



WEBTEC

WEBSTER INSTRUMENTS (A DIVISION OF WEBTEC PRODUCTS LIMITED)



Hydraulic Data Acquisition System with
ViscoCorrect™ (Automatic Viscosity Correction)

00010

Data
Logger

Introduction

Experience

Webster Instruments, a division of Webtec Products Ltd, designs and manufactures a wide range of hydraulic test equipment with thirty-five years experience in the fluid power industry.

Being at the leading edge of hydraulic diagnostic test equipment, Webster Instruments have always looked to improve their product range, and it is this philosophy which has led to the introduction of the Webster **C1000**.

The **C1000**, a dedicated hydraulic test system, has evolved from the PC100 that was originally designed for our own production testing and subsequently sold throughout the world.

In response to customer requirements, the **C1000** has been developed as a more rugged, easy-to-use system now incorporating all hardware and software.

The **C1000** software includes new features such as viscosity measurement and ViscoCorrect™ (a method of automatic viscosity correction for use with Webster turbine flow meters).



Webtec Products Ltd located at their new premises in St. Ives, Cambridgeshire, UK.

Webster C1000

The **C1000** is a complete hydraulic data acquisition system designed and built to your specification.

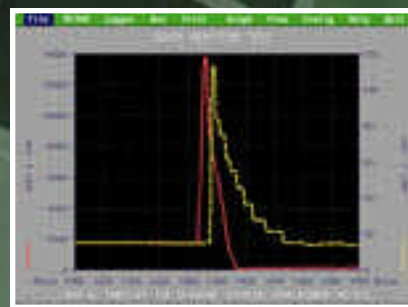
The system provides a complete solution for production and development testing of hydraulic components in a fast, efficient manner, without having to first learn complicated programming skills; all functions are controlled with simple on-screen menus while on-line help is never more than a key press away.

Principally designed for use with the Webster range of flow, temperature, pressure, and speed sensors, the **C1000** also allows you to customise input channels and perform real-time calculations.

You can display measurements in a variety of screens, while a host of data logging and report functions make the **C1000** a powerful test and diagnostics tool.

Features

The **C1000** allows you to display up to 28 'standard' inputs such as flow, speed, temperature and pressure. If required, different sensors can be added by defining special custom or 'soft' channels. Furthermore you can easily add 'virtual' channels to perform real-time calculations on any input.



Graph showing high speed data logging

All configuration details are stored in 'layout files' thus making the **C1000** highly flexible and allowing you to change the system set-up for different tests at the touch of a key.

The **C1000** is pre-configured with common fluid characteristics allowing you to easily monitor kinematic viscosity by measuring fluid temperature. In addition, ViscoCorrect™ can substantially reduce test times by allowing you to accurately measure flow over a wide range of temperatures.

Automatic Viscosity Correction Correct™

Applications

Whether your business involves fault-finding, calibrating or monitoring of hydraulic components, the **C1000** offers a method of data logging suitable for you. Five different methods allow data capture to be as fast as 2000 readings per second (0.5 ms), or as little as a reading every 10 minutes.

● Production / Rebuilding

Applications where the **C1000** excels are pump / motor manufacturers and rebuilders. The ability to supply component performance data quickly to a customer re-enforces the provider's expertise and assures original product performance. 'Log on a key press', 'online', and 'continuous' logs are designed for this type of testing.



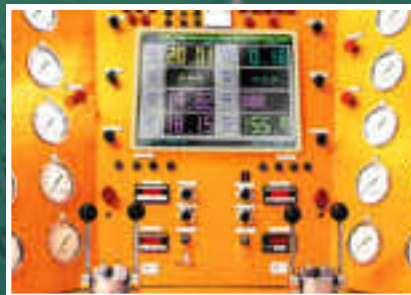
A typical pump test rig using Webster test equipment in Edmonton, Canada.

● Condition monitoring

With a 'periodic log' the **C1000** can be left to run for an extended time to record trend information about a hydraulic system.

● Diagnostics

The 'quick profile log' is a very powerful diagnostics tool allowing the user to rapidly measure shock pressures and other unpredictable conditions within a hydraulic system.



Webster test equipment installed on the pump test facility at Heavyparts Hydraulics Ltd based in the UK.

● Quality control

Due to the **C1000**'s range of report and graphing capabilities the system is ideal for documenting equipment for ISO 9000 conformity.

● Research and development

The versatility of the **C1000** allows the engineer to measure viscosity and perform real-time calculations such as power, torque, Reynolds number and other custom measurements.

Ease of use

The **C1000** is supplied fully tested and pre-configured to your specifications.

The intuitive software means you do not have to learn any special programming language, as all functions are menu-driven. Individual test set-ups are stored in the **C1000** and can be called up as required.

Should you require technical assistance, help is available at the touch of a key within the software, in the fully illustrated manual or from one of our experienced technical staff who can be contacted by phone / fax or e-mail.

User input to the **C1000** can be via keyboard or two foot-activated switches.

ViscoCorrect™ provides consistently accurate flow readings over a wide viscosity range, allowing you to spend less time waiting for oil to warm up and more time testing.



At-a-glance viewing of data display

Menu-driven

Software

Data logging

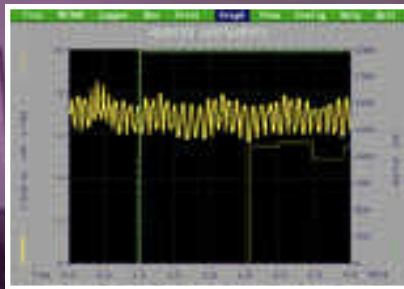
The **C1000** incorporates five methods of data logging, each one designed in answer to a specific situation. If, for example, you want to calibrate a piece of equipment logging results as and when appropriate, the test can be performed hands-free using 'log on a key press' with the foot pedals. Should you wish to graphically view results at a fixed rate then the 'online log' caters for that.

On other occasions you might want to log a hundred readings over ten seconds to measure a pump's performance. No problem, the 'continuous log' is designed for just that.



Normal panel display

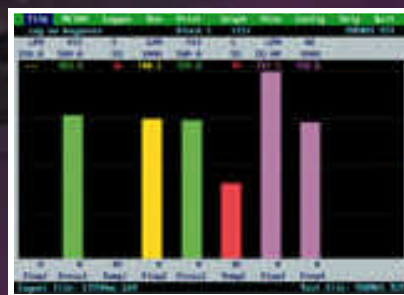
In unpredictable situations where you need to diagnose a fault the **C1000** comes into its own. The 'quick profile log' can be triggered on an input level's rise or decay past a pre-set value. A 'quick profile log' continuously records up to four channels in a buffer allowing you to see events before and after a trigger event.



Line graph display

Should you wish to measure a pressure spike in a system, you can log one flow and one pressure every 1/2 millisecond - fast enough to measure each piston on a piston pump.

For those of you in less of a hurry the 'periodic log' allows you to log results for an extended time, for example, to monitor equipment condition.



Histogram display

Channels

The **C1000** allows a maximum of 12 digital channels (flow and speed) and 16 analogue channels (temperature and pressure). If required, you can easily create customised 'soft' channels for different analogue and digital measurements.

Kinematic viscosity is automatically calculated by the **C1000** allowing you to measure the fluid viscosity wherever you have a temperature sensor. Should you wish to perform real-time calculations, 'virtual' channels can be used to create terms such as power, volumetric displacement, differential pressure, and Reynolds number.

All inputs whether 'standard', 'soft', or 'virtual' can be quickly configured using the on-screen menus.

The system flexibility allows 'screen layouts' to be created for particular applications; once configured you can store layout files using descriptive names for easy identification and later retrieval. Each layout file stores sensor configurations and software settings.

The end result is a flexible system that can be re-configured for a different application at the touch of a key.

Display

The **C1000** allows you to display readings in five different screens selected by a single key.

The 'normal panel' can simultaneously display all 28 inputs plus 'soft' and 'virtual' channels. During testing you may only want to see a select few measurements. The 'super panel' can display up to eight channels in **LARGE** (25 mm) numerals or as bar graphs allowing at-a-glance viewing.



Super panel display

In addition to the 'panel displays', the 'histogram' and 'line graph' graphically display readings in real-time allowing you to view a measurement trend as well as the exact value.

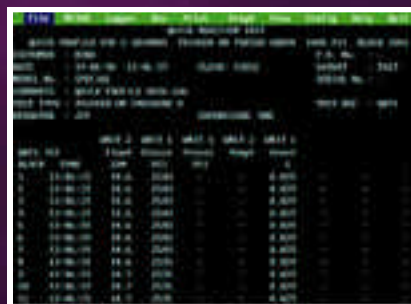
Once a test has been recorded data can be reviewed in any of these four panel screens, or as a 'data table' of the whole test.

Reports

An integral part of the **C1000** is its ability to quickly create text and graph reports either for your own records or to send to your customers.

Text reports can be 'narrow' to include eight specific measurements or 'wide' to include all active channels. When carrying out a test you can enter useful information such as test description, customer name, model number, serial number, and operator, etc. This information is automatically reproduced at the top of all text reports to ensure they play a valuable part in any ISO 9000 quality and certification system.

Both graph and text reports can be easily printed, using a variety of common printers, literally at the touch of a key.



From Data Table. . .



. . . to printed report (in one key press)

Specification

Channels

- Maximum 16 analogue, 12 digital
- 'Soft' and 'virtual' channels (maximum 44)

Display screens

- 'Normal panel' (1 to all channels)
- 'Super panel' (1 to 8 channels)
- 'Histogram' (1 to 10 channels)
- 'Line graph' (1 to 4 channels)

Data logging

- Five methods of data logging:
 - 'Log on a key press'
 - 'Online log'
 - 'Continuous log'
 - 'Quick profile log'
 - 'Periodic log'
- Maximum 2000 readings/second (sample rate 0.5 ms)
- Maximum number of readings 44 per block
- Maximum number of blocks 8000 / test

Output

- 'Wide' and 'narrow' text reports
- 'Line graphs'
- Colour printer and plotter support including:
 - HP inkjet
 - Laser postscript
 - HPGL plotter
 - Epson dot matrix
- Export files in ASCII format to commercial spreadsheeting packages
- Export data from the Webster MC100 to the C1000

2000 Readings/Sec

Micro processor based

Hardware

C1000-1



C1000-1

There are two standard variations of the C1000. The C1000-1 comprises two 19" units, the conditioning unit and an industrial computer, housed in a rugged 19" metal enclosure. The system can include up to 28 inputs, and is fitted with a 3.5" floppy disk and 2.1 Gb hard disk as standard. The computer has multiple ISA slots and sufficient space for additional hardware components to be added, (such as a network card or CD-ROM).

CE All hardware CE compliant



19" industrial computer - detail

C1000-2



C1000-2

The C1000-2 offers a compact solution with all the basic functionality of the C1000-1.

The C1000-2 comprises of a 19" conditioning unit housed in a rugged metal case and a wall mountable industrial computer. The system can include up to 28 inputs, and is fitted with a 3.5" floppy disk and 2.1 Gb hard disk as standard. Due to its compact design no additional hardware may be added to the computer.

CE All hardware CE compliant

Options & Accessories



17" Monitor and Keyboard

Both the C1000-1 and C1000-2 can be supplied with accessories, including VDU, keyboard, foot switches and printer. Optional Network card and CD-ROM are available for the C1000-1.

Customer modifications of both C1000 models are available on request.



Foot operated switches for 'hands free' data logging

Technical Specifications

General

Signal conditioning unit

Flow & temperature cards

- 3 channel
- Single Eurocard 100 x 160 mm
- 3 unit height
- 8 HP width front panel
- 5-pin locking DIN

Pressure cards

- 8 Channel
- Single Eurocard 100 x 160 mm
- 3 unit height
- 24 HP width front panel
- 5-pin locking DIN
- Independent variable gain instrumentation amplifiers
- Independent variable zero offset
- Nom. input sensitivity 100 mV
- 10 V excitation voltage

Post processing

Digital

- 16 bit pre-scalar
- 32 bit period counter
- Period clock: 1 MHz
- Maximum input frequency: 1 MHz
- Independent time-out counters
- Multiple period measurements
- Connection via four 9 way 'D' style connectors

Analogue

- 12 bit A/D, single channel 100 kHz maximum
- 16 channel multiplexer
- Connection via 37 way 'D' style connector

C1000-1

Industrial computer

- 19" rack mountable
- ISA BUS single board computer
- 14 slot ISA backplane
- 3.5" floppy disc drive
- 2.1 Gb hard drive
- Power supply 115 VAC / 230 VAC
- 300 W max. DC output (Optional CD-ROM) (Optional network card)

Dimensions:

C1000-1 metal enclosure

- H = 680 mm
- D = 600 mm
- W = 600 mm

C1000-2

Industrial computer

- Wall mountable
- ISA BUS single board computer
- 6 slot ISA backplane
- 3.5" floppy disc drive
- 2.1 Gb hard drive
- Power supply 115 VAC / 230 VAC
- 200 W max. DC output

Dimensions:

C1000-2 wall mountable industrial computer

- H = 266 mm
- D = 400 mm
- W = 175 mm

C1000-2 signal conditioning unit enclosure

- H = 200 mm (including feet)
- D = 450 mm
- W = 500 mm

Connections

- 5-pin locking DIN
- Mains via IEC (CE22) connector
- Keyboard via PS2 style 5 pin mini-DIN
- 1 Parallel port via 25 way 'D' style connector
- 2 serial ports via 9 way 'D' style connector
- VDU via High Density 'D' style connector

Options & Accessories

- Network card (BNC connector)
- CD-ROM
- 17" VGA VDU
- 102 key AT keyboard
- Printer

Fast & easy set-up

Associated products

Webster MC100

The Webster MC100 can simultaneously display and log eight inputs: two flows, two speeds, two temperatures, and two pressures. Advanced functions allow you to automatically measure differential pressure, peak pressure and power.



The MC100 with optional printer (MP100)

The MC100 portable flow computer is particularly aimed at on-site hydraulic diagnostic testing. The optional MP100 is ideal for printing performance graphs and test data for immediate analysis.

Data can be easily exported to the C1000 for advanced editing and report writing.

Webster Sensors

Bi-directional flow meters (Temperature output included with all these flow meters)

Without load valve		Flow
Model		
LT 5	0.1	5 lpm
LT10	0.2	10 lpm
LT20	0.3	20 lpm
LT50	2	50 lpm
LT125	4	125 lpm
LT250	10	250 lpm
LT400	15	400 lpm
LT500	20	500 lpm
LT750	25	800 lpm
VT125*	2	125 lpm
VT400*	5	400 lpm

* With ViscoCorrect™

With load valve		Flow
Model		
LT250R	10	300 lpm
LT400R	15	400 lpm
LT750R	25	800 lpm

Magnetic speed-pickup MT1A to measure shaft rpm

LPT pressure transducers

Model	Pressure
LPT 40	40 bar
LPT 100	100 bar
LPT 250	250 bar
LPT 400	400 bar

Temperature sensors

Model	Temperature
TP200	0 - 120°C

It is the aim of Webtec Products Ltd to design, develop and build new and innovative products to satisfy the requirements of our customers.

The company is committed to a programme of Total Quality incorporating all areas of manufacture, from product development through to after-sales support and has been approved to conform to BS EN ISO 9001.



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