Hardware Differences MPE to MCE

The rational for the new MCE (Master Control Electronics):

· cost

· components obsolete

· core shared firmware is much larger

Hardware Differences

MCE Master Control Electronics

PDB Power Distribution Board

GENINE GENeric Input/output Node Electronics

MCE

The MCE board contains all the control and imaging electronics to control a base Trendsetter machine. Supports the upgrade/expansion to these Spectrum or Autoloader options options with satellite boards (GENINE).

The MCE board replaces:

- MPE
- ALE
- FDPE
- Card cage/backplane
- 1/3 TEE

block diagram

MPE	MCE
ALE Board	All Engine Actuation function is on MCE board. The MCE board is connected directly to the engine manifolds via 24VDC, open collector.
FDPE Board	All image control is on MCE Board. Thermal head data is sent via hotlink cable and RS-422. Second MCE board is added as slave for dual-head devices (Hydra).
MPE Board	Main system function is on MCE board. The MCE board implements a CAN Bus system (see below) and has a board ID of 0. Hydra ONLY – Dual Head Interface Board, used to control master/slave MCE and tach functions between 2 heads
Backplane	Since all MPE card-cage board functionality is now on MCE board, a backplane is not required.
TEE Board	The MCE board carries the IO required to control the main engine outputs, relays, sensors, etc. Any IO required by the Autoloader or Spectrum options are controlled by a GENINE board.

Power Distribution Board

- provides fusing and power distribution to and from the 4 power supplies
- controls the system fans, head pump/chiller, and the drum vacuum for the Spectrum and Proofsetter
- provides safety loop control
- communicates with the MCE via the CANBUS on address 10

Since it is a satellite board and responsible for the safety loop circuitry, it has its own embedded control firmware.

Keyswitch & Interface Board (SIO): The keyswitch is the same as MPE, except it is 2 position instead of 3. The keyswitch is connected directly to the PDB, as interface board functionality is part of the PDB. (wiring schematic)

Power Supplies: see Power distribution Board wiring schematic for details.

Safety Loop Interlocks: Error messages indicate which door or panel is open. (wiring schematic)

All safety loop related control and sensing is done on the PDB. This includes door switches, emergency stops, and brake and service overrides. The only part of the safety loop under firmware control is the enable relay that provides power to the safety loop. Safety switches cannot be bypassed by firmware, disabling the loop enable relay removes all power to all safe circuitry

GENINE

GENINE boards are additional IO boards added to the MCE system. One GENINE board is used for each device option (Autoloader, Spectrum). The GENINE boards used by each option are physically identical to each other, except they use different CAN Bus ID numbers and have their own embedded firmware

The MCE board provides onboard actuation control for the base engine., The Genine board provides the additional control, required for Spectrum, Autoloader, debris control, etc. Communication with the MCE is by CANBUS. Each application uses a different CANBUS address to identify its function. For instance, a Genine board used for an Autoloader has a CAN address of 31, whereas a Spectrum Genine board has an address of 32. As well, the Genine board has its own onboard stepper motor driver.