Cambridge Regional College

"At Cambridge Regional College we teach students from the BTEC level 2 up to HND. Flowcode has become an essential part of the coursework and fits in extremely well with the syllabus. Flowcode offers our students an overview of microcontroller systems and allows problematic thinking to evolve with microelectronic designs.

Using Flowcode allows advanced designs to be constructed from start to finish. Students can work at their own skill level and adopt personal project design.

The software is unique in the educational workspace and creates an almost limitless new learning environment.

There is so much creativity now available to our students that we can run a great deal of our classes using the program.

We believe the Flowcode experience is something students should all have access to for its designing and learning possibilities. The people at Matrix have created something truly amazing and Flowcode cannot be called anything other than a world class product."

Steve Collins,
Cambridge Regional College

Brunel University London

"I used Flowcode for the students in a module called "Embedded Systems Engineering" (MSc and MEng module). Some students have never used microcontrollers before and they were able to use Flowcode easily for basic microcontroller based embedded system design on a ping pong game.

The students moved on to use Flowcode for a project on Zigbee based wireless network system for environment monitoring. The project was very successful."

Hongying Meng,
Brunel University, London.

UNIVERSITY OF LEEDS

"As the Senior Electrical/Electronic Technician in the Faculty of Engineering, I find that using 'Flowcode' is an invaluable tool, to clearly convey the Embedded Code to be used in applications with Microchip's 18F4455 & 18F2455 (ECIO Modules). Previously, the School of Electrical & Electronic Engineering have introduced students to the 'Formula Flowcode' with the little robot vehicle at their command. The School of Mechanical Engineering students build their own buggy designs and I am confident a few incorporate 'Flowcode' Modules into their designs."

Matthew Buckley,
Leeds University, UK.

"We have been using Flowcode and E-blocks in most of the electronics courses all over Flanders for the past 8 years. It's a great tool to put your first steps in embedded programming and it's also great to do the high level stuff like embedded webservers, Bluetooth and USB. The excellent and fast support of the Matrix team gives teachers the necessary confidence to take their projects to the next level."

Bart Huyskens,
St.Jozefinstituut, Schoten, Belgium.

Flowcode software allows you to develop complex electronic and electromechanical systems with ease.

Flowcode is an advanced integrated development environment (IDE) for electronic and electromechanical system development. Engineers - both professional and academic - use Flowcode to develop systems for control and measurement based on microcontrollers, computers, or on rugged industrial interfaces using Windows compatible personal computers.

Flowcode 8 is the latest version to be released and is packed full of exciting new features. Users can program Arduino, PIC, AVR and ARM MCU's that have been available in previous versions, but there is also the ability to control hardware running on a Raspberry Pi.

Furthermore, Flowcode 8 allows full simulation (including simulation of C code), with users also being able to convert C code to flowcharts and other programming languages.

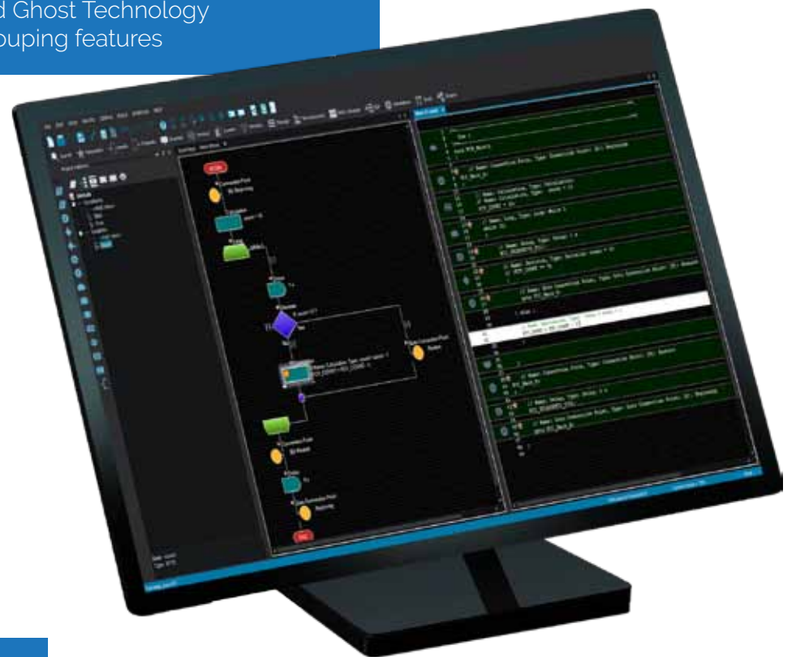
Other brand new features included the ability to Auto ID your E-blocks2 hardware you are using, improved compatibility with Arduino hardware, to give a more streamlined and smooth approach to programming this popular family, and SCADA mode – meaning users can now control external hardware from their PC, using this impressive feature.

As with previous versions, a 2D and 3D graphical development interface allows users to construct a complete electronic system on-screen, develop a program based on standard flowcharts, simulate the system and then produce hex code for programming a range of devices including Arduino, Microchip's PIC MCU; 8-bit, 16-bit and 32-bit, as well as Atmel AVR, ARM and Raspberry Pi devices.

- Multiple programming languages means it's easy to use the language you are familair with
- Microcontroller flexibility - switch between multiple hardware platforms
- Advanced simulation - including compatibility with CAD packages including Solidworks
- Test & debugging - using built in data recorder and oscilloscope
- Enables development of comms based projects using built-in comms support for UART, Bluetooth, I2C, SPI etc.
- Open architecture - all aspects of Flowcode are fully customisable for your projects
- Fully supported - with online videos, courses, documentation and an active online community

What's new in Flowcode 8?

- C code to flowchart converter and C code simulation
- Two new programming modes: "Blocks" and "Pseudocode"
- Auto ID your hardware
- SCADA mode
- Compatibility with Raspberry Pi
- Improved test, debug and Ghost Technology
- Code folding and icon grouping features



Did you know? Flowcode academic licences allow your students FREE Flowcode licences for use at home

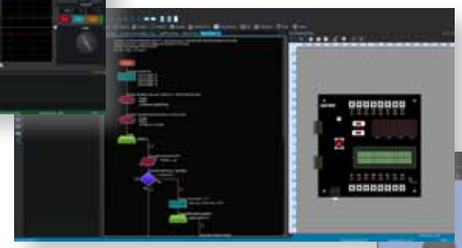
What is FLOWCODE

Test enviroment

- Full simulation capabilities
- In-Circuit-Test
- In-Circuit-Debugging
- Ghost Technology

MCU programming

- 8, 16 and 32-bit PIC
- AVR
- Arduino
- 32-bit STM32 ARM MCU's
- Raspberry Pi

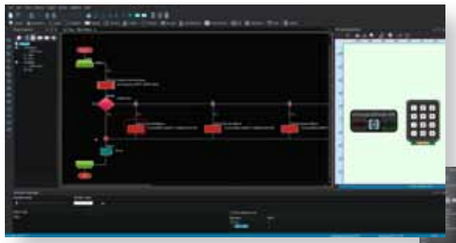


SCADA IDE

- Hardware support
- Separate SCADA mode

Mechatronic system development

- Robotics
- AllCode technology
- MIAC PLC

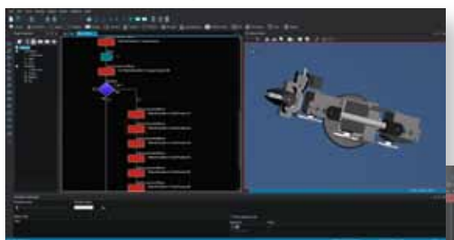


C code editor

- Full C code editor
- Simulate your C code
- Convert between C and flowcharts etc.

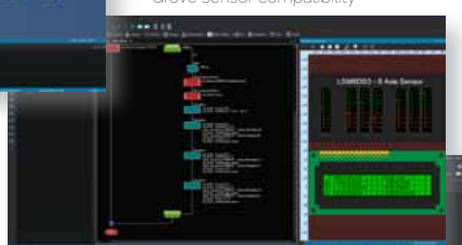
Wired & wireless communications

- Serial comms including I2C
- Comms hardware solutions available
- Internet of Things project development



Sensor interface

- Sensor module support
- Grove sensor compatibility



Multiple programming languages

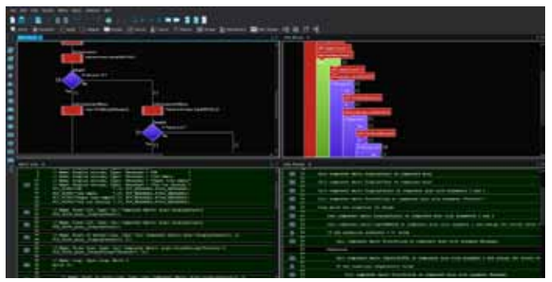
- Flowcharts
- Blocks
- Pseudocode
- C code

The new version 8 user interface allows students to design, simulate and test a wide variety of microcontroller based systems with ease.

1. Icon tool bar - drag and drop standard flowchart icons onto your flowchart. Click to edit properties for a syntax-correct program.
2. Project explorer - instantly see all the ports, macros, variables, constants and components in your project.
3. C code program - monitor the C code equivalent of your flowchart; as fast, syntax correct code is generated automatically on a per icon basis.
4. Control tool bar - use the standard tool bar for editing your program and also for simulating your program and running In-Circuit-Debug / Test.
5. Component tool bar - choose your electromechanical component from our large library of parts; from simple switch to Bluetooth module.
6. Flowchart program - drag, drop and edit standard flowchart icons to create a program. Design flowchart macros that can be called from other icons. Use Flowcode's powerful PC-side language to control external instruments, and monitor your systems.
7. Properties editor - see and edit the properties of all components.
8. Component debug - see the API calls in your program and component design.
9. Icon list window - for search results, error messages, breakpoints and bookmarks.
10. Analogue window - see the state of the analogue inputs in your design.
11. System panel - design your system using the multi-view system panel. Use off-the-shelf electromechanical components or design your own. Import your model from a program like SketchUp or Solidworks.
12. Dashboard panel - control and monitor your program in simulation and In-Circuit-Test. Write programs using simulation API commands to show real world equivalents of your data in human-friendly formats.
13. Data recorder - use this to show time-varying signals in your system. Link the scope to simulation data or real data during In-Circuit-test.
14. Chip - use the chip window to view and control the status of the inputs and outputs on your chip in simulation and In-Circuit-Test.
15. Oscilloscope - another important debugging tool that displays important data from your project.

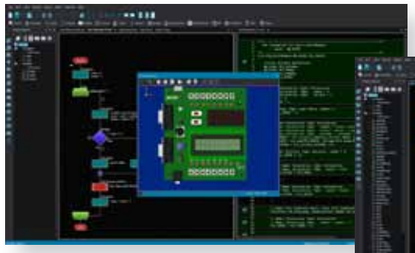
Did you know? Flowcode 8 now allows you to embrace multiple programming languages including:

- Flowcharts
- Blocks
- C code
- Pseudocode



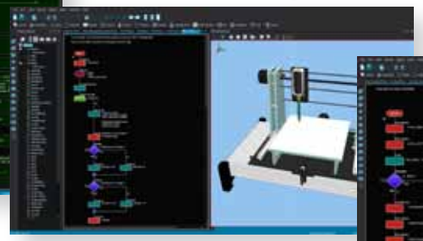
Design

Electronic engineer



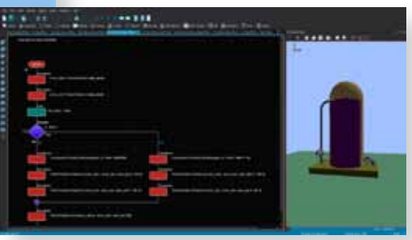
Design a virtual circuit board with PCB level components that connect to a virtual microcontroller and develop the program using flowcharts.

Electromechanical engineer



Develop a mechanical system in Solidworks and characterise it for Flowcode. Develop a flowchart program for control and operational data conditioning.

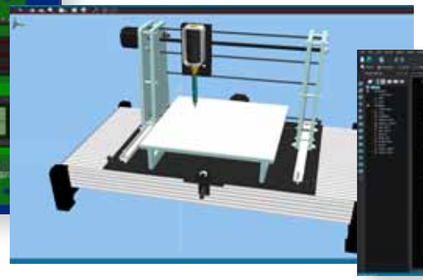
System engineer



Develop a mathematical and/or physical model of your system, and develop a flowchart control program using Flowcode.

Simulate

Simulate the program and circuit board components to check function using LEDs, and interact with virtual switches to control the system.



Simulate the mechanical system, the electronic system and the data decoding algorithms all in one package.

Use Flowcode Dashboard objects to simulate system performance in human friendly graphical format.

Test

Download to the microcontroller in the E-blocks development system and use In-Circuit-Test and Oscilloscope feature to verify operation at pin level.

Use In-Circuit-Test to test and debug at a pin level.

Link Dashboard objects, Oscilloscope and Console to third party instruments using DLLs in SCADA fashion to verify performance in real time.

Deploy

Develop the final circuit board and release to market.

Develop the final product, verify operation and release to market.

Deploy your system in a control system based on microcontrollers, MIAC controller or Windows PC linked to third party controllers using DLLs.

Supported devices

E-blocks2

Use Flowcode to program Matrix's new hardware platform E-blocks2; the perfect platform for learners, engineers and electronic system developers to prototype designs on a rugged platform. A range of programming boards and peripheral downstream boards such as input, output, communications, prototype boards and more make this the ultimate development platform.

MIAC

The MIAC range from Matrix gives electronic engineers a rugged industrial platform on which to develop their designs. With MIACs now available not only with an 8bit PIC MCU but also 16bit PIC, Arduino and Raspberry Pi (not compatible with Flowcode), users have a rugged PLC which is easy to program and perfect for harsh, industrial environments.

Arduino

One of the major benefits of using Flowcode, is that it simplifies the programming of Arduino platforms. AVR support means you can do more with your Arduino than you ever dreamed – you can even integrate it into our E-blocks modules with our E-blocks Arduino Shields.

Did you know? Flowcode academic licences allow your students **FREE** Flowcode licences for use at home

8bit PIC

Flowcode provides support for the entire performance range of 8-bit microcontrollers from Microchip, with easy-to-use development tools, complete technical documentation and post design in support through a global sales and distribution network.

16bit PIC

Flowcode also supports Microchip's 16bit family of MCU's - also known as dsPIC or PIC24 devices.

32bit PIC

The PIC32 family delivers 32bit performance and more memory to solve increasing complex embedded system design challenges.

Raspberry Pi - NEW

New for version 8 is the ability to control Raspberry Pi devices using Flowcode. We have even developed a hardware platform, on which your Raspberry Pi becomes compatible with the whole new range of E-blocks2 boards. Perfect for those in Computer Science, or who wish to develop using the Pi.

AVR & ARM

Atmel's AVR devices including the popular Arduino, plus a range of 32-bit STM32 ARM MCU's are also supported in Flowcode 8.

Academic support and support for learners

Flowcode delivers outcomes not only in professional, and industrial businesses but also at a number of levels of education. For many years Flowcode has delivered at further and higher education levels.

Students can use Flowcode for learning programming, electronic design, robotics, and pneumatics and can link programs to a range of Matrix hardware systems including our low cost Prototype and Projects boards, Formula AllCode robot, our MIAC and Automatics solutions and any third party hardware that accepts hex code for the appropriate microcontroller devices.

What's more, Flowcode also has compatibility with packages including Solidworks meaning users can characterise electronic elements and parts in their mechanical designs.

Flowcode is very well supported. Complete beginners will find our free online resources great for covering the basics of developing electronic systems.

All users will value the support offered by our engineers, valued contributors, and extended online community.

The Flowcode Wiki site provides you with a detailed glossary style overview of the aspects of the Flowcode environment. The Matrix forum is a great place to share ideas and solve problems with our well established community of long term as well as new users. It's attended to and updated by our own engineers on a daily basis.

Wiki

Forum

Course

Examples

Flowcode 8

Microcontroller system training & support for education

Flowcode is a unique platform for studying a range of subjects and disciplines. None more so than the development of microcontroller systems. As a software, Flowcode is approved by Pearson's BTEC qualification at level 3 for the new mandatory unit (6) on microcontroller systems for engineers. For this unit and many others across vocational and higher education, we are proud to develop and offer an option for your institution that delivers an excellent development environment, engages students in their projects based on multiple hardware platforms including Arduino, and we are confident that our expertise in training, support and curriculum will give you the perfect choice for teaching electronics and microcontroller related subject areas.

Try out the free version at www.matrixtsl.com/flowcode

For further information on how we can help to give you what you need, do not hesitate to contact us today