

## General Description

The logging system comprises of multi channel data logger with high contrast backlit LCD display fitted in a clear boron silicate instrument globe, mounted in a stainless steel frame. The globe is held in place by spring loaded mounting rings at the north and south pole.

The data logger unit, and battery power supply are fitted inside the globe. The data logger is connected to the sensor inputs via two multi core cables terminating in a cylindrical anodised aluminium junction box. Up to 16 external sensors may be connected to the logger via the junction box.

The data logger can log up to 10 analogue inputs from pressure sensors, flow meters, temperature sensors or any other sensors with voltage, 4-20mA or frequency outputs. It also has an RS485 serial channel capable of logging up to 8 Keller subsea pressure sensors with 0.05% or optional 0.01% accuracy.



Complete system fitted in mounting frame with junction box

The logger also has an integral x,y,z accelerometer which can be used for the measurement of orientation or motion. The high contrast LCD backlit display is programmable and can display to 12 channels simultaneously. The backlight intensity is adjustable, and the backlight can be light activated. The logger has an internal flash memory capacity of 1.5 million readings which overwrites the last reading when the memory is full. There is also a micro SD card which holds 100 million readings, which does not overwrite to provide full data protection.

Data can be downloaded direct from the unit via the external RS232 port to a PC, or remotely using the optional subsea optical modem connected via the RS232 port. An enhanced communications option is available providing programming and data download over WiFi, with the RS232 port available for use in environments where WiFi is not available. Data from the micro SD card can only be downloaded over WiFi, or by removing the card from the logger.

Instrument Globe	Low expansion borosilicate 13+(330mm) sphere, in two hemispheres, weight 9.7 Kg, depth rated with bulk-head connectors to 6000 metres, refractive index 1.48, Young's Modulus 62GPa.
Frame	Welded 316 stainless steel, 29+x 19+x 19+( 725 x 475 x 475 mm )
Junction Box	Stainless steel, 9+long by 7.5+diameter ( 225 x 190 mm )
Data Logger	MSL 1200D logger with 10 analogue inputs and 1 serial ( support 8 Keller pressure sensors ) input. Max logging rate 1 Hz. SD card memory. Windows user interface.
Power Supply	Internal lithium polymer re-chargeable for minimum 1 month operation.
Communications	RS232 direct connection for data download ( flash memory )and logger control and programming WiFi option for data download of both flash and SD card memory and logger control and programming CANBUS serial port for external CANBUS devices Optional optical modem for wireless data transfer subsea

- Integral sensors for x,y,z acceleration and temperature
- 10 analogue 0-5v, 1 thermocouple and 1 serial input.
- Up to 7 analogue inputs can be configured for frequency inputs from flow meters
- User programmable
- Supports voltage (0-5v) and frequency inputs
- 1 serial channel for RS485 MODBUS data or other protocols as required
- 1 CANBUS channel for CANBUS sensors
- Serial channel can read up to 8 Keller subsea pressure sensors.
- Optional high contrast LCD display with backlight
- Internal memory 1.5 M readings
- Micro SD memory card slot
- Depth rated to 4000 metres
- External power supply 11-30vDC or internal battery.
- Internal battery option provides up to 1 month operation without external power

## Specification - Merlin Data Logger

Analogue Inputs	10 x 0-5v DC resolution 12 bit ( 1.2 mV, ) up to 7 channels can be configured for AC frequency input suitable for turbine flow meters
Input Channels	10 analogue, 1 thermocouple, 1 serial RS485 MODBUS/Keller protocol, 1 CANBUS
Memory Capacity	1,500,000 readings internal + micro SD card 100 million readings
Logging Modes	Single point, average, min, and max
Logging Rate	Programmable - 50 Hz up to 12 hours
Data Retention	Over 200 years with no power
Operating Range	-20 to +60 degrees C ( battery charging 0 to 45 degrees C )
Power Supply	External 10-30v DC or internal battery
Data Format	Graphic and CSV, suitable for export to Excel
Display	Optional high contrast backlit LCD 1 or 2 x 72 x 45 mm showing up to 12 channels of measurements simultaneously.
Communications	RS232 direct connection for data download ( flash memory ) and logger control and programming WiFi option for data download of both flash and SD card memory and logger control and programming CANBUS serial port for external CANBUS devices Optional optical modem for wireless data transfer subsea
Software	Windows software included for logger control and programming. Logger control application is a simple user interface to launch logger project and download data. Programming interface provides a menu driven graphical interface for setting up the logger program, downloading and viewing data.

## Specification - Subsea Pressure Sensors

Characteristics	PA33X-Subsea	Units
Pressure Ranges:	1, 3, 10, 30, 100, 300, 700, 1000, 1360	Bar gauge
Analogue Output	0-5v or 4-20mA	
Serial Output	RS485	
Temperature Output	RS485 only acc +/- 1 deg C	
Excitation Voltage	10-30	VDC
Input Current	<3	mA
Output Config	3 wire (0-5v) 2 wire (4-20mA) or 4 wire (RS485)	No. of wires
Accuracy	Analogue O/P 0.1	+/- % of rated O/P
Standard Unit	Serial O/P 0.05	+/- % of rated O/P
High Precision Unit	Serial O/P 0.01	+/- % of rated O/P
Temperature range	Compensated 10 to +40, -10 to +80 or . 5 to +35	°C
Stability	<0.05% over 12 months	+/- of Rated Output
Media Compatibility	Any media Compatible with 316 L St St	
Protection	I.P. 68 to 4000 metres seawater	
Electrical Connector	5 pole subcon male connector MCBH5M-SS or BH5M-SS	
Process Connection	1/4+BSP male, or 1/2+NPT male, other on request	



### Keller PA33X High Precision Transducers

TP*	PT Range		Accuracy +/- 0.1 bar			Sensitivity 0.05 bar		
	Min	Typical	% of TP*	% of FSDMin	% of FSDTyp	% of TP*	% of FSDMin	% of FSDTyp
200	250	300	0.015	0.012	0.01	0.003	0.0024	0.002
250	312.5	500	0.02	0.016	0.01	0.004	0.003	0.002
300	375	500	0.017	0.013	0.01	0.003	0.0027	0.002
350	437.5	500	0.014	0.011	0.01	0.0029	0.0023	0.002
400	500	700	0.018	0.014	0.01	0.0035	0.0028	0.002
450	562.5	700	0.016	0.013	0.01	0.003	0.0025	0.002
500	625	1000	0.02	0.016	0.01	0.004	0.0032	0.002
550	687.5	1000	0.018	0.015	0.01	0.0036	0.003	0.002
600	750	1000	0.017	0.013	0.01	0.0033	0.0027	0.002
650	812.5	1000	0.015	0.012	0.01	0.003	0.0025	0.002
700	875	1000	0.014	0.011	0.01	0.029	0.0023	0.002
750	937.5	1000	0.013	0.011	0.01	0.0027	0.0021	0.002
800	1000	1000	0.013	0.01	0.01	0.0025	0.002	0.002

## Specification - Subsea Temperature Sensors

Measurement Range	0-50, -20 to +80, 0-200 deg C
Output	4-20mA or 1-5 v DC
Sensor Type	3 wire PT100
Accuracy	0.2%
Operating Temperature	-30 to +140
Power Supply	8-32v DC
Media Compatibility	Any liquid compatible with 316 L St St
Protection	I.P. 68 to 4000 metres seawater
Electrical Connector	5 pole subcon male connector MCBH5M-SS



## Specification - Subsea Flow Meters

Characteristics	NT3-NT150-Subsea
Output Config	2 wire AC frequency signal 50mV-800mV
Accuracy	0.5% ( 0.3% for NT100 & NT150 )
Temperature range	-30 to +140
Pressure drop	0.2 - 0.5 bar depending on meter size
Media Compatability	Any clean liquid compatible with 316 L St St
Protection	I.P. 68 to 4000 metres seawater
Electrical Connector	3 pole subcon male connector MCBH3M-SS or BH3M-SS

Type	Flow Range Ltrs/Min	K factor Ltr	BSP Threads	ANSI Flanges
NT3	0.5-5	17000.0	3/8"	1/2+
NT5	1.2-10	5900.0	1/2"	1/2+
NT7	2-20	3000.0	1/2"	1/2+
NT11	5-50	2600.0	1/2"	1/2+
NT13	8-80	1950.0	3/4"	1/2+
NT19	15-150	630.0	1"	1"
NT24	25-250	350.0	1"	1"
NT32	45-450	135.0	1 1/4"	1 1/2+
NT38	65-650	117.0	1 1/2"	1 1/2"
NT48	110-1100	67.0	2"	2+
NT65	200-2000	18.0	3"	2 1/2+
NT80	300-3000	14.0	-	3+
NT100	500-5000	7.5	-	4+
NT150	1000-10000	3.4	-	6+





## OM-1000 Subsea Optical Modem

- Transfer real time and logged data from subsea logger to an ROV
- Optical non contact RS232 data transfer
- Half duplex transparent data link
- Data transfer rate 9600 to 57600 baud
- Suitable for depths to 4000 metres
- Power consumption 8.5mA @ 12v DC
- Compatible with MSL 1200D series loggers and all Omni Instruments subsea logging systems



The OM-1000 is a subsea optical modem suitable for use to depths of 4000 metres. It can be used to transfer data between any two serial devices with RS232 communications. The communication is half duplex transparent RS232 and is compatible with MSL1200D data logger and many other data loggers and serial devices.

The unit consists of a base modem, usually connected to the data logger and a remote unit which is connected to an ROV. To effect data transfer the ROV, using a manipulator drops the remote unit into the docking port. As the modems are transparent data transfer is controlled by the host PC on the surface via the ROV serial link.

Data communications are unaffected by electrical noise or suspended solid particles in the seawater.

## Specification

Baud Rate	Programmable 9600, 19200, 38400, 57600 baud
Serial Port	RS232
Power Supply	9-28v DC
Power Consumption	8.5mA at 12vDC
Operating Temperature	0 to 50 deg C
Data Protocol	Transparent RS232, half duplex
Protection	I.P. 68 to 4000 metres seawater
Housing Material	316 stainless steel or aluminium
Electrical Connector	8 pole subcon male connector MCBH8M-SS

