

# Mobile phone training solution V2

## What does it do?

Provides a motivating solution for learning about communications technology, system construction, and project development.

## Benefits

- Provides understanding of digital communications strategy, practice, and implementation

## Features

- Fully working mobile phone constructed from E-blocks
- Includes Flowcode Professional software
- Full curriculum support
- A great introduction to communications practice



## Description

This solution can be used to provide a complete 20 hour course in developing communication systems. This will give students who are familiar with microcontrollers an understanding of the programming techniques involved in developing communication systems, as well as an understanding of how electronic systems are developed from scratch. The solution can also be used as a motivating platform for learning general microcontroller programming, and is supplied with additional prototype and patch boards for project work.

The solution includes a fully working mobile phone based on E-blocks™. All E-blocks boards are fitted with clear acrylic covers which prevent links and chips from being removed. The solution is assembled and tested in the Factory, and is shipped in rugged plastic trays for storage and transport.

A full copy of Flowcode graphical programming software is provided. Flowcode allows students to understand communications programs and strategies without getting bogged down in the complexity of C or Assembly code. The system can also be used with C and Assembly code (software not provided).

A 50+ page printed and bound manual with student exercises is included. This is also available in electronic form (Word and PDF) along with fully worked examples on CD ROM. An additional CD ROM - Flowcourse 3 - is provided for those who need a refresher course in programming.

This solution is made available at a discount to the sum of the individual parts.

## Learning time

Dependant on course structure and options chosen from the teacher's manual. Approximate figures:

Electronics: up to 20 hours

## Prerequisites

- Some understanding of electronics
- Windows skills
- Some microcontroller programming in C, Assembly or Flowcharts

## Manual

A 50+ page manual is supplied with this product with a range of suggested student activities and sample files on CD ROM.

## System requirements

PC with CD ROM drive and Windows 98 or greater.

## Further information

A separate datasheet is available for each of the E-blocks boards included in the pack. Please see our web site for details.

## Order code

The order code for this product is EB118.

## Also consider

Bluetooth solution  
Digital Communications solution

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## Learning objectives

The mobile phone can be used for teaching microcontroller programming in a highly motivating context. It is also useful for teaching the specifics of communication system development and has many outcomes which include:

### Programming outcomes:

- General programming of systems including LCD, Keypad etc
- RS232 protocol and programming
- String construction and deconstruction in communications
- The use of state machines in controlling electronic systems

### Communications outcomes:

- RS232 communications and handshaking protocols
- ASCII representation of characters in messages
- AT command structure and command protocols used in telecommunications
- Sending and receiving text messages in mobile phone systems
- Modem control and messaging

### Project management and development outcomes

- The use of flowcharts and state diagrams in planning systems
  - How electronic systems are developed from scratch
- The modular approach to building electronic systems

## Pack contents

The table below gives a list of the pack contents. Datasheets on any individual item are available on request.

| Tray | Qty | Code       | Description                             |
|------|-----|------------|---|
|      | 1   | 1 EB00400  | E-Blocks LED board                      |
|      | 1   | 1 EB00700  | E-Blocks Switch board                   |
|      | 1   | 1 EB01300  | E-blocks D/A and memory board           |
|      | 1   | 1 EB01600  | E-Blocks Prototype board                |
|      | 1   | 1 EB01700  | E-blocks patch board                    |
|      | 1   | 1 EB210    | Pack of 100 M3 10mm nylon spacers       |
|      | 1   | 1 EB211    | Pack of 100 M3 25mm steel bolts         |
|      | 1   | 1 EB213    | Miniature speaker                       |
|      | 1   | 1 EB216    | Pack of 100 M3 anti-slip nuts           |
|      | 1   | 1 EB230    | Mobile Phone Solution CD                |
|      | 1   | 1 EB455    | Microphone and earpiece                 |
|      | 1   | 1 EB463    | Mobile phone teachers notes             |
|      | 1   | 1 EB704    | E-blocks LED board cover                |
|      | 1   | 1 EB707    | E-blocks switch board cover             |
|      | 1   | 1 EB713    | E-blocks SPI board cover                |
|      | 1   | 1 EBPUB    | E-blocks publicity sheet                |
|      | 1   | 1 ELSAM    | ELSAM mini CD ROM                       |
|      | 1   | 1 HP2045   | Shallow plastic tray                    |
|      | 1   | 1 HP233    | Hardware Warranty card                  |
|      | 1   | 1 HP3844   | Foam insert for trays                   |
|      | 1   | 1 HP4039   | Lid for plastic trays                   |
|      | 1   | 1 HP9734   | Cardboard box for trays                 |
|      | 1   | 1 HPPSU2   | Adjustable power supply                 |
|      | 1   | 1 HPUSB    | USB lead                                |
|      | 1   | 1 HSTMP    | Temperature probe                       |
|      | 1   | 1 TEFLCSI3 | Flowcode for PICmicro MCUs v3           |
|      | 1   | 1 ELFCSSI3 | Flowcourse 3 CD ROM                     |
|      | 2   | 1 BP232    | E-blocks backplane - tray compatible    |
|      | 2   | 1 EB00300  | E-blocks sensor interface               |
|      | 2   | 1 EB00500  | E-Blocks LCD board                      |
|      | 2   | 1 EB00600  | E-blocks USB Multiprogrammer            |
|      | 2   | 1 EB01400  | E-blocks Keypad                         |
|      | 2   | 1 EB01500  | E-blocks RS232 board                    |
|      | 2   | 1 EB182    | Mobile phone module GM28 or GM29        |
|      | 2   | 3 EB634    | E-blocks IDC cable                      |
|      | 2   | 1 EB703    | Clear plastic cover for Sensor board    |
|      | 2   | 1 EB705    | E-blocks LCD board cover                |
|      | 2   | 1 EB706    | E-blocks PICmicro multiprogrammer cover |
|      | 2   | 1 EB714    | E-blocks Keypad cover                   |
|      | 2   | 1 EB715    | E-blocks RS232 board cover              |
|      | 2   | 1 HP16F877 | PIC16F877A                              |
|      | 2   | 1 HP2045   | Shallow plastic tray                    |
|      | 2   | 1 HP3844   | Foam insert for trays                   |
|      | 2   | 1 HP4039   | Lid for plastic trays                   |
|      | 2   | 1 HP9734   | Cardboard box for trays                 |