## Sensor Data Manager (SDM)

The Sensor Data Manager is the abstract interface for the sensors. It provides a getter method to get the sensor data.  
A single sensor value isn’t meaningful because it is heavily influenced by the vibration jitter. Therefore the values which are provided by the getter method are simply pre-filtered with averaging. It’s averaging 20 values that have been measured with high frequency.   
Furthermore the SDM measures the time between the current and the last value.  
The SDM is running in a separate task, this makes is easy to encapsulate all the functionality of the Sensors in one component.

In the Sensor Data Manager is a two dimensional Array (9 by 20) were the 9 is fix and the 20 can be adjusted with the VALUE\_NUM define. This array is used to store all the read sensor value. Each of the 3 sensors provides 3 values, one for each axis(x,y,z). So the array providing space for 20 (=VALUE\_NUM) samples.   
Additionally there is and array “avgData” in which the last averaged data is stored. Furthermore there is a global flag called “SDM\_NEW\_DATA\_AVAILABLE “which indicates that new data is stored in the avgData-array. The avgData-array and the SDM\_NEW\_DATA\_AVAILABLE-flag have to be accessed within a semaphore because those are the interface between the Sensor Data Manager task and the Main Controlling task.   
The gyro meter provides a temperature value which could in theory used to compensate the changing value offset while warmup but this is not implemented jet.

The way to go to access the sensor data is check the SDM\_NEW\_DATA\_AVAILABLE-flag and if it’s set call the getSensorData(.. , ..). This functions has two parameters. Both are pointer for write back. The first pointer should point on an array of size 9 for the sensor data. The second pointer should point on an int for the deltaT.