

Model 3568-V2A
32-channel Calibration Relay
INSTRUCTION MANUAL

May, 1991

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Warranty	
Schematic Drawing #122229-C-6085 "A" Board	See Reply Card Following Warranty
Schematic Drawing #122229-C-6088 "B" Board	See Reply Card Following Warranty
KPG:rem(WP)	

KineticSystems Corporation

Standardized Data Acquisition and Control Systems

3568

32-channel Calibration Relay

ADVANCE INFORMATION

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FEATURES

- 32 channels
- Programmable on a per-channel basis

APPLICATIONS

- Jet and rocket engine testing
- Data acquisition systems with per-channel calibration requirements

GENERAL DESCRIPTION

The Model 3568 is a double-width CAMAC module containing 32 two-pole, double-throw relays for calibrating individual analog channels in data acquisition systems. Analog calibration requirements for a data acquisition system generally fall into one of the following categories:

1. The initial calibration and subsequent field calibration of the analog modules are sufficient to maintain the desired accuracy of the measurements.
2. Calibration can be accomplished by applying precision voltage levels to several channels of a multiplexed analog-to-digital subsystem. Often these channels are set to +80% full scale, zero volts, and -80% full scale.
3. Calibration of the data acquisition system must be performed on a channel-by-channel basis. This may be required to meet customer certification specifications or to achieve the desired accuracy. For systems that contain active elements (amplifiers, filters, etc.) ahead of the multiplexer, the calibration of these elements can only be accomplished by manual calibration or per-channel switching of a calibration source.

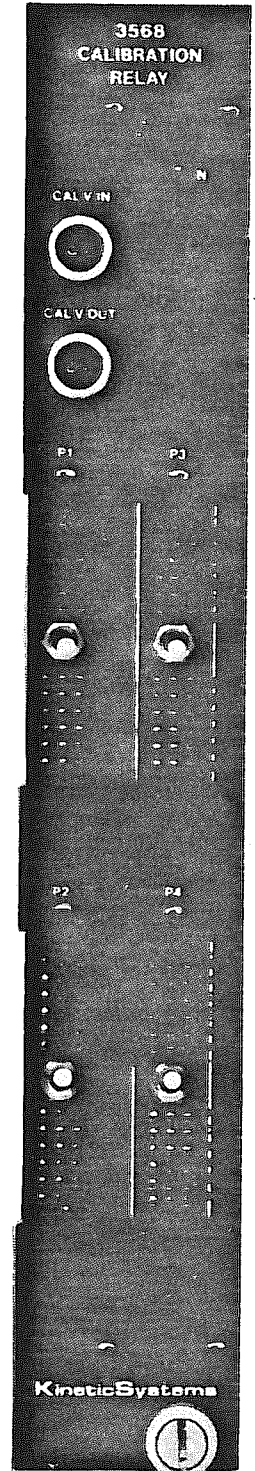
The 3568 module is intended for applications that fall into the third category. Wiring from the transducers is brought into the 3568 via two AMP, 36-contact, high-density, rectangular connectors mounted on the front panel. Two additional 36-contact AMP connectors provide the output path to modules such as the 3516 32-channel ADC or to signal conditioning "front end." Two front-panel LEMO connectors allow the voltage source to be "passed through" several 3568s. A computer-programmable source, such as the EDC Model 501J Voltage Calibrator, provides sufficient accuracy for most applications.

Note that this module is intended for calibration of voltage-input data acquisition channels (monitoring thermocouples, etc.) and cannot be used between RTDs, strain gages, etc. and their associated bridge modules.

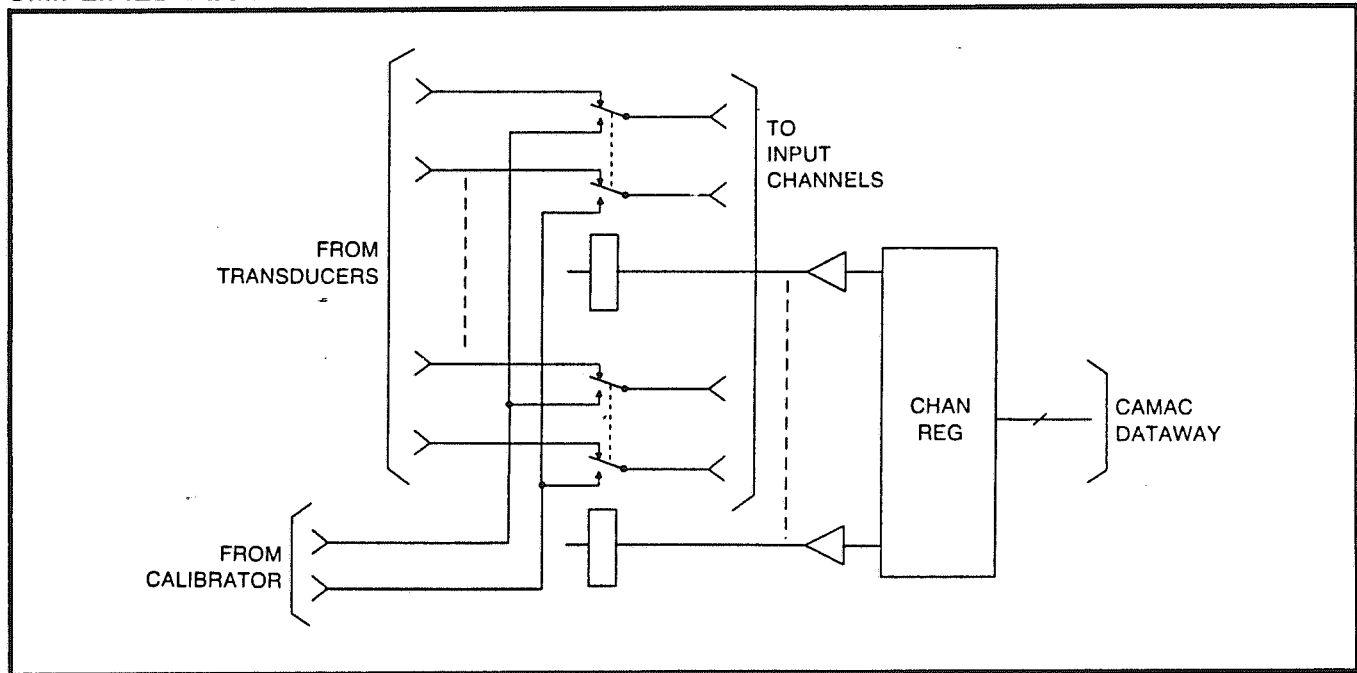
FUNCTION CODES

Command	Q	Action
F(0)·A(0) RD1	1	Reads the Channel Selection register for Channels 1 through 16.
F(0)·A(1) RD1	1	Reads the Channel Selection register for Channels 17 through 32.
F(9)·A(0) CLR	1	Clears both Channel Selection registers.
F(16)·A(0) WT1	1	Writes the Channel Selection register for Channels 1 through 16.
F(16)·A(1) WT1	1	Writes the Channel Selection register for Channels 17 through 32.
F(25)·A(0) XEQ	1	Sets all bits in both Channel Selection registers TRUE (causes all channels to be connected to the calibration source).
Z·S2 ZED		Clears both Channel Selection registers.

Note: X = 1 for all valid addressed commands.



SIMPLIFIED BLOCK DIAGRAM



OPERATION

The balanced signal path for each channel is normally "straight through," input to output. Two F(16) commands allow users to select, on a channel-by-channel basis, output paths that are connected to the calibration source. Generally, channels with the same gain will be grouped for calibration by this selection. All channels can be *cleared* (returned to "straight through") by an F(9)·A(0) command or *set* (connected to the calibration source) by an F(25)·A(0) command. A LED on the front panel flashes whenever the module is addressed.

POWER REQUIREMENTS

+ 6 volts — 975 mA

ORDERING INFORMATION

Model 3568-V2A — 32-channel Calibration Relay
Accessories — Model 3516 32-channel, Scanning A/D Converter
 Model 5855-A30J Cable Assembly (two required)
 Model 5944-Z1A Mating Connector (two connectors required)
 Model 1854-A2A Termination Panel with two Model 5855-B30J Cables

MODULE CONNECTIONS

External signals are brought into the 3568 via two AMP, 36 contact, high density, rectangular connectors mounted on the front panel. P1 is the input connector for channels 1-16, P3 for channels 17-32. Two model 5944-Z1A mating connectors are required to connect to inputs P1 and P3. Two additional 36 contact AMP connectors provide the output path from the 3568 to modules such as the 3516 32-channel ADC or to a signal conditioning front end. P2 is the output connector for channels 1-16, P4 is the output connector for channels 17-32. Two model 5866-A30J cables are required to connect the 3568 output connectors to a 3516 32-channel ADC or to a signal conditioning front end. (See pages 4-7 for 3568 input and output connector pinouts.)

A calibration voltage is brought into the 3568 module via a two-pin LEMO connector mounted on the front panel. Two front panel LEMO connectors are provided to allow the calibration voltage to be passed through several 3568s.

WRITE INSTRUCTIONS

The model 3568 contains two 16-bit channel selection registers. Two F(16) commands allow the user to select, on a channel-by-channel basis, output paths that are connected to the calibration source. By using the CAMAC command F(16)A(0), channels 1-16 may be selected. By using the CAMAC command F(16)A(1), channels 17-32 may be selected.

All channels can be cleared (returned to the straight through path) by an F(9)A(0) command or set (connected to the calibration source) by an F(25)A(0) command.

Data Bits	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01
Channel	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01

WRITE/READ Register 1
F(16)A(0)

Data Bits	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01
Channel	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17

WRITE/READ Register 2
F(16)A(1)

READ INSTRUCTIONS

The model 3568 contains two sets of read buffers that may be enabled to determine the status of the channel selection registers. By using the CAMAC command F(0)A(0), the status for channels 1-16 will be returned. By using the CAMAC command F(0)A(1), the status for channels 17-32 will be returned.

CONNECTOR P 1 PIN-OUT

PIN NO	NOMENCLATURE
A 1	CHANNEL 1 SIGNAL (INPUT)
A 2	CHANNEL 1 RETURN (INPUT)
A 3	CHANNEL 2 SIGNAL (INPUT)
A 4	CHANNEL 2 RETURN (INPUT)
A 5	CHANNEL 3 SIGNAL (INPUT)
A 6	CHANNEL 3 RETURN (INPUT)
A 7	CHANNEL 4 SIGNAL (INPUT)
A 8	CHANNEL 4 RETURN (INPUT)
A 9	CHANNEL 5 SIGNAL (INPUT)
A10	CHANNEL 5 RETURN (INPUT)
A11	CHANNEL 6 SIGNAL (INPUT)
A12	CHANNEL 6 RETURN (INPUT)
B 1	CHANNEL 7 SIGNAL (INPUT)
B 2	CHANNEL 7 RETURN (INPUT)
B 3	CHANNEL 8 SIGNAL (INPUT)
B 4	CHANNEL 8 RETURN (INPUT)
B 5	CHANNEL 9 SIGNAL (INPUT)
B 6	CHANNEL 9 RETURN (INPUT)
B 7	CHANNEL 10 SIGNAL (INPUT)
B 8	CHANNEL 10 RETURN (INPUT)
B 9	CHANNEL 11 SIGNAL (INPUT)
B10	CHANNEL 11 RETURN (INPUT)
B11	CHANNEL 12 SIGNAL (INPUT)
B12	CHANNEL 12 RETURN (INPUT)
C 1	CHANNEL 13 SIGNAL (INPUT)
C 2	CHANNEL 13 RETURN (INPUT)
C 3	CHANNEL 14 SIGNAL (INPUT)
C 4	CHANNEL 14 RETURN (INPUT)
C 5	CHANNEL 15 SIGNAL (INPUT)
C 6	CHANNEL 15 RETURN (INPUT)
C 7	CHANNEL 16 SIGNAL (INPUT)
C 8	CHANNEL 16 RETURN (INPUT)
C 9	DIGITAL GROUND
C10	DIGITAL GROUND
C11	DIGITAL GROUND
C12	DIGITAL GROUND

CONNECTOR P 2 PIN-OUT

PIN NO	NOMENCLATURE
A 1	CHANNEL 1 SIGNAL (OUTPUT)
A 2	CHANNEL 1 RETURN (OUTPUT)
A 3	CHANNEL 2 SIGNAL (OUTPUT)
A 4	CHANNEL 2 RETURN (OUTPUT)
A 5	CHANNEL 3 SIGNAL (OUTPUT)
A 6	CHANNEL 3 RETURN (OUTPUT)
A 7	CHANNEL 4 SIGNAL (OUTPUT)
A 8	CHANNEL 4 RETURN (OUTPUT)
A 9	CHANNEL 5 SIGNAL (OUTPUT)
A10	CHANNEL 5 RETURN (OUTPUT)
A11	CHANNEL 6 SIGNAL (OUTPUT)
A12	CHANNEL 6 RETURN (OUTPUT)
B 1	CHANNEL 7 SIGNAL (OUTPUT)
B 2	CHANNEL 7 RETURN (OUTPUT)
B 3	CHANNEL 8 SIGNAL (OUTPUT)
B 4	CHANNEL 8 RETURN (OUTPUT)
B 5	CHANNEL 9 SIGNAL (OUTPUT)
B 6	CHANNEL 9 RETURN (OUTPUT)
B 7	CHANNEL 10 SIGNAL (OUTPUT)
B 8	CHANNEL 10 RETURN (OUTPUT)
B 9	CHANNEL 11 SIGNAL (OUTPUT)
B10	CHANNEL 11 RETURN (OUTPUT)
B11	CHANNEL 12 SIGNAL (OUTPUT)
B12	CHANNEL 12 RETURN (OUTPUT)
C 1	CHANNEL 13 SIGNAL (OUTPUT)
C 2	CHANNEL 13 RETURN (OUTPUT)
C 3	CHANNEL 14 SIGNAL (OUTPUT)
C 4	CHANNEL 14 RETURN (OUTPUT)
C 5	CHANNEL 15 SIGNAL (OUTPUT)
C 6	CHANNEL 15 RETURN (OUTPUT)
C 7	CHANNEL 16 SIGNAL (OUTPUT)
C 8	CHANNEL 16 RETURN (OUTPUT)
C 9	DIGITAL GROUND
C10	DIGITAL GROUND
C11	DIGITAL GROUND
C12	DIGITAL GROUND

CONNECTOR P 3 PIN-OUT

PIN NO	NOMENCLATURE
A 1	CHANNEL 17 SIGNAL (INPUT)
A 2	CHANNEL 17 RETURN (INPUT)
A 3	CHANNEL 18 SIGNAL (INPUT)
A 4	CHANNEL 18 RETURN (INPUT)
A 5	CHANNEL 19 SIGNAL (INPUT)
A 6	CHANNEL 19 RETURN (INPUT)
A 7	CHANNEL 20 SIGNAL (INPUT)
A 8	CHANNEL 20 RETURN (INPUT)
A 9	CHANNEL 21 SIGNAL (INPUT)
A10	CHANNEL 21 RETURN (INPUT)
A11	CHANNEL 22 SIGNAL (INPUT)
A12	CHANNEL 22 RETURN (INPUT)
B 1	CHANNEL 23 SIGNAL (INPUT)
B 2	CHANNEL 23 RETURN (INPUT)
B 3	CHANNEL 24 SIGNAL (INPUT)
B 4	CHANNEL 24 RETURN (INPUT)
B 5	CHANNEL 25 SIGNAL (INPUT)
B 6	CHANNEL 25 RETURN (INPUT)
B 7	CHANNEL 26 SIGNAL (INPUT)
B 8	CHANNEL 26 RETURN (INPUT)
B 9	CHANNEL 27 SIGNAL (INPUT)
B10	CHANNEL 27 RETURN (INPUT)
B11	CHANNEL 28 SIGNAL (INPUT)
B12	CHANNEL 28 RETURN (INPUT)
C 1	CHANNEL 29 SIGNAL (INPUT)
C 2	CHANNEL 29 RETURN (INPUT)
C 3	CHANNEL 30 SIGNAL (INPUT)
C 4	CHANNEL 30 RETURN (INPUT)
C 5	CHANNEL 31 SIGNAL (INPUT)
C 6	CHANNEL 31 RETURN (INPUT)
C 7	CHANNEL 32 SIGNAL (INPUT)
C 8	CHANNEL 32 RETURN (INPUT)
C 9	DIGITAL GROUND
C10	DIGITAL GROUND
C11	DIGITAL GROUND
C12	DIGITAL GROUND

CONNECTOR P 4 PIN-OUT

PIN NO	NOMENCLATURE
A 1	CHANNEL 17 SIGNAL (OUTPUT)
A 2	CHANNEL 17 RETURN (OUTPUT)
A 3	CHANNEL 18 SIGNAL (OUTPUT)
A 4	CHANNEL 18 RETURN (OUTPUT)
A 5	CHANNEL 19 SIGNAL (OUTPUT)
A 6	CHANNEL 19 RETURN (OUTPUT)
A 7	CHANNEL 20 SIGNAL (OUTPUT)
A 8	CHANNEL 20 RETURN (OUTPUT)
A 9	CHANNEL 21 SIGNAL (OUTPUT)
A10	CHANNEL 21 RETURN (OUTPUT)
A11	CHANNEL 22 SIGNAL (OUTPUT)
A12	CHANNEL 22 RETURN (OUTPUT)
B 1	CHANNEL 23 SIGNAL (OUTPUT)
B 2	CHANNEL 23 RETURN (OUTPUT)
B 3	CHANNEL 24 SIGNAL (OUTPUT)
B 4	CHANNEL 24 RETURN (OUTPUT)
B 5	CHANNEL 25 SIGNAL (OUTPUT)
B 6	CHANNEL 25 RETURN (OUTPUT)
B 7	CHANNEL 26 SIGNAL (OUTPUT)
B 8	CHANNEL 26 RETURN (OUTPUT)
B 9	CHANNEL 27 SIGNAL (OUTPUT)
B10	CHANNEL 27 RETURN (OUTPUT)
B11	CHANNEL 28 SIGNAL (OUTPUT)
B12	CHANNEL 28 RETURN (OUTPUT)
C 1	CHANNEL 29 SIGNAL (OUTPUT)
C 2	CHANNEL 29 RETURN (OUTPUT)
C 3	CHANNEL 30 SIGNAL (OUTPUT)
C 4	CHANNEL 30 RETURN (OUTPUT)
C 5	CHANNEL 31 SIGNAL (OUTPUT)
C 6	CHANNEL 31 RETURN (OUTPUT)
C 7	CHANNEL 32 SIGNAL (OUTPUT)
C 8	CHANNEL 32 RETURN (OUTPUT)
C 9	DIGITAL GROUND
C10	DIGITAL GROUND
C11	DIGITAL GROUND
C12	DIGITAL GROUND