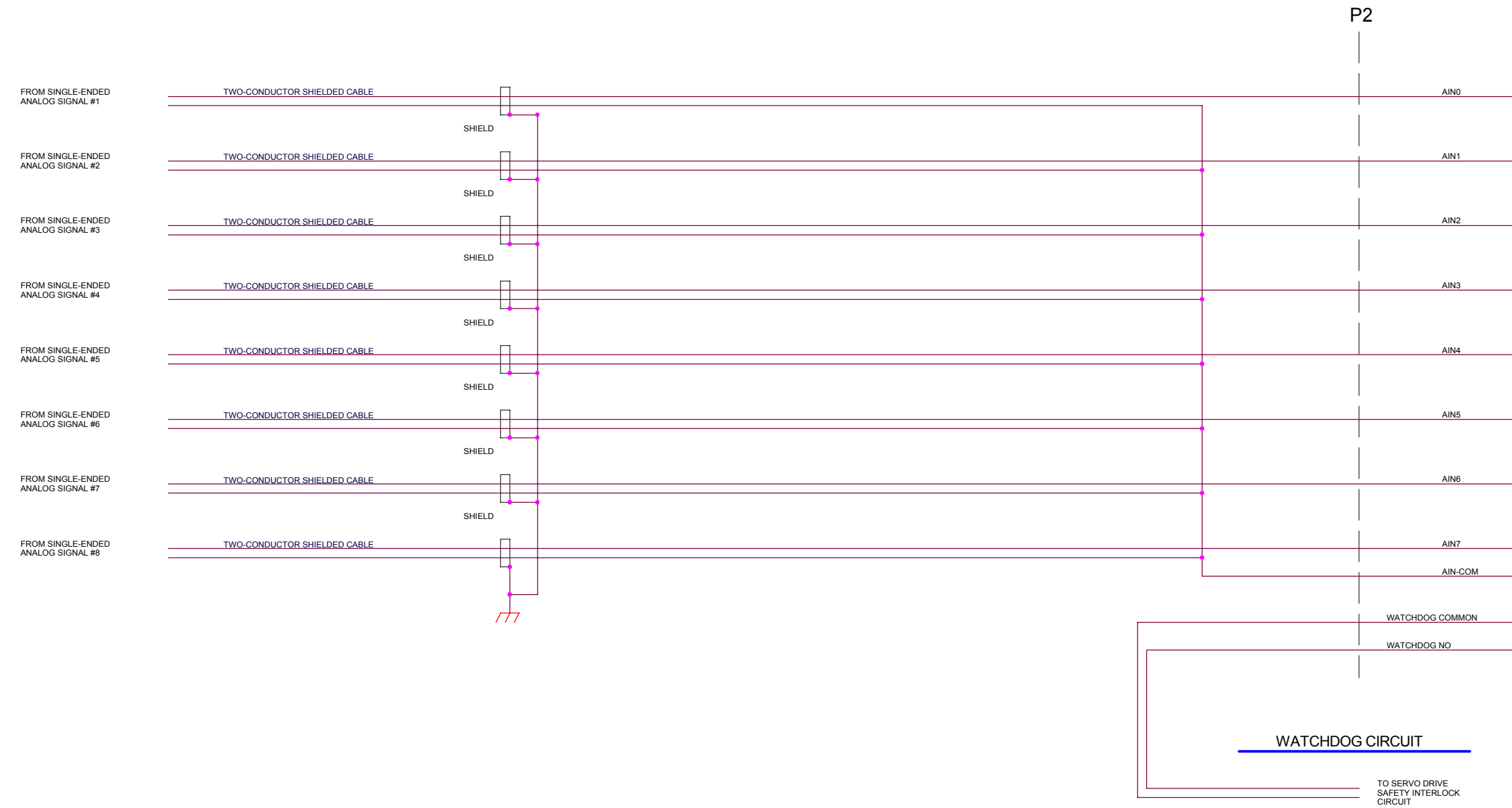


WATCHDOG CONTACTS USED TO DISABLE SERVO DRIVE UNTIL ACR8020 CONTROLLER HAS FULL CONTROL OF ALL DIGITAL AND ANALOG SIGNALS TO PREVENT POSSIBLE MOTOR SURGE ON INITIAL START-UP

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Title ACR8020 WIRING EXAMPLE		
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# ANALOG P2 CONNECTOR INPUT WIRING

## SINGLE-ENDED WIRING EXAMPLE



### WATCHDOG CIRCUIT

TO SERVO DRIVE  
SAFETY INTERLOCK  
CIRCUIT

WATCHDOG CONTACTS USED TO DISABLE SERVO DRIVE  
UNTIL ACR8020 CONTROLLER HAS FULL CONTROL  
OF ALL DIGITAL AND ANALOG SIGNALS TO PREVENT  
POSSIBLE MOTOR SURGE ON INITIAL START-UP

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Title ACR8020 WIRING EXAMPLE		
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