Trigentic AB

EmpirBus Graphical Tool User manual

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1. Introduction

The EmpirBus Graphical Tool is a software created to design and edit layouts for Raymarine Digital Switching (RMDS) on Raymarine Multifunction Displays (MFD). The software is owned and maintained by Trigentic AB, Sweden. For legal notes and other documents , please see our homepage www.empirbus.com.

2. Prerequisites and recommended system requirements

2.1 Software

The software is optimized for MS Windows 7 and later. It is recommended to have an image manipulating software installed in order to create or edit images for the project. Freely downloadable recommended open source software is GIMP (www.gimp.org) and Inkscape (www.inkscape.org).

In order to create a new project, an EmpirBus Project (EBP) file needs to be imported. This file is designed with the EmpirBus Studio software. Contact your EmpirBus dealer if you need further assistance with EBP-files.

The MFD needs to be updated to LightHouse 2. Visit www.raymarine.com for updates.

2.2 Hardware

Aside from a PC that can run MS Windows 7, a microSD card and a microSD card reader is needed to install the project file on an MFD.

3. Designing a New Project

Confirm that the prerequisites in chapter 2 are met before continuing.

3.1 Planning

MFDs come with different specifications and when designing the layout one must keep in mind that there are different aspect ratios and resolutions on different MFDs.

In addition to buttons and indicators, the layout usually also consists of graphics. The recommended file format is PNG since the software is able to handle transparency. JPG is also possible but then it is recommended to use a black background in the graphics as most layouts use black as background color.

The highest MFD screen resolution is currently 1280 x 800 so any original graphics file with a resolution higher than this can be used for any layout with a good result. The software is able to both scale images down and up, but scaling up results in a poor image quality.

It is technically possible to upload a layout designed for one resolution on a MFD with another resolution. The layout will be rescaled and dragged to fit the MFD and the larger difference in aspect ratio the more apparent will the distortion be. If buttons and texts are significantly scaled down it could become difficult to use the layout. See table 3.1 for model range and resolution.

MFD model	Resolution	Aspect ratio
a65	640 x 480 pixels (VGA)	4:3
a67	640 x 480 pixels (VGA)	4:3
a68	640 x 480 pixels (VGA)	4:3
a75	800 x 480 pixels (WVGA)	5:3
a77	800 x 480 pixels (WVGA)	5:3
a78	800 x 480 pixels (WVGA)	5:3
c125	1280 x 800 pixels (WXGA)	16:10
c127	1280 x 800 pixels (WXGA)	16:10
c95	800 x 480 pixels (WVGA)	5:3
c97	800 x 480 pixels (WVGA)	5:3
e125	1280 x 800 pixels (WXGA)	16:10
e127	1280 x 800 pixels (WXGA)	16:10
e165	1280 x 800 pixels (WXGA)	16:10
e7	800 x 480 pixels (WVGA)	5:3
e7D	800 x 480 pixels (WVGA)	5:3
e95	800 x 480 pixels (WVGA)	5:3
e97	800 x 480 pixels (WVGA)	5:3
gS95	800 x 480 pixels (WVGA)	5:3
gS125	1280 x 800 pixels (WXGA)	16:10
gS165	1280 x 800 pixels (WXGA)	16:10

Table 3.1: Model range

The menu border containing buttons and status is 50 pixels high and the small page title border is 25 pixels high. This means that on a MFD with resolution 1280 x 800, the layout will with default settings use 1280 x 725.

3.2 Creating a New Project File

Go to menu option *File – Create New Project*

You will be prompted to save a file with the suggested file name `RMDS_.zip`. Change this file name to a name relevant to your project and save. The file name must not exceed 28 characters and may contain characters a-z, A-Z, numericals, . (dot), -, and _.
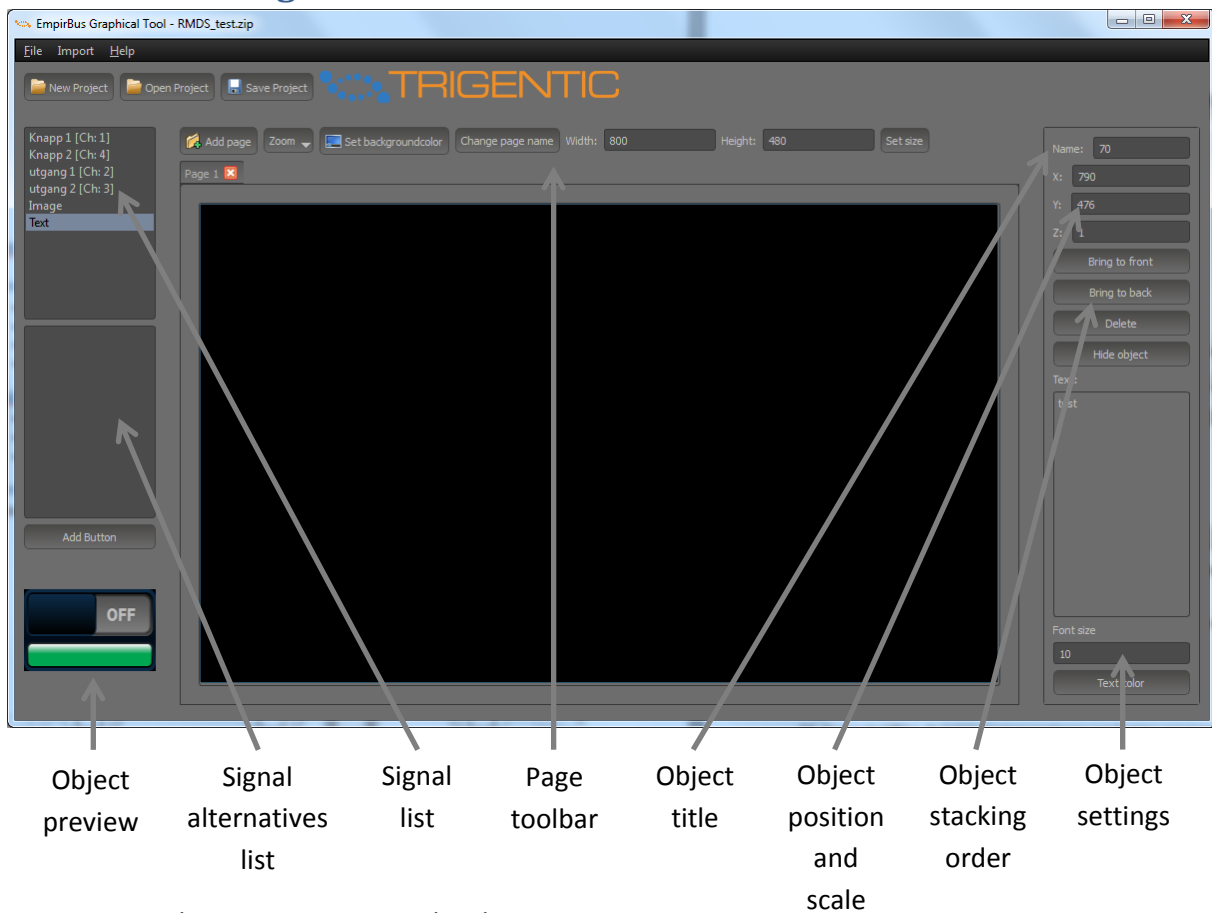
Example:
`RMDS_TMP_GF001_ver_1.3.2.zip`

Next step is to import the EBP file. Go to menu option *Import – Import EmpirBus Project File* and browse to and import the EBP file.

You are now ready to begin creating you design.

4. Basic Design

Graphic 4.1: Program window layout

4.1 Signal types

If an EBP file with MFD signals has been imported to the software, the signal list window will be populated with the available signals. The basic features of the signal are defined in the EBP file that was imported and will be reflected in the signal alternatives list window.

4.1.1 Pulse Button

Toggle

CircuitBreaker

StatusIndicator
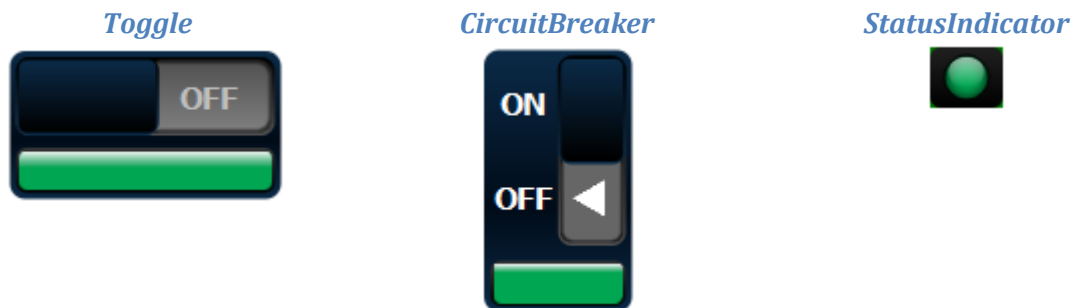
IndicatorImage
This alternative allows for an image object to be displayed when the signal is ON

ModeButton
A custom or predefined button with press and rest feature.

Object Settings

The pulse button has the following settings

- Name: This is the title visible over the button. The default name is imported from the EBP file.
- X, Y, Z: Change X and Y coordinates to define its position, Z to define its height when stacked on other objects.

4.1.2 Momentary Switch

Momentary

Klaxxon

ChangeView

Creates a standard button that navigates to a defined MFD layout page.

ChangeViewCustom

Creates a custom button that navigates to a defined MFD layout page.

Object Settings

The momentary switch has the following settings

- Name: This is the title visible over the button. The default name is imported from the EBP file.
- X, Y, Z: Change X and Y coordinates to define its position, Z to define its height when stacked on other objects.

4.1.3 Rotary Switch
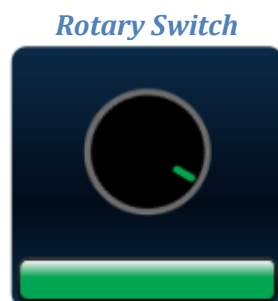
Rotary Switch

Object Settings

The rotary switch has the following settings

- Name: This is the title visible over the button. The default name is imported from the EBP file.
- X, Y, Z: Change X and Y coordinates to define its position, Z to define its height when stacked on other objects.

4.1.4 Dimmer Control

Dimmer Control

Object Settings

The dimmer control has the following settings

- Name: This is the title visible over the button. The default name is imported from the EBP file.
- X, Y, Z: Change X and Y coordinates to define its position, Z to define its height when stacked on other objects.
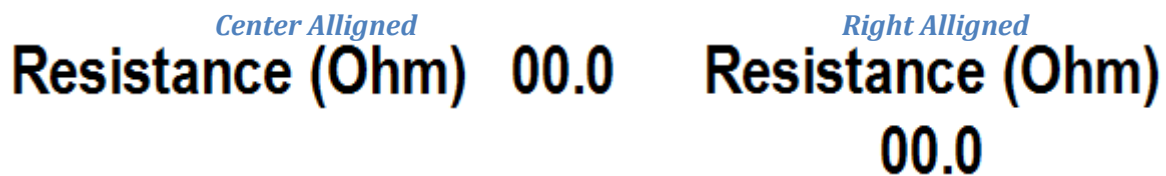
4.1.5 MultiState Switch

MultiState Switch

Object Settings

The multistate switch has the following settings

- Name: This is the title visible over the button. The default name is imported from the EBP file.
- X, Y, Z: Change X and Y coordinates to define its position, Z to define its height when stacked on other objects.

4.1.6 Signal Value

Center Alligned   *Right Alligned*

Resistance (Ohm) 00.0   Resistance (Ohm)
                                                              00.0

Displays a live numerical value with or without units.

Object Settings

The signal value has the following settings

- Name: This is the title visible over the button. The default name is imported from the EBP file.
- X, Y, Z: Change X and Y coordinates to define its position, Z to define its height when stacked on other objects.
- Low value: If the value drops below this defined value, the numbers will turn yellow
- High value: If the value exceeds this defined value, the numbers will turn red
- Title font size and color: Change these values to set title font size and color
- Value font size and color: Change these values to set value font size and color
- Cell Width: Sets the width of the textbox that contains the title and value.
- Decimals: Sets the number of decimals
- Value Text: This value is only used for preview purposes
- Unit text: Sets the unit of the value.

4.2 Images

The software can handle PNG and JPG/JPEG and SVG files. PNG is recommended as it is a compressed file format that can handle image transparency. Image transparency is exceptionally useful since it allows images to seem as if they had round or irregular shapes, also when placed over another image.

4.3 Texts

Some signals come with a customizable title. Other needs to have titles added manually. Texts can either be generated externally with third party image software and then imported as an image (see chapter 4.2) or can be generated and edited directly in the software.

4.4 NMEA2000 PGNs

In addition to displaying live values using Signal Values (see chapter 4.1.6), the software can also handle analog battery status and fluid level indicators.

PGN127508

PGN127505
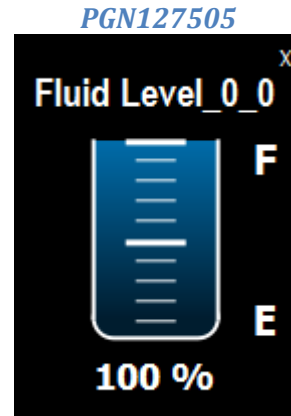
Object Settings

The voltage indicator has the following settings

- Name: This is the title visible over the button. The default name is imported from the EBP file.
- X, Y, Z: Change X and Y coordinates to define its position, Z to define its height when stacked on other objects.
- Low value: Sets the left red arch of the indicator
- High value: Sets the right red arch of the indicator
- Min value: Sets the min value of the indicator
- Max value: Sets the max value of the indicator
- Major tick interval: Sets the number of value ticks on the indicator. E.g. setting this value to 5 when max and min is 32 and 0 will give the write numbered tics at 0, 8, 16, 24 and 32.
- Minor tick interval: Sets the number of unnumbered ticks in the interval.

The fluid level indicator has the following settings

- Name: This is the title visible over the button. The default name is imported from the EBP file.
- X, Y, Z: Change X and Y coordinates to define its position, Z to define its height when stacked on other objects.
- Low value: Values below this value will color the indicator red
- High value: Values above this value will color the indicator red

5 Uploading Layout to MFD

5.1 Preparation

In order to upload the layout to the MFD you need to put the layout file in the root (top) folder of a microSD memory card.
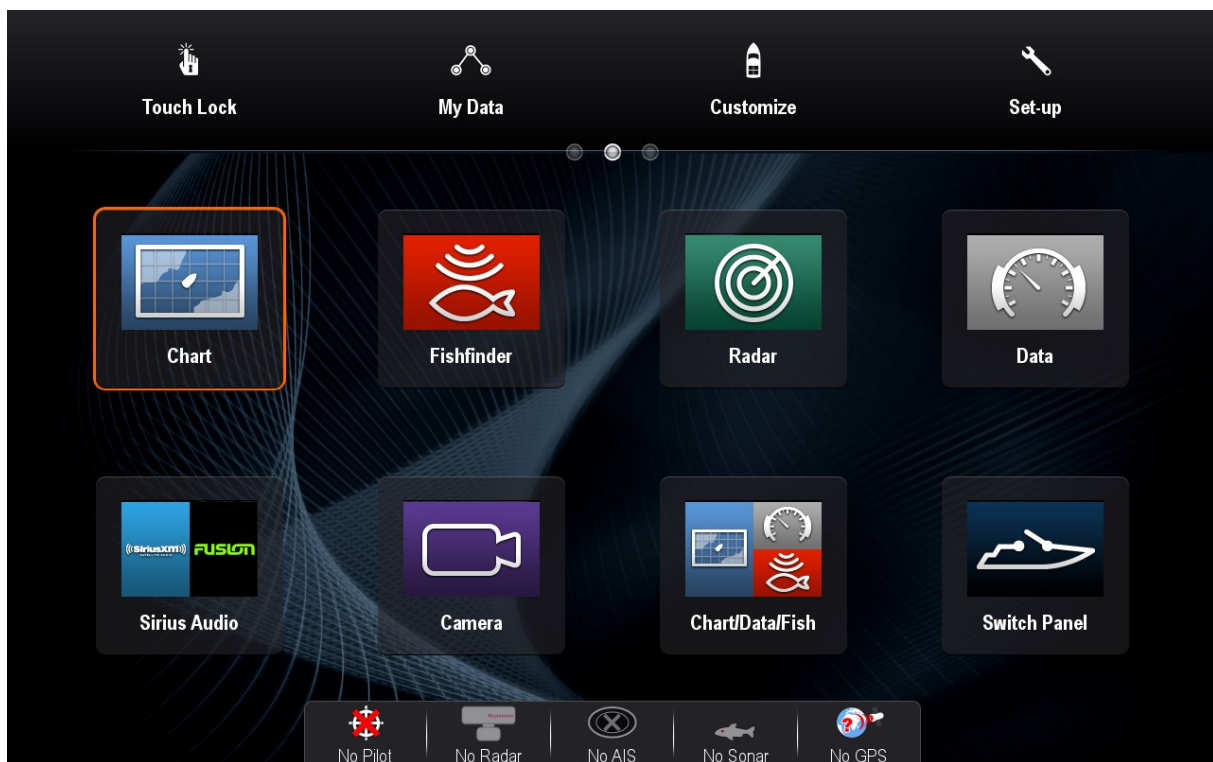
Example:
```
F:\RMDS_TMP_GF001_ver_1.3.2.zip
```

`F\:` is in this example the mircroSD memory card drive letter. Please also note that the MFD will not recognize the layout if the content is extracted – it must be remain packaged in the ZIP file.

5.2 Installing the layout

Begin at the home screen.

Graphic 5.1: LightHouse 2 home screen with RMDS Switch Panel icon

1. Go to MFD menu option **Set-up – System Settings – External Devices – Switch Panel Set-up**
2. If the option **Uninstall Config File** is available, select this option. If the menu is closed after this step, repeat step 1.
3. Chose **Install Config File**
4. If asked, select from the list the memory card where the layout file is stored.
5. Select from the list the layout file to be installed. Wait for the message "Importing complete" to confirm that the layout has been successfully installed.
6. If the MFD previously had a layout installed, a white icon called "Customize" will appear on the homescreen. If the icon exists, select it and proceed to step 9.
7. Go to MFD menu option **Customize – Homescreen – Edit Page**

8. Select an unused icon.
9. Scroll down in the list and select option **Switch Panel**. Then scroll back up to the top and select **Finish**
10. Set the title of the icon (default is "Switch Panel") and select **SAVE**

The layout file is now installed and can be accessed by the digital switching icon as seen as the bottom right icon called Switch Panel on graphic 5.1.

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