

Multi-Input Data Acquisition System

MIDAS 400



A powerful data acquisition and control system, customised to suit clients' specific sensor requirements and applications.

FEATURES

- Up to 32Mbyte memory
- True synchronised sampling
- Interfaces to a wide variety of sensors
- Conditional sampling regime
- DataLog 400™ software package
- Integral battery pack
- Custom housings and configurations
- OEM versions available
- Delay Start function

INTRODUCTION

The MIDAS 400 (Multi-Input Data Acquisition System) has been designed with the aim of providing a powerful logger and sensor control package, customised to the exact requirements of each client's application. The MIDAS 400 is based on Valeport's "400 series" electronics package, which interfaces to multiple sensors, and provides power and sampling control to each.

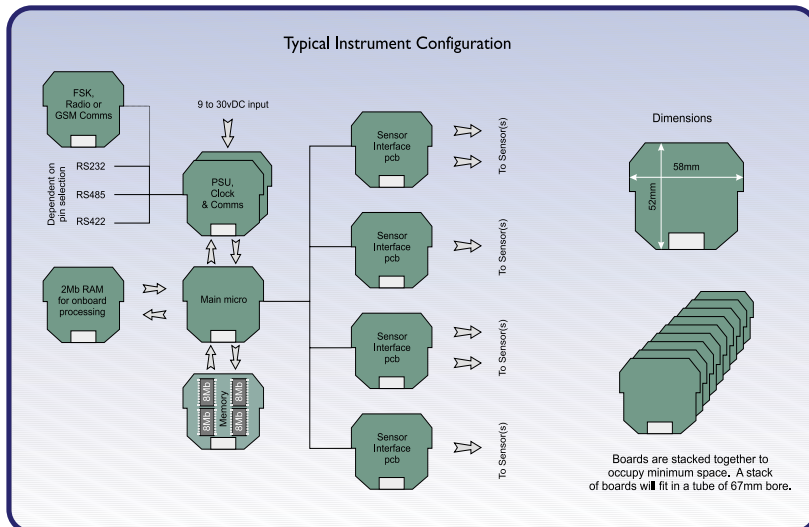
The "400 series" system is in use in many of Valeport's standard products, bringing the benefit of features such as synchronised sampling and conditional sampling regimes. However, no matter how

comprehensive the range of standard products, there will always be applications where a specific suite of sensors is required. The plug and play nature of the MIDAS 400 system overcomes this problem, and with customised housings designed and machined by Valeport's own engineers, offers itself as a true standard product for non-standard applications.

Multi-Input Data Acquisition System

MIDAS 400

OVERVIEW



The MIDAS 400 utilises Valeport's latest "400 series" modular sensor technology. The basic principle is to use a core electronics package, and then add a small microprocessor to interface each individual sensor. The core electronics consists of a power control board, a main microprocessor, and memory and communications boards. This system automatically detects whichever sensors are fitted, and controls the sampling regime of each sensor.

Aside from the fact that each sensor and interface board are thus fully calibrated modules in their own right, this system also allows full central control of each sensor, and results in features unique to the Valeport product. Such features include true synchronised sampling, where each sensor is sampled at exactly the same instant rather than in sequence, and a highly configurable Conditional Sampling regime whereby data sampling is only triggered by the readings from any individual sensor.

The MIDAS 400 system can address

up to 20 individual interface boards, some of which interface to 2 or 3 different sensors (e.g. pressure and temperature are controlled by a single interface board). The sensor types suggested in this brochure are standard, commonly used oceanographic sensors. Between them they use a variety of output types, including digital and frequency, current or voltage analogues. The customisable nature of the MIDAS 400 means that interface to any sensor type can be considered - even if the output is not similar to one of these standard sensors, it may be possible to modify the interface to suit. If in doubt, contact Valeport.

Data from all sensors is logged to a central memory, and is also available in real time; RS232, RS485 and RS422 communications are all built in, chosen by pin selection on the output connector.

Finally, the instrument can be supplied in a customised underwater housing, or as an OEM package.

Dissolved Oxygen: High accuracy, high stability, fast response, pressure balanced DO sensor.

pH: Pressure balanced pH sensor

Redox (ORP): Pressure balanced Redox sensor

Combined pH/ Redox: Single pressure balanced sensor measuring both pH and Redox

Fluorometer: Choose from Seapoint Sensors' Chlorophyll, Rhodamine or Fluorescein sensors, or Chelsea Instruments' Minitracka II Chlorophyll, Rhodamine or Nephelometer sensors. All supplied with 1m pigtail. (Other types available on request).

PAR: Photosynthetically Active Radiation sensor on 1 m pigtail.

Water Bottle Trigger: Internal pcb & 1m flylead for interface to water bottle triggering mechanism (not supplied). Contact Valeport for details of trigger output.

Compass Valeport flux gate 2 axis compass module.

Current Speed/Direction Valeport 2 axis electromagnetic current sensor - variety of designs available (see Model 802 datasheet for details).

Tilt/Roll 2 axis capacitive bubble sensor.

Each sensor is supplied with an interface pcb to the main electronics. The sensor & pcb module is supplied fully calibrated, and only needs to be plugged into the electronics for installation.

Note that the above sensors use a variety of current, frequency and voltage analogue signals, or RS232, TTL serial and RS485 digital signals. If an alternative sensor is required, please contact the factory to discuss interfacing details.

Suggested Sensors:
See back page for detailed specifications

Conductivity: Valeport pressure balanced inductive sensor.

Pressure: Choose either Strain gauge type (vented or absolute), or resonant

quartz type. A variety of ranges for both types are available.

Temperature: Fast response Platinum Resistance Thermometer.

Turbidity: Bulkhead mounted sensor

Data Acquisition

Scan Rate: 1, 2, 4 or 8 Hz synchronous sampling. As an example, if 6 sensors are fitted, 8Hz synchronous sampling equates to 48 data points per second (this would often be quoted as 48Hz sampling in sequential sampling systems).

Sample Modes

Continuous Sampling: Sampling at a fixed rate until interrupted.

Trip Sampling: Typically used for profiling, where data is sampled at regular pressure increments.

Burst Sampling: Ideal for long term deployments. Instrument takes a series of samples, then sleeps for a set length of time before waking up and repeating the process. Power is conserved during sleep mode. Standard Deviation and data averaging are available in this mode.

Conditional Sampling: Output from a selected sensor is monitored at regular intervals. When it reaches a trigger level, full sampling occurs until data from the selected sensor falls (or rises) back past the trigger level.

Water Bottle Trigger: A trigger pulse is output either at regular time intervals, on the basis of data from any sensor passing a trip level, or by manual control through software in real time. A record of when triggering has occurred is stored with the data file.

Switch On

By insertion of a switch plug in self-recording mode, or via power or software control in real time mode.

Memory

The MIDAS 400 is fitted with 8 Mbyte memory as standard. This is upgradeable in 8 Mbyte steps to a maximum of 32 Mbyte.

Each fitted parameter uses either 2 or 4 bytes of memory per record, depending on sensor type. 8 Mbyte memory actually consists of 8,388,608 bytes. A system with 6 x 2 byte sensors and 2 x 4 byte sensors (as an example) will use 20 bytes per record. 8 Mbyte will therefore hold over 400,000 complete records. Note that in Trip sampling mode, each record also has a 6 byte time stamp, reducing capacity in this example to approximately 320,000 records.

Power

Power consumption naturally depends on the number of sensor fitted. The basic electronics package draws 30mA at 12v when running, and 0.4mA in

sleep mode. All sensors are turned off in sleep mode.

The MIDAS 400 can be fitted with a choice of internal or external battery packs to meet the demands of the specific application. Alternatively, the system will accept an external input of 9 to 30vDC.

Communications

RS232, RS485 and RS422 communications are all fitted as standard, chosen by pin selection on the connector. Maximum baud rate is 115,200 for RS232, or 57,600 for RS485 & RS422.

RS232 communications may be used directly with a standard PC comm port, over cable lengths up to 200m. RS485 and RS422 communications may be

used with up to 1500m cable lengths, but will require a surface adaptor set to interface to PC.

As an option, an FSK modem adaptor can be fitted to the instrument, allowing two wire communications over 6000m cable.

UHF, VHF and GSM telemetry are also available.

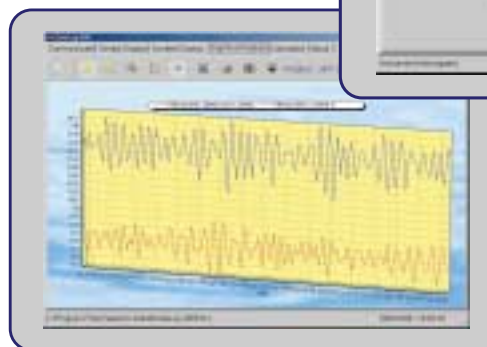
Housings

Valeport has in-house facilities for design and manufacture of housings to suit the particular specification. Available materials include acetal, anodised aluminium and titanium.

Alternatively, OEM systems may be supplied, so that the user may design their own housing.

SOFTWARE

The DataLog 400™ software package supplied with the instrument is written in Delphi for Windows, and works with Win95 and above. The software allows setup of the required sampling regime, extraction and display of



logged data, recording and display of real time data, scrolled data presentation and graphical data presentation.

The software automatically detects which sensors are fitted to the

instrument - it is one standard program, whatever the system configuration.

Naturally the software performs better the more powerful the computer. We recommend a minimum PC specification of 100MHz Pentium, 16Mbyte RAM and 100Mbyte drive space - note that 32Mbyte of raw logged data will convert to over 200Mbyte of calibrated text files. Note that data may be viewed in standard spreadsheet packages as well as DataLog 400™.

ORDERING

Please contact Valeport or local agent to discuss your specific application.

Multi-Input Data Acquisition System

MIDAS 400

SPECIFICATION

Parameter	Type	Range	Accuracy	Resolution	Response Time	Comments
Conductivity	Pressure Balanced inductive coils	0.1 to 60mS/cm	±0.01mS/cm	0.003mS/cm	100ms	
Temperature	Fast PRT	-5 to +35°C	±0.005°C	0.002°C	100ms	
Pressure	Strain gauge	100, 500, 3000, 5000dBar	±0.1%FS	0.005%FS	20mS	
Pressure	Resonant Quartz	variety to 10,000psi (7,000dBar)	±0.01%FS	0.001% @ 8Hz	Measures for 20ms @ 8Hz	Quartzonix type to 700psi, Digiquartz type to 10,000psi
Turbidity	Seapoint	0 - 2000FTU (max)	linearity ±<2% to 750 FTU	0.005% FS	0.1s (63%)	Software selectable range, 25, 125, 500 or 2000 FTU
DO	Pressure balanced Clark cell	0 - 16ml/l	±0.07ml/l	0.017ml/l	2s (63%) 20s (90%)	Stability <0.5% per day
pH	Pressure balanced electrode	2-12	±0.05	0.01		Available as individual sensors or as a single combined sensor
Redox (ORP)	Pressure balanced electrode	±1500mV	±1mV	0.08mV		
Fluorometer	Seapoint Chlorophyll	0.02 - 150µg/l (max)	±<0.03 µg/l RMS noise	0.005%FS	0.1s (63%)	Software selectable range, 5, 15, 50 or 150 µg/l
Fluorometer	Seapoint Rhodamine	0.02 - 150ppb (max)	±<0.03 ppb RMS noise	0.005%FS	0.1s (63%)	Software selectable range, 5, 15, 50 or 150 ppb
Fluorometer	Seapoint Fluorescein	0.02 - 150µg/l (max)	±<0.03 µg/l RMS noise	0.005%FS	0.1s (63%)	Software selectable range, 5, 15, 50 or 150 µg/l
Fluorometer	Chelsea Minitracka II Chlorophyll	0.03 - 100 µg/l	±0.01 µg/l RMS noise	0.01µg/l		
Fluorometer	Chelsea Minitracka II Rhodamine	0.03 - 100 µg/l	±0.01 µg/l RMS noise	0.01µg/l		
Fluorometer	Chelsea Minitracka II Nephelometer	0.04 - 100 FTU	±0.01 FTU RMS noise	0.01FTU		
PAR	Licor	0 - 10,000µmol/s/m²	Linearity ±1% over range	0.5µmol/s/m²	10µs	Stability <±2% per year

Specifications of other sensors available on request

Valeport manufactures a wide range of oceanographic and hydrometric instruments including self-recording and direct reading multi-parameter current meters, sound velocity probes, CTD probes, wave recorders, tide gauges, open channel flow meters, water and plankton samplers, winches, sinker weights, connectors and accessories.

VALEPORT 

Valeport Limited
Townstal Industrial Estate
Dartmouth, Devon TQ6 9LX
United Kingdom
Tel: +44 (0)1803 834031
Fax: +44 (0)1803 834320
e-mail: sales@valeport.co.uk
Web Site: <http://www.valeport.co.uk>

As part of our policy of continuing development, we reserve the right to alter, without notice, all specifications, designs, prices and conditions of supply of all equipment. Data Sheet Reference No. 400/1