SBE 41CP Standard V 3.0c COMMAND REFERENCE   Revised 12 Jun 2012

Identification:

prange = F   pressure sensor range (psia).

psn=S   pressure sensor serial number.

*serialnumber=N   CTD serial number.

Operating:

autobinavg=y   Automatically average stored data into bins when profile is stopped due to pressure less than pcutoff.

autobinavg=n   Do not automatically average stored data into bins when profile is stopped due to pressure less than pcutoff.

binaverage   Average stored data into bins.

dtdp   Send last calculated value for dt/dp.

fp   Power analog electronics, take pressure sample, send pressure data, power off..

fpt   Run pump 0.25 seconds, power analog electronics, take pressure sample and temperature sample, send pressure and temperature data, power off.

lts   Send last sample, take new sample and hold it in non-volatile RAM, and leave power on.

ltss   Send last sample, take new sample and hold it in non-volatile RAM, power off.

echocmd=y   echo commands after receiving <CR>

echocmd=n   do not echo commands after receiving <CR>

outputpressure=y   Output pressure once per second while profiling.

outputpressure=n   Do not output pressure while profiling.

outputsn=y   Output sample number once per second while profiling.

outputsn=n   Do not output sample number while profiling.

pcutoff=N   Set pcutoff=N decibars.

pts   Power analog electronics, run pump, take sample, send sample, power off.

qs   Power off digital and analog electronics, enter low power quiescent state. Quiescent state is entered automatically when not profiling and a command has not been received for 2 minutes.

resetoffset   Sample pressure for 1 minute. Store measured pressure as new pressure offset. Maximum allowed offset is 2 percent of full scale.

resumeprofile   Start profile, store t, s, and p in SRAM once per second

resumeprofileN Wait N seconds with pump running, start profile, store t, s, p in SRAM once per second.

startprofile   Set samplenum = 0, start profile, store t, s, p in SRAM once per second .

startprofileN   Set samplenum = 0, wait N seconds with pump running, start profile, store t, s, p in SRAM once per second .

stopprofile   Stop profile, if number of stopprofile commands received since last startprofile command is > 1 calculate dt/dp, power off. Profile halted automatically when pressure is less than pCutOff or profile time has exceeded 30,000 seconds. Value for dt/dp is calculated as:

t = temperature from last sample before receiving stopprofile command.

p = pressure from last sample before receiving stopprofile command.

oldt = temperature from last sample before receiving previous stopprofile command.

oldp = pressure from last sample before receiving previous stopprofile command.

$$dt/dp = (t - oldt) / (oldp - p)$$

slp	Send last pressure sample during profiling.
slt	Send last temperature sample during profiling.
slpt	Send last pressure and temperature sample during profiling.

Status:

dan	Display number of bins created when data was averaged (4 characters followed by <CR><LF>).
dc	Display calibration coefficients.
ddn	Display number of samples (5 characters followed by <CR><LF>).
ds	Display CTD settings.
nbin	Display number of bins created when data was averaged.

Upload Data:

dd	Dump all unaveraged data in engineering units.
ddS.F	Dump unaveraged data in engineering units, scans S through F.
ddh	Dump all unaveraged data in HEX format.
ddhS.F	Dump unaveraged data in HEX format, scans S through F.
da	Dump all bin averaged data in engineering units.
daS.F	Dump bin averaged data in engineering units, bins S through F.
dah	Dump all bin averaged data in HEX format.
dahS.F	Dump bin averaged data in HEX format, bins S through F.

Engineering Units Data Format without number of scans per bin:

ppppp.pp,ttt.tttt,sss.ssss<CR><LF>

p = pressure in decibars

ttt.tttt = temperature in ITS-90 (Deg C)

sss.ssss = salinity

HEX Data Format:

PPPPPTTTTTSSSS<CR>LF>

PPPPP = 5 HEX characters representing pressure,

pressure = (decimal equivalent of PPPPP) / 100 – 10

If pressure < –10; PPPPP is set to 00000.

If pressure > 3000, PPPPP is set to FFFFF.

TTTTT = 5 HEX characters representing temperature,

temperature = (decimal equivalent of TTTTT) / 10000 – 5

If temperature < –5, TTTTT is set to 00000.

If temperature > 35.0, TTTTT is set to FFFFF.

SSSSS = 5 HEX characters representing salinity,

salinity = (decimal equivalent of SSSSS) / 10000 – 1

If salinity < 1.0, SSSSS is set to 00000.

If salinity > 45, SSSSS is set to FFFFF.

Example:

HEX data = 28e8e0e2d65c98d
PPPPP = 28e8e, decimal equivalent = 167,566, p = 1665.66 decibars.
TTTTT = 0e2d6, decimal equivalent = 58,070, t = 0.8070 Dec C.
SSSSS = 5c98d, decimal equivalent = 379,277, s = 36.9277.

Bin Averaging Parameters (stored in EEPROM):

top_bin_interval=F

top_bin_size=F

top_bin_max=F

middle_bin_interval=F

middle_bin_size=F

middle_bin_max=F

bottom_bin_interval=F

bottom_bin_size=F

includetransitionbin=y   Add two transition bins.

includetransitionbin=n   Do not add two transition bins.

The two transition bins are:

   top_bin_max + (top_bin_interval / 2) to top_bin_max + (middle_bin_interval / 2)
   middle_bin_max + (middle_bin_interval / 2) to middle_bin_max + (bottom_bin_interval / 2)

bin averaging notes:

   Bin Average is divided into three sections: top, middle, and bottom

   interval: Spacing between bins. If interval is 10 decibars in top section, then bin centers
                    will be at 0, 10, 20 .... decibars.

   size: Scans from bin center ± size/2 will be included in average. Size is <= interval.

   max: Maximum pressure for section; bottom section has no maximum pressure.

   SBE 41CP performs bin averaging *without* interpolation.

   SBE 41CP processes approximately 90 scans per second when running binaverage.

Calibration Coefficients (entered at factory):

*serialnumber=N	serial number of this CTD sensor.
ta0=F	temperature A0 coefficient = F.
ta1=F	temperature A1 coefficient = F.
ta2=F	temperature A2 coefficient = F.
ta3=F	temperature A3 coefficient = F.
tcaldate=S	string for temperature calibration date.
cg=F	conductivity G coefficient = F.
ch=F	conductivity H coefficient = F.
ci=F	conductivity I coefficient = F.
cj=F	conductivity J coefficient = F.
wbotc=F	conductivity circuit temperature coefficient=F.
ctcor=F	conductivity cell thermal coefficient = F.
cpcor=F	conductivity cell pressure coefficient = F.
ccaldate=S	string for conductivity calibration date.
pa0=F	pressure A0 coefficient = F.
pa1=F	pressure A1 coefficient = F.
pa2=F	pressure A2 coefficient = F.
ptha0=F	pressure temperature sensor A0 coefficient = F.
ptha1=F	pressure temperature sensor A1 coefficient = F.
ptha2=F	pressure temperature sensor A2 coefficient = F.
ptca0=F	pressure temperature compensation offset A0 coefficient = F.
ptca1=F	pressure temperature compensation offset A1 coefficient = F.
ptca2=F	pressure temperature compensation offset A2 coefficient = F.
ptcb0=F	pressure temperature compensation span B0 coefficient = F.
ptcb1=F	pressure temperature compensation span B1 coefficient = F.
ptcb2=F	pressure temperature compensation span B2 coefficient = F.
poffset=F	pressure sensor offset=F (decibars).
pcaldate=S	string for pressure calibration date.

Testing (factory use only):

memorytest	Test static RAM and EEPROM. EEPROM contents are not modified.
loadprofile	Load 10050 scan dummy profile into SRAM.
Loadprofile=N	Load N scan dummy profile into SRAM.
analogon	Power analog electronics.
analogoff	Power off analog electronics.
pumpfast	Run pump at fast speed.
pumpslow	Run pump at slow speed.
pumpon	Run pump at fast speed for 2.5 seconds, then run pump at slow speed.
pumpoff	Turn off pump.
ts	Power analog electronics. take sample. send sample, power off.
tc	Power analog electronics. take 100 conductivity measurements, power off analog electronics. output is S/m.
tcr	Power analog electronics. take 100 conductivity measurements. power off analog electronics. output is raw frequency.
tp	Power analog electronics. take 100 pressure measurements. power off analog electronics, output is decibars.
tpr	Power analog electronics, take 100 pressure measurements, power off analog electronics, output is raw A/D counts from pressure and pressure temperature.
tt	Power analog electronics, take 100 temperature measurements, power off analog electronics, output is degrees C.
ttr	Power analog electronics, take 100 temperature measurements, power off analog electronics, output is raw A/D counts.

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sbe41cp_STD_CommandReference3_0cRevJune12.doc

5