Gated Integrators and Boxcar Averagers

SR245 — Computer interface module with GPIB and RS-232

- **Eight analog I/O ports**
- **8-bit digital I/O port**
- **Two TTL I/O ports**
- **RS-232 and GPIB interfaces**
- **3500 point sample memory**
- **Simple command structure**

SR245 Computer Interface

The SR245 Computer Interface module is a powerful tool for data acquisition. It provides both an analog and a digital interface between your computer and your experiment.

Analog I/O

The eight analog I/O channels can be designated through software as all inputs, all outputs, or as a combination of inputs and outputs. All channels have 13 bits of resolution over the ±10.24 VDC full-scale range, with 0.05 % accuracy.

Digital I/O

Two front-panel digital I/O bits are provided for use as counters or triggers and can be set or read by the computer. Additionally, an 8-bit input and an 8-bit output port are available (on an internal connector) for your own custom digital interfaces.

RS-232 and GPIB interfaces

Both RS-232 and GPIB interfaces are standard features of the SR245. Simple commands make programming easy from a variety of high-level languages—all that's necessary is the ability to send and receive ASCII strings. For example, sending "?5" instructs the module to measure the voltage on the 5th analog input BNC. Other commands allow you to record in the module's 3500 point buffer memory, ramp an analog output at a specified rate (for gate scanning), or read the contents of a digital counter.

Ordering Information

SR245	Computer interface module

Analog Ports

Configuration	Any number of the eight ports may be designated under program control as input ports, the rest default to output ports.
Inputs	1 MΩ impedance, ±10.24 VDC range Protected to 40 VDC 13-bit resolution (2.5 mV) 0.5 % accuracy Input offset <2.5 mV Maximum A/D rate is 2 kHz
Outputs	<1 Ω impedance Short circuit current limit is 20 mA 13-bit resolution (2.5 mV) 0.5 % accuracy Output offset <2.5 mV

Digital Ports

Type	Two front-panel I/O TTL bits, one 8-bit digital input port, one 8-bit latched digital output port
Front-panel inputs	Input impedances >100 kΩ Minimum pulse width is 200 ns Maximum count rate is 4 MHz Logic one >3 VDC, logic zero <0.7 VDC Inputs protected to ±10 VDC
Front-panel outputs	Can drive 50 Ω loads to TTL levels

General

Interfaces	IEEE-488 (GPIB) and RS-232 (110 baud to 19.2 kbaud)
Power	+24 V/60 mA, 24 V/60 mA, +12 V/20 mA, approx. 8 watts
Mechanical	Single-width standard NIM module
Warranty	One year parts and labor on defects in materials and workmanship

Command List

Input/Output Commands

I<*n*> *n*=0 to 8	Designates the first *n* analog ports as inputs, the remainder become outputs
?<*n*> *n*=1 to 8	Returns the value of the designated analog port
?B<*n*> *n*=1,2	Returns the value (0 or 1) of the designated digital port
?D	Returns the value of the 8-bit digital input port
?S	Returns the value of the status byte, and clears the status byte
C	Configures B2 as an input and resets the B2 counter
?C	Returns number of pulses occurring at B2 since the previous ?C
S<*n*>=<*x*>	Sets the analog port *n* (which must be designated as an output) to the value *x* (*x* = −10.237 to +10.237 V) *n* = 1 to 8
SB<*n*>=<*m*>	Designates digital bit *n* as output and sets its value to *m* (*n* = 1, 2 and *m* = 0, 1)
SB<*n*>=I	Designates the selected bit as an input (*n* = 1, 2)
SD=<*n*>	Sets the 8-bit digital output port to the value *n* (*n* = 0 to 255)
SM=<*n*>	Sets the GPIB SRQ mask to the value *n* (*n* = 0 to 255)

Trigger Commands

MS	Sets the synchronous mode. Responses to ? commands are returned after next trigger.
MA	Sets the asynchronous mode (default). Responses to ? commands are returned after command is received.
T<*n*>	Designates every n^{th} pulse at B1 as a trigger (*n* = 1 to 32,767)
DT	Masks the trigger input so that no triggers are recognized
ET	Unmasks the trigger input
PB<*n*>	Outputs a 10 µs TTL pulse at digital port *n* (*n* = 1, 2)
P/<*n*>	Outputs a 10 µs TTL pulse at B2 each n^{th} trigger (*n* = 1 to 255)

Scan Commands

SC<*i*>,<*k*>:<*n*>	Scans the list *i*..*k* of analog ports or digital port for *n* triggers. Total # of samples may not exceed 3711. (*i*..*k*=1 to 8, D)
ES	Ends the current scan immediately and resets the point sending counter
N	Sends the next point of stored scan
?N	Returns # of points scanned
A<*n*>,<*i*>	Adds *n* × 2.5 mV to the value of analog port 8 (must be positive) on every i^{th} trigger (*n*,*i* = 1 to 255)
SS<*i*>,<*k*>:<*n*>	Scans the list *i*..*k* of analog ports or digital port for *n* triggers. Data is sent in a 2 byte binary format while scan is in progress.(*i*..*k* = 1 to 8, D)
X	Sends the data of a stored scan in 2 byte binary format

Miscellaneous Commands

MR	Master reset returns the SR245 to its default values.
W<*n*>	Introduces a delay of (*n* × 400 µs) before sending each character over the RS-232 interface (*n* = 0 to 255)
Z<*i*>,<*k*>	Changes the end-of-record characters sent by SR245 to those specified by the ASCII codes, *i*...*k*