#### 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 ±30º<br>Resolution 0.001º |
| xx.xxx | Pitch in deg | Pitch ±30º<br>Resolution 0.001º |

**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 ±30º<br>Resolution 0.001º |
| xx.xxx | Pitch in deg | Pitch ±30º<br>Resolution 0.001º |
| 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 ±30º<br>Resolution 0.01º |
| xx.xx | Pitch in deg | Pitch ±30º<br>Resolution 0.01º |
| 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 ±30º<br>Resolution 0.001º |
| xx.xxx | Pitch in deg | Pitch ±30º<br>Resolution 0.001º |
| 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 ±30º<br>Resolution 0.001º |
| xx.xxx | Pitch in deg | Pitch ±30º<br>Resolution 0.001º |
| 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 ± 45º<br>Unit 0.01º<br>M = space if positive<br>– if negative |
| MPPPP | Pitch in deg | Pitch ± 45º<br>Unit 0.01º<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

**$PSXN,10,xx,x.xx,x.xx,x.xx,x.xx,x.xx,x.xx<CR><LF>**

- Seatex
- id
- User
- data 1
- data 2
- data 3
- data 4
- data 5
- data 6

**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>**

- Seatex
- id
- Roll
- Pitch
- Heading
- Heave
- Checksum

**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 ±30º<br>Resolution 0.01º |
| Pitch | Pitch in deg | Pitch ±30º<br>Resolution 0.01º |
| 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.