



OASIS® – OPEN ARCHITECTURE SYSTEM INTEGRATION SYMBOLOGY

CUSTOMIZABLE FLIGHT DISPLAY SYMBOLOGY
WITHOUT RECERTIFICATION

OPEN ARCHITECTURE SYSTEM INTEGRATION SYMBOLOGY (OASIS®)

OASIS® is a ground-breaking embedded software tool from Moog's Genesys avionics which allows customers or third parties to autonomously generate specific symbology to customize OASIS and synoptic displays on the Genesys IDU EFIS Smart Displays. OASIS can also create customized flight symbology for overlays on the existing certified EFIS PFD page. The OASIS tool is embedded in the display's RTCA/DO-178B Level A software. OASIS pages and overlays are created with a configuration file, loaded onto target displays, and do not require lengthy software recertification process.

BENEFITS OF THE OASIS SOFTWARE TOOL

Feature	Benefit
User-definable symbology for most flight display pages	Custom, aircraft-specific flight display symbology with reduced non-recurring costs and faster aircraft certification
Pre-defined "widgets" for common elements	Minimizes development time for new applications
OASIS programming tool is human-readable English language ASCII text	Easy to learn and implement
Windows toolkit and simulator	Allows for lab simulation and testing prior to loading on aircraft
Open source audio	Supports any sound, any language, any gender
Open IP ownership	OASIS files can be owned and controlled by the OEM, integrator, or end customer
Math functions and Boolean operations	Extremely powerful conditional display and alert logic
"Dummy" I/O ports	Enables complex ARINC label handling
DO-178 Level-A software	Suitable for any class of aircraft
TSO-independent certification	OASIS files do not affect the TSOs of the avionics system; the functions are tested and approved at the aircraft level.

DATA - OASIS can read any label on an ARINC 429 receive port and has access to all system discrete inputs and outputs. OASIS also interfaces with certain custom RS-232/422 message data. OASIS can manipulate incoming ARINC 429 data and output modified labels to any ARINC 429 transmit port. It can also assert any of the system discrete inputs and outputs.

STANDARDIZED SYMBOL ELEMENTS - EICAS customization is accomplished by using a library of RTCA/DO-178B Level A software elements. The appearance, arrangement and behavior of these elements are defined using a configuration file so the core EFIS software is not affected, thereby eliminating the need to recertify software when changes are made.

- Open architecture symbology provides extensive opportunities for future autonomous growth.
- Extensive customization as well as changes late into flight test programs can be accommodated without affecting certification schedules.
- Configuration changes only require unit testing and acceptance testing instead of lengthy software certification testing.
- Each OASIS data element can be depicted as a standard symbol element or as a custom designed symbol.



Engine and system indication and CAS messaging can be developed to meet customer specifications; Typical parameters include:

- Fuel quantity
- Fuel Temperature
- Battery temperature
- Fuel pressure
- ITT indicator
- Hydraulic oil temperature
- Hydraulic system pressure
- Transmission oil temperature and pressure
- Gearbox Oil Temperature and Pressure
- Engine oil temperature and pressure
- Triple tachometer
- Dual torque pressure
- Dual DC ammeter
- Dual AC and DC voltmeter
- Chip detectors



CAS MESSAGES - Up to 1024 custom CAS messages can be created in an OASIS configuration. CAS messages can appear on the EFIS PFD and/or in a CAS box on any OASIS page. CAS messages can be assigned advisory, caution, or warning visual alerts and can be assigned any of the system aural alerts or custom sounds. In addition, CAS messages can be entirely logic in nature with no visible CAS message or audible sound. In this manner, CAS messages can be used for complex Boolean logic functions that are used to manipulate the behavior of other OASIS elements and functions.

OPEN ARCHITECTURE SYSTEM INTEGRATION SYMBOLOGY (OASIS®)

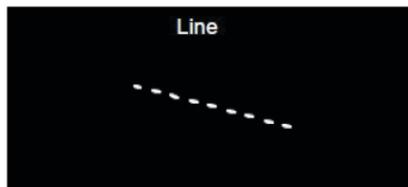
MULTIPLE PAGES - Each side in a system (Pilot/Copilot) can contain up to 10 different OASIS pages. Each page can support up to 512 symbols. Synoptic pages can be developed to easily display specific conditions of aircraft hydraulic, electrical and fuel systems. PFD overlay allows any OASIS symbol to be conditionally displayed on the PFD.

LIMITS AND EXCEEDANCES - Limits and exceedances can be configured for each element to determine caution and warning levels. This can determine when and how the alert is displayed to the crew. Each OASIS element can be linked to the source ARINC 429 label value with a math operator (=, <, <=, >, >=) to define the appropriate gauge ranges, limits, and exceedance logging. For example, oil pressure limits can change based on RPM, volt/amp gauge changes based on the position of the monitor switch, or torque/temperature limits change during OEI operation.

STANDARD SYMBOL ELEMENTS

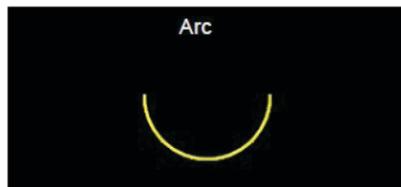
Each OASIS page can accommodate up to 512 standardized symbology elements allowing virtually any type of display to be constructed with the OASIS configuration file. Each element size, angle, color and behavior can be configured to create unique Engine or Synoptic pages or even overlaid on the PFD. The following lists the standardized symbology elements:

OASIS GRAPHICAL ELEMENTS



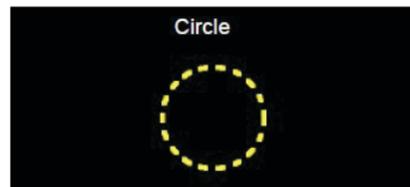
Configurable Options

Starting Position
End Position
Line Color
Dashed Line
Haloed Line
Line Thickness



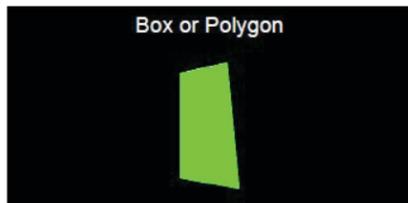
Configurable Options

Center Position
Start/End Angle
Arc Color
Dashed Line
Haloed Line
Arc Thickness
Arc Radius



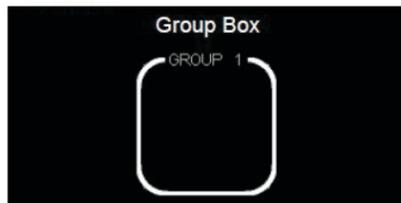
Configurable Options

Center Position
Circle Color
Dashed Line
Halo Line
Circle Radius
Circle Thickness



Configurable Options

Position
Color
Dashed Line
Haloed Line
Fill
3 - 10 Vertices
Line Thickness



Configurable Options

Box Size
Box Line Thickness
Box Line Color
Box Line Haloed
Corner Radius
Text
Text Color
Text Size
Haloed Text
Text Thickness



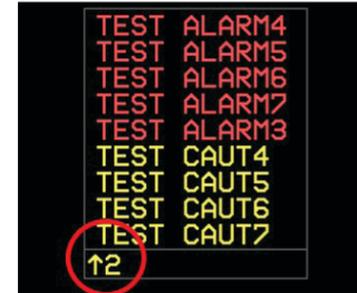
Configurable Options

Position
Text
Text Color
Haloed Text
Text Size
Text Thickness

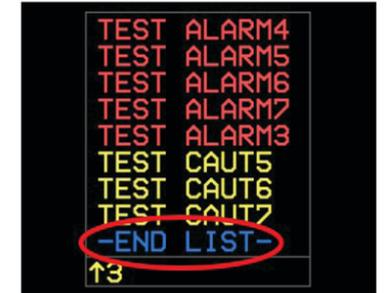
CREW ALERTING SYSTEM (CAS) ELEMENTS - Custom CAS messages can be displayed in a scrolling box or as a full CAS page. CAS messages can appear on the EFIS PFD and/or in a CAS box on any OASIS page.

CAS Display Box

- Custom CAS messages
- Messages are visually prioritized in order:
 - **WARNING** - level messages (red)
 - **CAUTION** - level messages (yellow)
 - **ADVISORY** - level messages (blue)
- Messages are stacked in chronological order
- Scrolling box to for CAUTION and ADVISORY messages
 - WARNING messages will always stay visible
 - Out-of-view counters to designate messages out of view



Indicates 2 more CAUTION warnings above



Indicates the end of CAS messages

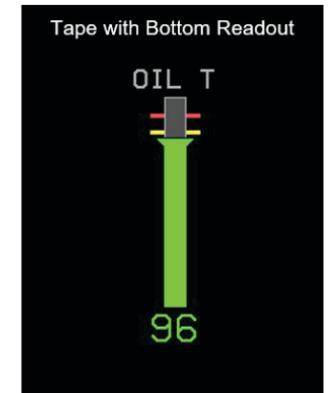
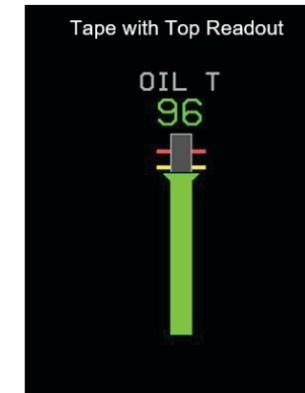
Configurable Options

Box Position
Max. Number of Characters - This will determine the width of the box
Max. Number of Lines - This will determine the height of the box

TAPE INDICATION ELEMENT - Multiple tape indications elements can be utilized for displaying engine parameter levels, such as the temperature and pressures of engine, oil or hydraulic systems. The text designator, digital readout, limit lines and tape appearance are all configurable.

Configurable Options

Position
Text Color, Size, Thickness, Halo
Tape Thickness
Digital readout Decimal Places
Up to 8 definable Limits
Variable limits based on events

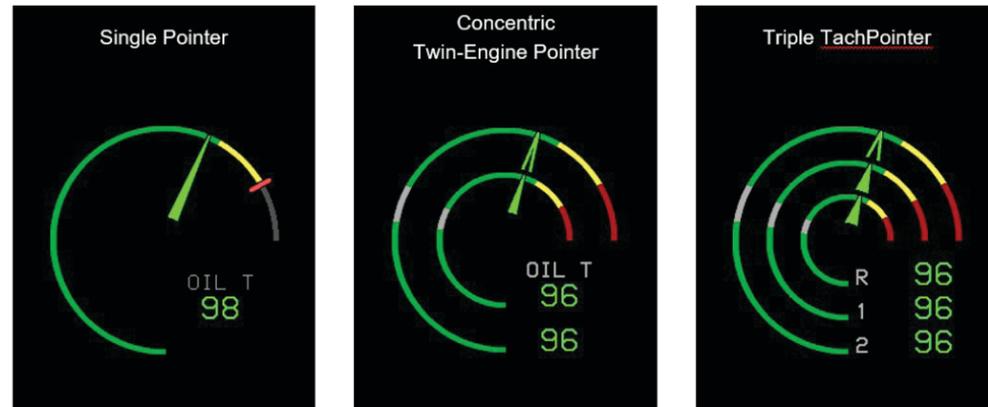


STANDARD SYMBOL ELEMENTS (CONT.)

POINTER INDICATION ELEMENT - Engine parameters can be displayed as single, twin or triple pointer indication elements. The text designator, digital readout, limit lines and tape appearance are all configurable.

Configurable Options

- Position
- Arc Radius
- Text Color, Size, Thickness, Halo
- Digital readout Decimal Places
- Up to 8 definable Limits
- Variable limits based on events

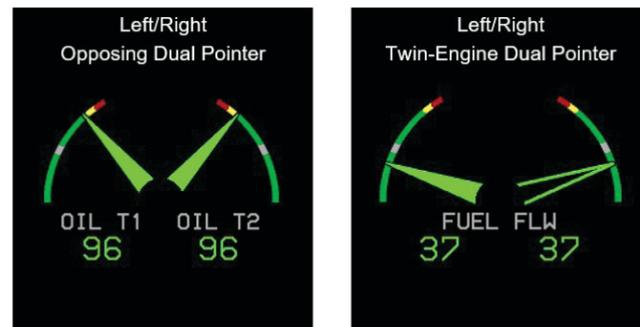


Dual opposing pointer indication elements are available for easy comparison between two parameters.

The twin-engine dual pointer will use a solid colored pointer for engine #1 and a hollow pointer to indicate the #2 engine. It also has a common text designator and separate digital readouts, whereas the dual opposing pointer can accommodate different text designators. The text designator, digital readout, limit lines and tape appearance are all configurable.

Configurable Options

- Position
- Text Color, Size, Thickness, Halo
- Tape Thickness
- Digital readout Decimal Places
- Up to 8 definable Limits
- Variable limits based on events



FUEL TANK ELEMENTS - The fuel tank element can be used for individual fuel tanks or to display the aircraft total fuel and consists of a color-coded tape with the digital readout displayed within the tape. Fuel tank indications have configurable color-coded tapes that will behave in accordance with their associated limits.

The total fuel element will react to the minimum and emergency fuel limits. The tape color changes to yellow when the fuel level is below minimum fuel levels and red below emergency fuel levels. All other levels are displayed as cyan.

Configurable Options

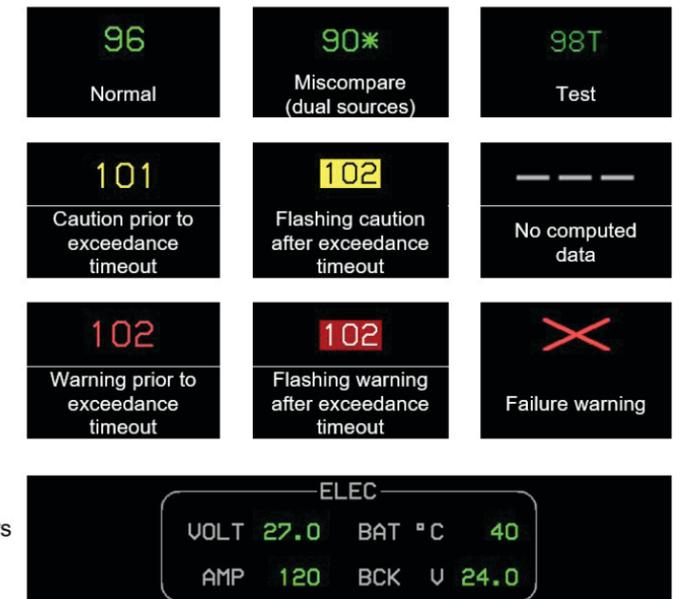
- Position
- Tape Thickness
- Digital readout Decimal Places
- Up to 8 definable Limits
- Variable limits based on events



DIGITAL PARAMETER INDICATION - Digital Parameter readouts are used in conjunction with tapes and pointers, as standalone values or grouped together as a system. In normal conditions the color can be configured to suit the application. The readout can automatically change to YELLOW (caution) or RED (warning) based on the associated exceedances or limits.

Configurable Options

- Position
- Readout size, color, thickness
- Digital readout Decimal Places
- Readout Label
- Up to 8 definable Limits
- Variable limits based on events
- Miscompare Threshold

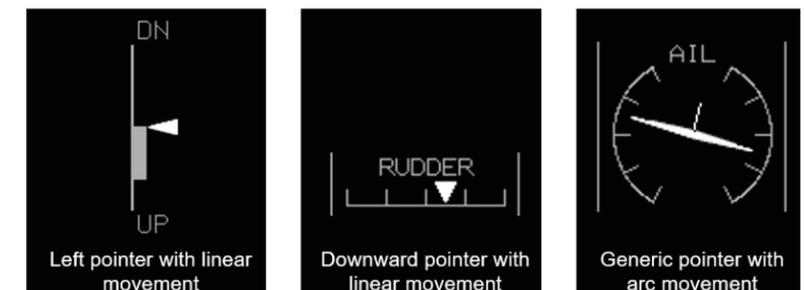


Example of Digital Parameters being used within a Group Box

GENERIC POINTER - Generic triangular pointers can be used to indicate any desired aircraft parameter such as flap and rudder position. The pointers can operate in a linear or arc movement.

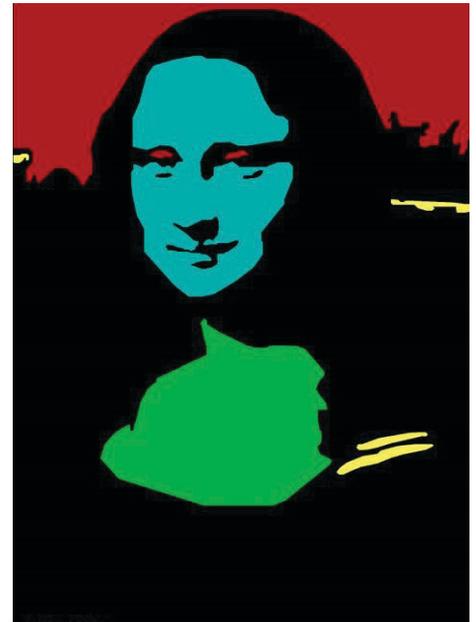
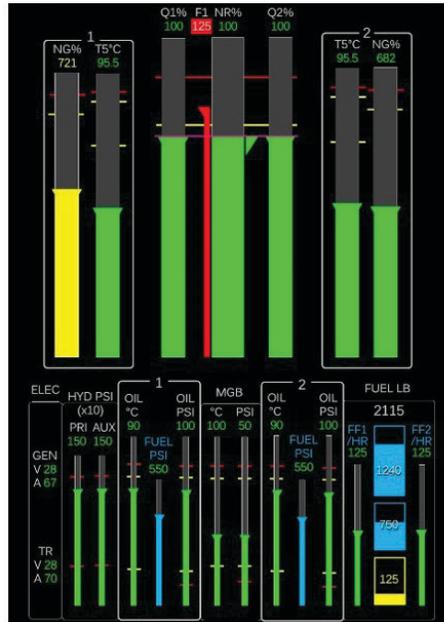
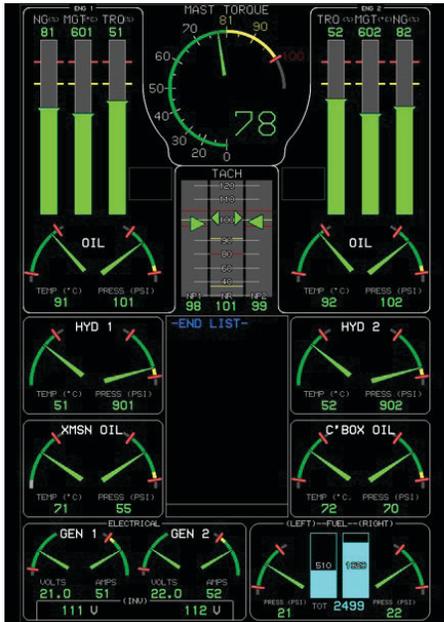
Configurable Options

- Color
- Pointer length and position
- Left/right/up/down pointers
- Arc radius/angle (arc movement pointer only)

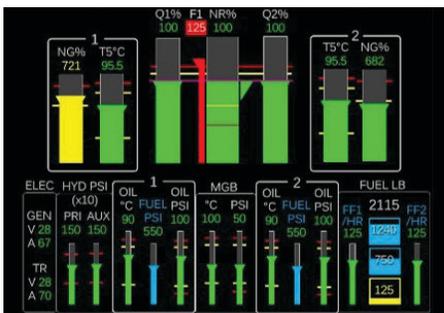


EXAMPLE DISPLAYS

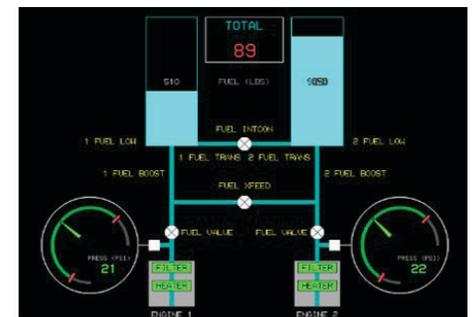
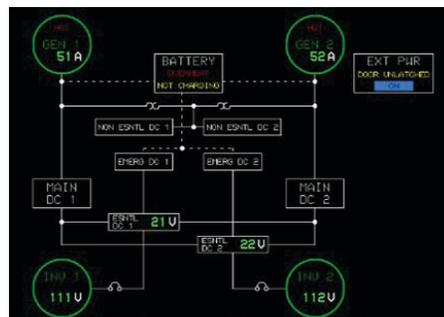
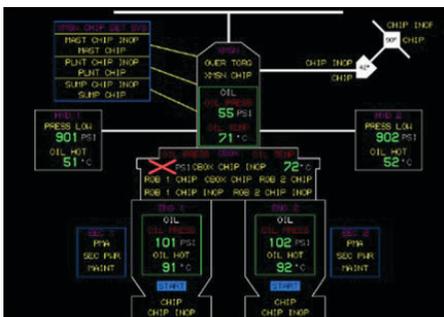
EXAMPLE FULL SCREEN EICAS DISPLAYS - Useful for engines start, high/hot operations, and external load work where peak engine performance is required



EXAMPLE HALF-SCREEN ENGINE DISPLAYS



EXAMPLE SYNOPTIC DISPLAYS



Example hydraulic system synoptic

Example electrical system synoptic

Example fuel system synoptic



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