

# Lambda P.S. Note

## *Addendum*

Mon, Nov 25, 2002

Planned sequence of analog channels for each power supply:

- \*Actual voltage
- \*Actual current
- Set voltage
- Set current
- \*Over-voltage level
- \*Under-voltage limit
- Peak output voltage
- Peak output current

The Actual voltage and actual current channels can be controllable, along with the over-voltage and under-voltage values. The set voltage and set current are readings of what the power supply thinks is the current programmed setting values. They are certainly affected by controlling the actual voltage and current channels, but they are not the basis for control.

There does not need to be a special analog control type designed to support control of these power supplies. The controllable channels can merely be dummy channels, where the analog control type field is simply `0x12000000`. The local application must take on the job of monitoring changes that occur in the dummy setting values for these channels. When a change is noticed, it arranges to have the new setting passed to the supply at the next convenient time. A subsequent update in the set voltage or current channel does not affect the setting fields of the actual voltage and current channels.

The digital control options can be handled as a set of dummy bits that cause the indicated effect to be delivered to the supply. This scheme is analogous to that used for HLRF systems. A dummy bit is set to "1" to ask that a digital action be taken, and the LA clears the bit when it has accomplished that action. Eight bits is probably enough for all digital actions supported by the power supply.

The digital status bytes comprise the status returned by the supply, which consists of one byte, plus two 5-bit fields. It may be useful to assign one of the unused bits of these three status bytes to indicate communications failure with the power supply.

All in all, one has a set of 8 analog channels and 4 digital bytes that make up the software interface to each power supply. And this approach means that no system changes are required to implement this kind of power supply support; all the required logic is provided by the local application. Its name might be *ZUPS*, referring to the Zero-UP series of Lambda Power Supplies that use this protocol.