Model 5330

Programmable Synchro/Resolver Simulator

- **0.001° Resolution**
- **0.003° Accuracy at No Load**
- **Frequency 47 Hz to 10 kHz**
- **Programmable Output Voltages**
- **Velocity to 12,600°/sec at 0.01° Resolution**
- **Direct Replacement for DDC SM-31210B Series**

GENERAL

The Model 5330 is a versatile programmable simulator that will generate three-wire Synchro or four-wire Resolver signals at various voltage levels and different frequency inputs. Static angles and bi-directional rotational velocities are fully programmable. This instrument is an ideal replacement for older units that do not offer rotational capability.

The dynamic mode simulates a rotating component in either clockwise or counterclockwise direction. Any rotational speed between ± 0.5 rps and ±35 rps/sec may be programmed. These dynamic signals may be used to test servo systems under slewing conditions or to verify that electromechanical systems repeat their angular positions.

When combined with our programmable angle position indicator Model 8810, a high-accuracy manual/automatic test set configuration is formed that can be used to check rotating components, Synchro/Resolver-to-digital converters and similar items or systems requiring such stimulus.

SPECIFICATIONS

Item	Specification
SIGNAL	
Accuracy*	**No Load** / **Load Error****
-F2 60 Hz to 1,000 Hz	+/- 0.003° / 0.003°/VA
47 Hz to <60 Hz	+/- 0.025° / 0.003°/VA
-F1 360 Hz to 2,000 Hz	+/- 0.003° / 0.003°/VA
10,000 Hz	+/-0.015° / 0.015°/VA
	*Accuracy degrades as a linear function of frequency from 2 KHz to 10 KHz.
	**Balanced 80° phase angle load.
Resolution	0.001°
Velocity	CW or CCW from 0.5° to 12,600°/second with 0.01° resolution
Output Format	Synchro or Resolver, transformer isolated
Output Voltage	Programmable for 11.8/26/90 V_{L-L} Output voltage tracks reference input.
Minimum L-L Load Impedance	**90 V_{L-L}** / **26 V_{L-L}** / **11.8 V_{L-L}**
Synchro (47-2000 Hz)	2025Ω (3 VA) / ------ / 35Ω (3 VA)
Resolver (47-2000 Hz)	2700Ω (3 VA) / 225 Ω (3 VA) / 35Ω (3 VA)
Resolver (2-11 KHz)	------ / ------ / 93Ω (3 VA)
REFERENCE	
Reference Input	26 Vrms or 115 Vrms
Reference Frequency	See Part Number (Option) Designation
Reference Current	2.5 MA max.
GENERAL	
Angle Range	000.000° to 359.999°
Magnitude Variation	0.03%
Settling Time	Less than 100 μS
Front Panel Controls	
Power On/Off	Main Power Control
Lamp Test	All LED's light at power-up
Remote	Indicator lights when remote. Press key to go to LOCAL
Input Angle Selector	6 lever switches, one per decade.. Sets static angles or velocity.
Static/CW/CCW	Selects either discrete angle inputs or direction of rotation
Enter	Starts rotation and changes angle in STEP mode.
Stop	Stops rotation.
Step	In STATIC mode, output follows input changes immediately. In STEP mode, output will change only when ENTER switch is pressed.

Table 1-2. Specifications (continued)

Item	Specification
Input Power	110/220 Vrms +/-10%, 50/400 Hz, transformer isolated. (35 VA)
Operating Temperature	0°C to +70°C
Dimensions	9.5" x 3.47" (panel) x 14.63" (standard half-rack mountable) Supplied with feet and bail stand.
Weight	16 lbs.
Accessories	19" rack mount ears (optional)
Controller Interface	IEEE-488. Mating cable and connectors not supplied.
Connectors	Front Panel: 5-way Binding Posts Rear Panel: 9 Pin D-Subminiature male 50 pin D-Subminiature male

The following tables show the pin designations for rear panel connectors J1, J2, and J3.

J1 Pin Designations

Pin	Signal Name	Function
1	SPARE	Do Not Use
2	SPARE	Do Not Use
3	S1	Synchro/Resolver Output
4	S2	Synchro/Resolver Output
5	REF LO	Reference Low Input
6	REF HI 26V	26 V Reference Input
7	S4	Synchro/Resolver Output
8	S3	Synchro/Resolver Output
9	REF HI 115V	115 V Reference Input

NOTE: J1 mating connector: P1, 9-pin, female, D-type connector.

J2 Pin Designations

Pi	Signal Name	Function
1	DIO1	Data I/O 1
2	DIO2	Data I/O 2
3	DIO3	Data I/O 3
4	DIO4	Data I/O 4
5	EOI	End or Identify
6	DAV	Data Valid
7	NRFD	Not Ready For Data
8	NDAC	Not Data Accepted
9	IFC	Interface Clear
10	SRQ	Service Request
11	ATN	Attention
12	SAFETY GND	Safety Ground
13	DIO5	Data I/O 5
14	DIO6	Data I/O 6
15	DIO7	Data I/O 7
16	DIO8	Data I/O 8
17	REN	Remote Enable
18-24	SIGNAL GND	Signal Ground

NOTE: J2 mating connector: IEEE-488 Standard

J3 Pin Designations

Pi	Signal Name	Function
1-2	SPARE	Do Not Use
3	CASE GND	Chassis (Earth) Ground
4-17	SPARE	Do Not Use
18	S2	Synchro/Resolver Output
19	S4	Synchro/Resolver Output
20	REF LO	Reference Low Input
21-33	SPARE	Do Not Use
34	S1	Synchro/Resolver Output
35	S3	Synchro/Resolver Output
36	SPARE	Do Not Use
37	REF HI 115V	115 V Reference Input
38	REF HI 26V	26 V Reference Input
39-50	SPARE	Do Not Use

NOTE: J3 mating connector: P1, 50-pin, female, D-type connector.

Controls and Indicators

Controls and Indicators: Operation of front panel controls and indicators are as summarized below and illustrated in figure on next page.

Power Switch: When in ON position as indicated by red band on upper edge of switch actuator, unit has AC power applied and is ready for use.

11.8/26/90 Line-to-Line Voltage Selection Keys: Selection of output line-to-line voltage is accomplished by pressing 11.8, 26 or 90 keys. Indicator light above key lights to indicate selection. **Note:** There may be a delay of several seconds between time that key is pressed and time indicator lights. This delay is due to time required for internal calibration values to be calculated and stored.

SYN/RSVR Mode Selection: Selection of 4-wire Resolver output or 3-wire Synchro output is accomplished by pressing SYN or RSVR key. Indicator above key will light to indicated selection made, **Note:** There may be a delay of several seconds between time that key is pressed and time indicator lights. This delay is due to time required for internal calibration values to be calculated and stored.

STATIC/CW/CCW Operation: Default mode of operation is STATIC. In STATIC mode the output angle is equal to the value set on the ANGLE SELECTOR lever switches. CW and CCW select direction of rotation for dynamic angle output. Indicator LED above key switch will show selection.

ENTER Key: Starts rotation or changes angle in STEP mode.

STEP Key: In STATIC mode output angle follows lever switch value immediately. In STEP mode, output angle will change only when ENTER key is pressed. LED above key indicates selection made.

REMOTE Key: Indicator above key lights when unit is under remote control. To activate LOCAL control, press key. If there is no IEEE-488 LOCAL LOCKOUT condition, unit will return to LOCAL control.

Input Lever Switches: A 6 decade lever switch provides Angle Input or Velocity. For Angle Input, lever switches may be set to values from 000.000 to 359.999 as needed. For Velocity, lever switches may be set to values from 1 to 12,600 degree/second in 1 degree/second steps. The right digit indicates 1 degree/second.

Model 5330 Programming

Address Switch:
The rear panel of the Model 5330 contains a 5-position DIP-Switch for setting the IEE-488 bus address of the device. The switch is continuously monitored by the control microprocessor in the Model 5330 and changes to this switch may be done with device power on.

The switch is configured as binary value of basic bus address, least significant on right as viewed from the rear panel. For each switch actuator, the UP position represents a binary 1 value for that bit position.

For example:

The following represents address 5

DN	DN	UP	DN	UP
0	0	1	0	1

The Model 5330 can be programmed for emulation of the **North Atlantic Model 5310** or the **ILC Data Device Corp Model SIM-31200**. The Model 5330 may be configured to emulate the interface language of these products. Once configured, the Model 5330 will power up with selected language emulation activated.

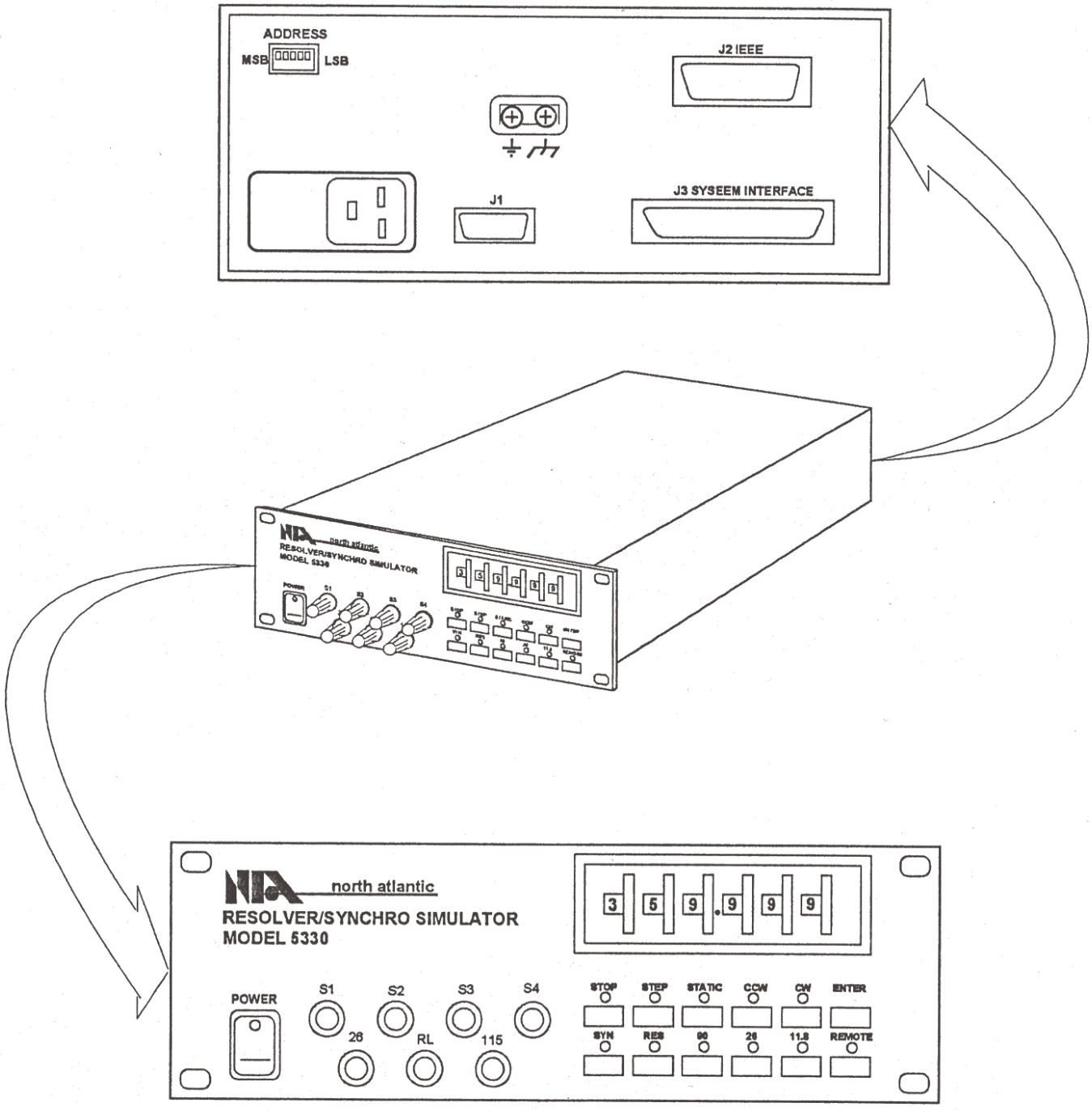
Language emulation option is set at the factory prior to shipment. Standard MATE language may be temporarily activated with an IEEE-488 command string as shown in the Table below:

Language Emulation

Model	Emulation Command String
5330	Set at Factory
5330 TEMP*	LANG<sp>TMATE<cr><lf>
5310	Set at Factory
31200	Set at Factory

*Temporarily switches to Model 5330 standard MATE language, but returns to previous factory set language emulation at next power up sequence.

Front and Rear Views of Model 5330



Rack Mounting Adapter Accessories

Type of Mount	Description	NAI P/N
Full Rack Mounting	Mounts one unit in 19-inch rack	783893
Tandem Full Rack Mounting	Mounts two units side by side in 19-inch rack (3-1/2-inch rack height)	548557

FEATURES AND OPTIONS

The Model 5330 is available with 2 standard options as shown below.

5330-F1 (Frequency Range 360Hz to 10 KHz)

5330-F2 (Frequency Range 47Hz to 1 KHz)

Custom solutions can be made to meet the needs of your application. Please contact Sales@naii.com or Techsupport@naii.com for any special options or requirements you may have.