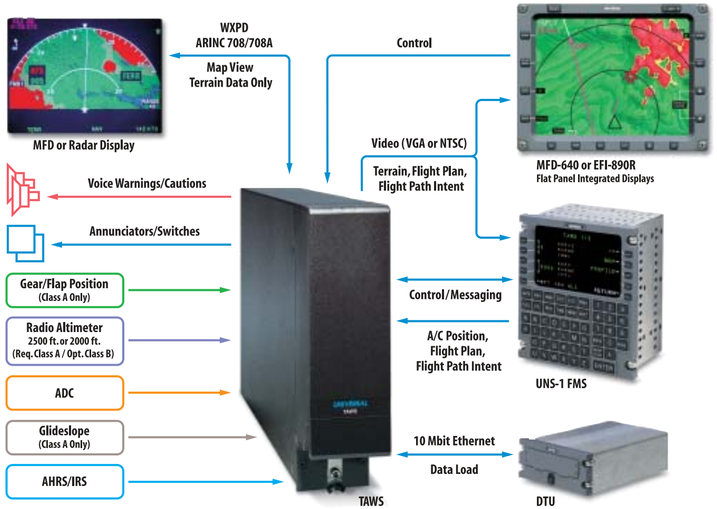


Display Interfaces:

Universal Avionics

EFI-890R
MFD-640
UNS FMS (5-inch display)

Honeywell

Primus 1000
EFIS-805 (specific versions via WXPD/SCI)
EFIS-10 (ARINC 708)
PRIMUS 880/660/440 series
PRIMUS 800/870/650 (WXPD/SCI)
RDR 4A/B

Collins

FDS-2000
PL-4000 EFIS
PL-21 EFIS
EFIS 85/86 (via WXP-850 or WXA-1000)
WXR-850
WXR-70X

Additional interfaces under development.
Contact your Universal Avionics representative.

Specifications:

Size: 2 MCU
Weight: 9.6 lbs (4.7 Kg)
Cooling: Passive cooling fan
Power: 28VDC @ 1.0 Amp nominal
Environmental categories: DO-160D
Minimum Performance Standards: DO-161A
Airborne Ground Proximity Warning Equipment
Software Certification: DO-178B Level C
Criticality level: Major
Terrain Database: DO-200A compliant
TSO: C151b Terrain Awareness and Warning System,
C92c Airborne Ground Proximity Warning Equipment

UNIVERSAL AVIONICS SYSTEMS CORPORATION

Corporate Offices
Marketing/Support
3260 E. Universal Way
Tucson, Arizona 85706 U.S.A.
Tel: (520) 295-2300
(800) 321-5253
Fax: (520) 295-2395

Midwest Operations
3815 Midco Street
Wichita, Kansas 67215 U.S.A.
Tel: (316) 524-9500
(800) 255-0282
Fax: (316) 524-9700

European Operations
Seewenweg 3
CH-4153 Reinach, Switzerland
Tel: +41-61-717-8310
Fax: +41-61-717-8311

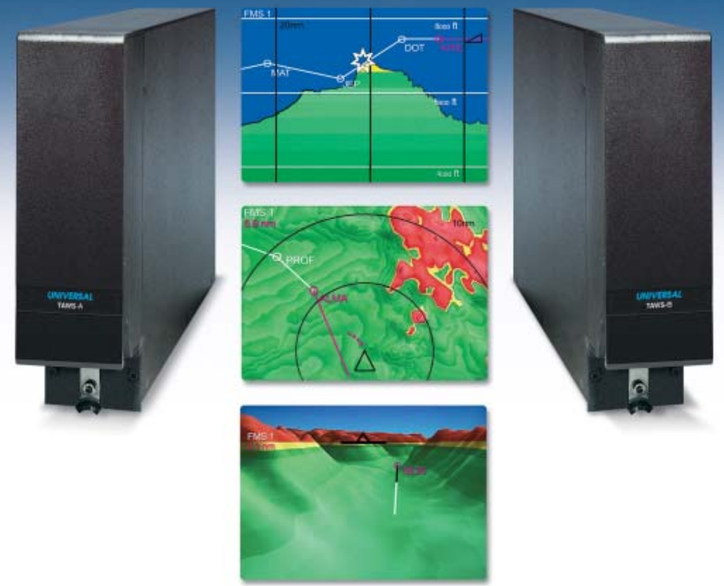
Internet
www.uasc.com
e-mail: info@uasc.com

TAWS-10/03

TAWS

CLASS A and CLASS B

Terrain Awareness and Warning Systems



UNIVERSAL AVIONICS SYSTEMS CORPORATION

Innovations in Situational Awareness…

Our unique 3-D Perspective View provides the highest level of situational awareness. Your TO waypoint is identified with a magenta circle at the position and altitude correlated with the FMS flight plan. The black portion of the pole extending from the waypoint to the terrain below represents up to 1,000 feet. Beyond this point the pole is colored white.

The Profile View shows terrain under the projected flight path. VNAV waypoints from the flight plan can be shown at their respective assigned altitudes. "Look Ahead" conflict advisories are depicted with a white threat symbol.

…Offering the Highest Level of Safety.

As a leader in the development of advanced avionics systems for over 20 years, we have dedicated our resources to increasing the safety of flight through enhanced pilot situational awareness and flightdeck workload reduction. Since 1986, our UNS-1 Flight Management Systems have provided three-dimensional guidance on non-precision approaches, worldwide, IFR approved. With the addition of either of our TAWS Terrain Awareness and Warning Systems you are provided yet another level of safety unparalleled in the industry.

The FAA-mandated deadline for TAWS equipage is coming soon (March 29, 2005). Be proactive in making decisions concerning your safety of flight. The studies conducted by the FAA determined that a large percentage of CFIT accidents could have been avoided with a terrain warning and display system. Our TAWS systems go well beyond the requirements, offering additional interface capabilities and unique display presentations which can provide you with the highest level of situational awareness and increase the safety of your flight today.

Contact a Universal Representative for a demonstration, and see for yourself the benefits afforded by selecting an advanced TAWS from Universal Avionics.

Class A and Class B TAWS

Our Class A or Class B TAWS will increase your situational awareness and provide advanced warning of a Controlled Flight Into Terrain (CFIT) condition. These systems, approved in accordance with TSO C151b requirements, offer forward looking terrain avoidance based on terrain data and the aircraft's state and predicted flight path. They also provide the class-specific, required RTCA DO-161A and TSO-C92c ground proximity functions warning of imminent contact with the ground. Both systems also provide the required Premature Descent Alerts, an aural "Five Hundred" callout, and alerts based on temperature-compensated and GPS altitudes. Our Class A system will also support smart bank angle alerts.

The Map View includes a trend vector depicting a 30-second flight path prediction based on aircraft state. The Map View will automatically pop up onto the display should a conflict be detected.

A map view of terrain can be output using ARINC 708 or WXPD formats for interface with various existing weather radar displays as well as Primus and Pro Line EFIS. The maximum terrain elevation is also displayed.

Color-coding is utilized to depict terrain relative to the aircraft's altitude. Red shows terrain above. The yellow band is flight phase dependent reflecting terrain down to 1,000 feet below during enroute, 500 feet in terminal areas, and 250 feet on approach.

Display Interfaces

Both our Class A and Class B TAWS systems provide outputs for dynamic display of terrain relative to aircraft state and predicted flight path.

The most advanced display features are available on our video-display-capable MFD-640, EFI-890R and Super FMS Control Display Unit. These displays support an advanced Map View, and, when used with a current-version UNS FMS, they can offer unprecedented 3-D Perspective and Profile Views as well. In the event of an alert, the Map View will automatically pop up onto the display with the appropriate threat graphic displayed (yellow caution or red warning) flashing at the associated position of terrain conflict. With compatible FMS data, the Map View can include a trend vector depicting a 30-second flight path prediction, and the Profile View can include the display of waypoints at altitudes correlated to the FMS vertical flight plan. The Profile View also displays "look ahead" advisories (white conflict graphic) should a terrain conflict, not close enough to trigger a caution or warning, be identified farther along your flight plan.

Offering the greatest installation flexibility, both Class A and Class B systems can also output terrain data to other displays including those with ARINC 708 compatibility, as well as both current and legacy Collins Pro Line® and Honeywell Primus® EFIS and WXPD weather radar displays.

Terrain Data

Our high-resolution terrain database is stored in internal flash memory and is updated using our Data Transfer Unit via a 10Mbit Ethernet bus. It features a data point approximately every 0.5 mile worldwide and up to 0.1 mile at mountainous airports. The terrain database also includes data for depicting oceans and large inland water bodies.

Safety

With TAWS, you are afforded the highest level of safety in avoiding accidents associated with controlled flight into terrain.

Exceeding Mandated Requirements with Options to Match Your Operation	Class A	Class B
Ground Proximity Warning functions per DO-161A and TSO 92c	■	■
Mode 1: Excessive rates of descent	■	■ Notes 1, 2, 4
Mode 2: Excessive closure rate to terrain	■	
Mode 3: Negative climb rate or altitude loss after takeoff	■	■ Notes 1, 2, 4
Mode 4: Flight into terrain when not in landing configuration	■	
Mode 5: Excessive downward deviation from an Instrument Landing System (ILS) glideslope.	■	■ Notes 1, 3, 4
Mode 6: Altitude Aural Callouts	■ RA required	■ Notes 1, 3, 4
"Five Hundred" callout	■	■
Additional altitude callouts	■ (opt.) Note 5	
Smart bank angle alerts	■ (opt.)	
Forward Looking Terrain Avoidance functions per TSO-C151b	■	■
Reduced Required Terrain Clearance Alerts – Generated when the aircraft is currently above the terrain in the projected flight path of the aircraft, but the projected value of terrain clearance is considered unsafe for the phase of flight.	■	■
Imminent Terrain Impact Alerts – Generated when the aircraft is currently below the elevation of a terrain cell along the lateral projected flight path of the airplane and, based on the vertical projected flight path, the system predicts that the terrain clearance will be less than the required terrain clearance for the phase of flight.	■	■
High Terrain Impact Alerts – Generated when the terrain ahead and along the flight path is higher than 1500 feet above the projected vertical path.	■	■
Flight Path Intent Advisory Alerts – Generated when the terrain ahead and along the flight plan conflict.	■	■
Terrain Display function	■	■
VGA/RGBS Video (Interface to Universal MFD-640, EFI-890R and FMS 5-inch CDUs. Provides contoured Map View, Profile View and 3D Perspective View.)	■	■
Honeywell - Primus EFIS and WXPD displays (See Display Interfaces)	■	■
Collins - WXR, Pro Line and FDS 2000 displays (See Display Interfaces)	■	■
ARINC 708 weather radar displays	■	■
Appropriate visual and aural discrete signals for both caution and warning alerts	■	■
Premature Descent Alerts (PDA) – Generated when the aircraft violates the minimum ground clearance boundary (MGCB) protection along the final approach segment to an airport.	■	■
Temperature-compensated altitude	■	■
GPS altitude	■	■
Predicted Wind Shear prioritization interface	■	■

■ *Required*
■ *Included*

Note 1: These select GPWS alerts use Height Above Terrain (HAT) in lieu of Radio Altitude (RA) since RA is not required for these installations.
Note 2: If RA is available, it will be used for these alerts, and the system will revert to HAT if the RA fails.
Note 3: Mode 5 alerts and other altitude callouts may be configured if RA is available, but they will not function if RA has failed.
Note 4: Class A TAWS requires a 2500-foot or 2000-foot RA. Either RA may be used for Class B TAWS, but neither is required.
Note 5: A large number of selected altitudes between 10 and 2000 feet may be configured for audio callout.