

GCTS is committed to designing accurate testing systems by integrating innovative software engineering with advanced hardware. GCTS systems perform at the highest levels of reliability, providing efficient systems that satisfy customer needs and expectations.



► **SCON-2000 & SCON-1500**
Universal Digital Signal Conditioning and Control Units



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- **850 MHz micro-processor with 64 MB RAM and 128/64 MB solid state disk**
- **16-bit A/D and 16-bit D/A resolution**
- **Modular design**
- **Universal digital signal conditioning**
- **32-bit CATS software compliant with Windows™ 98 / NT / 2000 / XP**
- **Automatic sensor recognition (plug & play)**
- **Remote monitoring of test through network**
- **Easy to use & secure environment**
- **Watchdog timer to detect control program status for automatic interlock shutdown**
- **Motor on/off control signal and remote oil temperature and oil level readouts as well as power, motor and filter status feedback**

DESCRIPTION

The SCON-2000 and SCON-1500 feature an integrated 850 MHz microprocessor based digital servo controller and includes the CATS software. These are a complete and self-contained modules featuring built in function generator, data acquisition, and digital I/O unit. Utilizing state-of-the-art Universal Signal Conditioning boards, these systems can accept load cells, pressure transducers, LVDTs, or other analog input signals. There is no longer a need to buy specific signal conditioning for a particular sensor. The sensor amplifier gain and offset are digitally and precisely controlled by the software eliminating the need to use reference gauges or shunt resistors to setup each sensor. With the SCON-2000 and SCON-1500, all it is required is to install a new sensor is to type in the calibration factors and the signal

conditioning automatically sets the amplification and offset values to accurately read this new sensor.

Each input features digital offset and gain, 16-bit resolution, and anti-alias filter. The SCON-2000 and SCON-1500 system provides an analog anti-alias filter for high frequencies, and a digital filter for lower frequencies. This configuration produces a very stable and precise signal measurement and control system. These systems also include an A/D converter with "track-and-hold." Track-and-hold ensures that the converted values from all attached sensors (load cells, deformation, etc.) represent a single instant in time eliminating any data skew from delays in the A/D converter.

The signal conditioning electronics are fully digital with settings directly manipulated by the software. Different equipment configurations are saved making it very easy to change sensors like load cells or deformation transducers. At the same time, the digital settings are protected from inexperienced users to eliminate accidental modifications to sensor calibrations and amplifications. In addition, the system incorporates automatic sensor recognition that will automatically load the correct sensor setup upon connecting or changing a transducer.

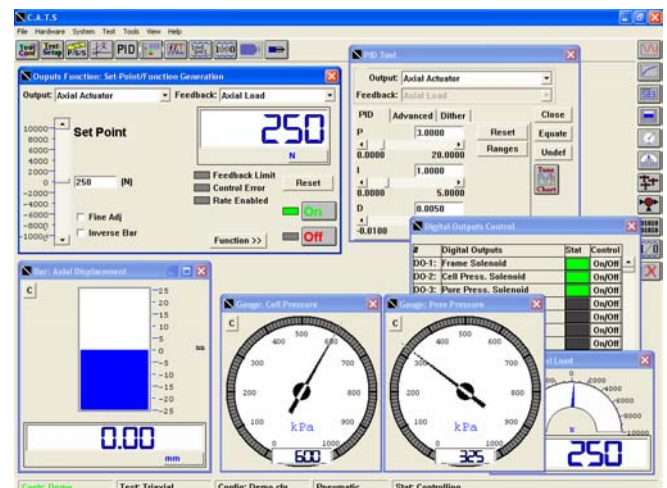
The SCON-2000 and SCON-1500 systems are equipped with Remote Interlock and Watchdog Timer for safety operation of the test equipment. They also include 4 specialized analog inputs to measure its internal temperature, the external ambient temperature, and if used with GCTS hydraulic pump, the hydraulic oil temperature and oil level. These signals are a great help to maintain and troubleshoot the entire testing system.

The modular design of the SCON-2000 and SCON-1500 allows the user to easily upgrade the unit at any time by adding more input or output boards. GCTS offers output boards to control most servo and proportional valves.

The difference between the SCON-2000 and SCON-1500 are mainly the number of input and/or output channels that they support. The SCON-2000 has the capacity for 32 channels (24 inputs and 8 outputs, 32 inputs, or 16 inputs and 16 outputs), while the SCON-1500 has the capacity for 12 channels (8 inputs and 4 outputs, or 12 inputs). Standard with the SCON-2000 are 8 digital inputs and 8 digital outputs, while the SCON-1500 has 4 of each. The SCON-1500 is ideal for simple testing systems where 8 analog inputs are sufficient. While by default the SCON-1500 comes with the CATS

Standard software, it can be upgraded to have the CATS Advanced software.

Included with these systems is a true 32-bit Windows™ GCTS CATS software (Win 98/NT/2000/XP) Graphical User Interface with a Universal Test module that allows you to create an unlimited variety of wave forms including user generated profiles such as a digitized earthquake record. The SCON-2000 comes with the CATS Advanced software while the SCON-1500 includes the CATS Standard software. The system also includes calculated inputs from one or several analog inputs that can be directly servo controlled or monitored in real time.



GCTS Software Screen

The CATS software features User Defined Function inputs that can combine a number of inputs for simple mathematical calculations (for averaging inputs, finding volume from area, etc.).

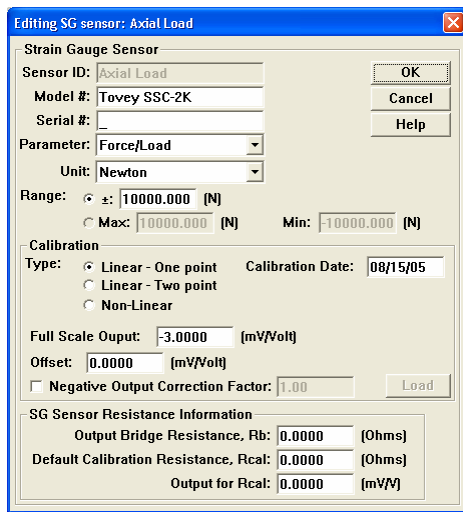
Within the software, any system sensor can be used to provide advanced servo control with "on-the-fly bump less" transfer switching between any connected transducer or calculated inputs. Another new feature called enhanced stabilization not only uses the feedback sensor input to control the test, but also utilizes other associated sensors to provide accurate system control. The Forward Gain allows the phase shift between the output and the feedback to be eliminated. The Peak & Valley Compensation allows dynamic signals to match the programmed function more precisely even under specimen response degradation.

The CATS software includes a frequency spectrum analyzer for signal analysis of any available sensor signal.

The CATS Advanced software allows the use of non-linear sensors by linearizing their output with a 3rd degree polynomial. The Advanced software also provides the ability to define User Defined Correction inputs that correct an input by a 3rd degree polynomial function of another input. The CATS Advanced software also comes with 2 Temperature Outputs, which are Digital Outputs optimized for the control of temperature.

Included in the CATS Advanced software are 2 VCDs – Volume Change Devices, whereas the software can handle automatic and/or manual volume change devices. Included are 3 PVCs – Pressure/Volume Controllers, that have the ability to control and handle manual or GCTS automatic pressure/volume controllers.

Within the Universal Test Program, the CATS Standard software is easy to use with the ability to run a single phase test, while the CATS Advanced software can run a unlimited (99) number of phases. The Advanced software also has the capability to perform frequency and amplitude “sweeps” by allowing the user to change the frequency and/or amplitude during the phase.



Software Sensor Definition

Several programs are offered within the CATS software environment including Triaxial Test, Direct Shear, Resilient Modulus Test, Unsaturated Soil Test, Simple Shear Test, etc. The Universal Module allows the user to perform customizable test procedures. Each software module utilizes state of the art data acquisition features such as Peak & Valley and Level Crossing data acquisition.

All of our testing systems have been designed to take full advantage of our new software and SCON-2000 or SCON-1500 electronics so that all test stages can be

automatically performed from beginning to end with minimal user intervention. GCTS systems provide

all the necessary tools required to meet all of your testing needs.



SCON-1500

SPECIFICATIONS

SCON-2000			
Disk size	128 MB		
Included Software	CATS Advanced		
Max Loop Rate	6 kHz		
	Standard	Option 1	Option 2
Max Analog Input boards	24	16	32
Max Analog Output boards	8	16	0
Max Digital Inputs	8		
Max Digital Outputs	8		
Digital Counter	48 bit		

SCON-1500		
Disk size	64 MB	
Included Software	CATS Advanced	
Max Loop Rate	4 kHz	
	Standard	Option 1
Max Analog Input boards	8	12
Max Analog Output boards	4	0
Max Digital Inputs	4	
Max Digital Outputs	4	
Digital Counter	Not Available	

SCON -2000 & SCON-1500

Microprocessor based digital servo controller, function generator, data acquisition, and digital I/O unit. Advanced servo control from any system sensor with "on-the-fly bump-less" transfer switching between any connected transducer or calculated input.

Can be configured to read up to 28 transducers or inputs and control up to 8 analog outputs.

- 850 MHz micro-processor.
- 16-bit resolution.
- 250 kHz conversion rate between channels.
- Readout for controller internal temperature, pump oil temperature, pump oil level, external temperature.
- Watchdog timer to detect control program status for automatic interlock shutdown.
- TCP/IP and RS-232 Communications.

AVAILABLE COMPONENTS

DSB-111: Universal Signal Conditioning Board

Universal signal conditioning module for load cells, LVDTs (AC and DC), pressure sensors, thermocouples, or other analog input signals. Each module includes digital (computer) controlled offset and gain. Requires one for each connected sensor.

- 16-bit resolution.
- Adjustable offset range: ± 5 volts.
- Adjustable gain range: 1 to 1000.
- ± 5 volt DC excitation.
- 5 Volt RMS @ 3 kHz AC excitation.
- Anti-alias filter with 0-100 Hz flat response with less than 0.009 dB ripple and 60 dB attenuation at frequencies larger than 1,500 Hz.

DSB-113: ± 10 Volt Dc Input Board

± 10 volt DC input Board for general DC signals. Each module includes digital (computer) controlled offset and gain.

- 16-bit resolution.
- ± 10 volt DC range.
- Standard BNC Connector.
- Anti-alias filter with 0-200 Hz flat response with less than 0.009 dB ripple and 60 dB attenuation at frequencies larger than 1,500 Hz.

DSB-121: ± 10 Volt DC Output Board

16-bit resolution, ± 10 volt output board with 25 mA maximum current. Includes null and gain adjustments.

DSB-122: Servo Amplifier Board

16-bit resolution and 325 mA maximum output servo amplifier board to drive servo valves for the control of the axial actuators, cell pressure, and back pressure. Includes null, gain, dither amplitude, dither frequency, and current limit adjustments.

DSB-123: Servo/Proportional Amplifier Board

16-bit resolution, ± 10 volt output board with 25 mA maximum current along with ± 15 VDC supply (1 amp. Maximum) and +24 VDC supply (1 amp. Maximum) to drive servo and/or proportional valves requiring ± 15 and/or +24 VDC supply. Includes null, and gain adjustments.

SR-TA-2200: Temperature sensor -50 to 150 °C range. 1 degree C absolute accuracy and 0.1 degree C resolution. Includes 7 m long cable and mating connector.

CABLES

CBL-111-AC: AC sensor cable. For LVDT and other AC sensors. 5 VAC excitation. 7 m. long. Includes memory chip to store sensor calibration information. AMP 205838-1 Plug connector

CBL-111-AC-VAL: AC sensor cable. For pressure and volume change transducers. 5 VAC excitation. 7 m. long. Includes memory chip to store sensor calibration information. PT06A-10-6S (SR) connector.

CBL-111-DC: DC sensor cable. For high level voltage output sensors (10 VDC max). 0-5 or 0-10 VDC excitation. 7 m. long. Includes memory chip to store sensor calibration information.

CBL-111-SG-OM: STRAIN GAGE sensor cable. For pressure transducers. 10 VDC excitation. 7 m. long. Includes memory chip to store sensor calibration information. AMP 205841-2 connector.

CBL-111-SG-TV: STRAIN GAGE sensor cable. For load cells. 10 VDC excitation. 7 m. long. Includes memory chip to store sensor calibration information. PT06A-10-6S connector.

CBL-121-BNC: DC output cable. BNC coaxial (female) connector. 7 m. long.

CBL-121-DIN: DC Output cable. 7 m. long. DIN 10/250 connector.

CBL-122-S: Servo Valve cable. 7 m. long. 97-3106A-14S-2S connector

CBL-123-P: Servo/Proportional valve cable. +/-15 excitation and +/-10 volt signal. 7 m. long.

CBL-124-P: Servo/Proportional valve cable. 24 VDC excitation and +/-10 volt signal. 7 m. long. DIN 43563 connector.

CBL-2501-SOL: Solenoid cable. 7 m. long. DIN 43650 Connector

CBL-2701-M: Hydraulic Pump Cable. 10 m. long. AMP 206037-1 Connector

CBL-2702-ESTOP: Remote Emergency Stop Switch and Cable. 7 m. long.