DAC - Analogue Outputs Application Note

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Implementation and Troubleshooting of Analogue Outputs

This document relates to use of

- Analogue Output Module (13E690) used on Lucid, Luci PM/AR, system 2X/4X
- Integral D/A Output option on equipment using PCB's 13E1063, 13E1131 and 13E1155

Recommendations:

- The preferred output is current loop. This has much better EMC performance and the output is not affected by parasitic host or cable capacitance.

  We advise NEVER to use (or connect to) the +VOUT unless to an adjacent piece of equipment in the same overall enclosure.

- If a voltage input must be used consider using the current loop output driving a (semi-) precision resistor (typical 50ppm 470R) across the input at the host. This preserves EMC integrity- but will reduce the dynamic range – typically zero will be set at 2ma (1V) top at 20mA (10V)

- If using the voltage output:
  - Keep interconnections short (<3m).
  - Ensure driven (host) input is high impedance and low capacitance (>100k is preferable, although the output will drive down to ~5k; <200pF input capacitance)
  - Expect some EMC disturbance (on the host input) if in a noisy environment and ensure that no critical process depends on having a perfect signal.
  - Ensure that linearity, as perceived by the 'host'/controller, is within limits at zero, span and, at least 4 points in between. If the input capacitance lies in the range from 200pf to 22nf for 690 and 4700pf to 47nf for 1063/1131/1155 instability on the output may be observed
  - If instability proves to be a problem, there are two solutions –

    1. Add a good quality 1k resistor in *series* with the voltage output terminal +VOUT/+VDC (This will have little effect on the voltage into the host if the input impedance is, as recommended, high)

    2. Add a good quality 100nF ceramic capacitor *across* the voltage output terminals '+VOUT/+VDC' and '0V COMMON/DACOM'
       Any such capacitor must be removed if the current output is to be used instead.