

SKIPPER DATA BULLETIN		<i>Number</i>	SDB_EML224_05
<i>For System</i>	EML224S	<i>Date</i>	21.09.09
<i>Serial from / to</i>	07000-present	<i>Author</i>	PC
<h1>Upgrading and checking EML sensor firmware</h1>			

1. Diagnosis

This bulletin tackles some problems seen in the EML224S sensor running in OEM mode, as well as general upgrading.

Problem 1. The system does not retain the calibration, and does not show VLW. The options are missing

Problem 2. The system does not contain VHW in the required format.

General upgrade: In some cases firmware may need to be upgraded to include extra functions, or resolve problems.

Problem 3. The system after upgrade does not function and shows only \$PSKP??VMTXT,1,1,1,BL SW 1.00.04

2. Cause

Problem 1 – Loss of options. For these functions to operate, the sensor must be placed in OEM mode. All systems are sent from the factory with these options activated, however in some cases it is suspected that these options are lost under installation or non standard use (power glitches). This is due to the fact that the sensor reset to its defaults of non OEM. These defaults were changed in version 1.14, and so this problem is permanently removed by upgrading to this version or later, and resetting the options

Problem 2 – Initial versions of the firmware did not contain format VHW, and then in versions 1.10-1.12 contained VHW in the format with resultant speed through water. Although this is the correct format, this is not the most commonly used version of which is/has been used for single axis systems with only ahead speed. The latest codes (version 12+) contain VHW with ahead speed, although resultant speed is still available in the sensor.

Problem 3 – is a valid result of a failed firmware upgrade, it can be caused by noise on the line (not normal) or by compatibility issues with the com port, or settings and are normally fixed by ensuring the Terminal settings are correct, and if they are, resetting the PC and repowering the sensor, before retrying.

The Sensor loads the code and verifies the integrity at the same time, sending back the valid memory location as a confirmation. Once the whole program is loaded the system does integrity check of the whole code.

If successful It then restarts itself in it default mode (Version 1.14 keeps calibration and output settings).

If not successful, the code is discarded and Bootloader remains.

3. Details/how to fix it

Problems 1, 2 and 3 are permanently fixed by upgrading firmware

Upgrading firmware. (Recommended)

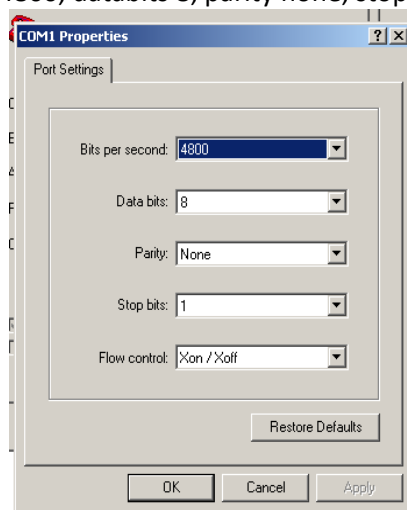
This upgrade is performed through the NMEA input of the sensor. The sensor contains two programs, a bootloader, which is permanent and a application which may vary. Since there is not enough memory in the device to hold two applications simultaneously the application is wiped ass it is upgraded.

If an application upgrade has been unsuccessful, the user will only see a response from the bootloader, as it waits for the application to be loaded in

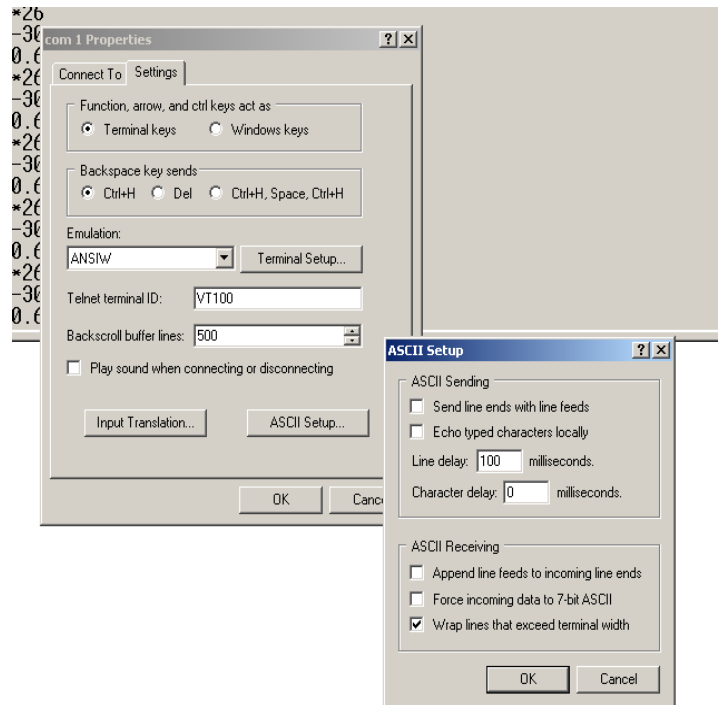
This may look like this

```
$PSKP??VMTXT,1,1,1,BL SW 1.00.04
```

1. Open Hyperterm. Found in windows machines under applications-communications. Set the settings in hyperterm to the following:
In properties – correct com port
Under Configure – Baudrate 4800, databits 8, parity none, stopbits 1, Flow control Xon/Xoff



Under Additional parameter-Properties-Settings tab-ASCII Setup;
Enter 100 ms into Line delay



Connect the emulator (telephone symbol)

You should get a message(s) from the sensor. If not, check the baud rate and settings. (also flashing patterns on the electronic unit LD200)

Send the program file by going to
Transfer-Send datafile and select the correct file (e.g. EML224 1 01 14.txt)

You will see progress being reported by the memory locations scrolling down the screen. These will continue until the program is loaded and the system should reboot and show the software version and then start showing data. This may take several minutes.

If the unit just freezes recycle the power, if this does not start the unit, restart the PC and try again.

If upgrade is successful the Terminal emulator will show on restart.

```
$PSKP??VMTXT,1,1,1,BL SW 1.00.04  
$PSKP??VMVERS,1,1,1,AP SW 1.01.14
```

If not the unit will only show
\$PSKP??VMTXT,1,1,1,BL SW 1.00.04

The output messages will now be present on the com channel. This should include \$VMVLW,... if it doesn't check the message

Verify options settings. Send the file "Options readback.txt". Make sure, that the sensor is answering with the following message:

\$PSKPPCVMOPTN,00000000000001110000000000000000*38

If not, send the file “Options setup.txt”. It contains appropriate password and the message, activating all needed options.

To check change and recheck settings and calibration of if logging of the procedure is required, use file “Set_Check options.txt” followed by “Set NMEA.txt” see below for details.

Further testing

If required, you may then check that the system has received the calibration from the display unit by sending “Check Cal.txt” to turn off the calibration format send “Set NMEA.txt”. (see below)

Once the system is running again, check the data values are reasonably constant and correct in the VBW sentence. (This may not be the case if the system has recently been lifted from the water (within 5 hours).

The log may only be properly calibrated when sailing. The calibration procedure is described in the installation manual. The crew may require demonstration. Normal values may require calibration of up to 2x (measured 5kn, real speed 10kn) but normal is 70% i.e. at measured speed 7kn, Real speed 10kn.

If you do not have the text files available make text files with the following format:

CHECK OPTIONS (Options readback.txt)

\$PSKPVMPCOPTN<RETURN(CR,LF)>

CHANGE OPTIONS FORMAT: (Options setup.txt)

\$PSKPVMPCLOGN,Ooppttiioonnss<RETURN(CR,LF)>
\$PSKPVMPCOPTN,CHNG,17,ON,18,ON,19,ON<RETURN(CR,LF)>

CHECK CALIBRATION ON: (Check Cal.txt)

\$PSKPVMPCLOGN,User calib<RETURN(CR,LF)>
\$PSKPVMPCFRMT,CHNG,16,ON<RETURN(CR,LF)>

CHECK CALIBRATION OFF: (Set NMEA.txt)

and

TURN ON MESSAGES VBW,VLW,MTW,:

\$PSKPVMPCLOGN,User calib<RETURN(CR,LF)>
\$PSKPVMPCFRMT,SET,3,ON,6,ON,22,ON<RETURN(CR,LF)>

A combination of these can be placed in a single file to turn on the functions, check them, then turn on the calibration table to check it is in place, remember to use hyperterm line delay 100ms to ensure all messages are received.

(Set_Check options.txt)

```
$PSKPVMPCOPTN  
$PSKPVMPCLGN,Ooppttiioonss  
$PSKPVMPCOPTN,CHNG,17,ON,18,ON,19,ON  
$PSKPVMPCLGN,User calib  
$PSKPVMPCFRMT,CHNG,16,ON  
$PSKPVMPCOPTN
```

Typical responses from the sensor

In this case above you will see something like

```
$PSKPPCVMOPTN,00000000000000000000000000000000*39 – Options (incorrect)  
$VMVBW,-1.31,-0.06,A,,,V,,V,,V*4A - Speed through water should be stable  
$VMMTW,21.8,C*03 - Temperature should read temperature of water  
$PSKPPCVMOPMD,A*6B -Password confirmation  
$PSKPPCVMOPTN,A*78 -Option confirmation  
$PSKPPCVMOPMD,A*6B -User password confirmation  
$VMVBW,-1.28,-0.06,A,,,V,,V,,V*42 - Speed should be stable  
$VMMTW,21.7,C*0C  
$VMVLW,957.46,N,957.46,N*56 - Trip should be present, if not options has not worked  
$PSKP??VMUTMC,0,2,@,@  
$PSKP??VMUSRC,0,10,7.0@10.0,@,@,@,@,@,@,@,@ - calibration values from display here.  
$PSKP??VMUDRC,0,10,@,@,@,@,@,@,@,@,@ - offset angle from display here if present.  
$PSKPPCVMOPTN,00000000000001110000000000000000*38 – Options correct
```