



TYPE S-3130 DIGITAL MEASUREMENT SYSTEM



- **DYNAMIC MEASUREMENT**
 - PULSE RISETIME AND FALLTIME**
 - PULSE WIDTH AND PERIOD**
 - PROPAGATION DELAY AND STORAGE TIME**
 - PULSE AMPLITUDE AND SATURATION VOLTAGE**
 - MANY OTHER SPECIFIC MEASUREMENTS**
- **1600 MEASUREMENT STORAGE**
- **PROGRAMMABLE**
 - PULSE GENERATOR**
 - POWER SUPPLIES**
- **100 MEASUREMENTS PER SECOND**
- **400-ps RISETIME**
- **PROGRAM BRANCHING FOR DIAGNOSTIC TESTING**
- **100 ps/DIV to 500 ms/DIV**
 - CALIBRATED SWEEP RANGE**
- **20 mV/DIV to 2 V/DIV**
 - CALIBRATED VOLTAGE RANGE**

TYPE S-3130

The Type S-3130 Digital Measurement System is a dynamic measurement system intended for measuring the performance of active devices under simulated operating conditions. It is designed to test integrated circuits, transistors, diodes, circuit modules, circuit boards and sub-assemblies in all segments of the electronic industry. Typical areas of application are found in production testing, QC, incoming inspection and preproduction.

The Type S-3130 can sequence through measurements at a rate of more than 100 measurements per second. The Disc Memory provides local storage and random access to 1600 independent measurements, and permits sorting and classifying. Diagnostic test routines may also be performed. Provisions are made for a computer or other control device to control the measurement or measurement routine. The computer can make calculations based on test data and employ the Disc Memory for further measurements.

The following instruments comprise the Type S-3130: Type R568 Oscilloscope with the Type 3T6 Programmable Sampling Sweep and Type 3S6 Programmable Sampling Unit, two Type S-3 Sampling Heads, Type R240 Program Control Unit, Type R250 Auxiliary Program Unit, Type R116 MOD 703L Programmable Pulse Generator, four Programmable Power Supplies, a Disc Memory, Punched Tape Reader, Probe Choppers, and a dual-bay enclosed cabinet with an operator table containing Test Station at one side. Several options for the Type S-3130 are available to satisfy specific measurement requirements.

VERTICAL AMPLIFIER

Vertical characteristics are stated with the 10X attenuator. Either the 10X or 100X attenuators must be used with the included probe choppers.

Voltage measurements are from 20 mV/div to 2 V/div (8 div full scale) accurate within 3%.

Bandwidth is equivalent to DC to 875 MHz.

Risetime is less than or equal to 400 ps.

Input characteristics are 1 M Ω paralleled by 2 pF.

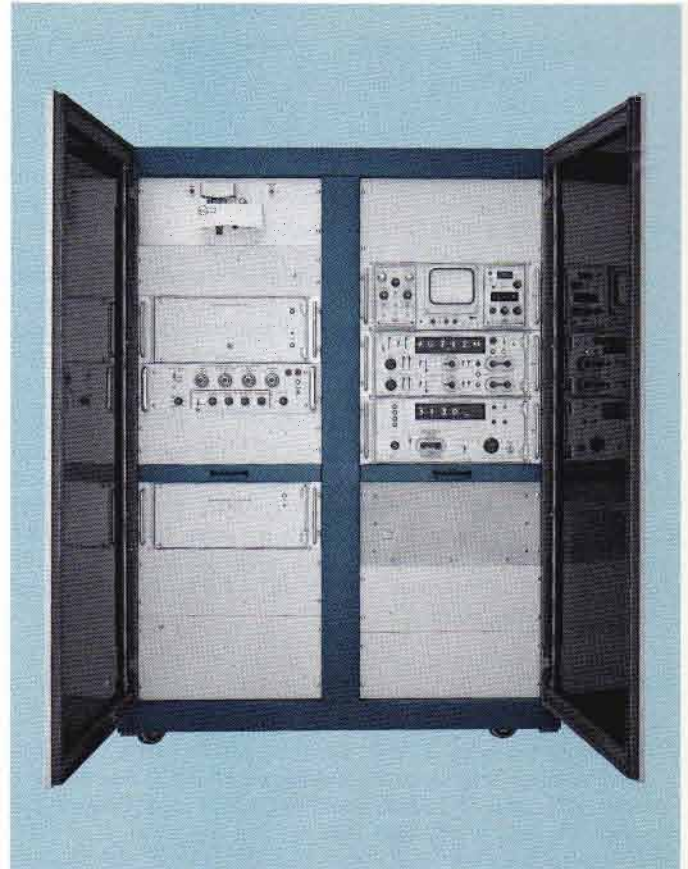
Programmable DC offset is from +9.95 V to -9.95 V in 50-mV steps.

TIME BASE

Programmable sweep time/div is from 100 ps/div to 0.5 s/div in 30 calibrated steps, accurate within 3%.

Programmable digital delay range is from 0 to 999.9 μ s in increments of 100 ps, 1 ns or 100 ns, depending on the sweep time/div.

Automatic triggering eliminates the need for trigger adjustments over a wide range of trigger amplitudes, shapes and repetition rates. Automatically triggers on signals of 100-mV to 500-mV amplitude over a frequency range from DC to 100-MHz.



DIGITAL UNIT

Units of measure are readout in V, mV, ns, μ s, ms, s.

Numerical readout is from -3999 to +3999.

Programmable measurement limits are from -3999 to +3999.

Data output is in parallel BCD code, 29 lines; 1, 2, 4, 8; true = ground, false = +12 V.

MEMORY AND PROGRAMMING

Storage capacity is 1600 measurements. Programming format is a fixed word length of 96 4-bit characters. A parity check is made on each character read into the Type 240 Program Control Unit. Program access time is 17 ms average and can be optimized to approximately 1 ms through minimum-access time programming. 360 parallel program lines are available to various systems instruments.

THREE 40-VOLT PROGRAMMABLE POWER SUPPLIES

Operating ranges from 0 to \pm 40 V, programmed in 10-mV steps, repeatable within 0.5%, \pm 3 mV. Output slewing rate is 20 V/ms. Load regulation is within 0.25% or 1 mV, whichever is greater. Line regulation is within 0.02% or 0.5 mV, whichever is greater. Ripple is less than 3 mV RMS.

TYPE S-3130

80-VOLT PROGRAMMABLE POWER SUPPLY

Operating range is from 0 V to ± 79.9 V, programmed in 100-mV steps, repeatable within 1.0%, ± 3 mV. Output slewing rate is 20 V/ms. Load regulation is within 0.25% or 1 mV, whichever is greater. Line regulation is within 0.02% or 0.5 mV, whichever is greater. Ripple is less than 3 mV RMS.

PROGRAMMABLE PULSE GENERATOR

The Type R116 Programmable Pulse Generator is modified (MOD 703L) to include 5 program assembly cards, that provide digital-to-analog conversion of program data. The Type R116 is calibrated with the program assembly cards that are mounted in the Type R250. The input and output connectors of the Type R116 are moved to the rear panel.

All functions of the Type R116 MOD 703L are programmed in the Type S-3130. These functions include: pulse period from 100 ns to 10.9 ms; pulse delay/period from 50 ns to 545 μ s; pulse width from 50 ns to 545 μ s; pulse amplitude from 0.4 V to 9.9 V; pulse risetime and falltime from 10 ns to 109 μ s; pulse DC offset from -4.9 V to $+4.9$ V. For additional information see page 43.

DISPLAY UNIT

CRT display is 8 x 10 cm with P31 phosphor. Calibrator provides 20 kHz accurate within 0.05%, and approximately 1-kHz signals; amplitudes of 0.5 V and 5 V P-P within 2% into ≥ 100 -k Ω load, or 50 mV and 500 mV P-P within 2% into a 1% 50- Ω load.

TEST STATION

The Test Station is in the operator table and provides the interface between the Type S-3130 and the device under test. Test inputs and outputs of the Type S-3130, including 32 program lines, are available on a 56-pin connector and through 50- Ω connectors located in the Test Station. A test fixture card that contains a socket for the device under test, and the appropriate test circuitry for input and output signals, can quickly and easily be inserted into the Test Station. This feature permits the test fixture to be easily changed when various devices are to be checked. Two unwired test fixture cards are included with the Type S-3130. They require circuit design and wiring to obtain a proper interface to the device under test. A system performance check-out test fixture card is also included. Consult your Field Engineer, Representative, or Distributor for quotations on wired test fixture cards for specific devices and tests.

DIMENSIONS

The Type S-3130 is 62 $\frac{1}{2}$ inches high, 99 inches wide, and 46 inches deep, including the operator table. Instruments are mounted on slide-out tracks and individually can be pulled out, tilted, and locked in any one of seven positions for convenient access.

POWER REQUIREMENTS

105 V to 125 V, 60 Hz, approx 1000 watts at 115 V and 60 Hz. Rear panel selectors on each instrument provide rapid accommodation for line-voltage ranges.

INSTALLATION

A Tektronix System Technician installs the Type S-3130. He checks the complete system for proper operation, and assures that it meets or exceeds published specifications.

FACTORY TRAINING

Tektronix provides an intensive 3-week System Training course on the Type S-3130. Theory of operation, programming, calibration, and trouble-shooting are discussed for each System instrument, as well as the complete System. Classes are held at the Tektronix Industrial Park, Beaverton, Oregon.

TYPE S-3130 DIGITAL MEASUREMENT SYSTEM

Includes the following instruments in a dual-bay enclosed cabinet with operator table containing a Test Station at one side: Type R568 Oscilloscope; Type R230 Digital Unit; Type R240 Program Control Unit; Type R250 Program Unit; Type 3S6 Programmable Sampling Unit; Type 3T6 Programmable Sampling Sweep; two Type S-3 Sampling Heads; Type R116 Programmable Pulse Generator MOD 703L; Disc Memory; Punched Tape Reader; four Programmable Power Supplies; two Probe Choppers; two unwired test fixture cards; a performance check-out test fixture card; and includes the standard accessories of the above instruments.

PUNCHED TAPE PROGRAMMING ONLY

The Type S-3131 is identical to the standard Type S-3130 with the exception that the Disc Memory is deleted and programming is accomplished with the Punched Tape Reader. The maximum measurement rate with the Punched Tape Reader is 3 measurements per second. The Disc Memory can be added to the system at any time.

TYPE S-3131 DIGITAL MEASUREMENT SYSTEM

DISC MEMORY PROGRAMMING ONLY

The Type S-3132 deletes the Punched Tape Reader from the standard Type S-3130 and maintains the maximum measurement rate of 100 measurements per second. The Punched Tape Reader can be added to the system at any time.

TYPE S-3132 DIGITAL MEASUREMENT SYSTEM

OPTIONS

DUAL-TEST STATIONS

Dual-Test Stations are available for the Type S-3130 that permits full use of its measurement speed of 100 measurements per second. This lets the Type S-3130 scan the two test stations, making measurements from either station on command. If the Type S-3130 is making a measurement at one station and receives a start command from the other station, it finishes the first measurement sequence before switching stations.

Each station has separate test fixture cards that permit checking different devices at each station. The station selects its own measurement sequence, indicates the measurement limit results (high, low, go), has a start and reset button, and indicates the station's condition of test (in process or waiting).

Order 015-0133-00

SELF-CALIBRATION

The self-calibration option checks and adjusts, when necessary, the vertical deflection factor (5 mV/div to 100 mV/div) and the horizontal sweep rates (1 ns/div to 0.5 s/div) to within 1%*.

Order 015-0131-00

TAPE PUNCH

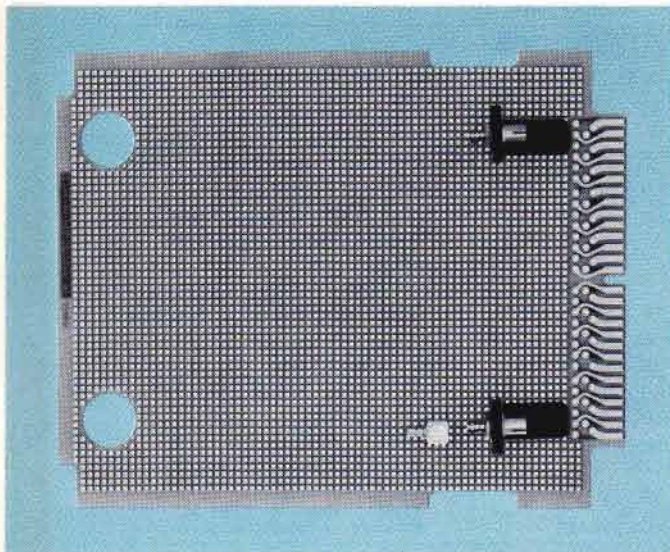
The Tape Punch provides punched tape copies of program data stored in the Disc Memory. The Tape Punch can be ordered installed, when ordering a Type S-3130.

TYPE R250 AUXILIARY PROGRAM UNIT

An additional Type R250 can be added to the Type S-3130 System. The Type R250 adds 192 program lines that can be used to program additional power supplies, pulse generators, programmable fixtures, automatic handles, or other programmable equipment. Consult your Tektronix Field Engineer, Representative, or Distributor for a quotation on the Type R250 designed to do your specific programming job.

The Type S-3130 is also available with different Sampling Heads featuring up to 25-ps risetime capabilities, and data recording options. Consult your Field Engineer, Representative, or Distributor for additional information.

*Accuracy on 1 mV/div and 10 mV/div positions is within 5% and 2% respectively.



TEST FIXTURE CARDS

Additional unwired test fixture cards can be ordered at any time. They require circuit design and wiring to obtain a proper interface to the device under test. The fixture card mates to the 56-pin connector in the Type S-3130 and has a coaxial connector for the pulse generator input and has two probe connectors mounted on the card.

Order 670-1016-00