

F O Engineering has a strong track record of designing Fast and Optimal control systems for the defense, aerospace and industrial markets. Our products encompass a broad range of technologies including high performance and reliable digital designs. Our engineers can satisfy hard to meet requirements ranging from compact design and unique environmental conditions to complex applications and challenging price points.

Common System Controller (CSC)

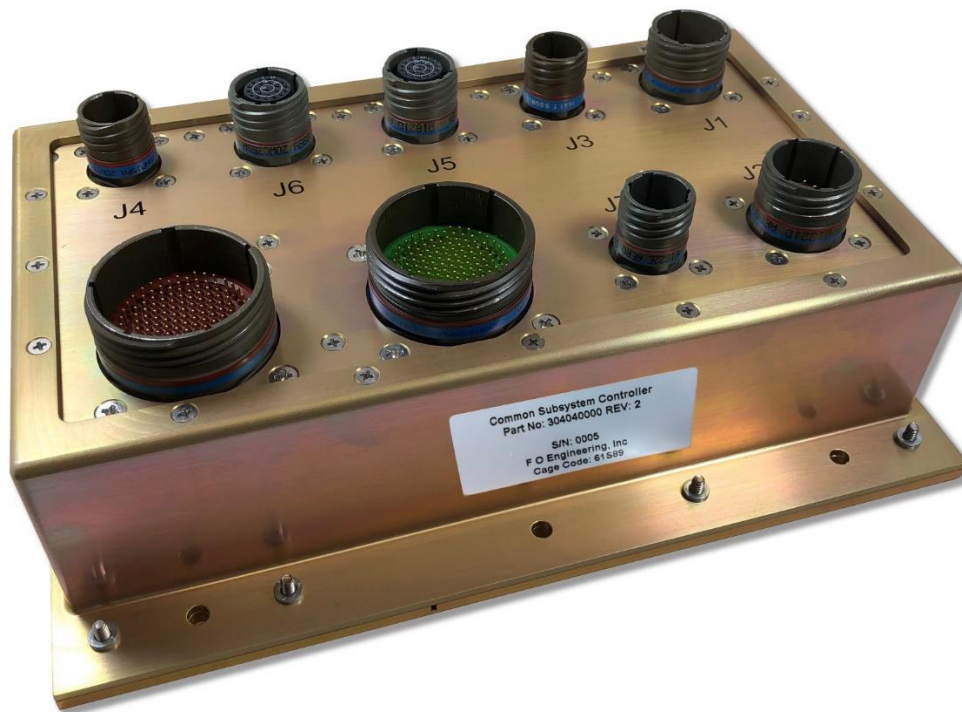


Figure 1 Common System Controller

The Common System Controller (CSC) is a general-purpose box designed for interfacing between redundant Flight Control Computers (FCC) and classic analog and discrete aircraft controls. The CSC was designed for the 5GAT (Fifth Generation Aerial Target) program and provides all of the interfaces to the engines, fuel measurement and control, hydraulics, landing gear and brakes, tail hook and other items. Additionally, it provides path switching for the digital interface between the Active and Standby FCC and the aircraft redundant flight controls.

The CSC is fully redundant with a duplicated Active and Standby channel that self-monitors and switches lanes independently from the FCC. The basic block diagram is depicted in figure 2. Where interface circuits must be common to support legacy hardware interfaces, the buffers are redundantly supplied

from both power busses. The CSC is capable of reading analog and discrete inputs as well as supporting resolver, LVDT, tachometer, and other input interfaces. It also provides several protected solenoid drivers and two Electro-Hydraulic Servo-Valve drivers. Communication with the FCC is via RS-422 or RS-485.

The software design is extremely flexible with matrix programmable assignment between all of the interfaces and data locations in the command-response serial protocol. Additionally, gains, offsets, limits, etc. are configuration file settable. As used for the 5GAT program, the software also contains verified and validated code for a complex fuel system measurement and control algorithm, flexible landing gear sequencing, and an anti-skid and anti-lock braking system.

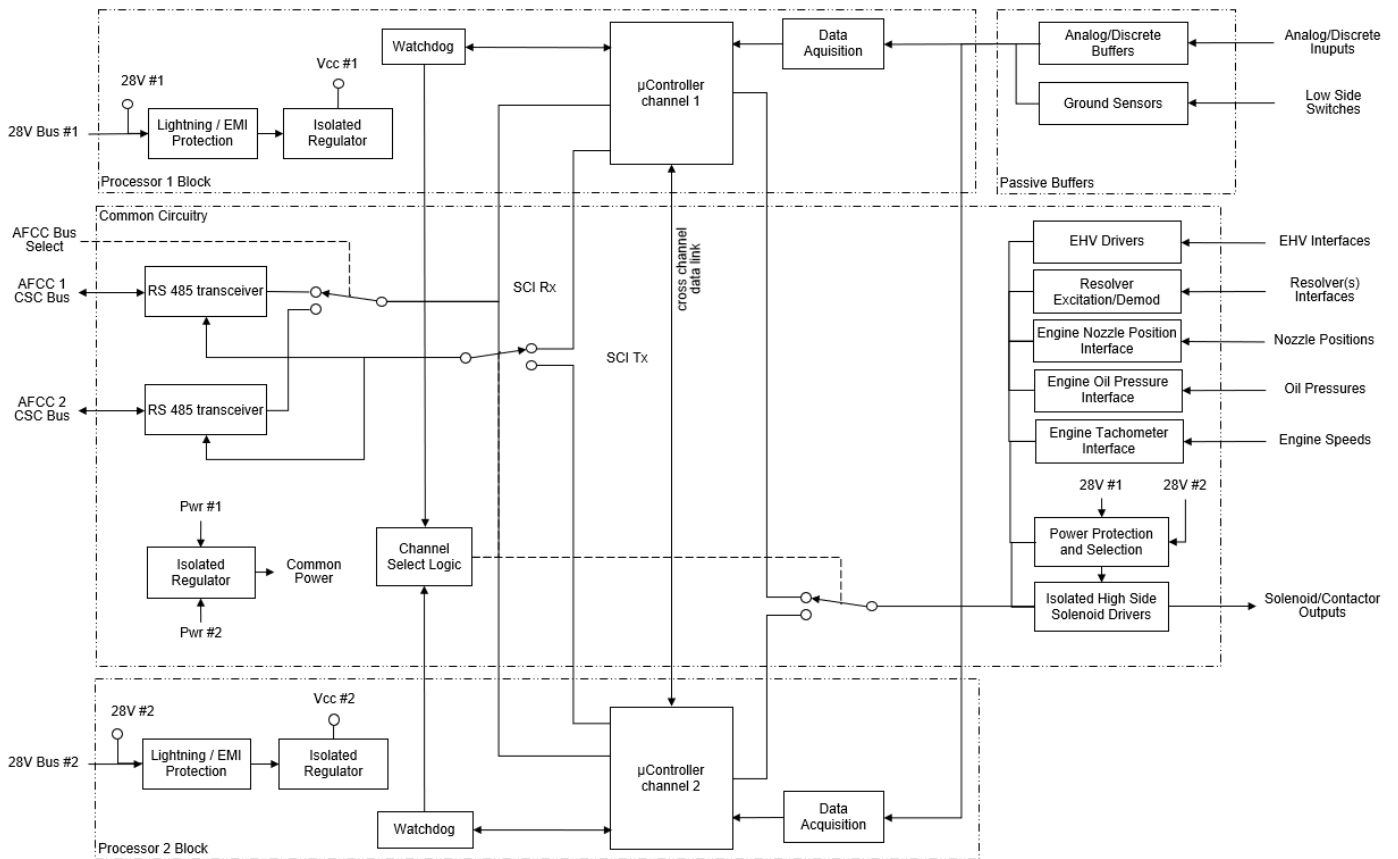


Figure 2 CSC Architectural Block Diagram

Features:

- Dual Channel – Operates in the Active Standby mode
- Supports reading of the following inputs
 - Analog and discrete sources
 - Type K and RDT temperature sensors
 - Resolver and LVDT interfaces (can be used to read synchro's)
 - Tachometer and other time-based inputs
 - Potentiometer input (single to three phases)
- Supports the following outputs:
 - 16 Solenoid Drivers – short circuit protected
 - 2 EHV outputs with current feedback
- RS-422 / RS-485 Digital Communication supports a command / response protocol and Configuration file tailoring
 - Sophisticated matrix setup to assign inputs and outputs to match the digital protocol
 - Setup of scaling, offsets, actions, and limits of all of general I/O interfaces
- Configurable Control Laws for coded all special functions:
 - Fuel measurement and control
 - Landing gear sequencing
 - Anti-skid, Anti-lock, and “normal” braking
 - Cooling door sequencing
 - Your custom requirements can be accommodated within the design paradyme
- Self-Monitoring Fault Detection Logic:
 - FCC Communication
 - Analog and discrete input circuit checks
 - Temperature sensors (both Type K and RDT)
 - Resolver and/or LVDT integrity
 - EHV Current – command vs. measured
 - Solenoid Current – short circuit detection
 - Channel Command mismatch
 - Cross Channel Data Link Fault
 - Power Supplies and Board Over Temperature
- Failure Reversion Mode
 - Customer settable by faults
 - Failed Active channel reverts to the Backup – If it is available
 - Backup channel remains on even in the event specific I/O failures
- Qualification:
 - MIL-STD 704 28 VDC Power Requirements
 - MIL-STD 461
 - Radiated and Susceptibility Requirements
 - Pin and Cable Bundle Injection
 - Operating Temperature range -65°F to 170°F

- Vibration and Shock levels for engine areas
- Software Certification is DO-178B, DAL B (Internally Conducted)
- Physical
 - Weight – 3.60 pounds
 - Dimensions
 - Length – 9.60”
 - Width – 6.90
 - Height – 2.61”

We maintain an ISO9001 and AS9100 certified design and production facility in Santa Clarita, California. We welcome the opportunity to introduce you to our engineering capabilities. Please contact us with any questions you may have about our company and products.