



October 1, 2009
0-1mA Output Option Document Revision B
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-C21 (formerly DOC2.1) Single II Demand Meters
-C23 (formerly DOC2.3) Triple II Demand Meters
-C24 (formerly DOC2.4) Quad II Demand Meters

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CERTIFICATION

Bitronics LLC certifies that the calibration of its products are based on measurements using equipment whose calibration is traceable to the United States National Institute of Standards Technology (NIST).

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INSTALLATION AND MAINTENANCE

Bitronics' products are designed for ease of installation and maintenance. As with any product of this nature, however, such installation and maintenance can present electrical hazards and should only be performed by properly trained and qualified personnel. If the equipment is used in a manner not specified by Bitronics, the protection provided by the equipment may be impaired.

WARRANTY AND ASSISTANCE

Products manufactured by Bitronics LLC are warranted against defects in materials and workmanship for a period of thirty-six (36) months from the date of their original shipment from the factory. Products repaired at the factory are likewise warranted for eighteen (18) months from the date the repaired product is shipped, or for the remainder of the product's original Warranty, whichever is greater. Obligation under this warranty is limited to repairing or replacing, at Bitronics' factory, any part or parts which Bitronics' examination shows to be defective. Warranties only apply to products subject to normal use and service. There are no warranties, obligations, liabilities for consequential damages, or other liabilities on the part of Bitronics except this Warranty covering the repair of defective materials. The warranties of merchantability and fitness for a particular purpose are expressly excluded.

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1.0 DESCRIPTION

1.1 Introduction

The Bitronics 0-1mA dc current output option is designed to interface directly with SCADA systems and remote terminal units without the need for separate transducers. This option allows external access to Bitronics' precision ammeter circuitry. It provides isolated 0-1mA dc output signals proportional to the true RMS value of the meter input current for each channel. Loads from 1-10K ohms can be driven for meter inputs up to 5A ac. Additionally, the three independent channels use a common output ground to simplify external wiring. The current output sources are protected from transient voltages, and are also isolated from the meter input signals. The Bitronics current output option provides all the precision of our Ampere Demand Meter in the same compact package.

1.2 Specifications

Output Current:	0-1mA dc output for 0-5A ac input.
Output Load:	1-10K ohm. Short and Open Circuit protected.
Accuracy:	Better than 0.5%. Typically +/- 0.2% of full-scale into 5K Ohm load.
Maximum Output Voltage:	
Temperature Range:	-20C to 70C

1.3 Circuit Description

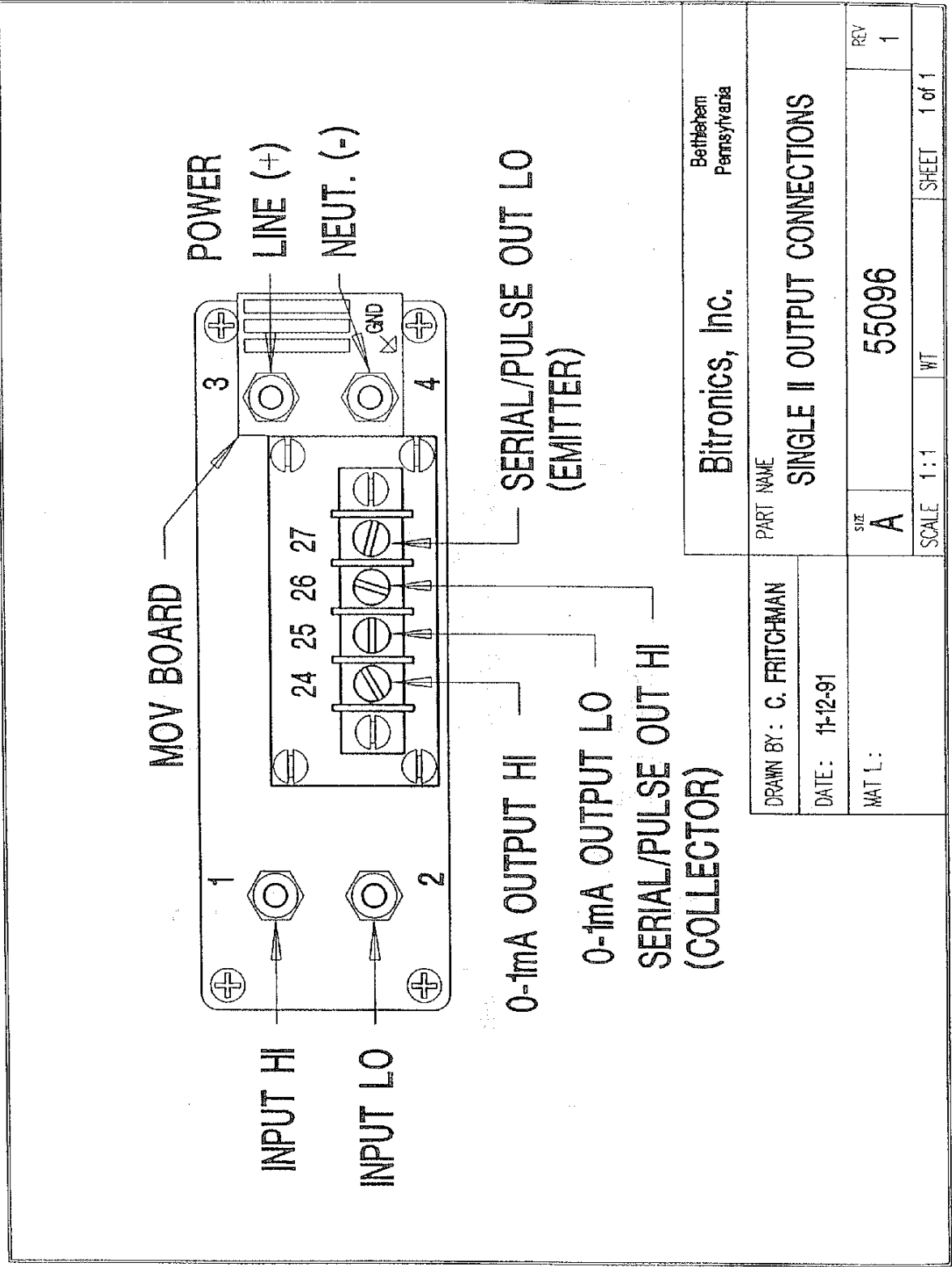
The circuit for each channel consists of two high accuracy instrumentation amplifiers, four matched resistors, and a sense resistor and trim (see drawing A-55058). Amplifier U3 drives current, proportional to the input voltage at R4, through resistor network of R5 and VR1 and into the load. The voltage created across these resistors is used to adjust the input of U3 so that its output is a constant current, independent of load. Amplifier U2 is used to make sure' all output current flows through the load, not back through the resistor R3. Capacitor C8 forms a filter to block input ripple, while C9, 01, and R6 provide output protection for the circuit. An additional resistor in series with the current return provides further protection from external surges (drawing A-55059). The output low from all phases can be connected in common if desired.

The power supply is located on the current driver card, and consists of a 5V to +/-10V dc converter. The higher supply voltages allow the amplifiers to- drive output currents into loads up to 10K ohms.

1.4 Current Source Calibration Procedure

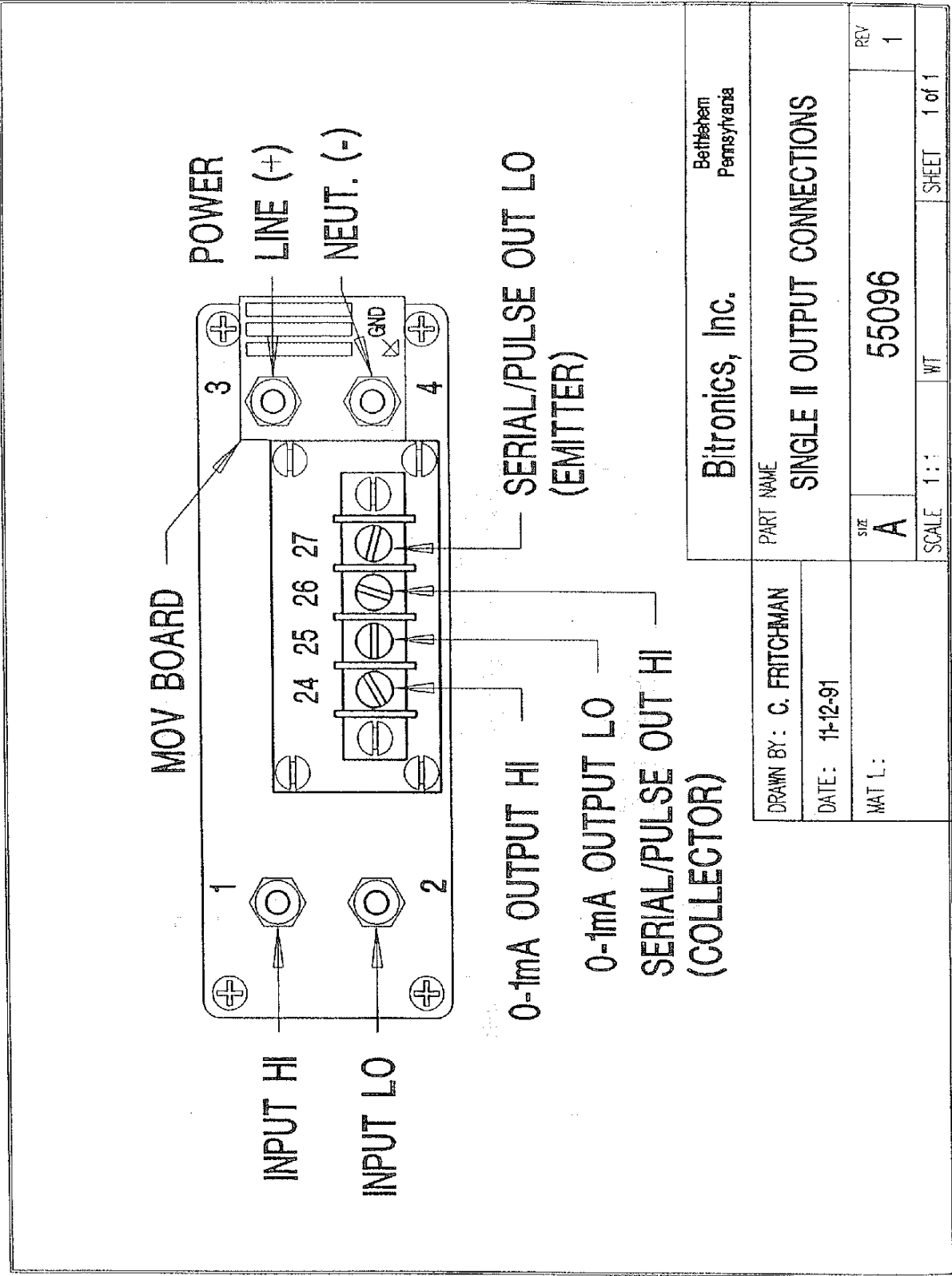
NOTE: ROUTINE CALIBRATION OF THE CURRENT OUTPUT SOURCE IS NOT NECESSARY OR RECOMMENDED. ADJUSTMENTS ARE NEEDED ONLY IF REPAIRS HAVE BEEN MADE TO THE CURRENT SOURCE CIRCUIT.

1. Remove the four outer screws which hold the front face on the instrument.
2. Remove the module for the phase to be adjusted, insert an extender card (BI Part #DSP1), and plug the module (with the output driver board attached) into the extender card.
3. Connect the appropriate current sources and calibrators as shown in the enclosed calibration drawing. Alternative sources and instruments can be used, but their accuracy and precision should be at least four digits, traceable to NBS.
4. Apply 3.000 amperes, 60 Hz calibration current to the instrument with a calibrated 5K-ohm load connected between the current output source common and the phase A output terminal.
5. Measure the voltage across the load resistor with a high resolution digital voltmeter. The voltage should be 3.000V dc +/- 0.015V. If outside this range, adjust the phase A potentiometer (VR1) on the current output board. See NOTE above.
6. Change the 5K ohm load to 1K ohm and 10K ohms. The voltage across these loads should be approximately 0.600 volts and 6.000 volts respectively.
- 7: Repeat steps 4 through 6 for phases Band C, and close the instrument.



Bitronics, Inc.		Bethlehem Pennsylvania	
PART NAME			
SINGLE II OUTPUT CONNECTIONS			
SIZE	55096	REV	1
A			
SCALE	1:1	WT	SHEET 1 of 1

DRAWN BY: C. FRITCHMAN	
DATE: 11-12-91	
MAT L:	



Bitronics, Inc.
Bethlehem
Pennsylvania

DRAWN BY: C. FRITCHMAN		PART NAME	
DATE: 11-12-91		SINGLE II OUTPUT CONNECTIONS	
MAT L:		SIZE	REV
		A	1
		SCALE 1:1	WT
		SHEET 1 of 1	

CT Connections

- 1 Phase A HI
- 2 Phase A LO
- 3 Phase B HI
- 4 Phase B LO
- 5 Phase C HI
- 6 Phase C LO
- 22 Neutral HI
- 23 Neutral LO

Auxiliary Power Connections

- 7 Auxiliary Power Connection
- 8 Auxiliary Power Connection

RS232 or Pulse Output Option (cont.)

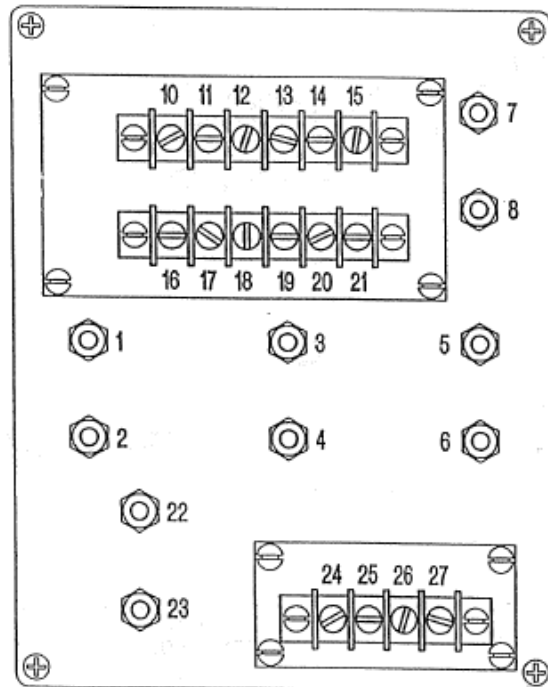
- 12 Phase B Collector
- 13 Phase B Emitter
- 14 Phase C Collector
- 15 Phase C Emitter
- 26 Neutral Collector
- 27 Neutral Emitter

0-1mA dc Output Option Connections

- 16 Phase A HI
- 17 Phase A LO
- 18 Phase B HI
- 19 Phase B LO
- 20 Phase C HI
- 21 Phase C LO
- 24 Neutral HI
- 25 Neutral LO

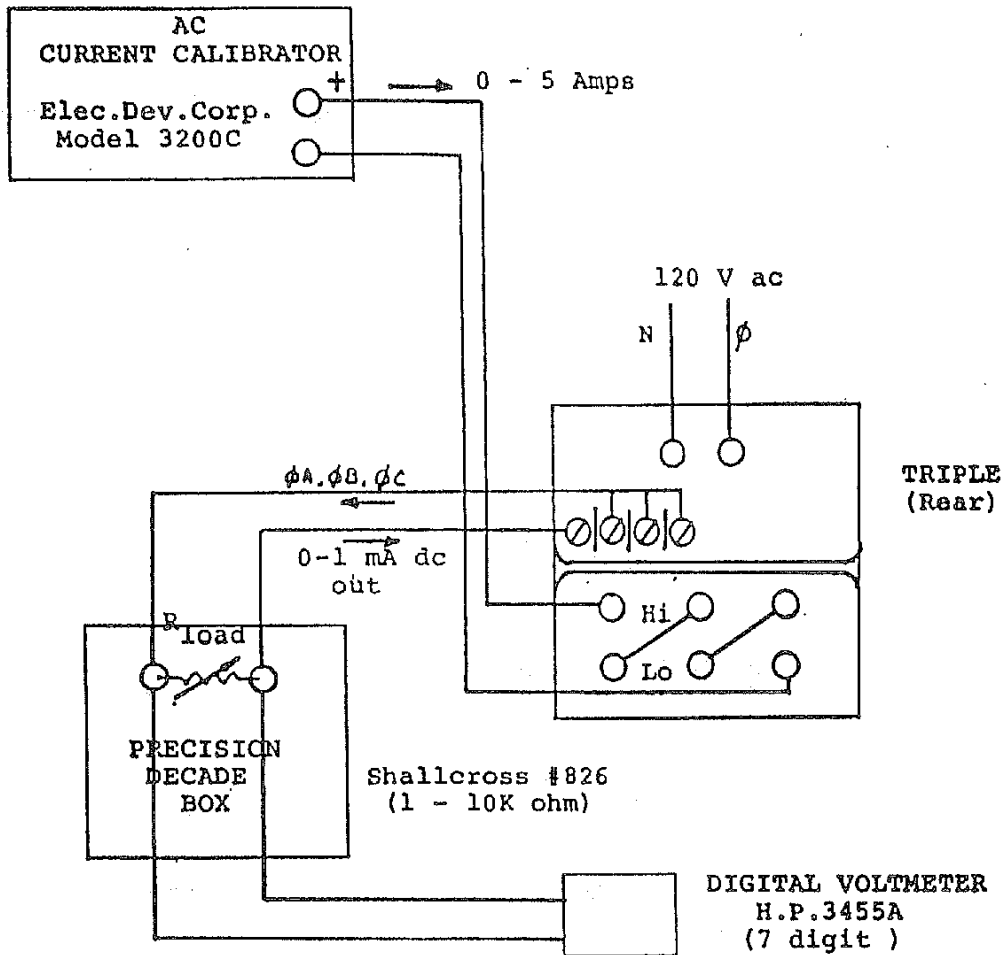
Either RS232 or Pulse Output Option Connections

- 10 Phase A Collector
- 11 Phase A Emitter



		Bitronics, Inc.		Bethlehem Pennsylvania
DRAWN BY: G. FRITZMAN	DATE: 3-4-91	PART NAME: QUAD II OPTIONS CONNECTIONS		
REF. A-55095 & A-55096 FOR SIGNAL ASSIGNMENT		REV A	A-55097	
SCALE 1:1		VI	SHEET	

ZONE	LTR	DESCRIPTION	DATE	APPROVED
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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONS \pm ANGLES \pm 3 PLACE DECIMALS \pm 2 PLACE DECIMALS \pm MATL/FINISH	BITRONICS, INC. BETHLEHEM, PA		0-1 mA dc CURRENT SOURCE OUTPUT CALIBRATION	
	PREPARED	<i>WH</i>	4/18/88	PART NAME
	CHECKED			
	ENGINEER			
		SIZE B	CODE IDENT NO.	DRAWING NO.
		SCALE	WT	SHEET

Revision	Date	Changes	By
A	01/30/2009	Update Bitronics Name, Logo	E. Demicco
B	10/01/09	Updated logos and cover page	MarCom
C			



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