5. Checking Calibration Factors

A calibration factor is unique to each monitor. When the accelerometer measures movement, the raw movement sum is divided by the calibration factor for that unit. This means that the same output should be produced for the same amount of movement between units. This calibration factor is set within the accelerometer unit by the manufacturer.
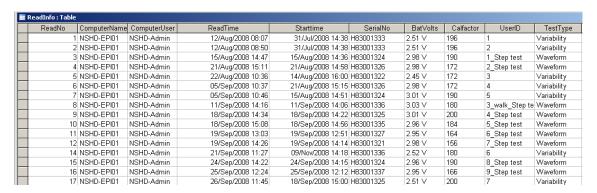
Occasionally when there is a problem with the firmware of the monitor, the monitor has not been calibrated during the manufacture process or the software has not read the monitor correctly it can enter a default calibration factor. This will mean the accelerometer data would vastly underestimate the actual amount of movement being produced.

Common default Serial Number or calibration factor errors:

- **78/79/81/83 Monitors:** 81FFFFF and cal factor 510
- **9 Monitors:** 90000000 and cal factor 255

- To search for the default calibration factors open the database in access. Within the ReadInfo table there is a column entitled Calfactor

ReadInfo : Table

ReadNo	ComputerName	ComputerUser	ReadTime	Starttime	SerialNo	BatVolts	Calfactor	UserID	TestType
1	NSHD-EPI01	NSHD-Admin	12/Aug/2008 08:07	31/Jul/2008 14:38	H83001333	2.51 V	196	1	Variability
2	NSHD-EPI01	NSHD-Admin	12/Aug/2008 08:50	31/Jul/2008 14:38	H83001333	2.51 V	196	2	Variability
3	NSHD-EPI01	NSHD-Admin	15/Aug/2008 14:47	15/Aug/2008 14:36	H83001324	2.98 V	190	1_Step test	Waveform
4	NSHD-EPI01	NSHD-Admin	21/Aug/2008 15:11	21/Aug/2008 14:58	H83001326	2.98 V	172	2_Step test	Waveform
5	NSHD-EPI01	NSHD-Admin	22/Aug/2008 10:36	14/Aug/2008 16:00	H83001322	2.45 V	172	3	Variability
6	NSHD-EPI01	NSHD-Admin	05/Sep/2008 10:37	21/Aug/2008 15:15	H83001326	2.98 V	172	4	Variability
7	NSHD-EPI01	NSHD-Admin	05/Sep/2008 10:46	15/Aug/2008 14:51	H83001324	3.01 V	190	5	Variability
8	NSHD-EPI01	NSHD-Admin	11/Sep/2008 14:16	11/Sep/2008 14:06	H83001336	3.03 V	180	3_walk_Step te	Waveform
9	NSHD-EPI01	NSHD-Admin	18/Sep/2008 14:34	18/Sep/2008 14:22	H83001325	3.01 V	200	4_Step test	Waveform
10	NSHD-EPI01	NSHD-Admin	18/Sep/2008 15:08	18/Sep/2008 14:56	H83001335	2.96 V	184	5_Step test	Waveform
11	NSHD-EPI01	NSHD-Admin	19/Sep/2008 13:03	19/Sep/2008 12:51	H83001327	2.95 V	164	6_Step test	Waveform
12	NSHD-EPI01	NSHD-Admin	19/Sep/2008 14:26	19/Sep/2008 14:14	H83001321	2.98 V	156	7_Step test	Waveform
14	NSHD-EPI01	NSHD-Admin	21/Sep/2008 11:27	09/Nov/2008 14:18	H83001336	2.52 V	180	6	Variability
15	NSHD-EPI01	NSHD-Admin	24/Sep/2008 14:22	24/Sep/2008 14:15	H83001324	2.96 V	190	8_Step test	Waveform
16	NSHD-EPI01	NSHD-Admin	25/Sep/2008 12:24	25/Sep/2008 12:12	H83001337	2.95 V	166	9_Step test	Waveform
17	NSHD-EPI01	NSHD-Admin	26/Sep/2008 11:45	18/Sep/2008 15:00	H83001325	2.51 V	200	7	Variability

- Click on the Header 'Calfactor' to highlight the whole column, right click and select 'SortAscending'. This will sort all the data in order of increasing calibration factor. This will allow us to easily see if the 255/510 appears in the database.

If there are any errors, make a note of the monitor number (if available in SerialNo column) and the UserID that it is associated with it.

If the monitor that is in question appears in the database again relating to another test with a likely calibration factor (and has not been sent for repair/recalibrated in between the 2 files) then change to this value.

Checking out of range cal factors:

From Feb 2006 all MRC-Epid monitors are checked and calibrated before being circulated in the field (refer to calibration of AH monitor SOP for further information). We recommend checking the calibration factors to see whether they were out of range, as prior to this date there may be some "out of range" monitors which may require investigation and the data can be corrected. As a

general rule, as well as checking default calibration factors, check anything that falls outside the general range (see below). Some monitors will (correctly) have calibration factors above or below this value but it is worth flagging for checking to make sure they do not need changing.

Ranges for Cal factors:
- **78/79/81/83 Monitors:** 100-240
- **9* Monitors:** 140-180

Remember to note any changes made in a discrepancy log. If it does not appear elsewhere in the database, make a note of the monitor number worn by the participant and contact MRC Tech Team (if MRC collaborator).

Sometimes when a default value is found the associated monitor number reads 83FFFFF/90000000. In this case you will have to investigate further and look back at any Actiheart logs or records you may have to see what "real" serial number that volunteer was sent away with. This info can be used to determine what the "real" calibration factor for that monitor should be. In such instances, please note those files that need alteration and contact MRC Tech Team (if MRC collaborator).

MRC:

Where a monitor exists where a cal factor cannot be determined, using an average cal factor of the database is a last resort. Refer to "Calculating Average Calibration monitors for Rogue Monitors.doc"