

### 5.4.1.1 SMCR

SMC standard Roll & Pitch

**Data Sent**    Roll  
                    Pitch

#### Data Frame

**\$PSMCR±yy.yyy,±xx.xxx<CR><LF>**

|        |              |                                 |
|--------|--------------|---------------------------------|
| yy.yyy | Roll in deg  | Roll ±30°<br>Resolution 0.001°  |
| xx.xxx | Pitch in deg | Pitch ±30°<br>Resolution 0.001° |

**Note:** For the SMCT protocol to run at an Data Update Frequency of 100Hz the sensor bit rate must be set at a minimum of 57600. To run the sensor at a Bit Rate of 19200 the Data Update Frequency needs to be below 66Hz. Failure to do this may result in problems with the output data.

### 5.4.1.2 SMCS

**Data Sent**    Roll  
                    Pitch  
                    Heave

#### Data Frame

**\$PSMCS±yy.yyy,±xx.xxx,±hh.hh<CR><LF>**

**Note:** For the SMCS protocol to run at an Data Update Frequency of 100Hz the sensor bit rate must be set at a minimum of 38400. To run the sensor at a Bit Rate of 19200 the Data Update Frequency needs to be below 53Hz. Failure to do this may result in problems with the output data.

|        |              |                                 |
|--------|--------------|---------------------------------|
| yy.yyy | Roll in deg  | Roll ±30°<br>Resolution 0.001°  |
| xx.xxx | Pitch in deg | Pitch ±30°<br>Resolution 0.001° |
| hh.hh  | Heave in m   | Heave ±10m<br>Resolution 0.01m  |

### 5.4.1.4 SMCT

**Data Sent**     Date  
                       Time  
                       Roll  
                       Pitch  
                       Heave

#### Data Frame

**\$PSMCT,YYYY/MM/DD,HH:MS:SS.HU±yy.yy,±xx.xx,±hh.hh<CR><LF>**

#### Example

**\$PSMCT,2006/11/07,15:54:23.71,-06.22,+21.60,-00.20**

**Note:** For the SMCT protocol to run at an Data Update Frequency of 100Hz the sensor bit rate must be set at a minimum of 57600. To run the sensor at a Bit Rate of 38400 the Data Update Frequency needs to be below 67Hz. Failure to do this may result in problems with the output data.

|             |                              |                                |
|-------------|------------------------------|--------------------------------|
| YYYY/MM/DD  | Year/month/day               |                                |
| HH:MI:SS.HU | Hour:minute:second.hundredth |                                |
| yy.yy       | Roll in deg                  | Roll ±30°<br>Resolution 0.01°  |
| xx.xx       | Pitch in deg                 | Pitch ±30°<br>Resolution 0.01° |
| hh.hh       | Heave in m                   | Heave ±10m<br>Resolution 0.01m |

### 5.4.1.3 SMCA

**Data Sent**    Roll  
                   Pitch  
                   Heave  
                   Surge  
                   Sway

**Data Frame**

**\$PSMCA±yy.yyy,±xx.xxx,±hh.hh,±ss.ss,±ww.ww<CR><LF>**

**Note:** For the SMCA protocol to run at an Data Update Frequency of 100Hz the sensor bit rate must be set at a minimum of 57600. To run the sensor at a Bit Rate of 38400 the Data Update Frequency needs to be below 77Hz. Failure to do this may result in problems with the output data.

|        |              |                                 |
|--------|--------------|---------------------------------|
| yy.yyy | Roll in deg  | Roll ±30°<br>Resolution 0.001°  |
| xx.xxx | Pitch in deg | Pitch ±30°<br>Resolution 0.001° |
| hh.hh  | Heave in m   | Heave ±10m<br>Resolution 0.01m  |
| ss.ss  | Surge        | Not available                   |
| ww.ww  | Sway         | Not available                   |

### 5.4.1.4 SMCF

**Data Sent**    Serial Number  
                   Roll  
                   Pitch  
                   Heave  
                   Surge  
                   Sway

**Data Frame**

**\$PSMCFnnnnnn,±yy.yyy,±xx.xxx,±hh.hh,±ss.ss,±ww.ww<CR><LF>**

**Note:** For the SMCF protocol to run at an Data Update Frequency of 100Hz the sensor bit rate must be set at a minimum of 57600. To run the sensor at a Bit Rate of 38400 the Data Update Frequency needs to be below 67Hz. Failure to do this may result in problems with the output data.

|        |                    |                                 |
|--------|--------------------|---------------------------------|
| nnnnnn | Unit Serial number |                                 |
| yy.yyy | Roll in deg        | Roll ±30°<br>Resolution 0.001°  |
| xx.xxx | Pitch in deg       | Pitch ±30°<br>Resolution 0.001° |
| hh.hh  | Heave in m         | Heave ±10m<br>Resolution 0.01m  |
| ss.ss  | Surge in m         | Not available                   |
| ww.ww  | Sway in m          | Not available                   |

### 5.4.2 Additional Protocols

The SMC S-108 sensor can be pre-programmed with additional customer requested signal strings. These will be displayed below.

#### 5.4.2.1 TSS1/DMS

TSS proprietary protocol with Heave

Data Sent      Roll  
                     Pitch  
                     Heave

Data Frame

**:XXAAAASMHHHHQMRRRRSMPPPP<CR><LF>**

**Note:** For the TSS1 protocol to run at an Data Update Frequency of 100Hz the sensor bit rate must be set at a minimum of 38400. To run the sensor at a Bit Rate of 19200 the Data Update Frequency needs to be below 58Hz. Failure to do this may result in problems with the output data.

|       |                     |   |
|-------|---------------------|---|
| :     | LSB start character |   |
| XX    | Horizontal Acc N/A  | S-108 displays 00   |
| AAAA  | Vertical Acc N/A    | S-108 displays 00   |
| S     | Space Character     |   |
| MHHHH | Heave               | Heave: ±10 m<br>Unit 1cm<br>M = space if positive<br>– if negative  |
| Q     | Status flag         | ‘U’ Settled mode (Nominal)<br>’u’ settling mode                     |
| MRRRR | Roll in deg         | Roll ± 45°<br>Unit 0.01°<br>M = space if positive<br>– if negative  |
| MPPPP | Pitch in deg        | Pitch ± 45°<br>Unit 0.01°<br>M = space if positive<br>– if negative |

Example :000000 0002U-2839 -0050

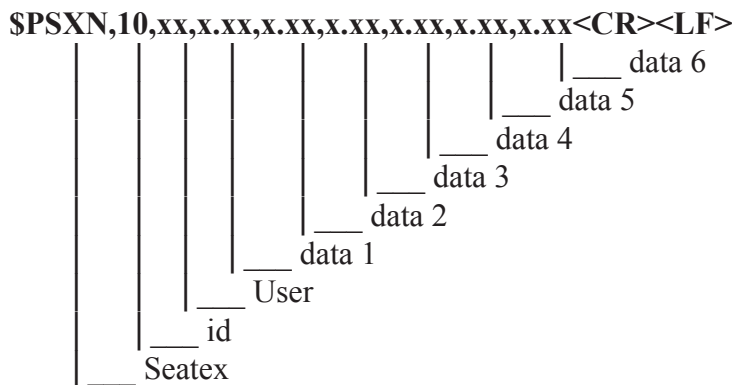
### 5.4.2.2 SEATEX MRU NMEA

The MRU NMEA sentence outputs six variables, but where the SMC S-108 does not supply data for all these will be empty fields.

The Float data fields are written in scientific format (eg

Data Sent                      Roll  
                                     Pitch  
                                     Heave

Data Frame



**Note:** For the Seatex protocol to run at an Data Update Frequency of 100Hz the sensor bit rate must be set at a minimum of 57600. To run the sensor at a Bit Rate of 38400 the Data Update Frequency needs to be below 78Hz. Failure to do this may result in problems with the output data.

|         |                 |                |
|---------|-----------------|----------------|
| id      | 10              | 10 when stable |
| User id | 070             |                |
| Data 1  | Roll in radian  |                |
| Data 2  | Pitch in radian |                |
| Data 3  | Heave in radian |                |
| Data 4  | Not Used        |                |
| Data 5  | Not Used        |                |
| Data 6  | Not Used        |                |

Example

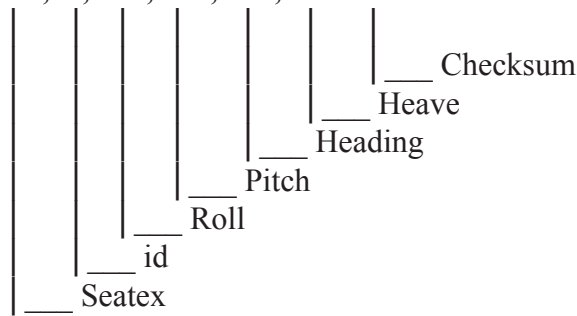
\$PSXN,10,070,-5.264e-01,1.030e-02,-2.629e-03,0,,\*50

### 5.4.2.3 SEAPATH

Data Sent      Roll  
                   Pitch  
                   Heave

Data Frame

RVDAS time tag \$PSXN,23,x.xx,x.xx,x.xx,x.xx<CR><LF>



**Note:** For the SEAPATH protocol to run at an Data Update Frequency of 100Hz the sensor bit rate must be set at a minimum of 115200. To run the sensor at a Bit Rate of 57600 the Data Update Frequency needs to be below 81Hz & for 38400 54Hz. Failure to do this may result in problems with the output data.

|                |              |                                |
|----------------|--------------|--------------------------------|
| RVDAS time tag | Not Used     |                                |
| id             | 23           |                                |
| Roll           | Roll in deg  | Roll ±30°<br>Resolution 0.01°  |
| Pitch          | Pitch in deg | Pitch ±30°<br>Resolution 0.01° |
| Heading        | Not Used     |                                |
| Heave          | Heave in m   | Heave ±10m<br>Resolution 0.01m |

Example

00+000:00:00:00:000 \$PSXN,10,070,-5.264e-01,1.030e-02,-2,629e-03,0,,\*50

### 5.4.2.4 Binary protocols

Descriptions of the binary protocols SMC1 and SMC2 are available on demand.