



Multimeter Calibration Systems

- **Calibrates Any Type of DMM or Analog Meter**
- **Comprehensive Menu Driven Structure, Easy to Use**
- **Runs on IBM PC-XT, HP Vectra, Compaq Portable**
- **Extensive Instrument Inventory Management Capabilities**
- **Compatible With All Datron Calibrators**

The 4100 PORTOCAL series of multimeter calibration systems offers a selection of high quality systems configured with Datron calibrators, calibration software and accessories. All 4100 systems are supplied with the 4101B Portocal Multimeter Calibration Software, a powerful and flexible package which is totally menu driven, and compatible with all Datron calibrators and IBM PC-XT, HP Vectra and Compaq Portable II controllers.

Users of this software have a tremendous choice of options in setting up automated calibration systems. The calibration hardware available ranges from the model 4707 (for calibration of standards and high performance system DMM's) to the more cost effective models 4700 or 4705 (for 6½ and 5½ digit calibration), and even the model 4600 Transconductance Amplifier for high current calibration. In addition, a range of accessories is also available which includes lead kits, bar code readers, tape drive units, cabinets and mobile calibration carts so that systems can be

configured for many different requirements—from bench use in the calibration laboratory to far more demanding mobile calibration roles.

4101B Software

The Portocal software is a self-contained package resident in its own subdirectory on the hard disk, allowing the use of the controller for tasks other than calibration. It is designed to maximize the effectiveness of the Datron Autocal range of calibrator hardware and to guide the user in developing and controlling the calibration process, while providing, through the use of passwords, protection against unauthorized modification of any of the calibration procedures or historical data stored on the system.

Its use is not confined to IEEE-488 controllable DMMs, in fact all types of DMMs may be calibrated, from instruments that incorporate some method of electronic calibration (e.g. Autocal), to instruments that are controllable over the IEEE-488 interface but calibrated by

operator intervention, and finally to instruments that are totally manually controlled and calibrated.

A dual port IEEE-488 interface is used so that the system calibrator is on a separate bus to the instrument under test. This means that should an instrument under test be faulty, Portocal is always able to reset the analog output of the system to a safe level and make error reporting and diagnosis easier. Secondly, this allows the software to execute an auto address search routine for the instrument-under-test, eliminating the need for any address settings to be modified. Thirdly, it enables an in-situ approach to the calibration of systems DMMs, as the address of the calibrator will not conflict with any instruments in the system containing the device under test.

Easy to Use

Ease of use is a prime feature of Portocal which, being menu-driven, does not require the user to be familiar with either instrument controllers

or their various languages. Furthermore, the software is specifically designed for the minimum of operator intervention in order to reduce possible human errors. For example, incorporating the calibration procedure library and the instrument and results database on a high capacity hard disk means that the operator has only to enter the instrument's serial number (either via the keyboard or the optional barcode reader) to completely set up the system for calibration of that instrument. The storage of all files required on the hard disk also eliminates the need for an operator to be constantly changing floppy disks.

Calibration Procedures

Generation of a calibration procedure for bus controlled instruments is swift and straightforward as detailed understanding of the operation and programming requirements of the IEEE-488 interface is not required. The user merely has to inform the 4101B software of which commands are required to select a given function, range, etc., and how the instrument should be triggered (information that is readily available from the instrument's operating manual) and the software is then able to control the instrument under test.

Programming the calibration of manually controlled instruments is even simpler. At each point that manual intervention is required, the user enters the relevant instruction text into an instruction menu, and the software then automatically handles all of the interaction with the operator and the calibrator.

Different manufacturers have different ways of expressing an instrument's performance, so there are many different ways that the user can specify the limits to which the unit is to be tested. Entry of these limits is simply a matter of entering the specifications as they are printed in the manufacturer's datasheet or operating manual, and Portocal will make all of the necessary calculations at run time.

Custom Certificates

Each organization has its own terminology, nomenclature and calibration certificate formats. Portocal allows the generation and storage of up to 20 customized calibration certificate designs, which are stored in a certificate library. Furthermore, the Universal Titles facility allows the user to modify the contents of fields displayed throughout the software. This allows the user to change, say, the prompt "Serial Number" to "Asset Number" in one single menu and have this change reflected throughout the software.

Instrument & Results Database

The use of a high capacity hard disk for the storage of all data and programs means that the details of all instruments calibrated by the system may be stored in the instrument inventory and calibration results database. Extensive database search facilities exist which allow, say, a search for all instruments that

will require calibration next week. This facility is not limited to instruments that may be calibrated by the system, and therefore provides the basis for a computerized inventory management system. The user has access to the results in the library through an easy to use, menu driven sub-program, where results may be selected for recall, analyzed, printed, or "dumped" into an ASCII disk file or over the RS-232 serial interface for later examination by other commercial or even user-generated software.

System Management

The system management facilities available are comprehensive. They enable important functions such as backup of data to floppy disk or tape drive unit to be performed without leaving Portocal. Unwanted calibration results and instrument records may be deleted from the database, while the archive results facility allows important calibration results to be transferred from the results library to floppy disks in order to free up disk space. An abbreviated record for each result archived in this way is retained in the results library, so that these results are still accessible to the user. If recall of any of these archived results is required, the system will automatically prompt the user for the insertion of the correct archive disk.

SYSTEM ANALOG PERFORMANCE

To specify performance at the remote end of the analog lead assembly (either the 4102/4112 calibration carts or the PLK-1 and PLK-2 lead kits), add the following uncertainties to the specifications of the calibrator to be used in the system.

DC Voltage: No additions required.

AC Voltage:

1 mV to 100 mV Ranges:

Add 2% R+3% FS (100 kHz-1 MHz).

1V and 10V Ranges:

Add 0.3% R+0.1% FS (300 kHz-1 MHz).

Volts x Hertz product 2×10^7 Max.

No other additions required.

Resistance:

1M Ω Range: Add 10 ppm Output.

10M Ω Range: Add 100 ppm Output.

100M Ω Range: Add 1000 ppm Output.

DCI and ACI: No additions required.

MODEL 4101B SOFTWARE

Program Size: 1.5 MBytes.

Max Number of Calibration Procedures: 999.

Typical Procedure File Size: 10 kBytes.

Max Number of Certificate Designs: 20.

Typical Certificate File Size: 8 kBytes.

Capacity of Instrument Inventory: 32,000.

Typical Instrument File Size: 120 Bytes.

Disk Operating System: PC-DOS 3.0 or later, MS-DOS 3.1 or later.

CONTROLLER CONFIGURATIONS

These are the controller configurations that will support the 4101B software package

IBM PC-XT

System unit, including 256k Ram (minimum), 360kByte floppy drive, 20MByte hard drive and asynchronous communications adaptor.

Parallel Printer Adaptor

CGA Color Card

Color Monitor

Keyboard

IBM PC-DOS (3.0 or later)

IBM Basic

Ziatech ZT1488A and zSBX20 Interface Cards

Model 4103A

HP Vectra ES Model 22 (D1222A). Includes 45979D CPU, 1.2 MByte floppy (5.25 in.), 20 MByte winchester, EGA video card, serial and parallel ports.

14 In. Enhanced Monitor (35743 BU)

MSDOS 3.2 + PAM (45951 BU)

GW Basic (HP 45952A)

Ziatech ZT1488A and zSBX20 Interface Cards (Datron Part 440127)

Model 4103B

Compaq Portable II Model 3. Includes 640k RAM, 360 kByte (5.25 in.) floppy drive, 20 MByte winchester, CGA video card, serial and parallel ports, keyboard and integral monitor.

MS-DOS (3.1 or later).

Basic Interpreter

Ziatech ZT1488A and zSBX20 Interface Cards (Datron Part 440127).

Model 1404

Epson Printers: FX80 and FX800 Series.

MODEL 4102 CALIBRATION CART

Includes all power distribution and cabling.

OPTIONS & ACCESSORIES

03: Barcode Reader

440127: Ziatech ZT1488A and zSBX20 Interfaces

PLK-1: Analog Benchtop Lead Kit. For 4000A, 4200A Configurations.

PLK-2: Analog Benchtop Lead Kit. For 4700 Series Configurations.

440154: 11A Current Lead Kit. For use in systems containing model 4600.

400277-0.5: 0.5m IEEE Cable

400277-1: 1m IEEE Cable

400277-2: 2m IEEE Cable

FACTORY/FOB

Indianapolis, IN

Norwich, England