

<http://12Blocks.com>

12Blocks is a visual language and tool that makes programming micros easy.

Visual Programming

Drag blocks from the library to the worksheet and press run. Snap blocks together with their tabs. Blocks are customized by their parameters. Click on a parameter to edit it. Drag one or more blocks into a parameter region to pass their result to the parameter.

Editing Tools

Drag blocks with your mouse. Use the block tabs to connect blocks. Delete blocks by dragging them back to the library. Use the scrollbars or mouse scroll wheel to scroll around the worksheet. Undo/Redo actions. Select a single block by clicking on it. Select multiple by lassoing around them and/or selecting blocks while pressing the <shift> or <control> key. Copy/Cut/Paste/Delete blocks. Right drag a block to create a copy. Press the Ctrl key to drag out a single block from a stack.

FEATURES

View and Edit Source

“Edit/View Source” to edit the text code representation of your program. When you return to 12Blocks the blocks will reflect the changes you've made.

Copy/Paste as Code

Select blocks, “Edit/Copy” then “Paste” into your text editor as actual code. Or “Copy” actual code and “Edit/Paste” into your worksheet.

Built-in Compiler and Loader

Press “Run” to convert to text code, compile to binary and upload.

Schematics, Photos, Description

Include everything you need in one worksheet- “File/Properties” to drag/drop a schematic for your hardware, add photos and enter description

Connect to Monitor and Control

By default a serial connection between 12Blocks and your micro is made after a program is loaded to let you monitor and control the program. On the Propeller this uses one of the eight cog to provide a 1Mbps connection-it does not affect the speed of the program running in the other 7 cogs. The connection let's you change program parameters without recompiling.

Real-time Graphing

“View/Values” to show the actual values of global variables. Variables can be graphed in real-time at different timescales with optional trigger

IO Pin Graphing

“View/Pins” to show the actual state of the micro's IO pins used to communicate with other devices. Pins can be graphed in real-time at different timescales with optional trigger

Built-in Terminal

“View/Terminal” to start a terminal connection to the micro. Send/receive strings and numbers with blocks from the terminal section.

Save As EXE

“File/Save As/exe” builds a single file package that can be run on another computer to load, control and monitor a program with a custom interface

Save as ZIP

“File/Save As/zip” builds a package of all source code required by a program

Save As PNG/ Print

“File/Save As/png” to save your program as an image or “File/Print” it

Load Permanently

“Device/Load Permanently” to burn the program into your micro's EEPROM

Tabbed Worksheets

Open, Save, and create New worksheets using the File menu. Use tabs to switch between open worksheets. Drag blocks onto another tab to move blocks between worksheets.

Port Selector

Manually specify the port of the device you wish to program or let 12Blocks automatically find it. In Auto mode, 12Blocks will display the current port with an asterix: “COM10*”

Library Selector

Choose which device you wish to program. This affects pin assignment, clock constants and which blocks are supported by the hardware. See the “12Blocks/hardware” directory to support custom hardware.

Supports popular microcontrollers

Propeller (bs2, arduino, picaxe, mindstorm, vex under development)

Multiplatform

Windows (Mac and Linux under development)

Resources

Online Video tutorials demonstrating how to build solutions with 12Blocks

Examples: "File/Examples" for dozens of commented example programs

Reference Help: "Help/Reference" to get more information about a topic

Exercise Guide: More than 20 exercises from blinking to PID control

Tutorials: "File/Tutorials" for step-by-step tutorials to get you started- or write your own by saving a commented file into the "Tutorial" folder.

Custom Blocks

"File/Import Blocks" to import a source file to the current worksheet and automatically create blocks. Block properties can be edited manual using "File/Properties" or provided with inline XML in the source file. Source file can also be saved into 12Blocks/hardware/device directory to permanently add blocks to library for use with all worksheets.

Comprehensive Library

Over 100 blocks to solve most problems including:

Repeat a stack of blocks: forever, a set number of times, or while a condition is true

State Machines support different behaviours based on the state of your program

Triggers start blocks when something happens

Tasks let you delegate behavior- either synchronously or asynchronously

TV and VGA graphics

Sound text to speech, play/record wav files, synthesize music

Motor/Servo control high and low level blocks- including ramping and idle

Sensors proximity, compass, mouse, keyboard...

Arrays, Variables and Strings

Functions with parameters, local variables and return values. Can be refactored and used in recursion

Pin Input and Output including frequencies, periods, discharge rate, serial protocols, pulse width modulation

User Interface blocks to control and monitor your program with a custom interface- including image background, meter, joystick, gamepad

Skype to monitor/control your device remotely via text chat messages

Fiducial detection to control devices using computer vision

Export to File to save variable values to file

ROS integration to interoperate with other devices and algorithms like computer vision, motion planning, Kinect, structure from motion, and SLAM using the Robot Operation System