

1.6 TECHNICAL CHARACTERISTICS

Table 1-1 summarizes the principal characteristics of the instrument.

Table 1-1. Technical Characteristics

Angular Range	0.00 to 359.99° continuous rotation
SR-203	or 0.00 to $\pm 179.99^\circ$ bi-polar.
HSR-203	0.000 to 359.999° continuous rotation
	or 0.000 to $\pm 179.999^\circ$ bi-polar.
Accuracy	
SR-203	$\pm .03^\circ$
HSR-203	$\pm .005^\circ$
Tracking Rate, no error	
SR-203	720° / sec at 400 Hz
	180° / sec at 50-60 Hz
HSR-203	72° / sec at 400 Hz
	18° / sec at 50-60 Hz
Settling Time (to within 1 LSB) for a 179° step change	
High Bandwidth	
SR-203	0.6 sec
HSR-203	3.5 sec
Low Bandwidth	
SR-203	1.7 sec
HSR-203	8 sec
Open Loop Transfer Function	
High Bandwidth	
SR-203	$G = \frac{(86)^2(S/46 + 1)}{S^2(S/460 + 1)}$
HSR-203	$G = \frac{(42)^2(S/21 + 1)}{S^2(S/210 + 1)}$
Low Bandwidth	
SR-203	$G = \frac{(18)^2(S/10 + 1)}{S^2(S/100 + 1)}$
HSR-203	$G = \frac{(13)^2(S/10 + 1)}{S^2(S/100 + 1)}$
Display Resolution	
SR-203	$\pm 0.01^\circ$ (5 BCD Digits)
HSR-203	$\pm 0.001^\circ$ (6 BCD Digits)

Table 1-1. Technical Characteristics (Cont'd.)

Repeatability	
SR-203	$\pm 0.01^\circ$
HSR-203	$\pm 0.002^\circ$
Reference Input	
Voltage	10-150 volts rms
Frequency	47-1000 Hz, from same source as synchro/resolver excitation
Phase, relative to signal	$\pm 50^\circ$
Input impedance	100 kilohms min.
Isolation	Transformer
Breakdown, to logic gnd	1000 V min.
Harmonic content	$\pm 10\%$ max.
Signal Input	
Type	Synchro or resolver, transformer isolated
Voltage, L-L	Any level, 10V to 100V, auto leveling
Frequency	Same as reference
Allowable phase shift	$\pm 50^\circ$ max., relative to reference
Input Impedance	
SR-203	150 kilohm min. @ 47 Hz
	250 kilohm min. @ 60-1000 Hz
HSR-203	1 megohm min.
Isolation	Transformer
Breakdown, to logic gnd	1000 V min.
Digital Inputs (TTL Compatible)	
Inhibit (INH)	Logic 1 or open = track Logic 0 or gnd = hold (freeze)
Lamp Test (LT)	Logic 1 or open = θ (angle) Logic 0 or gnd = 888.88° (SR-203) or 888.888° (HSR-203)
Bandwidth (BW)	Logic 1 or open = lo bandwidth (47-1000 Hz) Logic 0 or gnd = hi bandwidth (360-1000 Hz)
Uni-polar/Bi-polar (U/B)	Logic 1 or open = uni-polar operation Logic 0 or gnd = bi-polar operation
Loading	0.5 TTL unit loads max.
Remote Channel Select	Logic 0 or gnd = channel 1 Logic 1 or open = channel 2
Remote Synchro/Resolver Select	Logic 1 or open = resolver Logic 0 or gnd = synchro

Table 1-1. Technical Characteristics (Cont'd.)

Digital Outputs (TTL Compatible)	
Shaft Angle (ϕ)	
SR-203	5 BCD buffered TTL decades (18 lines total). Positive true logic, continuously available. In bi-polar mode, minus sign = logic 1 on MSB.
HSR-203	Same as SR-203, except 6 BCD decades used (22 lines total).
BITE	Logic 1 = fault (tracking failure) Logic 0 = no fault
Converter Busy (CB)	Logic 1 pulses = busy* Logic 0 = data stable
Drive Capability	4 unit TTL loads, buffered output
Display Characteristics	
Display Scan Rate	
SR-203	333 Hz
HSR-203	278 Hz
Display Duty Cycle	
SR-203	20%
HSR-203	16.7%
Display Clock	1.67 Hz
Display Clock Duty Cycle	50%
Power Input	
Voltage	115V/230V RMS**
Power	20 va max
Frequency	47-500 Hz
Isolation	Transformer
Breakdown to logic gnd	1000V DC
Temperature Range	
Operating	0°C to 55°C
Storage	-55°C to +125°C
Dimensions	
Option 1	
(carry handle)	9-3/8"W x 3-15/32"H x 14-1/2"D
Option 2	
(half-rack mount)	9-1/2"W x 3-15/32"H x 14-1/2"D
Option 3	
(center mount on 19" panel)	19"W x 3-15/32"H x 14-1/2" D
Weight	5 lbs (approx.)

*4 usec positive pulses; leading edge initiates conversion.

**Voltage selectable by two internal switches. See para. 2.1.

Table 1-2. IEEE-488 Interface Data
 Command Function: The Following subset of the IEEE-488 standard is implemented.

SH1	Full <u>Source Handshake</u> capability.
AH1	Full <u>Acceptor Handshake</u> capability.
T6	Basic <u>Talk</u> capabilities with <u>Serial Poll</u> and untalk if my listen address.
L4	Basic <u>Listen</u> capabilities with unlisten if my talk address.
SR1	Full <u>Service Request</u> capability.
RLO	<u>Remote Local</u> selection via manual front panel switch.
DCO	No <u>Device Clear</u> capability.
DTO	No <u>Device Trigger</u> capability.
CO	No Controller capability.

Table 1-3. IEEE-488 Interface Data

Device Commands	
Control Word (ASCII)	Function
P	Preset to Channel 1, Synchro Input, no Inhibit, no Lamp Test, High Bandwidth, Unipolar output.
S	Synchro input mode.
R	Resolver input mode.
1	Channel 1 Remote Input.
2	Channel 2 Remote Input.
H	High bandwidth select.
L	Low bandwidth select.
U	Unipolar display and output.
B	Bipolar display and output.
I	Inhibit converter tracking.
F	Enables converter tracking.
T	Enables lamp test.
D	Disables lamp test; causes angle data to be displayed.

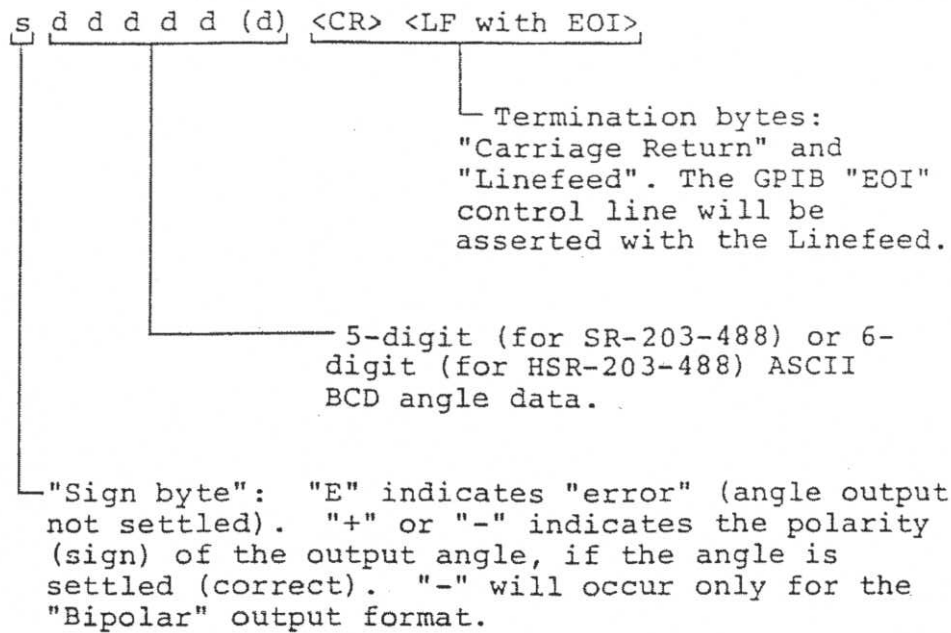


Figure 1-5. Talk Routine (Reply String)

Table 1-4. Status Byte

BIT	BIT WEIGHT (HEX)	BIT DESCRIPTION
7 (MSB)	80	Not Used.
6	40	RQS (Request for Service)
5	20	Not Used.
4	10	Not Used.
3	08	Not Used.
2	04	Not Used.
1	02	Error in input command string (illegal command received).
0	01	Command received when instrument is in "Local" control mode.

SRQ Conditions:

- (1) Error in input command string.
- (2) Command received when instrument is in "Local" control mode.