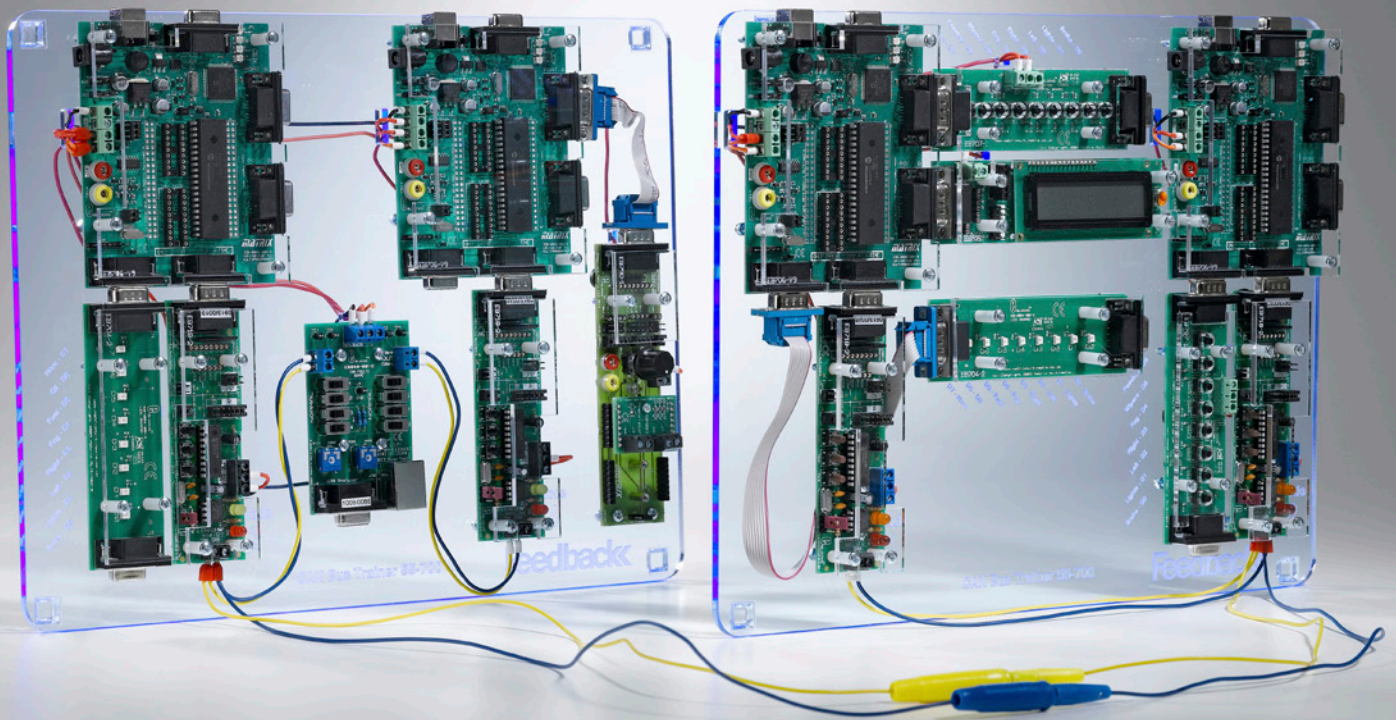


# Feedback

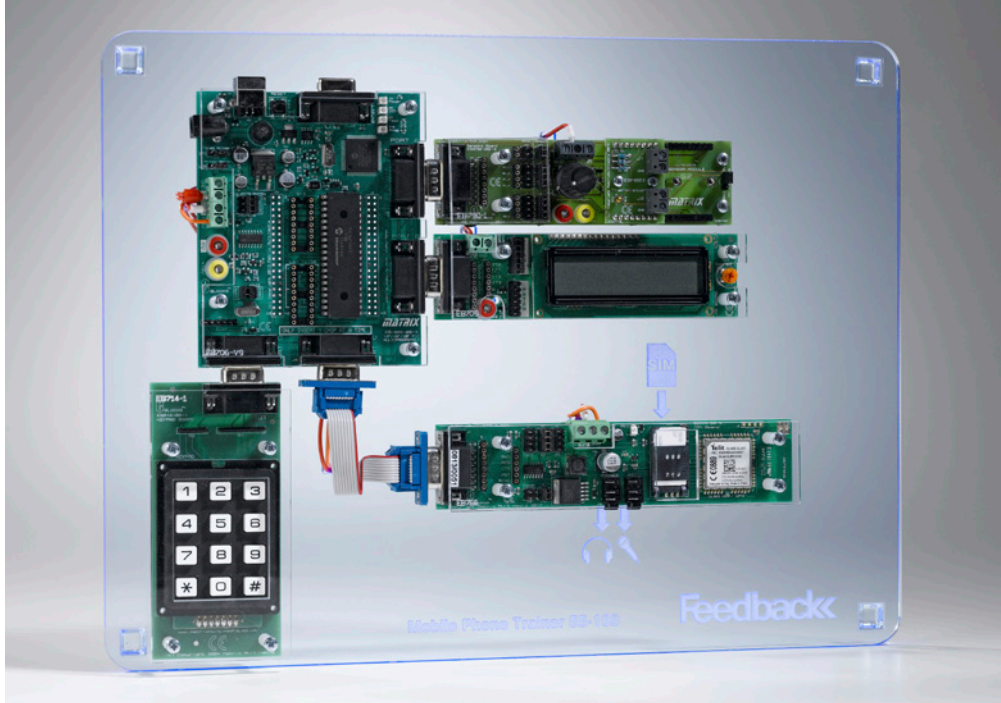
NEW

## 55-SERIES



MODERN DIGITAL  
COMMUNICATIONS  
TRAINERS

## 55-100 Mobile Phone Trainer



The Mobile Phone Trainer provides a complete course in developing communication systems covering the subject areas of communications systems, the AT command protocol and communications strategies.

### SUBJECTS STUDIED INCLUDE:

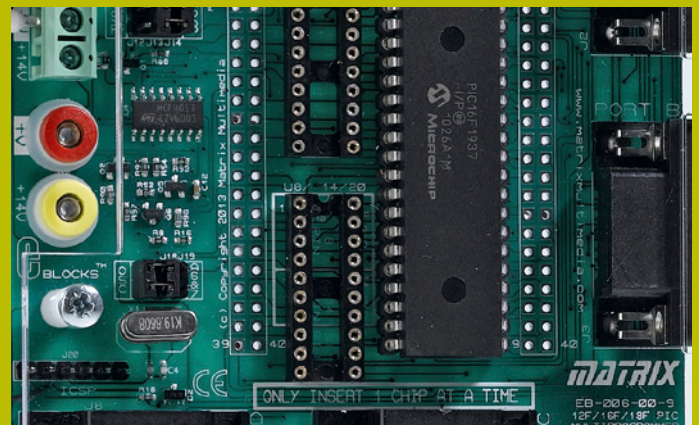
#### PROGRAMMING

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

#### COMMUNICATIONS

- 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

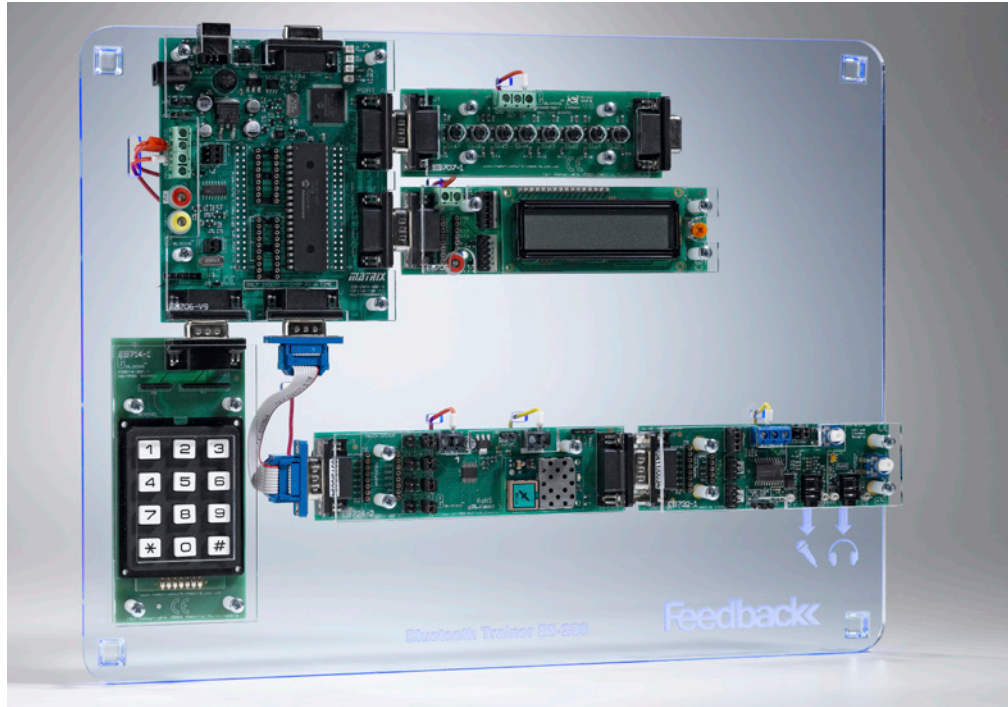
## 55-300 Zigbee Trainer



The Zigbee Trainer provides a complete course in developing wireless area networks based on the Zig-Bee standard. It gives students who are familiar with microcontrollers an understanding of the programming techniques involved in developing ZigBee wireless communications systems. A ZigBee packet analyser is included in the solution, along with four fully working ZigBee nodes based on E-blocks.



## 55-200 Bluetooth Trainer



The Bluetooth Trainer provides a complete course including investigations into the Bluetooth standard using high level macros. Students use the hardware, software and curriculum to investigate the various Bluetooth protocols and functions including the serial protocol (SPP), local area protocol (LAP) and the headset protocol (HPP).

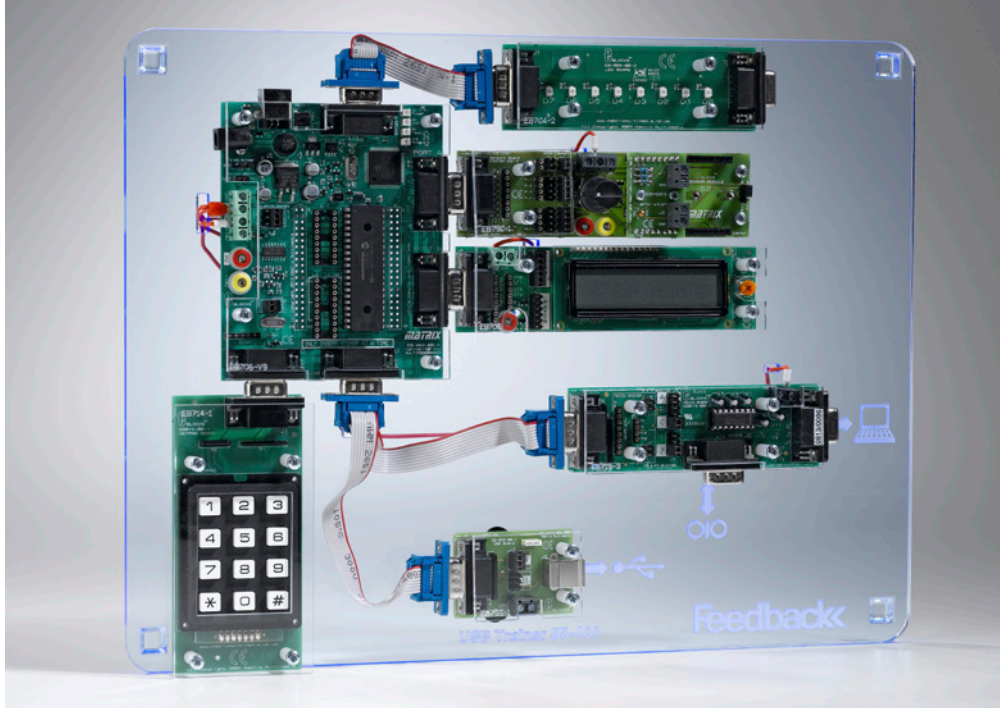
#### SUBJECTS STUDIED INCLUDE:

- Zigbee protocols, message transmission and reception and networks
- Zigbee principles, topologies and components
- Development of microcontroller based systems
- Moulding the network
- Adding nodes
- Expanding the network
- Reducing power consumption
- Dynamic networks
- Message routing
- Data logging gateways
- A complete modular fire and burglar alarm
- Improving network security

#### SUBJECTS STUDIED INCLUDE:

- Data communication between microcontroller and Bluetooth modules
- AT command structure and programming strategy in AT controlled systems
- Bluetooth visibility
- Device discovery, pass keys and addresses
- Responses - sequence flow and error checking
- Connecting and pairing
- Data communication
- Using Bluetooth for control applications
- Audio and implementation of the audio gateway
- Headset and telephone profiles

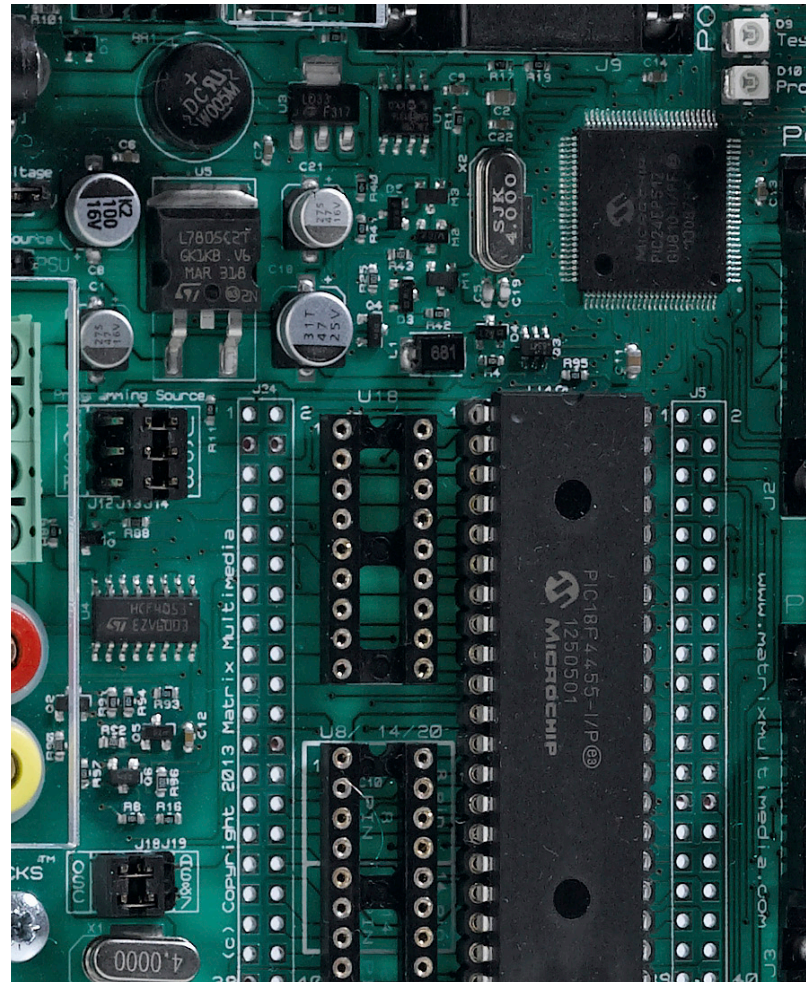
### 55-400 USB Trainer



This USB Trainer enables practical exercises in USB technology. Students learn about USB through eight different systems: mouse, joystick, temperature logger, USB terminal, USB to RS232 converter, basic slave, storage scope and oscilloscope with variable trigger. By working through these exercises, students build an understanding of the various types of USB system including Human Interface Devices, communications devices and slave devices.

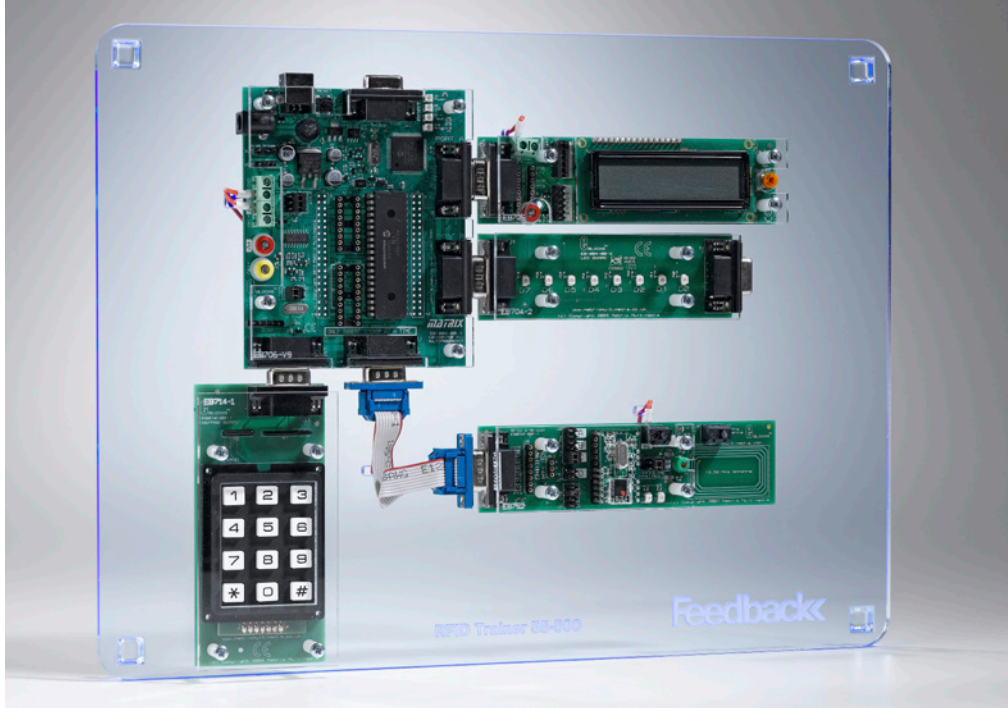
#### SUBJECTS STUDIED INCLUDE:

- USB protocol and packet structure
- Devices, descriptors and configuration
- USB HID, Serial and slave protocols
- Development of microcontroller based systems using USB technology
- HID Mouse
- HID Keyboard
- HID Datalogger
- HID USB terminal
- HID RS232
- Storage and triggered scope

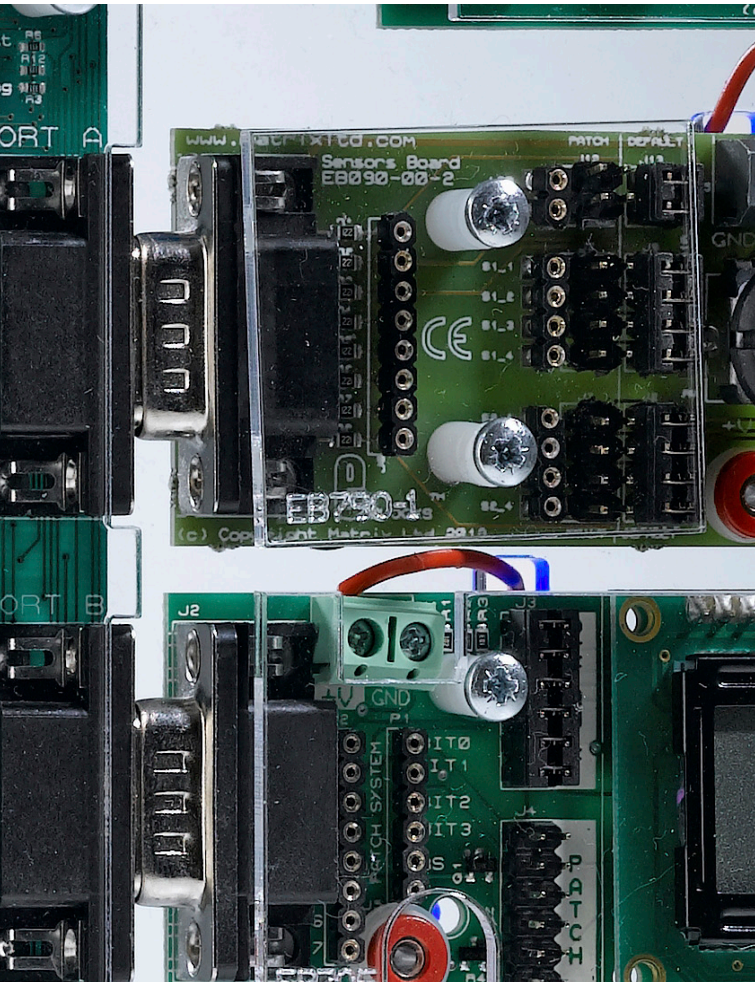




### 55-500 RFID Trainer



The RFID Trainer provides a complete course in developing RFID systems. It gives students who are familiar with micro-controllers an understanding of the programming involved in developing RFID systems. An RFID board and four RFID tags embedded into credit cards are included. This hardware allows students to learn about reading and writing transponder data in both I-code and Mirfare mode.

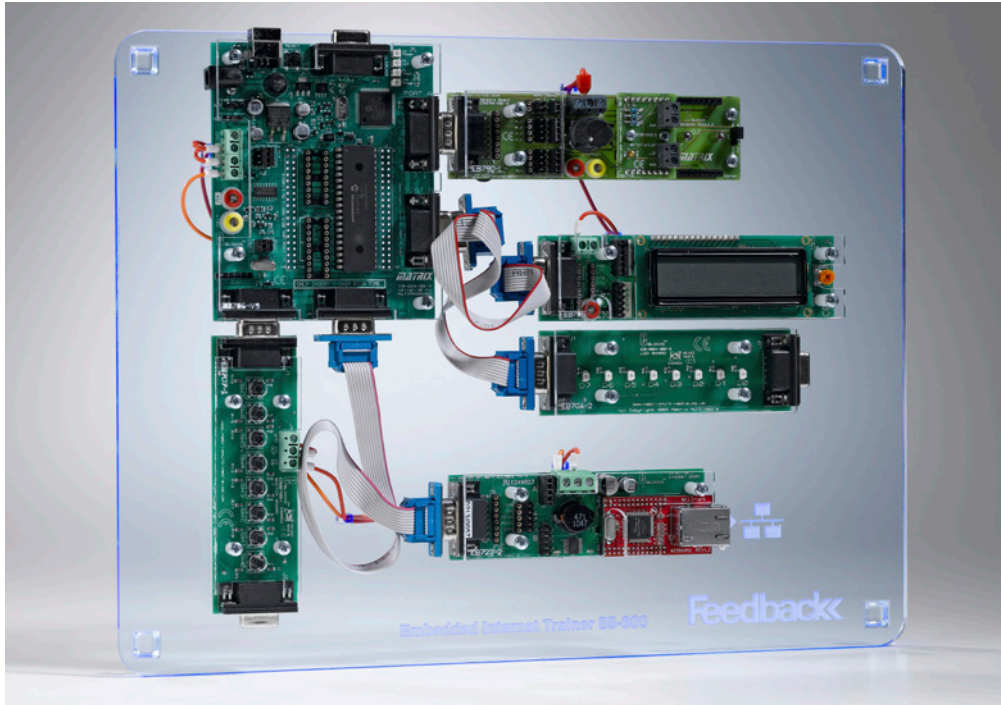


#### SUBJECTS STUDIED INCLUDE:

- RFID systems and applications
- Configuring RFID readers
- Commands and syntax used in reading and writing data to and from RFID cards
- Communication with both Mirfare and I-code systems
- Development of microcontroller based systems using
- Transponder unique ID
- Reading transponder data
- Writing transponder data
- Value format



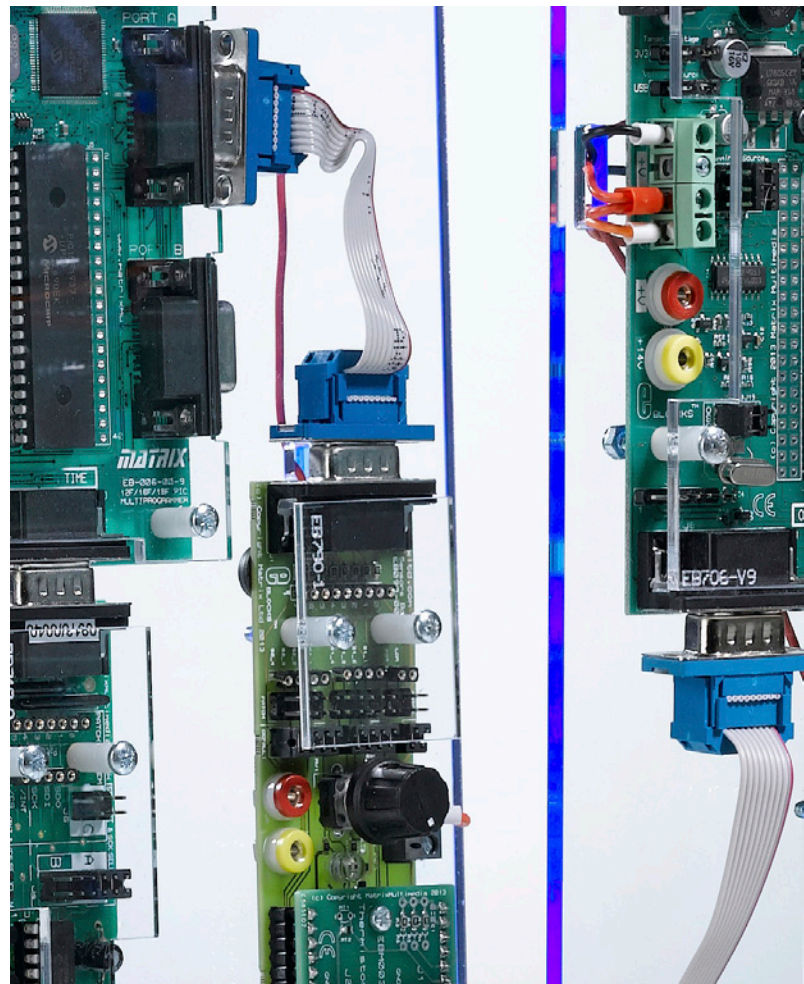
## 55-600 Embedded Internet Trainer



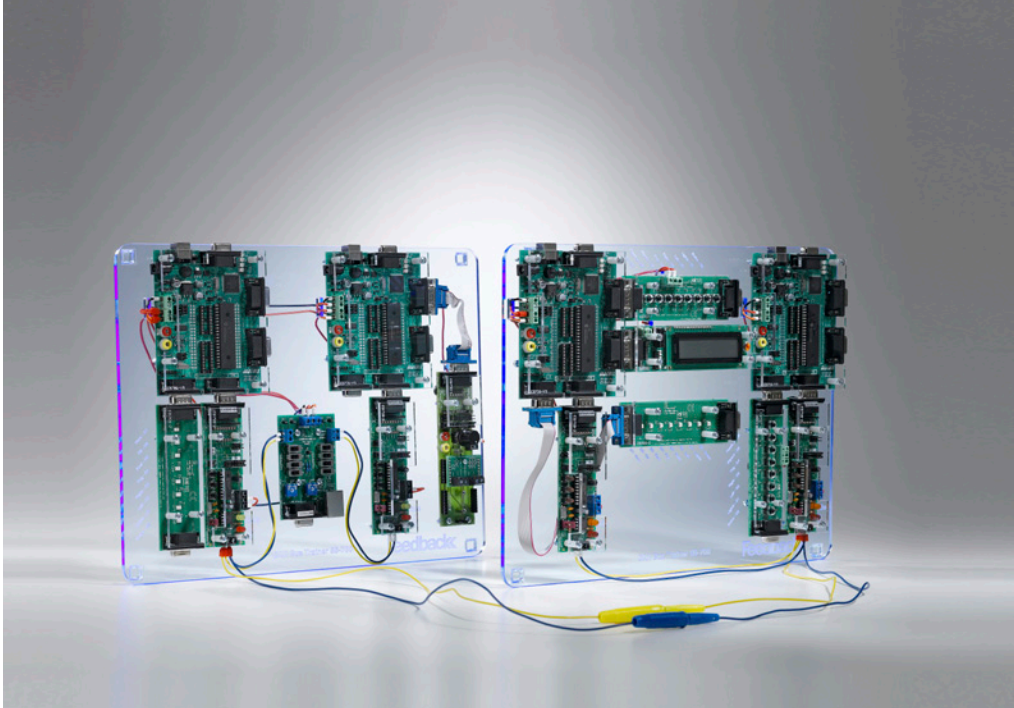
The Embedded Internet Trainer provides students with a full understanding of modern digital communications protocols and the development of embedded internet-based products.

### SUBJECTS STUDIED INCLUDE:

- OSI model and layers
- Ethernet, DLC, MAC, ARP, TCP, IP, UDP, ICMP, HTTP and POP3 protocols
- MAC packet structure and message creation using microcontrollers
- Communication strategy and information flow
- Packet injectors and debuggers
- ARP scanning
- Ping
- Time and date messages using UDP
- Sending HTML using HTTP protocol
- Receiving HTML
- Sending an email using SMTP protocol
- Custom messaging using UDP
- A firewall application



### 55-700 CAN Bus Trainer



The CAN bus Trainer provides a course which includes the development and investigation of systems that use the CAN bus protocol. Four fully programmable CAN nodes are included in the solution, along with circuit boards which mimic the functions of indicator lamps, switches and sensors. A CAN bus analyser and message generator are also included.



**Coming soon (Sept 2014)**  
**55-800 FPGA Trainer**  
**55-900 DSP Audio Trainer**

#### SUBJECTS STUDIED INCLUDE:

- CAN technology, wiring, topology and networks
- CAN message structure and physical layer transmission
- Understanding CAN bus protocols
- Using buffers in CAN systems
- Using CAN transmit and receive messages
- Errors in CAN systems
- Programming techniques in CAN systems
- Masks and filters in CAN systems
- Higher level protocols
- Development of complete CAN systems based on microcontrollers





Engineering Teaching Solutions

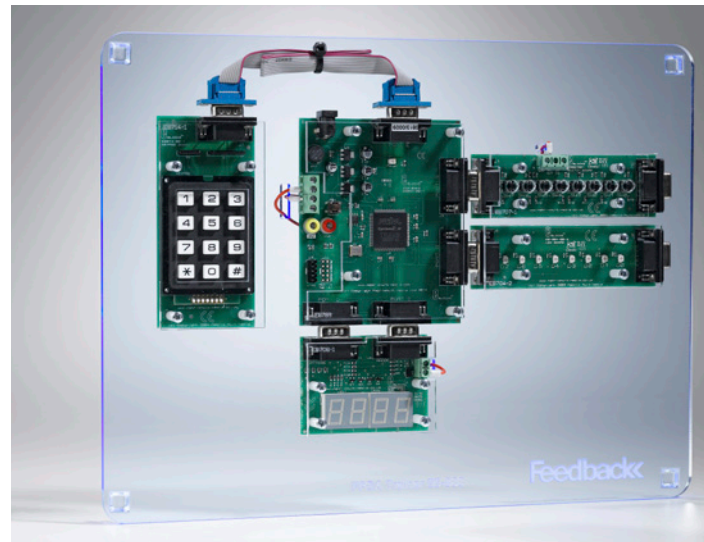
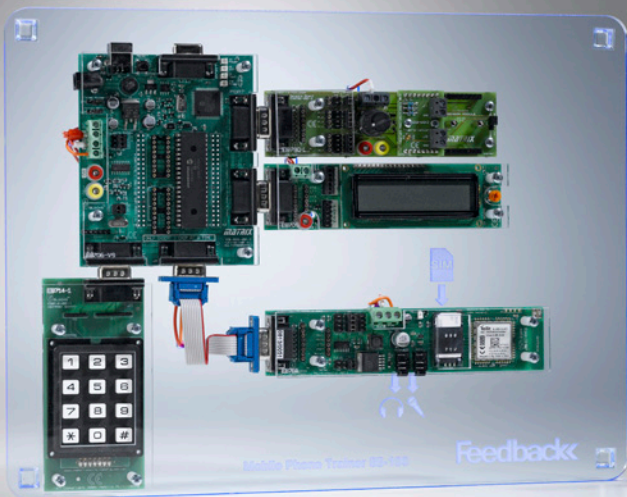
## CONTACT

UK:

Feedback Instruments Limited  
5 & 6 Warren Court  
Park Road, Crowborough  
East Sussex  
TN6 2QX  
Tel.: +44 (0)1892 653322  
Fax: +44 (0)1892 663719  
Email: [sales@feedback-instruments.com](mailto:sales@feedback-instruments.com)  
[www.feedback-instruments.com](http://www.feedback-instruments.com)

USA:

Feedback Inc.  
437 Dimmocks Mill Road  
Suite 27  
Hillsborough  
NC 27278, USA  
Tel.: +1 (919) 644 6466  
Fax: +1 (919) 644 6470  
Email: [sales@feedback-instruments.com](mailto:sales@feedback-instruments.com)  
[www.feedback-instruments.com](http://www.feedback-instruments.com)



[WWW.FEEDBACK-INSTRUMENTS.COM](http://WWW.FEEDBACK-INSTRUMENTS.COM)

BRANDS OF THE LD DIDACTIC GROUP

LEYBOLD® Feedback ELWE® TECHNIK