

SBE 16plus (RS-485) SEACAT Reference Sheet

(see SBE 16plus [RS-485] SEACAT User's Manual for complete details)

Communication Setup

1. Double click on SeaTerm.exe.
2. Once main screen appears, in Configure menu select *SBE 16plus*.
 - A. Com Settings tab
Serial Port: COM1 through COM10 are available. Baud Rate: 9600 (or other if applicable).
Data Bits: 8 Parity: None Mode: RS-485 (half duplex)
Modem/RS485 ID: Automatically get ID if 1 SEACAT on RS-485 line; Prompt ID if multiple SEACATs on line
 - B. Upload Settings tab — define data upload for when you use Upload on Toolbar
 - C. Header Information tab — define header information included with uploaded data
3. In Configure menu, select Header Form to customize header if desired.
4. Click Connect on Toolbar. SEATERM should return *S>* prompt.
5. Set Date and Time — see page 2 for *Command List*.
6. Set up other parameters if desired — see *Command List*. User-selectable sampling modes include:
 - **Autonomous** – At pre-programmed intervals, SEACAT wakes up, samples, stores data in memory, and powers off.
 - **Polled** – On command, SEACAT takes 1 sample and sends data to computer.
 - **Serial Line Sync** - SEACAT wakes up, samples, stores data in memory, and powers off in response to pulse on serial line.

Deployment

1. Batteries:
 - A. *Remove battery end cap*: Wipe dry housing/end cap seam. Unthread end cap by rotating counter-clockwise. Wipe dry O-ring mating surfaces in housing with lint-free cloth.
 - B. *Remove and replace battery cover plate and batteries*: Remove three Phillips-head screws and washers from battery cover plate, and remove cover plate. Turn SEACAT over and remove batteries. Install new batteries, + terminals against flat contacts and - terminals against spring contacts. Align battery cover plate with housing. Reinstall three Phillips-head screws and washers, while pushing hard on battery cover plate to depress spring contacts at bottom of battery compartment.
 - C. *Reinstall battery end cap*: Remove water from O-rings and mating surfaces with lint-free cloth. Inspect O-rings and mating surfaces for dirt, nicks, and cuts. Clean/replace as necessary. Apply light coat of O-ring lubricant to O-ring and mating surfaces. Fit end cap into housing and rethread into place, using a wrench to ensure end cap is tightly secured.
2. Program SEACAT for intended deployment (see page 2 for *Command List*):
 - A. Set date and time.
 - B. Ensure all data has been uploaded, and then send **#iiINITLOGGING** to make entire memory available for recording. If **#iiINITLOGGING** is not sent, data will be stored after last recorded sample.
 - C. Establish setup and sampling parameters. If desired, use **#iiSTARTMMDDYY=**, **#iiSTARTHHMMSS=**, and **#iiSTARTLATER** to establish delayed start date and time
3. Install cable or dummy plug for each connector on SEACAT end cap. Install locking sleeve over each plug/cable connector. Connect other end of cables to appropriate sensors.
4. Verify hardware and external fittings are secure.
5. (if applicable) Remove Tygon tubing that was looped end-to-end around conductivity cell for storage.
6. Autonomous sampling: If not already done, send **#iiSTARTNOW** or **#iiSTARTMMDDYY=**, **#iiSTARTHHMMSS=**, and **#iiSTARTLATER**.

Data Uploading

1. Connect I/O cable from SEACAT to computer.
2. Double click on SeaTerm.exe. Click Connect on Toolbar. SEATERM should return *S>* prompt.
3. If in Autonomous sampling mode, command SEACAT to stop logging by sending **#iiSTOP**.
4. Click Upload on Toolbar to upload stored data.
5. Process file and review data in SBE Data Processing (data processing software) to ensure all data has been uploaded.

Command Instructions

- Input commands in upper or lower case letters, and register commands by pressing Enter key.
- SEACAT sends *?CMD* if invalid command is entered.
- If new command is not received within 2 minutes after completion of a command, SEACAT returns to quiescent (sleep) state.
- If in quiescent (sleep) state, re-establish communications by clicking Connect on Toolbar.
- For reliable operation, all commands *may* need to be preceded with two @ characters to clear communication microcontroller receive buffers.

Example (status command for SEACAT 01): **S>@@#01DS**

Shown on page 2 are commands used most commonly in field. See Manual for complete listing and detailed descriptions.

Command List (for all commands indicating ii, ii = SEACAT ID, ranging from 0 – 99)

FUNCTION	CATEGORY	COMMAND	DESCRIPTION
Communication Microcontroller Commands	Global (data from ADATA, GDATA, STARTSAMPLE, and GSAMPLE not stored in FLASH memory)	ADATA	All SEACATs get average data from acquisition units, start next averaging cycle, turn power off. Comm microcontrollers hold averaged data in buffer until receiving DATAii .
		GDATA	All SEACATs take 1 sample, turn power off. Comm microcontrollers hold data in buffer until receiving DATAii .
		STARTSAMPLE	All SEACATs take 1 sample, leave power on. Comm microcontrollers hold data in buffer until receiving DATAii . Send once before GSAMPLE .
		GSAMPLE	All SEACATs get last sample, take new sample, leave power on. Comm microcontrollers hold last sample in buffer until receiving DATAii .
		MDDYY=mmddy	All SEACATs set clock month, day, and year. Must follow with HHMSS= .
		DDMMYY=ddmmyy	All SEACATs set clock day, month, and year. Must follow with HHMSS= .
		HHMSS=hmmss	All SEACATs set clock hour, minute, and second.
	PWROFF	All SEACATs enter quiescent (sleep) state. Main power turned off; logging and memory unaffected.	
	Get Data	DATAii	Get data obtained with GDATA , ADATA , STARTSAMPLE , or GSAMPLE .
	SEACAT ID	ID?	Get SEACAT ID.
		*ID=ii	Set SEACAT ID to ii. Must be sent twice.
	Miscellaneous	!iiDS	Display communication microcontroller status.
		!iiRXDELAY=x	x= delay after SEACAT receives command until transmitter is enabled (1 – 500 msec). Default 25 msec.
		!iiTXDELAY=x	x= delay after SEACAT transmits reply until transmitter is disabled (1 – 500 msec). Default 25 msec.
!iiRXMAX=x		x= time communication microcontroller waits for reply from acquisition microcontroller before it times out (1 - 180 sec). Default 30 sec.	
!iiSYNCSYNCMODE=x		x=Y: Enable serial line sync mode. x=N: disable serial line sync mode.	
!iiBAUD=x		x= baud rate (1200, 2400, 4800, or 9600).	
!ii*EETEST		Test EEPROM. Erases calibration coefficients and user-programmed parameters.	
Acquisition Microcontroller Commands	Status	!iiDS	Display status.
	General Setup	!iiMDDYY=mmddy	Set clock month, day, year. Follow with !iiHHMSS= or it will not set date.
		!iiDDMMYY=ddmmyy	Set clock day, month, year. Follow with !iiHHMSS= or it will not set date.
		!iiHHMSS=hmmss	Set clock hour, minute, second.
		!iiPUMPMODE=x	x=0: No pump. x=1: Run pump for 0.5 sec before each sample. x=2: Run during each sample.
		!iiNCYCLES=x	x= number of measurements to take and average for every sample.
	Output Format	!iiINITLOGGING	After uploading data, initialize logging to make entire memory available for recording.
		!iiOUTPUTFORMAT=x	x=0: Raw frequencies/voltages in Hex. x=1: Converted data in Hex. x=2: Raw frequencies/voltages in decimal. x=3: Converted data in decimal.
		!iiOUTPUTSAL=x	x=Y: Calculate and output salinity (psu). x=N: do not.
	Pressure Sensor (internally mounted) Setup	!iiOUTPUTSV=x	x=Y: Calculate and output sound velocity (m/sec). x=N: do not.
		!iiPTYPE=x	x=0: No pressure sensor. x=1: Strain gauge pressure sensor. x=3: Quartz pressure sensor with temperature compensation.
		!iiREFPRESS=x	x= reference pressure (gauge) in db to use if no internally mounted pressure sensor.
	Voltage Sensor Setup	!iiPAROSINTEGRATION=x	x= integration time (seconds) for Quartz pressure sensor.
		!iiVOLT0=x #iiVOLT1=x #iiVOLT2=x #iiVOLT3=x	x=Y: Enable external voltage (voltage 0, 1, 2, or 3). x=N: Do not.
		!iiDELAYBEFORESAMPLING=x	x= time (seconds) to wait after switching on external voltage before sampling.
	RS-232 Sensor Setup	!iiBIOWIPER=x	x=Y: Configuration includes ECO-FL fluorometer with Bio-Wiper. x=N: Does not.
		!iiSBE38=x	x=Y: Enable SBE 38 secondary temperature sensor. x=N: Do not.
		!iiSBE50=x	x=Y: Enable SBE 50 pressure sensor. x=N: Do not.
		!iiGTD=x	x=Y: Enable GTD (Pro-Oceanus Gas Tension Device). x=N: Do not.
		!iiDUALGTD=x	x=Y: Enable dual (2) GTDs. x=N: Do not.
	Autonomous Sampling (logging)	!iiTGTD	Measure GTD(s), output 1 converted data sample for each GTD.
		!iiSENDGTD=command	Send command to GTD and receive response (any command recognized by GTD).
		!iiSAMPLEINTERVAL=x	x= interval between samples (10 – 14,400 seconds).
		!iiSTARTNOW	Start logging now. Data stored in FLASH.
		!iiSTARTMDDYY=mmddy	Delayed logging start: month, day, year. Must follow with !iiSTARHHMSS= .
		!iiSTARTDDMMYY=ddmmyy	Delayed logging start: day, month, year. Must follow with !iiSTARHHMSS= .
		!iiSTARHHMSS=hmmss	Delayed logging start: hour, minute, second.
		!iiSTARTLATER	Start logging at delayed logging start time. Data stored in FLASH memory.
		!iiSTOP	Stop logging or waiting to start logging. Send this command before uploading data.
		Polled Sampling	!iiSL
	!iiSLT		Output last sample from buffer, take new sample and store in buffer, turn power off.
	!iiTS		Take sample, store in buffer, output data, turn power off.
	!iiTSS		Take sample, store in buffer and FLASH, output data, turn power off.
Data Upload	!iiDDb,e	Upload data from scan b to e . Send !iiSTOP before sending !iiDDb,e .	
	!iiDHb,e	Upload header b to e . Send !iiSTOP before sending !iiDHb,e .	
Coefficients	!iiDCAL	Display calibration coefficients.	