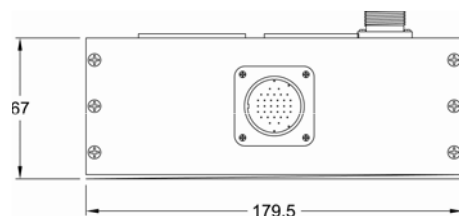
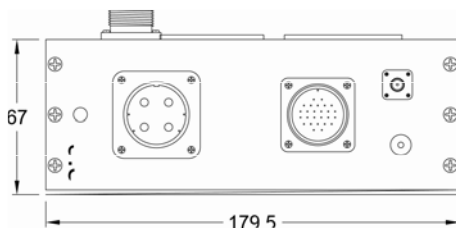


IFCS-7000 Integrated Flight Control System

- Complete autonomous operation
- Auto takeoff and land capability*
- 3 microprocessors and dual sensors for increased redundancy
- Includes all sensors required for complete airframe stabilization, control and navigation
- Surface Mount components used for reduced size and increased reliability
- Multiple waypoint GPS navigation



The IFCS-7000 Flight Control System is a low cost integrated flight control system incorporating navigation, stability, and control. These capabilities include airspeed hold, altitude hold, turn coordination, GPS navigation as well as autonomous takeoff and landing. Extensive data logging and manual overrides are also supported, as is a highly functional command buffer. All feedback loop gains and flight parameters are user programmable. Expansion options, in the form of several customized modules, are available. A PC based mission simulator is also available for the IFCS-7000.

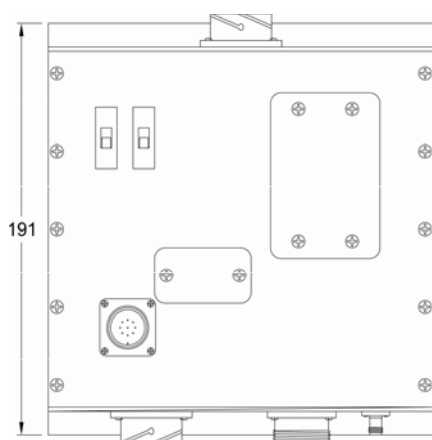


- ? Manually piloted, Manually directed and autonomous flight modes
- ? Supports flaps, flaperons, elevons, v-tail, split rudders, and flap/aileron mixing
- ? User programmable feedback gains and flight parameters
- ? Extensive data log capability
- ? Low battery warning: both on the ground and in flight
- ? User programmable error handlers for: loss of GPS signal, loss of RC signal, loss of data link, and low battery voltage.
- ? 6 DOF IMU . 3 Rate Gyros & 3 accelerometers.

* Supported with expansion module.

Expansion Options:

- Barometric Altitude Control System (BACS)
- Barometric Altitude Hold Module (AHS)
- Engine control unit (ECU)
- Telecommand interfaces up to C & X – Bands
- Radar Altimeter Module (RAM)
- Laser Range-finding Module (LRM)
- SIGINT Module
- ELINT Module
- RECON Module for payload control
- Communications Repeater Module (COM-R)
- Communications Jammer Module (COM-J)
- Dual Power Source Backup Module (DPM)
- MDI Module – Acoustic Radar
- Mission Analysis Module (MAM)
- Flight Data Recorder Module (FDR)
- Multi-UAV Control Module
- AHRS module.
- Auto Land Module
- Auto Takeoff Module



Architecture

The main microprocessor handles the flight stability augmentation and the navigation. Additional support microprocessors are dedicated to the redundant flight stability and navigation module and control of the radio receiver, payloads, expansion modules and servos. Servos are updated at the standard 19 mS frame rate.

Specifications	
Weight	30 grams
Size	73mm x 41mm x 28mm (2.9" x 1.6" x 1")
Power	5.3 to 8 Volts at 100 mA
Temperature	-20C to 70C
Acceleration	4 G operational, 100 G Max speed 250 km/hour
damage Max speed	250 km/hour
Max altitude	5000 meters above ground level

Note: The IFCS-7000 Flight Control System uses the Metric System for distance and speed. All distance units are in meters, and speed units in kilometers per hour (kph, km/hr) unless otherwise noted. The unit must be handled in an ESD safe environment.

RCV CONECTOR

The RC receiver connector is intended to connect to a 5 channel RC receiver. Either PPM or PCM receivers

Pin	Function	Pin	Function
1	Ground	2	Receiver power, +5 V regulated
3	RC receiver channel 1 (Ailerons)	4	RC receiver channel 2 (Elevator)
5	RC receiver channel 3 (Throttle)	6	RC receiver channel 4 (Rudder)
7	RC receiver channel 5 (Gear)	8	Unused

The regulated power supplied to the RC receiver should not exceed 30 mA. Due to this limitation, servos may not be plugged into the receiver unless a separate power supply to the servos is provided.

Sensors

6 DOF IMU including 3 rate gyros, 3 accelerometers, dual airspeed and altitude sensors, and AHRS interface are mounted on the sensor board attached to the main electronics unit. Altitude and position are obtained from the GPS receiver and corrected for INS deviation by the stability and control module.

Mounting

The IFCS-7000 Flight Control System must be mounted in a specific orientation with the gyros towards the front of the aircraft. The IFCS-7000 Flight Control System may be mounted directly to the frame of the aircraft.

The J1 connector provides all of the user inputs and outputs.

Pin	Function	Pin	Function
1	Ground	2	Main power input, 6 VDC at 120 mA
3	Ground	4	Ground
5	Servo Power	6	Servo Power
7	Aileron servo signal	8	Elevator servo signal
9	Ground	10	Ground
11	Servo Power	12	Servo Power
13	Throttle servo signal	14	Rudder servo signal
15	Flaps servo signal	16	Mission 1 servo signal
17	Mission 2 servo signal	18	Mission 3 servo signal
19	GCS data to transmitter, TTL serial	20	GCS data from receiver, TTL serial
21	Digital output control 1	22	Digital output control 2
23	Digital output control 3	24	Battery voltage monitor input
25	Operator data to PC, RS-232	26	Reserved
27	Ground	28	+5 Volt regulated, 50 mA max output
29	Operator data from PC, RS-232	30	Ground

J1 is arranged so that servos may be plugged in directly; however, it is recommended that a 30 pin header is used for increased reliability. The pin out of the J1 connector is designed to facilitate the creation of a wire harness. In general, a contact is provided for each wire to each peripheral function.

Power

Main power is applied at pins 1 (ground) and 2 (positive) of the J1 connector. The IFCS-7000 Flight Control System may be powered by either an unregulated 6 VDC source or a regulated 5 VDC source.

The servos receive power from the same power source (J1, pin 2) as the IFCS. In case a separate power supply for the servos is desired, please contact the factory for details.

PIC, RPV, and UAV Modes

The IFCS-7000 FLIGHT CONTROL SYSTEM has 3 modes of operation. These are the PIC (Pilot-In-Command or RC mode), RPV mode and the UAV (Unmanned Autonomous Vehicle) mode.

The Pilot In Command mode allows the pilot direct RC control of the aileron, elevator, throttle and rudder servos. This mode is always available by switching to PIC position.

If the transmitter is turned off or if switching is set to the UAV position, the plane enters the UAV mode. At this point the aircraft becomes completely autonomous, executing the commands entered before takeoff.

The RPV flight mode is available in conjunction with an RF data linked Ground Control Station.

Operator Interface

All parameters and diagnostics are available via RS-232 connection to the main processor. Use the cable provided to connect a PC running Integrated Dynamics **APLINK** or **Sensor View** software (19.2k, 8, N, 1, no flow control, VT100 emulation).

