

TRANSMAGNETICS, INC.

10 BIT, MUX SYNCHRO/RESOLVER TO DIGITAL CONVERTER SYSTEM SERIES 5309

(4, 6, 8, OR MORE CHANNELS)

FEATURES:

- 10 Bit Resolution
- ± 45 arc minutes accuracy
- Noise immune, not a peak sampler
- Insensitive to carrier amplitude variations
- Tristate outputs to simplify computer interconnect
- Fully interchangeable modules
- Hermetically sealed units available
- Meets MIL-STD-202D; Methods 101C, 105B, 106C, 107C,
202D, 204B and 205D
- Hi-Reliability 883B or MIL-M-38510 units on request
- Expandable by adding additional Demodulator modules
- No special precautions required against static electricity

CONCEPT:

Multiplexing is a method or system for processing several data inputs, either randomly or sequentially, through a switching matrix, and time sharing a common output to view each input in a line slot determined by the multiplexer address.

DESCRIPTION:

This model describes a low cost, time proven multiplexed system using a continuous demodulation rather than a peak sampling approach. This technique assures accuracy, even though system noise is present, because peak samplers respond to perturbations on the sampled waveform with resulting deterioration of output accuracy.

This system consists of two potted, but factory repairable, modules that are designed for PC board mounting. The Demodulator module 5309 converts the four input channels into DC sine/cosine format. A switching matrix, contained within the Demodulator module, selects the particular input channel that will be converted into digital form. Each channel incorporates transformer isolated signal and reference inputs and can operate from different reference supplies. Any reference and input voltage level and frequency can be supplied. The successive approximation converter module 1659 accepts the selected DC sine/cosine input signal and upon receipt of a Convert Command, digitizes the input into a binary coded word. A handshake Data Ready indicates that conversion was completed. No matching of modules is required. Any demodulator

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module will work with any Digitizer module, thus simplifying spare parts requirements. No calibrations, adjustments or warm-up are required. The number of input channels may be increased by adding additional Demodulator modules.

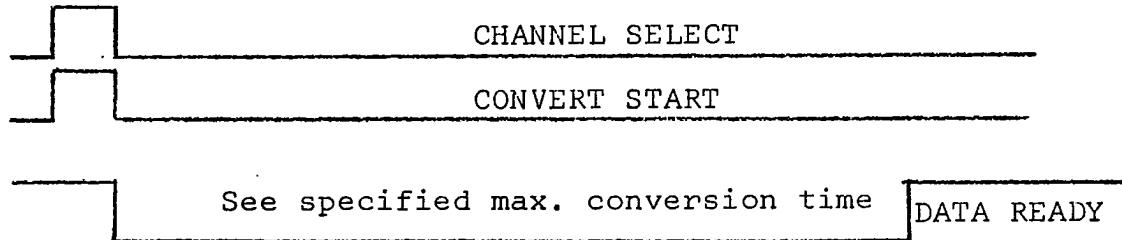
SPECIFICATIONS:

Resolution:	10 bits
Accuracy:	45 arc minutes at 25°C; 60 arc minutes over temp.
Reference:	See part number designation
Input:	See part number designation
Input Z:	40K min.
Logic:	Parallel, positive, TTL or CMOS compatible binary coded angle
Output Mode:	Tristate. Fan Out: 2 LPTTL Loads Ground tristate "Enable" to activate outputs.
Conversion Time:	*150 µs/channel or slower. See part number designation
Dynamic Lag:	40 arc seconds/rpm (400 Hz units)
Convert Command:	Positive TTL level pulse of 5.0 µs min width. Triggers at trailing edge. Fan In: 1 LPTTL
Data Ready:	A transition from "0" to "1" indicates that conversion is complete and that data is ready. Output stays high and data remains valid until next Convert Start. Fan Out: 2 LPTTL Loads.
Channel Address:	500 ns typical
Channel Access:	Random or sequential
Channel Address Logic:	2 lines for 4 channels, 3 lines for 8 channels
Fan In:	1 LPTTL Load
Isolation:	Reference and inputs are transformer isolated.
Power Requirement:	± 15 VDC 5% at 60 mA. ± 12 VDC option is available. + 5 VDC 5% at 15 mA
Operating Temperature:	-55°C to + 85°C
Storage Temperature:	-55°C to + 105°C
Grounds:	Separate analog and logic grounds are supplied to minimize potential ground loop problems.
Potting:	Potting is available for high shock or vibration environments. See part number designation.
Size:	2 channel demodulator: 3.125 x 2.625 x .42 4 channel demodulator: 3.125 x 2.625 x .82 4 channel 50/60 Hz demodulator: 3.625 x 4.750 x .82 Digitizer module: 3.125 x 2.625 x .42

- * Conversion time can be supplied as low as 150 µs/channel. However, good engineering practice dictates the use of the maximum conversion time allowed by the system, because a longer conversion time enables additional filtering to be added to the converter.

MULTIPLEXING SEQUENCE:

1. Select channel by setting appropriate address logic.
2. Initiate Convert Command.
3. Within the specified max. conversion time, the Data Ready Line will go high indicating that data is ready.
4. Ground Tristate Enable to connect outputs to Data Lines.
5. Repeat.



ORDERING INFORMATION:

DEMODULATOR: (One required for 4 channels, 2 for 8 channels, etc.)

5309-*****

- Add 883 for Hi-Rel
- Add P for Potting
- Add H for Hermetically Sealed
- Add D for separate logic ground
- See table for Input/Ref Code
- Temperature Range (C or M)
- Add A to specify a two channel demodulator

1659*-*****-

- Conversion time (see chart)
- Add 883 for Hi-Rel
- Add P for Potting
- Add H for Hermetically Sealed
- Add D for separate logic ground
- Resolution (C = 10 bits)
- Temperature Range (C or M)

CONVERSION TIME CHART

DASH #	CONVERT TIME
None	150 μ s
-1 & -2	1ms
-3	250 μ s

INPUT/REFERENCE CODE:

Code	Channel 1			Channel 2			Channel 3			Channel 4		
	Type	Input (VL-L)	Ref (Vrms)	Freq.	Type	Input (VL-L)	Ref (Vrms)	Freq.	Type	Input (VL-L)	Ref (Vrms)	Freq.
-1	Syn	90	115	400	Syn	90	115	400	Syn	90	115	400
-2	Syn	11.8	26	400	Syn	11.8	26	400	Syn	11.8	26	400
-3	Syn	11.8	115	400	Syn	11.8	115	400	Syn	11.8	115	400
-4	Syn	90	115	400	Syn	90	115	400	Syn	90	115	400
-5*	Syn	90	115	50/60	Syn	90	115	50/60	Syn	90	115	50/60
-6	Rsvr	11.8	26	400	Rsvr	11.8	26	400	Syn	11.8	26	400

*Size increased to 3.125 x 4.750 x .82"

Reference Voltage Tolerance: ± 10%

Frequency Tolerance: ± 10%