

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

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

Note: *ii* in commands is MicroCAT's user-assigned ID (0 – 99). For example, #01gethd sends gethd to MicroCAT with ID=01.

## Setup

1. Install batteries:
  - A. *Remove connector end cap*: Wipe dry housing/end cap seam. Remove 2 cap screws from end cap, and twist end cap counterclockwise. Pull end cap out. Disconnect Molex connecting 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 yellow 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 yellow cover plate onto battery pack assembly.
  - C. *Reinstall battery pack and connector end cap*: Align D-shaped opening and pins on shaft. 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 cap screws.
2. Install 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. Ensure all data has been uploaded from memory, and then send **#iiInitLogging** to make entire memory available for recording. If **#iiInitLogging** is not sent, data will be stored after last recorded sample.
7. Set Date and Time (**#iiDateTime=**).
8. Set up other parameters if desired — see Command Instructions and Command List. User-selectable sampling modes include:
  - **Autonomous** – At pre-programmed intervals, wake up, run pump for 1 second, sample, store data in memory, and go to sleep.
  - **Polled** – On command, run pump for 1 second, take 1 sample, and send 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, wake up, run pump for 1 second, sample, store data in memory, transmit data (if **#iiTxSyncMode=Y**), and go to sleep.

## Deployment

1. Wiring – deploy with dummy plug or cable (for external power and/or serial communication during deployment):
  - A. Standard connector: Align raised bump on side of dummy plug/connector with large pin on MicroCAT.
  - B. Install locking sleeve.
2. Mount MicroCAT, using Sea-Bird or customer-supplied hardware. **MicroCAT is intended for deployment with connector at bottom for proper operation – see manual for details.**

## Data Upload

1. Connect 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. Seaterm485 prompts you to run SBE Data Processing to convert uploaded .hex file to .cnv file for use by other modules in data processing software. Process file and review data 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

## Command List

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

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 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.
Get Data	<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 <b>ii</b> = 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>	<b>x</b> = baud rate (600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200).
	<b>#iiRxDelay=x</b>	<b>x</b> = delay after MicroCAT receives command until transmitter enabled (1 - 500 msec). Default 25 msec.
	<b>#iiTxDelay=x</b>	<b>x</b> = 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>	<b>x=Y</b> : output XML Executed and Executing tags. <b>x=N</b> : do not.
Pump Setup	<b>#iiReferencePressure=x</b>	<b>x</b> = reference pressure (gauge) in db (used when MicroCAT has no pressure sensor).
	<b>#iiMinCondFreq=</b>	<b>X</b> = 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.
	<b>#iiPumpOff</b>	Turn pump off, if turned on with <b>#iiPumpOn</b> .
Memory Setup	<b>#iiInitLogging</b>	Initialize logging to make entire memory available for recording.
	<b>#iiSampleNumber=x</b>	<b>x</b> = sample number for last sample in memory. <b>#iiSampleNumber=0</b> equivalent to <b>#iiInitLogging</b> .
Output Format Setup	<b>#iiOutputFormat=x</b>	<b>x=0</b> : output raw decimal data. <b>x=2</b> : output converted decimal data in XML. <b>x=1</b> : output converted decimal data. <b>x=3</b> : output converted decimal data, alternate format.
	<b>#iiOutputSal=x</b>	<b>x=Y</b> : calculate and output salinity (psu). <b>x=N</b> : do not.
	<b>#iiOutputSV=x</b>	<b>x=Y</b> : calculate and output sound velocity (m/sec). <b>x=N</b> : do not.
	<b>#iiOutputDepth=x</b>	<b>x=Y</b> : calculate and output depth (m). <b>x=N</b> : do not.
	<b>#iiOutputDensity=x</b>	<b>x=Y</b> : calculate and output density sigma (kg/m <sup>3</sup> ). <b>x=N</b> : do not.
Autonomous Sampling (Logging)	<b>#iiLatitude=x</b>	<b>x</b> = latitude (degrees) to use in depth calculation.
	<b>#iiSampleInterval=x</b>	<b>x</b> = interval between samples (6 - 21600 seconds). When commanded to start sampling with <b>#iiStartNow</b> or <b>#iiStartLater</b> , MicroCAT runs pump, takes sample, stores data in FLASH memory, and goes to sleep at <b>x</b> second intervals.
	<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, take sample, store data in buffer, output data.
	<b>#iiTSR</b>	Run pump, take sample, store data in buffer, output data in raw decimal form (regardless of <b>#iiOutputFormat</b> ).
	<b>#iiTSH</b>	Run pump, take sample, store data in buffer, do not output data.
	<b>#iiTSS</b>	Run pump, take sample, store data in buffer and in FLASH memory, output data.
	<b>#iiTSN:x</b>	Run pump continuously while taking <b>x</b> 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, take new sample, and store data in buffer.
	<b>#iiSyncMode=x</b>	<b>x=Y</b> : Enable serial line sync mode. <b>x=N</b> : Disable serial line sync mode.
Data Upload	<b>#iiTxSyncMode=x</b>	<b>x=Y</b> : Transmit real-time data in serial line sync mode. <b>x=N</b> : do not.
	<b>#iiDDb,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> .
Calibration Coefficients	<i>See manual</i>	