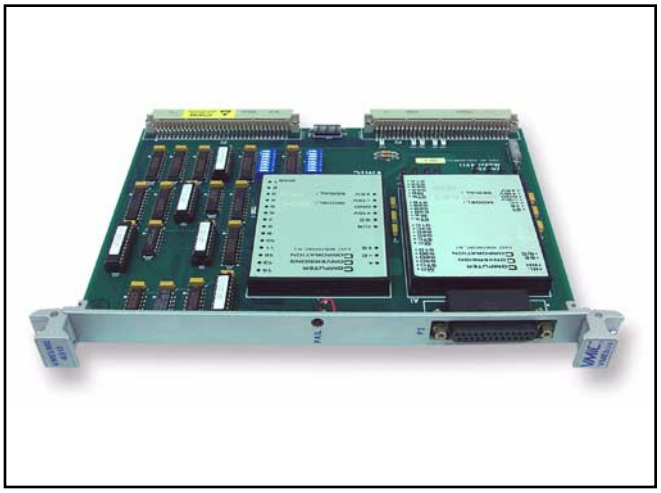
VMIVME-4911
Quad-Channel Multiplexed Synchro/Resolver-to-Digital Converter Board

- 14-bit converter
- Quad-channel multiplexer
- Simultaneous sampling and random access
- Expandable by adding multiplexers
- 3-wire synchro plus reference or 4-wire resolver plus reference
- Internal transformers for 60 and 400 Hz references
- Front panel fail LED
- Double Eurocard form factor
- Supports Built-in-Test for VMIVME-49xx series digital-to-synchro/ resolvers
- Compatible with VMIC's family of Intelligent I/O Controllers



INTRODUCTION — The VMIVME-4911 board is a four-channel, 14-bit multiplexed Synchro/Resolver-to-Digital Converter. The multiplexed input scheme is cost-effective because fewer components and interconnections are required. The product was designed utilizing primarily two modules. A converter module is interconnected to the multiplexer and S&H module to form a four-channel board. All common synchro and resolver line-to-line voltages and frequencies are available.

The VMIVME-4911 is designed to support fault detection and isolation of VMIC's Synchro/Resolver-to-Digital Converter product line (VMIVME-4900 or -4905). When configured in this mode, Channel 0 is jumpered to support signals via the P2 backplane. Channel 0 in this application is not available for processing user inputs. For a thorough understanding of Built-in-Test schemes associated with VMIC's Synchro/Resolver product line, the reader should refer to VMIC's Document No. 825-000000-004.

The Built-in-Test features of this product are supported by jumperable options that allow the user to process real-time signals on three channels while testing is accomplished on Channel 0. If the Built-in-Test is not required, all four channels may be programmed to process real-time input data.

APPLICATIONS — Multiplexed Synchro-to-Digital and Resolver-to-Digital Converters can be used when multiple synchro or resolver inputs are sampled for digital computation or display, and real-time tracking is not required. Multiplexing is found in data logging systems, process monitors, ordnance aiming controls, navigation systems, numerical control, and range instrumentation. The synchro and resolver inputs often represent variables which are analyzed by a computer for monitoring or control.

FUNCTIONAL CHARACTERISTICS

Compatibility: VMEbus specification compatible. Double height form factor.

Input Connector Type: AMP 25-pin D-type (no. 206584-1) PC board connector

Ordering Options

October 28, 1994 800-004911-000 D

VMIVME-4911

Quad-Channel Synchro/Resolver-to-Digital Board [1]
(Dual Height, Quad-Channel with Front Panel Fail LED)

Description	Signal/Ref V Input (VL-L) [3]	Freq. (Hz)	Resolution (Bits)	Board Input Type	Model No. [2] VMIVME-
Multiplexer	90/115	360-440	N/A	Synchro	4911-0B0
Multiplexer	90/115	47-66	N/A	Synchro	4911-0B1
Multiplexer	11.8/26	360-440	N/A	Synchro	4911-0B2
Multiplexer	90/115	360-440	N/A	Resolver	4911-0B3
Multiplexer	26/26	360-440	N/A	Resolver	4911-0B4
Multiplexer	11.8/26	360-440	N/A	Resolver	4911-0B5
Multiplexer	11.8/26	47-66	N/A	Synchro	4911-0B6
Converter/Multiplexer	90/115	360-440	14	Synchro	4911-1B0
Converter/Multiplexer	90/115	47-66	14	Synchro	4911-1B1
Converter/Multiplexer	11.8/26	360-440	14	Synchro	4911-1B2
Converter/Multiplexer	90/115	360-440	14	Resolver	4911-1B3
Converter/Multiplexer	26/26	360-440	14	Resolver	4911-1B4
Converter/Multiplexer	11.8/26	360-440	14	Resolver	4911-1B5
Converter/Multiplexer	11.8/26	47-66	14	Synchro	4911-1B6

Notes

1. Supports Built-in-Test on Digital-to-Synchro/Resolver Boards (VMIVME-4900 Series).
2. B = Access code options.
   The user may select the following VMEbus address modifier access codes:
   0 = Supervisory or nonprivileged
   1 = Supervisory only
   2 = Nonprivileged only
3. Reference Input Voltage equals 26 or 115 VRMS (±20 percent) depending on option selected.

Connector Data

Compatible Cable Connector	AMP 747322-2
Strain Relief Kit	Type D
PC Board Header Connector	AMP 206584-1

For Ordering Information, Call:
1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859
E-mail: info@vmic.com Web Address: www.vmic.com

Input Organization: Four channels, 16 bits wide. Channel 0 is jumper-selectable for front panel or P2 inputs.

Address Modifier Codes: Factory configured via programmed PAL to respond to short supervisory and/or short nonprivileged I/O access according to option ordered, see the Ordering Options.

Addressing Scheme: Four channels selectable by writing to the Control and Status Register (CSR). Address DIP switches provide unlimited short data I/O address map selection.

Fail LED: A front panel Fail LED (red) is provided for quick fault isolation. The LED is illuminated upon power up clear (system reset) and is extinguished upon successful diagnostic execution.

PHYSICAL/ENVIRONMENTAL

Temperature Range: 0 to +55 °C, operating
-20 to +85 °C, storage

Relative Humidity Range: 20 to 80 percent, noncondensing

Cooling: Convection

Power Requirements: +5 V at 610 mA maximum
+15 V at 40 mA [1]
-15 V at 40 mA [1]

Reference Input Voltage:
26 or 115 VRMS (±20 percent) per option selected

TRADEMARKS

1. External power required.

Table 1. Specifications

Apply over reference frequency, reference amplitude, temperature, and power supply ranges; 10 percent signal amplitude variation; and up to 10 percent harmonic distortion in the reference.

PARAMETER	VALUE
Resolution	**14 bits**
Accuracy	**±4.6 Minutes ± 1/2 LSB**
DYNAMIC CHARACTERISTICS	
Signal Sample Rate at Each Signal Input Channel	Once per cycle of the reference processor controlling that input channel.
Conversion Time, Per Channel	120 to 150 µs.
Number of Conversions per Carrier Cycle	
At 400 Hz	15 maximum.
At 60 Hz	100 maximum.
Channel Access	Random, one address per line per channel.
ANALOG INPUT CHARACTERISTICS	
Input Type	Transformer isolation, both reference and signal inputs.
Breakdown Voltage	500 V minimum to ground.

REFERENCE AND SIGNAL CHARACTERISTICS

Synchro Input	Min Z_{IN} L-L (Balanced, Resistive)	Ref Input Voltage (±20%)	Min Ref Z_{IN} (Resistive)
11.8 V L-L, 47 to 66 Hz	19 K	26 VRMS	40 K
11.8 V L-L, 360 to 440 Hz	19 K	26 VRMS	40 K
90 V L-L, 360 to 440 Hz	148 K	115 VRMS	160 K
90 V L-L, 47 to 66 Hz	148 K	115 VRMS	160 K
Resolver Input			
11.8 V L-L, 360 to 440 Hz	26 K	26 VRMS	40 K
26 V L-L, 360 to 440 Hz	57 K	26 VRMS	40 K
90 V L-L, 360 to 440 Hz	198 K	115 VRMS	160 K

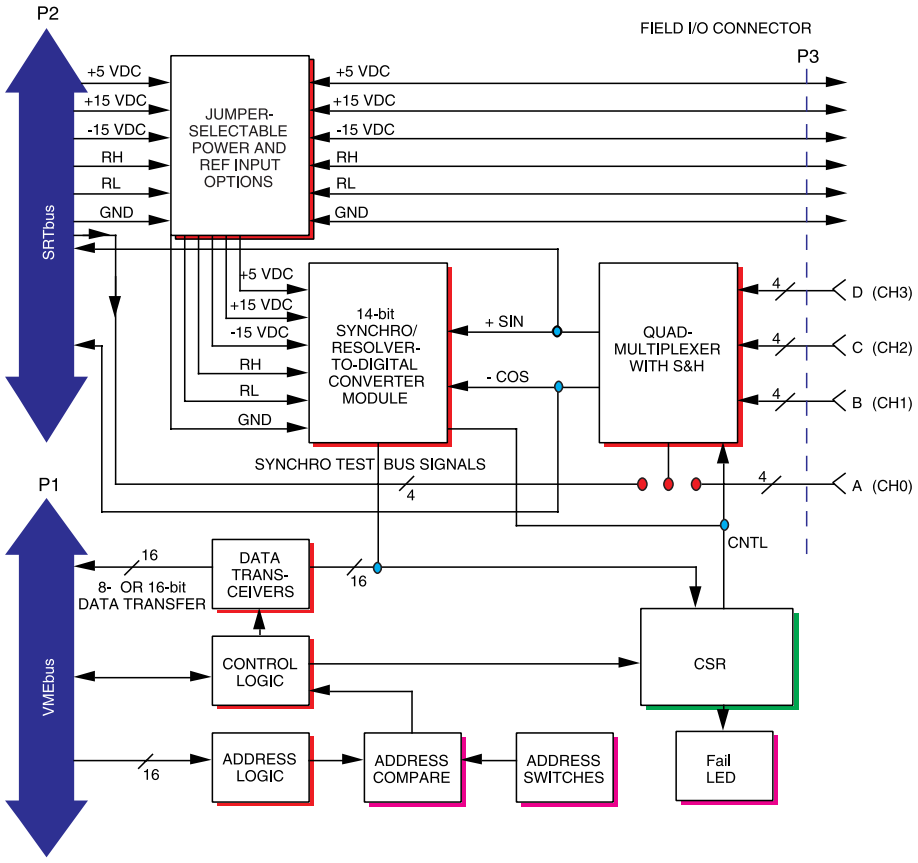
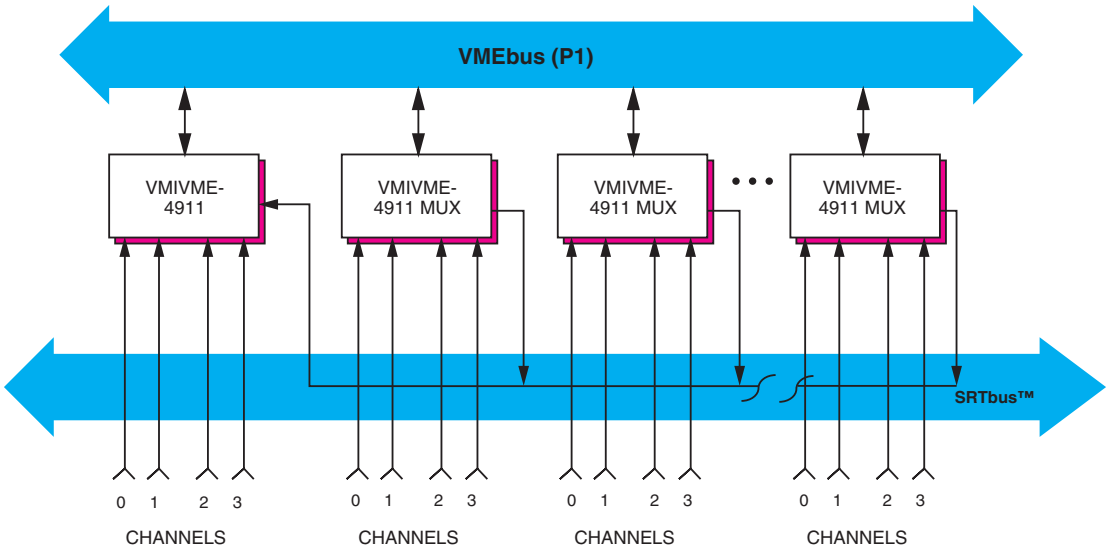


Figure 1. VMIVME-4911 Single Channel Synchro/Resolver-to-Digital Converter Module Functional Block Diagram



This configuration requires the multiplexed signals on P2 be interconnected. The VMIC SRTbus™ backplanes provide the required P2 interconnect.

Figure 2. Low-Cost Synchro/Resolver Input Subsystem Using One VMIVME-4911 with Converter and Multiplexer, and Up to 16 Multiplexer Expansions

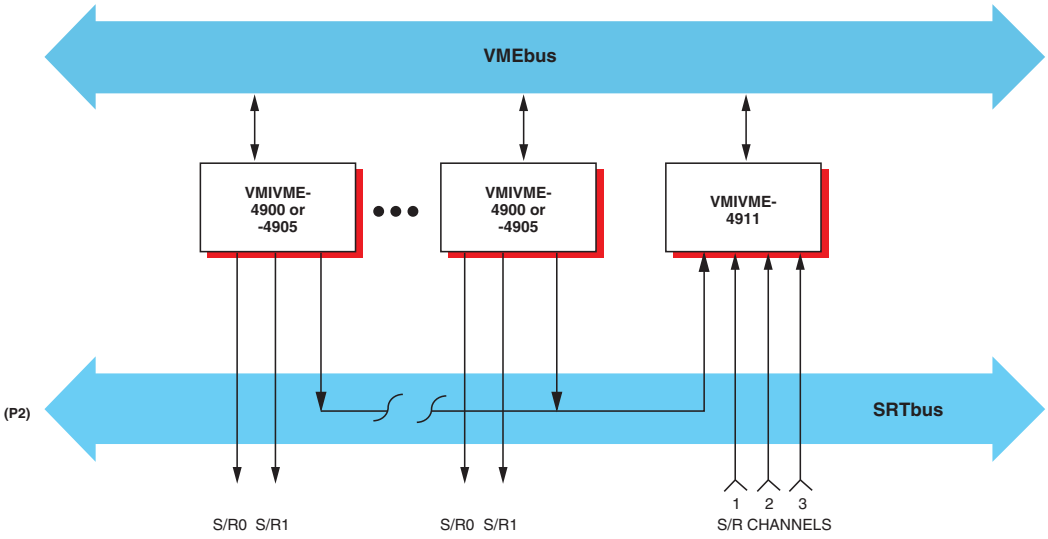


Figure 3. Typical Subsystem Configuration for Testing VMIC's VMIVME-49XX Synchro Output Boards

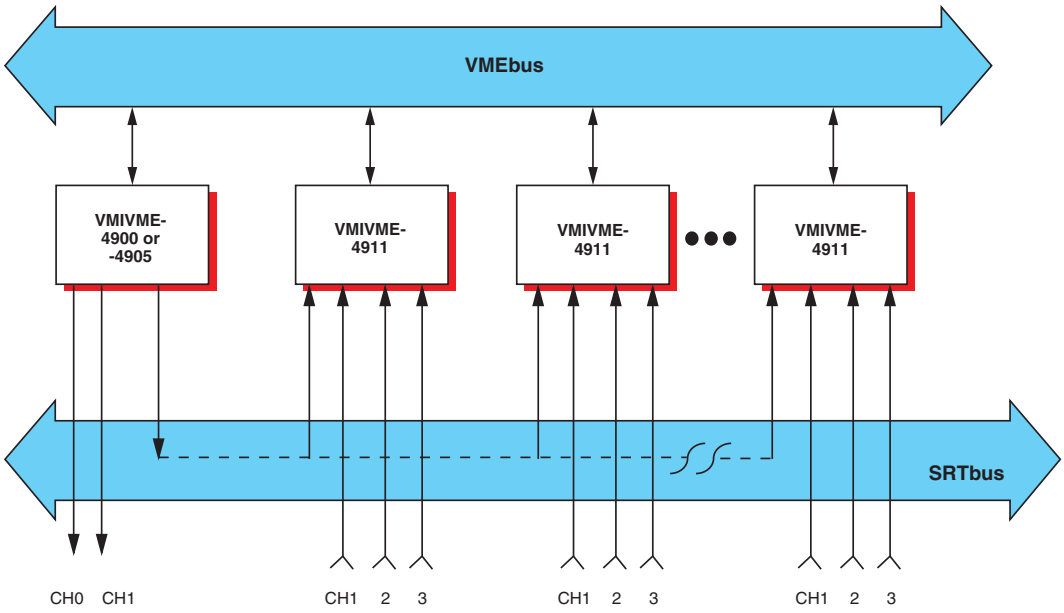


Figure 4. Typical Synchro/Resolver Input Subsystem with Built-in-Test

APPLICATION AND CONFIGURATION GUIDES — The following Application and Configuration Guides are available from VMIC to assist the user in the selection, specification, and implementation of systems based on VMIC's products.

Title	Document No.
Digital Input Board Application Guide	825-000000-000
Change-of-State Board Application Guide	825-000000-002
Digital I/O (with Built-in-Test) Product Line Description	825-000000-003
Synchro/Resolver (Built-in-Test) Subsystem Configuration Guide	825-000000-004
Analog I/O Products (with Built-in-Test) Configuration Guide	825-000000-005
Connector and I/O Cable Application Guide	825-000000-006