**Existing features of DEBROS-based controllers**

By Mark Davis  
Last Updated: 2012-12-18

* **System log**
  + Human-readable log entries with timestamps for all non-trivial events.
  + In-memory ring buffer with new entries continuously and automatically backed up to file server
  + The in-memory buffer survives reboots, even power cycling if battery-backup provided. This means any entries that didn’t get backed up to the server before an unexpected reboot are not lost (very helpful diagnostic tool)
  + Uses TCP connection to file server
* **Automatic discovery and configuration**
  + The physical devices each controller is responsible for is uniquely identified by a 16-bit controller type and a 32-bit ID.
  + Configuration values specific to the physical devices attached to the controller are stored in a file on the controller’s flash memory.
  + Values are restored on startup and any changes are loaded automatically backed up to the file server
  + Allows a spare controller to be swapped for a faulty one simply by setting the ID switches. No need to determine what the existing configuration of the old one is or establish a connection to the spare to manually configure it.
  + Allows controller to start up faster and function even if it is unable to connection to a server
  + Uses TCP connection to file server
* **High-resolution decision making and logging** 
  + Event processing and resulting decisions regarding when and what is important to log occur at the resolution of the control loop rather than that of the link to the control system.
  + X
* **ModBus and CA protocols**
  + Standard ModBusTCP for numeric values, CA for larger values (e.g. strings, waveforms or other arrays)
  + CA handles subscriptions (value change events) as well as one-time sets and reads
  + CA discovery mechanism supported but not currently in use
  + Uses TCP connection to one or more clients. UDP required if CA discovery service enabled
* **Generic bench-top and field-level calibrations**
  + X
  + X
* **Primary and backup boot images**
  + X
  + X
* **Diagnostic/test commands**
  + Force state of inputs and outputs
  + Start/stop individual services
* **Multiple user connections**
  + X
  + X
* **Soft real-time, fully-preemptive, priority-based OS compatible with Linux**
  + X
  + X
* **xxxx**
  + X
  + X
* **xxxx**
  + X
  + X