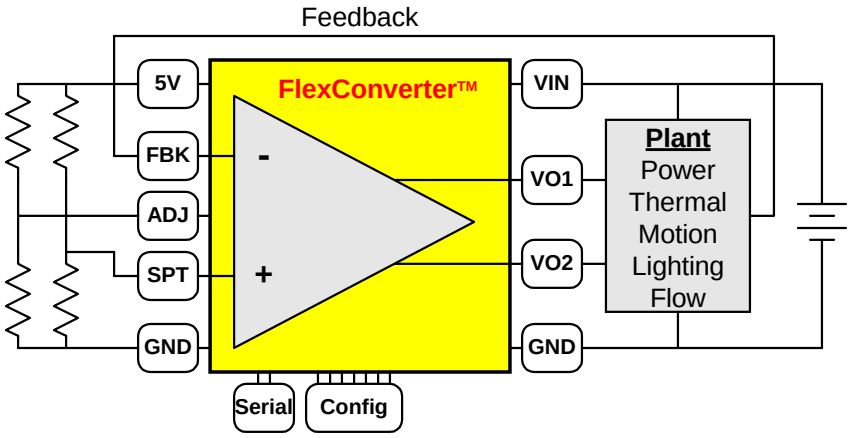
FlexConverter™ Advance Information
Flextek Electronics
www.flex-tek.com

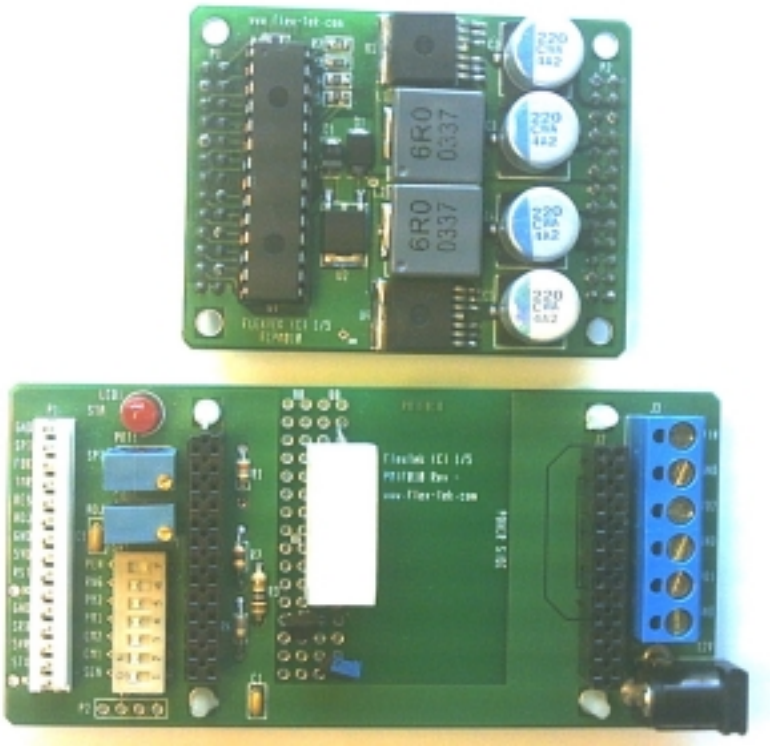
FUTURE PRODUCT: Use Flextek CLZD010 Chip for Immediate Process Control Needs

Description
Flexible power converter satisfies wide variety of tasks quickly and easily, including Point-Of-Load applications and challenging process controls. Power stage has dual filtered half-bridges that can be run independently or paralleled for higher current and lower ripple, as well as full-bridge or sequentially switched. On-board intelligence is accomplished through an embedded DSP preprogrammed as a flexible closed loop controller. This patented product may be applied as a digital power supply, TEC thermal regulator, DC motor driver, or controller for lighting and flow applications. Featured as "Innovative New Product" at Power Systems World 2005.

Highlights
- Power stage is configurable by pin settings
- Voltage regulation or external feedback
- Single parameter adjustment for closed loop control
- Simple interfaces that are intuitive and familiar
- Stand-alone operation or serial communication
- Multiple applications without programming



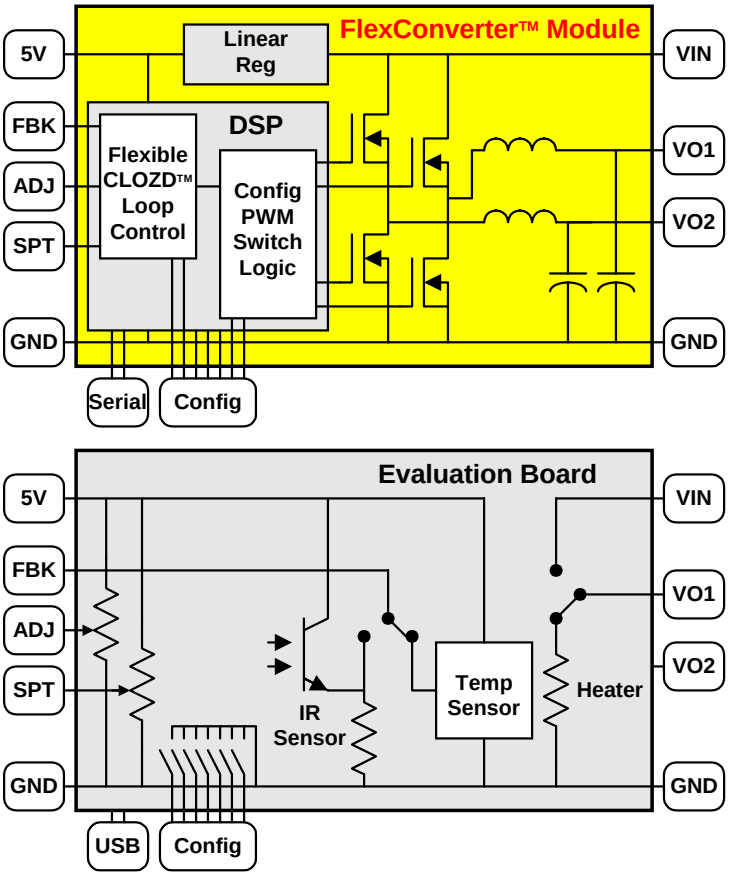
FlexConverter™ Typical Application



FlexConverter™ Evaluation Kit Photo

FlexConverter™ Power Module
- Power module is 2.5in X 1.9in, evaluation board is 4.5in X 1.9in
- Pins spaced 0.1in to fit standard prototype boards or solder to PCB
- Input voltage range is 10–14V and output is 0–12V
- Total output current is 12A through two phase shifted outputs
- Full load efficiency is 92%
- Recovery time to stepped loads is less than 100uS

FlexConverter™ Evaluation Board
- Power module plugs into evaluation board
- Evaluation board
    - Convenient screw terminals and power plug
    - Pots, switches, LED, and test points
    - Experiments for lighting and thermal

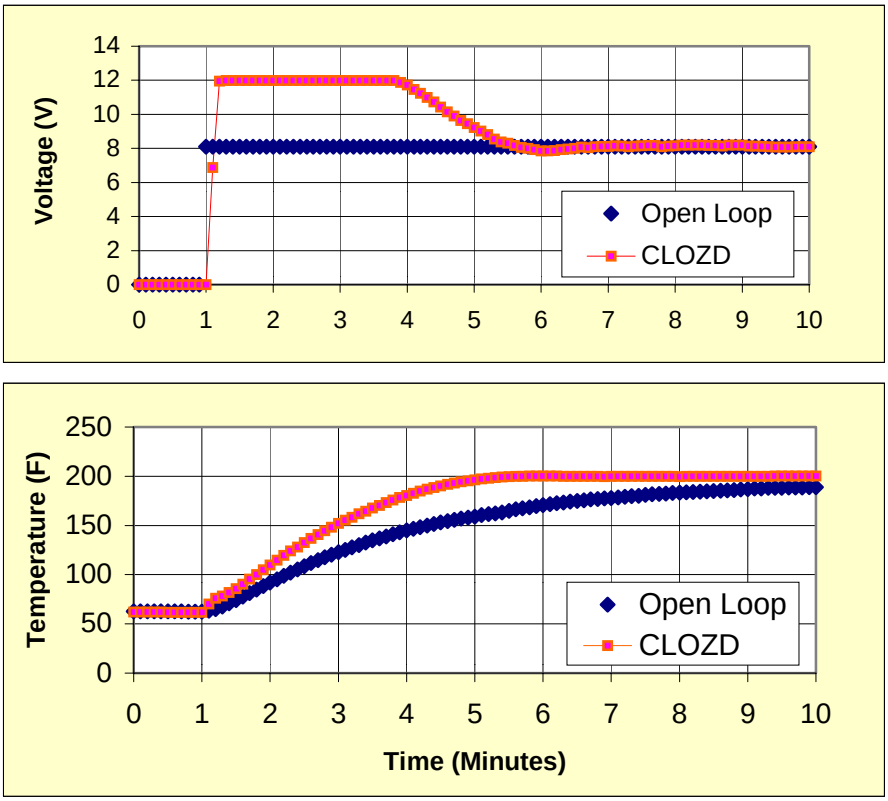


FlexConverter™ Evaluation Kit Block Diagram

Power stage
- Dual filtered half-bridges
- Independent outputs or paralleled for higher current and lower ripple
- Full-bridge or sequentially switched

DSP intelligence
- Preprogrammed as a flexible closed loop controller
- Advanced digital algorithms available through familiar analog interface
- Configuration is through pin settings for stand-alone operation
- Optional serial port enables processor or PC communication

Advantages
- Fills gap between digital power converters and programmable real-time controllers
- Satisfy variety of applications quickly and easily without programming
- Inexpensive because components are common and support is minimal
- Same product in multiple applications
    - Reduces component cost through volume purchase
    - Reduces development time by re-applying familiar technology
    - Increases reliability by utilizing a proven component



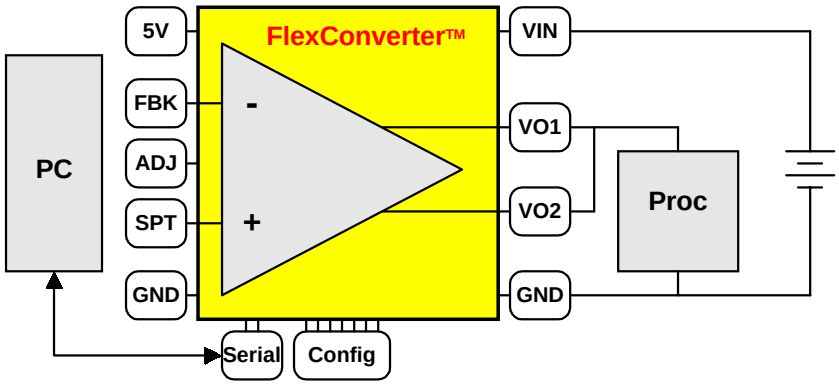
FlexConverter™ Evaluation Kit Thermal Response

CLOZD™ Loop Controller

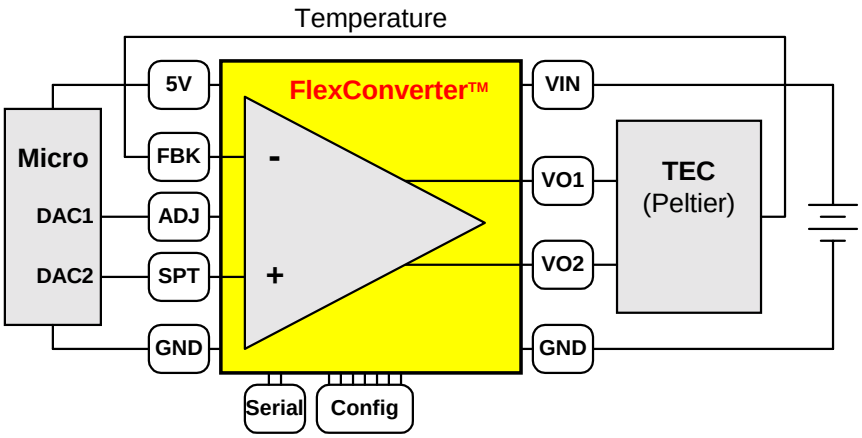
- Simplified control with CLOZD™ (Caldwell Loop Optimization in Z-Domain)
  - Proprietary DSP algorithm
  - Compares feedback FBK signal to setpoint SPT command
  - Calculates output voltage VO1 and VO2 to force FBK equal to SPT
- Single ADJ pin to set for each application
  - Inspect system open loop time constant and look up ADJ voltage from data sheet
  - Compare to three parameters of analog-based PID technique
  - Intuitive time-domain setting rather than the complex frequency-domain

Example Applications

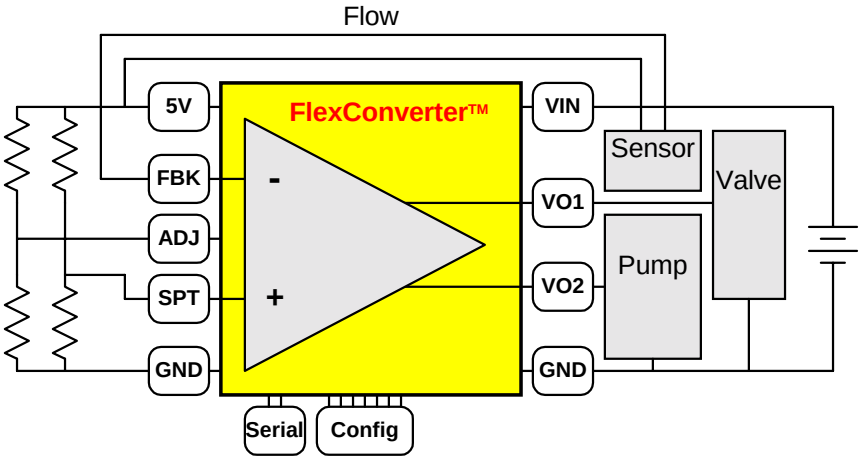
- PC-based POL converter with parallel phased outputs
- Full-bridge for bi-directional thermal control (cooling or heating)
- Sequential flow regulator
  - Valve is first gradually opened
  - Pump is then linearly powered to maintain constant flow
  - Alternatively use independent outputs as dual power supply.
- Many other applications enabled through flexible interfaces



PC-Based Point-Of-Load Converter with Paralleled Outputs



Bi-directional Thermo-Electric-Cooler with Full-Bridge Power Stage



Automatic Flow Controller with Sequential Drives