

VALEPORT LIMITED

miniCT

Operating Manual

Document Ref: 0660827

Document Version: B

Date: February 2012

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1 **INTRODUCTION**

This manual covers the basic specifications, deployment and maintenance procedures for the:

- miniCT Direct reading *CT sensor*

The instruments can be controlled by sending commands directly, using a suitable terminal emulation program such as HyperTerminal.

The instrument is based on Valeport's existing "mini" sensor range. The product is available in either 500m rated acetal or 6000m rated titanium housing. The housing material has no effect on instrument function or operation. Where illustrations show plastic housing, it may be taken that the instructions apply equally to titanium housing, and vice versa.

The product has been designed to be simple to use and maintain, as well as being small and lightweight for easy handling and deployment.

2 SPECIFICATIONS

Dimensions:

	Housing Ø	Sensor bulkhead Ø	Overall length
<i>miniCT</i>	36mm	54mm	266mm

Materials:

Part	Material
Main housing	Titanium (6000m) or acetal (500m)
Sensor bulkhead	Titanium (6000m) or acetal (500m)
Conductivity Sensor (6000m)	Titanium structure, polyurethane coating, ceramic core
Conductivity Sensor (500m)	Acetal structure, ceramic core
Temperature sensor	PRT in titanium housing with polyurethane backing.

Power:

<i>External</i>	9 – 28v DC input
<i>miniCT</i>	<250mW (20mA @12v)

Connection:

Standard is Subconn type MCBH6F (In titanium on titanium housings, in brass on acetal housings)

Alternatives may be supplied on request

Wiring Information is in Section 4

Output:

Units are fitted with both RS232 and half-duplex RS485 communications as standard, selected by pin choice on the output connector. Protocol is 8 data bits, 1 stop bit, no parity, and no flow control.

Baud rate is factory set to 19200. User may choose between 2400, 4800, 9600, 19200, 38400, 57600, 115200. (Note that fast data rates may not be possible with low baud rates). Continuous output at 1, 2, 4 or 8Hz

Performance:

Sensor		miniCT
Conductivity	<i>Range</i>	0 – 80mS/cm
	<i>Accuracy</i>	±0.01mS/cm
	<i>Resolution</i>	0.001mS/cm
Temperature	<i>Range</i>	-5 to +35°C
	<i>Accuracy</i>	±0.01°C
	<i>Resolution</i>	0.001°C

Certain features of the sensors used in the “mini” range are designed specifically to enable high quality data to be delivered:

Conductivity (miniCT)	
<i>Construction Materials:</i>	The materials used in the Valeport Conductivity sensor have been specially chosen to resist compression at high pressure; This unique approach ensures that it performs within specification under even the harshest of field conditions.
<i>Digital Sampling Technique:</i>	A new digital sampling technique allows the Valeport conductivity sensor to operate with significantly less noise and greater long term stability than traditional inductive cells.

3 DATA REQUESTS AND OUTPUT FORMATS

The miniCT respond to a series of text commands that are detailed here, for those users who wish to interface the products to other systems. Note that this list is not comprehensive, but will allow the standard functions of the instrument to be accessed. For more detailed information, please contact Valeport Ltd.

Notes

- All commands must be confirmed using “Carriage Return” or “Enter” on the keyboard, with the exception of the “Stop” command (#).
- All commands are echoed back by the instrument as they are typed

Code	Followed By	Operation
#		Interrupts instrument when running
M	rate<CR>	Performs continuous measurement at set rate. If rate is omitted then instrument performs continuous measurements at previous rate. 1 ,2, 4 or 8 Hz
S	<CR>	Returns a single reading
#001	;address<CR>	Sets the 485 address
#002	<CR>	Returns the address
#004	<CR>	Read header info
#005	;ON<CR> or ;OFF<CR>	Turns ON or OFF address mode
#006	<CR>	Returns ON or OFF for address mode
#015	<CR>	Returns last result
#026	;valeport_separator<CR>	Sets the Valeport output string separator (4 chars)
#027	<CR>	Returns the Valeport output string separator
#028	<CR>	Set the unit into run mode
#029	<CR>	Read run mode
#032	<CR>	Returns the software version number.
#034	<CR>	Returns the units serial number
#039	;ModeValue<CR>	Set mode without putting unit into run mode Where Mode = M Value = 1,2,4 or 8 for Normal mode (M)
#040	<CR>	Read operating mode.

#059	;baud_rate<CR>	Sets the units baud rate 2400,4800,9600,19200,38400
#082	;3 ;CSV ;SB ;RES	See format details below
#089	<CR>	Reads current output format
#091	;ON<CR> or ;OFF<CR>	Sets miniCT startup mode. OFF=No readings at startup, ON=Readings at last rate at startup
#102	;ON or OFF<CR>	Sets 485 mode
#103	<CR>	Sends 485 mode

Data Formats

Real time data follows the format described below. Use #091 to control whether the instrument starts sampling as soon as power is applied or waits for command.

Format 3:

Example

19.786 46.554

- The data separator is a tab (this may be altered if required).
- Data is presented in the order: Temperature, Conductivity
- The temperature data is given to 3 decimal places. Value is in °C and leading zeroes are included; signed if negative:
 - 21.456
 - 02.769
 - -01.174
- Conductivity (miniCTD) is given in mS/cm, as a fixed length string with 3 decimal places, and leading zeroes if appropriate.

Format CSV

Example:

023.7720,00.00000,0000.0000,00046.553

- The data separator is a comma
- Data is presented in the order: Temperature, Blank, Blank, Conductivity
- The temperature data is given to 4 decimal places. Value is in °C and leading zeroes are included; signed if negative
- Conductivity is given in mS/cm, as a fixed length string with 3 decimal places, and leading zeroes if appropriate

Format Seabird

Example

23.8015,0.0033

- The data separator is a comma
- Data is presented in the order: Temperature, Conductivity
- The temperature data is given to 4 decimal places. Value is in °C and leading zeroes are included; signed if negative
- Conductivity is given in mS/cm, as a fixed length string with 4 decimal places, and leading zeroes if appropriate

Format Reson

Example

00:00:00, 31-01-2050, 00.003, 23.676, +0.00, 0.00

- The data separator is a comma
- Data is presented in the order:
Time, Date, Conductivity, Conductivity, Blank, Blank;
- Time/Date field are fixed as the miniCT has no internal clock.
- The temperature data is given to 3 decimal places. Value is in °C; signed if negative
- Conductivity is given in mS/cm, as a fixed length string with 3 decimal places, and leading zeroes if appropriate

4 WIRING INFORMATION

Wiring colours are correct at the time the manual was printed. However, it is advised that continuity checks are performed prior to all terminations.

Systems are supplied with a short (50cm) lead for splicing or testing

Subconn 6 pin male line (MCIL6M)		Function	9 Way D Type	4mm Banana Plugs	
Pin	Wire Colour (See note 1)		Pin	Pin	Wire colour
1		RS232 GND	5 (Link to 1,6,8,9)		
2		RS232 Tx (Out of sensor) or RS485A	2		
3		RS232 Rx (Into sensor) or RS485B	3		
4		+V		Red Plug	Red, linked to Green inside D type
5		Link to Pin 1 for RS485. N/C for RS232			
6 (Link to pin 1 in sensor)		Power GND		Black Plug	Black, linked to Brown inside D type

1: Due to colour differences in supplied pigtailed, no colours have been stated, therefore it is necessary to check colour to pin number.