



WAAS SBAS - Flight Management Systems

# Flight Management Systems

The Flight Management Systems from Universal comply with future requirements and includes a wide range of advantages and features, including:

- ▶ Advanced future-proofed technology developed over the last 30 years
- ▶ Extensive navigation features, including 3-D guidance approach
- ▶ Easy and clear control of the system
- ▶ Extensive interface capabilities
- ▶ High contrast LCD-displays for excellent readability

# A safer approach - a safer flight



**With the WAAS/SBAS-capable FMS, you have access to all RNAV (GPS) approach types including the most precise and accurate GPS-based approaches available today. With Minimum Descent Altitudes (MDAs) as low as 200-feet with ½ mile visibility, this approach type improves safety and accessibility to airports which have much higher minima or no IFR approach at all.**

- LPV approach capability provides you with ILS-like guidance down to near CAT I ILS minimums (as low as 200-feet with 1/2-mile visibility).
- The integral GPS/WAAS receiver is certified to provide navigation accuracy within 0.01 nm with 99.999% availability when in the WAAS coverage area.
- Enhanced integrity and accuracy monitoring removes the RAIM prediction requirement.
- Allows you to plan GPS approaches to your flight plan destination as well as alternative.
- Allows approaches at smaller municipal airports at night when no local altimeter setting is available.
- Access to all RNAV (GPS) approaches - there are currently over 1,500 RNAV (GPS) approaches approved for use with WAAS worldwide, and more are being added every day.
- Universal's GPS/WAAS receiver is TSO-146b, class Gamma-3 and the WAAS antenna was the first to receive the TSO-C190 certification for a WAAS antenna.



# Superior - Now and in the future

## Hardware

Universal has continually and innovatively used advancements in computer technology to increase cockpit safety. The WAAS/SBAS-FMSs provide the latest generation platform for system development. The system has incorporated advanced-technology LCD flat panel displays which offer superior sunlight readability, higher resolution and wider viewing angles.

## Software

Designed for pilots by pilots, the intuitive system operation allows you to comfortably manage even the most complex flight maneuvers efficiently and quickly. The system provides the pilot with the greatest situational awareness, most efficient data entry and concise informative displays. The net result is more pilot heads-up time and increased flight safety.



## RNP/ANP

The systems meet emerging Required Navigation Performance/Actual Navigation Performance airspace operational requirements around the world, including European B-RNAV and P-RNAV. As RNP SAAAR requirements develop, WAAS/SBAS equipment will be a key enabler to provide 0.1 RNP capabilities.

## Datalink

Each FMS provides control and display functionality for the UniLink Communication Management Unit, offering air-to-ground, two-way datalink capabilities. A host of features are available today, including full ACARS messaging, position updates, clearances, weather, D-ATIS and more. The WAAS/SBAS-FMSs combine with the optional UniLink to offer a Communication, Navigation, Surveillance (CNS) suite which will allow you to take advantage of the routing/communication benefits available in the NextGen CNS/ATM environment.

## TAWS

The systems are also designed to interface with both our Class A and Class B TAWS Terrain Awareness and Warning Systems. TAWS increases situational awareness by providing visual terrain displays relative to current and predicted aircraft position supplied by the WAAS/SBAS-FMS. Alerts in accordance with standard Ground Proximity Warning System modes are also provided. The WAAS/SBAS-FMS and TAWS combine to realize the highest level of safety in protecting against Controlled Flight Into Terrain (CFIT) accidents.

# An extensive range of functions

## FPL

### Flight Planning Function

The Flight Planning function provides the pilot with the quickest, most efficient means of creating a flight plan, and the most pilot-friendly method of altering the flight plan elements as desired by the Air Traffic Control. It has been engineered to incorporate the greatest level of safety, with numerous built-in safeguards such as the entry of list-referenced selections which reduce both keystrokes and errors.

## NAV

### Navigation

The WAAS/SBAS-FMS will fly all procedural leg types in accordance with ARINC 424. This sophisticated capability allows you to fly the most complex procedures such as a heading to altitude, precision arc, procedure turn, holding pattern and more – all the necessary maneuvers required to accurately fly SIDs, STARs and approaches.

## DTO

### “Direct-To” Function

The DTO function key is specifically dedicated for flight plan changes in response to “Direct-To” clearances. The WAAS/SBAS-FMS easily takes you from your present position direct to any point on or off your flight plan using circular arc steering.

## VNAV

### Vertical Navigation

The WAAS/SBAS-FMSs incorporate the most advanced concepts in vertical guidance and control. VNAV pages provide for such features as computed Top-Of-Descent, Target Vertical Speed indication and selection, and Vertical Direct-To commands.

## FUEL

### Fuel Management

Using inputs from the fuel flow sensors, the WAAS/SBAS-FMSs provide real-time fuel management with the most extensive fuel information and calculations available – the kind that can eliminate unnecessary fuel stops, save you time and money and provide increased safety.

## PERF

### Performance Option

The UNS-1Ew and 1Fw WAAS/SBAS-FMSs provide a Performance option for select aircraft types for which performance charts from the Airplane Flight Manual are digitized and stored in memory.



## DATA

### DATA Function

The DATA function key provides access to a variety of navigation data management capabilities. Pages provide easy access to your stored navigation database for detailed review of SIDs, STARs, approaches, runways, airways, intersections, nav aids and airports.

## LIST

### LIST Function

Universal's unique LIST function provides quick and efficient means to access and enter data, minimizing alphanumeric entries and reducing input errors. The "smart" lists are geographically prioritized based on aircraft position and course, then alphabetized on each page.



## TUNE

### TUNE Function

Frequency management capabilities allow you to tune your NAV and COMM radios through the WAAS/SBAS-FMS – completely interfaced with your existing Radio Management Unit. The WAAS/SBAS-FMS presents a list of suggested COMM, Nav and NDB frequencies pre-selected based on aircraft position and phase of flight.

## MSG

### Message Function

An extensive library of messages has been programmed into the WAAS/SBAS-FMS. The message annunciator alerts the pilot of system status advisories, including waypoint alerts, sensor watchdog functions, TAWS alerts and self test.

# Universal WAAS/SBAS FMSs

## UNS-1Ew

The UNS-1Ew features an all-in-one package design which includes control/display functions and the navigation computer with integral GPS/WAAS receiver all in a single unit.

The system includes a graphics- and video-capable 5-inch diagonal display with a housing depth approximately 9 inches.

## UNS-1Lw

The UNS-1Lw is comprised of a 4- or 5-inch FPCDU and remotely mounted navigation computer.

The navigation computer is housed in a 2-MCU sized Line Replaceable Unit (LRU) which includes the integral GPS/WAAS receiver.

## UNS-1Fw

The UNS-1Fw is comprised of a Flat Panel Control Display Unit (FPCDU) and a remotely mounted navigation computer unit.

Three FPCDUs are available: a compact FPCDU with 4-inch color display, the standard FPCDU with 5-inch color display and an airline-type Multi-Function CDU (MCDU). All CDUs provide graphics support for weather images as well as video display capabilities for TAWS and camera interfaces.

The 4- and 5-inch FPCDUs are both just 3 1/4 inches deep. The navigation computer is housed in a 2-MCU sized Line Replaceable Unit (LRU) which includes the integral GPS/WAAS receiver. The UNS-1Fw incorporates extensive input/output capabilities for advanced system integration.



UNS-1Ew



UNS-1Lw



UNS-1Fw



# System features

	UNS-1Ew	UNS-1Fw	UNS-1Lw
<b>Flat panel color displays</b>	Integral	CDU	CDU
MCDU (video/graphics std.)		■	■
5-inch (video/graphics opt.)	■	■	■
4-inch (video/graphics opt.)		■	■
<b>Internal 12-channel GPS/WAAS</b>	■	■	■
TSO (JTSO) C129a Class A1/B1/C1	■	■	■
FDE prediction program for remote/oceanic ops	■	■	■
<b>Company route storage</b>	2,000	2,000	2,000
Clearance-language format	■	■	■
<b>Nav Database</b>	64 MB	64 MB	64 MB
SID/STAR procedures	■	■	■
Airways	■	■	■
Approaches	■	■	■
Plain-language references	■	■	■
<b>ARINC 424 procedural leg guidance</b>	■	■	■
<b>Heading Mode</b>	■	■	■
<b>VNAV</b>	■	■	■
Fully coupled	■	■	■
Computed top-of-descent	■	■	■
Target vertical speed	■	■	■
Vertical direct-to	■	■	■
<b>Holding patterns</b>	■	■	■
Included in navigation database	■	■	■
Manually defined	■	■	■
<b>3-D Approach Mode</b>	■	■	■
Laterally coupled	■	■	■
Vertically coupled	■	■	■
<b>Fuel Management</b>	■	■	■
Fuel flow inputs	4	4	4
<b>Take Off/Landing</b>	■	■	■
<b>Frequency Management</b>	■	■	■
<b>UniLink compatible</b>	■	■	■
Wx graphics	■	■	■
Text messaging	■	■	■
<b>TAWS compatible</b>	■	■	■
TAWS graphics	■	■	■
<b>Universal Cockpit Display compatible</b>	■	■	■
<b>SCAT-I GPS approach compatible</b>	■	■	■
<b>WAAS planned growth</b>	■	■	■
<b>LAAS planned growth</b>	■	■	■

# COMPLETE TURN-KEY SOLUTIONS

Scandinavian Avionics provides complete turn-key solutions for your FMS requirements:

► **Equipment**

Supply of Universal FMS and other required equipment.

► **Certification**

Supply of existing STC or development of new STC depending on the aircraft type.

► **Installation**

Installation of the Universal FMS at one of our facilities around the world or at any other EASA Part 145 approved facility.

► **Training**

Universal FMS familiarization training.

If you need more information or are interested in discussing your possibilities with the FMS solutions from Universal, please feel free to contact us.



We are Aircraft Systems Integration company with Design & Engineering as its core strength which is backed by Civil & Military approvals like Design -21, Sub Part J & CEMILAC including multiple years of successful track record of bringing Technology at the door step of customers & ensuring a sustainable business & industry at large.

We are team of technical craftsman with several decades of expertise in building new design & having it certified by respective regulator as STC for further implementation on aircraft.

With the stated expertise in the niche field we take pride in delivering a Safe & Complaint Solutions In India & subcontinent since several years consistently & winning the trust of customers.

CAR-145 | CAR/PART -21 | CEMILAC | ISO | WPC I