

# SBE 37-SMP (RS-485) MicroCAT Reference Sheet

(see SBE 37-SMP [RS-485] MicroCAT User's Manual for complete details)

## System Setup

1. Install batteries:
  - A. *Remove I/O connector end cap*: Wipe dry housing/end cap seam. Remove 2 flat Phillips-head screws from end cap. Pull end cap out. Disconnect Molex connector connecting end cap to battery pack. Wipe dry O-ring mating surfaces in housing with lint-free cloth.
  - B. *Remove battery pack and install batteries*: Loosen captured screw in battery pack cover. Use handle to lift battery pack out of housing. Keep handle upright. Unscrew red cover plate from top of battery pack assembly. Roll 2 O-rings on side of battery pack out of grooves. Insert batteries into battery pack, and roll 2 O-rings into grooves on side of battery pack. Align pin on battery cover plate PCB with post hole, keep handle upright, and screw red cover plate onto battery pack assembly.
  - C. *Reinstall battery pack and I/O connector end cap*: Align D-shaped opening and notch. Lower battery pack into housing; push gently to mate. Tighten captured screw to secure battery pack in housing. Remove water from O-rings and mating surfaces with lint-free cloth. Inspect O-rings and mating surfaces for dirt, nicks, and cuts. Clean as necessary. Apply light coat of O-ring lubricant to O-ring and mating surfaces. Plug Molex connector together. Fit end cap into housing. Reinstall 2 flat Phillips-head screws to secure.
2. Install I/O cable connector, aligning raised bump on connector side with large pin on MicroCAT. Connect to computer serial port.
3. Double click on SeatermV2.exe. SeatermV2 opens; in Instruments menu, select *SBE 37 RS485*. Seaterm485 opens.
4. In Seaterm485's Communications menu, select *Configure*. In dialog box, select Comm port and baud rate (factory set to 9600). Set ID to *Automatically get ID* for 1 MicroCAT on line; set ID to *Use fixed ID* for multiple MicroCATs on line. Click OK.
5. Seaterm485 should automatically connect to MicroCAT. As it connects, it sends **#iiGetHD** and displays response, and then fills Send Commands window with list of commands for your MicroCAT.
6. Set Date and Time — see Command Instructions and Command List.
7. Set up other parameters if desired — see Command Instructions and Command List. User-selectable sampling modes include:
  - **Autonomous** – At pre-programmed intervals, MicroCAT wakes up, runs pump for 1.0 second, samples, stores data in memory, and goes to sleep.
  - **Polled** – On command, MicroCAT runs pump for 1.0 second, takes 1 sample, and sends data to computer. Useful for integrating with satellite, radio, or wire telemetry equipment.
  - **Serial Line Sync** - In response to simple pulse (or single character) on serial line, MicroCAT wakes up, runs pump for 1.0 second, samples, stores data in memory, transmits data (if **#iiTxSyncMode=Y**), and goes to sleep.

## Deployment

1. Wiring to MicroCAT – deploy with dummy plug or I/O cable connector installed:
  - Install dummy plug, aligning raised bump on side of connector with large pin on MicroCAT. Install locking sleeve. **OR**
  - Install I/O cable connector, aligning raised bump on side of connector with large pin on MicroCAT. Install locking sleeve. Connect I/O cable connector to computer serial port.
2. Attach MicroCAT to mooring line with Sea-Bird mounting brackets. **MicroCAT is intended for deployment with connector at bottom for proper operation – see manual for details.**

## Data Uploading

1. Connect I/O cable from MicroCAT to computer.
2. Double click on SeatermV2.exe. SeatermV2 opens; in Instruments menu, select *SBE 37 RS485*. Seaterm485 opens.
3. In Seaterm485's Communications menu, select *Configure*. In dialog box, select Comm port and baud rate (factory set to 9600). Set ID to *Automatically get ID* for 1 MicroCAT on line; set ID to *Use fixed ID* for multiple MicroCATs on line. Click OK.
4. Seaterm485 should automatically connect to MicroCAT. As it connects, it sends **#iiGetHD** and displays response, and then fills Send Commands window with list of commands for your MicroCAT.
5. If sampling autonomously (logging), command MicroCAT to stop logging by sending **#iiStop**.
6. Click Upload menu to upload stored data.
7. Select *Convert .XML data file* in Tools menu to convert uploaded .xml file to .cnv file for use by data processing software (SBE Data Processing).
8. Process file and review data in Sea-Bird 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.
- MicroCAT sends an error message if invalid command is entered.
- If new command is not received within 2 minutes after completion of a command, MicroCAT returns to quiescent (sleep) state.
- If in quiescent (sleep) state, re-establish communications by selecting *Connect* in Seaterm485's Communications menu, sending two @ characters, or pressing any key.
- For reliable operation, all commands *may* need to be preceded with two @ characters.  
*Example* (status command for MicroCAT 01):        **@@#01DS**

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

## Command List

CATEGORY	COMMAND	DESCRIPTION
Global	<b>DateTime=mmddyyhhmmss</b>	Set clock month, day, year, hour, minute, second.
	<b>GData</b>	Command <b>all</b> MicroCATs to run pump for 1.0 second and take 1 sample. MicroCATs hold data in buffer until receiving <b>Dataii</b> . Data not stored in FLASH memory.
	<b>PwrOff</b>	Enter quiescent (sleep) state. Main power turned off, but data logging and memory retention unaffected.
<b>Get Data</b>	<b>Dataii</b>	Get data obtained with <b>GData</b> .
ID	<b>ID?</b>	Get MicroCAT ID.
	<b>*ID=ii</b>	Set MicroCAT ID to <b>ii</b> , where ii= 0-99. Command must be sent twice.
Status	<b>#iiGetCD</b>	Get and display configuration data.
	<b>#iiGetSD</b>	Get and display status data.
	<b>#iiGetCC</b>	Get and display calibration coefficients.
	<b>#iiGetEC</b>	Get and display event counter data.
	<b>#iiResetEC</b>	Reset event counter.
	<b>#iiGetHD</b>	Get and display hardware data.
	<b>#iiDS or !iiDS</b>	Get and display status.
General Setup	<b>#iiDC</b>	Get and display calibration coefficients.
	<b>#iiBaudRate=x</b>	x= baud rate (600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200).
	<b>#iiRxDelay=x</b>	x= delay after MicroCAT receives command until transmitter enabled (1 - 500 msec). Default 25 msec.
	<b>#iiTxDelay=x</b>	x= delay after MicroCAT transmits reply until transmitter disabled (1 - 500 msec). Default 25 msec.
	<b>#iiDateTime=mmddyyhhmmss</b>	Set clock month, day, year, hour, minute, second.
	<b>#iiOutputExecutedTag=x</b>	x=Y: output XML Executed and Executing tags. x=N: do not.
Pump Setup	<b>#iiReferencePressure=x</b>	x= reference pressure (gauge) in db (used when MicroCAT has no pressure sensor).
	<b>#iiMinCondFreq=</b>	X= minimum conductivity frequency (Hz) to enable pump turn-on for autonomous or serial line sync mode sampling.
	<b>#iiPumpOn</b>	Turn pump on for testing or to remove sediment.
Memory Setup	<b>#iiPumpOff</b>	Turn pump off, if turned on with <b>#iiPumpOn</b> .
	<b>#iiInitLogging</b>	Initialize logging to make entire memory available for recording.
Output Format Setup	<b>#iiSampleNumber=x</b>	x= sample number for last sample in memory. <b>#iiSampleNumber=0</b> equivalent to <b>#iiInitLogging</b> .
	<b>#iiOutputFormat=x</b>	x=0: output raw decimal data. x=1: output converted decimal data. x=2: output converted decimal data in XML. x=3: output converted decimal data, alternate format.
	<b>#iiOutputSal=x</b>	x=Y: calculate and output salinity (psu). x=N: do not.
	<b>#iiOutputSV=x</b>	x=Y: calculate and output sound velocity (m/sec). x=N: do not.
	<b>#iiOutputDepth=x</b>	x=Y: calculate and output depth (m). x=N: do not.
	<b>#iiOutputDensity=x</b>	x=Y: calculate and output density sigma (kg/m <sup>3</sup> ). x=N: do not.
Autonomous Sampling (Logging)	<b>#iiLatitude=x</b>	x= latitude (degrees) to use in depth calculation.
	<b>#iiSampleInterval=x</b>	x = interval between samples (6 - 21600 seconds). When commanded to start sampling with <b>#iiStartNow</b> or <b>#iiStartLater</b> , at x second intervals MicroCAT runs pump for 1.0 second, takes sample, stores data in FLASH memory, and goes to sleep.
	<b>#iiStartNow</b>	Start logging now.
	<b>#iiStartDateTime=mmddyyhhmmss</b>	Delayed logging start: month, day, year, hour, minute, second.
	<b>#iiStartLater</b>	Start logging at delayed logging start time.
Polled Sampling	<b>#iiStop</b>	Stop logging or waiting to start logging. Send <b>#iiStop</b> before uploading data.
	<b>#iiTS</b>	Run pump for 1.0 second, take sample, store data in buffer, output data.
	<b>#iiTSR</b>	Run pump for 1.0 second, take sample, store data in buffer, output data in raw decimal form (regardless of <b>#iiOutputFormat=</b> ).
	<b>#iiTSH</b>	Run pump for 1.0 second, take sample, store data in buffer, do not output data.
	<b>#iiTSS</b>	Run pump for 1.0 second, take sample, store data in buffer and in FLASH memory, output data.
	<b>#iiTSn:x</b>	Run pump continuously while taking x samples and outputting data.
	<b>#iiSL</b>	Output last sample stored in buffer.
Serial Line Sync	<b>#iiSLT</b>	Output last sample stored in buffer, then run pump for 1.0 second, take new sample, and store data in buffer.
	<b>#iiSyncMode=x</b>	x=Y: Enable serial line sync mode. x=N: Disable serial line sync mode.
Data Upload	<b>#iiTxSyncMode=x</b>	x=Y: Transmit real-time data in serial line sync mode. x=N: do not.
	<b>#iiIDDb,e</b>	Upload data from scan <b>b</b> to <b>e</b> , in alternate converted decimal form ( <b>#iiOutputFormat=3</b> ) (regardless of setting for <b>#iiOutputFormat</b> ).
Calibration Coefficients	<b>#iiGetSamples:b,e</b>	Upload data from scan <b>b</b> to <b>e</b> , in format defined by <b>#iiOutputFormat</b> .
Hardware Configuration	<i>See manual.</i>	