



Voltage Amplifier Modules ... Both Precision and High Speed Amplifiers

Current to Voltage Converter Modules... Pico-Amp, Nano-Amp, Milli-Amp ... 1A, 10A/V, 100A/V

Transimpedance Amplifiers... Pico-Amp, Nano-Amp, Milli-Amp ... 1A, 10A/V, 100A/V

Constant Current Source / Sink Modules... $\pm 10\text{pA}$ to 125mA, 1A, 5A & 10A full range output modules

Voltage to Constant Current Converter Modules... $\pm 10\text{pA}$ to 125mA, 1A, 5A & 10A full range output modules

Precision Isolation Amplifiers

**CONTINUE TO NEXT PAGE FOR
DOCUMENTATION**

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Don't waste your time designing and/or packaging a Constant Current output Op-Amp or Voltage to Current Conversion amplifier circuit for your application. Utilize one of our self contained Ready Modules for your application or simply use in conjunction with a basic Multimeter as an inexpensive alternative to an expensive Constant Current Source.



- ◆ Adjustable Constant Current Output
- ◆ Floating and Grounded Constant Current Outputs
- ◆ Output Current Ranges: $\pm 10\text{pA}$, $\pm 100\text{pA}$, $\pm 1\text{nA}$, $\pm 10\text{nA}$, $\pm 100\text{nA}$, $\pm 1\mu\text{A}$, $\pm 10\mu\text{A}$, $\pm 100\mu\text{A}$, $\pm 1\text{mA}$, $\pm 10\text{mA}$, $\pm 100\text{mA}$
- ◆ Current Output Monitor; Vout proportional to current out.
- ◆ Converts from input voltage to output constant current.
- ◆ Current Output Control:
 - a.) Option#1: $\pm 10\text{V}$ input relative to applicable full range current out.
 - b.) Option#2: Manual Trim-Potentiometer adjustment .
- ◆ Offset Null Capability for calibration.
- ◆ Load Compliance Voltage $\leq \pm 10$... Optional voltage up to 32V.
- ◆ Constant within a wide temperature range
- ◆ Low Power Consumption
- ◆ Contact us for multi-range or custom constant current modules.
- ◆ Contact us for single supply or lower power consumptive constant current modules.

(2 weeks Delivery, Call for order quantities greater than 5)

General Specifications ...

CSE Type Module

Desc.	Value	Unit
Operating Temperature	10 to 40	C
DC Supply Voltage	+5V (4.9 to 6.0)	VDC
Signal In / Out connector	BNC or SMA	female
Dimensions (L x H x W)		

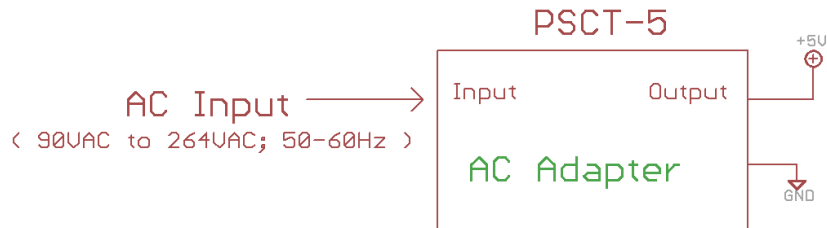
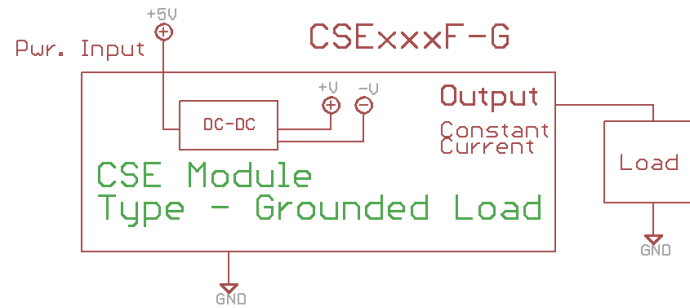
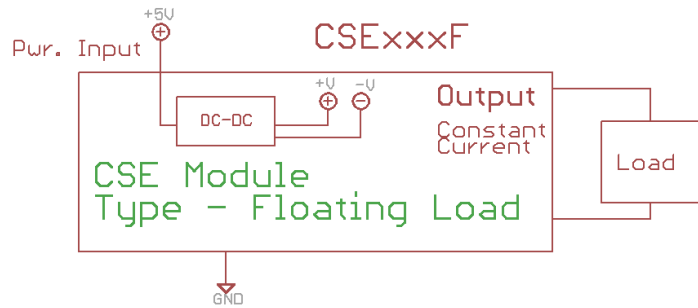
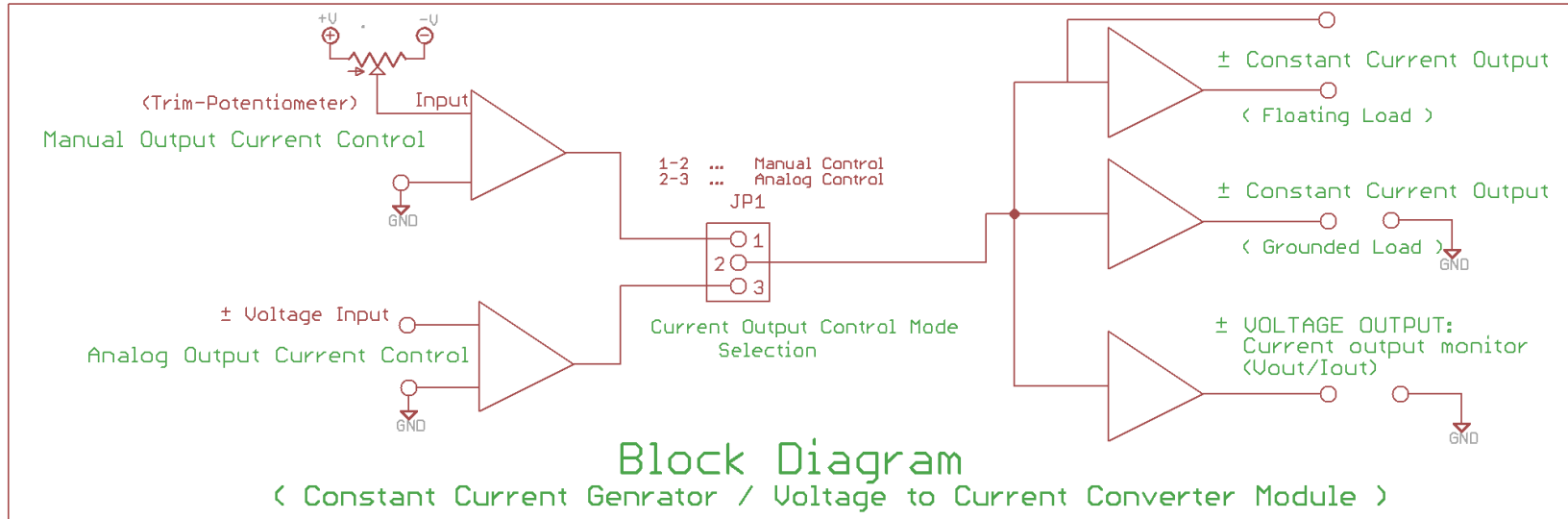
General Specifications ...

CSM Type Module

Desc.	Value	Unit
Operating Temperature	10 to 40	C
DC Supply Voltage	+5V (4.9 to 6.0)	VDC
Signal In / Out connector	BNC or SMA	female
Dimensions (L x H x W)		

(Note: CSM Type modules exclusively have either floating or grounded output and do not include a Current monitor output.)

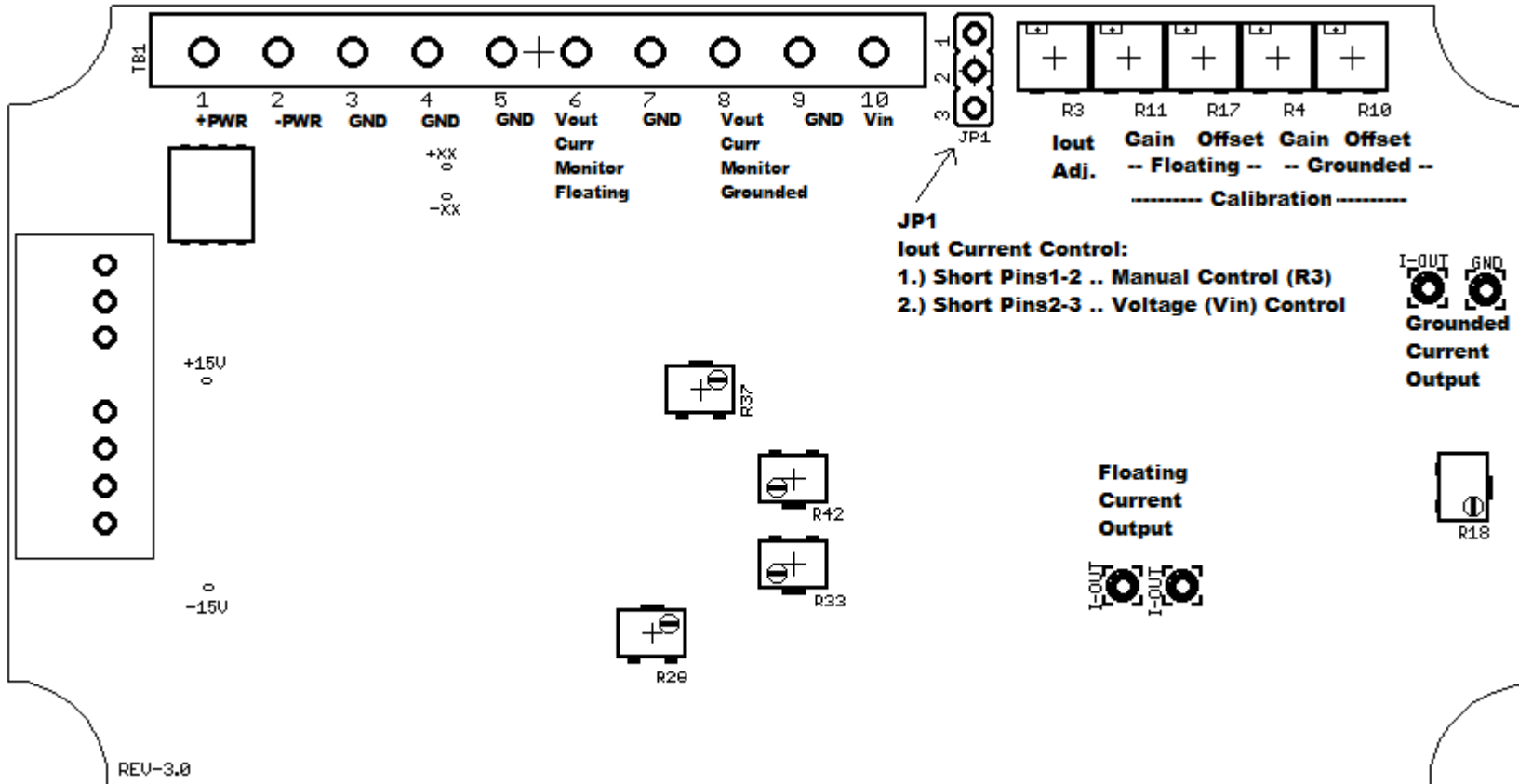
Note: For previous revisions go to <https://www.rdm-apps.com/documentation.html>



RDM-Apps www.rdm-apps.com	
TITLE: CSE-Module Block Diagram-U1-7	
Document Number:	REV: 1.7
Date: 5/29/2017 4:11:08 PM	Sheet: 1/1

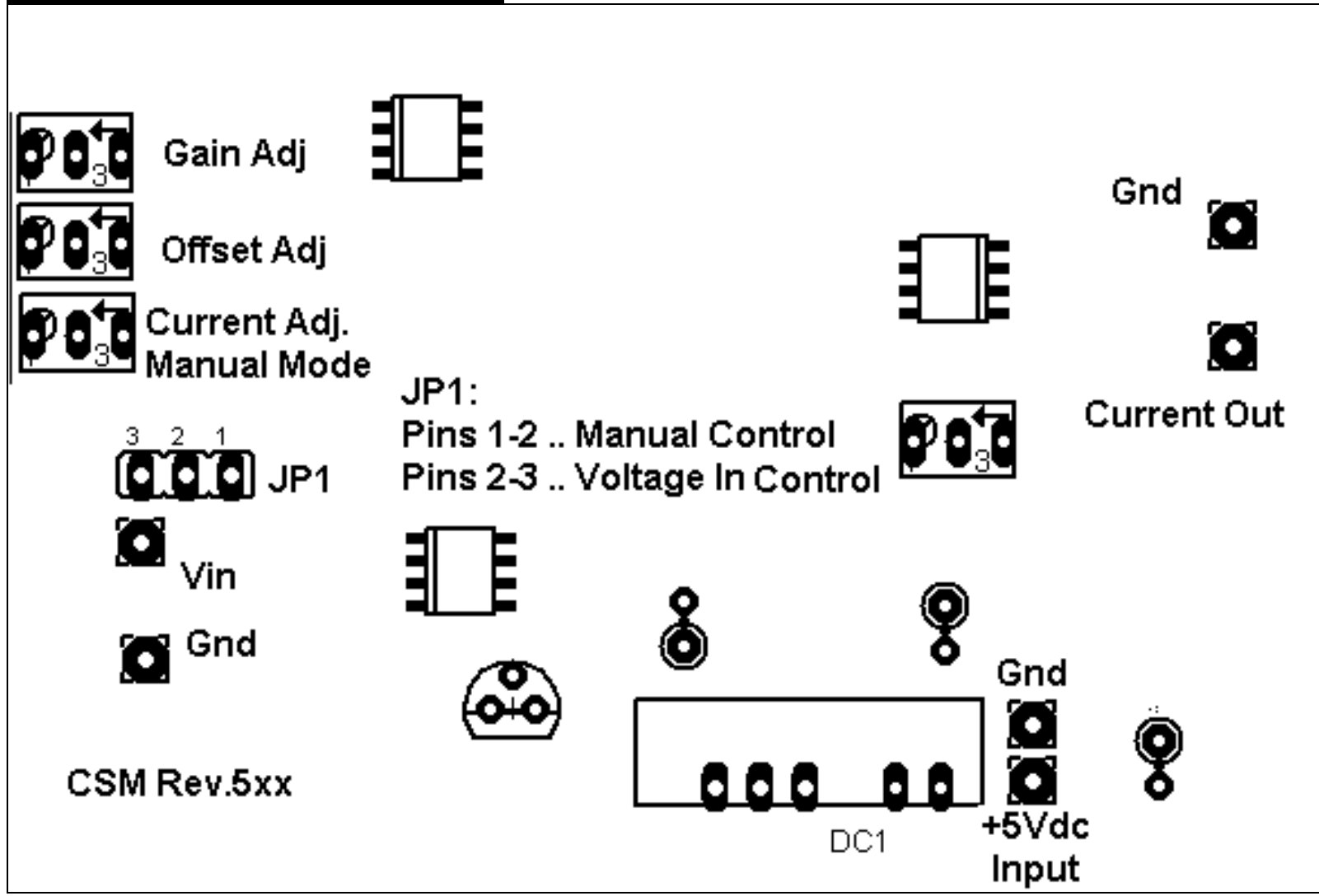
The CSE PCB inter-connections must be shielded! Insufficient shielding will increase the noise-signal ratio which will result in inaccurate CSE output.

CSE Module PCB Layout Rev.3.xx



Note: For previous revisions go to <https://www.rdm-apps.com/documentation.html>

CSM Module PCB Layout



Specifications				
Desc.		CSE10PV	CSE09NV	Unit
Current Output Adjustment Range		±100	±1000	pA
Current Output vs. Voltage Monitor Output		±10.0	±100	pA / V
Current Output Max. Load Impedance		90	9	G ohm
Current Output Accuracy; BETTER THAN (@ 25C ±5C) Rload < 90% of Max.		0.05	0.05	%
Current Output Manual Adj. Resolution		0.2	2	pA
Current Output: Drift; less than		0.02	0.1	pA / Deg.C
Voltage Monitor Output: Drift		20.0	20.0	uV / Deg.C
Voltage Monitor Output: Noise		20.0	20.0	uVp-p
Voltage Monitor Output: Impedance		1.0	1.0	K ohm
Voltage Monitor Output: Max. load current		±10.0	±10.0	mA

Specifications				
Desc.	CSE08NV	CSE07NV	CSE06UV	Unit
Current Output Adjustment Range	±10	±100	±1000	nA
Current Output vs. Voltage Monitor Output	±1.0	±10.0	±100	nA / V
Max. Load Impedance	900	90	9	M ohm
Current Output Accuracy; BETTER THAN (@ 25C ±5C) Rload < 90% of Max.	0.1	0.1	0.1	%
Current Output Manual Adj. Resolution	0.02	0.2	2	nA
Current Output: Drift; less than	0.01	0.01	0.01	nA / Deg.C
Voltage Output: Drift	20.0	20.0	20.0	uV / Deg.C
Voltage Output: Noise	20.0	20.0	20.0	uVp-p
Voltage Monitor Output: Impedance	1.0	1.0	1.0	K ohm
Voltage Monitor Output: Max. load current	±10.0	±10.0	±10.0	mA

Specifications				
Desc.	CSE05UV	CSE04UV	CSE03MV	Unit
Current Output Adjustment Range	±10	±100	±1000	uA
Current Output vs. Voltage Monitor Output	±1.0	±10.0	±100	uA / V
Max. Load Impedance	900	90	9	K ohm
Current Output Accuracy; BETTER THAN (@ 25C ±5C) Rload < 90% of Max.	0.1	0.1	0.1	%
Current Output Manual Adj. Resolution	0.02	0.2	2	uA
Current Output: Drift; less than	0.1	0.1	1.0	nA / Deg.C
Voltage Output: Drift	20.0	20.0	20.0	uV / Deg.C
Voltage Output: Noise	20.0	20.0	20.0	uVp-p
Voltage Monitor Output: Impedance	1.0	1.0	1.0	K ohm
Voltage Monitor Output: Max. load current	±10.0	±10.0	±10.0	mA

Continue Specs to next page ...

Specifications		
Desc.	CSE02MV	Unit
Current Output Adjustment Range	±10	mA
Current Output vs. Voltage Monitor Output	±1.0	mA / V
Max. Load Impedance	900	ohm
Current Output Accuracy; BETTER THAN (@ 25C ±5C) Rload <= 100% of Max.	0.1	%
Current Output Manual Adj. Resolution	0.02	mA
Current Output: Drift; less than	2.0	nA / Deg.C
Voltage Output: Drift	30.0	uV / Deg.C
Voltage Output: Noise	35.0	uVp-p
Voltage Monitor Output: Impedance	1.0	K ohm
Voltage Monitor Output: Max. load current	±10.0	mA

Gain / Offset Calibration Procedure:

Required equipment:

- 1.) An accurate ±10vdc voltage source.
- 2.) A current meter with accuracy better than 0.1% of the CSE full current range output.

Required Conditions::

- 1.) CSE Module must be jumpered for Analog Voltage Control Mode (JP1 pins 2-3).
- 2.) CSE Module must have required DC power applied.
- 3.) Connect voltage source to CSE module voltage input (Vin) connector.
- 4.) Connect current meter to the applicable CSE module current output (Iout) connector.
- 5.) Allow CSE module to warm up for at least 3 mins. Before continuing to the procedure.

Procedure exclusively for Grounded or Floating current outputs:

- 1.) Use your voltage source to apply 0.000V to the CSE voltage input (Vin) connector. Adjust "OFFSET" trim-pot until the CSE module current output (current meter) reads zero amps ... within 0.1% of the CSE full range output.
- 2.) Apply +5VDC to the CSE voltage input and adjust "GAIN" trim-pot to the required output current. For example, if your CSE module has a full range output of ±10uA and the Vin / Iout (Input / Output) ratio is 1V/uA then the current output should be +5uA. Conversely , a -5VDC input should result in a -5uA output.

Note(s): you will probably have to repeat procedure steps 1 and 2 a couple of times to assure proper calibration. If the Gain adjustment potentiometer is set to one of the extreme top or bottom extents extremely high or low gain states can occur which may cause confusion when making sequential offset and gain adjustments. Also, we advise you adjust the gain using input voltages that are mid-range values.