Model 5410C-89

Three Synchro/Resolver to Digital Channels & Three Digital to Synchro/Resolver Channels, VXIbus

FEATURES:
- Three Measurement Channels
- Three Stimulus Channels
- Autoranging Measurement
- High-speed data transfer
- Programmable rotation for each D/S channel
- Optional Single or two-speed programmable
- External or internal trigger
- Self-Test
- Message Based (MATE CIIL) C-Size to Rev 1.3
- No Adjustments or Trimming

DESCRIPTION:
This single slot, message based VXIbus instrument provides **Three Synchro/Resolver-to-Digital and Three Digital to Synchro-Resolver channels with the ability to rotate. The output channels can be programmed for either single or two-speed formats. Wrap-around self-test is included**. Each S/D and D/S channel is separate and transformer isolated and will therefore accept separate reference voltages.
The transformer isolated Synchro/Resolver simulators provide individual programmable sources of three wire Synchro or four wire Resolver signals. Static angles and various rotational speeds can be independently selected for each channel. Each D/S channel can be supplied with a different output voltage. The transformer isolated autoranging Synchro/Resolver-to-digital converter is used as a very stable independent angle-measuring device that is also utilized for the wraparound self-test mode. Synchro or Resolver format can be selected via the bus. This unit automatically senses and adjusts to any line-to-line and reference voltage by auto-ranging the input from 3.5-100V and the reference from 5-115V, thus eliminating the need to pre-program the input signal levels. Further, there is no hang-up possibility with a 180° step input. No adjustment or trimming is required. Units can be supplied with input and reference voltages that Autorange from 2-26 Volts.
A special processor converts the CIIL message string into the commanded output within 5 ms. In addition, our high-speed VXIbus data rate of 500 Kbytes/sec. frees the bus for other functions. Programming is accomplished in Control Intermediate Interface Language (CIIL) using an imbedded TMA. Our design will accept the following data formats: Floating Point, Decimal, Integer, String and Scientific Notation. This unit is in full compliance with Rev. 1.3

ROTATION: Any output channel can be programmed to rotate from 0.1°/sec to 1000°/sec with a resolution of 0.1°/sec. Stepping rate will be in 0.02° increments. Any or all of the D/S channels can be triggered, through the front panel connector or via Trigger bus, to turn CW or CCW after being armed via CIIL.

MODULAR CONCEPT: This IAC consists primarily of modules and relays that can be replaced in minutes.

CONFIDENCE TEST: A CNF command will cause relays to disconnect the D/S outputs from the outside world and to connect them, through a switching matrix, to the internal S/D. The microprocessor will activate an internal reference supply, and then program a series of D/S angles that will be verified by the S/D converter. This test will be completed within 1 minute and will provide 95% fault detection to the module level. The results of this test will be reported to the IAC Bus Controller upon receipt of the STA command.

SPECIFICATIONS

	Input (Measurement)	Output (Simulation)
Number of Channels:	Three (Channels 0-2)	Three (channels 3-5)
Resolution:	.001°	16 bits
Accuracy:	0.0083°	Refer to "Output Code" table
Format:	Synchro or Resolver, programmable	Refer to "Output Code" table
Voltage:	3.5-100 VL-L autoranging	Refer to "Output Code" table
Tracking speed:	180°/sec max.	N/A
Input impedance:	100KΩ min.	N/A
Auto Phase Correction:	±60°	N/A
Settling time:	2 sec.	N/A
Reference Voltage:	5-115Vrms, autoranging	Refer to "Output Code" table
Reference Frequency:	360Hz to 5 KHz	Refer to "Output Code" table
Reference Current:	3.0mA max total	3.0mA max total

Output Format & Voltage:	Output voltage varies directly with changes in reference voltage. All outputs are short circuit protected.
Wrap-Around Testing:	Input and Output channels may be connected together in pairs for self-verification using a cable length of 36 inches or less. Cable should use twisted pairs; (RHI↔RLO), (S1↔S3) and (S2↔S4). Accuracy will be the sum of the input channel accuracy and output channel accuracy.
Trigger:	Rotation may be initiated by either an External (Front Panel) or the Trigger bus. External trigger is terminated with a 499 Ω resistor and is connected to a differential Line Receiver SN75115N. Input trigger to be 8 µs min. width
Trigger capability:	TTLTRG0 to TTLTRG7
Conversion rate:	5 ms per CIIL string message
VXIbus Data Rate:	500Kbytes/sec

COMMON SPECIFICATIONS

Temperature, Operating:	-10°C to +65°C
Temperature, Storage:	-40°C to +85°C
Relative humidity:	90% RH
Shock:	Designed to meet 15G, 11 ms
Vibration:	Designed to meet MIL-T-28800C for class "V" equipment.
Altitude, Operating:	10,000 feet
Altitude, Non-operating:	40,000 feet
Cooling:	15 cfm at .12"
Power Requirements:	±24 VDC at 100mA +12 VDC at 200mA +5 VDC at 1.2 A
Size:	"C" size (13.4" x 9.2") with 1.2" pitch; (349 mm x 234 mm) with 30 mm pitch
Weight:	4 lbs. (1.8 Kilos)
MTBF:	148,342 hours
Acoustic noise:	None
Max. Corrective time:	0.5 hours. No preventive maintenance is required.
Calibration intervals:	1 year
Connectors:	All connections are via front panel; Male "D" connectors: J1 - DC37P (MATE: DC37S with Hood DC24660; ***Not Supplied***) J2 - DB25P (MATE: DB25S with Hood DB24659; ***Not supplied***)

PIN DESIGNATION & CONNECTORS

J1: DC37P (Output Connector)
(MATE: DC37S with Hood DC24660; ***Not Supplied***)

Pin	Ch. 3	Pin	Ch. 4	Pin	Ch. 5
2	S1	5	S1	8	S1
3	S2	6	S2	9	S2
4	S3	7	S3	10	S3
20	S4	23	S4	26	S4
21	R HI	24	R HI	27	R HI
22	R LO	25	R LO	28	R LO
1	Chassis	19	TRIGGER LO	37	TRIGGER HI

J2: DB25P (Input Connector)
(MATE: DB25S with Hood DB24659; ***Not supplied***)

Pin	Ch. 0	Pin	Ch. 1	Pin	Ch. 2
12	S1	2	S1	16	S1
13	S2	19	S2	14	S2
25	S3	18	S3	15	S3
23	S4	17	S4	1	S4
20	R HI	7	R HI	22	R HI
10	R LO	8	R LO	24	R LO
3	Chassis				

OUTPUT CODE

Code	Format	Ch. 3 (VL-L)	Ch. 4 (VL-L)	Ch. 5 (VL-L)	REF(Vrms)	Frequency vs. Accuracy	Load (min.)
1	Synchro/Resolver	11.8	11.8	11.8	26	360 - 440Hz: ±0.0055° 440 - 2000Hz: ±0.0055° to ±0.0165° (1) 2000 - 5000Hz: ±0.0165° to ±0.0275° (1)	20KΩ (2)
4	Resolver	3.5	3.5	3.5	7.0	5000Hz: ±0.0055°	1KΩ (3)
5	Synchro	90	90	90	115	400Hz: ±0.0055°	100KΩ (2)
7	Resolver	7.0	7.0	7.0	7.0	360 - 5000Hz: ±0.0055° 5000 - 7500Hz: ±0.0055° to ±0.0110° (1)	2KΩ (2)
9	Resolver	3.5	3.5	3.5	7.0	360 - 5000Hz: ±0.0055° 5000 - 7500Hz: ±0.0055° to ±0.0110° (1)	2KΩ (3)
11	Resolver	3.5	3.5	3.5	3.5	2200 / 2800Hz: ±0.0055°	2KΩ (4)

(1) Accuracy de-rates linearly
(2) Loaded accuracy is ±0.010° at 400Hz
(3) Loaded accuracy is ±0.010° at 5000Hz
(4) Loaded accuracy is ±0.010° at 2800Hz

ORDERING INFORMATION

Example part number → 5410C-89-**1**

Select a "Code" from the "Output Code" table