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Introduction

Mates Studio's Commander is the simplest among all the environments. Providing a simple user interface for simply adding predesigned pages to the project, it allows project development to finish within seconds. It also provides a quick discussion of each page added and all the widgets it contains making it a perfect choice for those who are just starting with BBM products.

Commander environment offers two main parts, a project editor and a [host simulator](#). This manual will focus on the project editor including how to add built-in and custom pages and checking a short documentation for the page.

Main Interface

The main editor interface can be divided into the [menu bar](#) and two separate columns.

The screenshot shows the Commander Editor interface. The top menu bar includes 'Project', 'Control', and connection options for 'COM9'. The left pane (labeled '1') displays a grid of project pages: Page0 (bar chart), Page1 (digital display), Page2 (analog gauges), Page3 (digital display), Page4 (audio player), and a plus sign for adding new pages. The right pane (labeled '2') shows the 'Page0' discussion, including a description, a preview of the bar chart widget, and code snippets for activating the page and updating its spectrum values.

Page0

A page layout designed to be used in Audio applications

To activate Page0, run the library function `setPage(0)`:

```
mates.setPage(0); // Activate Page0
```

Here's a list of multiple state widgets in Page0 and their respective widget type, index and ID

Name	Type	Index	ID	Min	Max
LedSpectrum0	LED_SPECTRUM	0x00	0x4B00	0	100

LedSpectrum0

To update LedSpectrum0, run the library function `setLedSpectrumValue(0, col, value)`, where **col** is the column number and **value** is the new target value for the spectrum column.

```
// Update column 'col' of LED_SPECTRUM widget indexed 0
mates.setLedSpectrumValue(0, col, value);
// NOTE: Setting the value of an invalid widget
// can result to erratic behavior
```

1. Project Editor

This provides a simple way to add or remove pages to the project

2. Page Discussion

This area displays a short summary discussion for all the widgets present in the selected page

Menu Bar

Commander project windows provides a menu bar for basic functionalities including save, compile, upload and more.



From left to right, the menu items included are listed below:

Project Tab

Switches to the project editor. This allows developers to add or remove pages to their project.

Control Tab

Switches to [controller interface](#). This allows developers to simulate how a host controller can communicate with a BBM module programmed with the Commander project.

Upload

Uploads the project to the module connected to the target port

Create New Project

Opens a new Mates Studio setup window

Open Project

Displays an Open File Window to browse the computer for project files

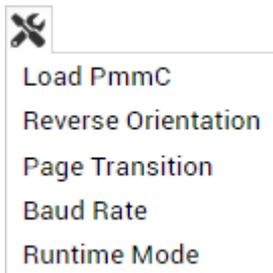
Save Options

Provides a dropdown menu which provides multiple save functionalities

Item	Description
Save Project	Save the project
Save Project As	Save the project with a new filename
Export as Architect Project	Export the project as Architect with a new filename

Tools and Configuration

Provides a dropdown menu which provides [tools and project configuration](#)



Item	Description
Load PmmC	Opens the Load PmmC window for updating firmware
Reverse Orientation	Provides option to reverse module orientation
Page Transition	Provides option to select transitioning effect (default: None)
Baud Rate	Provides option to set baud rate for communicating (default: 9600)
Runtime Mode	Provides option to make widget parameters editable or fixed during runtime (default: Fixed)

Note

When using any of these tools and project configurations, it is important to reupload the project.

Software Information

Opens the About window showing the version information of Mates Studio

Port Status

Shows whether the display module is connected successfully for the [controller interface](#)

Port Selection

Provides a dropdown selection of all available ports. Selected port is used when programming and when using the [controller interface](#)

Port Connect Button

Connects to the module for use with the [controller interface](#)

Port Reset Button

Reset connection when using the [controller interface](#)

Project Editor

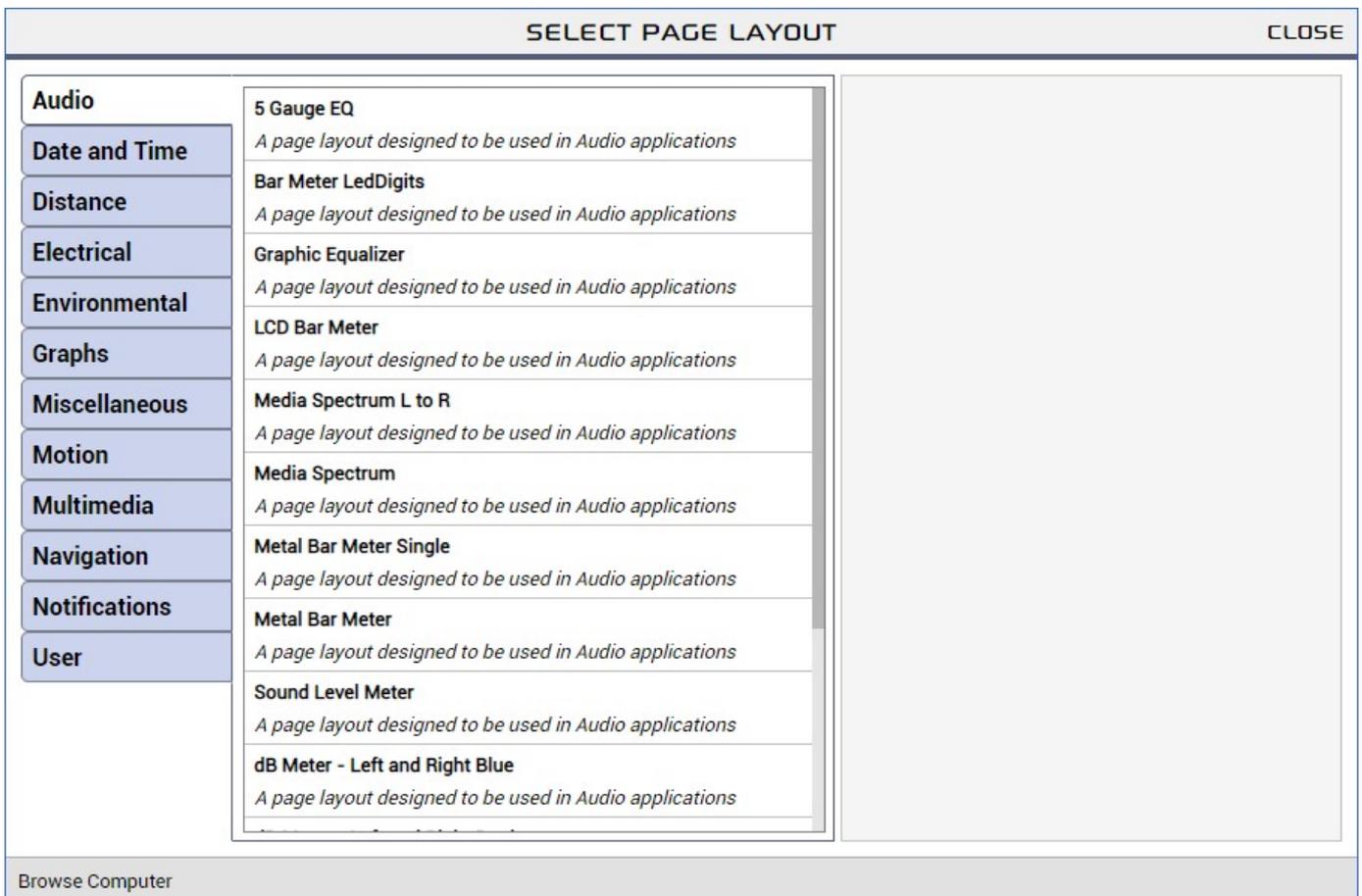
The project editor provides a simple interface allowing developers to select and utilize different page designs/ layouts from a built-in collection provided by the Breadboard Mates team and its community. This allows users to quickly produce nice looking GUI applications in seconds.

Adding Pages

By clicking the **Add Page** button, a collection of pre-made page designs can be browsed.



The *Page Selection Window* will appear as shown:

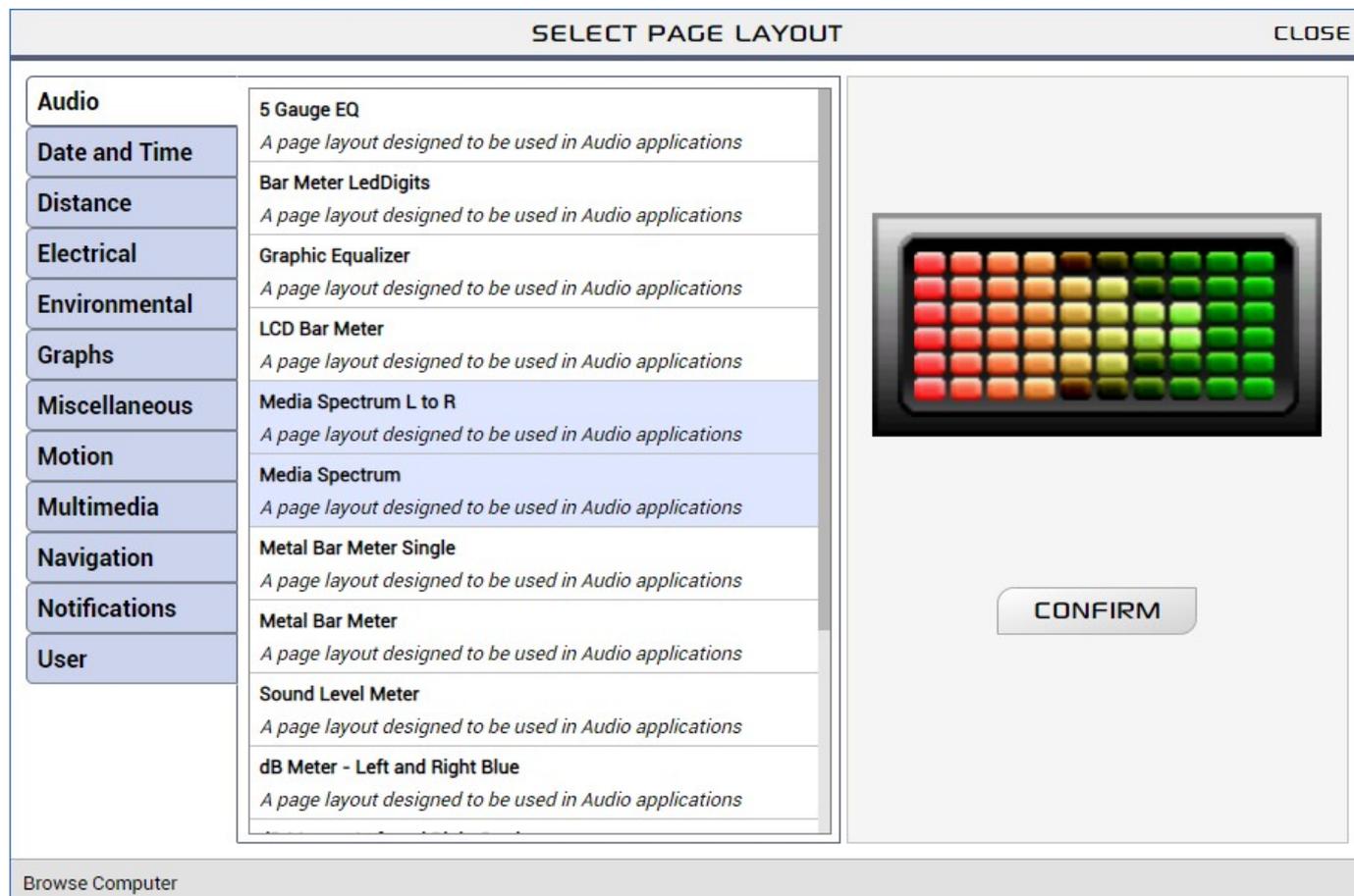


Page designs can be filtered by choosing the category tabs on the left-hand side. A special category, labeled **User**, contains custom designs made using Architect, Genius and Builder and is saved to:

C:\Users\%USERNAME%\Documents\Mates Studio Pages

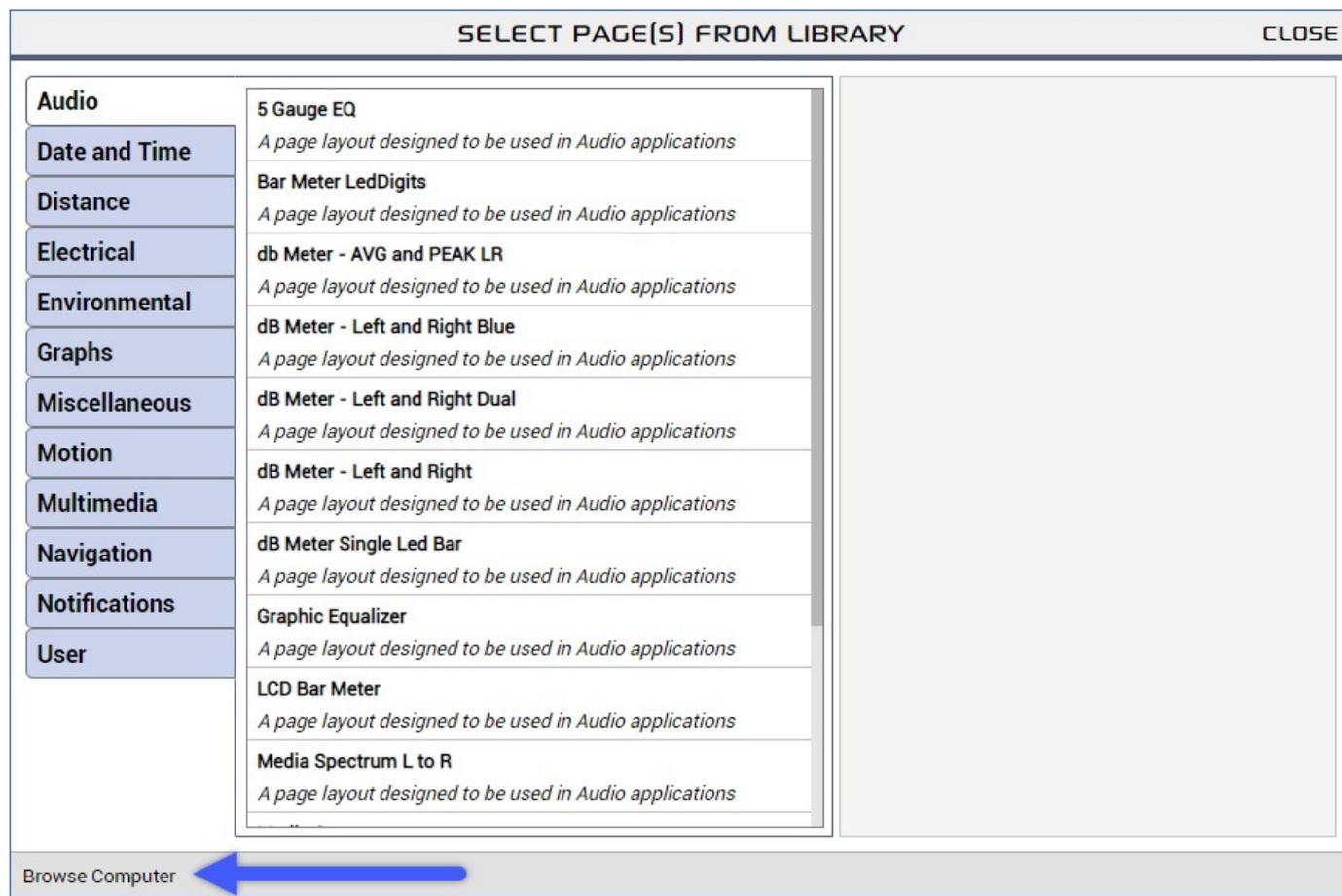
By selecting a page design from the list shown in the middle column of the window, a preview of the page will be shown on the right-hand side.

Multiple page layouts can be selected at the same time by holding CTRL key before clicking the page item.

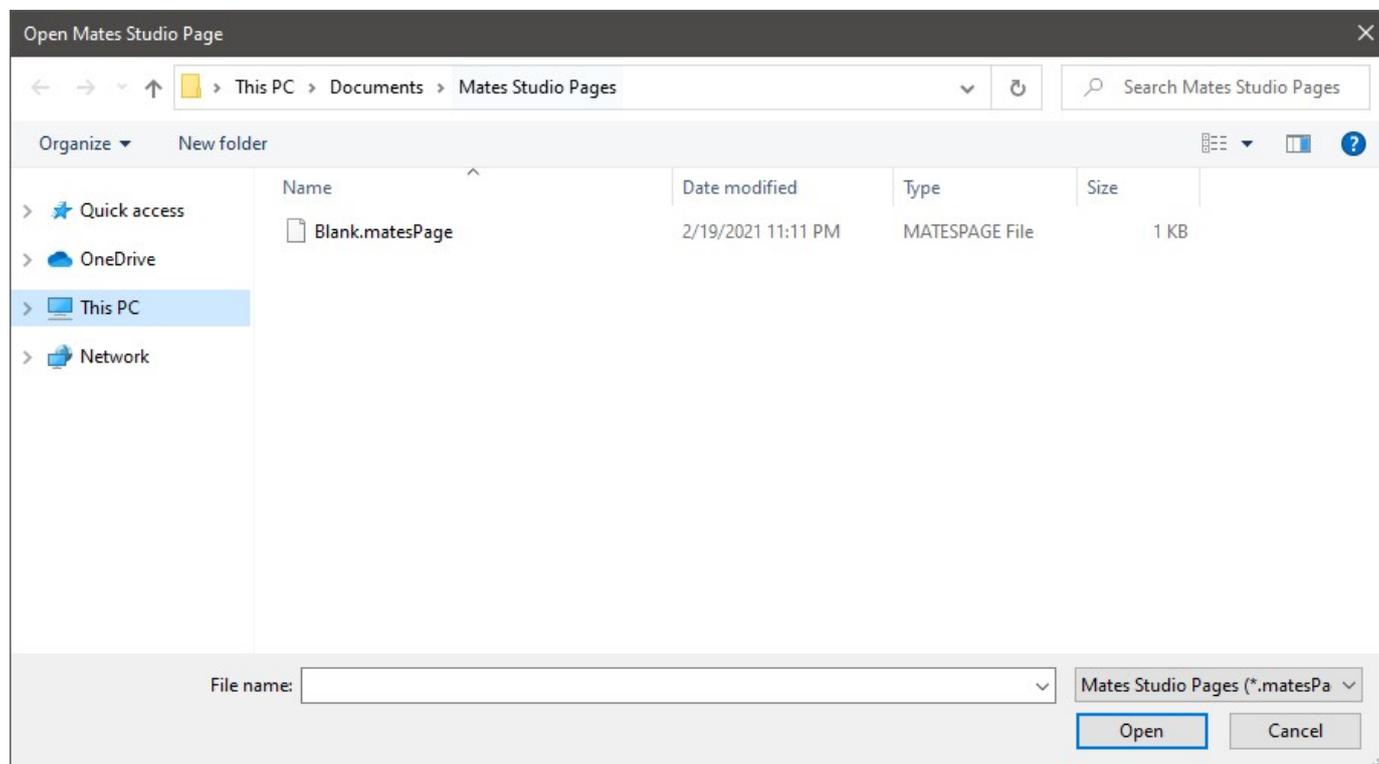


Confirm selections by clicking on the **CONFIRM** button.

Alternatively, a Browse Computer option is provided to allow loading of page templates located in other PC directories.



Navigate to the location of the page (*matesPage*) file.



Confirm selections by clicking on the **Open** button.

Newly added pages will be added and shown in the project editor.

Removing Pages

Pages not required in the project can easily be deleted by using the delete button included in the page preview shown in the left-hand side of the window.

The screenshot shows the Commander Editor interface. On the left, a grid of page thumbnails (Page0 to Page5) is displayed. A blue arrow points to the delete icon on the Page5 thumbnail. The right-hand side of the window shows the 'Page5' discussion area, which includes a description, a preview of the page layout (a grid of colored buttons), and a table of state widgets.

Page5
A page layout designed to be used in Audio applications

To activate Page5, run the library function `setPage(Page5)`:

```
mates.setPage(Page5); // Activate Page5
```

Here's a list of multiple state widgets in Page5 and their respective widget type, index and ID

Name	Type	Index	ID	Min	Max
MediaSpectrum0	MEDIA_SPECTRUM	0x00	0x4C00	0	100

MediaSpectrum0

To update MediaSpectrum0, run the library function `setSpectrumValue(MediaSpectrum0, index, value)`, where **index** is the column number and **value** is the new target value for the spectrum column.

```
// Update MediaSpectrum0
mates.setSpectrumValue(MediaSpectrum0, index, value);
```

Page Discussion

A short documentation is also automatically generated for every page that is added. It is displayed in the Page Discussion area.

The screenshot shows the Commander Editor interface. On the left, a grid of page thumbnails (Page0 to Page4) is displayed. The right-hand side of the window shows the 'Page4' discussion area, which includes a description, a preview of the page layout (a notification box), and a table of state widgets.

Page4
A page layout designed to be used in Notifications applications

To activate Page4, run the library function `setPage(Page4)`:

```
mates.setPage(Page4); // Activate Page4
```

Here's a list of multiple state widgets in Page4 and their respective widget type, index and ID

Name	Type	Index	ID	Min	Max
MediaLed8	MEDIA_LED	0x08	0x4008	0	1
PrintArea0	PRINT_AREA	0x00	---	---	---
TextArea2	TEXT_AREA	0x02	---	---	---

MediaLed8

To update MediaLed8, run the library function `setWidgetValue(MediaLed8, value)`, where **value** is the new target value for the widget.

```
// Update MediaLed8
mates.setWidgetValue(MediaLed8, value);
```

By clicking on the page items on the project editor, the documentation will update to match the last clicked page item. The discussion generated contains code snippets that can be used together with [Mates Serial Command libraries](#).

The screenshot shows the Commander Editor interface. At the top, there's a dark header with 'Project', 'Control', and 'TIMI-96 LANDSCAPE'. On the right of the header, it says '(No Port Detected)', 'Connect', and 'Reset'. Below the header is a grid of page thumbnails: Page0 (digital clock), Page1 (analog gauge), Page2 (bar chart), Page3 (LED bar), and Page4 (text area with a red 'X' icon). A blue arrow points from the Page4 thumbnail to the right-hand panel.

Page4

A page layout designed to be used in Notifications applications

To activate Page4, run the library function `setPage(Page4)`:

```
mates.setPage(Page4); // Activate Page4
```

Here's a list of multiple state widgets in Page4 and their respective widget type, index and ID

Name	Type	Index	ID	Min	Max
MediaLed8	MEDIA_LED	0x08	0x4008	0	1
PrintArea0	PRINT_AREA	0x00	---	---	---
TextArea2	TEXT_AREA	0x02	---	---	---

MediaLed8

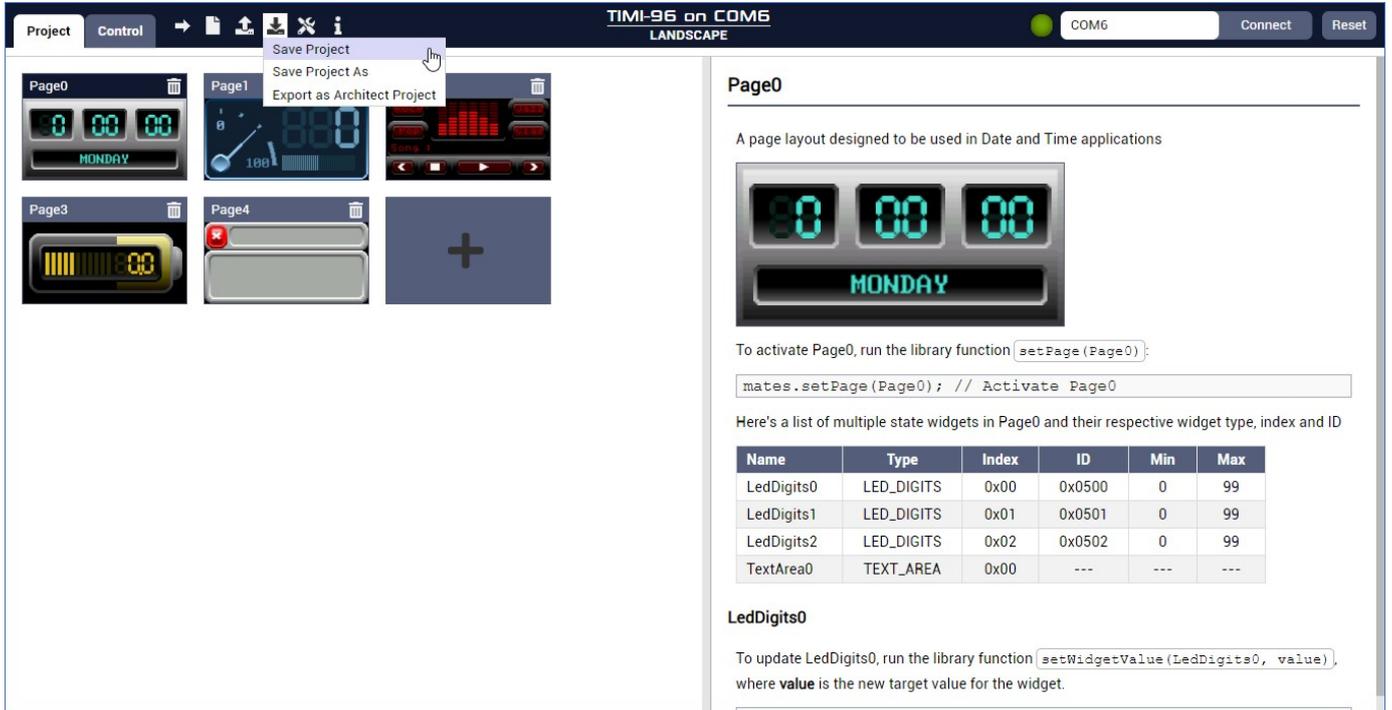
To update MediaLed8, run the library function `setWidgetValue(MediaLed8, value)`, where **value** is the new target value for the widget.

```
// Update MediaLed8
mates.setWidgetValue(MediaLed8, value);
```

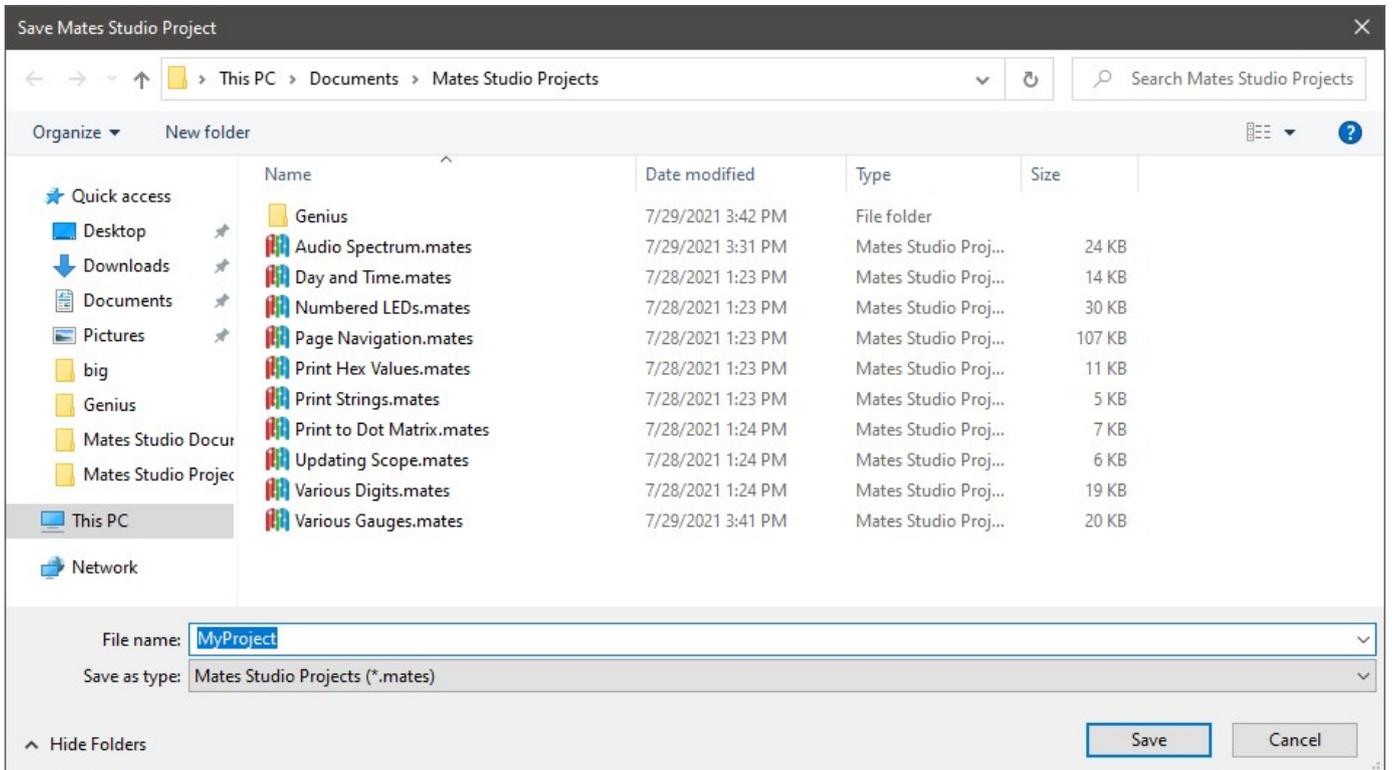
Save Options

Save Project

Save projects by clicking the **Save** icon button and selecting **Save Project**.

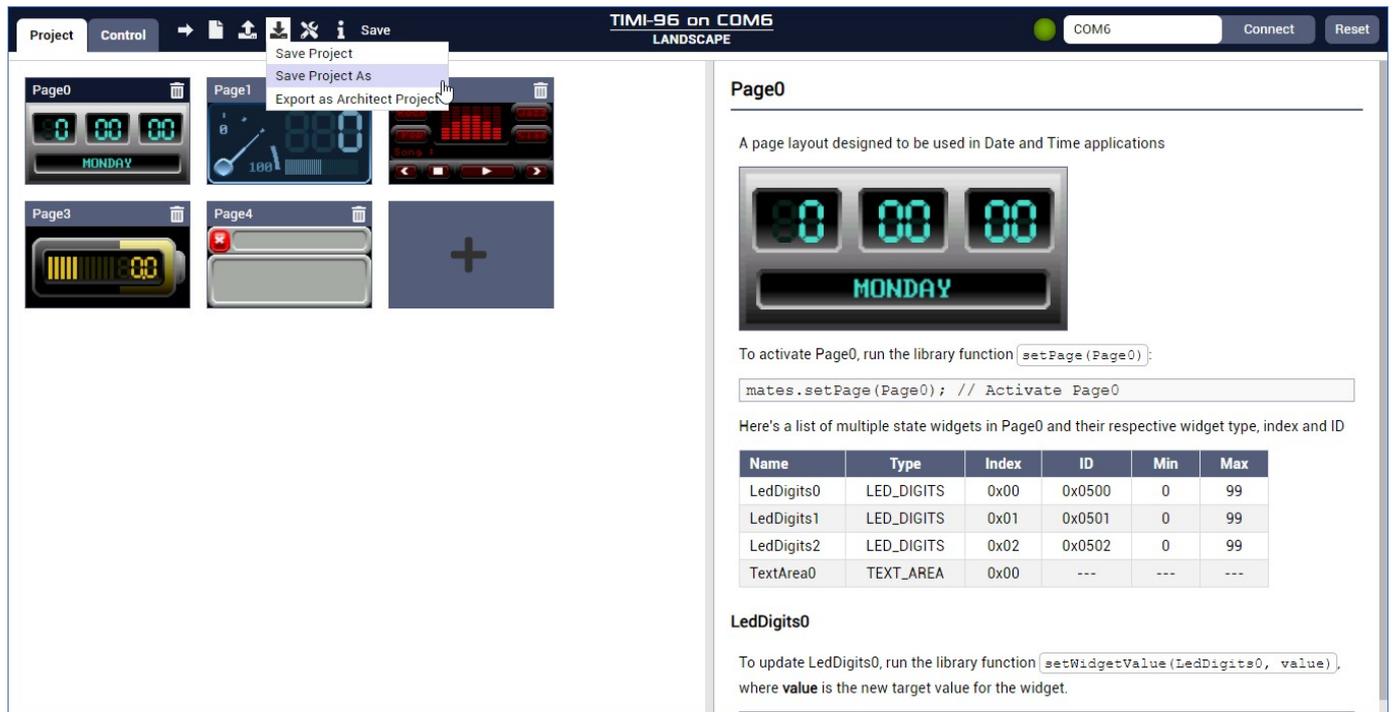


For a new project, a Save Project window will open to request for the location and filename to use when saving.



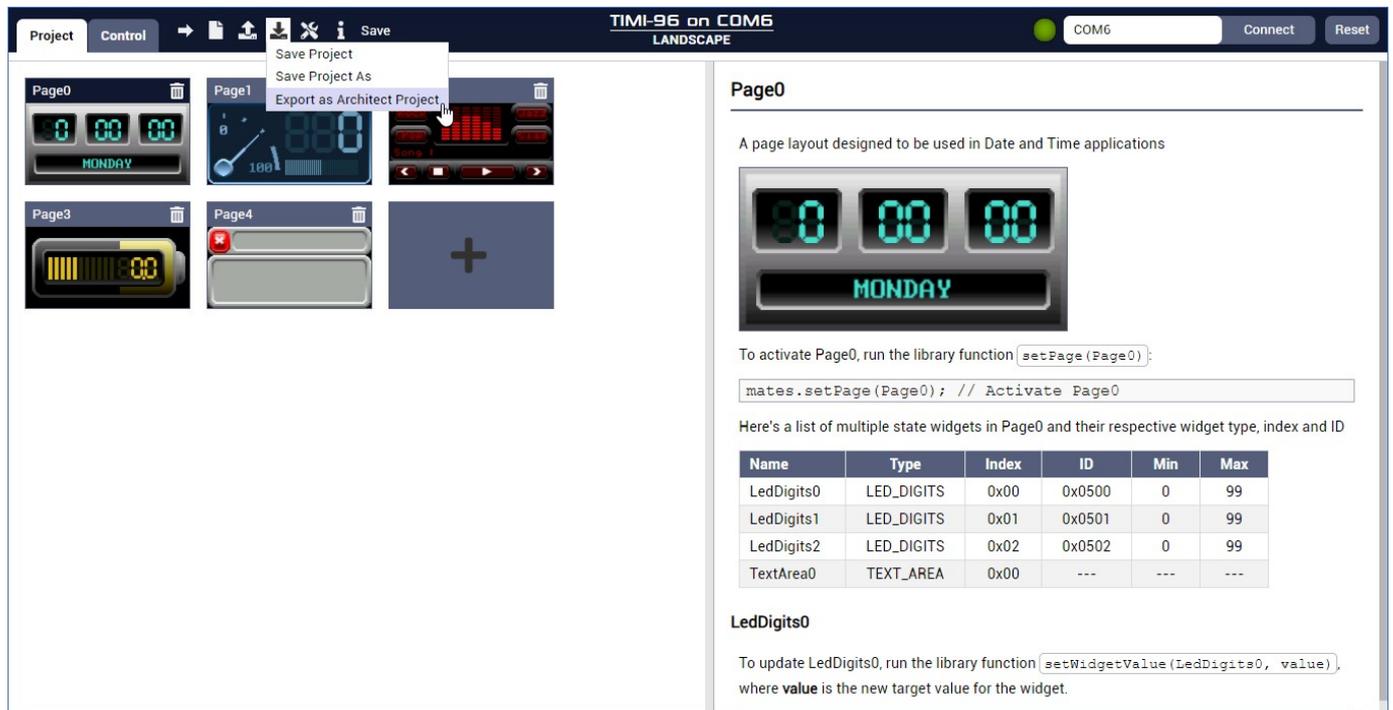
Save Project As

A previously saved project can also be saved to a different location by selecting the **Save Project As** option instead.

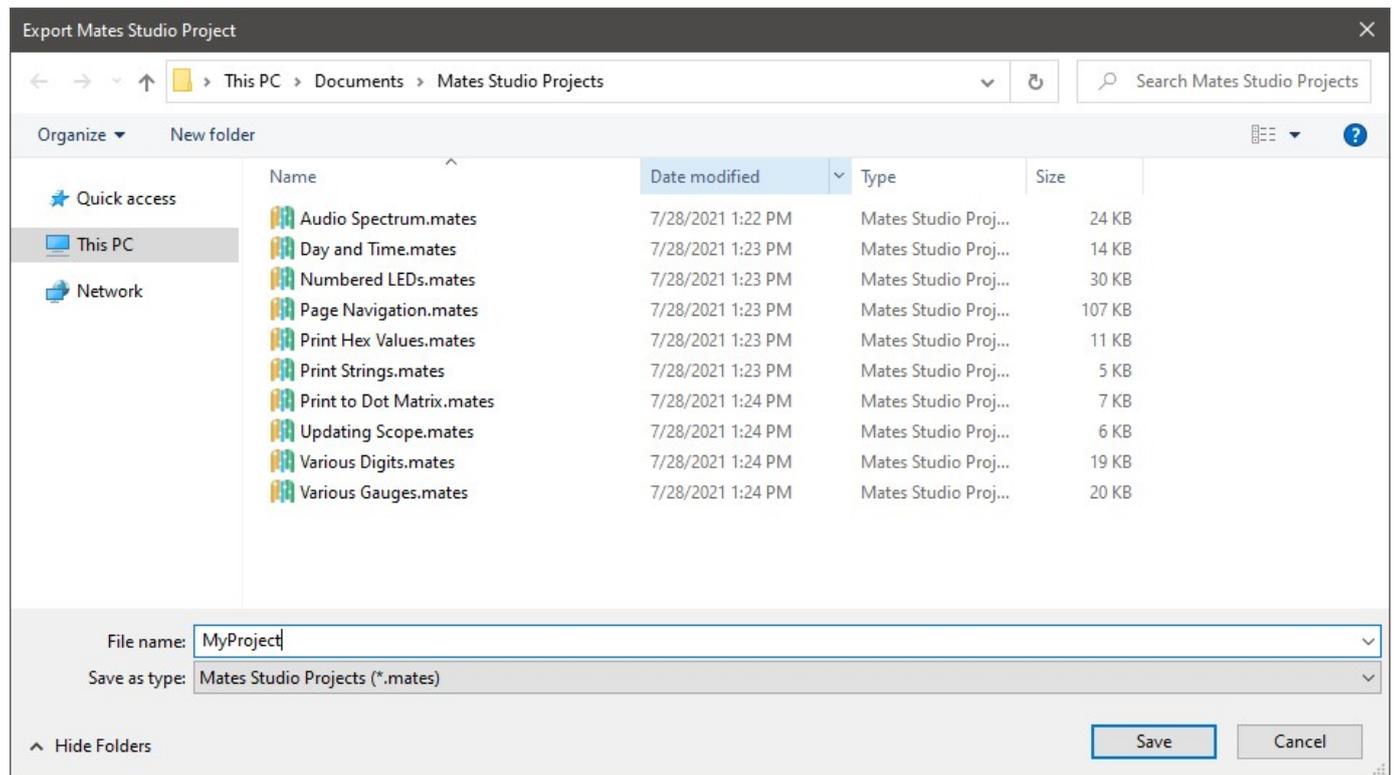


Export as Architect Project

Commander projects can be exported as an Architect project. This allows users to edit individual widgets from pre-made page designs.



An Export Project window will open to request for the location and filename to use when exporting the project.



Tools and Configuration

This section discusses tools and project configurations which can be used and modified.

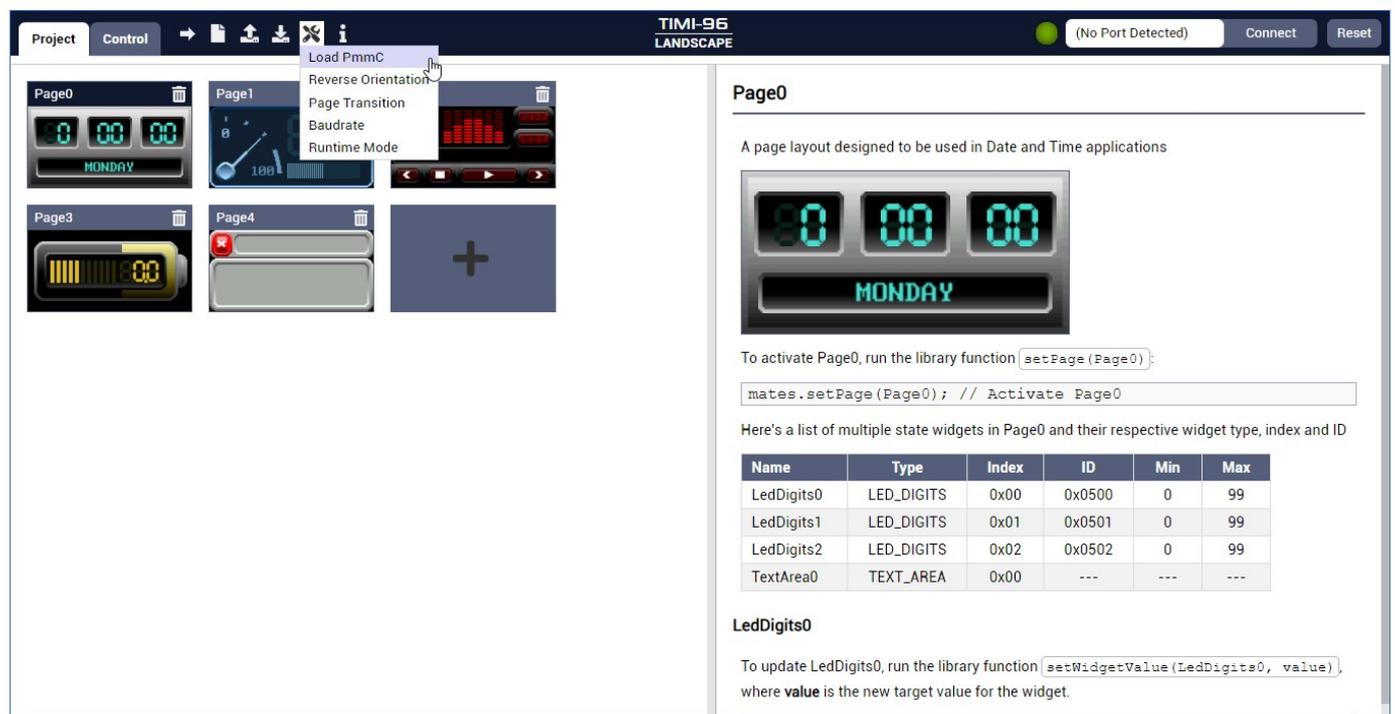
Note

When using any of these tools and project configurations, it is important to reupload the project.

Loading (PmmC) Firmware

All BBM products are factory-programmed with the latest stable firmware from 4D Labs. Firmware updates contain improvements and bug fixes. Therefore, it is ideal to load the latest version available during development.

The Commander environment provides a simple way to load any firmware provided with Mates Studio for the target product.



The screenshot shows the Commander Editor interface for a project named 'TIMI-96 LANDSCAPE'. The top bar includes 'Project', 'Control', and a status indicator '(No Port Detected)'. A context menu is open over the 'Page0' widget, with 'Load PmmC' selected. Other menu items include 'Reverse Orientation', 'Page Transition', 'Baudrate', and 'Runtime Mode'. The main workspace displays several page layouts (Page0, Page1, Page3, Page4) and a detailed view of 'Page0' on the right. The 'Page0' view shows a digital clock display with 'MONDAY' below it. Below the display, there is a code editor with the following text:

```
To activate Page0, run the library function setPage(Page0):  

mates.setPage(Page0); // Activate Page0
```

Here's a list of multiple state widgets in Page0 and their respective widget type, index and ID

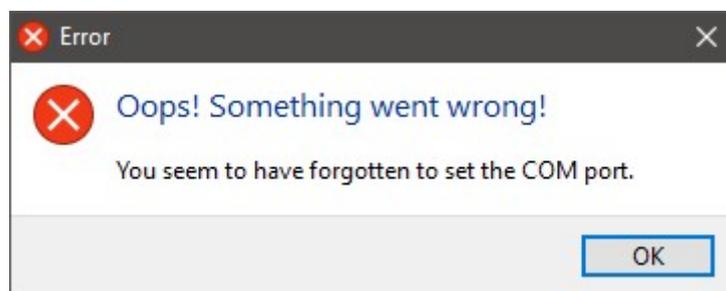
Name	Type	Index	ID	Min	Max
LedDigits0	LED_DIGITS	0x00	0x0500	0	99
LedDigits1	LED_DIGITS	0x01	0x0501	0	99
LedDigits2	LED_DIGITS	0x02	0x0502	0	99
TextArea0	TEXT_AREA	0x00	---	---	---

Below the table, there is a section for 'LedDigits0' with the following text:

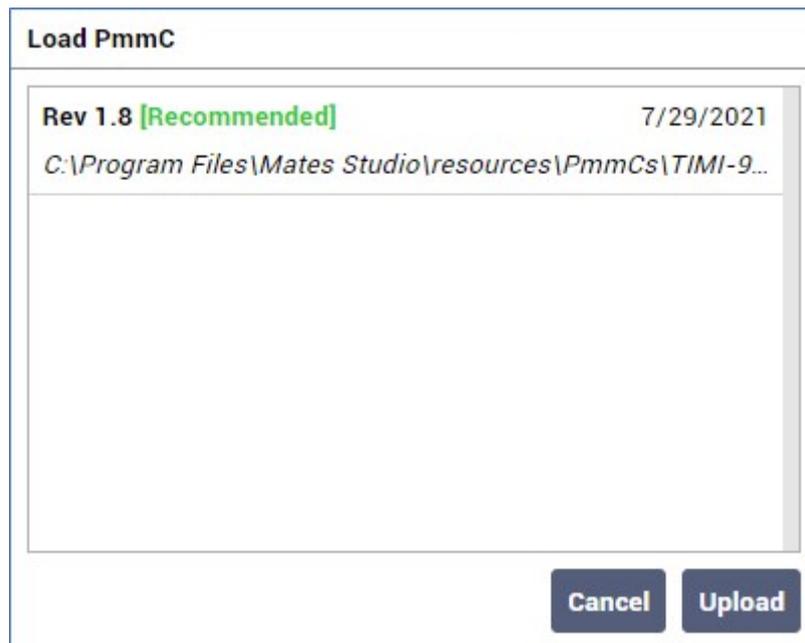
```
To update LedDigits0, run the library function setWidgetValue(LedDigits0, value),  

where value is the new target value for the widget.
```

If there's currently no COM port selected, an error window will be shown prompting to set a COM port before loading the firmware.

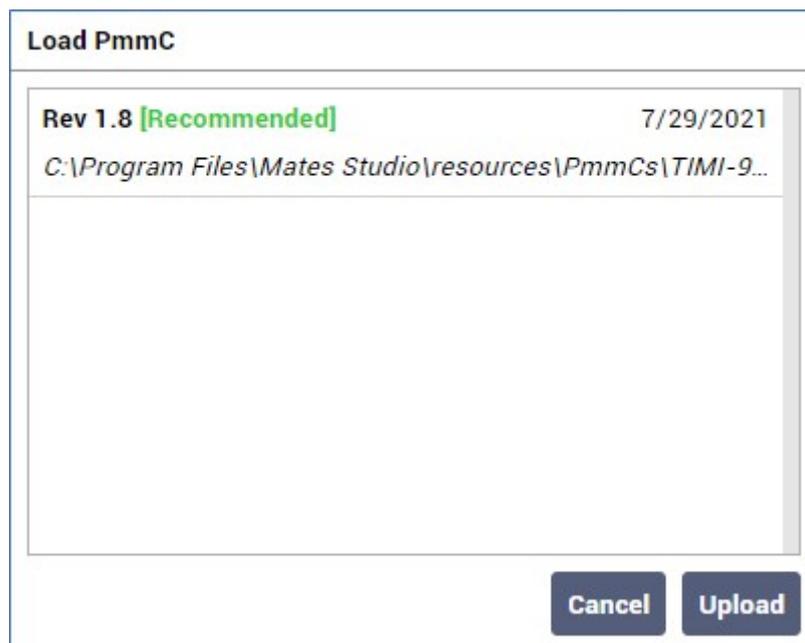


Otherwise, the Load PmmC window will open.

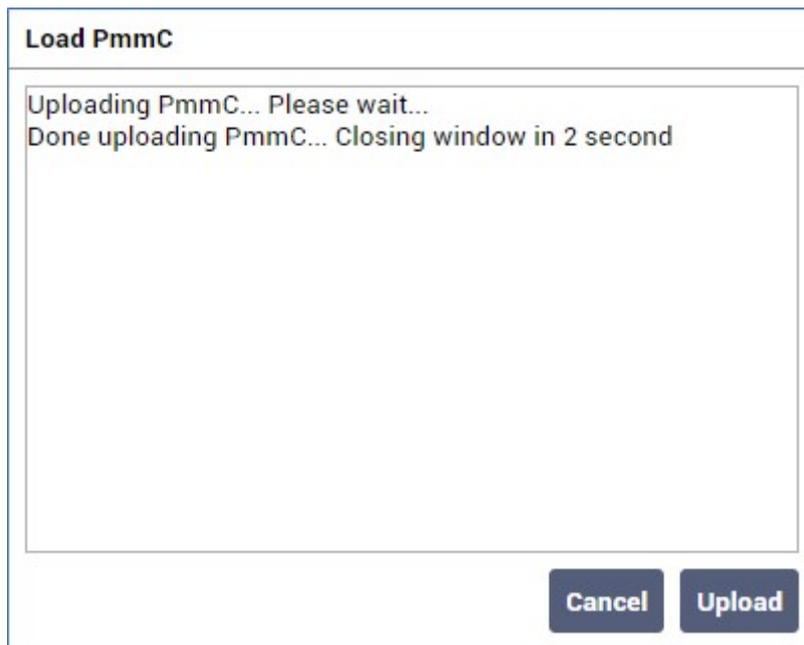


As shown, a recommended latest version will be labeled. Click on the target item to select the firmware version.

To proceed with the loading the selected item, click the **Upload** button.



Wait until the upload finishes.



The window will automatically close a few seconds after the upload completes.

Reversing Orientation

The commander environment only allows inverting a project's orientation.

The screenshot shows the Commander Editor interface. The 'Tools and Configuration' menu is open, and the 'Reverse Orientation' option is selected. The main workspace displays a project named 'TIMI-96 on COM6 LANDSCAPE' with several pages (Page0, Page1, Page3, Page4) and a detailed view of Page0 on the right. Page0 is a page layout designed to be used in Date and Time applications, featuring three LED digits and a text area displaying 'MONDAY'. Below the page preview, there is a code editor showing the library function `setPage(Page0)` and a table listing multiple state widgets in Page0 and their respective widget type, index and ID.

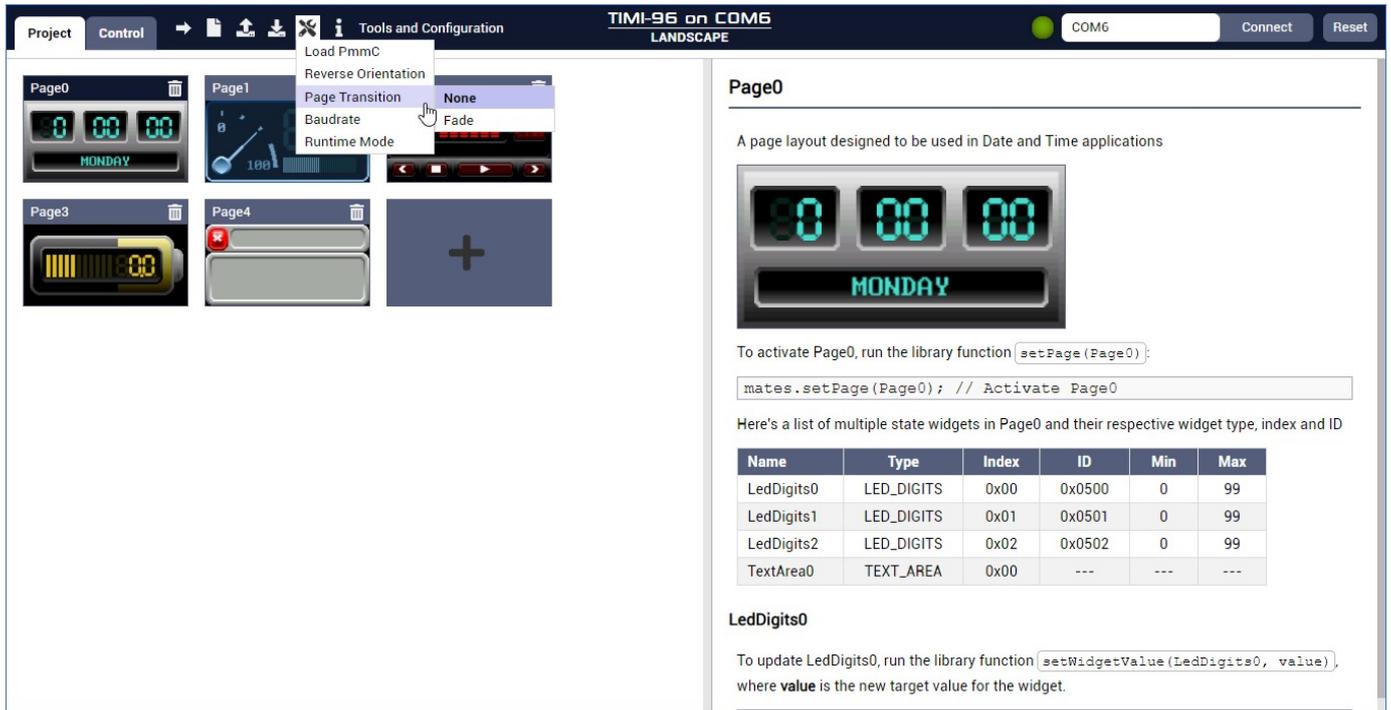
Name	Type	Index	ID	Min	Max
LedDigits0	LED_DIGITS	0x00	0x0500	0	99
LedDigits1	LED_DIGITS	0x01	0x0501	0	99
LedDigits2	LED_DIGITS	0x02	0x0502	0	99
TextArea0	TEXT_AREA	0x00	---	---	---

Below the table, there is a section for 'LedDigits0' with a code editor showing the library function `setWidgetValue(LedDigits0, value)` and a note that `value` is the new target value for the widget.

Since this environment does not provide editing capabilities for widgets, rotating the orientation restricted to 180 degrees.

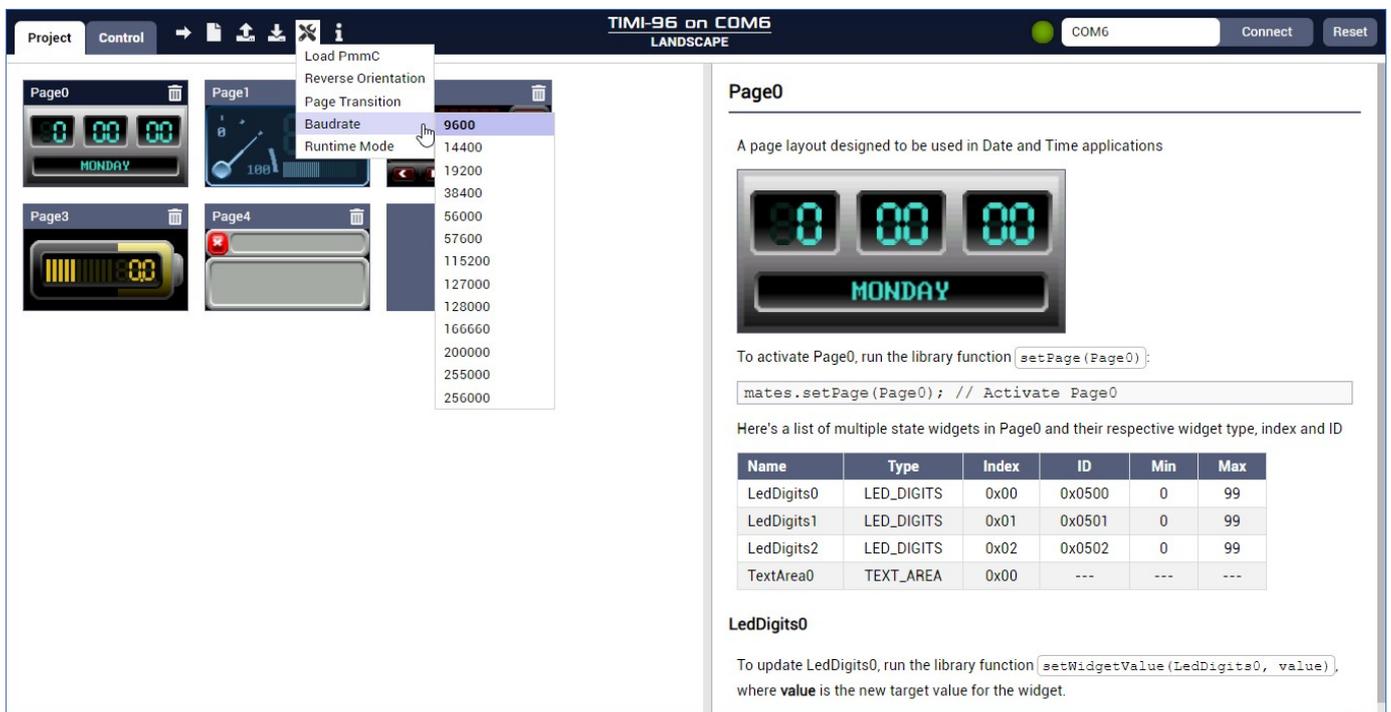
Page Transitions

Commander environments provides different transition effects. By default, None or no transition effect is applied in a project.



Project Baud Rate

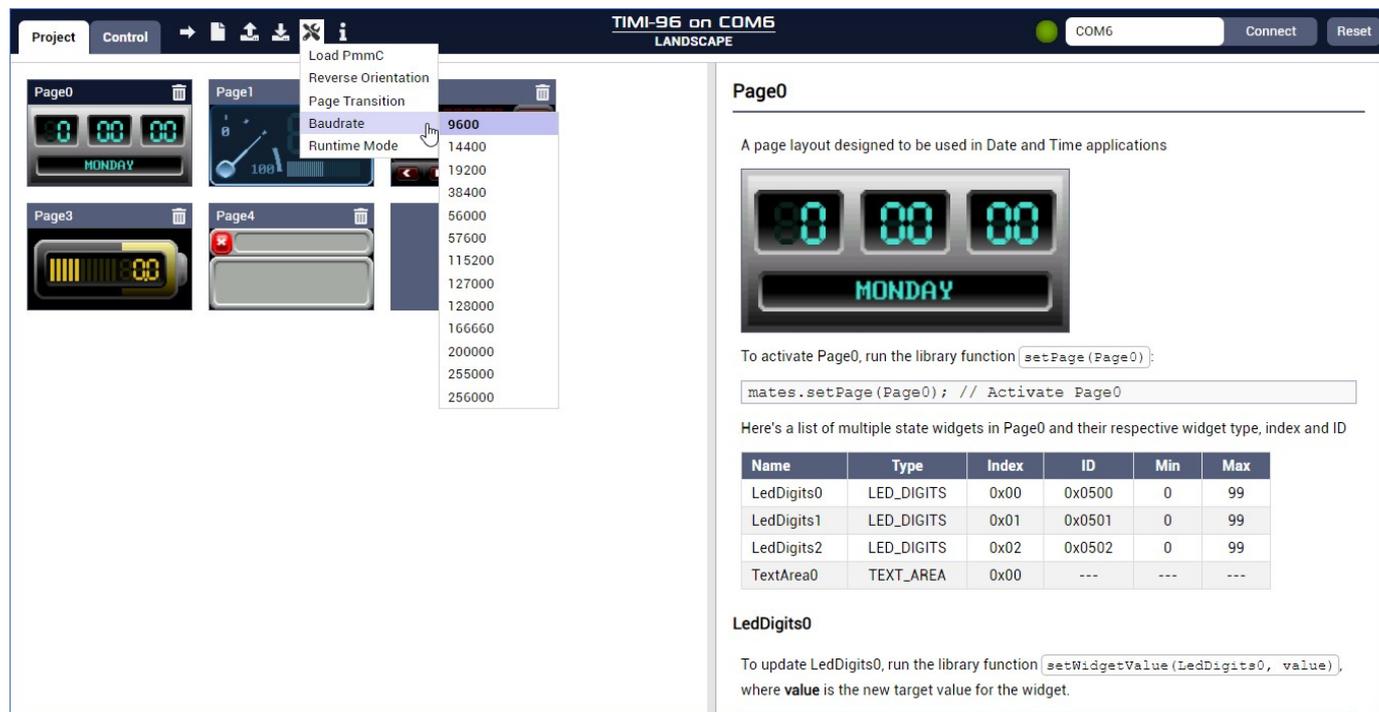
By default, Commander projects use 9600 baud for [Mates Serial Command Protocol](#).



This can be changed by clicking some alternative options as shown.

Runtime Mode

As previously discussed, the Commander environment doesn't feature design time changes to widgets. Instead, it offers the option to change certain widget parameters during runtime using [Mates Serial Commands](#).



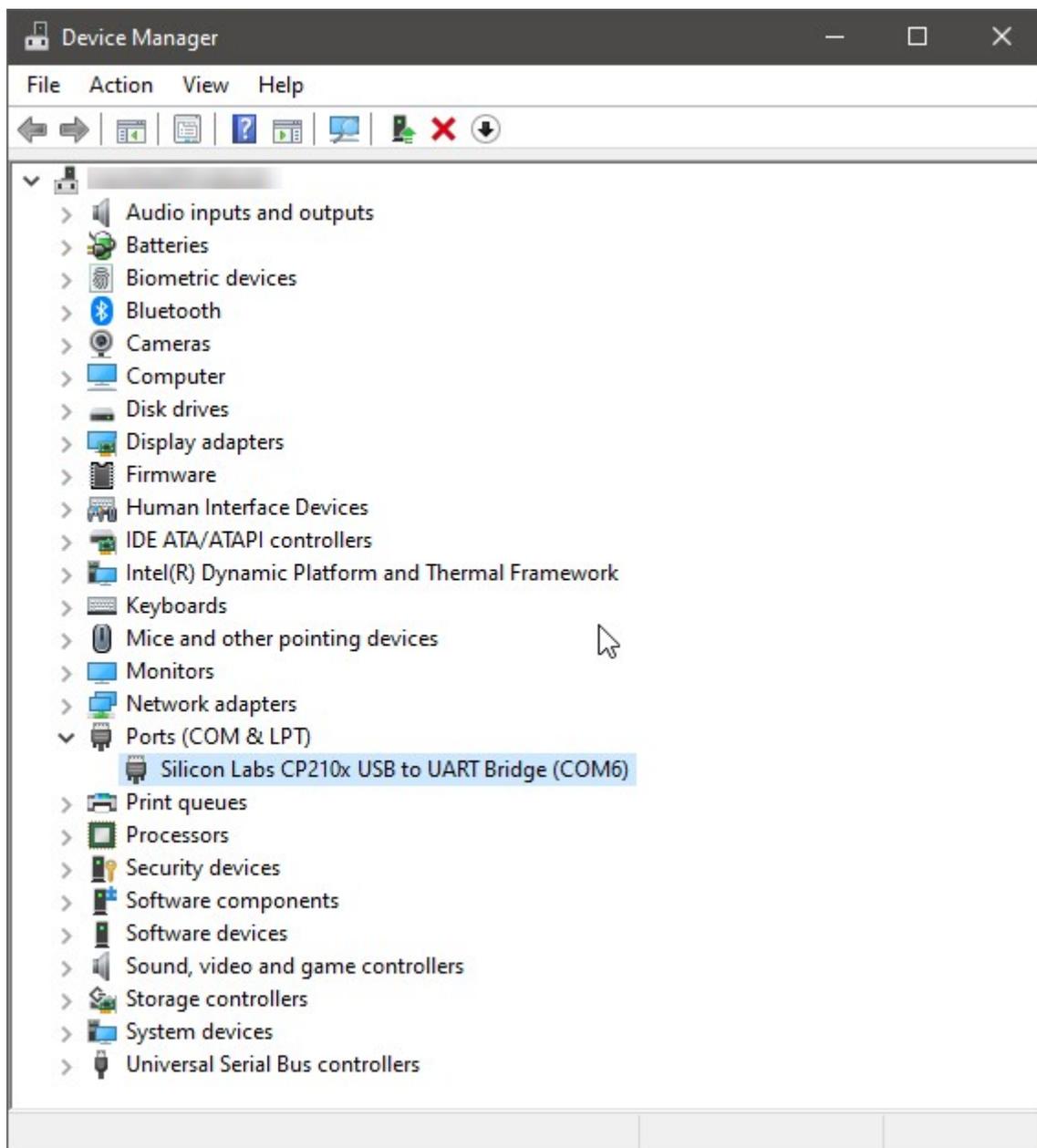
By default, the Commander uses **Fixed** runtime mode. In this mode, widget colors cannot be modified during runtime. This mode consumes less code space and memory and is more stable than the alternative option.

Running the Project

Identifying the Correct Port

To successfully upload a project, update the firmware and control a programmed display, the correct target port needs to be selected. The easiest way to confirm if you are using the correct port is by opening Windows's Device Manager.

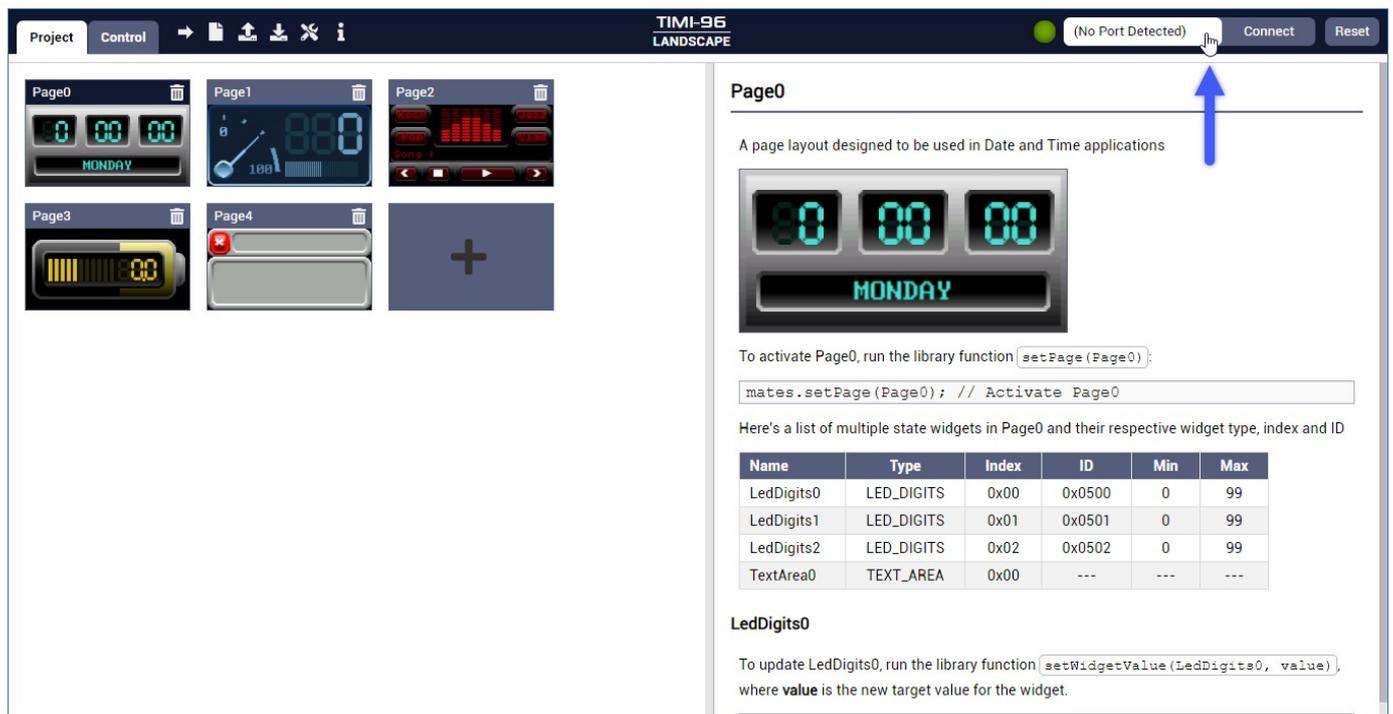
Before connecting the module to the computer, open Device Manager. Next, connect the module and the window will refresh.



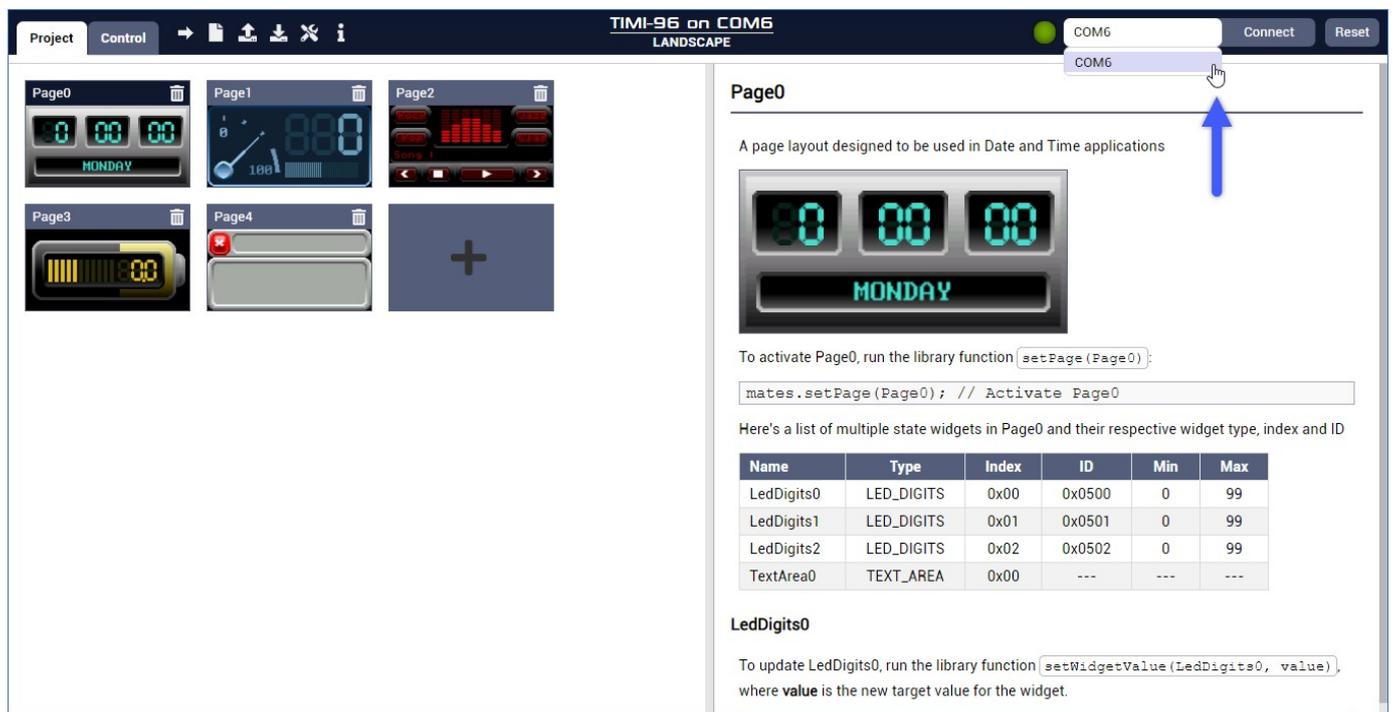
As shown under **Ports (COM & LPT)**, a device is now connected to COM6. If multiple devices are shown, the device recently added is the correct port.

Selecting the Target Port

After identifying the correct port, the target port for the project can be selected.



As shown above, there is no port detected. By clicking on the dropdown menu, the application will search for connected ports that the target product might be using.



Uploading the Project

After finalizing the project, it can be uploaded to the target device specified by the selected port.

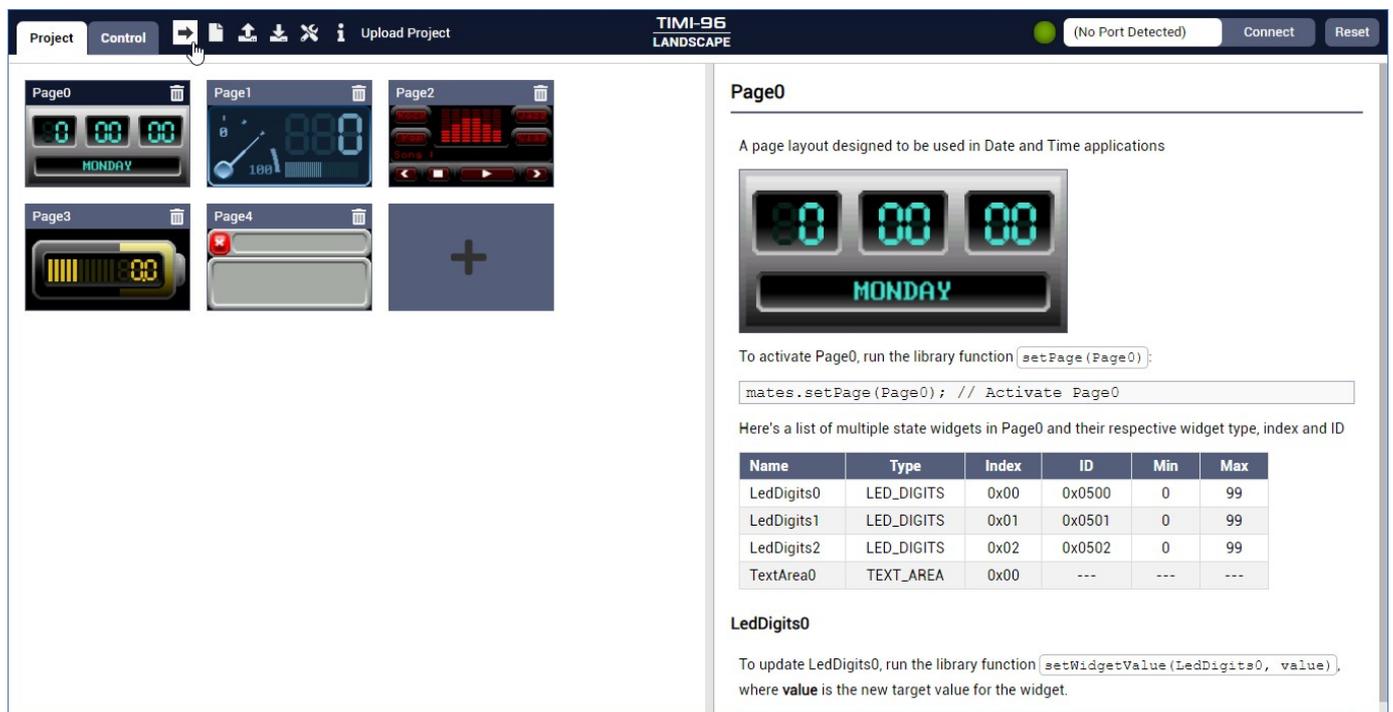
Before uploading, the following needs to be confirmed:

- The port selected is correct and the target product is connected.
- The port selected is not being used by other applications or other Mates Studio windows.

Note

Refer to [Establishing Connection](#) section of the Controller Interface for a tip on how to easily confirm that the port is not busy_)

After checking the items above, upload the project by clicking the Upload button.



The screenshot shows the Commander Editor interface. At the top, there is a 'Project' tab and a 'Control' tab. The 'Upload Project' button is highlighted. The main area displays a preview of the project, showing several pages (Page0, Page1, Page2, Page3, Page4) and a plus sign for adding new pages. The right-hand side shows a detailed view of 'Page0', which is designed for date and time applications. It features a digital display showing '00:00' and 'MONDAY'. Below the preview, there is a code editor showing the library function `mates.setPage(Page0); // Activate Page0`. A table lists the state widgets in Page0:

Name	Type	Index	ID	Min	Max
LedDigits0	LED_DIGITS	0x00	0x0500	0	99
LedDigits1	LED_DIGITS	0x01	0x0501	0	99
LedDigits2	LED_DIGITS	0x02	0x0502	0	99
TextArea0	TEXT_AREA	0x00	---	---	---

Below the table, there is a section for 'LedDigits0' with the library function `setWidgetValue(LedDigits0, value)`, where `value` is the new target value for the widget.

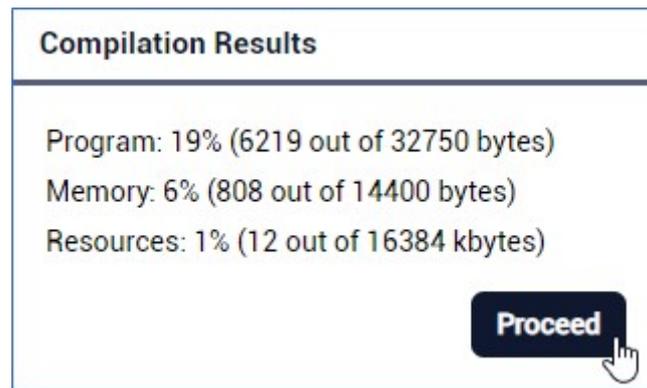
Uploading unsaved projects will automatically open a Save Project window before the application proceeds with uploading the project to the target device.

The project will be compiled for graphical resources.

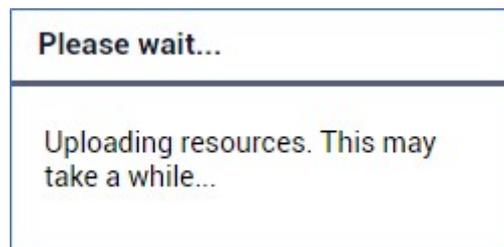
Please wait...

Preparing graphical resources.
This may take a while...

Afterwards, an information window containing the compilation results will be shown.



Click **Proceed** to continue with the upload.



The graphical resources will be uploaded, and the display will be programmed with the Commander project.

Simply wait for the process to finish successfully. Once it completes, the module will show the first Page of the Commander project.

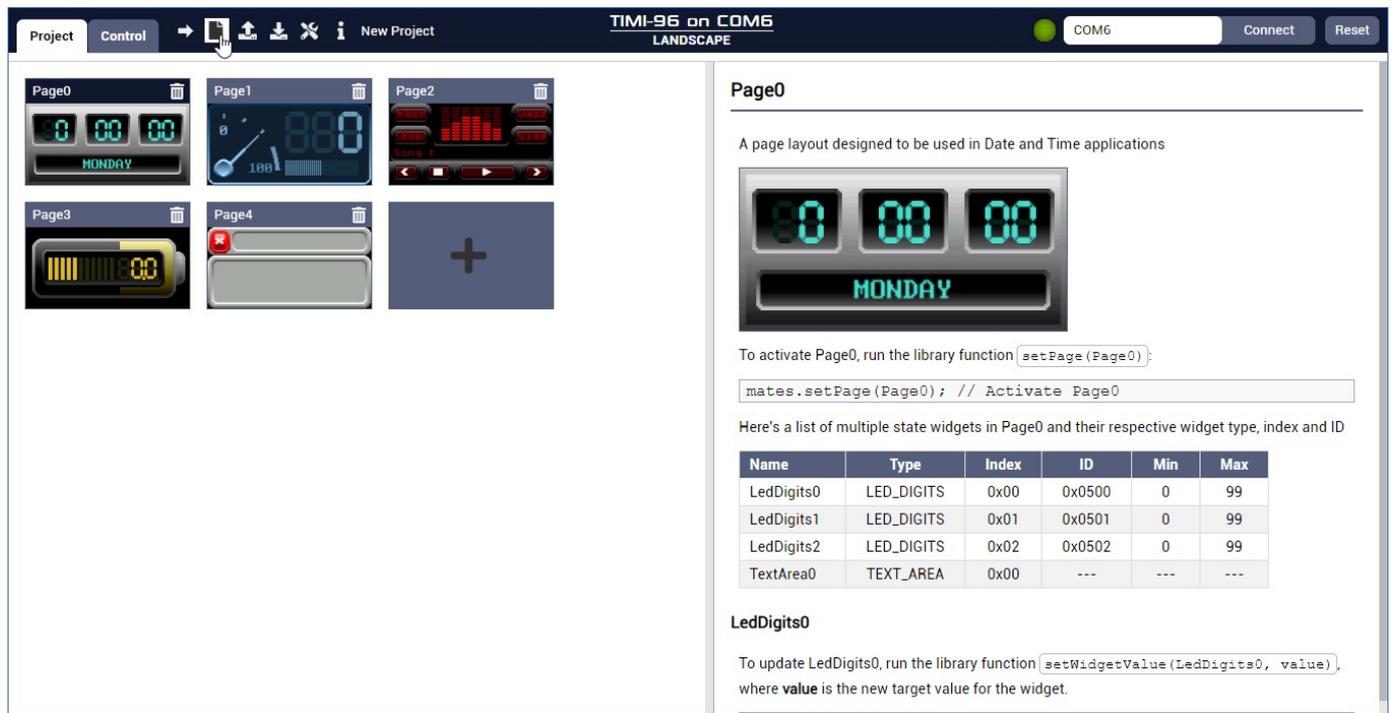
 **Note**

For instructions on how to test the project, please refer to the [Controller Interface](#) documentation.

Additional Options

Creating a New Project

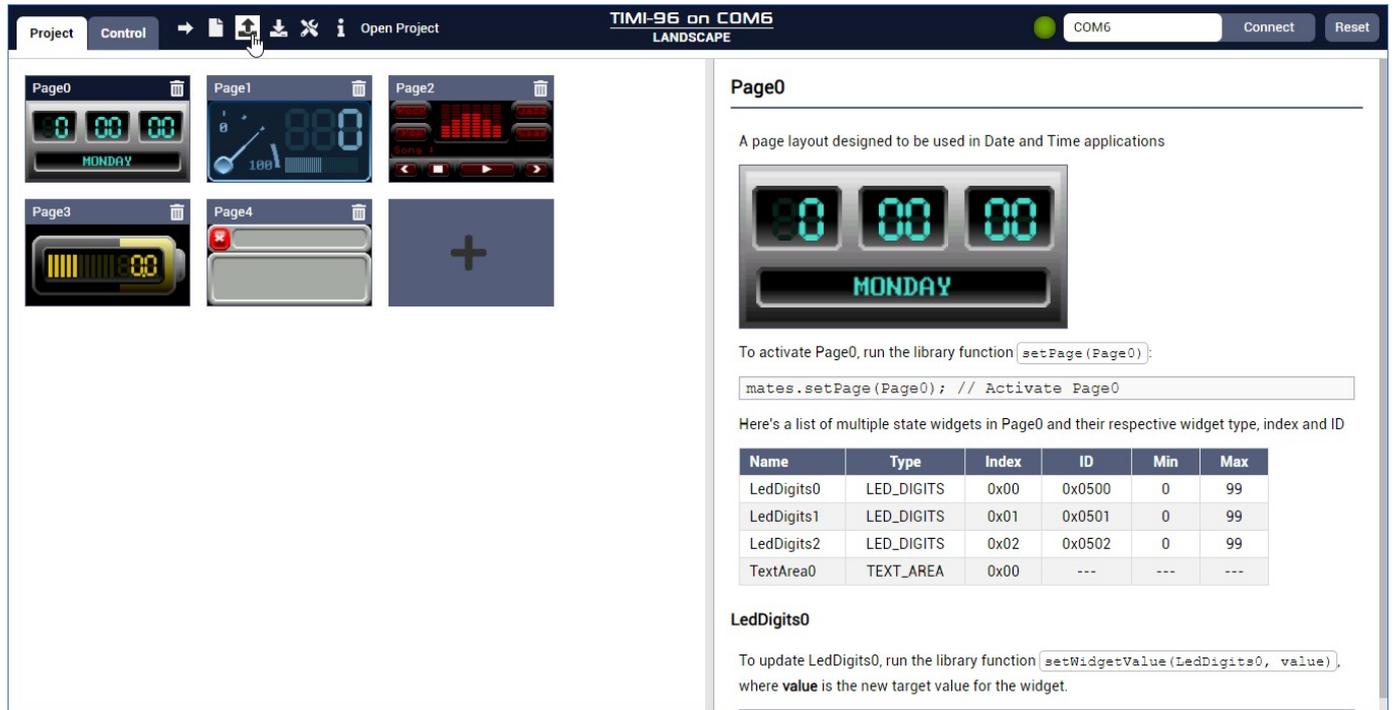
The setup window can be opened from a Commander window by clicking the **New Project** button as shown:



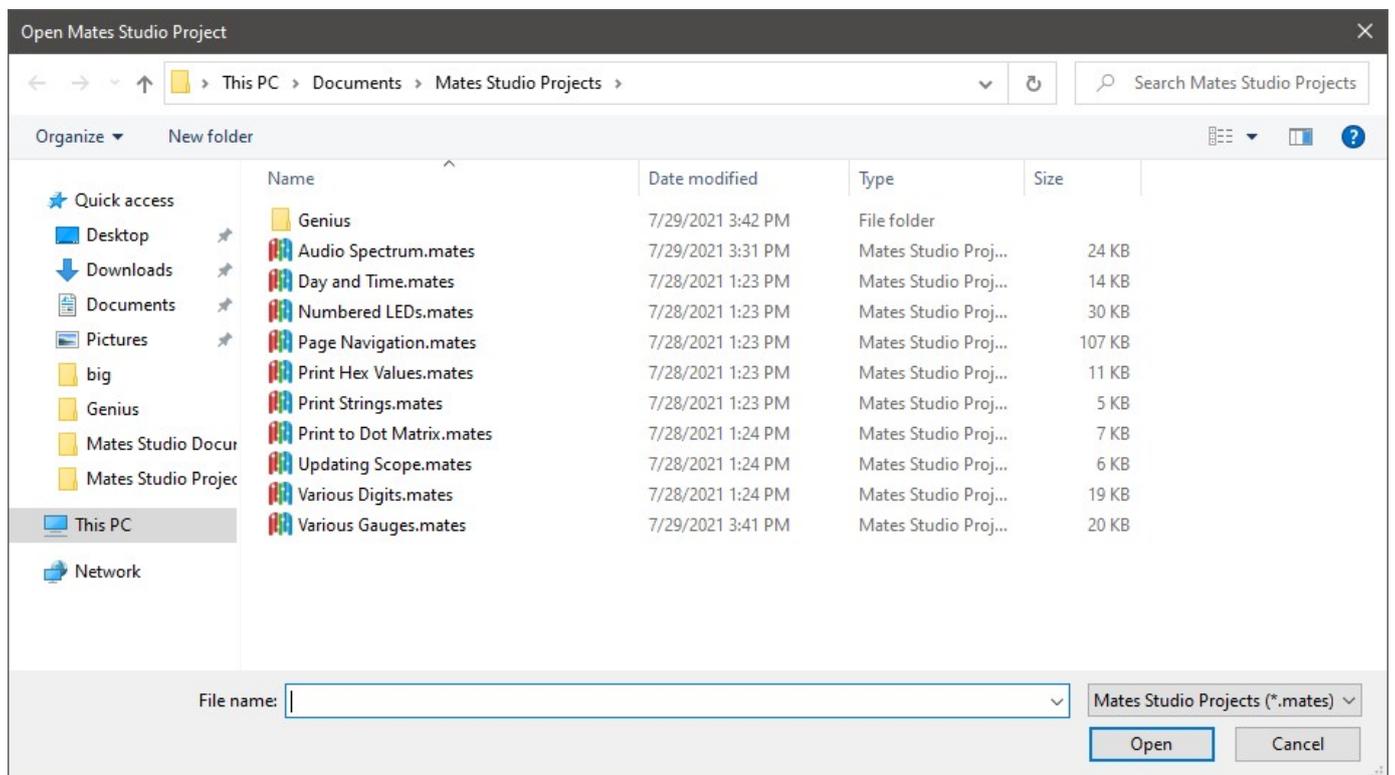
This will open the Setup Window as shown when opening Mates Studio. Please refer to the [Mates Studio User Guide](#) for more information.

Opening a Project

An Open Project window can be opened directly from a Commander project by clicking the Open Project button as shown:

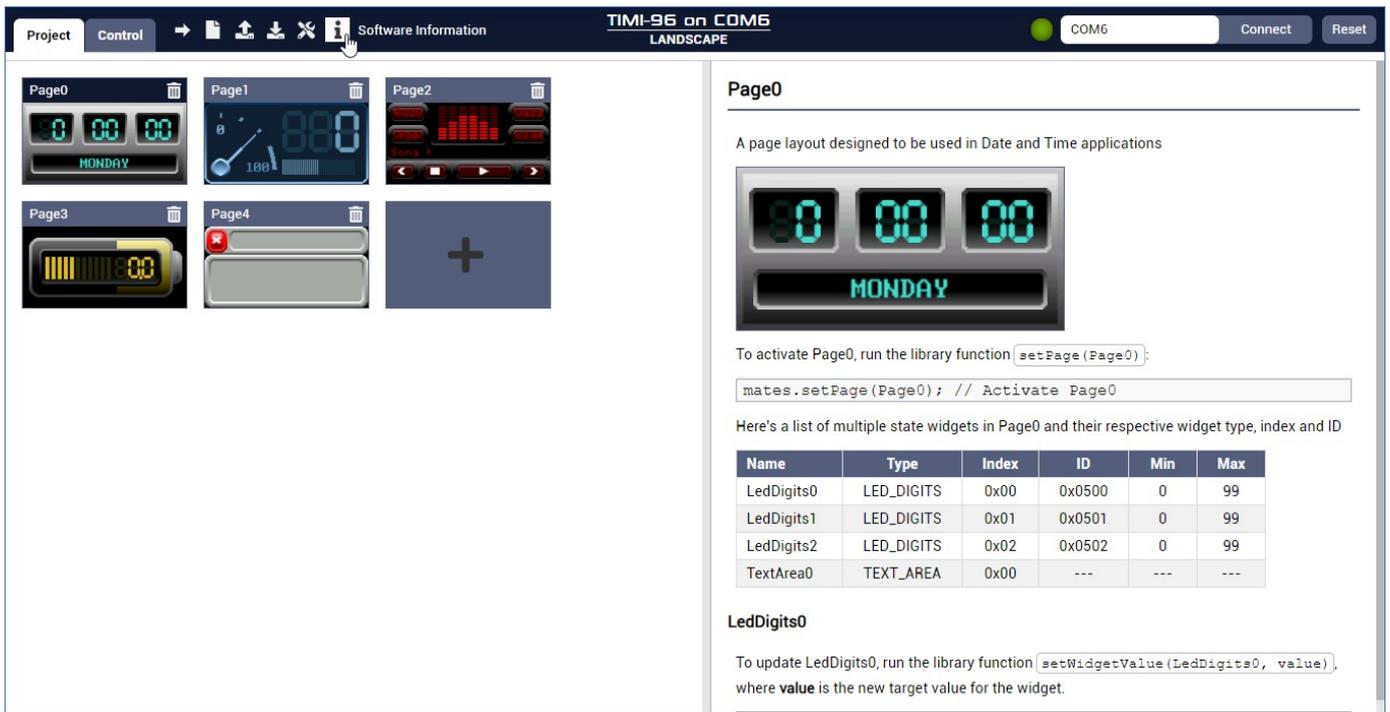


This option will open a file selection window for you to find and select a project file to open.



Software Information

The application version can be checked by clicking the button as shown:



This will open a small window containing version and contact information.

Mates Studio - Commander 1.0.0

An IDE developed by Breadboard Mates for designing and programming BBM display modules.

For technical support, visit our [support page](#).

For sales inquiries, you can contact our team through sales@breadboardmates.com

CLOSE