Innovative Solutions & Support

Innovation in Aerospace
Innovative Solutions & Support - A Leading Supplier of Cockpit Information Systems

Innovative Solutions & Support specializes in the design, development, manufacture, and support of avionics equipment for Commercial Transport, Military, Government and Business aviation applications that include:

- Precision Air Data Instruments
- Integrated Avionics Suites
- Flight Management Systems
- Flat Panel Primary Flight and Navigational Displays (Cockpit/IP®)
- Engine Instrument Displays
- Flat Panel Multifunction Displays
- Mission Displays
- Fuel Quantity Gauging Instruments

The foundation of our success is customer satisfaction. Many of the world’s most respected aircraft builders, owners and operators have come to rely on our leading edge avionics technology, superior craftsmanship, and stringent quality standards to significantly enhance reliability and performance and provide superior value.

Our manufacturing processes enable us to offer a substantially reduced product cycle time and cost advantage over our competition.

Our Exton, PA facility houses all the disciplines and equipment needed to support the design, qualification, production and support requirements of our many programs.

Commitment to Quality

Product quality is of vital importance to IS&S and its customers. Our quality system has been audited and approved by The Boeing Company, Northrop Grumman, Gulfstream Aerospace, Continental Airlines, and others.

Utilizing the Six Sigma process evaluation program, we are continuously seeking to improve our operational efficiencies, including our design and manufacturing processes and thus the general quality of our products.

IS&S is certified and compliant to AS9100 Revision B, (based on and including ISO9001:2000) by the independent registrant KEMA-Registered Quality, for both design and manufacturing. As an AS9100 certified manufacturer, we maintain high quality industry standards in the education of our employees and the design and manufacture of our products. Our goal is to insure that we can consistently deliver our products and related services in a manner that meets or exceeds customer quality requirements.

Innovative Solutions & Support is well versed in the philosophy that variation causes defects. As part of our growth and knowledge in trying to control and reduce variability, IS&S made significant capital expenditures to bring surface mount technology (SMT) capabilities in-house. This investment resulted in a significant reduction of solder joint defects along with significant cycle time reduction. Our self-sufficiency in this area enhances our ability to bring new products to market faster.
State-of-the-Art Facility

Our design and manufacturing campus in Exton, Pennsylvania houses all the disciplines and equipment needed to support the design, qualification, production and support requirements of our many programs.

In addition to corporate and administrative functions, this facility contains the following:

**Design Engineering** – This department encompasses Mechanical, Electrical, and Manufacturing Engineering and is co-located with Documentation and Configuration Management to ensure traceability and change control throughout each project’s life cycle. Each product is designed for ease of maintainability and troubleshooting. As part of the preliminary design process, a life cycle assessment is conducted for every component used in the production of IS&S products.

**Software Engineering** – IS&S has a mature DO-178B compliant software development process, with dozens of products certified to Level A, as well as many other products certified to lower levels. We employ the services of an independent FAA DER for all FAA-certified software development and have been audited by many customers as well as the FAA.

**Engineering Lab** – The IS&S research and development lab is fully equipped to support product development and testing with full environmental and ESD controls. A full complement of test equipment required to support product development resides in this area.

**Customer Service and Repair** - Our ability to provide prompt and effective repair and upgrade service for our products after the sale is critical to our future growth. An AOG line is supported 24/7 and ensures timely resolution of our customers’ service issues.

**SMT/PWA Assembly** – Full service PWA assembly area that includes an optically aligned screen printer, MYDATA SMT placement, Reflow oven, automated CCA cleaner, screen cleaner and wave soldering. This area has the capacity to produce over 5,000 PWAs per month.

**Clean Room Final Assembly** – IS&S has a Class 100,000 clean room. All mechanical and final assembly occurs in this positive pressure room, with full ESD and humidity controls. Several hundred instruments are produced each month in this area.

**Final Acceptance and ESS Test** – All (100%) instruments are calibrated, subjected to Environmental Stress Screening (ESS) and Final Acceptance tested in this area. This room is equipped with a full complement of vibration equipment, ESS chambers, and custom and standard test equipment required to support production.

---

**Quality Audits and FAA Approvals**

The growing concern for safety in aviation has increased external Customer Quality Audits/Site Surveys nearly six-fold in the past five years. IS&S continues to successfully support routine audits from its diverse customer base. The Boeing Company approved our Quality Management System to BQMS D6-82479, Appendix A.

The Federal Aviation Administration (FAA) has surveyed IS&S’ production quality system and has issued approval to 14 CFR FAA Part 21, Subpart 0 for Technical Standard Order (TSO) Authorizations. IS&S is also a FAA Production Approval Holder (PAH) under facility/project number PQ0929NE. Our latest Aircraft Certification Systems Evaluation Program (ACSEP) audit was conducted with zero findings issued.

IS&S holds 59 Technical Standard Orders (TSO), 8 Supplemental Type Certificates (STC) and 11 Parts Manufacturing Approvals.

In addition, IS&S holds a 14 CFR FAA Part 145 Repair Station Air Agency Certificate with a Limited Accessory and Instrument Rating, Air Agency Certificate Number 172R916X.
Our Products

Air Data Display Unit
The RVSM compliant ADDU performs air data computation, input processing, data display, and alert functions enabling the system to display altitude, target altitude, and baro setting data; provide decision height and altitude alert indication; as well as compute and output altitude, airspeed, and alert flight control data. Signal processing is performed by an optional Analog Interface Unit (AIU) to interface with and support a wide range of autopilot/flight control, flight data recording, and alert equipment.

Altimeter
The RVSM compliant altimeter functions in the self-sensing (Standby) or repeater (Normal) mode. It computes and displays ASN and the Hbc from pressure altitude data received from the digital air data computer via ARINC 429.

Airspeed Indicator
The RVSM compliant ASI operates in Normal or Standby mode. It displays IAS, ground speed (GS), true airspeed (TAS), Vmo, and angle of attack (AoA) data from the digital air data computer via ARINC 429.

Digital Air Data Computers
The DADC instrument computes air data for interfacing equipment in analog, digital, and discrete formats. The DADC supports operation of Altimeters, Mach Airspeed Indicators, Autopilot Controllers, as well as other instruments.

Engine/Fuel Instruments
IS&S provides multiple engine and fuel gauges for military and commercial applications. The SHP indicator provides indication of shaft horsepower at a constant 13,820 RPM. The Turbine Inlet Temperature Indicator provides an updated form, fit and function replacement for the earlier P-3 TIT Indicator made by Lockheed. It is compatible with military thermocouple standards and aircraft connectors. Our Fuel Quantity Indicator/Totalizer operates in any of the individual fuel quantity indicator (FQI) positions or the totalizer position. Pin jumpers in the mating connector direct operating mode, English (LB) or metric (KG) units of measure, and scaling.

Primary Flight / Navigation Displays
The IS&S Cockpit/IP® is an easily installed upgrade designed to replace existing EFIS, as well as the current pilot and copilot altimeter, airspeed, VSI, and RDMI gauges. Flat Panel Display Systems can add value and increase the operation life of legacy aircraft. IS&S Flat Panel Display Systems have received TSO and STC Approval.

Mission Displays
Specialty AMLCD mission displays as supplied for GTTA Aerial Refueling Operator Control Display and US Navy LCAC Programs.

Multifunction Displays
A variety of functions are served by IS&S MFDs, such as the Pilot’s Mission Display (PMD) for the 767 Tanker. Available in a large menu of sizes.

Engine Displays
Flat Panel Engine Instrument Display for low cost upgrade of the C-130 engine instrument cluster with a 75% reduction of LRUs.
Next Generation Aerospace Solutions

IS&S is proud to serve a broad array of aerospace customers with increasingly sophisticated and technically advanced products. IS&S is at the forefront of developing a new generation of products which will meet the increasing demands of customers and regulators as requirements for fuel savings and environmentally friendly aircraft increase. Designed for OEM or retrofit these new products add value to your aircraft and extend operational life.

Integrated Standby Unit (ISU)

The IS&S Integrated Standby Unit (ISU) calculates, processes and displays altitude, attitude, airspeed, slip/skid, and navigation display information in a logical and concise single instrument display. The unit is designed to support additional enhancements for Radio Management and Alternate Navigation (ILS, VOR, DME, ADF, FMS, GPS) functionality.

RNP/LPV Navigator

IS&S designed its RNP/LPV Navigator to allow for RNP operations without having to modify the existing FMS in older aircraft. This saves many operators from performing costly FMS and MMR upgrades. The solution is easily integrated into our Flat Panel Display System or Integrated Standby Unit increasing operator flexibility while minimizing aircraft downtime as the modification can typically be performed in 3 days.

Operators will continue to fly takeoff, departure, en route, and arrival flight segments using their legacy FMS continuing to leverage fuel saving OEM performance algorithms. IS&S will provide the existing FMS accurate position information from our display system by blending IRU and GPS data.

Once a flight is cleared for an RNP/LPV approach, that approach is entered into the IS&S display system. Aircraft control is switched to IS&S for the approach segment with the flight plan presented seamlessly to the pilot on the display system.

In addition the system will provide enhanced safety through improved situational awareness, and reduced crew workload. The upgrade includes a Primary Flight and Navigation Flat Panel Display System (FPDS), Engine Instrument Display (EID), a Next Generation Flight Management System (FMS), and an Integrated Standby Unit (ISU).

Global Positioning System Sensor Unit (GPSSU)

The IS&S GPS Sensor Unit is a satellite receiver that utilizes the signals coming from Global Positioning System (GPS) satellite constellation and satellite-based augmentation systems (SBAS) such as the USA Wide Area Augmentation System (WAAS). It is a DO-229D compliant GPS-SBAS receiver certified by the FAA for TSO-C145c Class Beta 3.

The primary function of the receiver is to compute the position, velocity of an aircraft and the precise time (PVT). It also computes the integrity of the PVT from the SBAS signal, if available. The receiver detects and excludes failed satellites (FD/FDE) using receiver autonomous integrity monitoring (RAIM) algorithm, whenever there are enough number of tracked satellites. The sensor unit communicates with a host computer through a serial communication link.
IS&S designed its NextGen Flight Deck to increase operational flexibility and reliability, improve dispatch and on time arrival availability and simplify maintenance. The system provides enhanced safety through improved situational awareness, and reduced crew workload. Included are a Primary Flight and Navigation Flat Panel Display System (FPDS), Engine Instrument Display (EID), a Next Generation Flight Management System (FMS), and an Integrated Standby Unit (ISU).

This Next Generation Flight Deck upgrade provides full RNP, RTA, and GPS capabilities eliminating legacy avionics while maintaining the flexibility to install future upgrades while implementing Data Link and ADS-B capabilities. The included Beta 3 GPS Navigation system provides three-dimensional position and velocity information accurate to 10 feet.

The IS&S Advantage
The NextGen Flight Deck provides a cost-effective solution and state-of-the-art retrofit technology for a variety of aircraft.

Enhanced Readability
- High resolution multi-color LCD flat panel display
- Exceptional cross cockpit viewing angle
- Greatly enhanced sunlight viewability
- Broad brightness control range
- LED backlighting

LRU Reduction
- LRU (part numbers) reduced
- Component count reduced
- Logistics Savings

Substantial Weight and Heat Savings
- Lighter weight design
- Reduced power and fuel consumption
- Shorten trip times
- Reduced carbon emissions

Improved Dispatch Reliability
- Full performance, navigation and mission planning capabilities
- Provides MEL Relief (Level C, 10 day)
- Can dispatch with failed DU or DCP
- Dual redundant channels in data concentrator
- Reduced down time and operation costs

Functional Evolution for NextGen
- User-customizable, flexible graphic symbology
- On-aircraft software updates
- NextGen requirements CPDLC, RNP, RTA, LPV and ADS-B

Minimal Retraining
- Familiar format reduces conversion training
- B-Level difference training program
- Conforms to current flight deck presentations

FMS Functions
- Ability to Store Global Nav Database on 64 GB Solid State Drive
- Coupled Lateral Navigation
- Coupled Vertical Navigation
- Full ARINC 424 Procedures and Leg Types
- Fuel Data Integration and Planning
- Geometric Descent Vertical Navigation
- INS Alignment
- LPV Approaches
- Navigation for Enroute, Terminal and Approach, Primary Oceanic/Remote
- Receiver Autonomous Integrity Monitoring
- Required Time of Arrival
- RNP/ANP Navigation
- DME/DME Positioning
- Storage up to 200 Waypoints, up to 100 Flight Plans
- Supports Auto Flight, Indicators, Displays (EFIS) and Alerts
- WAAS GPS Interface Beta 3 TSO C145c
IS&S serves the leading aerospace companies in the world and has been given numerous awards for its products by customers such as Boeing, Lockheed Martin, Rockwell Collins, Gulfstream, and Raytheon.

Whether the customer is large or small, IS&S strives to provide the personal and responsive service on which its success is achieved.

Innovative Solutions & Support’s Clients and Programs

IS&S serves the leading aerospace companies in the world and has been given numerous awards for its products by customers such as Boeing, Lockheed Martin, Rockwell Collins, Gulfstream, and Raytheon.

Whether the customer is large or small, IS&S strives to provide the personal and responsive service on which its success is achieved.

Aeromech, Inc.-- RVSM · EADS Aerospatiale/Airbus -- Corvette RVSM · Air Canada Inc. -- 737 RVSM
Air Canada Inc. -- DC-9 Altimeter · ABX Air, Inc. -- DC-8, DC-9 RVSM, 767 Cockpit/IP®
Alternative Avionics -- Falcon 10/20, Westwind, RVSM · Antavia -- Corvette RVSM
ARINC -- 727, DC-8 RVSM · ATI -- DC-8 RVSM · Avcon -- Learjet
20 Series RVSM · Avionics Mobile -- BAC1-II RVSM
Avionik Straubing — RVSM · BAE Systems -- BAE 146 RVSM · Bombardier/Learjet -- 31/35/36/55 RVSM
Columbia Avionics -- Citation 500, 650 RVSM and AdViz Cockpit/IP®
Champion Air -- 727 RVSM · DHL Airways Inc (Astair) - 727 and DC-8 RVSM
Duncan -- Jetstar 200, Challenger 600, GII, G1B RVSM · EADS
Manching — BR1150 RVSM, NATO AWACS TCA RVSM
Eclipse Aerospace - E500 and E550 Integrated Flight Management System
Elliott Aviation -- Falcon 10 RVSM · EPPS Aviation, PC-12 Cockpit/IPTM · European Air -- 737 RVSM
Federal Express -- DC-10 Fuel Gauging, RVSM, B757 FPDS
Garrett -- Cessna Citation RVSM, Falcon 10 RVSM
Genesis III — Falcon 20 RVSM · Global Aviation Services -- NASA B-57 Alerter · Gulfstream
GII/G1B RVSM · Iceland Air B757 FPDS · IPT -- F-16 SSBA · Jet Aviation — Falcon 10
RVSM · Kalitta Air LLC -- B727 RVSM, 747 Altimeter, 747 EIDS · L-3 -- RC-135 RVSM
Lockheed Martin -- C-130H FPDS, Flight Management System, Air Data, Engine
Instruments, Engine Instrument Display System (EIDS) Retrofit C-9 RVSM
Marshall Aerospace -- C-130 DADC, C-130 Cockpit/IP® · Midcoast Aviation/Sabreliner, Hawkewer 700 RVSM
Murray Air -- DC-8 RVSM · National Nuclear Security Agency - 737
Garrett -- RC-135 RVSM · NAVSEA -- LCAC Bridge Flat Panel Displays · NLX -- KC-135 Simulator
Northrop Grumman -- JSTARS Altitude Alerter · Northwest Airlines Corp--DC-9 Alerter/DC-9 RVSM
Piaggio -- P-180 RVSM · Pilatus Aircraft, Ltd. -- Utilities Management System (UMS for
PC-24Air Data Instruments · Plain Avionics -- Westwind, Falcon 10 RVSM
Pro Star Aviation -- Hawkewer 700 RVSM · RAAF -- P-3 TIT Indicator, C-130 DADC
Raytheon -- King Air 200 & 350 RVSM, Hawkewer 700 RVSM, Beech 1900 Altimeter, Beechjet 400/MU-300 RVSM
Rockwell International Corp. -- KC-135 RVSM, AP-105 ADS Replacement
Ruag Aerospace -- F-5 RVSM, SSBA · Sabreliner -- Sabre 60/80 RVSM
Stevens Aviation -- P-180 RVSM · Star Aviation -- Citation RVSM
The Boeing Company -- Various Programs, including KDC-10 Cockpit Display Upgrade,
KC-135 RVSM, E-3 Alerter, KC-767A GTTA Mission Displays, KC-46 Tanker Display
United Parcel Service -- 767 Altimeter, FPDS · US Navy -- P-3 TIT
Indicators, P-3 Torquemeter Indicators, C-9 RVSM
USA Jet -- DC-9 RVSM, Falcon 20 RVSM · Western Aircraft — PC-12 Cockpit/IP®
USAF -- C-9 RVSM, E-3 RVSM Altitude Alerter, F-16 Altimeter, Standard
Altimeters, KC-135 RVSM, A10 CADC, F-16 SSBA
IS&S is the world’s leading supplier of RVSM systems and integrator of Cockpit Information Systems (Cockpit/IP®) for the Commercial Air Transport, Military, and Business Aviation Markets. IS&S incorporates leading edge technologies into sophisticated, cost-effective solutions for the aerospace industry.