ASPERA-3/4 TM Housekeeping monitor bug

Bug description

Two (2) is added to the monitor values when reading ADC output. Since all monitors are 8-bit unsigned integers, the bug also affects most significant byte in the 16-bit words containing 8-bit reference and 8-bit monitor when the monitor real value is 254 or 255.

Affected monitor values

All HK monitor values except ELS deflection voltage.

Affected reference values

Only reference values in HK packets are affected. Those are:

Affected reference value	Overflowing monitor value
els_minus_5v_screen_grid_ref	els_minus_5v_screen_grid_mon
els_bias_mcp_ref	els_bias_mon
hk_i_plus_30v	hk_i_plus_5v
hk_v_plus_12v	hk_v_plus_30v
hk_v_plus_5v	hk_v_minus_12v
npi_bias_ref	npi_bias_mon
npi_defl_ref	npi_defl_mon

Bug correction

Monitor values

TM value 0 corresponds to the real value 254
TM value 1 corresponds to the real value 255
1 < TM_value <= 255 corresponds to the: real_value = TM_value-2

Reference values

If 1 < TM_overflow_monitor_value <= 255, no correction in the corresponding TM_reference_values.
If TM_overflow_monitor_value = 0 OR TM_overflow_monitor_value = 1, the reference values is:
reference = TM_reference_value-1

Important note!

Since all HK monitor calibration values were obtained with the bug present, one **MUST ONLY MAKE A CORRECTION WHEN MONITOR READING IS 0 OR 1.**

TM monitor value 0 corresponds to the Cal_value = CalFunction(256)
TM monitor value 1 corresponds to the Cal_value = CalFunction(257)

The full correction is applicable for raw numbers only.