SCMVAS

Voltage Attenuator System

Description

The SCMVAS (Signal Conditioning Modular Voltage Attenuator System) is an analog signal conditioning system designed to safely monitor and accurately measure voltage potentials up to 495VAC (1400V peak-to-peak). These highlevel voltages are typically found in industrial applications such as induction heaters or electric-motor drive controllers. The system reduces the input signal to a level suitable for interface to data acquisition systems, while at the same time providing various filter characteristics and 1500Vrms isolation (Figure 1).

For each channel of analog input, an attenuator module, SCMVAS-Mnnn, pre-conditions the signal which is then filtered, isolated, and converted to a high-level voltage output using an SCM5B30-07 or SCM5B40-07 module. The SCM5B40-07 module with a 10kHz bandwidth is recommended for common 50/ 60Hz signals low in harmonics where the user is interested in measuring only AC voltage. The SCM5B30-07 module is used for low frequency AC signals below 4Hz. The attenuator and signal conditioning modules have excellent stability over time and do not require recalibration. Overall system accuracy is ±0.06%.

Input signal connections to the SCMVAS-Mnnn attenuator module are made using a pluggable terminal block for ease of system assembly and reconfiguration. For safety purposes, the terminal block has a cover over the screws and there are no other exposed high-voltage points on the SCMVAS-Mnnn series modules, SCM5B30-07 or SCM5B40-07 module, or the mounting backpanel.

The SCMVAS system has two specially designed backpanels for mounting the attenuator and signal conditioning modules. The SCMVAS-PB8 high density, 8- channel backpanel (Figures 2, 3) can be panel mounted or DIN rail mounted and provides the conditioned output signal on screw terminal blocks. Jumpers are provided on each channel to optionally connect or isolate each module's I/O Common from other channel's I/O Common and/or Power Common. The SCMVAS-PB16 (Figures 4, 5) has 16 channels of analog I/O simultaneously available to high-speed data acquisition (ADC) boards through a 26-conductor ribbon cable. Refer to the SCMPB01 Data Sheet in this catalog and Application Note AN502 at www.dataforth.com for recommended ground connections and host system interfaces. Both the SCMVAS-PB8 and SCMVAS-PB16 backpanels can be mounted on the SCMXRK-002 19-inch metal rack.

Features

- Accepts High Voltage Signals up to 495VAC (1400V Peak-to-Peak)
- 5 or 10 Volt Output for A/D Systems
- 1500Vrms Transformer Isolation
- True 3-Way Isolation
- Up to 160dB CMR
- ±0.06% Accuracy
- Panel or DIN Rail Mounting Options
- CSA Certified
- CE Compliant
- ATEX Compliant (all models except SCMVAS-M400, -M500, -M600, -M650)

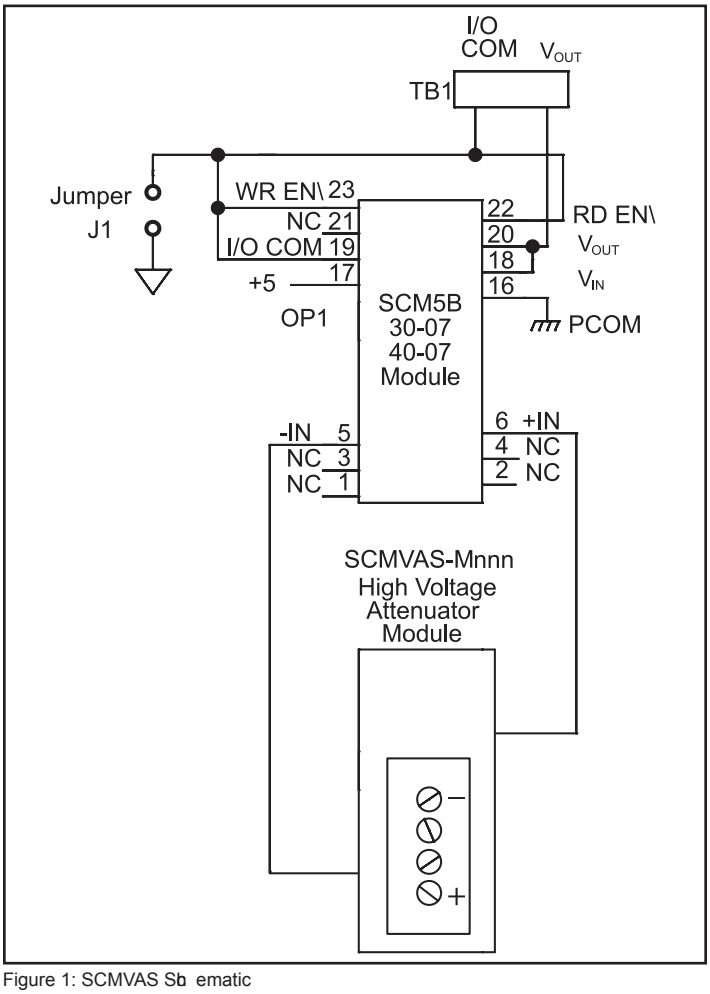


Figure 1: SCMVAS Sb ematic

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SCM5B30/40-07

Isolated Analog Voltage Input Modules

Specifications

Typical* at T_A = +25°C and +5VDC power

Module	SCM5B30-07	SCM5B40-07
Input Range	–1.0V to +1.0V	*
Input Bias Current	±0.5nA	*
Input Resistance		
Normal	50MΩ	200MΩ
Power Off	40kΩ	*
Overload	40kΩ	*
Input Protection		
Continuous	240Vrms max	*
Transient	ANSI/IEEE C37.90.1	*
CMV, Input to Output		
Continuous	1500Vrms max	*
Transient	ANSI/IEEE C37.90.1	*
CMR (50 or 60Hz)	160dB	100dB
NMR	95dB at 50Hz, 90dB at 60Hz	120dB per Decade above 10kHz
Accuracy(1)	±0.03% Span	*
Linearity	±0.005% Span	±0.01% Span
Stability		
Input Offset	±20µV/°C	*
Output Offset	±20µV/°C	*
Gain	±50ppm/°C	*
Noise		
Input, DC to 10Hz	2µVrms	*
Output, 100kHz	200µVrms	2mVp-p
Bandwidth, -3dB	4Hz	10kHz
Response Time (to 90% final value)	0.2s	35µ s
Output Range	–5V to +5V (–10V to +10V, D model versions)	*
Output Resistance	50Ω	*
Output Protection	Continuous Short to Ground	*
Output Selection Time (to ±1mV of V_{OUT})	6.0µS at C_{load} = 0 to 2000pF	*
Output Current Limit	±8mA	*
Output Enable Control		
Max Logic "0"	+0.8V	*
Min Logic "1"	+2.4V	*
Max Logic "1"	+36V	*
Input Current "0,1"	0.5µA	*
Power Supply Voltage	+5VDC ±5%	*
Power Supply Current	30mA	*
Power Supply Sensitivity	±200µ V/% RTI(2)	*
Mechanical Dimensions (h)(w)(d)	2.28"x 2.26"x 0.60" (58mm x 57mm x 15mm)	*
Environmental		
Operating Temp. Range	–40°C to +85°C	*
Storage Temp. Range	–40°C to +85°C	*
Relative Humidity	0 to 95% Noncondensing	*
Emissions EN61000-6-4	ISM, Group 1	*
Radiated, Conducted	Class A	*
Immunity EN61000-6-2	ISM, Group 1	*
RF	Performance A ±0.5% Span Error	*
ESD,EFT	Performance B	*

Ordering Information

Model	Description
SCM5B30-07	V Isolation Module, ±5V Output, 4Hz Bandwidth
SCM5B40-07	V Isolation Module, ±5V Output, 10kHz Bandwidth
SCM5B30-07D	V Isolation Module, ±10V Output, 4Hz Bandwidth
SCM5B40-07D	V Isolation Module, ±10V Output, 10kHz Bandwidth

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) Includes linearity, hysteresis and repeatability.
(2) RTI = Referenced to input.

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SCMVAS-Mnnn

High Voltage Attenuator Modules

Specifications

Typical* at T_A = +25°C

Module	SCMVAS-Mnnn
Input Range Input Voltage Maximum Input Resistance	±100Vpeak to ±700Vpeak (70VAC to 495VAC) ±750Vpeak 10MΩ
Accuracy Stability	±0.03% ±50ppm/°C
Output Range Output Resistance	±1V <100kΩ
Mechanical Dimensions (h)(w)(d)	1.70"x 1.98"x 0.69" (44mm x 51mm x 18mm)
Environmental Operating Temp. Range Storage Temp. Range Relative Humidity HazLoc CSA ATEX	 –40°C to +85°C –40°C to +85°C 0 to 95% Noncondensing All models except SCMVAS-M700 All models except SCMVAS-M400, -M500, -M600, -M650, -M700

*Contact factory or your local Dataforth sales office for maximum values.

Ordering Information

Model	Description	Input Range with V Isolation Module
SCMVAS-M100	Attenuator Module	±100V Input (70VAC)
SCMVAS-M200	Attenuator Module	±200V Input (141VAC)
SCMVAS-M300	Attenuator Module	±300V Input (212VAC)
SCMVAS-M400	Attenuator Module	±400V Input (282VAC)
SCMVAS-M500	Attenuator Module	±500V Input (353VAC)
SCMVAS-M600	Attenuator Module	±600V Input (424VAC)
SCMVAS-M650	Attenuator Module	±650V Input (460VAC)
SCMVAS-M700	Attenuator Module	±700V Input (495VAC)
SCMVAS-MPT	Attenuator Module, Pass-Thru 1-to-1	

Accessories

Model	Description
SCMVAS-PB8	Backpanel, 8-Channel
SCMVAS-PB8D	Backpanel, 8-Channel, DIN Rail Mount
SCMVAS-PB16	Backpanel, 16-Channel
SCMVAS-PB16D	Backpanel, 16-Channel, DIN Rail Mount

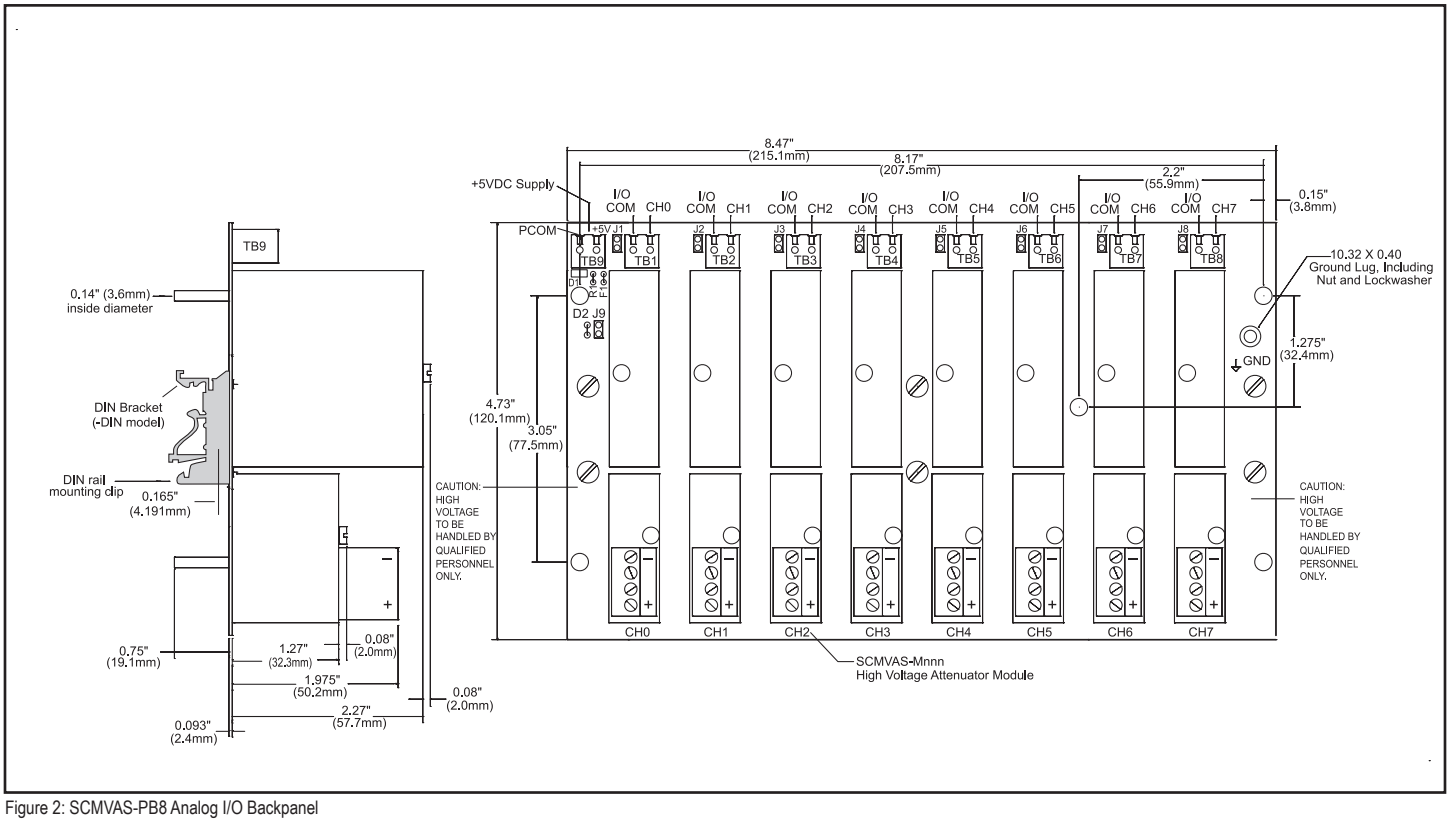


Figure 2: SCMVAS-PB8 Analog I/O Backpanel

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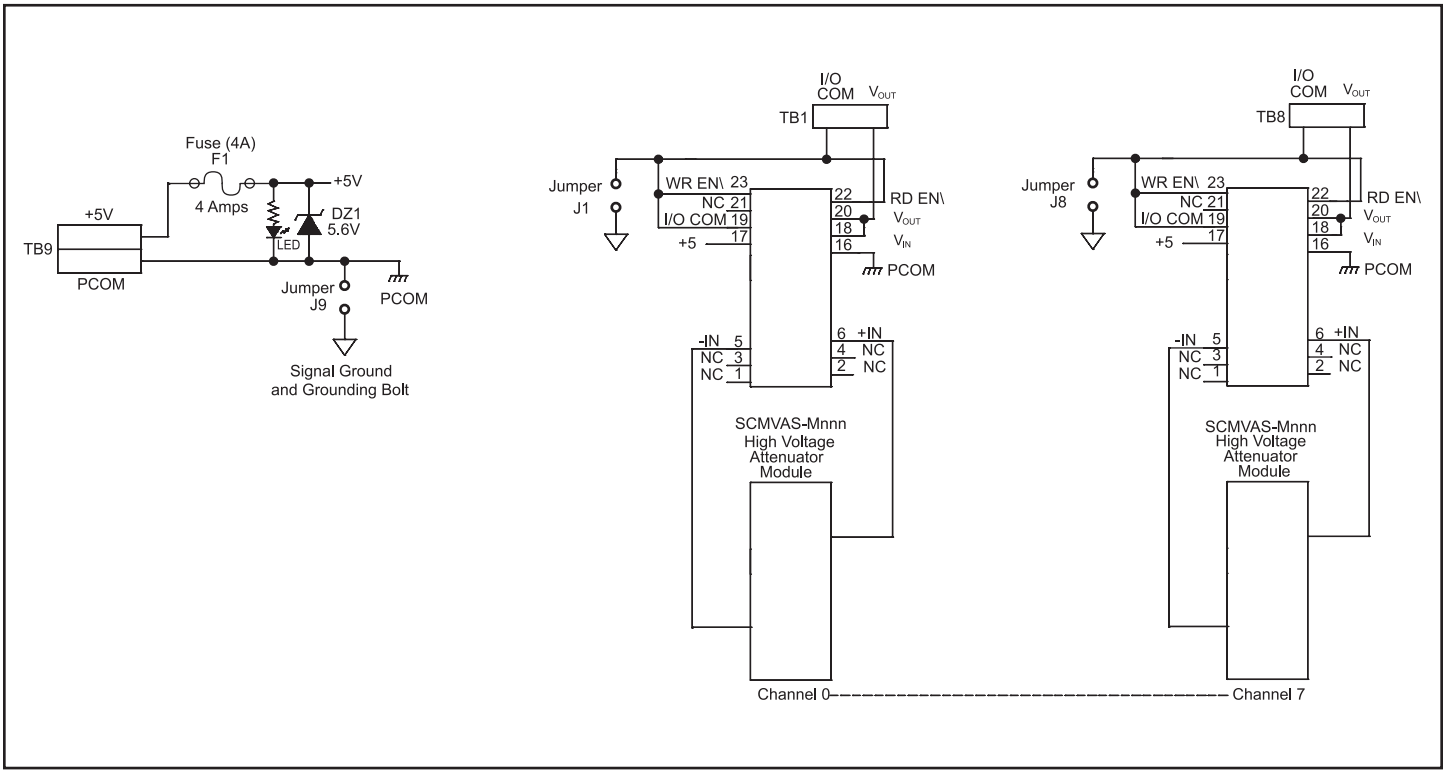


Figure 3: SCMVAS-PB8 Schematic

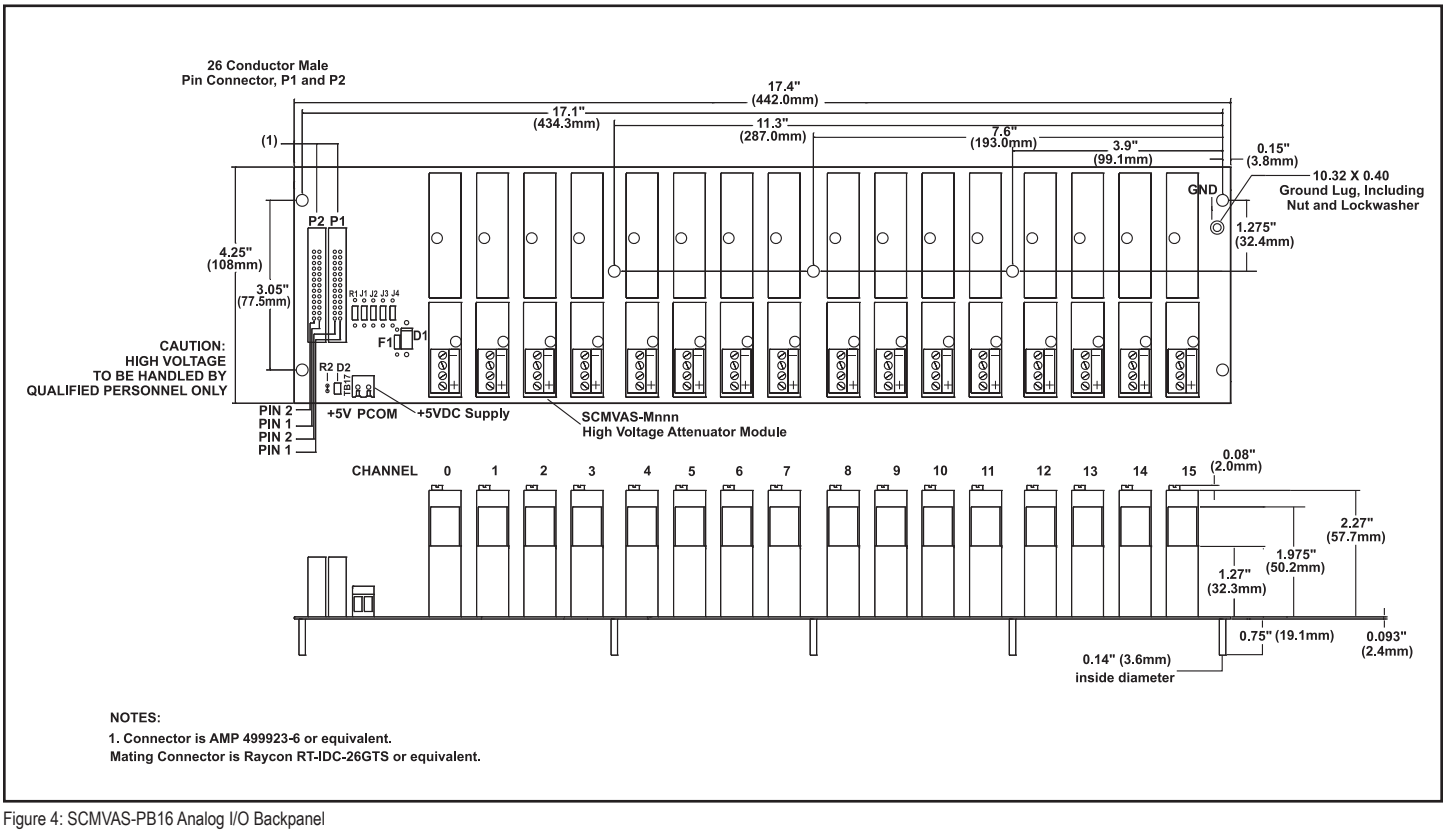


Figure 4: SCMVAS-PB16 Analog I/O Backpanel

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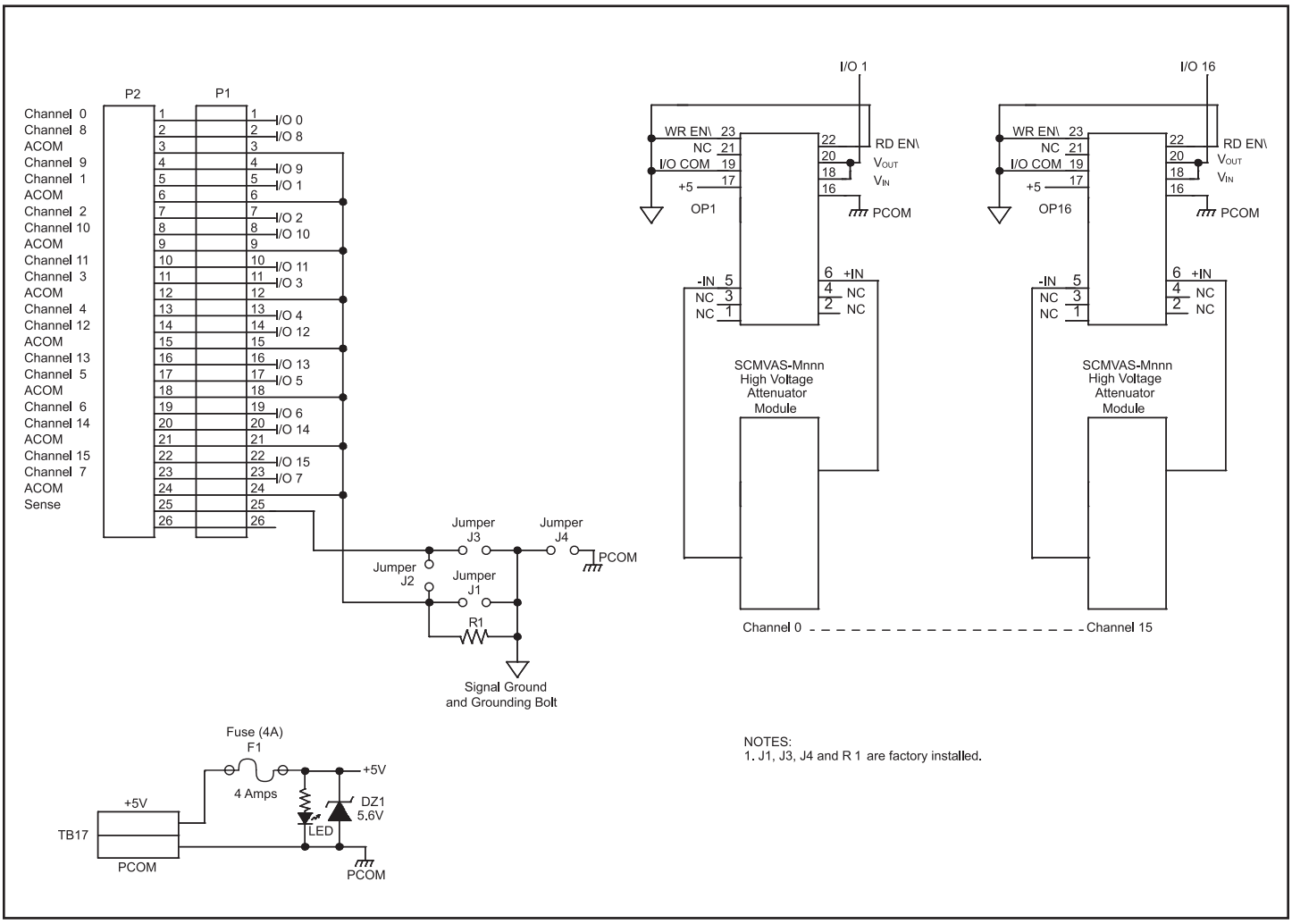


Figure 5: SCMVAS-PB16 Schematic

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