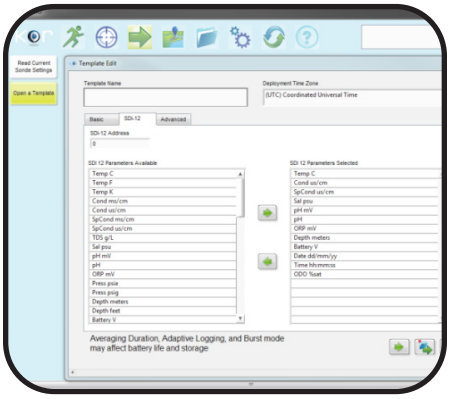
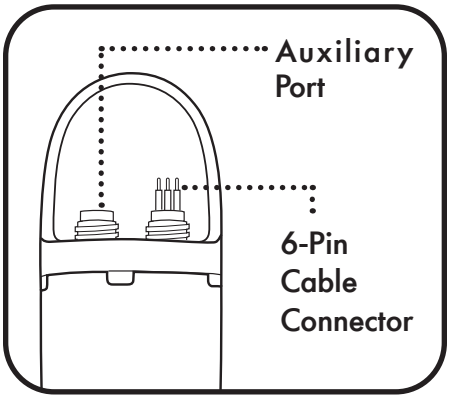
Daisy Chaining EXO Sondes
Quick Start Guide

It is possible to daisy chain up to three EXO2 sondes using the built-in topside auxiliary port. Below is a quick start guide for setting up sondes for long-term deployment in this application.



1 Set Deployment Templates.

Connect to each sonde individually via KOR. One by one, use the Deploy menu to Read Current Sonde Settings and make changes to the deployment templates. If using SDI-12 communications (recommended), set each sonde with a unique SDI-12 address.



2 Connect the Sondes.

Remove power from the DCP adapter and remove all batteries from the instruments, then connect the 2-3 sondes in series using standard EXO field cables (connecting one sonde's communications connector with another sonde's topside auxiliary port).

Note: Total cable length cannot exceed 300m, and the sondes themselves cannot exceed 250m depth.

3 Connect Sondes to DCP.

Using a flying lead cable, connect the topmost sonde to an EXO DCP Signal Output Adapter (599800). Install batteries in the sonde furthest from the DCP adapter first. Then install batteries in the next sonde furthest from the adapter and then the sonde closest to the adapter if there are three sondes attached. Make sure the installed batteries are new and have around 6.0 volts supplied.

The final step is to apply power to the DCP adapter. For more information on connecting sondes via a DCP-SOA see sections 2.14 & 4.11 of the EXO manual.

Note: See DCP-SOA wiring diagram on next page.

4 Test the System.

Once the batteries have been installed and power has been supplied to the DCP adapter - use the SDI-12/RS232 commands on the following page, communicate with each daisy chained sonde to ensure data is collected.

Note: Deploy the daisy chained system with a support cable connected to the bail of each sonde. If any changes are made to the configuration of the setup, the DCP adapter will need to be power cycled so the changes will take effect.

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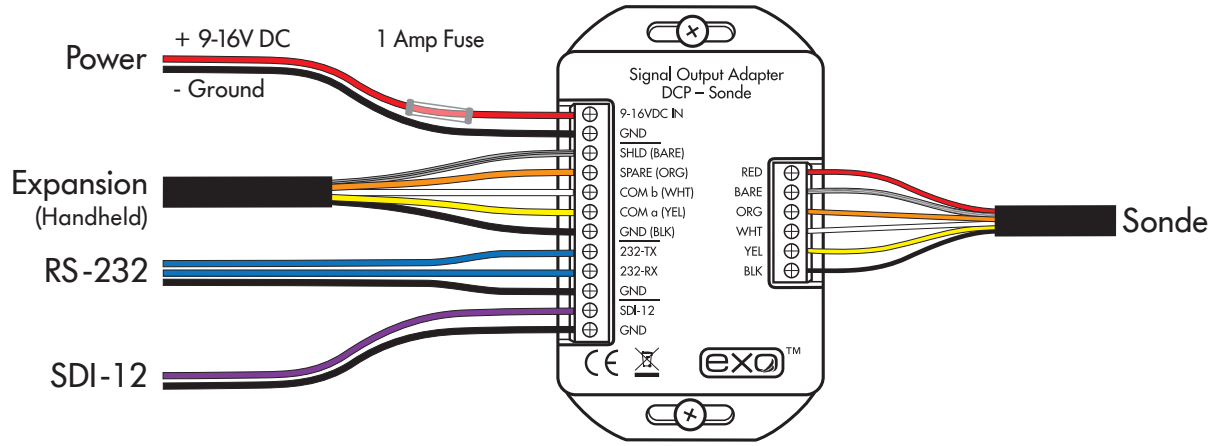
DCP-SOA Wiring Diagram



EXO SOA-DCP Operation

1. SDI-12 Interface

- **General**
  - Compatible with v1.3 of SDI-12 specification
  - Supports following standard commands:
    - ▹ '!' Address Query
    - ▹ 'A' Change Address
    - ▹ 'C' Concurrent Measurement
    - ▹ 'D' Data
    - ▹ 'I' Identification
    - ▹ 'M' Start Measurement
    - ▹ 'V' Start Verification

- **Extended Commands**
  - SDI-12 'Z' command
  - Supports the following RS232 commands:
    - ▹ 'sn' Serial Number
    - ▹ 'para' Parameter List
    - ▹ 'twipeb' Start wipe
    - ▹ 'ver' S/W version

2. RS-232 Interface

- **General**
  - Command Line
  - '#' is user prompt
  - Commands are not case senstive
  - Only spaces are recognized as delimiters
  - A command is terminated by a <CR><LF>
  - Minimum time from power up to valid readings is 19 seconds

- **Command List**
  - *See list of RS-232 commands on the next page.*

RS-232 Command List

[ ] indicates argument is optional **<i>** indicates argument is an integer

data
Returns one line of data readings. Data parameters specified in para command. Data delimiter is specified in the setdelim command.

dowait [<i>]
Turns "wait for DO" on if <i>=1 and off if <i>=0. The response is "OK". If you do not supply <i>, then the response is the current value of dowait. When enabled the SOA/DCP will not return data until sonde has been on for "dowarmup" seconds.

dowarmup [<i>]
Sets DO sensor warmup time where <i>=warmup time in seconds. The response is "OK". If you do not supply <i>, then the response is the current value for dowarmup. When "dowait" is enabled the SOA/DCP will not return data until sonde has been on for "dowarmup" seconds.

fltreset
Resets all sonde sensor filters. The response is "OK".

hwipesleft
Returns a value other than 0 if a wiper event is in progress. The value returned is normally the amount of "half" wipes that are left to go. When wiping is completely finished, the value will go to 0.

para
Returns the parameter numbers of all parameters selected for output. Each number returned matches one for one with the values returned in the data command. The numbers are space delimited. Refer to section 3 for list of parameter codes.

pwruptorun [<i>]
Turns "power up to run" on if <i>=1 and off if <i>=0. The response is "OK". If you do not supply <i>, then the response is the current value of pwruptorun.

run
Causes the sonde to SOA/DCP to take sonde readings at a 1Hz rate. The output is similar to the Data command except that readings are taken continuously. No headers are output. To abort send '0', <esc>, or turn power off to the SOA/DCP and then reapply.

setcomm [<i1>] [<i2>]
Changes the SOA/DCP's comm port baud rate and data length. The baud rate will be immediately changed after this command, so you will need to reconfigure your terminal to match.

<i1> can be:		**<i2> can be:**
2 - 1200 baud	6 - 19200 baud	0 - 7 bits
3 - 2400 baud	7 - 38400 baud	1 - 8 bits
4 - 4800 baud	8 - 57600 baud	
5 - 9600 baud	9 - 115200 baud	

RS-232 Command List, Continued

setdelim [<i>]
Changes the SOA/DCP's delimiter used in the data command response.
If you do not supply <i>, then the response is the current value for delimiter.

<i> can be: 0 = space, 1 = TAB, 2 = comma, 3 = none

setecho [<i>]
Enables (<i>=1) or disables (<i>=0) command echoes. When echoes are disabled, commands sent to the SOA/DCP will not be 'echoed' back and there will be no '# ' prompt. If you do not supply <i>, then the response is the current value for echo.

setradix [<i>]
Sets the radix point used for data output. If <i>=0 radix will be '.' If <i>=1 radix will be ',' Note that in SDI12 mode, the response to a 'D' command will always be with '.' regardless of this setting. The response is "OK". If you do not supply <i>, then the response is the current value for radix.

setsonde [<i>]
Selects a sonde for RS232 communications when more than 1 sonde are daisy-chained. <i> represents the order of the sonde in the chain where 1st sonde = 0, 2nd = 1, 3rd = 2. The response is "OK". If you do not supply <i>, then the response is the current value for sonde.

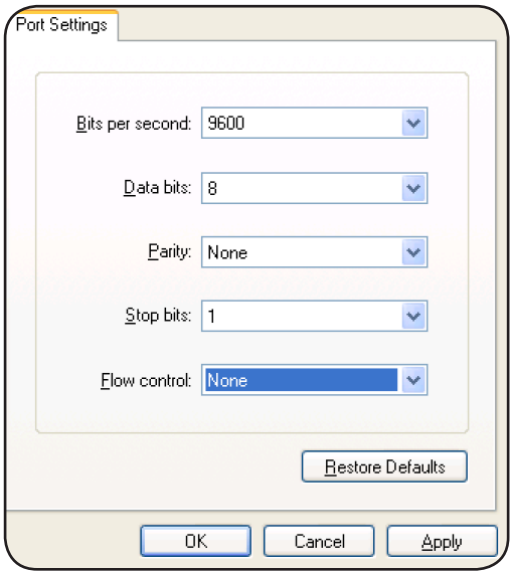
sn
Returns the unique serial number programmed into every YSI sonde.

time [<hh:mm:ss>]
Allows user to set time in the sonde in the HH:MM:SS format. The response is "OK". If you do not supply <hh:mm:ss>, then the response is the current value of time.

twipeb
Starts a wiper event. The response is the approximate time in seconds it will take to perform the wipe.

ver
Returns the software version number of the sonde.

verdate
Returns the time and date at which the current version of software in the sonde was compiled.



RS-232 settings should resemble this image.

Parameter Codes

- All codes below 223 are 6-series compatible
- Maximum of 23 codes in sonde parameter list

Parameter	EXO Code
Temp C	1
Temp F	2
Temp K	3
Cond mS/cm	4
Cond uS/cm	5
SpCond mS/cm	6
SpCond uS/cm	7
TDS g/L	10
Sal ppt	12
pH mV	17
pH	18
Orp mV	19
Press psia	20
Press psig	21
Depth meters	22
Depth feet	23
Battery Volts	28
Turbidity NTU	37
NH3 N mg/L	47
NH4+ N mg/L	48
Date D/M/Y	51
Date M/D/Y	52
Date Y/M/D	53
Time HH:MM:SS	54
TDS kg/L	95
NO3- N mV	101
NO3- N mg/L	106
NH4+ N mV	108

Parameter	EXO Code
TDS mg/L	110
Cl- mg/L	112
Cl- mV	145
TSS mg/L	190
TSS g/L	191
Chlorophyll ug/L	193
Fluorescence % full scale	194
ODO% %	211
ODO Conc+ mg/L	212
ODO % Local	214
BGA PC (RFU)	216
BGA PE (RFU)	218
Turbidity (FNU)	223
Turbidity (RAW)	224
BGA PC (ug/L)	225
BGA PE (ug/L)	226
fDOM (RFU)	227
fDOM (QSU)	228
Wiper Position (V)	229
External Power (V)	230
BGA-PC Raw	231
BGA-PE Raw	232
fDOM Raw	233
Chlorophyll Raw	234
nLF Cond mS/cm	237
nLF Cond uS/cm	238
Wiper Peak Current mA	239