

Datasheet SCS3000_VoltageIn

Revision: B

Document Version: 1.0

DESCRIPTION

The SCS3000_VoltageIn is a slot card being used with the SCS3000 slow control systems. It's a 8 channel (single) or 4 channel (differential) general voltage input card, configurable with different ranges

ELECTRICAL CHARACTERISTICS

Parameter	Condition	Value			Unit
		Min	Typ	Max	
Input Voltage, all inputs ¹⁾	referred to ground	-12,5		12,5	V
Single Input Voltage	±2.5V single input	-2,875		2,875	V
	±10V single input	-11,5		11,5	V
Differential Input Voltage	±2.5V diff input	-2,875		2,875	V
	±10V diff input	-11,5		11,5	V
Input Resistance ²⁾		10			MΩ
Analog Input Filter Cut off Frequency	-3dB		14		Hz
Input Offset Voltage ⁴⁾	LSB referred to noise free bits input shorted, after calibration			1	LSB
Input Offset Voltage Drift ³⁾	2.5V single input		87,5	405	nV/°C
	±2.5V diff input		87,5	435	nV/°C
	10V single input		40	780	nV/°C
	±10V diff input		40	810	nV/°C
Gain Error ³⁾			100	550	ppm
Gain Drift ³⁾			±0.5	±5	ppm/°C
Noise Free Bits			16		Bits
Sampling Frequency			125		Hz

Note 1: Exceeding the minimum or maximum voltage will trigger the under / overvoltage protection

Note 2: The input resistance is defined thru the leakage current of the input protection diode

Note 3: Gauss' law of error propagation assumed for typical values, not tested, values according datasheets

Note 4: The offset voltage also depends on the power consumption. This is a result of the ground differences from the slot card and the mainboard caused by the current (approx. 30uV). Use the differential configuration or use one channel as ground reference (short to ground on the the backplane) to subtract this offset by software.

Channels configuration for differential input:

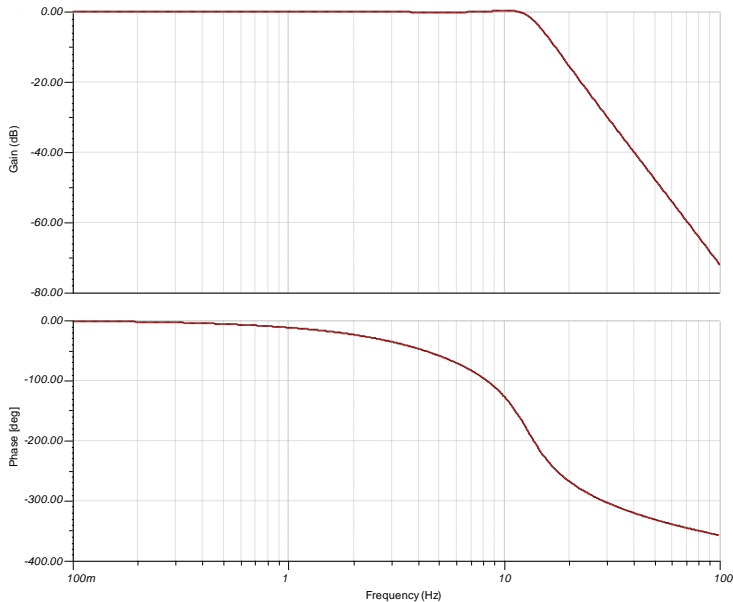
CH1+ CH0.

CH3+ CH2.

CH5+ CH4.

CH7+ CH6.

BODE DIAGRAM OF ANALOG INPUT



CALIBRATION

Do the following procedure to calibrate the offset and gain of the card:

- Short the inputs of CH0 and CH1 to GND on the backplane
- Make sure the device is running long enough before calibration (stabilization)
- The calibration starts with writing a one to the 8th variable of the card called "PxCalib"
- Wait until the system reboots
- The calibration has to be done for **every** different **configuration** once. The calibration values are stored on the EE-PROM of the card
- Calibrating the card in different slots can lead to slightly different results

```
node65535 (0xFFFF)> re
0: POUIn0    32bit F    2.67813e-005 volt
1: POUIn1    32bit F   -5.0175e-006 volt
2: POUIn2    32bit F    0.0219099 volt
3: POUIn3    32bit F   -0.00372521 volt
4: POUIn4    32bit F    0.0419814 volt
5: POUIn5    32bit F    0.0135507 volt
6: POUIn6    32bit F    0.00842204 volt
7: POUIn7    32bit F   -0.00192132 volt
8: P0Calib   8bit U      0 (0x00/00000000) boolean
node65535 (0xFFFF)>
```

MODULE IDENTIFICATION CODE

The different input voltages or configurations do not require a different slot card assembly! The hardware is the same for all configurations.

0xA0	±2.5V
0xA1	±10V
0xA2	±2.5V Diff
0xA3	±10V Diff

HAFTUNGSKLAUSEL

DEUTSCH

Das PSI haftet dem Vertragspartner nur für unmittelbare nachgewiesene Schäden, die das PSI absichtlich oder grob fahrlässig verursacht hat oder ein Haftungsausschluss geltendem Recht widersprechen würde. Die Haftung des PSI für direkte Sachschäden und reine Vermögensschäden ist auf die Vertragssumme begrenzt.

Eine Haftung für weitere Schäden oder Schadenersatz aus entgangenem Gewinn, Verlust von Daten oder Goodwill oder Folgeschäden, indirekten Schäden, Sonderschäden oder anderen Schäden, die aufgrund der Vertragserfüllung entstanden sind, sind - ungeachtet des Rechtsgrundes - ausgeschlossen.

Soweit gesetzlich möglich sind sämtliche Gewährleistungen, Garantien, Bedingungen, Erklärungen oder Stellungnahmen ausgeschlossen, ungeachtet dessen, ob sie ausdrücklich oder implizit gegeben sind oder auf Gesetz, Gewohnheitsrecht oder auf anderer Grundlage beruhen.

Das PSI haftet nicht für Schäden, die auf Ungenauigkeit oder Versäumnisse bei der Leistungserbringung beruhen oder aufgrund von Informationen entstanden sind, die vom Vertragspartner geliefert worden sind. Diese Haftungsbegrenzung gilt nicht, wenn das PSI die Ungenauigkeiten und Versäumnisse absichtlich oder grob fahrlässig verursacht hat.

ENGLISH

Regardless of the legal reason, PSI is not liable to the other party for any loss of profit, data or goodwill, or any other consequential, incidental, indirect, punitive or special damages in connection with claims arising out of this Agreement, except to the extent such damages were caused by the gross negligence or wilful misconduct of PSI or to the extent prohibited by applicable law. The liability of the PSI for direct damages or financial loss is limited to the amount actually paid for the services.

All warranties, conditions, representations, statement terms and provisions, express or implied by statute, common law or otherwise, are hereby excluded to the fullest extent permitted by law and for the avoidance of doubt all such warranties are expressly excluded in respect of any use of the Results.

PSI will not be held responsible for any consequences arising out of any inaccuracies or omissions of any work performed or any information given to the other party unless such inaccuracies or omissions are the result of gross negligence or wilful misconduct of PSI.