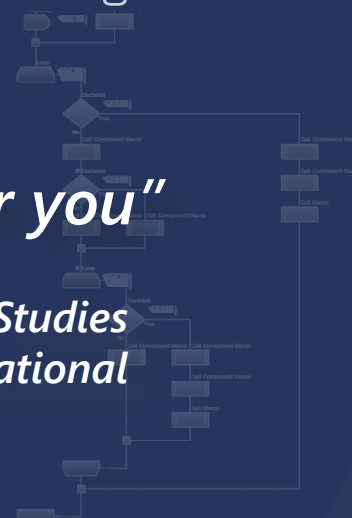# FLOWCODE**7**
Smarter programming

*"Making things
happen for you"*

*Case - Studies
Professional & Educational*

MATRIX

Matrix Technology Solutions Ltd. is a premier, global provider of technology solutions. Since 1993, Matrix have developed a wide range of Educational, and Industrial products simplifying subject matter including Electronics, Electricity, Programming, Robotics, Mechatronics, Technology and Computer Science.

professional users of the latest version

3,000

academic users of the latest version

20,000

38% of users programming Arduino

20 top UK Universities are using Flowcode 6

300+ French institutes using Flowcode

FLOWCODE7

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 or on rugged industrial interfaces using Windows compatible personal computers.

In this document, you will find a range of professional, academic and home use case studies from users of Flowcode, designed to provide you with assurance that Flowcode is an easy-to-use, advanced IDE for micro-controller project development.

Smith of Derby clockmakers are the UK's leading Church and public clock repairer and restorer, taking care of over 4,500 historical clocks in the UK and across the world.

With company heritage that dates back over 160 years, skills are retained and passed down from generation to generation blending cutting edge design with traditional values.

The Smith of Derby, patent applied PAR-100 Pendulum Regulator System provides automated time adjustment for weight driven tower and Church clocks. The PAR-100 prevents the clock from drifting out of time and is particularly useful where automatic winding has been fitted. The auto winding system replaces the need for regular hand-winding and the PAR regulates the time.

By setting the clock to run faster than normal the PAR 100 operates by, periodically, stopping the pendulum whilst real time "catches up" with indicated clock time. This constant re-synchronisation keeps the clock to within a very close tolerance of real time day on day, week on week and so on.

Matt Bean, Research and Development Manager at Smith of Derby said: *"We used Flowcode to develop the first prototype of the PAR-100 using the EB006 PIC E-block and a sample board. This allowed us to create quick prototypes of the initial concept which we could use to apply for a patent on the invention. The quicker code development time meant we were able to focus on the user interface and control routines and get the product into testing quicker. Flowcode gave us a stable programming environment to develop the code which enabled me to work on the design of the production PCB, actuator and enclosure.*

He continued: Sometimes, it's easy to miss little bits of syntax when inputting the code, such as a semi-colon or the wrong type of bracket. Flowcode eliminates this problem by automating syntax in the background, whilst giving a flowchart user an interface that converts the black art of coding into technical diagrams. To an engineer like myself this makes so much sense.

Furthermore, it works with ANSI C, which means I can import old proven routines, from our products, directly into Flowcode, meaning I don't have to re-write every program when I update products that are already written in C."

Matthew Bean, Smith of Derby, UK

Brunel University London

Brunel University London is a world-class university based in Uxbridge, West London, and was established in 1966. The College of Engineering, Design and Physical Sciences offers a challenging but supportive environment where excellence and enterprise is at the heart of everything .

"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

In 2015, the department of electronic engineering began using a range of E-blocks hardware solutions for specific telecommunications programs to be taught at the University.

"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 Microchips PIC series of microcontrollers.

Our students also use Matrix' robotics solutions and Flowcode hand in hand to develop commands and designs to control the robots."

Matthew Buckley,
Leeds University

UNIVERSITY OF LEEDS

Cambridge
Regional College

Long-time users of
Flowcode, Cambridge
Regional College use
the software to deliver
microcontroller studies
for a whole range of BTEC
qualifications.

Cambridge Regional College is
a leading Centre of Vocational
Excellence and one of the
UK's largest FE providers of
programmes for overseas
students with 4,000 full-time and
6,000 part-time students and 5,000
apprentices currently in training.

*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.*

Steven Collins,
Cambridge Regional College
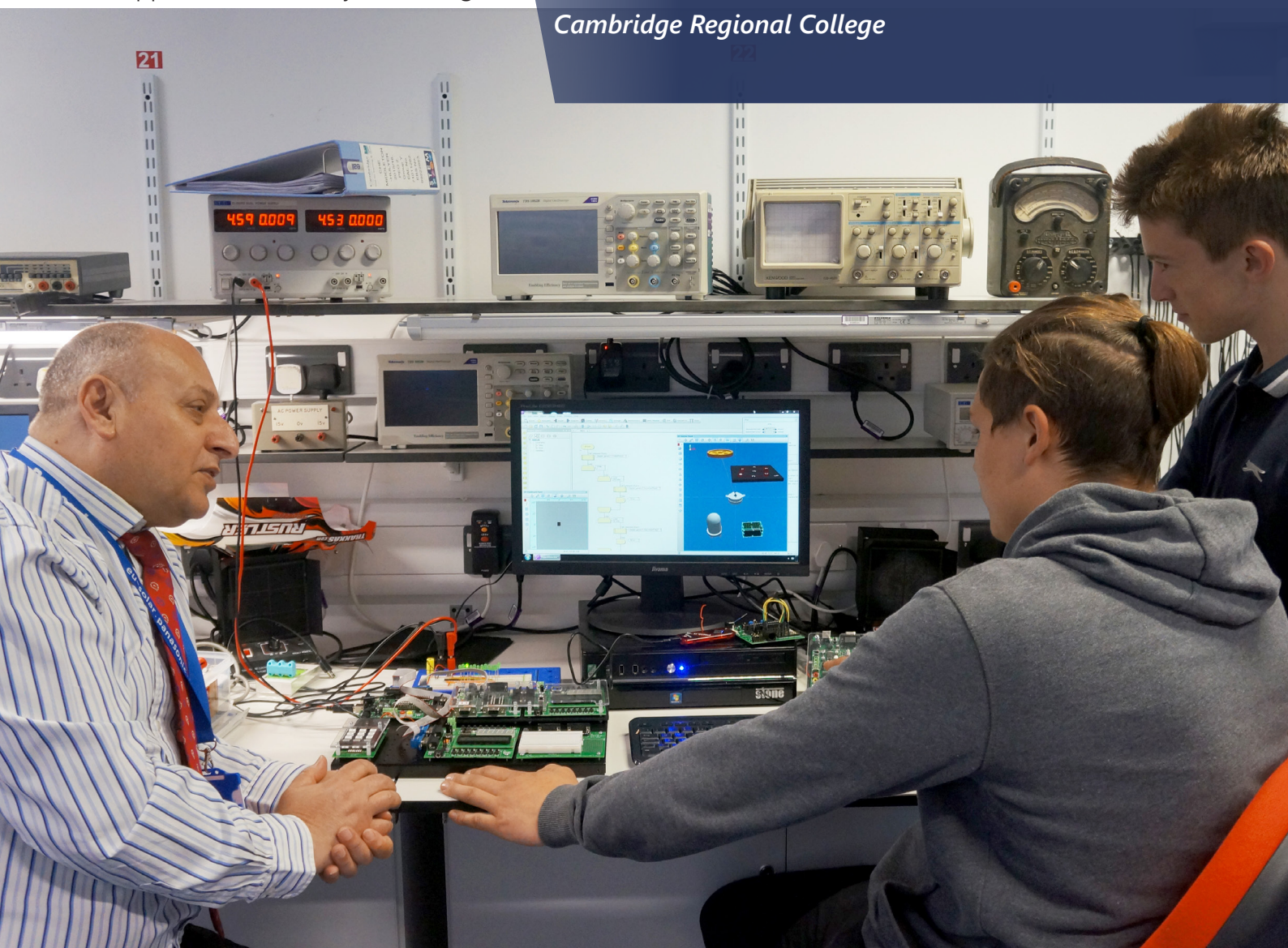
Flowcode not only gives practicing engineers and educational users in academia, a fantastic microcontroller programming environment, but it also gives hobbyists and makers who are looking to use Flowcode in the home, an affordable and feature-packed graphical IDE in which to easily develop complex projects.

The Matrix blog (www.matrixtsl.com/blog) is a perfect example of some of the cool maker projects Flowcode users have developed over the years. Here, we focus on just a few.
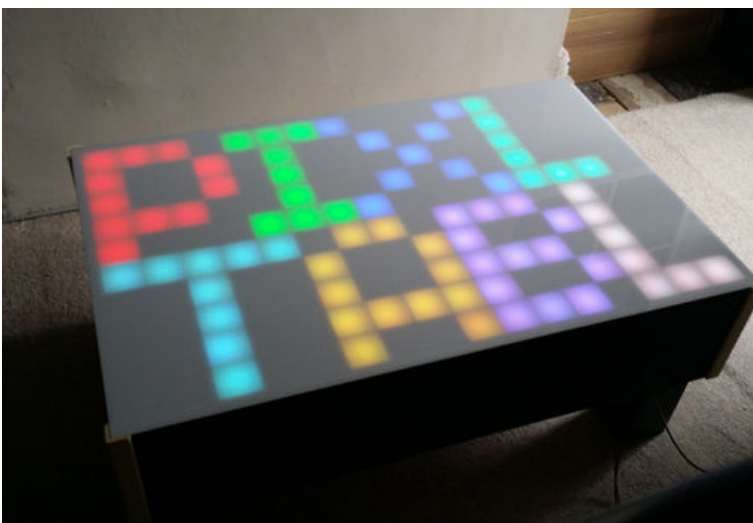

RGB pixel touch reactive gaming table

The gaming table featured in the picture above consists of 10 x 16 RGB LED arrays and Ir touch sensor arrays, an SD card, audio output and Bluetooth.

Carefully designed and put together, the 'node-firmware' was then created using Flowcode. Functionality is designed using standard macros within the software before a USBee protocol analyser is used to improve the efficiency of the firmware. Plus, Flowcode's ability to embed C code means you can use your microcontroller to the best of its ability.

Flowcode's simulation capabilities also paid dividends when it came to testing the project and aided in speeding up development of the software.
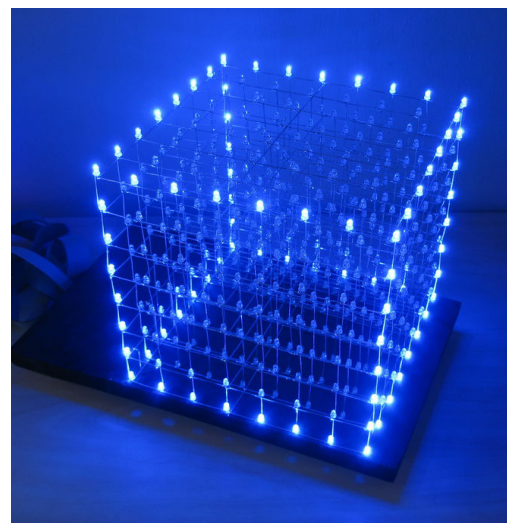
RGB LED Cube table

Another maker project featured is an 8 x 8 x 8 LED cube.

Each individual LED (512!) is bent and soldered together before being placed inside a home-made 3D printed cube. Controlling the LED's was no easy task considering each required 3 signals to drive each colour channel! This meant a custom PCB was best suited to power the cube. In turn, the whole system was developed using a customised Flowcode component which gave the ability to simulate and easily develop programs for any size of LED cube.

Did you know?

Flowcode 7 features a completely free version? The free version of Flowcode is designed to give home users and those wanting an evaluation version of the software, access to a feature limited version of Flowcode 7. The free version is not licenced for commercial or educational institution use but can be downloaded from www.matrixtsl.com/flowcode

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