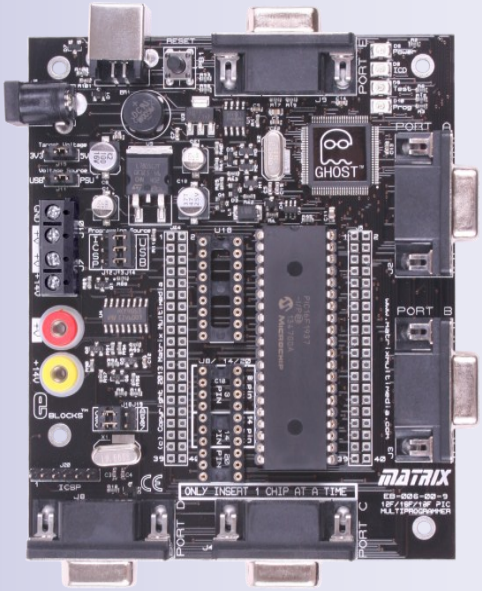
GHOST™

- Real time Input/output monitoring
- Step through the code on your hardware
- Seamless software/hardware integration
- Perfect combo of debug and prototyping tools

Introduction



Ghost is a new technology which, when combined with Flowcode, provides a revolutionary way of debugging electronic systems.

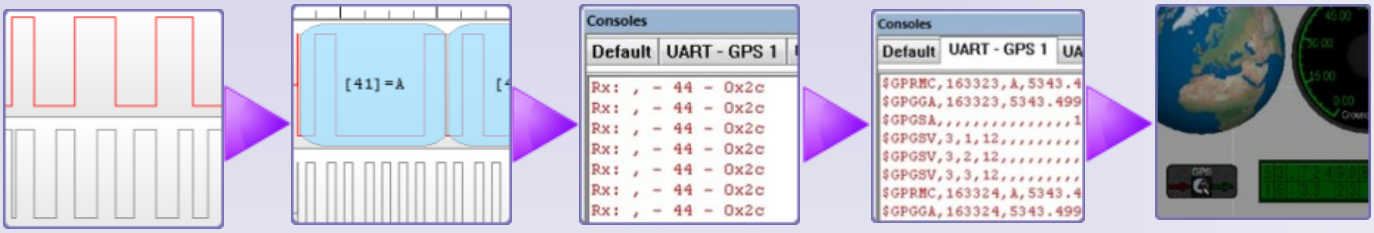
Ghost technology provides a real time log of the status of all the pins on the microcontroller whilst a Flowcode program is running on the device. Ghost data can be viewed on the Flowcode Softscope at the same time as the flow chart simulation. We call this 'In-Circuit Test'. You can run, pause and step through, your program and view Ghost data at the same time and view variables, registers and other memory locations. We call this 'In-Circuit Debug".

When this data is combined with the PC-side processing capabilities of Flowcode, it provides a very powerful debugging and learning tool. As an example of this, the 5 steps below show how ICT works to collect a steam of GPS digital data gathered from the E-blocks system and processed into layers of meaningful information to help the design process. All of this saves a huge amount of development time – whether you are working at a pin level and getting your first program to work or whether you are an advanced user wanting to perform a sanity check to make sure communications baud rates are set at the correct speed.

Both analogue and digital data is gathered through Ghost ICT and displayed on the Flowcode Softscope. For communications busses, decoding overlays for UART, SPI and I2C are available. Ghost data can also be passed to simulations/SCADA components in Flowcode to provide Human Machine Interface style debug features.

How can I use Ghost?

Below is a sample workflow of how Ghost can help debug and test a project.



SCOPE DATA

Ghost pin data is logged via USB and displayed on the scope window

PACKET DECODE

An I2C overlay is put on top of the trace so you can see the ASCII datastream

RAW CONSOLE DATA

The console displays incoming low level ASCII data on the input tab...

INTERPRETED CONSOLE DATA

...which is decoded to high level data and displayed on the GPS tab

GPS DATA

A Flowcode component shows world position and human-friendly GPS data

How does Ghost work?

Ghost is a unique piece of technology. The entire system works in real time as Ghost monitors all the I/O on the target chip and streams that data directly into Flowcode via USB. Below is a diagram explaining how the system works.

The chip being monitored by Ghost executes in real time

All the data lines are scanned by Ghost

The Ghost chip buffers the data it receives and prepares the data for transfer

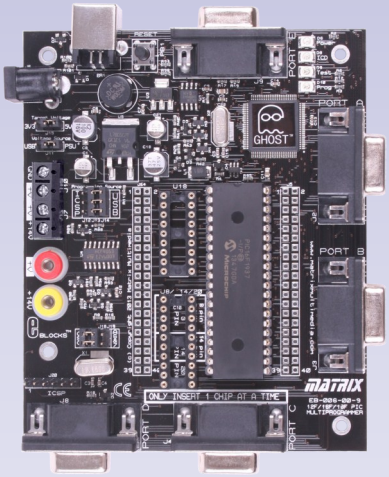
Data is sent via USB to the target PC

Flowcode receives the data from the Ghost and interprets it into graphs and console readouts

For a much more detailed description of how Ghost works, please see this Blog article by the creator of Ghost, Ben Rowland:

Ghost Blog Post

What do I need for Ghost?



EB006 v9 Multiprogrammer Board

To start using Ghost you will need the brand new EB006 version 9 board from Matrix. This board contains the Ghost chip which will allow you to both program your devices and monitor their I/O using the Ghost technology.

Flowcode 6

To use all the great data monitoring features Ghost has to offer, you will require the Flowcode professional license for PIC, which will produce the scope traces and console readings for the I/O on the EB006v9 board.