SBE 37-IMP-ODO MicroCAT Reference Sheet
(see SBE 37-IMP-ODO MicroCAT User's Manual for complete details)

Sampling Modes
- **Polled** – On command, wake up, run pump, take one sample, transmit data, and go to sleep.
- **Autonomous** – At pre-programmed intervals, wake up, run pump, sample, store data in FLASH memory, and go to sleep.
- **Combo** – On command, transmit last Autonomous sampling data.
- **Averaging** – On command, calculate and transmit average of Autonomous sampling data since last request.

Setup
1. Install AA lithium cells (Note: **ODO MicroCATs use a battery pack with a yellow cover plate**):
    A. *Remove modem 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 O-ring mating surfaces in housing with lint-free cloth.
    B. *Remove battery pack and install cells*: 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 cells 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 modem 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. Double click on SeatermV2.exe. In Instruments menu, select *SBE 37 IM*. SeatermIM opens.
3. In Communications menu, select *Configure*. In dialog box. Input Comm port and baud rate. 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. SeatermIM automatically connects 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. 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.
6. Set Date and Time (**#iiDateTime=**).
7. Set up other parameters as desired — see Command Instructions and Command List.

Deployment
1. Attach MicroCAT to insulated mooring cable with Sea-Bird mounting brackets. **MicroCAT is intended for deployment with the sensors at the top for proper operation – see manual for details.** Install (optional) ICC on mooring cable.
2. See MicroCAT manual for SIM wiring and configuration; see IMM manual for IMM wiring and configuration.

Direct Connection

Connection with Inductive Cable Coupler (ICC)
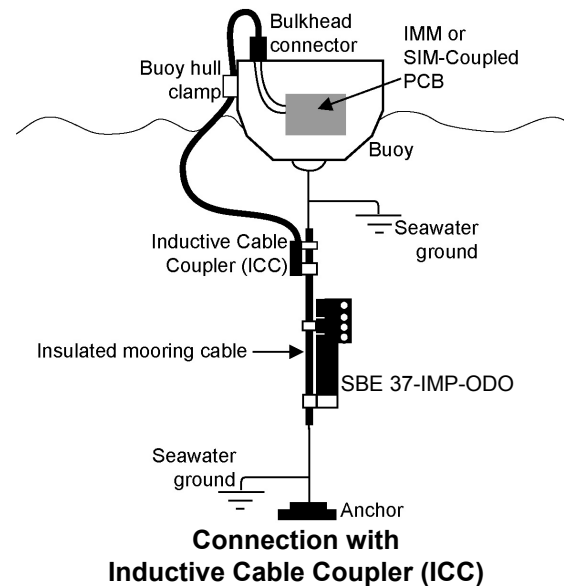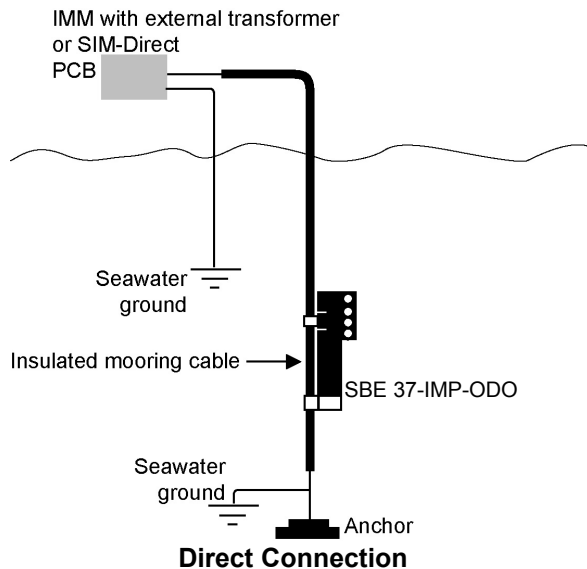
Data Upload
1. Connect cable from MicroCAT to computer.
2. Double click on SeatermV2.exe. SeatermV2 opens; in Instruments menu, select *SBE 37 IM*. SeatermIM opens.
3. In Communications menu, select *Configure*. In dialog box, select Comm port and baud rate (factory set to 9600). Set ID to *Automatically get ID* for 1 MicroCAT on line; set ID to *Use fixed ID* for multiple MicroCATs on line. Click OK.
4. SeatermIM automatically connects 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. SeatermIM 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 and List

- 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 SeatermIM's Communications menu.

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

FUNCTION	CATEGORY	COMMAND	DESCRIPTION
SIM Commands	**Power-On**	**PwrOn**	Send wakeup tone to **all** IMs.
		PwrOff	Send power off command to **all** IMs. Logging and memory retention unaffected.
		AutoPwrOn=x	**x=Y**: Send **PwrOn** to IMs when power applied to SIM. **x=N**: Do not.
	Status	**DS**	Display SIM firmware version and status.
	Communications	**Baud=x**	x= baud from SIM to computer (1200, 2400, 4800, or 9600). *Default 9600*.
		DataNNMax=x	x= timeout that applies to **Dataii**; *default 1000 millisec*.
		RelayMax=x	x= timeout that applies to all other commands; *default 20 sec*.
		EchoOn	Echo characters received from computer.
		EchoOff	Do not echo characters received from computer.
MicroCAT Integrated IMM Commands (ii = MicroCAT ID) *See IMM manual for complete details*	**ID and Group Number**	**ID?**	Get MicroCAT ID (0-99).
		*ID=ii	Set ID to **ii** (ii=0-99). Only 1 MicroCAT can be on line. Must be sent twice.
		!iiSetGroupNumber=x	Set MicroCAT group number (0–9). Group 0 pre-defined as all instruments with integrated IMM.
	Status	**!iiGetCD**	Get integrated IMM configuration data.
		!iiGetHD	Get integrated IMM hardware data.
		!iiGetSD	Get integrated IMM status data.
	Testing	**!iiTestCableCoupler**	Test integrity of integrated IMM. Line must be captured before command sent
	Get Data	**!iiSetGDataStr=x**	**x**= character string to send to MicroCAT acquisition microcontroller from integrated IMM when **GData** is sent from surface IMM/SIM.
		GData	Command all integrated IMMs to send command defined by **!iiSetGDataStr=**, and hold response in buffer until user sends **!iiData** or **Dataii** or **!iiGetReply**.
		!iiData, Dataii, or !iiGetReply	Get data obtained with **GData** from MicroCAT with ID=**ii**.
MicroCAT Acquisition Microcontroller Commands (ii = MicroCAT ID)	**Status**	**#iiGetCD**	Get and display configuration data.
		#iiGetSD	Get and display status data.
		#iiGetCC	Get and display calibration coefficients.
		#iiGetEC	Get and display event counter data.
		#iiResetEC	Reset event counter.
		#iiGetHD	Get and display hardware data.
		#iiDS	Display status.
		#iiDC	Display calibration coefficients.
	General Setup	**#iiDateTime=mmddyyyyhhmmss**	Set real-time clock month day year hour minute second.
		#iiBaudRate=x	x= baud (4800, 9600, 19200, 38400, 57600, 115200) for Serial Mode (internal RS-232 connector).
		#iiOutputExecutedTag=x	**x=Y**: Output XML Executed and Executing tags. **x=N**: Do not.
		#iiReferencePressure=x	**x** = reference pressure (decibars) (for MicroCAT without pressure sensor).
		QS	Place MicroCAT in quiescent (sleep) state; for use in Serial mode only.
	Pump Setup	**#iiMinCondFreq=x**	**x**= minimum conductivity frequency (Hz) to enable pump turn-on.
		#iiAdaptivePumpControl=x	**x=Y**: Use *Adaptive Pump Control*. **x=N**: Run pump for [**#iiOxNTau * #iiOxTau20**].
		#iiOxNTau=x	**x**= pump time multiplier. Range 1 – 100; *default 7*.
		#iiPumpOn / #iiPumpOff	Turn pump on or off, for testing.
	SBE 63 Optical DO Sensor Setup	**#iiSend63=command**	Command MicroCAT to send **command** to SBE 63 and receive response (**command** can be any command recognized by SBE 63).
		Other commands	See SBE 63 manual for command list. SBE 63 setup required for use with MicroCAT: **SetEcho=1, SetFormat=1, SetAvg=1 to 16** (recommended value is **2**), **SetAutoRun=0**.
	Memory Setup	**#iiInitLogging**	Initialize logging, setting memory pointer to 0.
		#iiSampleNumber=x	**x**= sample number for first sample when logging begins.
	Output Format Setup	**#iiOutputFormat=x**	**x=0**: Output raw decimal data. **x=1**: Output converted decimal data.
		#iiTimeFormat=x	**x=0**: Output dd mmm yyyy, hh:mm:ss. **x=1**: Output yyyy-mm-ddThh:mm:ss. **x=2**: Output hh:mm:ss, dd-mm-yyyy. **x=3**: Output hh:mm:ss, mm-dd-yyyy.
		#iiTxSampleNum=x	**x=Y**: Output sample number with data. **x=N**: Do not.
	Autonomous Sampling (logging)	**#iiSampleInterval=x**	**x** = interval between samples (10 – 21,600 sec).
		#iiStartNow	Start logging now. Data stored in FLASH memory.
		#iiStartDateTime=mmddyyyyhhmmss	Delayed logging start: month day year hour minute second.
		#iiStartLater	Start logging at delayed start time. Data stored in FLASH memory.
		#iiStop	Stop logging or waiting to log.
	Polled Sampling (data not stored in FLASH memory unless noted; format specified by **#iiOutputFormat=** unless noted)	**#iiTS**	(Do not run pump) Take sample, output data.
		#iiTPS	Run pump, take sample, output data.
		#iiTPSH	Run pump, take sample, do not output data.
		#iiTPSS	Run pump, take sample, **store in FLASH memory**, output data.
		#iiTSN:x	(Do not run pump) Take **x** samples and output data.
		#iiTPSN:x	Run pump continuously while taking **x** samples, output data.
		#iiT63	Do not pump. Take sample from SBE 63, output oxygen in format set by **SetFormat=** *in SBE 63*.
		#iiSL	Output last sample.
		#iiSLTP	Output data from last sample, then run pump and take new sample.
		#iiSLTPR	Output **raw** data from last sample, then run pump and take new sample.
		#iiDNx	Upload last **x** scans from memory; can send while logging
	Data Upload	**#iiGetSamples:b,e**	Upload scan **b** to **e**, in **#iiOutputFormat**. Send **#iiStop** before sending.
		#iiDDb,e	Upload scan **b** to **e**, converted decimal format Send **#iiStop** before sending.