0.1 TS - Thermosalinograph

Seabird SBE21 thermosalinograph with optional 'remote' (surface or inlet) temperature, WetStar fluorometer and water flow sensors.

Executible:	sbe21ts
Config files:	vv_sbe21ts.cfg
	One for each vessel. Sets status & calibration for each sensor. The master copies are in **src/ic** and the working copies in **etc**.
Raw Logging:	On/Off - Pref 0ff - All recs, ascii timestamped
Raw file:	.tsr
	"%s | %s", HHMMSS, instring
Logging:	On/Off - Lock On - @ logint - ascii timestamped, average over logint.
Log file:	.tsg
	"%s %c %5.2f %5.2f %5.2f %5.2f %5.2f %5.2f %5.2f %4d", DD-Mmm-YY HH:MM:SS, qual, surf_temp, sensor_temp, conduct, sal, fluorometer, fluor_flow_rate, ts_flow_rate, dummy, good_count
	Fields containing bad data or unused sensors set to "-9.99".
	The SBE21 has provision for 4, single-ended, A2D channels. 'dummy' is a place marker for the 4th channel, which has not yest been coded into the controller. It is set to "-9.99".
Logint:	pref 60
Status:	nil
Publish:	Coded On - @ logint - devstatus & ascii average over logint:
	SURFACE_TEMP, SENSOR_TEMP, CONDUCTIVITY, SALINITY. FLUOROMETER, FLOW_RATE, ATOD_VOLTS, DATA_QUALITY, NO_OF_SAMPLES
	If there was no "Good" data for the minute, it only publishes DATA_QUALITY = "Bad". If it has "Good" data, any bad or unused sensors are set to "-9.99"
Pubint:	na
PProg:	Beattie
Installed on:	Franklin & Southern Surveyor

Notes:

1. The thermosalinograph is fitted with flow sensors (one on the fluorometer line, and one to come on the SBE21 line), which are intended to monitor the status of the thermosalinograph pump and to detect clogging of the fluorometer.
2. The status of the sensors is published in sms variable FLOW_RATE . They will be shown as one of 'OK', 'LOW' or 'NOT_INUSE'. The minimum flow rates for 'OK' status are specified in sbs21ts_protocol.h.

   The flow rate(s) will flash on the DELP monitor if the flow rates are low, and appropriate messages, suggesting that the pump and/or fluorometer be checked, will be shown in the UI's TS status line and in the UI **<Action>** window.

3. Data is written to file regardless of the flow status.
4. The sensor calibration factors are read from $FDCS_HOME/etc/vv_sbe21ts.cfg, where 'vv' is the vessel code. The master copies of these files reside in $FDCS_HOME/src/ic
5. The calibration factors for the AtoD sensors are for the conversion from sensor voltage. If you are calibrating the fluorometer, you can access its voltage from the UI <data> window.
6. SBE21 hardware initialization.

   The initializtion dialogue is defined in structure sbe21_init, at the start of sbe21ts_protocol.c, and is excuted by the code at the beginning of function process_device_data, also in sbe21_protocol.c.

   Initialization is fairly simple-minded - SBE21 data logging is disabled, the sample interval is set (to 6 secs) and data logging is re-enabled. Any additional setting up, such as enabling the remote temperature sensor or specifiying the number of AtoD channels to log, must be done manually via a telnet session to the port.

   Once the SBE21 has been initialized, the controller passively waits for SBE21 data output.