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Fusion Application Form Custom Configuration

Contact Name: _____ Operator Name: _____
Phone: _____ Fax: _____ Address: _____
Email: _____ Vessel Name: _____

In order to insure that the correct system components are supplied and the DAU is configured to meet your needs, this application form must be completed and supplied to FTI at the time of order placement. If you have any system or configuration questions, please contact FTI, we will be happy to help you. Our goal is to supply a fuel management system that exceeds your expectations.

Propulsion System Information

Mechanical drive Electrical drive

Propulsion Engine Information

Propulsion Engine Make(s): _____

Number of Propulsion Engines: _____ 100% Power Rating: _____ HP kW

Fuel Piping Diameter: _____ inches mm Supply Line Pressure: _____ PSI Pa

Maximum Supply Flow Rate: _____ GPH Minimum Supply Flow Rate: _____ GPH

Maximum Return Flow Rate: _____ GPH Minimum Return Flow Rate: _____ GPH

Supply Fuel Temperature Max: _____ °F Nom: _____ °F Min: _____ °F

Return Fuel Temperature Max: _____ °F Nom: _____ °F Min: _____ °F

Engine Room Ambient Temperature Max: _____ °F Nom: _____ °F Min: _____ °F

RPM Sensor Setup

Engine 1: Model & Serial #: _____ # of Teeth on Flywheel: _____

Engine 2: Model & Serial #: _____ # of Teeth on Flywheel: _____

Engine 3: Model & Serial #: _____ # of Teeth on Flywheel: _____

Generator Engine Information

Generator Engine Make(s) & Model(s): _____
 Number of Generator Engines: _____ 100% Power Rating: _____ HP kW
 Fuel Piping Diameter: _____ inches mm Supply Line Pressure: _____ PSI Pa
 Maximum Supply Flow Rate: _____ GPH Minimum Supply Flow Rate: _____ GPH
 Maximum Return Flow Rate: _____ GPH Minimum Return Flow Rate: _____ GPH
 Supply Fuel Temperature Max: _____ °F Nom: _____ °F Min: _____ °F
 Return Fuel Temperature Max: _____ °F Nom: _____ °F Min: _____ °F
 Engine Room Ambient Temperature Max: _____ °F Nom: _____ °F Min: _____ °F

Analog Input Scaling Information

Analog Input 0 Type

CPP Angle (degrees) 4-20 mA 0-5 Vdc 0-10 Vdc
 Propulsion Drive Torque (ft-lbs) 4 mA: _____ 0 V: _____ 0 V: _____ min:
 Generator Power (kW) 20 mA: _____ 5 V: _____ 10 V: _____ max:

Analog Input 0 Scaling Details

Analog Input 1 Type

CPP Angle (degrees) 4-20 mA 0-5 Vdc 0-10 Vdc
 Propulsion Drive Torque (ft-lbs) 4 mA: _____ 0 V: _____ 0 V: _____ min:
 Generator Power (kW) 20 mA: _____ 5 V: _____ 10 V: _____ max:

Analog Input 1 Scaling Details

Analog Input 2 Type

CPP Angle (degrees) 4-20 mA 0-5 Vdc 0-10 Vdc
 Propulsion Drive Torque (ft-lbs) 4 mA: _____ 0 V: _____ 0 V: _____ min:
 Generator Power (kW) 20 mA: _____ 5 V: _____ 10 V: _____ max:

Analog Input 2 Scaling Details

Analog Input 3 Type

CPP Angle (degrees) 4-20 mA 0-5 Vdc 0-10 Vdc
 Propulsion Drive Torque (ft-lbs) 4 mA: _____ 0 V: _____ 0 V: _____ min:
 Generator Power (kW) 20 mA: _____ 5 V: _____ 10 V: _____ max:

Analog Input 3 Scaling Details

Analog Input 4 Type

CPP Angle (degrees) 4-20 mA 0-5 Vdc 0-10 Vdc

Analog Input 4 Scaling Details

- Propulsion Drive Torque (ft-lbs) 4 mA: _____ 0 V: _____ 0 V: _____ min:
 Generator Power (kW) 20 mA: _____ 5 V: _____ 10 V: _____ max:

Analog Input 5 Type

- CPP Angle (degrees) 4-20 mA 0-5 Vdc 0-10 Vdc
 Propulsion Drive Torque (ft-lbs) 4 mA: _____ 0 V: _____ 0 V: _____ min:
 Generator Power (kW) 20 mA: _____ 5 V: _____ 10 V: _____ max:

Analog Input 5 Scaling Details

Analog Input 6 Type

- CPP Angle (degrees) 4-20 mA 0-5 Vdc 0-10 Vdc
 Propulsion Drive Torque (ft-lbs) 4 mA: _____ 0 V: _____ 0 V: _____ min:
 Generator Power (kW) 20 mA: _____ 5 V: _____ 10 V: _____ max:

Analog Input 6 Scaling Details

Analog Input 7 Type

- CPP Angle (degrees) 4-20 mA 0-5 Vdc 0-10 Vdc
 Propulsion Drive Torque (ft-lbs) 4 mA: _____ 0 V: _____ 0 V: _____ min:
 Generator Power (kW) 20 mA: _____ 5 V: _____ 10 V: _____ max:

Analog Input 7 Scaling Details

Fuel Information

Fuel: Diesel #2 MGO Other (please specify) _____

Electrical Power Information

Power Available: 115 Vac 220 Vac

Global Positioning System (GPS) Information

Is a GPS available in the pilothouse with a serial NMEA 0183 signal to connect to the Fusion DAU?

- Yes No

Data Acquisition Unit Mounting Information

How would you like to mount your DAU in the pilothouse?

- Panel Mount
 Vertical Bulkhead (Wall) Mount Bracket



Horizontal Bulkhead (Ceiling) Mount Bracket
 29 in. tall, extendable to 49 in.



Data Acquisition Unit Configuration Information

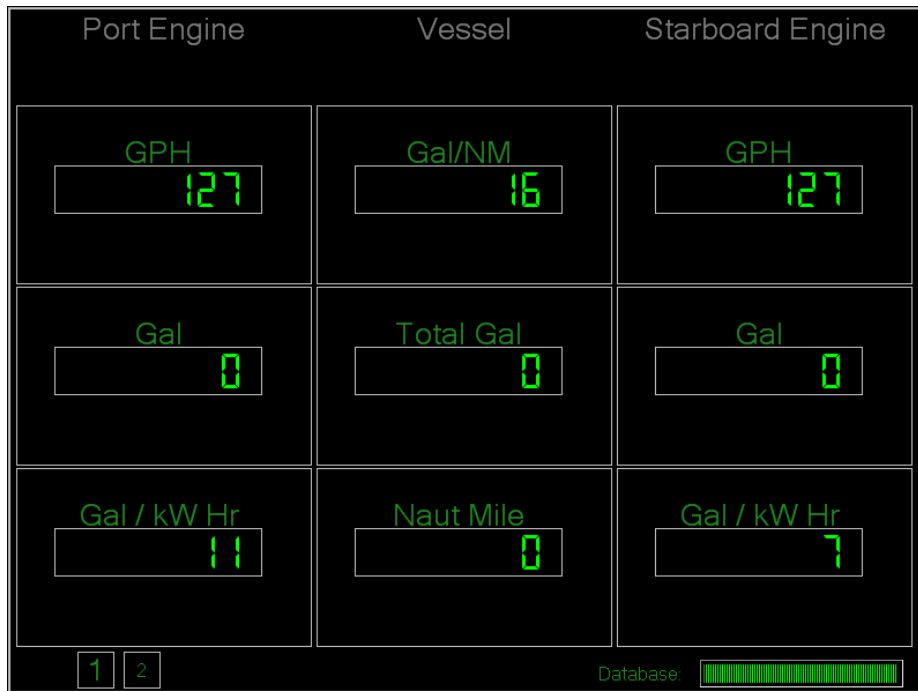
The Fusion DAU set up is extremely flexible, allowing the unit to collect data from various sources and display the information specifically for the application. Standard screen configurations are available, and can be viewed in FTI document number SF-69277. The Fusion system can be supplied with a custom screen configurations which will be set up and configured at the factory. If a custom configuration is required to meet your unique vessel requirements, please provide detailed information below.

Example Diesel Electric Generator Engine Configuration:

This diesel electric system consists of a supply and return flow meter for each engine as well as an analog to RS485 converter. The analog converter will allow a scaled analog signal representing the power produced by the generator to be captured and used for efficiency calculations in the DAU.

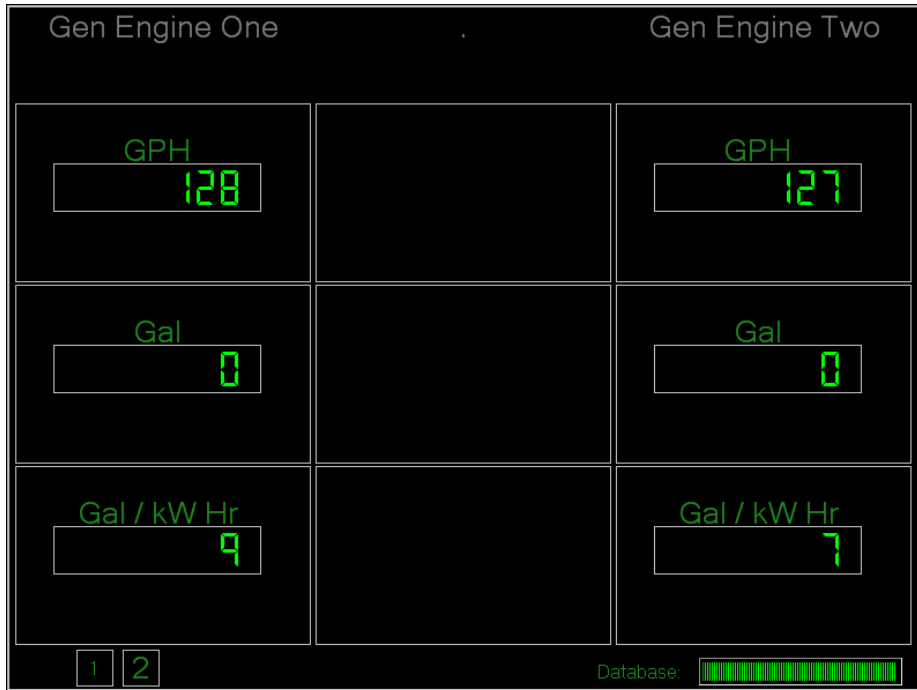
Main screen displayed information:

- 1) Port engine net fuel burn rate.
- 2) Port engine total fuel burned.
- 3) Port engine efficiency (fuel burn/kW Hr).
- 4) Starboard engine net fuel burn rate.
- 5) Starboard engine total fuel burned.
- 6) Starboard engine efficiency (fuel burn/kW Hr).
- 7) Vessel efficiency in fuel used per distance traveled. (port and starboard propulsion engines)
- 8) Vessel total fuel burned. (port and starboard propulsion engines, and generator one and two engines)
- 9) Vessel distance traveled.



Secondary screen displayed information:

- 1) Generator One engine net fuel burn rate.
- 2) Generator One engine total fuel burned.
- 3) Generator One efficiency (fuel burn/kW Hr).
- 4) Generator Two engine net fuel burn rate.
- 5) Generator Two engine total fuel burned.
- 6) Generator Two efficiency (fuel burn/kW Hr).



Display Units:

Display Units of Measure: English MPH/Knots: Metric LPH/Knots

Wheelhouse Display Configuration:

3 X 3 Grid
A B C

1	2	3
4	5	6
7	8	9

4 X 3 Grid
A B C D

1	2	3	4
5	6	7	8
9	10	11	12

3 X 4 Grid
A B C

1	2	3
4	5	6
7	8	9
10	11	12

4 X 4 Grid
A B C D

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Desired Column Titles (as applicable):

Column A: _____ Column B: _____ Column C: _____ Column D: _____
 Model #: _____ Model #: _____ Model #: _____ Model #: _____
 Serial #: _____ Serial #: _____ Serial #: _____ Serial #: _____

**Model and serial numbers above are needed. They are used as "tags" in the consumption database that allow you to monitor the performance of a specific engine/generator over time, and allow us to tag components for easy installation.*

Results to Display by Numbered Grid Location (as applicable):

Grid Square 1
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 2
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 3
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 4
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 5
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 6
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 7
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 8
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 9
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 10
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 11
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 12
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 13
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 14
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 15
Result: _____
Display Units: _____
Analog Bar Range*: _____
Low Bar Transition: _____
High Bar Transition: _____

Grid Square 16

Result: _____

Display Units: _____

Analog Bar Range*: _____

Low Bar Transition: _____

High Bar Transition: _____

Page Number: _____

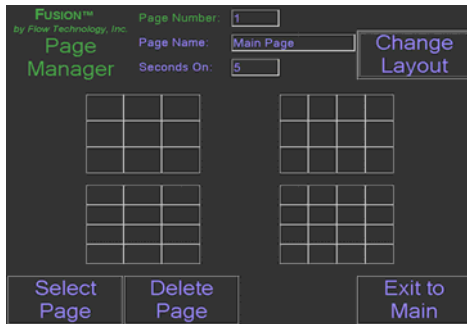
Time to Leave This Page on Display: _____ seconds

You'll only need to complete the page number and time fields above if you would like to rotate multiple screens on your DAU. For a multiple screen rotation, simply print out multiple copies of pages 1-2 of this form and complete them for each page you would like to display.

* Analog bars are not available for every display result. We will include them where requested and available.

Configuration Setup Sheet Help

Wheelhouse Display Configuration



In the picture below, the display gauges are laid out in a 3 X 3 grid. If you need or prefer to have your data displayed in a different way, there are also 3 X 4, 4 X 3, & 4 X 4 display grids available in Fusion.

You can configure the grid of your DAU by selecting the appropriate check box in the Wheelhouse Display Configuration section of the setup sheet.

Each column title you list under Desired Column Titles will be listed across the top of the display. "Engine #1" on this display is the title of Column A on the setup sheet. Titles can refer to individual engines, generators, groups of engines/generators, and/or the vessel itself.

Each grid square you configure will be located in the numbered location for the grid layout you selected. According to the 3 X 3 grid layout, this display location is grid square 1. You can configure the result gauge you want displayed here in the "Grid Square 1" box on the setup sheet.



Keep your column titles in mind when you're configuring the results gauges and their locations. These 3 results gauges are numbers 3, 6, & 9 on the 3 X 3 grid, but they will all be labeled with the Column C title. In this case, grid squares 3, 6, & 9 should all display results for "Vessel."

Completing Grid Squares

Result: The actual result you want the gauge to display. We recommend adding the applicable engine/generator to your description. A description of “Engine 1 Fuel Consumption” will display the average difference between the supply & return flows on Engine 1.

Display Units: The units of measure that you want the gauge to display the measured result in. The units you provide here will also be displayed above the gauge. (verbatim) In the example below, display units of “Gals / Hour” was requested.

Analog Bar Range: The complete range of results you want the analog bar to represent from the green values to the red values.

Low Bar Transition: The value you want to make as the transition when the bar turns from green to yellow.

High Bar Transition: The value you want to make as the transition when the bar turns from yellow to red.

**You can skip the analog bar settings if you don't want to display bars.*



The transition values can be fixed numbers, or a % of the bar's complete range

When defining results:

- 1. Keep in mind the sensors used for your configuration**
 - For example, you can't display engine RPM without RPM sensors
- 2. Results are created using math functions on system sensors**
 - An engine's fuel consumption is its supply flow minus its return flow
 - Fuel efficiency is the vessel's speed (from GPS) divided by fuel consumption
- 3. Results can be displayed as averages or totals**
 - Varying results like fuel consumption are averages over time
 - Totals can also be specified (a total of gallons consumed on a mission for example)
 - Analog bars are not available for results that display totals
- 4. Each sensor provides an output in a default unit of measure**
 - Different units of measure can be displayed for simple conversions
 - Sensor outputs can be multiplied by a fixed conversion value to change units
 - Conversions requiring complex calculations aren't available

Multiple Page Rotation

Page Number: You'll only need to fill this out if you want to rotate multiple screens. Simply print out multiple copies of pages 1-2 of the setup sheet, configure each page the way you like, and provide a unique number here for each page.

Time to Leave Page on Display: When using a multiple page display, you can set the timing of the rotation. Enter the number of seconds you'd like this page to be displayed before switching to the next page here.

Thanks for your order!



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