REAL INNOVATION... REAL SOLUTIONS.
Core Values

STEWARDSHIP
WE ARE RESPONSIBLE TO THE COMPANY, CUSTOMERS, AND EACH OTHER

EXCELLENCE
WE ARE THE BEST AT WHAT WE DO

CONTINUOUS IMPROVEMENT
WE REFINE WHAT WE DO AT EVERY OPPORTUNITY
Continued Growth

2005:
A Purpose-Built Plant…

30,000 Sq. Ft. Campus

Conference, Training, Production Areas

Modular Office Design
A Commitment to Quality

2008:
ISO 9001:2000 AS9100 Certification

2014:
ISO 9001:2008 AS9100 Certification
Certifications

Current Certifications/Specifications:
ISO 9001:2008 and AS9100C
FAA Title 14 CFR, Part 21 and Part 45
DO160
DO178 DAL D, Level E
Warranty Repair adheres to AS9104/1:2012 requirements

Pending Certifications:
AS9115
DO254

FAA-Approved Avionica Staff:
DER (1)
DMIR (2)
Avionica’s miniQAR Evolution

Avionica introduces the miniQAR
The industry’s first miniature quick access recorder

1999

Solid-state reliability
- 400 hour recording capacity
- Ease of installation forever changed the quick access recording marketplace and FOQA/FDM.

2008

Avionica’s miniQAR MkII
Leads the industry with over 5,000 worldwide installations

Today

Avionica’s miniQAR MkIII
Continues to lead the industry with 8,000 installations for the world’s most prestigious airlines, militaries, and business jets & turboprops.

Avionica Proprietary
avSYNC
Immediate Data Transmission
To and From the Aircraft

- FOQA
- ACMS

- Maintenance Docs Content
- EFB Content
- A/C Server Content
avSYNC is a web based service that enables the automated downloading of aircraft flight data.

- The service is enabled through installation of the avSYNC Core Server software and through aircraft installation of a miniQAR MKIII with Cellular Module (avCM). The miniQAR with Cellular Module will record and transmit flight data to the avSYNC™ Administrator Servers over the internet via an encrypted VPN tunnel.

The avSYNC Service will format the received data and transfer it, ready for processing to the Administrator’s FOQA server.

- The avSYNC Core Server software includes an administrative Web Page to manage avSYNC and to monitor data flow. Avionica also provides an optional “Cache and Forward” (CAF) in order to push data from Avionica servers to remote sites.
avSYNC Immediate Data Transfer Solution

**avSYNC Data Flow**

1. Aircraft
2. Cellular
3. Internet
4. VPN
5. avSYNC

- Flight data is collected during flight.
- After landing, when data transmission parameters are met, the unit connects to the cellular service provider radio tower. When roaming is enabled, a roaming network will be selected if the home network is not available.
- Once connected to the selected operator, the unit connects to the Internet.
- Once Internet connection has been established, the unit connects to the VPN where the avSYNC server resides.
- Once a VPN connection has been established, the unit sends its flight data to the avSYNC Core Server.
- Although Avionica hosts the avSYNC Core Server Software data is encrypted and not accessible by Avionica unless otherwise specified by the end user.
avSYNC Data Transfer Rates

**Typical Data Transfer Rates FROM aircraft**

- Data for a 1-hour flight requires 40 seconds*
- Data for 2.5-hour flight requires 100 seconds*
- Data for a 5-hour flight requires 200 seconds*

**Typical Data Transfer Rates TO Aircraft**

- 3G - 100mb file requires 140 seconds
- In 2015: 4G - 100mb file requires 70 seconds

*Based on a download rate of 256 words per second
avSYNC Control Center Web Interface, operators can adjust:

- Fleet Configurations
- Download Intervals and Content Upload Schedules
- Source/Target Server Data Routing by Internet address
- Encryption and Compression Options
miniQAR MkIII

- Continues the Reliable Tradition of Over 8,000 miniQARs now flying
- Backwards compatible with existing miniQARs
- Installation and maintenance as simple as that of our miniQAR Mk II
- Still under 6.5 oz (185 g)
miniQAR Mk III Design

SOC Design

• FPGA Embedded Soft Processor (100 MHz Altera NIOS II 32-bit) with:
  • 2 ARINC 573/717 Harvard Bi-Phase receivers
  • 1 ARINC 573/717 Bi-Polar Return to Zero (BPRZ) receiver
  • 3 ARINC 429 receivers
  • 3 UART receivers for EIA RS-422 and RS-232 inputs
  • 1 Multi Input ARINC 410 discrete input controller
  • 2 SD memory card controllers
  • 1 I²C serial transceiver
  • 1 USB 2.0 MAC transceiver controller
  • 2 Ethernet MAC transceiver controllers
  • 1 ARINC 429 transmitter (future release)

• 2 Gigabytes micro SD-RAM
  • User - upgradeable as required

• 2 Gigabytes SD-RAM, formatted FAT32
  • User - upgradeable as required
LRU: 4G avCM

Specifications:
- Size: 4.90cm x 5.59cm x 5.66cm
- Weight: 136g
- Max Speed: 7.2 Mbps/384Kbps
- Quad Band EGSM: • 800, 900, 1800, or 1900 MHz
- TriBand UMTS/HSDPA: • 850, 1900, or 2100 MHz

4G+ UMTS HSUPA/HSDPA cellular (Ground only operations).
Autonomous Power, Uninterrupted Connectivity
STC & PMA (AML on ~250 aircraft types)
Battery-less (No Li-On)
Internal Antennae (no mast)

State of the art Equipment
Avionica Proprietary
Summary

• Enabler of FDM and FOQA data programs
• Most cost-effective solution available
• 100,000 hrs MTBF reliability
• Multiple versions of the QAR address all data requirements
• Part of a modular, integrated data solution
• Ethernet linked for real time application support
• Wireless 4G solution
• Integrated ACMS option
Avionica's miniQARs may be the most widely STC’d QAR in the world…

150 Models Worldwide

<table>
<thead>
<tr>
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Uses of Avionica miniQAR Data

- Event Investigation
- FDM/SMS statistics
- FDM/SMS Dashboard
- 3D animations of flight path and instrumentation
The five Ws of FDM/FOQA Data Analysis

Who? .......... Aircraft Operators

What?.......... Identification of safety issues and development and implementation of corrective actions.

Where? ...... World Wide

When? ....... Continuously

Why? ... Regulatory Requirements or Recommendations
Tell me again; Why?

USA - Voluntary
14 CFR:
Part 13.401 Flight Operational Quality Assurance Programs
Part 119 Certification: Air Carriers and Commercial Operators
Part 193 Protection of voluntarily submitted information
AC 120-82 “Flight Operational Quality Assurance”

Internationally - Mandated:
EASA
Regulation (EU) 965/2012
AMC1 ORO.AOC.130
Appendix 1 to AMC1
ORO.AOC.130
GM1 ORO.AOC.130
UK CAA
CAP 739
EUROCAE
ICAO
Annex 19 “Safety Management”
What do all those regulations say?

FOQA/FDM is a non-punitive safety program designed to make commercial and general aviation safer.

The objective is met by early identification of adverse safety trends and the implementation of corrective actions and follow-up to assure remediation of the unsafe conditions.

FOQA is a voluntary program in the USA.

FDM is a vital part of the Safety Management System (SMS) mandated for all organizations in ICAO Member States and EASA Member States.
FDM/FOQA - General Principles

- **Increased Safety by Decreasing Risk**
- **Immediate In-Flight Data Transmission**
- **Data Mining**
- **FLY/LAND**
- **Corrective Action**
  - Fleet Wide Pilot Training
  - Educating Flight Crew on Results
  - Adjust Pilot Training Programs
  - Changes to Aircraft Operations
- **Statistical Analysis Across Fleet**
- **Flight Operations Events**

Additional elements include:
- **CORRECTIVE ACTION**
  - Flight Re-Routes
  - Ground Delays
- **Increased Efficiencies**
- **Increased Bottom Line**
Web-based FOQA Solution

Flight Data Monitoring
Operational Analysis
Engine Parameters Check
Flight Ops. Efficiency
ERGOSS’ SARA INTERFACE

- Displays with Strong Operational Intuitivity
- **Dashboard**: all your activity, trends and deviations at a glance
- Increased compatibility (tablets, smartphones)
- **Share-a-Flight**: exchange with flight crews and maximize return on experience
**SARA: ANALYSIS, STATISTICS, REPORTING**

- Fully **dynamic** reporting system, modify a filter and see *What-If* … immediately
- Use of industry-proven **Six-Sigma**, reduced data dispersion, variance examination
- Automatic highlight of areas of interest, enhanced analysis for better decision-making
- All of the above are **built-in features** of SARA’s core engine for **reporting modules**
Avionica/ERGOSS: Flight Operations Efficiency

Ultimate use of flight data and combined expertises

- Validate aircraft operational performances with regard to operator’s network
- Fine tune flight planning system and maintenance follow-up
- Anticipate from statistical analysis (taxi time, extra fuel, EGT margin, etc.)

Enhance SOPs and monitor results of new policies

Measure associated savings

- Optimized Fuel consumption
- Greater payload (belly freight)
- Reduced maintenance costs
Summary

Avionica: Uniquely Positioned to Ensure Your Success

- Nearly 8,000 Installed Airborne Avionics Worldwide
  - Over 500 Customers Worldwide
  - FAA STC’s familiarized with EASA, CAAC, ANAC, and Transport Canada.

Avionica’s avSYNC Solution:
- Leads to reduction in maintenance costs
- Convenient phone or I-Pad app: no need to carry paperwork
- Immediate transfer of data resulting in dispatch reliability
- Crew has immediate access to flight analysis for review
REAL INNOVATION... REAL SOLUTIONS.