



## **TE CalBench**

*A complete calibration laboratory in one test bench*

### **For on-site test facilities**

*Processing Plants*

*Offshore Platforms*

*Calibration Laboratories*

*Mining Operations*

*Refineries*

*Power Plants*

*Engineer Training Centres*

*Research and Design*

*Instrumentation Laboratories*

*Electricity and Electronics*

*Pharmaceuticals*

*Military / Defence*



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About CalBench

CalBench is the ultimate multifunction calibration station from Time Electronics. Each bench is custom-made to meet specific user requirements. Offering versatility and precision it is ideal for laboratories and workshops in need of multi-product testing that meets the highest industry standards.

A wide range of modules can be fitted to the primary console creating a highly flexible system that is both functional and easy to use. Further expansion can be achieved by adding the secondary console, mounted under the primary.

Calibration modules cover electronic signal, temperature, loop, and pressure applications. Power supplies, DMMs, oscilloscopes and generator modules can also be fitted into the bench consoles. Functions are clearly defined on each module and a competent technician will quickly master the operation of the system without training or constant reference to manuals.

Various fittings, functions, and additional devices can be added to CalBench to create a comprehensive work environment.



Calibrates

Multimeters	Pressure Gauges	Thermocouple Transmitters
AC/DC Signal Sources	Clamp Meters, Tachometers	Pressure Transducers
Signal Generators	Power Supplies	Frequency Meters
Oscilloscopes	Temperature Indicators, Sensors	Decade Boxes
AC/DC Millivoltmeters	RTD Transmitters	Pressure Transmitters
Loop Signal Indicators	Timer Counters	Ohmmeters

MODULE OPTIONS and EXTRAS

**Pressure:** Precision calibrators, indicators, and controller modules. Ranges from vacuum to 600bar.

**Power Supplies:** Fixed and adjustable AC and DC power supplies, dual and programmable units.

**Loop and Temperature:** High accuracy loop calibrator modules with source, measure and sink functions. Temperature calibrators capable of measuring and simulating RTDs/thermocouples.

**Multifunction Calibrator and DMM Modules:** The 7051 provides high accuracy multi-product calibration and has an internal 6½ digit multimeter. Also available are the 5065B (6½ digit) and 5075B (7½ digit) DMM modules.

**Additional Modules:** Further modules include oscilloscopes, frequency counters, function generators, and harmonics analyzers. Custom design modules can be fitted allows the user to integrate a familiar instrument into their system.

**External Options:** Pneumatic and hydraulic calibration pumps, pressure gauges, dead weight testers, dry block calibrators, pressure test kits, hoses and connectors, test lead sets, solder stations, vices, and much more.

**Bench Fittings:** Various fittings can be added to CalBench to improve usability and create a more efficient workspace. Under-worktop drawers, cabinets, CPU holders, and keyboard trays; tool holders and hooks for the perforated back panel; air preparation kits, desktop mountable devices, and more.

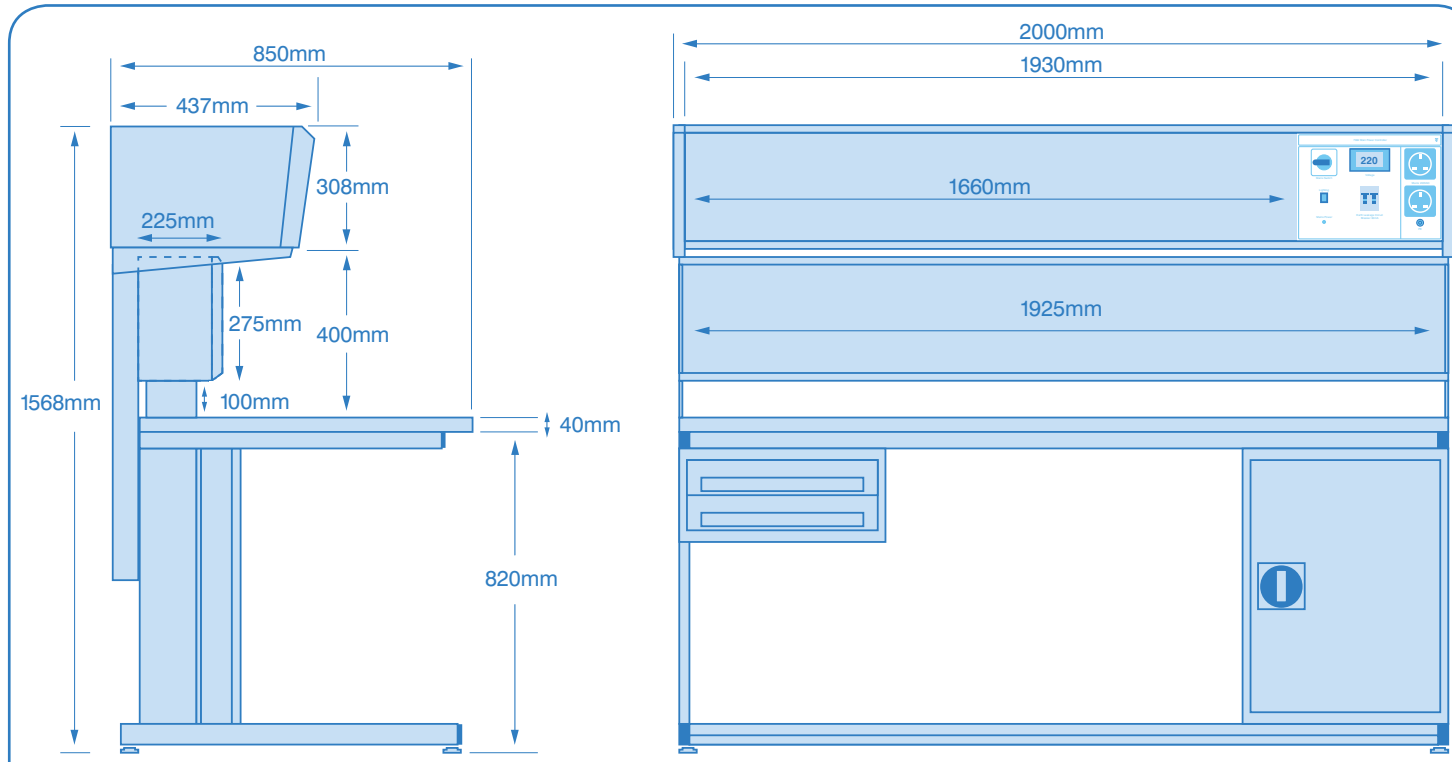
**Laboratory Design and Supply:** Time Electronics offers a turnkey laboratory design service for customers requiring a complete and efficient test facility. Using 3D software we create the layout then generate images and videos to visualise the concept. We supply all the necessary test equipment and surrounding laboratory furniture.





# CalBench General Specifications

Bench dimensions and console settings



The above drawing represents the bench with 7081 secondary console fitted. Without this option the overall height can be set at the shown 1568mm or 1413mm depending on user preference. The under-worktop fittings shown are optional (see page 4).

## CALBENCH DETAILS

The 7080 CalBench consists of the workstation frame, table top, and primary console. The 7082 mains power module is fitted as standard in every bench. The remaining space in the primary console houses the modules selected by the user for their applications.

The primary console is mounted on two support arms that fix to the rear of the workstation frame. There are two fixed settings available, allowing the user to position the console 250mm or 400mm above the worktop. A perforated back panel is fitted below the primary console. It is sized to accommodate both height settings and can be complemented with tool hooks, holders, and accessories.

The 7081 secondary console is an optional expansion that mounts under the primary, housing additional modules. Being 225mm deep it maintains user worktop space. When fitted the perfo panel is removed.

Each bench is heavy duty, constructed from mild steel throughout with side panels and console support arms welded to provide a reinforced frame. The bench worktop is a durable laminate finish with rolled front edge. An antistatic worktop is also available.

Bench set up is fast and simple as the consoles are supplied complete, fully tested, and with the modules installed. The complete system requires only basic construction and once the mains power and line pressure is connected it is ready for use.

The primary console is powered from a single-phase mains supply via a 16A heavy duty type IEC socket at the rear of the console. The secondary console is powered from the primary console via an IEC power link cable. For pressure, the external line input ports are arranged on the rear of the consoles.

## 7060 TABLETOP BENCH CONSOLE

The 7060 is a 1000mm wide tabletop console. It is designed for laboratories requiring a modular unit where space is limited or a mobile system is required. It can be supplied as a standalone unit ready for fitting or pre-mounted on either a standard or mobile workbench.

A compact 150mm 7082 mains power module is fitted as standard. This allows a further 830mm of module space for calibrators, power supplies, and more. Multiple 7060's can be used side by side or mounted on top of each other. Mains power can be separate for each console or combined, creating more module space.

The 7060 is supplied as a complete system with all modules fitted and tested, ready for use.

## 7082 MAINS POWER CONTROLLER MODULE

Fitted as standard in every bench the 7082 mains power controller module is a single-phase unit equipped with 2 power sockets and digital voltage meter.

- Mains power on/off switch to provide isolation for the entire bench
- Lighting switch to provide separate control of the worktop lighting
- 16A overload protection for bench. Residual current protection 0.03A
- 2 front panel earthed sockets (4 under console earthed sockets)
- Digital mains voltage meter (0 to 300V)
- 2 filters (mains and lighting) fitted to attenuate mains spikes
- Cooling via 2 mains powered 80mm extraction fans fitted internally
- PE socket is provided for wrist bands, mats, etc
- All metallic parts of the bench are connected to mains earth
- Optional isolated mains output sockets (7063)
- Various socket types available: UK 13A, Euro Shuko 16A, Indian Round Pin 15A, US 15A



## BENCH FITTINGS

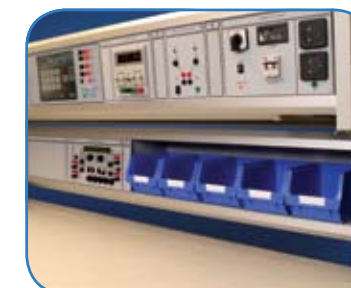
A number of fittings can be added to each bench. Standard items include under worktop drawers and cabinets, and tool hooks/holders for the perforated back panel.

- Under console lighting and 4 power sockets fitted as standard
- Under worktop single and multi drawer units
- Combination drawer and cabinet units
- Slotted divider kits and rubber mat inserts for drawers
- Horizontal or vertical fitted under worktop PC holders
- 20, 40, or 60 piece tool hook kits for the perforated back panel
- Perforated panel shelf units, storage bins, and power strips
- Bench mounted side arms for monitors, tools, and more
- Air preparation kits and filters (fitted under bench)

## BENCH MODIFICATIONS and EXTRAS

Modifications and add-ons are available to incorporate user specified features. Also available is a wide range of laboratory furniture to accompany the bench and create a full workshop.

- Optional secondary console shelf unit (7081S)
- Custom modules for additional functions (see page 23)
- Optional quad power socket module
- Worktop mounted tools and instruments
- Side tables, mobile benches, trolleys, cabinets and cupboards
- Wall mounted perforated panels for tools, storage bins, and more
- Tool cases and service kits
- Bench stools, height adjustable chairs, and foot rests
- ESD workstation kits and mats





# 7051 Multifunction Calibrator & Control Centre

Universal calibration and system control



## Calibrates

Digital/Analogue Multimeters

Process Calibrators

Voltage and Current Sources

Transducers and Transmitters

Temperature Indicators

Oscilloscopes

Frequency Meters

Clamp Meters

Decade Boxes

R-C-L Meters

Temperature Simulators

Data Loggers

## And more

### CALIBRATOR / DMM / TOUCH SCREEN PC

Mounted centrally in the primary console the 7051 combines a precision multifunction calibrator, 6½ digit multimeter, and industrial touch screen PC. It is the principle module for on-site facilities that require high performance calibration and maximum functionality.

**Calibrator:** Provides a wide range of calibrated outputs for AC/DC voltage and AC/DC current, plus a range of resistance and frequency functions. Internal options can be added for increased capabilities. These include PT100 simulation, high voltage/current, capacitance/inductance, and oscilloscope calibration. Further enhancements can be made by additional side modules, adaptors, and benchtop instruments.

**DMM:** The integral 6½ digit multimeter that can measure DC voltages to 1000V, AC voltages to 750V, resistance to 100Mohms, and frequency to 300kHz.

**PC:** The operating system is Windows XP embedded, running on a 2GHz PC which allows standard peripherals to be connected. The calibrator control software allows the wide range of functions to be easily selected using mouse, keyboard, or touch screen.

**EasyCal:** Enables automatic calibration to increase speed and efficiency of work. In addition EasyCal has features to manage and administrate both inventory and quality control. To complement the system a printer and connectivity kit is supplied as standard, for generation of certificates and reports.

**Communication:** Using EasyCal the operator can read back from compatible electrical, temperature, pressure, and loop modules within the bench. Furthermore the software can be used with external instruments such as dry block calibrators and portable test instruments.

### STANDARD FEATURES

#### Calibrator (source)

	Range	Best 1 year Specification
Voltage DC	0 to $\pm 22V$	$\pm 15\text{ppm}$ of setting
Current DC	0 to $\pm 220\text{mA}$	$\pm 80\text{ppm}$ of setting
Voltage AC	1mV to 22V (10Hz to 20kHz, sine-wave)	$\pm 300\text{ppm}$ of setting
Current AC	10 $\mu\text{A}$ to 220mA (20Hz to 1kHz, sine-wave)	$\pm 0.05\%$ of setting
Decade Resistance	1 $\Omega$ to 1G $\Omega$ (Fixed values, decade steps)	$\pm 20\text{ppm}$ of setting
Simulated Resistance	10 $\Omega$ to 40M $\Omega$	$\pm 0.02\%$ of setting
Conductance	1S to 1nS (Fixed values, decade steps)	$\pm 20\text{ppm}$ of setting
Thermocouple	-270 to 1800°C (Type J, K, R, T, S, B, E, N)	$\pm 0.15^\circ\text{C}$
PRT	-250 to 850°C	$\pm 0.1^\circ\text{C}$
Frequency/Period	0.1Hz to 10MHz / 100nS to 10S	$\pm 20\text{ppm}$ of setting

#### 6.5 Digit Multimeter (measure)

	Range	Best 1 year Specification
Voltage DC	0 to 1000V	35ppm of rdg + 6ppm of rng
Current DC	0 to 3A	500ppm of rdg + 50ppm of rng
Voltage AC	0 to 750V	0.06% of rdg + 0.04% of rng
Current AC	0 to 3A	0.1% of rdg + 0.04% of rng
Resistance	0 to 100M $\Omega$	100ppm of rdg + 50ppm of rng
Frequency	3Hz to 300kHz	0.01% of rdg

#### Internal PC

	Specification/Details
Processor	2GHz
RAM	512MB
Hard Drive	60GB
Ports	4 x USB, 1 x Fast Ethernet
Display	10.5in LCD, (Touch Screen)
Operating System	Windows XP Embedded
Pre loaded Software Programs	EasyCal Calibration Software
Supplied Hardware/Accessories	USB keyboard, Printer, DVD-RW, 4 port USB hub, Numeric key pad, USB Stick

### OPTIONS

#### Calibrator (internal)

	Range/Values	Best 1 year Specification
High Voltage/Current (9782)	220mA to 22A / 22V to 1050V AC/DC	DCI 250ppm. DCV 50ppm. ACI 0.2%. ACV 0.08%
Wideband AC Voltage (9771)	20 to 200mV/300kHz. 0.2 to 2V/1MHz. 2 to 20V/100kHz	$\pm 0.05\%$ of setting
Capacitance (9798)	1nF, 10nF, 100nF, 1 $\mu\text{F}$ , 10 $\mu\text{F}$ , 100 $\mu\text{F}$	$\pm 0.25\%$ of setting
Inductance (9798)	1mH, 1.9mH, 5mH, 10mH, 19mH, 50mH, 100mH, 190mH, 500mH, 1H, 10H	$\pm 0.1\%$ of setting
Full Range Resistance (9787)	1 $\Omega$ to 120M $\Omega$ (Variable)	$\pm 100\text{ppm}$ of setting
- PT100	-180 to 850°C	$\pm 0.2^\circ\text{C}$

#### Oscilloscope Calibration (9770)

- Amplitude	0mV to 200V and 0mV to 2V 50 $\Omega$ (square-wave or DC)	$\pm 0.05\%$
- Frequency/Period	0.1Hz to 100MHz / 100nS to 10S	$\pm 20\text{ppm}$ ( $\pm 0.1\text{ppm}$ optional)
- Duty Cycle	3 frequencies: 100Hz, 1kHz, 10kHz, settable from 0 to 100%	
- Fast-Rise	< 300ps. Bandwidth checking up to 600MHz	
2.2GHz Sweep (9769)	100MHz to 2.2GHz levelled sine-wave (0.5, 1, 1.5V pk-pk)	Amplitude $\pm 1\%$ , Frequency $\pm 20\text{ppm}$

#### Side Modules and Accompanying Bench Instruments (see page 7 for further details)

10 Channel Scanner Module (9714B)	Option for internal DMM. Allows multiple inputs to be measured
External Adaptors	Clamp meter adaptor (9780), tacho adaptor (9773), torque wrench calibration adaptor (9759)
External Instruments	Current transformers, bench/portable calibrators, attenuators, references
EasyCal Accessories	Bar code reader, Calibration and ID label printer, Job card and address label printer





# 7051 Accompanying Equipment

Supplied accessories and external options for use with the 7051 module



## SUPPLIED ACCESSORIES

Supplied as standard with the 7051. The printer and connectivity kit provides all the required components for use with the in-built PC. The test lead set has the necessary connections for virtually all test applications.

### Printer and Connectivity Kit

- USB keyboard and mouse
- Ink jet printer
- DVD-RW
- 4 port USB hub
- Numeric key pad
- USB memory stick

### Premium Test Lead Set (shown)

- Pair of High Voltage Leads (1.5kV)
- Pair of High Current Leads (30A)
- BNC Test Lead
- BNC to 4mm Adaptor
- 4mm Test Lead Couplers
- 4 Wire Screened Test Leads (Gold Plated)
- Pair of Low Thermal Test Leads (Gold Plated)
- Pair of 4mm to Spade Adaptors
- Thermocouple (mini) Adaptor
- Pair of 4mm Test Clips



## ADAPTORS

Various adaptors can be used with the 7051 for increased capabilities. Standard adaptors for clamp meters, tachometers and torque wrenches are available. Custom adaptors for user specific applications can be supplied upon request.

- Clamp meter adaptor x50 turn - AC/DC current up to 1100A (DC, 45 to 90Hz)
- Optical tacho adaptor - 6 rpm (0.1Hz) - 600,000 rpm (10kHz)
- Current probe adaptor (for 7051 with oscilloscope calibration option fitted)
- Torque wrench calibration adaptor
- Humidity and temperature sensor adaptors
- Picoamp source adaptors
- Customer specific adaptors



## ACCOMPANYING BENCHTOP INSTRUMENTS

The 7051 can be complemented by several benchtop instruments that enhance capabilities and provide more functions. Also available are portable versions of modules for site calibration work.

- 100A AC current Transformer (9790)
- Power calibrator: 0 to 20kW AC and DC (5077)
- Power amplifier: 60V AC, 90V DC – 100mA (9760 shown)
- Low noise attenuators: 100:1 and 1000:1 versions (9766 and 9767)
- Rubidium frequency reference (9762) for use with oscilloscope calibration option
- Additional instruments and modules for specific applications (see pages 23 to 25)



## EASYCAL SOFTWARE ACCESSORIES and OPTIONS

Several options are available for use with EasyCal calibration software. Items include a bar code reader which enables fast identification of devices in the pre-calibration stage, and label printers for tagging units after calibration.

- Bar code reader
- Calibration and ID label printer
- Job card and address label printer
- Extra user licenses for additional computers
- Durable over-laminate labels for field devices situated in harsh environments
- Cables, leads, and adaptors for interfacing EasyCal with separate computers

## 7051 GENERAL SPECIFICATION

Warm up .....	30 minutes to full accuracy
Settling Time .....	Less than 5 seconds
Interfaces .....	4 x USB, 1 x Fast Ethernet
Temperature Performance .....	Operating: 5 to 45°C. Calibration: 15 to 28°C. Storage: -10 to 50°C
Operating Humidity/Altitude .....	<80% non condensing. Altitude: 0 to 3km. Non operating: 3km to 12km
Line Power .....	100 to 230V AC 50/60 Hz. 200W maximum
Dimensions .....	w425mm, h201mm (primary console fitting only)

## 7051 ORDERING INFORMATION

### 7051 Multifunction Calibrator and Control Centre - Features and included items

- Precision Multifunction Calibrator
- AC/DC 22V / 220mA
- Decade Resistance 0 to 1GΩ
- Simulated Resistance 0 to 40MΩ
- PT100 (-180°C to 850°C)
- Thermocouple Simulation (J,K,R,T,S,B,E,N)
- 10MHz Frequency
- Internal DMM – 6.5 Digit (AC/DC 1kV/3A, 100MΩ, 300kHz)
- Internal PC – 10.5" colour LCD/touch screen
- 7051 Calibrator/DMM Control software
- EasyCal Calibration Software
- Printer and Connectivity kit
- Premium Test Lead Set
- User Manuals

### Internal Options

9782 .....	High Voltage/Current option AC/DC 1kV/22A (Multimeter Calibration)
9798 .....	Capacitance (1000pF to 100μF) / Inductance (1mH to 10H)
9787 .....	Full Range Resistance (1Ω to 120MΩ)
9771 .....	High Frequency AC Voltage (1MHz Max. 20mV to 20V )
9770 .....	Oscilloscope Calibration (1mV to 200V, 0.1Hz to 100MHz, < 1ns risetime)
9769 .....	Scope 2.2GHz Levelled Sine Generator
9783 .....	Oven-Controlled High Stability Frequency Reference (scope options only)
9714B .....	10 Channel Scanner Side Module (option for internal DMM)

### External Options

9762 .....	Rubidium High Stability Frequency Reference (oscilloscope calibration option must fitted)
9773 .....	Optical Tacho Adaptor
9780 .....	Clamp Meter Adaptor (1 and 50 turn coil)
9759 .....	Torque Wrench Calibration Adaptor
9764 .....	Current Probe Calibration Adaptor (oscilloscope calibration option must fitted)
9790 .....	100 Amp AC Current Transformer
5077 .....	Power Calibration (0 to 20kW AC and DC) - External Calibrator
9760 .....	Power Amplifier (60V AC, 90V DC – 100mA)
9766 .....	External Low Noise Attenuator 1000:1
9767 .....	External Low Noise Attenuator 100:1
C165 .....	Factory Calibration Certificate (NPL)
C134 .....	UKAS Calibration Certificate (17025)

### EasyCal Options

9777 .....	Bar Code Reader
9778 .....	Calibration and ID Label Printer
9779 .....	Job Card and Address Label Printer
9736 .....	Additional Users License - For use on separate PC's

Further options and full 7051 technical specifications available upon request.



## EASYCAL SOFTWARE - FOR THE CALIBRATION PROCESS

EasyCal is a complete software package with features covering all aspects of calibration work and management. With a familiar user interface all operators can quickly learn and navigate through the applications. EasyCal is supplied as standard with the 7051 module or can be used on separate computers in the test facility. It is network compatible meaning data can be shared and accessed around the site via a central server.

### FEATURES

- Communicate with calibrators and modules
- Automated planning and scheduling
- For use with multiple devices and instruments
- Print/email/store certificates and reports
- Network compatible
- Produce calibration labels
- Quickly generate procedures using templates
- 1000+ pre-written test procedures included
- Calibration due reminder system
- E-mail reminder letters and lists
- Customise reports and certificates
- Create PDF reports & certificates (PDF engine)
- Print and read bar codes
- Universal instrument control
- HART & Foundation Fieldbus communication
- Secure user log in and electronic signatures
- Create uncertainty tables for laboratory & site
- WebCert feature for online certificates

## EASYCAL SOFTWARE - MULTI-DEVICE CALIBRATION ACROSS INDUSTRIES

EasyCal incorporates specific features for use across industries. It offers a versatile solution to automated work flow, with the comprehensive functionality that is required in manufacturing and process plants, power stations, offshore platforms, refineries and many other sites.

**Pre-Calibration:** As a key aspect to improving efficiency, the calibration management features of EasyCal make the planning and organisation of on-site instrumentation calibration simple. A recall/reminder system informs the user of upcoming jobs, and search functions allow the user to quickly identify a unit for test.

**Calibration:** Whether performing automatic calibration runs using the 7051 calibrator/DMM module or manually testing devices, EasyCal optimises the process by allowing the user to create procedures quickly and easily. This can be done with the help of the included design wizards and pre-written templates.

**Post Calibration:** Once calibration has been performed the user can generate certificates, reports, and labels. These can be printed, stored, or emailed as PDFs. EasyCal has a selection of pre-formatted certificate templates suitable for displaying typical calibration results.



### DEVICES & INSTRUMENTS

- Electrical and Electronic
- Level, Pressure, and Flow
- Temperature
- Loop
- Mechanical
- Dimensional

### INDUSTRIES

- Oil and Gas
- Nuclear and Power
- Manufacturing and Design
- Electricity and Electronics
- Aviation and Automotive
- Metrology and Calibration

## EASYCAL SOFTWARE - THE BENEFITS

### Achieve compliance with quality standards

- Automated document control ensures conformity and quality
- Establish procedures to maintain repeatability and monitor quality
- Schedule and maintain calibration intervals.
- Evidence of traceability to national standards
- Record calibration environmental conditions
- Produce calibration labels, maintain calibration history
- Reduce possibilities for errors or omissions
- Electronic record retention ensures integrity for successful audits

### Create an efficient control and management system

- Reduce testing times
- Eliminate continual outsourcing calibration costs
- Full control over the calibration process
- Improve turnaround
- Quick and easy solution to instrument analysis when needed
- Internal scheduling for calibrations. No external factors
- Centralised document management
- On demand networked review of certificates and reports





# EasyCal Calibration Software

The comprehensive solution to calibration work and management

## INVENTORY, REMINDERS, AND JOBS

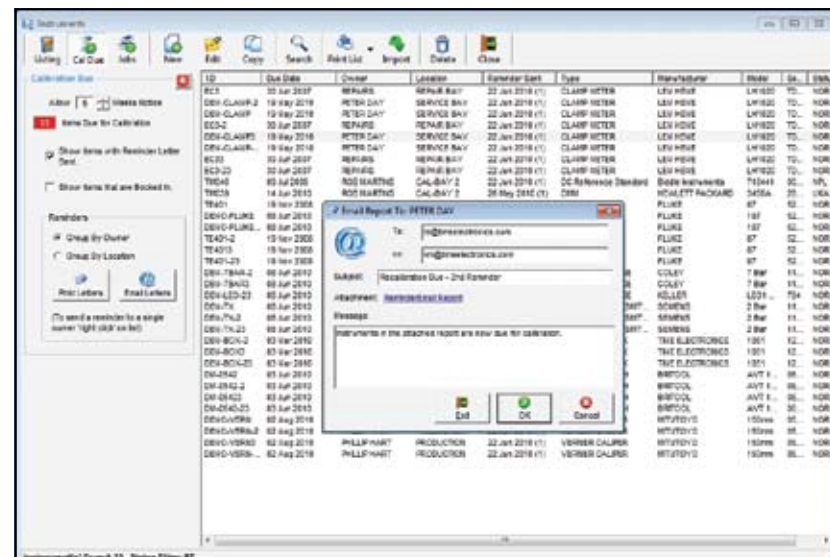
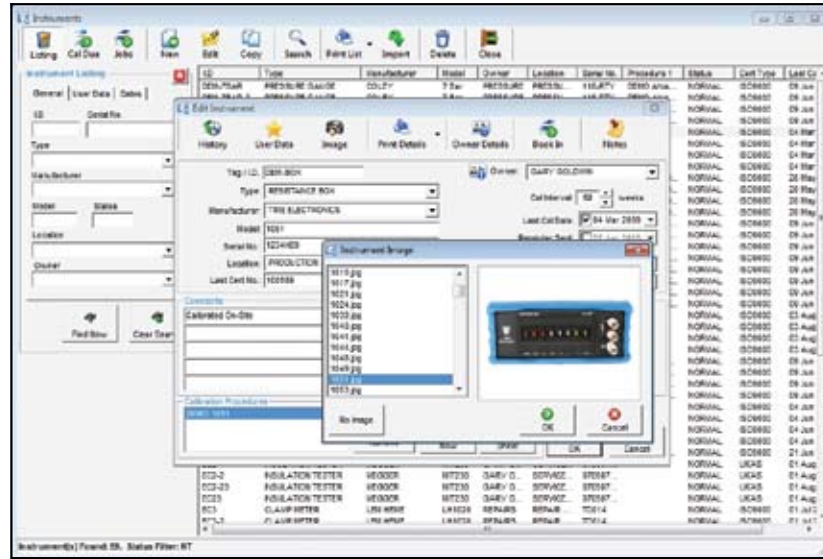
A comprehensive inventory database can be created and customised to company requirements. For internal calibration and quality management, departments and users can be specified. Alternatively EasyCal can be used as the controlling system for a calibration business based around customers and owners.

### Search

A powerful search feature enables the user to enter specific criteria to quickly find the required data. When adding details the user is aided by drop-down lists, which automatically update when new information is added.

### Input Fields

Used to add details such as ID and serial number, manufacturer and model, instrument status and service notes. In addition custom fields can be created to integrate with a company system. Images can be uploaded to provide further reference.



### Instrument Recall and Reminder System

Instruments which are due for calibration are listed on screen. Reminder letters and lists can be printed or emailed directly to the customer or department. An advanced notice period can be set to bring forward the recall date allowing for response time.

### Job Management

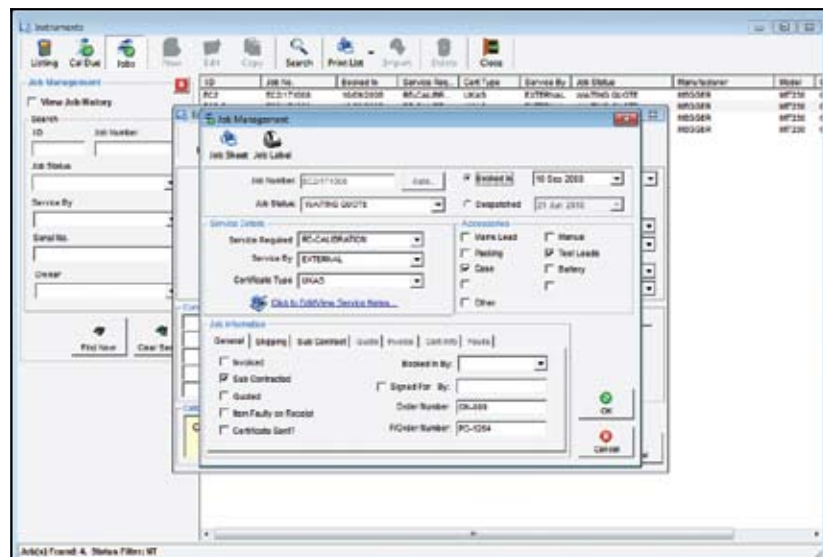
When a unit for test is booked in the job process starts. Specific information about the job is entered; such as 'service required', 'sub contracted' and 'accessories supplied'. A job sheet and label can be produced at this stage to accompany the instrument. As the job is put through the system these parameters can be updated, for example 'quote price', 'job status' and 'invoiced'.

### Devices and Standards used for Calibration

Traceability information for instruments and standards that perform the calibration work is stored and maintained by EasyCal.

### Uncertainties

Uncertainty tables for laboratory and site can be created for each calibrating instrument. These are then automatically processed and applied to certificates as required.



## PROCEDURE WRITING AND EDITING

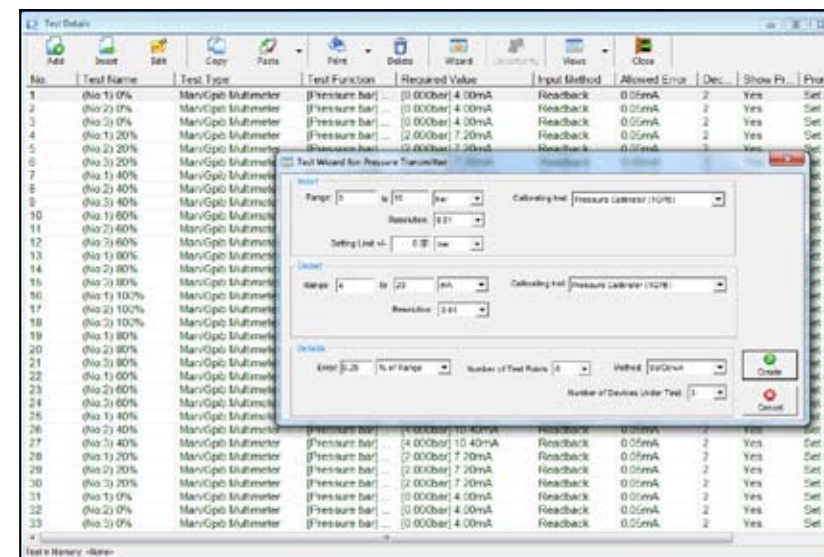
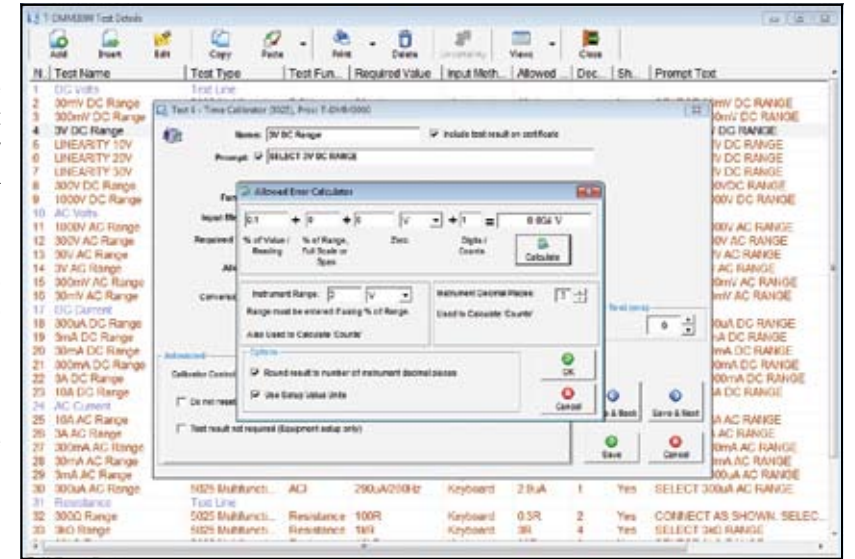
Creating and editing test procedures is made simple with an intuitive, user-friendly interface. Editing test information can be done by adding, inserting, or copy and pasting. EasyCal keeps track of each time a procedure is edited.

### Procedure Library

A calibration library comprising of over 1000 procedures covering a wide variety of instruments and devices is included as standard.

### Procedure Templates

Procedure templates for multimeters, clamp meters, decade boxes, insulation testers, and more can be used for creating any new procedures as required.



### Fast Procedure Creation and Editing

Copy and paste multiple tests. Globally edit a group of tests. Colour coded listing helps sort and identify different test types.

### Procedure Simulation

The Calibration Run Simulator enables a procedure to be tested without the need for a controlling instrument. To further assist with development of procedures a test can also be edited during the actual calibration run.

### Format Certificates

Colour code and add borders to test group titles. Add column headers where a change of layout is required. A preview feature allows the user to check the certificate layout to determine if formatting is correct.

### Document Links

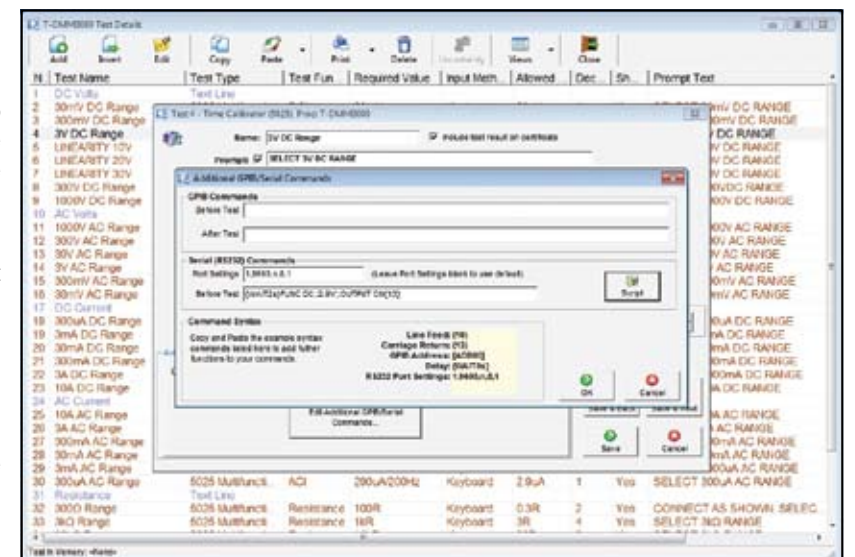
Create links to technical files, specifications, web pages, word documents, videos, and more. These can be set to automatically display prior to the calibration run.

### Conversion Tables

Conversion tables for thermocouples, RTDs, current transformers, and clamp meter adaptors are included. Alternatively user-defined tables can be created.

### Remote Commands

For more complex instrument control, commands can be sent on a test-by-test basis or run as a script. Closed loop calibration is also achievable using the universal readback feature.







## INSTRUMENT AND DEVICE CALIBRATION

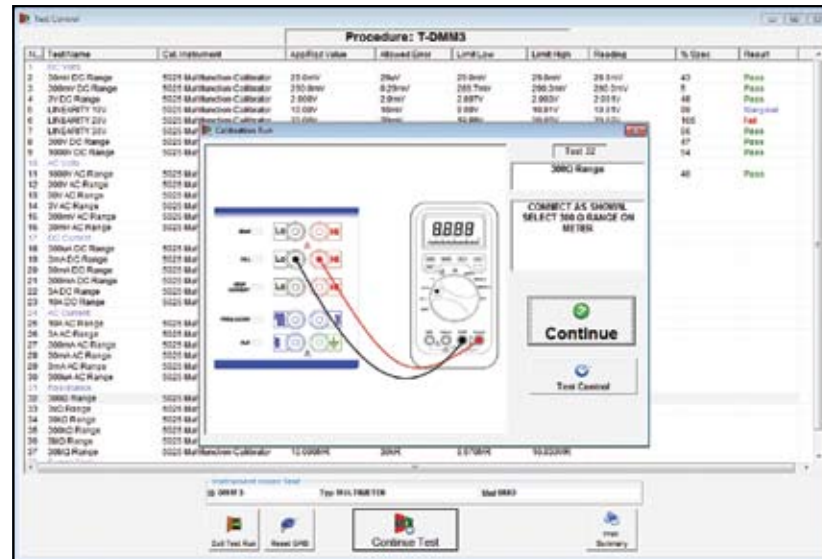
Automated calibration run provides fast and accurate collection of data, whether using direct instrument control or manual entry. EasyCal guides the operator through the procedure using graphical test screens and user prompts.

### Search

Selection of the device under test is quick and easy. With the use of a barcode scanner this selection becomes automatic.

### Calibration Prompts

Text and graphical prompts aid the user with instrument range selection and connection. So even the most complex calibrations can be performed with relative ease.



### Graphical Test Screen

The calibration run is made simple and efficient by a graphical user-interface, which increases speed of data entry. The colour coded indication bar displays the test limits. This allows the operator to easily identify out of tolerance results.

### Test Control

At any stage during the calibration run a summary can be displayed, this includes both completed and remaining tests. Colour coding indicates tests passed or failed. The operator is able to move forward or backward through the procedure as required.

### End of Calibration Run

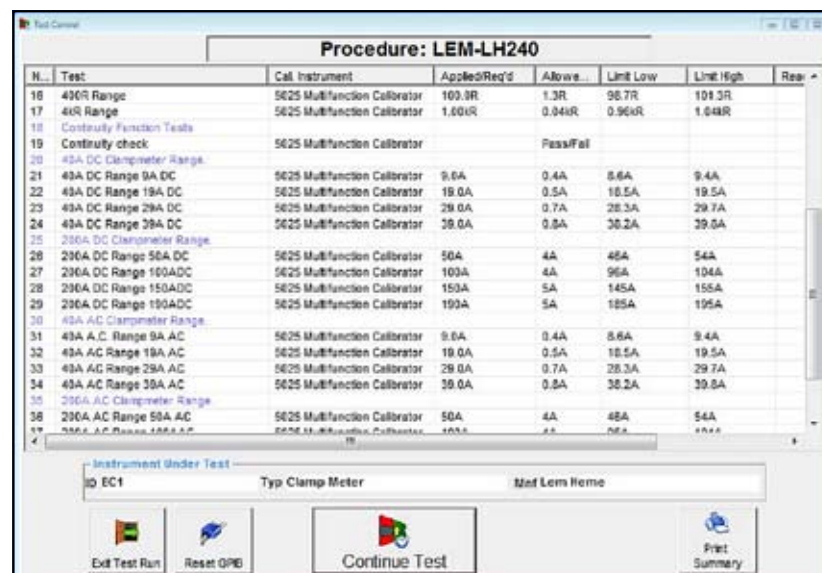
Data for every test is stored, including a snap shot of the procedure used. If required calibration comments and service history can be updated. The operator is able to print the certificate, produce a calibration label and/or store the results to be issued as required.

### Recovery Mode

If for any reason a calibration run is interrupted, recovery mode allows the user resume from the point of termination.

### Calibration Test Forms

Alternatively 'calibration test forms' for hand written results are available. This data is then entered manually into EasyCal at a later date.



## CERTIFICATES/REPORTS/DATA MANAGEMENT

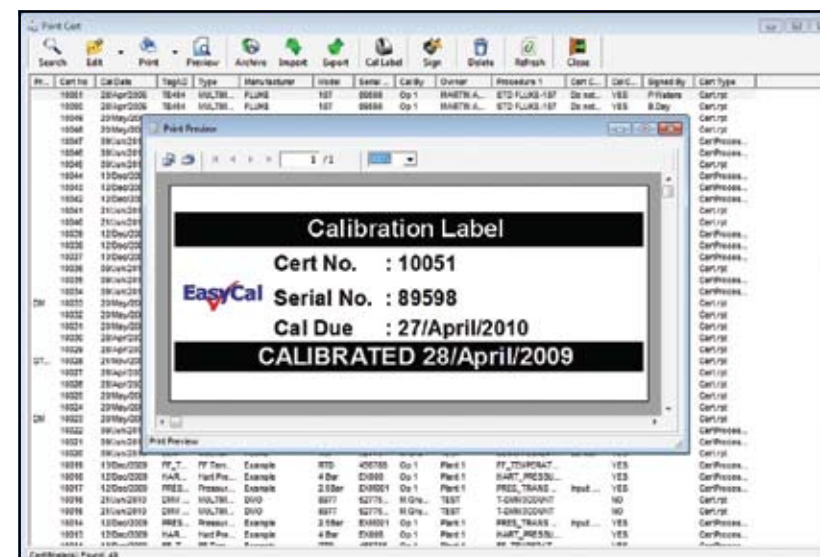
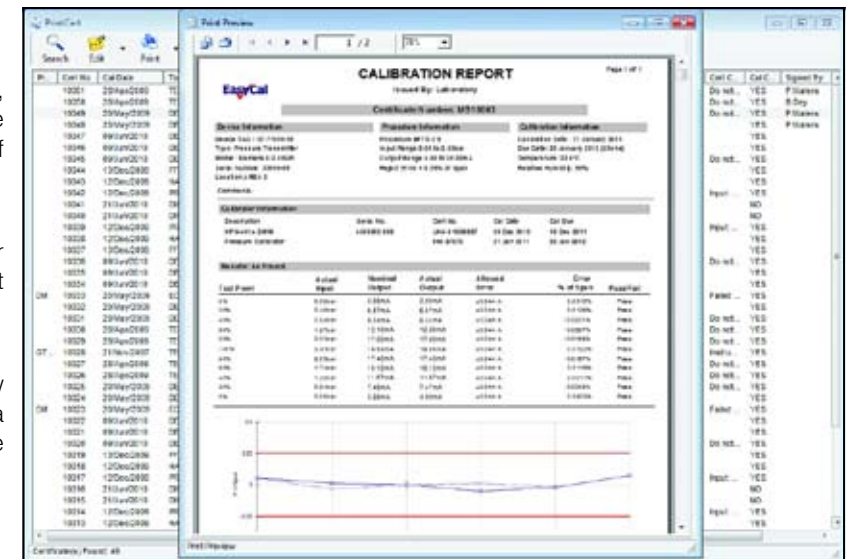
Produce, print, and store calibration certificates, reports, and labels. Simple search facilities enable the user to locate any data on demand. Keeping track of instrument history and servicing is made easy.

### Certificate Templates

A range of pre-formatted templates are available for immediate use. A company logo can be added without the need for 3rd party software.

### Electronic Signatures

Password protected electronic signatures allow management to approve certificates. In addition a scanned image of the signature can automatically be inserted, eliminating the need to print certificates.



### Built-in PDF Engine

Generate PDF reports and certificates ready for emailing and universal review.

### Calibration Reports

Documented traceability provides a recorded audit trail. Reports showing calibration duration times can assist with costing and assessments.

### Archive

The results database can be streamlined by using the archive feature. This improves data organisation and management. Archives are quickly retrieved, giving instant access to historical certificate data.

### Import and Export

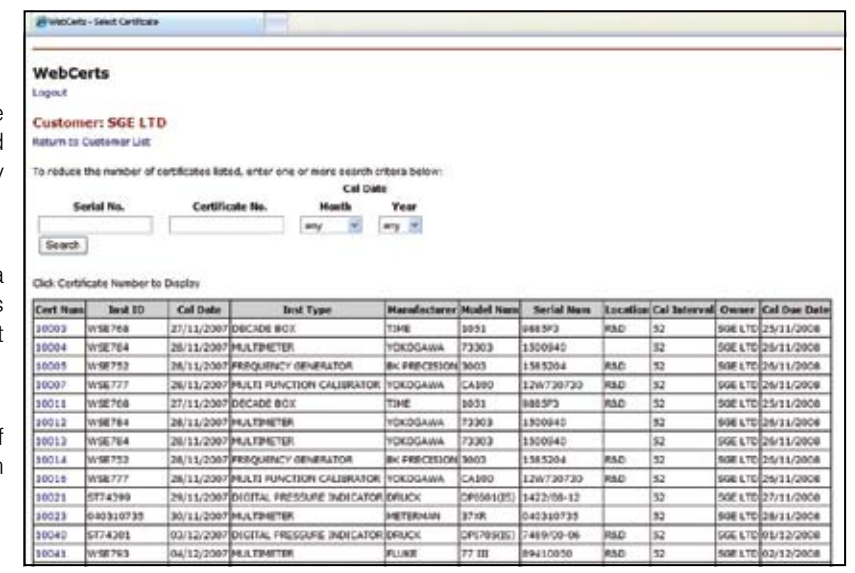
Exchange data from one system to another using the import/export feature. This method is ideal for site and field calibration work, where data is recorded externally then uploaded to the main database upon return.

### WebCerts

Enables the retrieval of PDF calibration certificates via a web based application. A secure log in feature allows access the user's private folder with their relevant documentation.

### Customise

Crystal Reports (optional) allows full modification of certificate, label, and report layouts. Design custom reports using queries, formulas, and running totals.

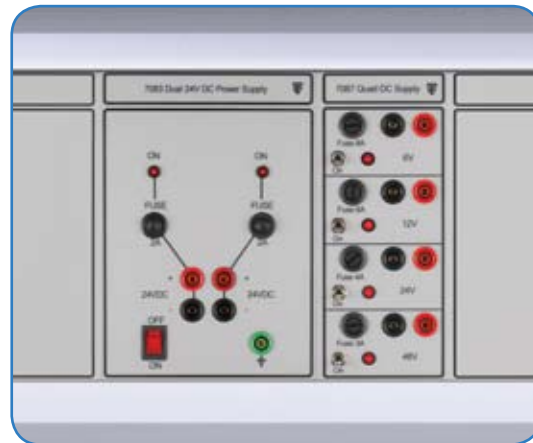






# Power Supply Modules

Fixed and adjustable AC and DC power modules



## 7083 and 7087 FIXED DC POWER SUPPLIES

Fixed DC power supplies suitable for powering loop signal instrumentation.

**7083** – 2 independent 24V (2A) floating supplies

- 4mm shrouded output sockets
- Ripple: Typically 240mV
- Regulation: Typically 2%
- Over-volt and current overload protection

**7087** – 4 fixed independent floating supplies: 6V (8A), 12V (8A), 24V (4A), 48V (3A)

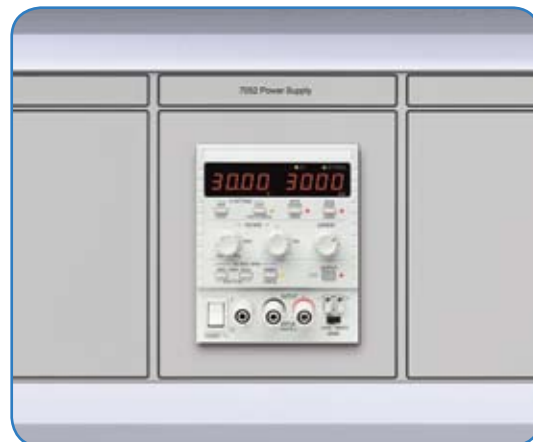
- 4mm shrouded output sockets
- Ripple and Noise: 50mV or 1% pk-pk, whichever is greater
- Over-volt and current overload protection
- Supplies can be connected in series to obtain an alternative output voltage



## 7075 FIXED 110V DC POWER MODULE

The 7075 provides an isolated DC supply. Output is pre-specified between 96 and 144 volts with a current capacity up to 7.5 amps. Output voltage and current are monitored on two analogue moving coil meters, access is from two 4mm shrouded sockets.

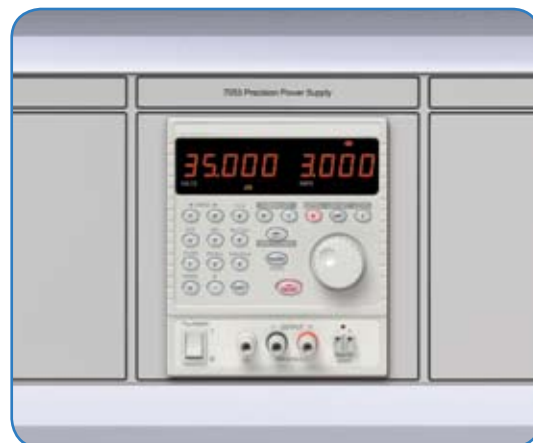
- 96V to 144V preset single fixed output
- Output Current 7.5A max (limit to 800 watts)
- 4mm shrouded output sockets
- Line regulation:  $\pm 0.1\%$
- Load regulation:  $\pm 0.5\%$
- Output accuracy:  $\pm 1.5\%$  of reading
- Output ripple ( $> 50\text{Hz}$ ):  $< 50\text{mV rms}$
- Hold up time:  $> 5\text{ms}$



## 7052 ADJUSTABLE DC POWER SUPPLY

A high performance linear regulated DC power supply with true analog controls and digital functionality.

- 0 to 30V, 0.1mA to 3A (90W maximum)
- High accuracy four digit meters have a fixed resolution for consistent readings
- Low current range gives 0.1mA meter resolution and finer low current setting
- S-Lock function - instantly lock settings
- V-Span function - customise the voltage range
- Independent, isolated tracking, ratio tracking
- DC output switches and "view limits" button
- Safety binding post terminals
- Programmable version available (USB, RS-232, LAN) - 7052P



## 7053 PRECISION ADJUSTABLE DC POWER SUPPLY

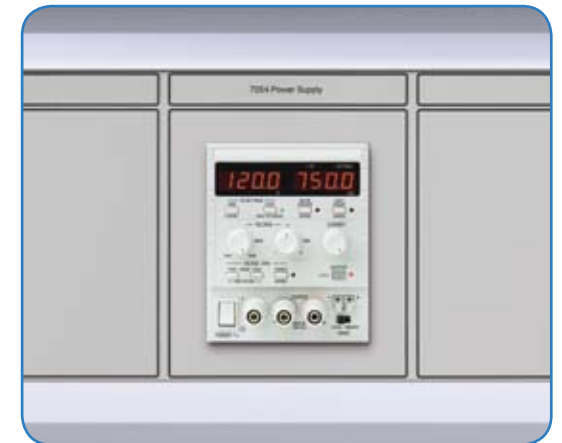
A DC linear power supply with high accuracy, resolution, stability and noise. Multiple output ranges provide increased current capability at lower voltages. An advanced user interface gives superior control, combining speed with safety.

- Single Output, 3 ranges: 0 to 56V, 0 to 2A. 0 to 25V, 0 to 4A. 0 to 56V, 0 to 500mA
- 112W maximum output power
- 1mV setting resolution at all output voltages
- Setting by direct numeric entry or spin wheel
- Multiple non-volatile setting memories with preview
- OVP and OCP trips with alarm output
- Selectable remote sense terminals
- Programmable version available (USB, RS-232, GPIB) - 7053P

## 7054 and 7055 HIGH VOLTAGE ADJUSTABLE DC SUPPLIES

Precision linear regulated DC power supplies with high power density and smart analog controls for voltages up to 120V or 250V.

- 7054: 0 to 120V / 0.01mA to 750mA (90W maximum)
- 7055: 0 to 250V / 0.01mA to 375mA (94W maximum)
- High accuracy four digit meters have a fixed resolution for consistent readings
- Low current range gives 0.1mA meter resolution and finer low current setting
- S-Lock function - instantly lock settings
- V-Span function - customise the voltage range
- Isolated analog remote control of voltage and current
- Low current range and current meter averaging
- Programmable version available (USB, RS-232, LAN) - 7054P and 7055P



## 7056 DUAL ADJUSTABLE DC POWER SUPPLY

A quad-mode dual output power supply with two identical outputs as per the 7052, with tracking and parallel modes.

- Dual outputs of 0 to 30V, 0.1mA to 3A (90W maximum)
- Single output of 0 to 30V, 0.2mA to 6A (180W maximum)
- 4 modes: Independent, isolated tracking, isolated ratio tracking, & true parallel
- In parallel mode power is channelled to the Master output for supply up to 6A
- In tracking mode the outputs can be wired in series to generate 0 to 60V
- High accuracy four digit meters have a fixed resolution for consistent readings
- Low current range gives 0.1mA meter resolution and finer low current setting
- Safety binding post terminals
- Programmable version available (USB, RS-232, LAN) - 7056P



## 7088 ADJUSTABLE AC POWER SUPPLY

The 7088 provides variable 50Hz AC power up to 10A. Two meters monitor the output voltage and current which is available from the front panel socket.

- Variable output voltage from 0 to 110% above line input
- 0 to 265V 50Hz, 10A at 240V input
- 0 to 121V 50Hz, 10A at 110V input
- Simple front panel analogue deviation control
- 0 to 10A output current
- Input fuse 10A slow blow
- Output circuit breaker: 10A (medium response time)
- AC moving iron meters to standard DIN specification
- Various socket types: UK 13A, Euro Shuko 16A, Indian Round Pin 15A, US 15A



## ADDITIONAL POWER MODULES

Further AC and DC power modules can be fitted in the bench consoles. These include fixed AC supplies, variable AC/DC supplies, 3 phase controllers, and custom fitted modules for specific user requirements.

- 7076 - 110V Fixed 8A AC Module (shown)
- 7043 - 3 phase mains controller module (shown)
- 7086 - 60V DC 3A Adjustable Power Supply (also see 7053)
- 7046 - Variable AC/DC Power Supply. AC 500VA, DC 400W, Freq 40 - 500Hz
- 7047 - Variable AC/DC Power Supply. AC 1000VA, DC 800W, Freq 40 - 500Hz
- 9758B - DC Electronic Load, 80A, 80V, 300W (see page 23)
- 7063 - Isolated mains output sockets for 7082 mains power module
- Customer specified power modules (supplies, sockets, controllers etc)





# Pressure Modules

Pressure calibrators, indicators, and controllers



## 7062 PRESSURE CALIBRATOR WITH REGULATOR 7059 VACUUM and PRESSURE CALIBRATOR

Regulated pneumatic pressure modules that are simple operation and high accuracy. The 7062 is pressure only, whilst 7059 is a combined vacuum and pressure calibrator.

- 7062 – Regulated low pressure: Vacuum, 0.2, 2, 5, 10, or 20bar versions
- 7059 – Dual Module with regulator: Vacuum plus 0.2, 2, 5, or 10bar versions

Range (bar)	Vacuum	0.2	2	5	10	20
Accuracy (%)	0.04	0.1	0.04	0.04	0.04	0.04
Resolution	.0001	0.01mbar	.0001	0.001	0.001	0.001

- 4.5 digit display
- 5 selectable pressure units
- Quick release fittings
- < 70ppm/°C temperature coefficient
- Over pressure warning
- Integrates with EasyCal software



## 7064 HIGH PRESSURE CALIBRATOR WITH REGULATOR

For pneumatic pressure calibration with versions available up to 200bar. Output pressure is controlled by a non-relieving type regulator, with bleed and block needle valves used to vent and isolate the output port. Common applications include testing pressure gauges and sensors.

Range (bar)	35	70	100	200
Accuracy (%)	0.04	0.04	0.04	0.1
Resolution	0.01	0.01	0.01	0.01

- 4.5 digit display
- 5 selectable pressure units
- Minimes fittings
- < 70ppm/°C temperature coefficient
- Over pressure warning
- Integrates with EasyCal software



## 7066 DIFFERENTIAL PRESSURE CALIBRATOR

A precision module designed for very stable measurement of differential pressures between its two output ports, enabling the calibration of differential pressure gauges, transducers, and transmitters.

Range (bar)	Vacuum	0.2	2	5	10
Accuracy (%)	0.04	0.1	0.04	0.04	0.04
Resolution	.0001	0.01mbar	.0001	0.001	0.001

- 4.5 digit display
- 5 selectable pressure units
- Quick release fittings
- 100ppm/°C temperature coefficient
- Over pressure warning
- Integrates with EasyCal software



## 7032 AUTOMATIC PRESSURE CALIBRATOR

A pneumatic pressure module designed to speed up routine calibration of pressure gauges, indicators and pressure transmitters. The user presets the required calibration points, typically 0%, 25%, 50%, 75%, 100% of full scale. If needed then other settings can be used, such as 0%, 10%, 50%, 70%, 95%.

Range (bar)	Vacuum	0.2	2	10
Accuracy (%)	0.04	0.1	0.04	0.04
Resolution	.0001	0.01mbar	.0001	0.001

- 4.5 digit display
- 5 selectable pressure units
- Quick release fittings
- < 70ppm/°C temperature coefficient
- Over pressure warning
- Integrates with EasyCal software

## 7030 PRECISION AUTOMATIC PRESSURE CALIBRATOR

The 7030 is a high performance calibrator that can control pressures to 0.005% stability across an extremely wide range, from vacuum to 210bar. Along with fully interchangeable SMART sensors, the 7030 provides a flexible and high accuracy solution for both industrial and metrological applications.

- Ranges from vacuum to 210bar
- Accuracy 0.01% F.S.D.
- Control Stability 0.005% F.S.D.
- Full colour touch-screen user interface
- Easy-to-use intuitive control menu
- Interchangeable SMART Sensors
- Integrates with EasyCal software



## 7038 and 7065 PRESSURE INDICATORS

Indicator modules with versions available up to 600bar. The 7038 has loop current measure, min/max logging (pressure & current), and leak rate display features. Fittings are quick release under 20bar and minimes from 35 to 600bar.

- 7038 – Multifunction Pressure Indicator (pneumatic or hydraulic input connection)
- 7065 – Standard Pressure Indicator (pneumatic or hydraulic input connection)

Range (bar)	Vac	0.2	2	5	10	20	35	70	100	200	400	600
Accuracy (%)	0.04	0.1	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.1	0.1	0.1
Resolution	.0001	0.01mb	.0001	0.001	0.001	0.001	0.01	0.01	0.01	0.01	0.1	0.1

- 4.5 digit display
- 5 selectable pressure units (7066)
- 9 selectable pressure units (7038)
- < 70ppm/°C temperature coefficient
- Over pressure warning
- Integrates with EasyCal software



## 7084 LINE PRESSURE CONTROLLER

The 7084 is used to provide adjustable regulated pressure for connection bench modules and external pressure devices. Incoming pneumatic line pressure is connected via the rear of the console, with output via the front panel port. The 63mm gauge displays the regulated line pressure.

Range (bar)	5	35	70	100	200
Accuracy (%)	0.04	0.04	0.04	0.04	0.1
Resolution	0.001	0.01	0.01	0.01	0.01

- Pneumatic self-relieving regulator
- Front panel output connection
- Quick test fittings
- 63mm anti-shock analogue gauge
- Needle isolation valve
- Pneumatic input connection



## PRESSURE MODULE CONNECTORS, KITS, and EXTRAS

A full range of accessories for pressure calibration and generation are available. These include bench fitted options, connection kits, and accompanying instruments and tools.

- Set of hoses/adaptors for connections to modules and pumps (7073)
- Minimes high pressure hose test kit (7097 shown)
- Air preparation and filtration kits
- Pneumatic and hydraulic calibration pumps (7090/7095, see page 24)
- Pneumatic and hydraulic dead weight testers (see page 24)
- Portable pressure calibrators for use outside the laboratory (see page 24)
- Line pressure tools - Compressors, vacuum pumps, boosters (see page 26)
- Customer specified modules and instruments (Time Electronics or 3rd party)

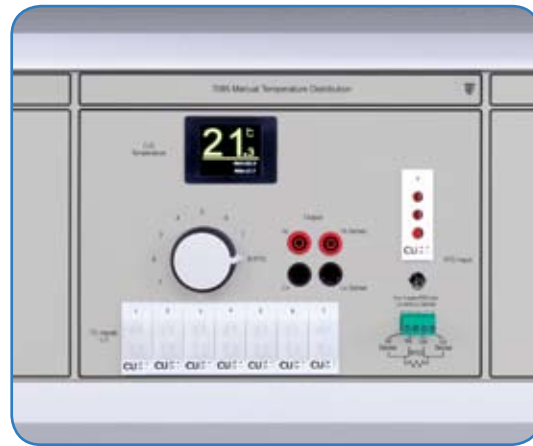






# Temperature and Loop Modules

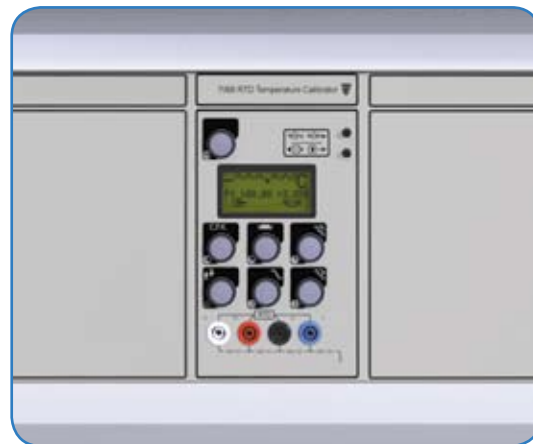
Loop calibrators, RTD and thermocouple calibrators



## 7085 TEMPERATURE DISTRIBUTION PANEL

A temperature distribution panel module that switches 7 thermocouple inputs and 1 RTD reference to a common output.

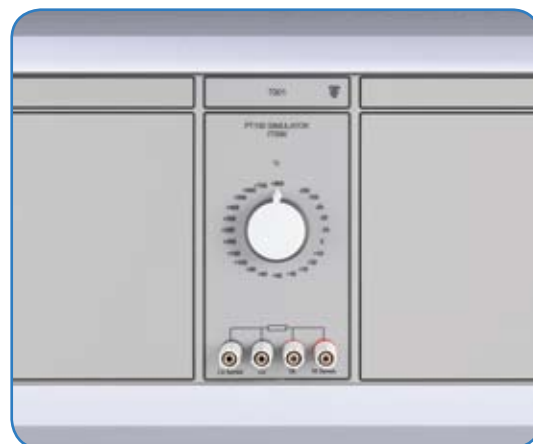
- Cold junction temperature display
- Records min/max ambient temperatures
- Integrates with 7051 and EasyCal
- Clear visual display of temperature (LCD)
- Suitable for use with dry block calibrators
- Automatic switching version available (7085A)



## 7068 PROGRAMMABLE RTD TEMPERATURE CALIBRATOR

A calibrator for accurately simulating and measuring the most commonly used RTD probes. The 7068 is specifically designed to automate and to speed up the task of calibrating instrumentation used in the process control industry. It can also be used as a temperature reference for dry block and other precision temperature baths.

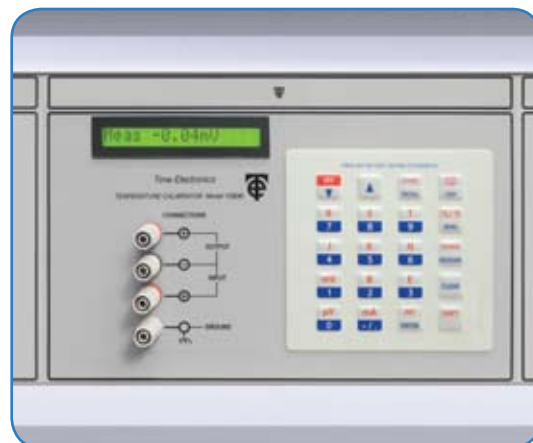
- Temperature – Accuracy 0.05°C (0.09°F). Resolution 0.01°C (0.02°F)
- Resistance – Accuracy 0.03Ω. Resolution 0.01Ω
- 2, 3, and 4 wire connections
- Measure and simulate °C, °F, °K, and ohms
- Ramp and step
- PT100 plus 7 other RTD types
- User programmable



## 7001 CLASS A °C PT100 SIMULATOR

A precision simulator for PT100 0.3850 platinum resistance elements used for accurate temperature measurement. High performance metal film resistors are used throughout to ensure a good temperature coefficient and long term stability.

- -200°C to +800°C with 23 set points
- Accuracy  $\pm 0.3^\circ\text{C}$
- Less than 30ppm/°C temperature coefficient
- ITS-90 IEC60751
- Exceeds class A
- Passive resistance source
- °F version available (-100°F to 1000°F,  $\pm 0.5^\circ\text{F}$  accuracy)



## 7077 TEMPERATURE PROCESS CALIBRATOR

A key-press operation module that combines source and measurement functions for thermocouples, RTDs, mV and mA. The 7077 features a memory storage function that holds frequently used values.

- Measures/simulates 8 thermocouple types, PT100-RTD, mV and mA
- Displays units in °C, °F,  $\mu\text{V}/\text{mV}$ , or mA
- Automatic or manual cold junction compensation
- 10 point memory recall feature
- Inching and step functions with time configurable steps
- Process loops 4 to 20mA and 0 to 50mA
- 24V loop drive voltage

## 7061 MULTIFUNCTION PROCESS CALIBRATOR

A process calibrator that combines the essential functions of measurement and simulation of volts, millivolts, milliamps, and ohms with the direct readout simulation of thermocouples and RTDs in °C or °F units.

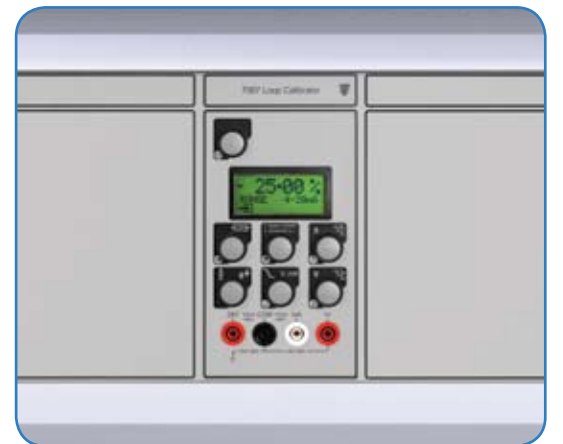
- Measure (3 ranges) up to 400V, 400mA, 40kΩ
- Output voltage (3 ranges) up to 10V, 1 $\mu\text{V}$  resolution
- Output current (3 ranges) up to 20mA, 1 $\mu\text{A}$  resolution
- Output resistance: 0 to 400Ω, 0.01Ω resolution
- Thermocouple measure and simulate: J, K, T, E, R, S, B, N
- RTD measure and simulate: PT100
- Ramp function



## 7067 LOOP CALIBRATOR

A high accuracy module for the calibration and simulation of voltage and current loops with source and measure capabilities.

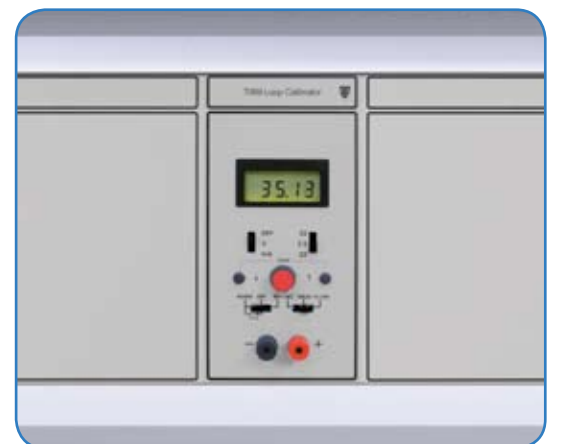
- Loop current/voltage source (simulating a transmitter and the loop supply)
- Sink of loop current (simulating a transmitter)
- Measurement of loop current/voltage (simulating a loop indicator)
- Current measurement: 125mA, source 50mA. Resolution 1 $\mu\text{A}$
- Voltage measurement: 25V, source 21V. Resolution 1mV
- Accuracy 0.01%
- Transmitter and square root functions
- Auto-ranging feature
- Programmable steps and ramp



## 7069 VOLTAGE/CURRENT/LOOP CALIBRATOR

A voltage, current, and process loop calibrator for ideal for process control applications. The 7069 combines digital accuracy with simple analogue control and is well suited to plant operations such as powering control loops.

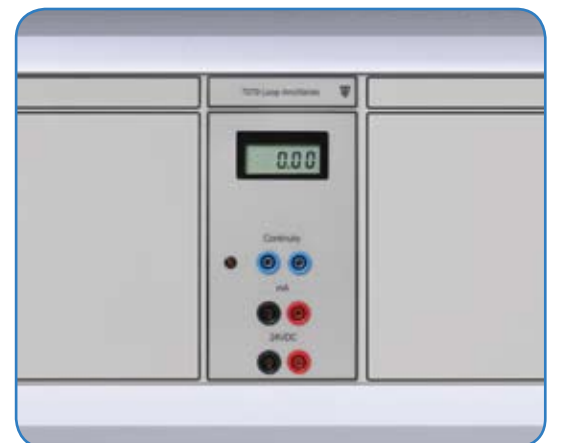
- Source/measure voltage and current
- 3 source ranges: 0 to 22mA and 0 to 22V
- 3 measure ranges: 0 to 70mA and 0 to 50V
- Accuracy 0.02%
- Transmitter simulator/sink loop control
- Output steps and ramps
- Fine adjustment (inching)



## 7079 LOOP ANCILLIARIES CALIBRATOR

A simple operation module suitable for powering process instrumentation such as pressure transmitters that require an external loop supply (4-20mA). An RS232 connection is available at the rear of the console enabling communication for data read back using EasyCal calibration software.

- Loop measure 0 to 199.99mA
- Continuity test (100Ω threshold or below - audible/visual indication is given)
- 24V output for powering 4 - 20mA loops
- 4.5 digit display
- Overload protection to loop
- Supply line protection by F250mA fuse
- RS232 connection - Allows read back with EasyCal software





# Electrical Test, DMMs, and Scope Modules

Insulation tester calibrators, digital multimeters, and oscilloscopes



## 5068B INSULATION TESTER/MEGOHMMETER CALIBRATOR

A precision module for calibrating general purpose insulation testers and megohmmeters with test voltages up to 2.5kV.

- Insulation resistance from 100K $\Omega$  to 10G $\Omega$
- Low ohm verification at 1 $\Omega$ , 10 $\Omega$ , 100 $\Omega$ , 1K $\Omega$
- Basic accuracy 1%
- Up to 2.5kV operation
- Continuous connection – no arcing
- Fully shrouded safety connectors
- Display of open circuit voltage (0 to 1.999kV or 0 to 2.50kV)
- Display of short circuit current (0 to 2mA or 0 to 20mA)



## 5065B DIGITAL MULTIMETER

A versatile 6½ digit multimeter module with 19 measurement functions. Simple operation, stability, and high accuracy make the 5065B an ideal DMM for a variety of applications.

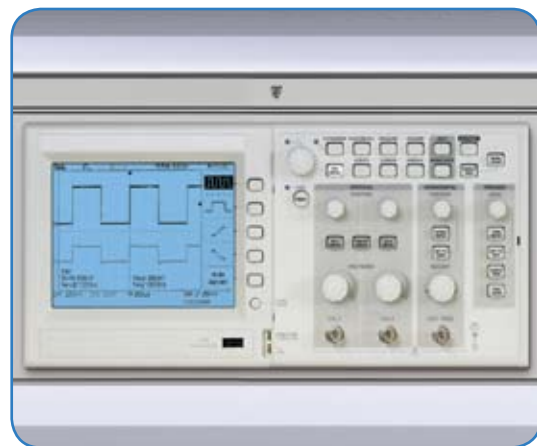
- 6½ digit resolution
- Accuracy 0.005% DC voltage
- RS232 and USB interface
- Optional GPIB interface
- Temperature measurements
- SCPI command set
- High sample rate
- 10 channel scanner card option
- PC control via EasyCal software (7051 has equivalent DMM internal)



## 5075B DIGITAL MULTIMETER

A digital multimeter that combines high performance with simple operation. The 5075B easily measures from nanovolts to 10kV, from picoamps to 30 amps, from micro-ohms up to 1G $\Omega$ , from picofarads to 300 $\mu$ F, with up to 7½ digit accuracy.

- 7 digit resolution
- 10nV to 10kV, 10pA to 30A
- Resistance, capacitance, frequency
- 18ppm accuracy/best 1 year
- 10 channel low thermal emf scanner option
- 7051/PC control via EasyCal software
- GPIB interface (USB adaptor available)



## OSCILLOSCOPE MODULES

Oscilloscope modules with standard features including USB connectivity, automated measurements, limit testing, data logging, and context-sensitive help.

- 5.7" LCD colour display
- External trigger output
- Autoset and signal auto-ranging
- Probe check wizard

Model	Bandwidth	Channels	Sample Rate/Ch	Record Length
7021	70MHz	2	1.0GS/s	2.5k points
7022	70MHz	4	1.0GS/s	2.5k points
7023	100MHz	4	2.0GS/s	2.5k points
7024	200MHz	4	2.0GS/s	2.5k points
7026	500MHz	4	5.0GS/s	10k points

# Frequency Counters, Generators, & RF Modules

Universal frequency counters, waveform generators, RF, and EMC test modules

## 7027 3GHz UNIVERSAL FREQUENCY COUNTER

The 7027 is a high quality 3GHz universal frequency counter which offers period measurement, frequency ratio, pulse width and event counting.

- 0.001Hz to 3000MHz frequency range
- TCXO timebase with better than 1ppm stability
- Frequency, period, pulse width and totalise modes
- Reciprocal counting measurements
- High impedance measurement up to 125MHz
- Low pass filter, attenuator and trigger level control
- AC or DC coupling, 1M/50 $\Omega$  selection, polarity invert
- Large 10 digit LCD display with annunciators
- Remote control and readback via USB



## 7029 and 7031 FUNCTION GENERATORS

High performance DDS arbitrary/function generators that offer high quality standard waveforms, high speed arbitrary waveforms, and full pulse generator facilities.

- 1 $\mu$ Hz to 50MHz (7031) or 25MHz (7029); 14 digits or 1 $\mu$ Hz resolution
- Sine, square, ramp, pulse, sin(x)/x, noise, exponential logarithmic rise waveforms
- True pulse generator with variable delay and variable rise/fall
- Arbitrary waveforms of up to 128K points at up to 125MS/s
- Waveform storage using USB flash drives
- Large graphic LCD with simultaneous text and waveform display
- Internal and external digital modulations including AM, FM, PM, PWM, and FSK
- 20mV to 20V pk-pk output from 50 $\Omega$ ; plus multifunction aux. out
- Programmable via USB and LAN interfaces
- Also available: 7028 10MHz DDS function generator (6 digits or 1mHz resolution)



## 7048 SYNTHESISED RF SIGNAL GENERATOR

A signal generator with the essential features required for most development, test and service work. The 7048 has high frequency accuracy and stability, wide dynamic range, low phase noise and leakage, and flexible modulation capabilities.

- 150kHz to 2000MHz frequency range
- 10Hz setability,  $\pm$  1ppm frequency stability
- Locking to external frequency standard
- -127dBm to +7dBm amplitude, 0.1dB steps
- AM, FM and Phase modulation, internal or external
- 80 character back-lit LCD display
- Keyboard and rotary encoder control
- Full remote control via RS232 and GPIB
- Also available - 7028 6GHz signal generator



## 7170 MAINS/HARMONICS ANALYZER

A fast, easy to use power and harmonics analyzer with a large and high resolution graphical display, capable of continuous real-time analysis. The 7170 is suitable for both the product development environment and for production line test verification.

- Compliance quality measurements to EN61000-3-2 and EN61000-3-3
- Measures peak/rms voltage or current, real/apparent power, power factor, phase
- Tabular/histogram of 40 harmonics
- Voltage/current waveforms displays
- Continuous analysis with real-time graphical update
- 320 x 240 pixel high-contrast display
- USB, RS232 and printer interfaces fitted
- PC control and documentation software supplied
- Accompanying module 7171: 1kW low-distortion source







# Additional Bench Modules

Extra modules for communication, calibration, and more



## 9758B DC ELECTRONIC LOAD MODULE

The 9758B electronic load works by putting a required DC load across a power source under test. It can be also be used to investigate the behaviour of many different types of power source such as batteries, solar cells, fuel cells or wind generators, as well as electronic power supply units.

- Constant current, resistance, conductance, voltage and power modes
- Wide voltage and current range, 0 to 80 volts and 0 to 80 amps
- 300 watts continuous dissipation at 40°C
- Ten turn controls for level setting
- Built-in transient generator with variable slew
- Current monitor output for waveform viewing
- Variable drop-out voltage for battery testing
- Analogue remote control capability



## 7002H HART COMMUNICATOR MODULE 7002FB FOUNDATION FIELDBUS MODULE

Available as two independent modules or a combined Hart and Fieldbus unit as shown. Enables communication with Hart and Fieldbus devices.

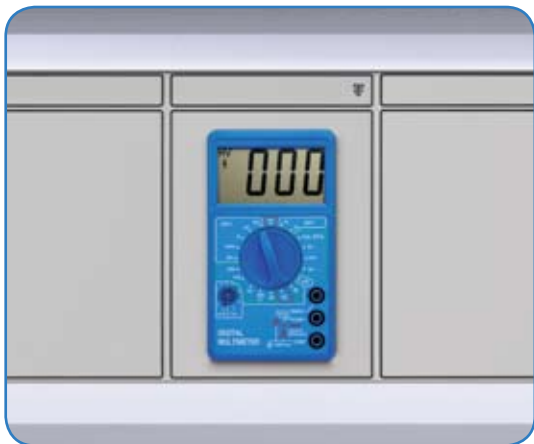
- EasyCal software communication programs for Hart and Foundation Fieldbus
- Provides monitoring of primary values and sensor outputs
- Provides conditioned power and network termination
- Device configuration and read back



## BENCH MODULE MODIFICATIONS

CalBench modules can be modified to incorporate features and functions depending on customer applications. These can be simple additions such as extra power sockets and input/output ports or internal fittings and components to provide extended capabilities.

- Existing modules can be modified to include specific functions
- Touch screen PC only module - 10.5" LCD display (shown)
- Automatic switching version of 7085 temperature distribution panel
- Programmable versions of DC power supplies 7052, 7053, 7054, 7055, and 7056
- Additional sockets, fittings, and connections on modules
- Interchangeable SMART sensors for 7030 automatic pressure calibrator
- Customer specified hand wheel types for regulators on high pressure modules



## CUSTOM DESIGN MODULES

Specific devices and instruments can be custom fitted into the bench as per customer requirement. This allows the user to integrate a familiar instrument into the workstation.

- Modules built from Time Electronics' range of portable/benchtop instruments
- External instruments such as handheld DMMs, analyzers, and more
- Fitted instruments can be configured to communicate with EasyCal software
- Additional power sockets and controller modules
- Solder station modules
- Portable instruments can be fitted to perforated back panel for easy removal
- Empty module space can be made into shelving for tool storage
- Depth constraints are 425mm for the primary console, 200mm for the secondary.

# Pressure Instruments for Lab and Field

Pumps, dead weight testers, and portable calibrators

## 7090 PNEUMATIC CALIBRATION PUMP 7095 HYDRAULIC CALIBRATION PUMP

Pneumatic and hydraulic calibration pumps that combine high performance with durability. Features include contoured cushioned handles for comfort and dual o-rings on all pistons to ensure zero leakage.

- 7090 – Pneumatic pressure to 40bar, Vacuum to -950mbar
- 7095 – Hydraulic pressure to 700bar
- Non-oil based lubricant used on all moving parts
- Both supplied as kits with carry case, hoses, and fittings
- 7090 – H200 x w125mm, weight 0.91kg
- 7095 – H240 x w125mm, weight 1.4kg
- Digital pressure gauges available



## HYDRAULIC and PNEUMATIC DEAD WEIGHT TESTERS

High accuracy and robust dead weight testers that are the primary standard for pressure calibration. Each model is supplied with software that allows the users to correct for the effects of environmental factors such as gravity and temperature and to determine the precise pressure generated by the dead weight testers.

Model	Type	Range	Standard Accuracy	Class 'A' Accuracy
7190	Hydraulic	1 to 700bar	0.015%	0.007%
7191	Hydraulic	1 to 1200bar	0.015%	0.007%
7192	Hydraulic	1 to 2600bar	0.02%	0.008%
7193	Pneumatic	1 to 120bar	0.015%	0.006%



## 7010 SINGLE CHANNEL PRESSURE CALIBRATOR 7015 DUAL CHANNEL PRESSURE CALIBRATOR

Portable battery or mains powered pressure calibrators designed for both lab and field applications. Controls equivalent to bench pressure modules.

- Vacuum, 0.2, 2, 5, 10, 20, 35, 70, 100, 200, 400, or 600bar versions
- Accuracy 0.04% of full scale
- Pneumatic or hydraulic
- Up to 5 selectable engineering units per channel
- Loop current measure
- 24/36V loop power
- Over-pressure alarm
- RS232 serial interface and EasyCal software compatible
- W270 x H175 x D250mm, weight 3kg



## 7016 REGULATED LOW PRESSURE CALIBRATOR 7018 DIFFERENTIAL PRESSURE CALIBRATOR

Portable pressure calibrators that are rugged design and simple operation. Suitable for pneumatic field calibration. Controls equivalent to pressure modules.

- 7016 – Regulated low pressure: Vacuum, 0.2, 2, 5, 10, or 20bar versions
- 7018 – Differential pressure: Vacuum, 0.2, 2, 5, 10bar versions
- Pneumatic
- Up to 5 selectable engineering units
- Loop current measure
- 24/36V loop power
- Over-pressure alarm
- RS232 serial interface and EasyCal software compatible
- W270 x H175 x D250mm, weight 3kg





# Additional Calibration Instruments

Portable test instruments for use in the lab or field

# Supporting Laboratory Equipment

Air supply tools, test kits, repair and maintenance, and ESD options



## DRY BLOCK CALIBRATORS

Precision compact dry block calibrators for calibration of RTDs, thermocouples, thermoswitches, thermistors, and other common temperature sensing devices.

- Interchangeable inserts
- Multi information display
- Multi-hole insertion tubes
- Auto stepping
- MVI Mains Variance Immunity
- EasyCal software compatible

Model	Temp Range	Heating Time	Accuracy	Stability	Immersion depth	Insert diameter
7070	-17 to 140°C	15 min	0.4°C	0.05°C	115mm	19 mm
7071	33 to 320°C	4 min	0.5°C	0.1°C	110mm	26 mm
7072	33 to 650°C	20 min	0.9°C	0.1°C	110mm	26 mm



## 1090 PROCESS and TEMPERATURE CALIBRATOR

A precision calibrator that combines source and measurement functions for thermocouples, RTDs, mV and mA. The 1090 features a memory storage function that holds frequently used values. It is equivalent to the 7077 bench module.

- Measures/simulates 8 thermocouple types, PT100-RTD, mV and mA
- Displays units in °C, °F,  $\mu$ V/mV, or mA
- Automatic or manual cold junction compensation
- Inching and step functions with time configurable steps
- Process loops 4 to 20mA and 0 to 50mA
- 24V loop drive voltage
- Mains or battery operation – 60 hours typical use between charges
- Supplied with battery charger and carry case
- H235 x w150 x D75mm, weight 1.2kg



## 7005 VOLTAGE/CURRENT/LOOP CALIBRATOR

A handheld instrument for the calibration and simulation of voltage and current loops. The 7005 is equivalent to the 7067 bench module.

- Current measurement: 125mA, source 50mA. Resolution 1 $\mu$ A
- Voltage measurement: 25V, source 21V. Resolution 1mV
- Accuracy 0.01%
- Transmitter and square root functions
- Auto-ranging feature
- Programmable steps and ramp
- 9 hours typical use between charges
- Supplied with battery charger and carry case
- H165 x w90 x D45mm, weight 0.42kg



## 1067 – 6 DECADE PRECISION RESISTANCE BOX

Time Electronics have a wide range of decade boxes for resistance, capacitance, and inductance. The 1067 is suitable for simulating and calibrating PT100 sensors and temperature indicators/meters that use resistive sensors.

- Range 0 to 12k $\Omega$  in 10m $\Omega$  steps, accuracy  $\pm$  0.01%
- Residual Resistance: Less than 10m $\Omega$ . Less than 1m $\Omega$  variation
- Power Rating: 0.35 watt per resistor
- Stability: 20ppm/year (>1 $\Omega$ ), 100ppm/year (<1 $\Omega$ )
- Voltage Rating: Maximum 200V DC/AC RMS
- Temperature Coefficient: 10ppm/°C (20ppm/°C below 1 $\Omega$ )
- Dimensions / Weight: w355 x H63 x D89mm / 1.1kg
- Other resistance, capacitance, inductance decade boxes available

## AIR COMPRESSORS, BOOSTERS, VACUUM PUMPS

For customers that require the supply of line pressure and vacuum to the CalBench. Standard compressors are available for pressures under 10bar, with air amplifiers and gas boosters to achieve higher pressures up to 600bar.

- 8bar compressor – 8.7 cfm displacement/50L/2.5hp (7173)
- 10bar silent running compressor – 14.9 cfm displacement/24L/3.3hp (7174)
- Optional external 200L receiver tank for the 7174 (7189)
- Single end air amplifier system – increases line pressure from 7 to 34bar (7175)
- Gas booster power unit – increases line pressure from 8bar up to 600bar (7176)
- Electrical vacuum pump (7149 shown)
- Units can be housed in cabinets for sound proofing and protection
- Air preparation kits, filters, and regulators for clean supply



## ADDITIONAL CALIBRATION TOOLS and TEST KITS

For applications that cannot be performed using the modules fitted to CalBench. These include test weights for calibrating scales and balances, and gauge block sets for vernier calibration.

- Test Weight Set (Stainless steel F1 class, 6110g total weight)
- 1mm Base Steel Gauge Block Set - 103 blocks, Tolerance Grade 1
- Mass flow controllers differential pressure, for gas, ranging from 0.01ml to 1000L
- Decade boxes, portable test instruments and DMMs
- Benchtop calibrators and analytical instruments
- 82 piece electronics service kit (7183 shown)
- Customer specified calibration tools and kits



## REPAIR and MAINTENANCE EQUIPMENT

Various repair and maintenance instruments such as oscilloscopes can be fitted into the bench as modules. External equipment is also supplied for benchtop use.

- Standard solder station (7144, module version also available)
- Advanced solder station and rework kit (7145 shown)
- Benchtop fume extraction kit for the above (7147)
- Heavy duty benchtop vice (7150)
- Tabletop circuit board holder (7180)
- Magnifying lamp (7181)
- Benchtop turntable with locking mechanism (7154)
- 82 piece electronics service kit (7183 shown above)



## ESD EQUIPMENT and OPTIONS

CalBench is a class 1 instrument, so for protection a ground connection must be provided. Each bench has earth bonding between the consoles and frame, a separate protective earth terminal on rear of console, and PE connection on the 7082 mains controller module. Various extras are available upon request.

- Melamine faced ESD bench worktop. Anti-static, scratch, impact & stain resistant.
- Anti-static benchtop mats
- Grounding products
- Anti-static wrist wraps
- Anti-static labels, tapes, and bags
- Heel and toe grounders
- Static test meters







# Laboratory Design and Supply

Turnkey workshop design service and supply

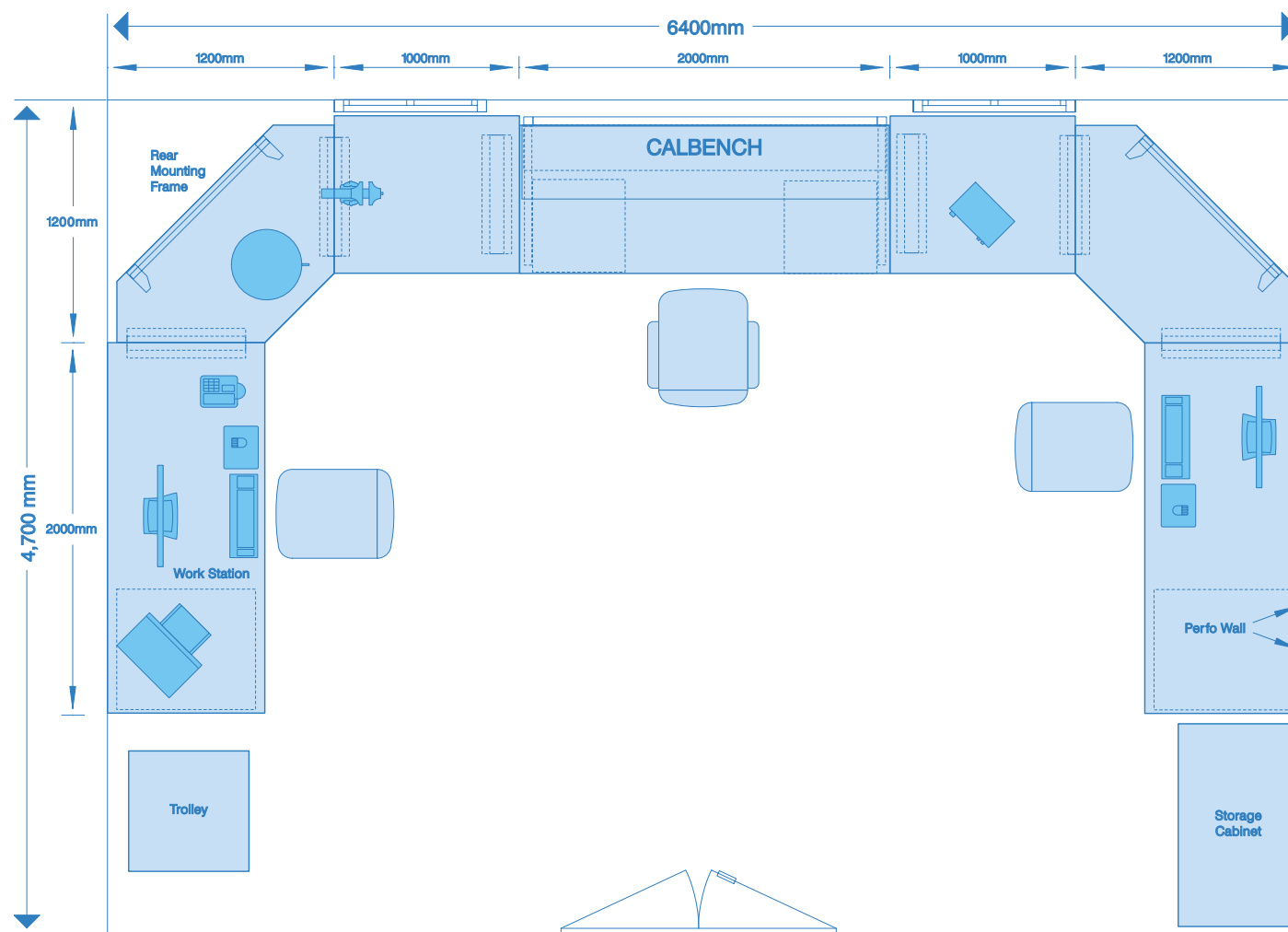
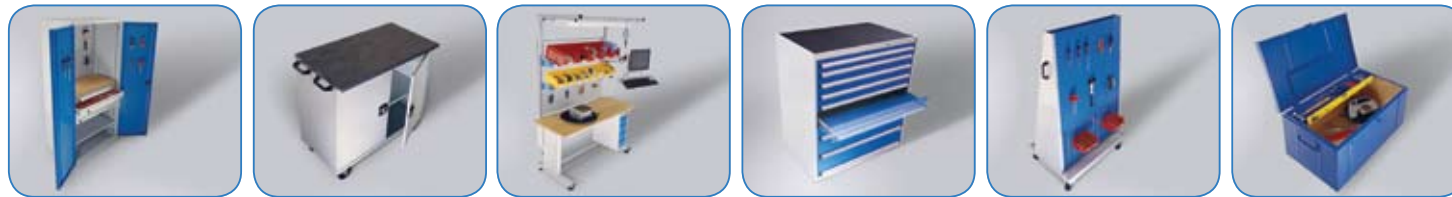
## THE DESIGN PROCESS

Time Electronics offer a turnkey design and supply service for customers requiring an efficient and ergonomic on-site calibration laboratory. It is created virtually, then supplied complete including all specified test instruments, tools, and furniture. CalBench acts as the primary work station of the laboratory, and is used for the main testing and verification workload.

The process starts by understanding the user's requirements and applications. Once this is determined the design team will firstly configure the suitable calibration bench or benches, and if necessary add supporting instruments for customer specific applications. Following this the workspace dimensions are supplied and the virtual design begins. Using custom software we create a 2D overview of the laboratory, then generate 3D images and videos to allow the end users to visualise the concept.

Each laboratory is designed to optimise the calibration process. This is accomplished by a dual approach of hardware and software. CalBench modules provide the functions to calibrate devices and instruments, whilst EasyCal software is the controlling platform for all work and management. It enables the operators to schedule workload, organise jobs, database and print/store information. It also speeds up calibration by automating test runs when used with the 7051 multifunction calibrator/DMM or other compatible bench modules and instruments.

In addition to the primary focus of calibration, the lab can incorporate customer designated areas of use. These could be stations for administration work, repair and maintenance, or storage units. Laboratories can be designed to be fully self-sufficient, including line pressure tools such as compressors and vacuum pumps.



## ON-SITE BENCH INSTALLATION, TRAINING, AND CALIBRATION

Time Electronics have comprehensive after-sales support packages for customers that purchase calibration benches, accompanying test instruments, and workshop equipment.

**On-site bench and lab installation:** A travelling engineer will visit the test facility and install and commission the CalBench, supporting instruments, and laboratory furniture. Our technicians can perform site visits worldwide and are qualified to work on offshore platforms, power and processing plants, and refineries.

**On-site training and demonstration:** Bench training can be included with the lab installation or scheduled for a later date. The technician will educate the users on how to set up the system and operate the bench modules and additional test instruments. They will also simulate the calibration process by demonstrating tests on actual devices at the site.

### On-site annual bench calibration and maintenance service:

A technician can visit the test facility annually to perform calibration of the CalBench and test equipment. This can be scheduled before or after installation and can include additional training if required.

### Factory acceptance testing and bench training at TE UK:

Customers can visit Time Electronics UK and receive training on their ordered system prior to shipment. We will schedule and arrange all aspects of the visit, including local transport and accommodation. Factory acceptance testing can be undertaken by the end user or their designated inspection company.

### Online EasyCal training:

Using remote desktop sharing we can help customers understand and utilise the software for calibration work and management. We can provide basic tutorials or troubleshoot specific applications relative to the user's system.



## CALIBRATION BENCHES and CONSOLES

7080	CalBench (W2000 x D850 x H1568/1413 mm). Includes frame, worktop, primary console, 7082 mains module. 1660mm module space. All modules can be fitted.
7081	Secondary Console (W2000 x D225 x H390 mm). 1925mm available module space.
- 7081S	Secondary Console Internal Shelf Version (page 4).
7060	Tabletop Bench Console (W1000 x D470 x H385mm). 830mm available module space.

### Standard Under Worktop Fittings (page 4)

7120	Cabinet with 1 door and 1 x shelf (W500 x D550 x H600mm)
7121	2 drawer Unit (W500 x D550 x H250mm)
7131	Combination Drawer/Cabinet Unit (W500 x D550 x H600mm)
7132	5 drawer Unit (W500 x D550 x H600mm)
7134	Slotted Divider Kit for drawers (3, 6, or 9 compartments)
7136	Soft Rubber Mat Insert for drawers inside 7121, 7131, 7132
7123	CPU Holder (Vertical)
7124	CPU Holder (Horizontal)

### Perforated Panel Options - only available without 7081 (page 4)

7125	20 piece Tool Hook Kit
7137	40 piece Tool Hook Kit
7138	60 piece Tool Hook Kit
7139	Shelf (W450 x D250 x H130mm)
7140	Shelf (W900 x D250 x H130mm)
7141	Storage Bin Strip (W450 x H75mm). With 4 x 1L bins
7142	Storage Bin Strip (W900 x H75mm). 6 x 3.5L or 4 x 10L bins
7143	Document Holder (W450 x H360mm)

## MODULES

### Multifunction Calibrator/Control Centre (for full listings with options see page 8)

7051	CalBench Control Centre and Multifunction Calibrator	425mm
- 9714B	10 Channel Scanner option (side module) for internal DMM	80mm

### Electrical and Power Supply Modules (page 15)

7082	Mains Power Controller (fitted as standard, socket type to be selected)	270mm
- 7063	Isolated mains output sockets for 7082 Mains Power Module	
7075	110V Fixed 7.5A DC Module with 2 shrouded 4mm safety sockets	160mm
7076	110V Fixed 10A AC Module	150mm
7043	3 phase mains controller Module	150mm
7083	Dual 24V DC Power Supply - 2 x 24v (2A)	131mm
7087	Quad DC Power Supply - 6V(8A), 12V(8A), 24V(4A), 48V(3A)	80mm
7052	30V DC 3A Adjustable Power Supply - Digital (programmable version 7052P)	150mm
7053	56V DC 4A Adjustable Power Supply - Digital (programmable version 7053P)	200mm
7086	60V DC 3A Adjustable Power Supply - Digital	168mm
7054	120V DC 750mA Adjustable Power Supply (programmable version 7054P)	150mm
7055	250V DC 375mA Adjustable Power Supply (programmable version 7055P)	150mm
7056	35V DC 4A Dual Adjustable Power Supply - Digital (programmable version 7056P)	295mm
7088	Adjustable AC Supply 0 - 270V/10A (or 110% above line voltage)	350mm
7046	Variable AC/DC Power Supply. AC 500VA, DC 400W, Frequency 40 - 500Hz	295mm
7047	Variable AC/DC Power Supply. AC 1000VA, DC 800W, Frequency 40 - 500Hz	500mm

### Pressure Modules and Connector Kits (page 17)

7062	Pressure Calibrator with regulator (Vac/0.2/2/5/10/20bar versions)	129mm
7059	Combined Vacuum/Pressure Calibrator (Vac and 0.2/2/5/10/20bar versions)	129mm
7064	High Pressure Calibrator with regulator (35/70/100/200bar versions)	200mm
7066	Differential Pressure Calibrator (0.2/2/5/10bar versions)	150mm
7032	Automatic Pressure Calibrator (0.2/2/5/10bar versions)	340mm
7030	Precision Automatic Pressure Calibrator (interchangeable sensors, versions up to 210bar)	500mm
7038	Multifunction Pressure Indicator (Vac/0.2/2/5/10/20/35/70/100/200/400/600bar versions)	100mm
7065	Pressure Indicator (Vac/0.2/2/5/10/20/35/70/100/200/400/600bar versions)	96mm
7084	Line Pressure Controller (5/35/70/100/200bar versions)	150mm
7073	Set of hoses/adaptors for connections to modules and pumps	
7097	Minimess high pressure hose test kit	
7148	Air Preparation Kit (Mounted on bench rear under panel or specified by customer)	

Pressure option codes for 7062, 7059, 7064, 7066, 7032, 7038, 7066, and 7084:

Range (bar)	Vac	0.2	2	5	10	20	35	70	100	200	400	600
Option Code	7111	7100	7101	7102	7103	7104	7105	7106	7107	7108	7109	7110

## MODULES

### Temperature and Loop Modules (page 19)

7001	PT100 Simulator Module	95mm
7085	Temperature Distribution Module (Thermocouple and RTD)	250mm
7085A	Auto Switching Temperature Distribution Module (requires 7051)	250mm
7068	RTD Temperature Calibrator Module	107mm
7077	Temperature and Process Calibrator Module	295mm
7061	Process Calibrator Module	285mm
7067	Precision Loop Calibrator Module	97mm
7069	V-I Loop Calibrator Module	97mm
7079	Loop Ancillaries Module	96mm

### Digital Multimeter and Electrical Test Modules (page 21)

5075B	Precision Digital Multimeter Module	500mm
5065B	6.5 Digital Multimeter Module	295mm
5068B	Insulation Tester Calibration Module (100kΩ - 10GΩ)	295mm

### Oscilloscope Modules (page 21)

7021	Digital Oscilloscope Module - 60MHz, 2 channel, colour LCD display	425mm
7022	Digital Oscilloscope Module - 60MHz, 4 channel, colour LCD display	425mm
7023	Digital Oscilloscope Module - 100MHz, 4 channel, colour LCD display	425mm
7024	Digital Oscilloscope Module - 200MHz, 4 channel, colour LCD display	425mm
7026	Digital Oscilloscope Module - 500MHz, 4 channel, colour LCD display	425mm

### Frequency Counters / Function Generators / RF / Harmonics Modules (page 22)

7027	3GHz Universal Frequency Counter	295mm
7028	10MHz DDS Function Generator	295mm
7029	25MHz Function/Arbitrary/Pulse Generator	295mm
7031	50MHz Function/Arbitrary/Pulse Generator	295mm
7048	2GHz Synthesised Signal Generator (AM, FM, phase modulation)	295mm
7058	6GHz Signal Generator	295mm
7170	Mains/Harmonics Analyzer including Flicker	400mm
- 7171	1kW Low Distortion Power Source (side module for 7170)	400mm

### Additional Modules

9758B	DC Electronic Load, 80A, 80V, 300W (aids power supply calibration)	295mm
7002H	Hart Communication Module	100mm
7002FB	Foundation Fieldbus Module (7002H+FB can be combined module)	100mm

## EXTERNAL EQUIPMENT

### Pressure / Temperature / Flow / Repair and Maintenance / ESD Equipment (page 23 to 26)

7090	Pneumatic Pump Kit (-950mbar to 40bar) hoses, fittings, case	7072	Dry Block Calibrator (33 to 650°C)
- 7091	Digital Pressure Gauge (Vacuum to 30bar, 0.2% Accuracy)	7177	Mass Flow Controller 0.1 to 10 L/min (other ranges available)
- 7089	Digital Pressure Gauge (0 to 40bar, 0.25% Accuracy)	7178	1mm Base Steel Gauge Block Set - 103 pc, Tolerance Grade 1
- 7078	Auto Ranging Digital Gauge (Vac to 200bar, 0.1% Accuracy)	7179	Test Weight Set (Stainless steel F1 class, 6110g total weight)
7095	Hydraulic Pump Kit (0 to 700bar) with hoses, fittings, case	7144	Standard Benchtop Solder Station
- 7096	Digital Pressure Gauge for 7095 (0 to 700bar, 0.25% Accuracy)	7145	Benchtop Solder Station and Rework Kit
7190	Hydraulic Dead Weight Tester (1 to 700bar, 0.015% accuracy)	- 7146	Extra Solder Tips for the above solder stations (3 piece set)
7191	Hydraulic Dead Weight Tester (1 to 1200bar, 0.015% accuracy)	- 7147	Benchtop Fume Extraction kit for above solder stations
7192	Hydraulic Dead Weight Tester (1 to 2600bar, 0.02% accuracy)	7150	Heavy Duty Vice with jaw width 120mm (other widths available)
7193	Pneumatic Dead Weight Tester (1 to 120bar, 0.015% accuracy)	- 7151	Turntable for above vice
7173	8bar Compressor (8.7cfm displacement/50L/2.5hp)	7180	Table top Circuit Board Holder
7174	10bar Silent Compressor (14.9 cfm displacement/24L/3.3hp)	7181	Magnifying Lamp (175mm diameter. 1.75x, 2.25x, or 3x mag lens)
- 7189	External receiver tank (200L) for 7174	7182	Table Base for magnifying lamp
7149	Electrical Vacuum Pump	7154	Benchtop Turntable with locking mechanism
7175	Single End Air Amplifier System	7183	Electronic service case (82 tools)
7176	Gas Booster Power Unit (for high output pressure)	7185	Melamine Faced ESD Tabletop for CalBench
7070	Dry Block Calibrator (-17 to 140°C)	7186	ESD wrist band with cable
7071	Dry Block Calibrator (33 to 320°C)		

For additional instruments, lab design and install services, and more please visit [www.timeelectronics.com](http://www.timeelectronics.com) or contact us for details.

Due to continuous development Time Electronics reserves the right to change specifications without prior notice.