AFIRS Edge™

Industry First 5G Wireless Quick Access Recorder (WQAR) & Aircraft Interface Device (AID)

Watch Demo

Extensible Multifunction Avionics Platform

Cutting Edge App Hosting

Unlock More Data In Your Aircraft

For FLIGHT OPERATIONS

- Improved Reliability, Efficiency, Safety & Compliance
  - Future-proof Dual QAR/DAR for Flight Safety Analysis (FOQA/FDM)
  - Secure Data Harvesting for operations & fuel efficiency
  - Comprehensive aircraft tracking and flight data recovery

5G cellular WQAR technology in AFIRS Edge™ extends the operational life of the WQAR far beyond current 4G LTE WQAR products.

Ask us how AFIRS Edge™ also allows you to maintain your Data Independence.

For the FLIGHT DECK

- Reduced Pilot Workload & Data Costs
  - Designed for all your chosen EFB applications, including Jeppesen
  - Flight Deck Wi-Fi and Enhanced Aircraft Interface Device (eAID) in a single unit — A834 ADIF
  - Reliable EFB IP connection gate-to-gate, including taxi-in and taxi-out
  - 1 TB A679 Network Attached Storage (NAS), remotely managed storage for EFB and maintenance applications.
  - ACARS over IP – increased data capacity at lower cost with 100% global coverage
  - EFB charging (optional)

Phone: 1.403.250.9956 Email: sales@flyht.com www.flyht.com FLYHT AEROSPACE SOLUTIONS LTD.

FLYHT INSIGHT • ACTION • CONTROL

For MAINTENANCE & ENGINEERING

- Reduced AOGs & Operational Disruptions
  - Massive sensor data harvesting for aircraft Predictive Maintenance
  - Engine (FADEC) & Flight Data Recorder (FDR) download on demand or on every landing
  - Onboard Data Loading including wireless distribution & storage, ARINC 645-1 compliant
  - Comprehensive telematics and real-time Aircraft Health Management
  - Onboard aircraft data access and Wi-Fi connectivity for line maintenance
  - On demand real-time data streaming for remote aircraft troubleshooting

For INNOVATION

- Enabling Airline Digital Transformation
  - 5G/4G/3G airport connectivity global roaming service for similar cost of domestic data
  - Global Satcom connectivity with Iridium Certus option
  - Remote Over-The-Air (OTA) managed
  - Onboard App Hosting
  - Next generation Edge Logic Application (ELA) ACMS featuring on-wing Machine Learning Inference
  - Internet of Things (IoT) Data Gateway
  - Cloud Native featuring AWS IoT Greengrass technology
  - Supports private 4G and 5G airport network deployments
  - Touchless fleet-wide updates, application & configuration management

JETBRIDGE — Supercharge your AFIRS Edge™ data

- **AFIRS Gateway™**
  - An interface that provides your airline with total control over Flight Data, Edge Device Health & Management, with access to help from Subject Matter Experts (SMEs).
- **ClearPort™**
  - Fully automated view into your entire airport turn process, including APU usage, which will allow you improve your On Time Performance (OTP). Get real-time updates on an easy-to-use mobile app.
- **FuelSense™**
  - Gain comprehensive insight into areas of improvement for your custom fuel burn reduction initiatives.
  - Save up to 4% of fuel costs, and help you meet carbon offset mandates, and other regulatory requirements.

Canada
#500, 1212 – 31 Avenue NE
Calgary, AB, T2E 7S8
Canada

USA
4600 South Syracuse, Suite 900
Denver, CO, 80237-2719
USA

Europe
Hanauer Landstrasse 312,
D-60314 Frankfurt a.M.
Germany

China
27 building 3-112, An De Lu No.55,
Dong Cheng District, Beijing
China

Phone: 1.403.250.9956 Email: sales@flyht.com www.flyht.com

AFIRS™ 228

IRIDIUM GLOBAL VOICE & DATA COMMUNICATIONS SYSTEM

TSO 159b Iridium SATCOM

Reliable ATS Voice and FANS 1/A+ ACARS over Iridium

Reliable voice and data services using Iridium's global satellite network including SATCOM voice

- Modernize your heavy, antiquated dual HF system and upgrade to Single HF and SATCOM.
  - Complies with Advisory Circular AC 20-150B as one of the two required long range communication systems
  - Complies with AC 20-140C in support of ATS data communications
- AFIRS 228 has extensive and expandable interface capabilities that allow it to connect to numerous aircraft systems
  - Built in QAR with wireless distribution options
  - Aircraft Data Interface Function (A834 ADIF) Options
- A true line replaceable unit with an Aircraft Configuration Module containing the SIM card, system configuration information and user-stored information
- Reliable voice and data services using Iridium's global satellite network including SATCOM voice, global flight tracking (GADSS compliance), and two-way text messaging

Future proof your systems by leveraging AFIRS Analytics with edge processing for aircraft health monitoring such as:

- Engine trending & engine/airframe exceedances
- Real- time engine data analytics
- Fuel management
- Real-time flight data management
- Live black box streaming
- Global flight tracking (GADSS compliance)
- Two-way text messaging
- Automated block and flight times

Related Products:

- AFIRS Controller
- AFIRS Edge
- JetBridge Applications
- GADSS Solutions

FLYHT™
INSIGHT • ACTION • CONTROL

AFIRS™ 228B

Product Details

ARINC 717 Rx (HBP or BPRZ)	1
ARINC 429 Rx	16
ARINC 429 Tx	7
Discrete Inputs	16
Discrete Outputs	8
Ethernet	4 + 1 (Maintenance)
RS-232 Serial (or RS-422)	4
2-Wire "Tip and Ring" Telephony Ports	2
Aircraft Audio System Interface	1
Number of Antennas Required	1

533 MHz Processor
1.5 million gate FPGA
Dual Redundant 16 GB Flash Memory Cards
Functions as Quick Access Recorder
EFB in-flight connectivity (Including iPad)

Designed to Meet the Following Specifications

ARINC 429 Mark 33 Digital Information Transfer System
ARINC 739A Multi-Purpose Control and Display Unit
ARINC 741 Aviation Satellite Communication System
ARINC 761 Second Generation Aviation Satellite Communication System
ARINC 717 Flight Data Acquisition and Recording System
RTCA/DO-160F

228S and 228S TSO

Product Details

ARINC 717 Rx (HBP or BPRZ)	1
ARINC 429 Rx	16
ARINC 429 Tx	7
Discrete Inputs	16
Discrete Outputs	8
Ethernet	4 + 1 (Maintenance)
RS-232 Serial (or RS-422)	4
2-Wire "Tip and Ring" Telephony Ports	2
Aircraft Audio System Interface	1
Number of Antennas Required	1

533 MHz Processor
1.5 million gate FPGA
Dual Redundant 16 GB Flash Memory Cards
Functions as Quick Access Recorder
EFB in-flight connectivity (Including iPad)

Designed to Meet the Following Specifications

ARINC 429 Mark 33 Digital Information Transfer System
ARINC 618 Air/Ground Character Oriented Protocol Specification
ARINC 739A Multi-Purpose Control and Display Unit
ARINC 741 Aviation Satellite Communication System
ARINC 761 Second Generation Aviation Satellite Communication System
ARINC 717 Flight Data Acquisition and Recording System
RTCA/DO-160G
RTCA/DO-178C
TSO C-159B
SITA VAQ
ARINC AQP

FLYHT Certifications

Transport Canada Civil Aviation Approved Manufacturer
Transport Canada Civil Aviation Approved Maintenance and Repair Organization
FAA, EASA, TCCA STC Approvals

LRU Specifications

Chassis L — 12.55", W — 2.27", H — 7.66"
Mounting ARINC 600 2 MCU
Rear Mating Connector Size 2 ARINC 600 Receptacle
Weight 7.0 lbs (3.2 kg)
SIM Card Housed in Aircraft Configuration Module (Avionics Tray)

Canada
#500, 1212 – 31 Avenue NE
Calgary, AB
Canada T2E 7S8

USA
4600 South Syracuse, Suite 900
Denver, CO, USA 80237-2719
USA

Europe
Hanauer Landstrasse 312,
D-60314 Frankfurt a.M.
Germany

China
27 building 3-112,
An De Lu No.55,
Dong cheng District, Beijing
China

AFIRS CONTROLLER

FLEXIBLE MULTI-PURPOSE CONTROL HEAD

FLYHT's new in-cockpit connectivity control head enables a variety of low-cost high-impact options

As a standalone purchase

- Electronic Flight Bag (EFB) data switch – connect to any broadband data link via ethernet and have secure wired data to your EFBs
- EFB power – future proof power solution resolving the disconnect between rigid STC management and changing tablet connectors

EFB Power in the Cockpit

- Low cost expandable EFB charging option
- Never worry about having a sufficient charge on your EFB prior to departure
- Compliant EFB power shutoff

When coupled with AFIRS hardware:

- Call control
  - Incoming call and fault notification
  - Audio switching and call termination for low-cost voice calling integrations
  - Multi-channel call control options
- AFIRS FLYHTLink EFB app enabler – Wireless QAR and 2-way text messaging
- AFIRS ACMS event – crew control to trigger snapshot reporting of aircraft systems

List of related products

- AFIRS 228 (B,S, and TSO)
- AFIRS Edge

FLYHT™
INSIGHT • ACTION • CONTROL

AFIRS EDGE MULTI-CHANNEL WQAR

UNIVERSAL AIRCRAFT DATA HARVESTING SOLUTION

Watch Demo

Skip upgrading to 4G LTE, and leap forward to 5G technology now!

Why choose QAR or DAR when you can have both?

Collect more data from your aircraft

Get your fleet ready for enhanced data harvesting for all your current and future big data initiatives for operational efficiency and predictive maintenance

AFIRS Edge Data Harvesting solution:

- Records both QAR and DAR data simultaneously
- Capture thousands of additional flight data parameters beyond OEM basic standard
- Future proof aircraft data acquisition: Ethernet, A429, A717, RS422, RS232, discretes
- Flange and tray mount installation options enabling plug-in replacement for old technology wireless QAR systems
- Get all your data after every landing anywhere in the world using FLYHT's secure cellular service
- Retain full ownership and establish your own data governance for data generated by your aircraft
- Uniquely supports 5G technology with 4G / 3G fall back providing long product life beyond 2040
- Reduce maintenance resource needs through remote configuration, management, and health monitoring

Related Products

- Flight Deck Solutions for EFB
- AFIRS Controller
- AFIRS Analytics
- Internet of Things (IoT) Data gateway
- ACARS over IP
- GADSS solutions
- JetBridge Applications

FLYHT™
INSIGHT • ACTION • CONTROL

FLIGHT DECK SOLUTIONS FOR EFBS

CONNECT YOUR EFB TO THE AIRCRAFT AND THE WORLD

- **Modularity gives you complete cost and capability control**
- **Future-proof with 5G**
- **Cutting edge application hosting**

Engineering and integration services tailoring the best solution for your needs and your budget.

Integrated solutions include:

- Power to your EFB – flexible port configurations not tied to STC changes
- Aircraft Interface Device (AID) – A834 ADIF with ADBP
- Global connectivity options
- Wired, WiFi and Bluetooth options to fit your needs

EFB data connectivity available:

- Global airport data connectivity (5G/4G/3G)
- Integration with existing onboard broadband
- Pole-to-pole in-flight IP connectivity with Iridium Certus SATCOM
- ADS-B IN receiver for situational awareness applications

Low maintenance enabled by remote configuration, management, and system health monitoring.

System Interfaces include:

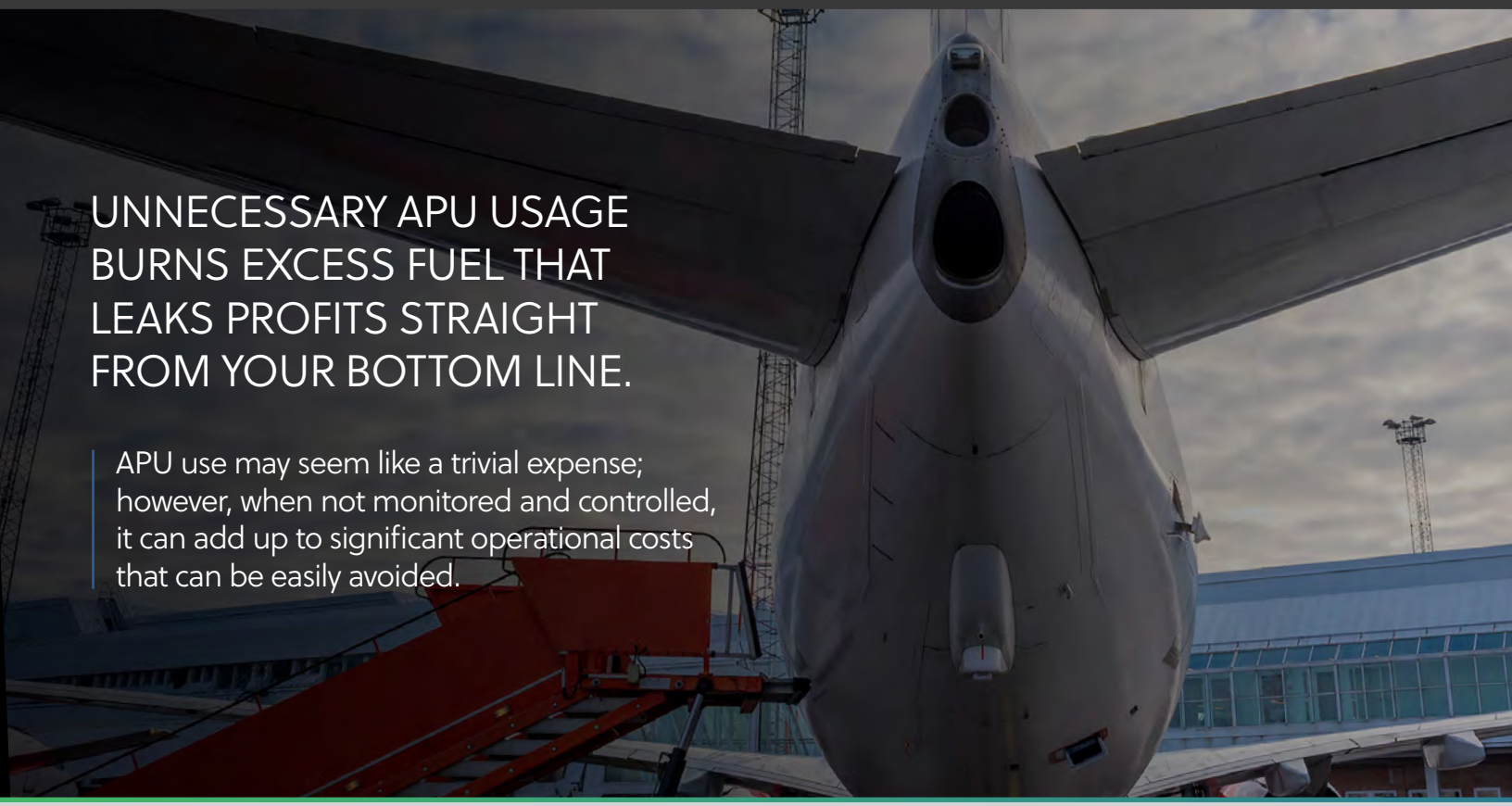
- Aircraft data access through A429, A717, RS232, RS422, and discretes
- Network interfaces including Ethernet and USB
- Bluetooth and WiFi wireless access point

Related Products:

- Multi-Channel WQAR
- AFIRS Analytics ACMS over IP
- ACARS over IP
- GADSS solutions
- JetBridge Applications

FLYHT™
INSIGHT • ACTION • CONTROL

ARE YOUR APUs BURNING PROFITS?



UNNECESSARY APU USAGE BURNS EXCESS FUEL THAT LEAKS PROFITS STRAIGHT FROM YOUR BOTTOM LINE.

> APU use may seem like a trivial expense; however, when not monitored and controlled, it can add up to significant operational costs that can be easily avoided.

Put AFIRS to work on your fleet and get a "REAL-TIME" handle on APU use.

Have remote situational awareness of all of your APU usage no matter where your aircraft are in the world. With AFIRS your operation center receives real-time notifications of APU over-use as soon as it occurs, day or night.

You can fully configure your APU notifications using the AFIRS over-the-air, remote customization function to manipulate reporting parameters such as:

- **Geo fencing**
- **Airport specific**
- **Time of day**
- **Gradated levels of exceedance** (e.g., 30 minutes amber, 45 minutes red)

FLYHT™
INSIGHT • ACTION • CONTROL

Customize your APU notifications and alerts to fit your organization

Alerts and notifications for when an APU exceeds your uniquely-tailored specifications can be sent via email to specified personnel, at specified sites, and at specified times. Notifications can also follow an escalation path to key personnel based on operating rules that you set. In addition to email, these alerts and notifications can be pushed to airline-provided tools and systems using an API.

Notification can also be sent and viewed on FLYHT's ASD FLYHTMap as illustrated below.

Use AFIRS to drive real-time operational savings

If not properly tracked and controlled, an unchecked APU can burn fuel and profits. The chart below illustrates how quickly fuel consumption over time can escalate your operating costs.

Aircraft Type	APU Fuel Burn lbs/h	Avg AC Cycles per Year	Avg APU cycles per AC Cycle	Avg APU RT per APU Cycle (hr)	APU Fuel burn per Aircraft per Year
CRJ 200	220	1850	2	0.2	42,774 USD
B737	243	1850	2	0.2	47,246 USD
B757/B767	253	1250	2	0.2	33,237 USD
A320	278	1850	2	0.2	54,051 USD
A330	463	1250	2	0.2	60,824 USD
B777	688	1250	2	0.2	90,383 USD

**Based on internal results and industry data such as IATA who have accumulated data from OEMs and airline customers.*

Costs associated with APU run-time go beyond just fuel burn; other factors contribute to cost overages such as warranty impact, MTBF tracking results, and even other power-by-the-hour contractual relationships.

By being instantly aware and notified of APU overages your organization is easily able to control the costs that are readily controllable and achieve an easy ROI on real-time APU alerts and actions.

Canada
#500, 1212 – 31 Avenue NE
Calgary, AB
Canada T2E 7S8

USA
4600 South Syracuse, Suite 900
Denver, CO, USA 80237-2719
USA

Europe
Hanauer Landstrasse 312,
D-60314 Frankfurt a.M.
Germany

China
27 building 3-112,
An De Lu No.55,
Dong cheng District, Beijing
China

ClearPort™

A Clear Window Into Your Turn Process

On Time Performance should not be based on luck. Move beyond reporting, take action before the delay.

- Transparency on ALL PROCESSES of the turn
- Manage ALL milestones in real-time
- Set KPIs based on data-driven targets
- Lower carbon emissions
- Decrease turn times

Manage Unmet Aircraft as they happen. Achieve increased aircraft utilization and network efficiency.

Increase On Time Performance (OTP)

- Understand the ROOT cause instead of finding blame after a delay.

Make Decisions In Real-Time

- Live data allows you to focus your attention on milestones that can cause a delay prior to a delay happening.

Hold ALL Parties Accountable

- Know ALL your milestones, including catering, grooming, bridge driving, to provide accountability to ALL parties involved in the turn.
- Use newly available data to develop service level agreements that reward adherence to the process and avoid charge backs.

Save time and resources with minimal IT involvement needed to integrate.

Lower Carbon Emissions

- By using alerts, make sure that you are turning off the APU when the conditions are right to save money and lower your carbon footprint.

Decrease Turn Times

- Visibility into your turn allows you to find those spots where you can save valuable time on your turns without affecting your OTP.

Subject Matter Experts At Your Disposal

- We provide full support throughout deployment and operation without involving your IT department.

Do you understand the root cause of your delays?

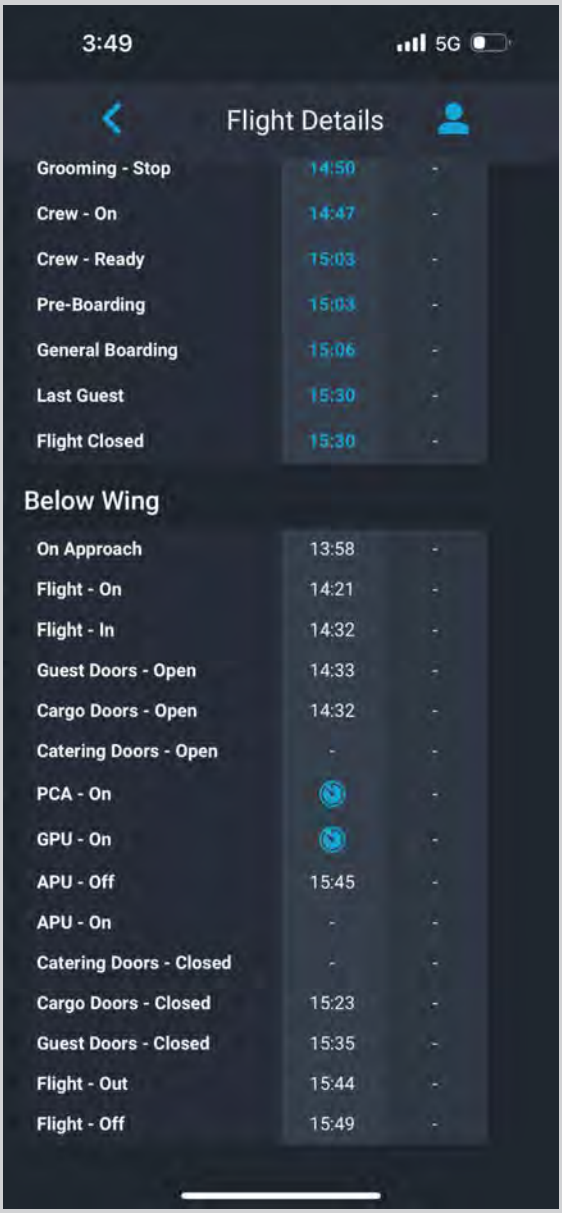
Be in the know. See more with ClearPort™.

Phone: 1.403.250.9956 Email: sales@flyht.com www.flyht.com FLYHT AEROSPACE SOLUTIONS LTD.

FLYHT INSIGHT • ACTION • CONTROL

Track your turn milestones in real-time

- ALL process of your turn in one simple app view.
- Historic data and trends so you can evaluate your KPIs



Canada
#500, 1212 – 31 Avenue NE
Calgary, AB, T2E 7S8
Canada

USA
4600 South Syracuse, Suite 900
Denver, CO, 80237-2719
USA

Europe
Hanauer Landstrasse 312,
D-60314 Frankfurt a.M.
Germany

China
27 building 3-112, An De Lu No.55,
Dong Cheng District, Beijing
China

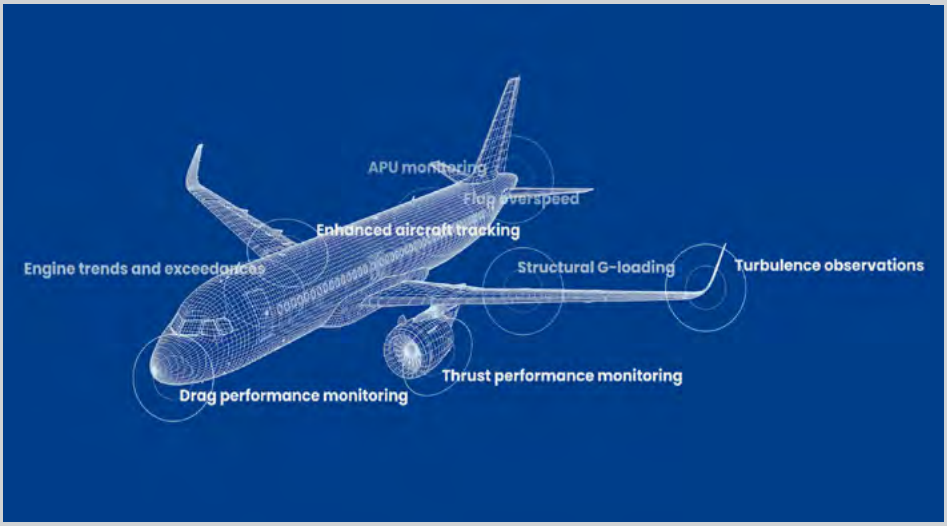
Phone: 1.403.250.9956 Email: sales@flyht.com www.flyht.com

FLYHT AEROSPACE SOLUTIONS LTD.

FLYHT
INSIGHT • ACTION • CONTROL

FLEETWATCH

FLIGHT FOLLOWING & GADSS ICAO COMPLIANCE



Customizable exception-based visual alerting

Configurable Fleet wide situational awareness on a global scale

Global Flight Tracking & Alerting

Track aircraft through the entire flight, including remote areas, for real-time alerting and actionable intelligence

Real-time AFIRS position data is displayed on FleetWatch, FLYHT's aircraft situational display (ASD)

Reporting intervals when integrated with the AFIRS system are fully configurable on the fly (30 seconds – 60 minutes) and appear as real-time plots, showing the exact position of the aircraft.

With AFIRS connecting to a variety of onboard systems

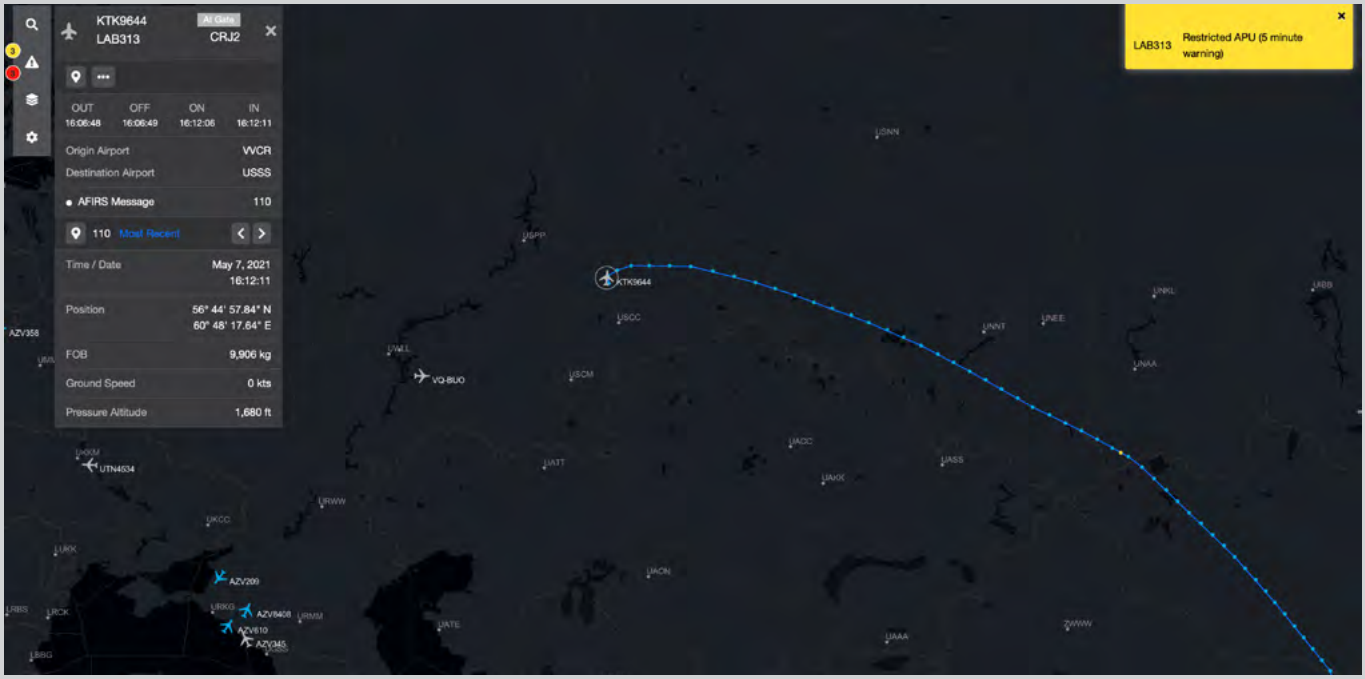
- Aircraft data can be used to monitor the status of aircraft
- Additional information such as fuel on board, departure/arrival airports and arrival time, for example, allow for a richer real-time view of the aircraft.

Related Products

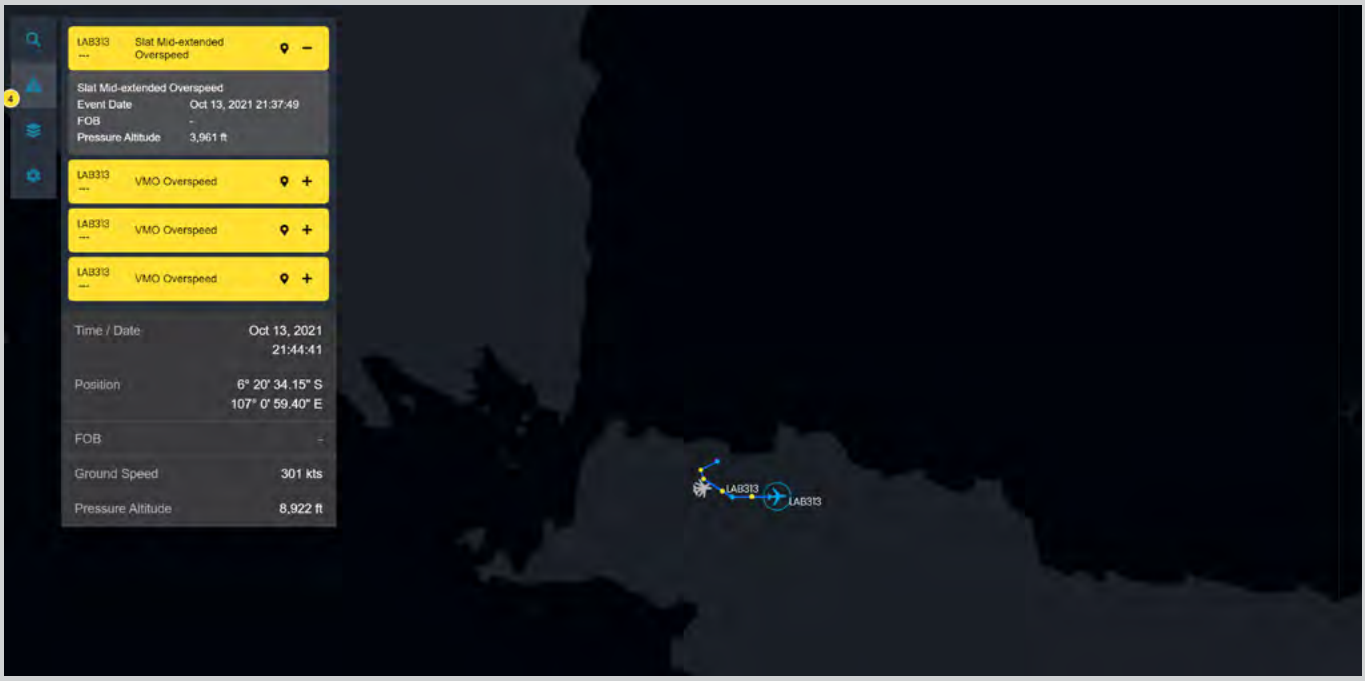
- FuelSense
- ClearPort
- AFIRS 228 (B, S, TSO)
- AFIRS Edge

FLYHT™
INSIGHT • ACTION • CONTROL

Fleet situational awareness at your fingertips



Real-time awareness of flight and aircraft condition



Canada
#500, 1212 – 31 Avenue NE
Calgary, AB
Canada T2E 7S8

USA
4600 South Syracuse, Suite 900
Denver, CO, USA 80237-2719
USA

Europe
Hanauer Landstrasse 312,
D-60314 Frankfurt a.M.
Germany

China
27 building 3-112,
An De Lu No.55,
Dong cheng District, Beijing
China

FUELSENSE

SAFE AND ACTIONABLE FUEL EFFICIENCY

Providing targeted guidance through impactful decision support

Drive operational change with quantifiable data

Discover the "fuel leaks" in your operation

- **Monitor** the effectiveness of operational policy and fleet changes right inside the program
- **Quantitatively understand** fuel efficiency at each phase of flight to improve flight crew procedures
- **Proactively manage** and minimize APU use
- Gain insight into **and prevent** gate arrival delays
- **Minimize** the cost of carriage and apply your learning to flight planning procedures
- **Compare** real flight data to how the flight was planned to highlight opportunities for improvement
- **Identify** the likelihood of various unplanned events and the relevant amounts of fuel required, allowing flight dispatchers the ability to learn to safety and confidently plan less fuel

Customized tracking and analysis solutions are effortless with FLYHT's team of developers, data scientists and subject matter experts

Complement FuelSense with the complete JetBridge product suite to further enhance your awareness of, and reaction to, fuel efficiency challenges

Related Products:

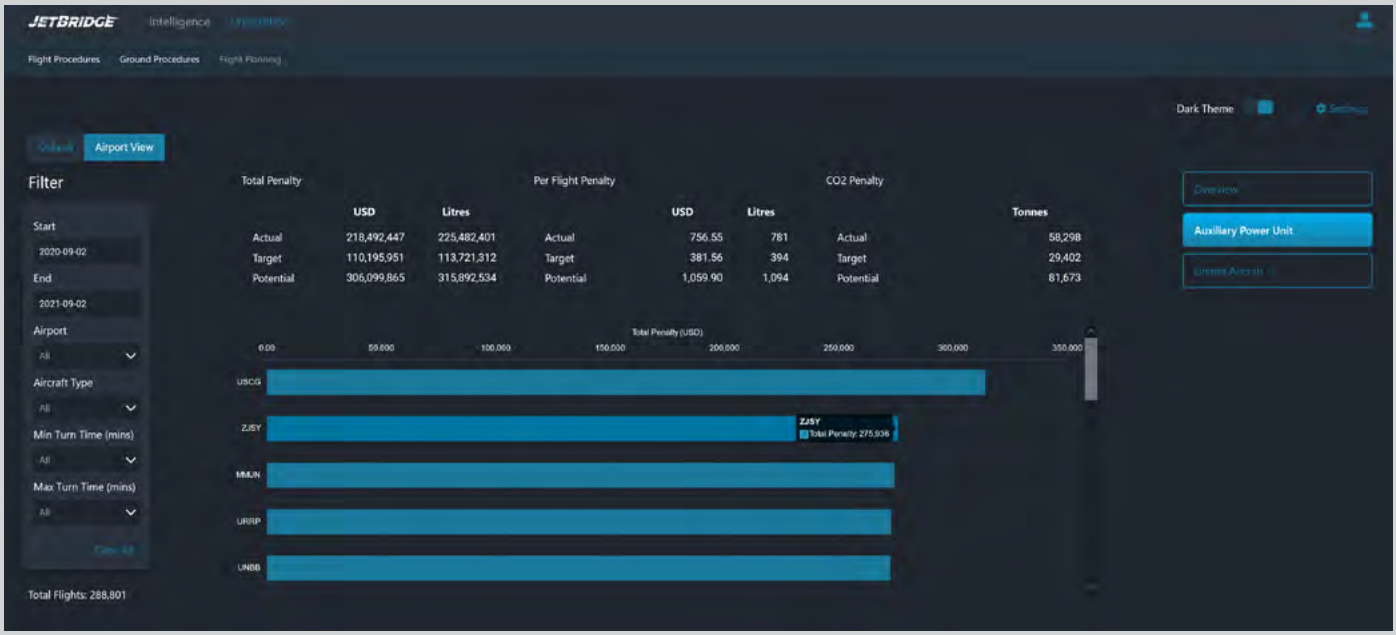
- FleetWatch
- ClearPort
- AFIRS 228 (B, S)
- AFIRS Edge

FLYHT™

INSIGHT • ACTION • CONTROL

Forecast definitive savings

Manage multiple initiatives with an intuitive interface



Canada
#500, 1212 – 31 Avenue NE
Calgary, AB
Canada T2E 7S8

USA
4600 South Syracuse, Suite 900
Denver, CO, USA 80237-2719
USA

Europe
Hanauer Landstrasse 312,
D-60314 Frankfurt a.M.
Germany

China
27 building 3-112,
An De Lu No.55,
Dong cheng District, Beijing
China

AIRCRAFT-BASED MOISTURE MEASUREMENT

AIRCRAFT-BASED OBSERVATIONS WITH MOISTURE DATA ARE A CRITICAL DATA INPUT TO IMPROVE WEATHER SERVICES FOR AVIATION OPERATIONS

AVAILABLE AIRCRAFT BASED MOISTURE MEASUREMENT SYSTEMS

- FLYHT-WVSS-II: Operational on commercial aircraft since 2005
- TAMDAR: Operational on commercial aircraft since 2004

BENEFITS TO WEATHER COMMUNITY:

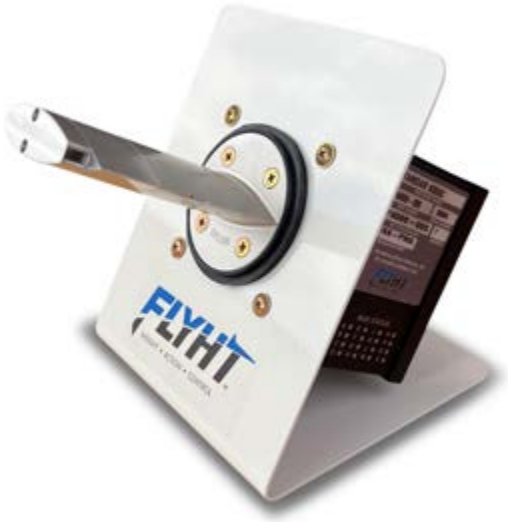
- Supplements the existing radiosonde network to increase spatial and temporal resolution of upper air observations
- Since introducing moisture observations to national weather services, the data have improved warnings and forecasts for the following conditions:
  - Precipitation type and intensity
  - Thunderstorms/heavy rain/flooding events
  - Low-level wind shear/crosswinds
  - Clouds (base/tops amount)
  - Low visibility conditions (IFR and MVFR)
  - Icing/frost/fog
  - Droughts/wildfire weather

BENEFITS TO AIRLINES:

- 70% of all delays at high-capacity airports are weather related. Better planning for weather events supports significantly flight operations
- Safer and more accurate route planning to avoid severe weather
- Improved forecasts will improve optimization of fuel planning and consumption and reduction of fuel costs and CO2 emissions
- Improved prediction of conditions favoring contrail production and avoidance
- Customer perception improved due to taking a leading role in reducing emissions footprint and addressing to environmental concerns

As extreme weather events continue to increase, we can reduce human impacts and save money by increasing the accuracy of weather forecasts.

CrossConsense®
A FLYHT Company



FLYHT-WVSS-II

- Stand-alone water vapor sensor that uses Tunable Diode Laser Absorption Spectroscopy
- Combine with aircraft AMDAR to measure and report static air temperature, winds, pressure altitude, indicated airspeed, GPS position and time
- No adjustments or settings necessary by airline partner
- Data are continuously transmitted
- No routine maintenance is necessary and minimal long-term maintenance is required
- No consumable components to be exchanged

TAMDAR

- All-inclusive sensor that measures and reports air temperature, ice presence, static and pressure altitude, relative humidity (two capacitive humidity sensors), turbulence (EDR), winds, GPS lat/long/alt/time
- Data are continuously transmitted over Iridium satellite network
- Ideal system for regional aircraft
- 3-5 years lifespan (7000-8000 flight hours)

OPPORTUNITY

A complete "end-to-end" solution:

- Proprietary high impact data from aircraft-based sensors
- Real time data, from anywhere on the planet communicated over various platforms (SATCOM, VHF, HF or Iridium)
- Increased vertical, horizontal and temporal data resolution supplementary to radiosondes
- Less expensive than the total cost of radiosondes over 5 years

Superior weather data, forecasting and analytics leading to faster decision making, more proactive risk mitigation, and lower costs

Additional Resources:

https://public.wmo.int/en/our-mandate/what-we-do/observations/Aircraft-based-observations
https://library.wmo.int/doc_num.php?explnum_id=9882
https://community.wmo.int/activity-areas/wmo-iata-collaborative-amdar-programme/benefits/amdar-benefits
https://community.wmo.int/activity-areas/aircraft-based-observations/resources/papers-and-references

Europe
Hanauer Landstrasse 312,
D-60314 Frankfurt a.M.
Germany

Canada
#500, 1212 – 31 Avenue NE
Calgary, AB
Canada T2E 7S8

USA
4600 South Syracuse, Suite 900
Denver, CO, USA 80237-2719
USA

China
27 building 3-112,
An De Lu No.55,
Dong cheng District, Beijing
China

Phone: +49 (0) 69.40 35 76 00 Email: marketing@crossconsense.de www.crossconsense.com

CrossConsense® A FLYHT Company