



Model 6906 VMEbus

Six Programmable Resistor Channels



FEATURES:

- 12 bit resolution
- Connections via Front panel, P2 or both
- Isolated output
- Only +5V and +12 VDC required
- No adjustment or trimming required
- Commercial and Military Applications
- Conducted cooled versions available
- Background Self-Test

DESCRIPTION:

The 6906 is a single slot VMEbus card that incorporates up to six isolated programmable resistor output channels that simulate resistive transducers (e.g. thermocouple, TAT probe...etc). The output is always a true resistor. The card is designed to accommodate multiple resistor values or mixed configurations (different channels with different values) up to a total of 6 channels.

This board is available to operate over a "C" or "M" operating temperature range and can also be supplied as an Enhanced Reliability design. (See part number designation). The "C" version operates is populated with standard high quality commercial semiconductors. The "M" version is populated with high quality military semiconductors.

A self-test feature, when addressed, disconnects the outputs and programs two predetermined resistance values to check system performance.

In addition, the PC board incorporates a thermal layer that conducts heat from the components to the enclosure. Conduction cooling, using wedge locks, can be specified by adding suffix "W" to part number.

SPECIFICATIONS:

Resistance range:	(See Configuration Table)
Resolution:	(See Configuration Table)
Accuracy:	0.25% FS
Maximum Voltage:	100 max. depending on max. power (See Configuration Table)
Power:	+5 VDC \pm 1% at 500mA; +12 VDC \pm 5% at 750mA
Temperature, operating:	"C": 0°C to +70°C "M": -55°C to +85°C "W": -55°C to +85°C
Temperature, storage:	-65°C to +105°C
Connector:	DE15P; Mating Connector: DE15S (<i>Not Supplied</i>)
Size:	6U (9.2" height), 4HP (0.8" width) 233.4 mm x 20.3 mm x 160 mm deep
MTBF:	54,310 Hrs. (35°C Ground Fixed, Controlled (Bellcore TR-332 issue 5)) 27,155 Hrs. (35°C Ground Fixed, uncontrolled (Bellcore TR-332 issue 5))

I/O CONFIGURATION:

The VMEbus interface can be user configurable to respond to A32:16, A24:16 and A16:16 DTB cycles. In the A32 mode, unit responds to address modifier OD (Extended Supervisory Data Access) or 09 (Extended Non-Privileged Data Access). The base address can be set with switches anywhere in the 4 Gigabyte address space on 256 byte boundaries. In the A24 mode, unit responds to address modifier 3D (Standard Supervisory Data Access) or 39 (Standard Non-Privileged Data Access). The base address can be set with switches anywhere in the 16 Megabyte address space on 256 byte boundaries. In the A16 mode, unit responds to address modifier 2D (Short Supervisory Access) or 29 (Short Non-Privileged Access) The base address can be set with switches anywhere in the 64 K byte address space on 256 byte boundaries. The interface does not implement interrupt functions but will only transfer data if IACK* is HIGH. The interrupt daisy chain is jumped on board.

REGISTER ADDRESS MAP (ADDRESS = BOARD ADDRESS + OFFSET)

Offset Hex	Register	Read/Write
00	Resistor 1	R/W
02	Resistor 2	R/W
04	Resistor 3	R/W
06	Resistor 4	R/W
08	Resistor 5	R/W
0A	Resistor 6	R/W
0C	Test Mode	R/W
0E	Test Results	R

REGISTER DATA

	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Data Input Code*	X	X	X	X	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
Test Mode	X	X	X	X	X	X	X	X	X	X	X	X	X	T ₂	T ₁	T ₀
Test Results	X	X	X	X	X	X	X	X	X	X	X	X	X	X	R _L	R _H

* The programmed value is the Resolution multiplied by 2^N and adds to the base low-end value (see configuration table).

Data Input Code: “1” = Resistor connected
 “0” = Resistor unconnected

T ₂	T ₁	T ₀	Test Mode:
0	0	0	Normal Mode
0	0	1	Test Resistor 1
0	1	0	Test Resistor 2
0	1	1	Test Resistor 3
1	0	0	Test Resistor 4
1	0	1	Test Resistor 5
1	1	0	Test Resistor 6
1	1	1	Normal Mode

Test Results: R_L: “1” = Low value Resistor test failed
 “0” = Low value Resistor test passed

R_H: “1” = High Value Resistor test failed
 “0” = High Value Resistor test passed

PROCEDURE FOR NORMAL OPERATION

Normal Mode:

- 1) Write "0" (HEX 0000) to Test Mode Register OFFSET HEX of "0C"
This sets device into the normal mode.
- 2) Chan. 1 (resistor 1)
Write to (OFFSET HEX of "00"); the desired resistance for Channel 1 with Data Input bits D11- D0.

Example: D11 = "1", D10-D0 = "0" (HEX 0800) generates a resistance of 2¹¹ times 0.1Ω or 204.8Ω plus the base low end value, if the resolution is 0.1 ohm.

- 3) Chan. 2 (resistor 2)
Write to OFFSET HEX of "02" the desired resistance for Chan. 2 with Data input bits D11- D0.

PROCEDURE FOR TEST MODE OPERATION

Example: Low Value Resistor Test

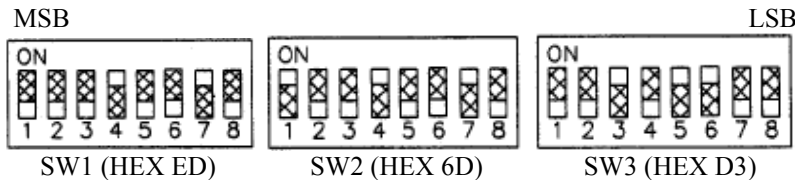
- a) For Resistor 1, set D2-D0 to "001" in Test Mode Register OFFSET HEX "0C"
This sets unit in Test Mode for Resistor 1.
- b) Write (HEX 0000) to Resistor 1 Register OFFSET HEX "00".
- c) Read Test Results Register OFFSET HEX "0E'
Pass - D1 ="0" (HEX 0001), Fail - D1 = "1" (HEX 0003 or 0002)
- d) Repeat Steps a-c for Resistor 2. In Step a, set D2 - D0 to "010" in Test Mode Register OFFSET HEX "0C"
In Step b, write (HEX 0000) to Resistor 2 Register OFFSET HEX "02"
- e) Use similar procedure for Resistors 3-6.

Example: High Value Resistor Test

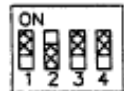
- a) For Resistor 5, set D2-D0 to "101" in Test Mode Register OFFSET HEX "0C"
This sets unit in Test Mode for Resistor 5.
- b) Write (HEX 0FFF) to Resistor 5 Register OFFSET HEX "08".
- c) Read Test Results Register OFFSET HEX "0E'
Pass - D0 ="0" (HEX 0002) , Fail - D0 = "1" (HEX 0003 or 0001)
- d) Repeat Steps a-c for Resistor 6. In Step a, set D2-D0 to "110" in Test Mode Register OFFSET HEX "0C"
In Step b, write (HEX 0FFF) to Resistor 6 Register OFFSET HEX "0A"
- e) Use similar procedure for Resistors 1-4.

Address Configuration

Example: Address Setting - ED6DD3 (ON = "0", OFF = "1")



Example: Address Mode Setting (A16)



SW4 (A16)

ADDRESS MODES			
	A32	A24	A16
SW4-1	ON	OFF	OFF
SW4-2	ON	OFF	ON
SW4-3	NOT USED		
SW4-4	NOT USED		

Connector & Pin Designations

Front Panel Connector (J1)

Pin	Designation	Pin	Designation	Pin	Designation
1	Resistor Channel 1	3	Resistor Channel 3	5	Resistor Channel 5
9	Resistor Channel 1	11	Resistor Channel 3	13	Resistor Channel 5
2	Resistor Channel 2	4	Resistor Channel 4	6	Resistor Channel 6
10	Resistor Channel 2	12	Resistor Channel 4	14	Resistor Channel 6
8	Chassis				

Connector Type: DE15P; Mating Connector: DE15S (Not Supplied)

Rear Panel Connector (P2)

Pin	Designation	Pin	Designation	Pin	Designation
1C	Channel 1	5 C	Channel 3	9 C	Channel 5
2 C	Channel 1	6 C	Channel 3	10 C	Channel 5
3 C	Channel 2	7 C	Channel 4	11 C	Channel 6
4 C	Channel 2	8 C	Channel 4	12 C	Channel 6

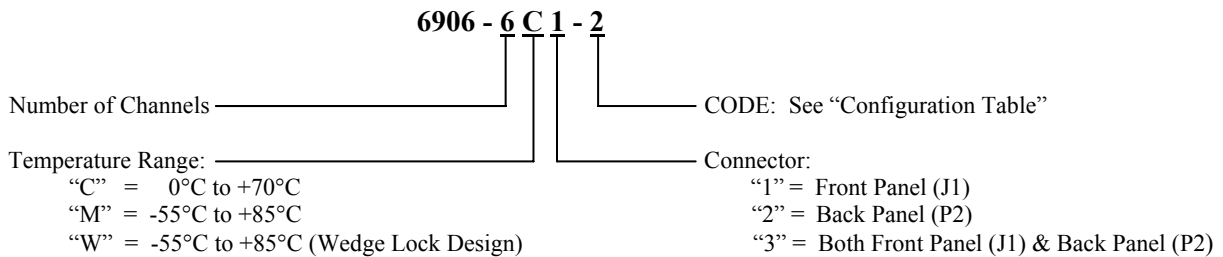
Configuration Table

Code	Resistor Range	Resolution	Maximum Power
1	330Ω – 739.5Ω	0.1 Ω	1 Watt
2	830Ω – 1,649.0Ω	0.2 Ω	1 Watt
3	50Ω – 459.5Ω	0.1 Ω	1 Watt
4	830Ω – 4106Ω	0.8 Ω	1 Watt
6	3 Channels (1,2,3): 50Ω – 459.5Ω 3 Channels (4,5,6): 567Ω – 2204.8Ω	0.1 Ω 0.4 Ω	1 Watt 1 Watt
7	0Ω – 409.5Ω	0.1 Ω	1 Watt
8	567Ω – 2205Ω	0.4 Ω	1 Watt
10	0Ω – 1638Ω	0.4 Ω	1 Watt
11	3 Channels (1,2,3): 1,800Ω – 2,209.5Ω 3 Channels (4,5,6): 8,000Ω – 34,208Ω	0.1 Ω 6.4 Ω	1 Watt 1 Watt
12	245Ω – 1,064Ω	0.2 Ω	1 Watt
13	0Ω – 13,104Ω	3.2 Ω	1 Watt
14	0Ω – 819Ω	0.2 Ω	1 Watt
15	25Ω – 844Ω	0.2 Ω	1 Watt
21	800Ω – 1,209.6Ω	0.1 Ω	1 Watt

Other resistor ranges and mixed configurations can be specified, contact factory.

NOTE: CAUTION must be observed with 0Ω Range since all power is across shunt when programmed for 0Ω.

Ordering Information



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