

# The MST - A Breakthrough Concept in Mixed Signal Testing



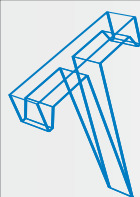
The Telco Testing Solutions Division of Telco Inc. produces Automatic Test Solutions that are sharply focused on production testing, extremely high throughput, and rock bottom cost of ownership. The MST cost of ownership model is based upon an unbeatable feature set:

- Multi-site testing
- Distributed processing with multi-threaded code
- DSP technology throughout system
- Built-in motorized head manipulation
- The smallest footprint in the industry
- Network connectivity for:
  - Remote system control
  - Remote program distribution
  - Remote statistical collection
  - Remote maintenance
  - Flexible factory systems interface
  - Remote device programming and debug
- Visually-oriented icon-driven test language
- Feature-laden board set
- Flexible architecture
- Digital and analog arbitrary waveform generation
- Sophisticated resource synchronization
- CE Compliant

**multi-site testing**

**the smallest footprint in the industry**

**network connectivity**



**TELCO**

TESTING SOLUTIONS, LLC

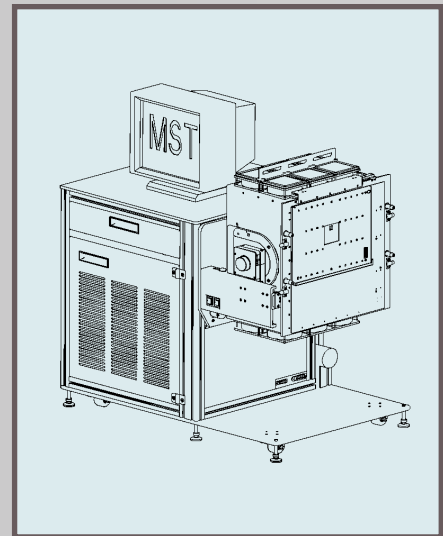
## MECHANICALLY ROBUST

The MST system is housed in an exceptionally small package just 4 feet long, 4 feet high and 3 feet deep. The test head is a mechanical marvel, with motion along all three axes, and it contains a provision for theta adjust for overhead probe applications. The 575-pound machine draws a maximum of 30 amps, 50/60 Hz of 208 V power, with an average heat dissipation of 1.8 KW (typical).

## SYSTEM RESOURCES

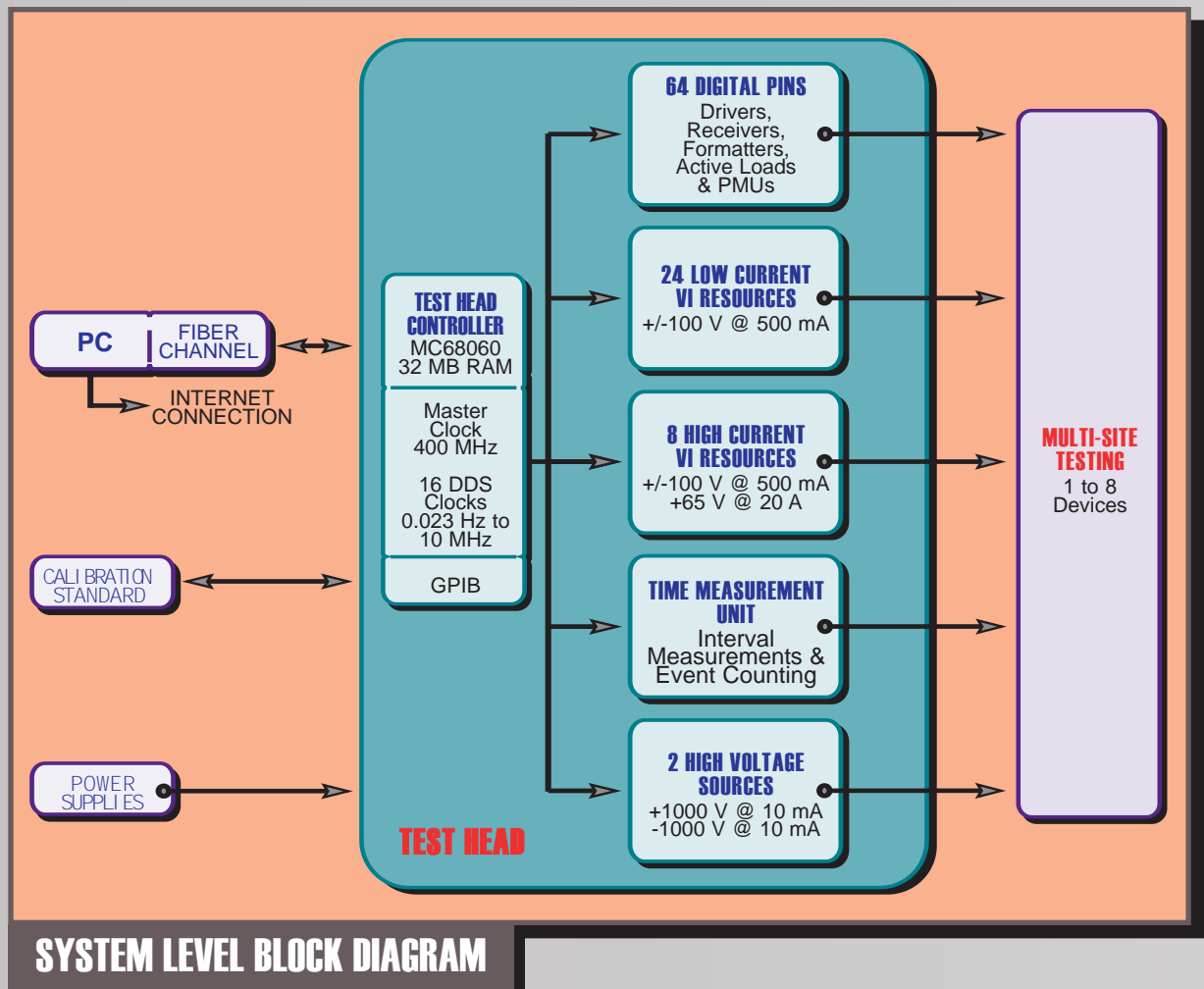
The test head can accommodate up to 12 resource boards. The software architecture allows for flexible backplane configuration. Custom backplanes may be created to facilitate special resource requirements.

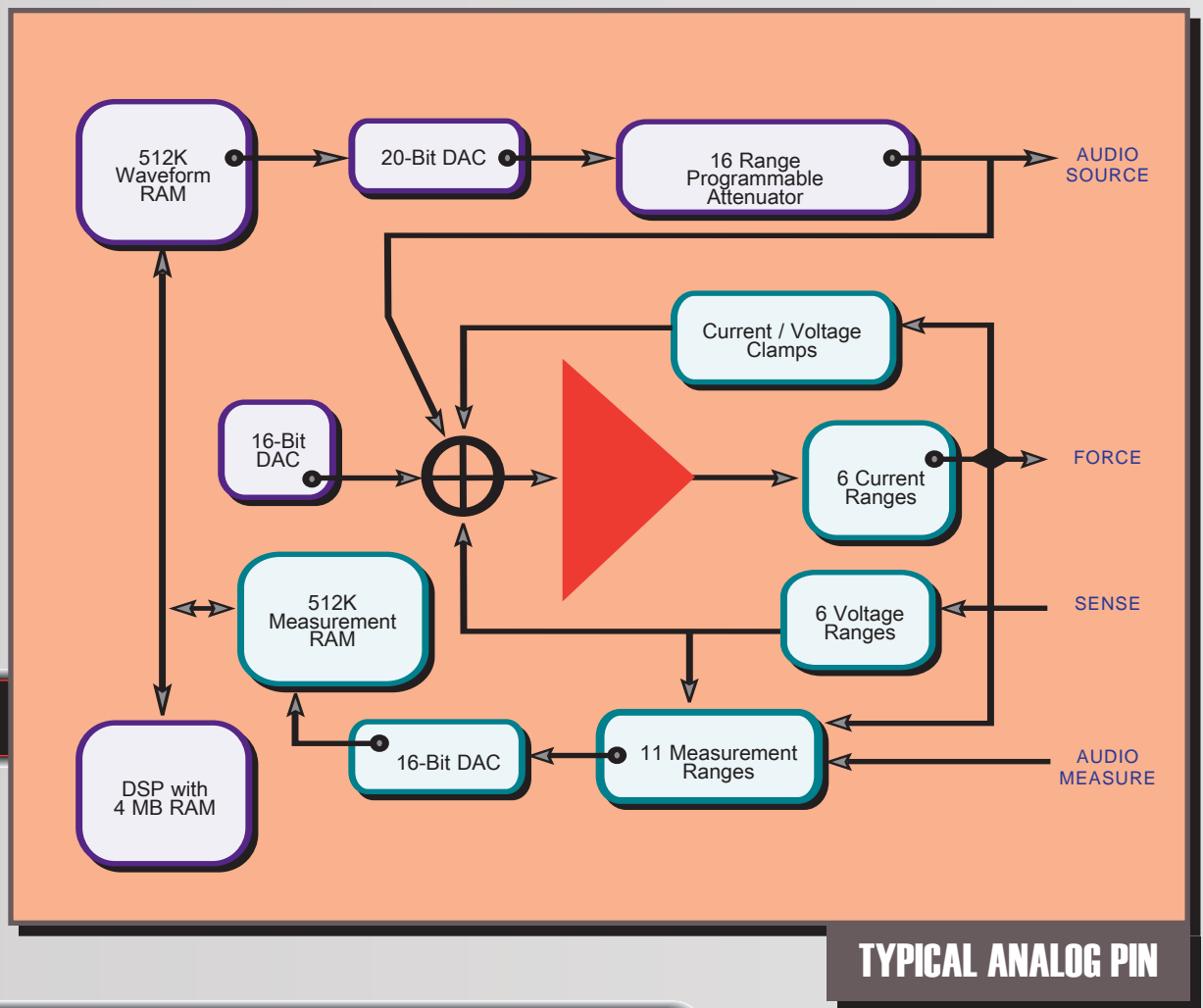
The **Test Head CPU Resource** interfaces with a IBM-compatible PC through a 1.2 GHz fiber channel interface. A high-stability, 400 MHz master clock and 16 DDS clocks provide the fundamental system timing. 64 fault-protected 200MA drivers provide load-board relay switching. The CPU Resource provides integrated IEEE 488 support, as well as Enhanced 1149.1 JTAG for boundary scan applications. A 16-bit synchronization bus facilitates scheduling and control of asynchronous resource activities.



*Smallest footprint in the industry.*

**distributed processing**





## multi-site testing

The MST supports a growing family of **VI Resources**. The family members include low-current, high-current and high-voltage resources.

Each VI Resource uses a common DSP subsystem to provide waveform generation and measurement capability. The programmable arbitrary waveform resolution is 64K steps using 20-bit values with a maximum clock rate of 500 kHz. The low-current VI contains 6 four-quadrant voltage/ current sources on each resource card. Voltage force is +/- 100 V maximum and each source can supply up to 500 mA @ 100% duty cycle. Many backplane configurations are possible to

meet user resource requirements. The present backplane supports 4 low-current VI Resource cards for a total of 24 low-current VI sources. Parallel sources are supported.

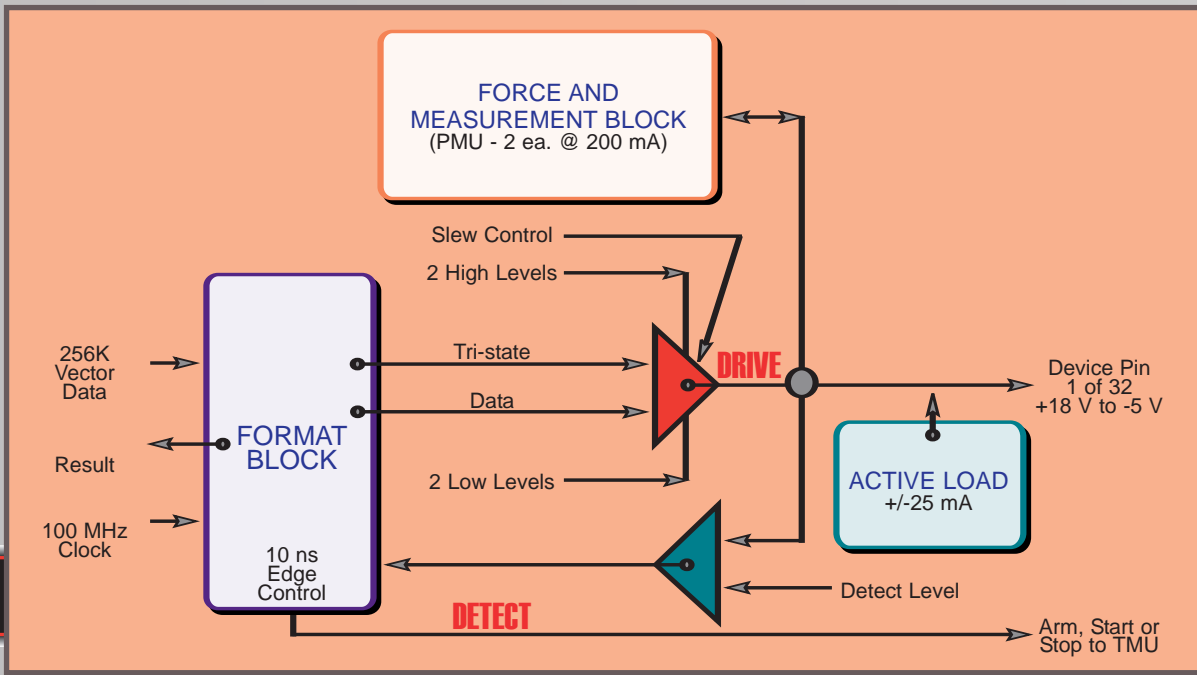
The high-current VI contains 4 high-power sources that are identical to the low-current sources with an added 100% duty cycle high-current range of 20 A at 65 V.

The high-voltage VI contains 2 high-voltage current sources. One source has a maximum of +1000 V at 10 mA. The other source is -1000 V at 10 mA. This VI is interlocked with the loadboard shields to prevent any inadvertent high-voltage contact.

## visually oriented interface

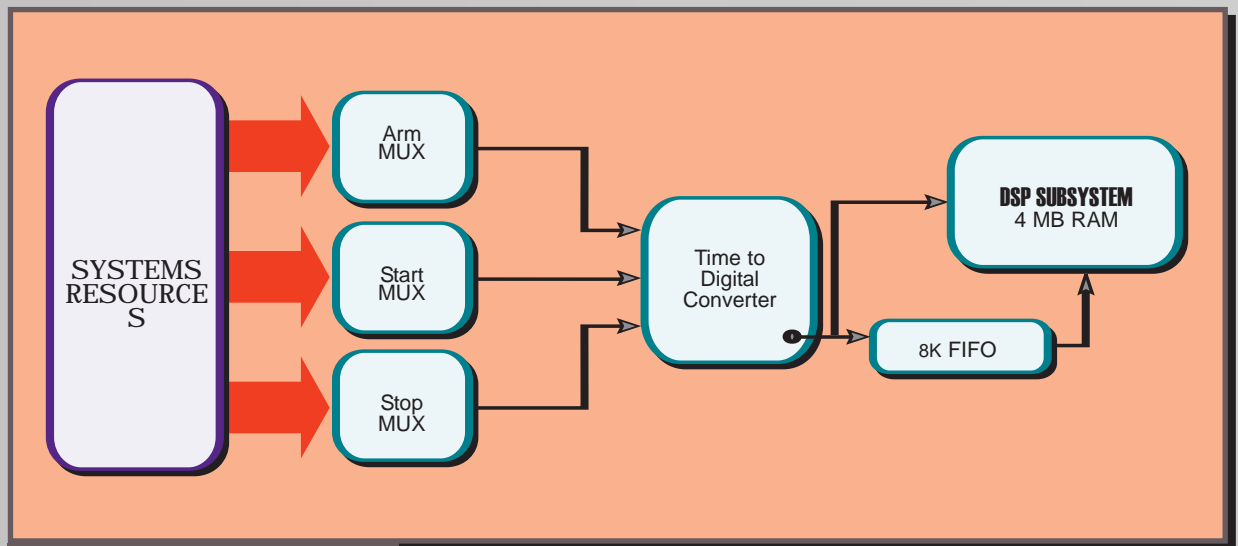
Each **Digital Pin Electronics Resource** provides 32 digital signal pins. Each digital pin is comprised of a driver, a comparator, and an active load. Functional NRZ patterns of up to 256K vectors may be executed at rates from

50 kHz to 50 MHz. Functional patterns from DC to 50 kHz are driven from an on-board interval timer. Vector looping and branching are supported. There are two parametric measurement units for each group of 32 pins. Either of these PMUs may be connected to any digital pin. The PMUs can supply 200 mA over the range of +18 V to -3 V.



## TYPICAL DIGITAL PIN

## comprehensive system diagnostics



## TIMING MEASUREMENT

The **Time Measurement Unit** resource measures up to 22 minutes with either 20 ps or 625 ps resolution. The TMU can store 8K measurements at a 10 MHz rate. The resource is able to count 2

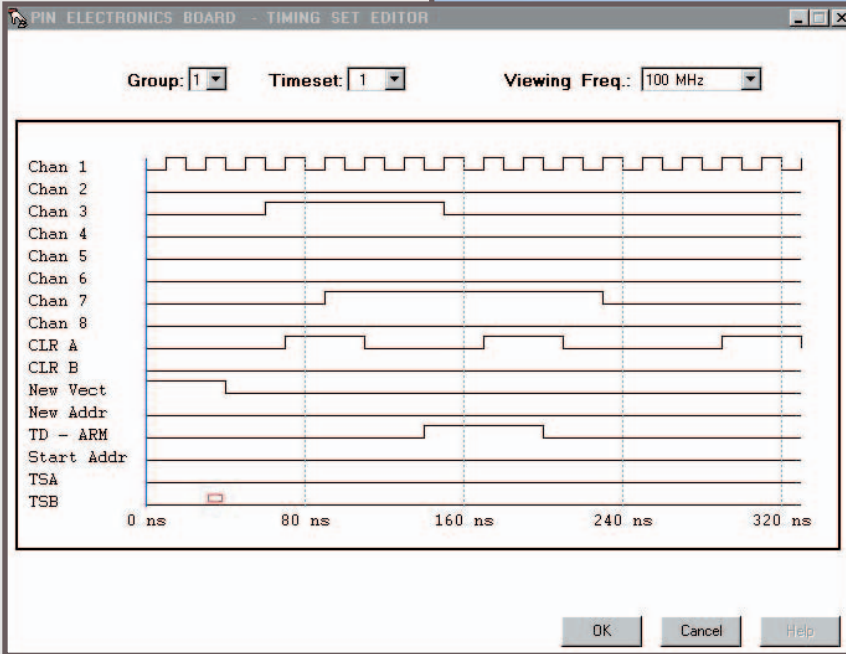
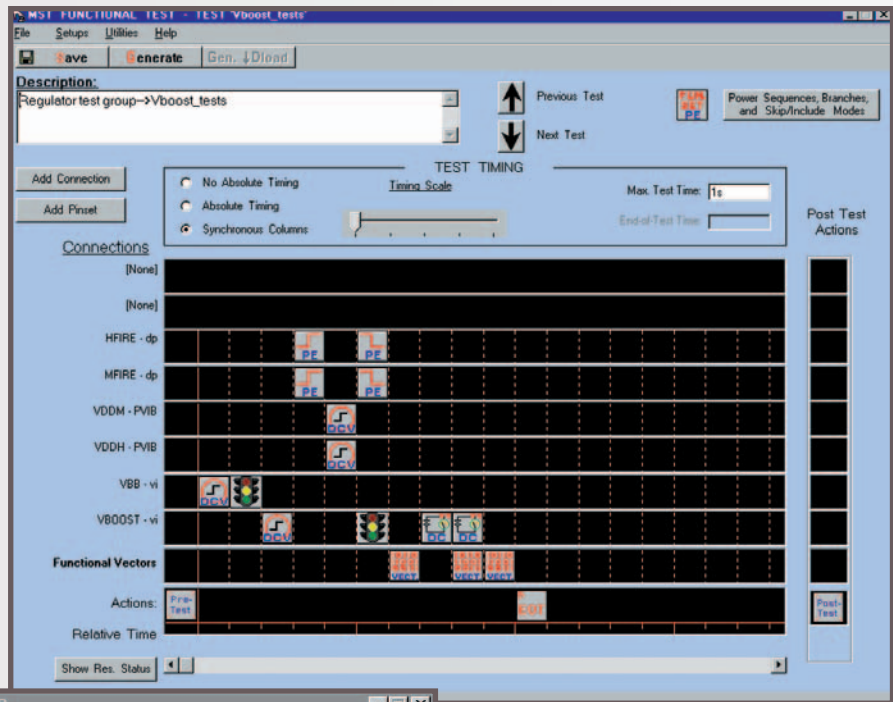
trillion events. The system supports arming, starting and stopping measurements based on events from all of the system resources, with multiple levels of conditional logic. Supported features include

period, frequency, duty cycle, prop delay, pulse width, event counting and rise/fall measurements. The external gating functions include programmable time and event holdoff.

## SOFTWARE ENVIRONMENT

The MST Software environment has established itself as the leader in speed of device program development and ease of use. The environment provides a graphical test language that seamlessly manages the multi-threaded distributed processing resources, without burdening the device programmer with the details of synchronization or inter-processor communication.

An icon screen that displays the input and output actions on the



Integrated functional vector editor

Icon-driven test language.

vertical axis and their timing relationships on the horizontal axis is intuitive and easy to learn and use. Measurements can be precisely placed and timed relative to input waveforms.

A powerful feature of the software environment is the multi-site test capability. The MST makes serial or parallel multi-site testing simple

by creating the device program for a single site, and automatically expanding the program to test up to 8 sites.

The Test Program Generator supports multiple flows and limits within a single device program. Each program flow can have a common set of user-defined symbols associated with it.

These symbols can represent forcing values, limits, ranges or calculation constants allowing the programmer to use a single program to test a device in a variety of different environments. Multiple program flows are also supported so that specific environments will cause the tester to execute different tests in the same program.

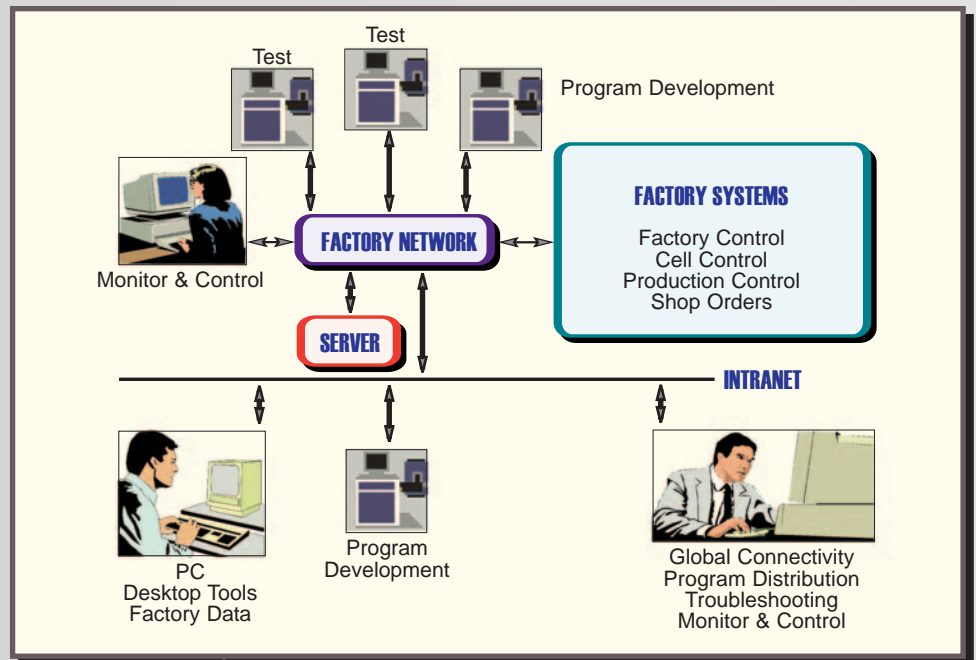
The Test Program Generator also supports editing of functional vector timing sets, arbitrary waveform generation, and an integrated functional vector editor.

The Graphical Test Program Generator can be installed on any Windows 98, 2000 or NT computer.

## CONNECTIVITY

Powerful MST connectivity facilitates host and server communications as well as a flexible factory systems interface. A unique data-log design provides a simple path to common desktop tools such as spread sheets, word processors, graphics packages, and math packages.

A software-driven machine interface allows remote monitoring and control. The suite of connectivity tools provided with the MST allows remote system diagnostics and device program debug to be performed from anywhere in the world.



*Powerful connectivity.*

## DIAGNOSTICS AND CALIBRATION

An IEEE-488 controller driven from the test head drives an integrated traceable standard for fully automatic calibration. The 488 controller is also available to run an external "rack & stack". The standard MST software suite provides an integrated Gauge R&R and auto-correlation system to tightly control production floor quality. The system contains a comprehensive set of system diagnostics and assurance tests. This diagnostic tool set guarantees the quality of the MST to the specification limits.

## SERVICE AND SUPPORT

Telco Testing Solutions offers a full line of service and support that can be tailored to the specific needs of the engineering and manufacturing segments of your business. We offer on-line technical support, in-house training, service contracts, regional or on-site customer service, and a host of other options. Our goal is to keep your system fully productive! See your Telco Testing Solutions Customer Service representative for more details.



*MST Over-head Probe Interface.*



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