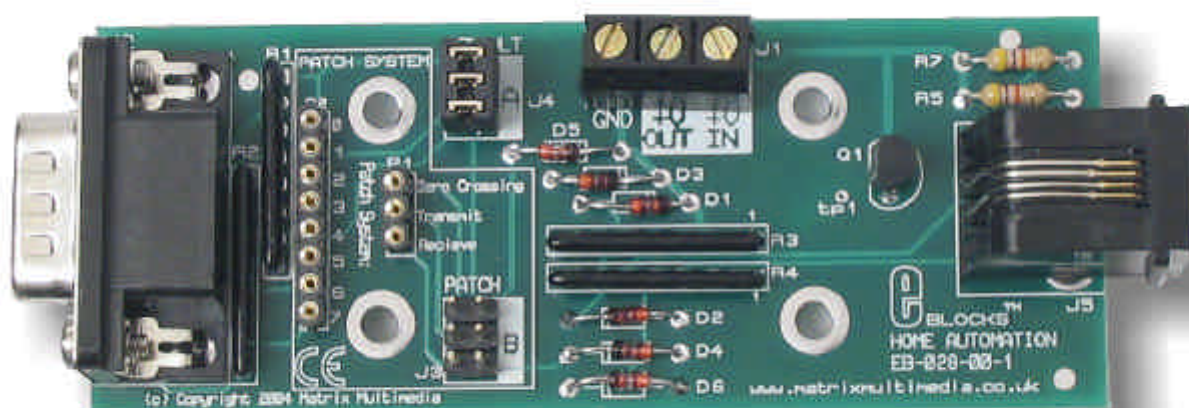


Home Automation Board datasheet



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1 About this document

This document concerns the Matrix Home Automation Board code EB-028-00-1.

Trademarks and Copyright

PIC, PICmicro are registered trademarks of Arizona Microchip Inc.

E-blocks is a trademark of Matrix Multimedia Limited.

EB-028-00-1 and associated software and documentation are Copyright ©2004 Matrix Multimedia Limited.

Other sources of information

There are various other documents and sources that you may find useful:

Getting started with E-Blocks.pdf

This describes the E-blocks system and how it can be used to develop complete systems for learning electronics and for PICmicro programming.

PPP Help file

This describes the PPP software and its functionality. PPP software is used for transferring hex code to a PICmicro microcontroller.

C and Assembly strategies

For strategy information for creating 'C' and Assembly code for the Home Automation board see the E-Blocks members area. This can be found at www.matrixmultimedia.com/eblocks

Disclaimer

The information in this document is correct at the time of going to press. Matrix Multimedia reserves the right to change specifications from time to time.

Technical support

If you have any problems operating this product then please refer to the troubleshooting section of this document first. You will find the latest software updates, FAQs and other information on our web site: www.matrixmultimedia.co.uk. If you still have problems please email us at: support@matrixmultimedia.co.uk. When emailing please state the operating system, the version of PPP you are using.

2 General information

This E-block allows investigation into Home Automation. Home Automation allows messages to be sent and received via the electrical wiring system within a building. This enables communication of devices plugged into the mains power supply with no extra wiring.

The Home Automation board allows main-borne communication using a low cost controller device like a PICmicro® microcontroller found on the E-Blocks Multiprogrammer. The Home Automation Board is connected to the mains wiring system via the TTL Interface module. All devices to be controlled are plugged into separate Appliance modules. The controller, for example the Multiprogrammer, then sends simple messages to the device in order to control the state of the device. It can also receive, decode and react to incoming messages.

The Home Automation system uses modulated signals to send information via the electrical wiring system. The Appliance modules deal with all the modulation and demodulation. So the ease of use is simply by sending the appropriate messages by setting the correct bits to generate the message. An example of this is turning on a device connected to the Home Automation units. The message is simply setting the address for the message (e.g. B4) and the actual message (e.g. B On).

All signals are X10® compatible. X10® is an emerging major standard in Home Automation.

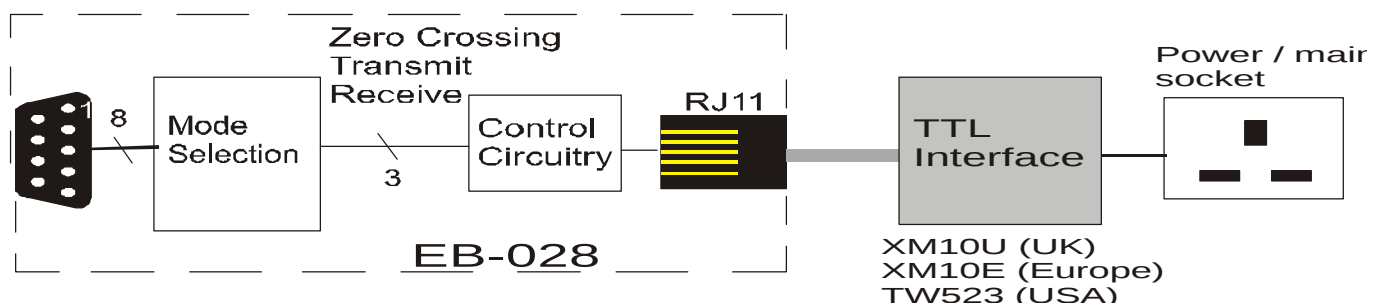
We anticipate Flowcode macros that make this device easier to use will be available in the first quarter of 2005. Please check the website for details.

For strategy information for creating 'C' and Assembly code for the Home Automation board see the E-Blocks members area. This can be found at www.matrixmultimedia.com/eblocks

Features

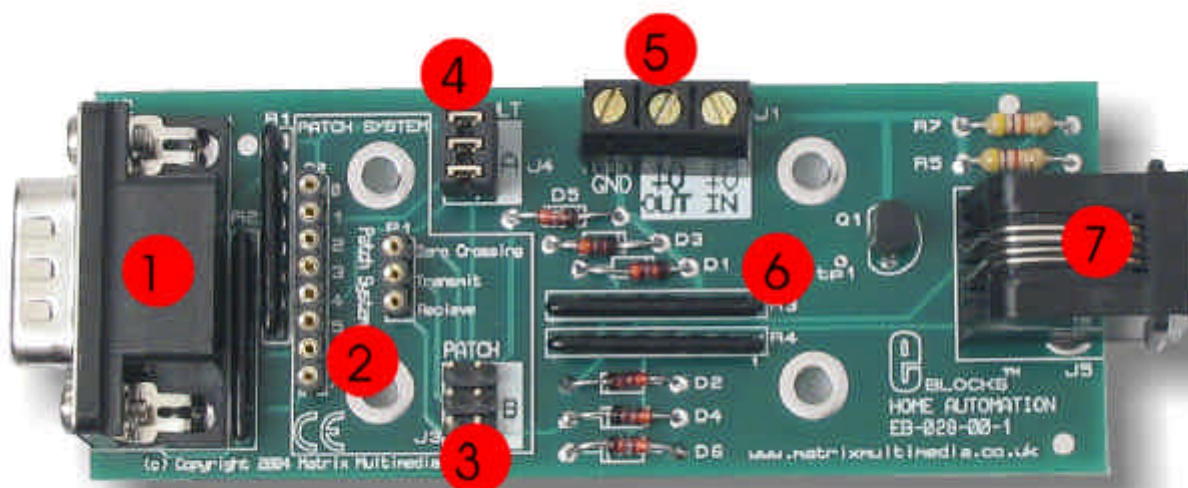
- Transmit and receive via mains wiring systems
- Enable communication of devices without the need of large wiring looms
- Control the state of any mains device

Block schematic



3 Home Automation Board Layout

Important: Please note that the mode selection jumpers are orientated in the correct way – i.e. with the metal connect strips HORIZONTAL as shown in the picture above.



- 1) 9-way downstream D-type connector
- 2) Patch system
- 3) Patch selection jumper pins
- 4) Default selection jumper pins
- 5) Power screw terminals
- 6) Control circuit
- 7) RJ11 connector socket

Connection guide for Zero-crossing, Transmit and Receive settings

Jumper Settings	Description
A	Hardwired Zero crossing, Transmit and Receive selection Zero crossing = Bit 0, Transmit = Bit 1, Receive = Bit 4
B	Patch System

For more information on see Section 4 – Circuit Description

4 Getting Started

Home automation will control the state (either on or off) of a device that is connected. The two-way TTL Interface module carries out all modulation and demodulation. The Home Automation board should connect to the Up-stream device that you are using via the 9-way D-type connector (J2) and to the TTL Interface module via the RJ11 connector (J5). The TTL Module is then plugged into the Power / Main socket. This set-up can be seen in the 'Block Schematic' in Chapter 2.

Testing the Home Automation Board

The following instructions explain the steps to test and use your Home Automation Board. The instructions assume that PPP is installed and functional. It also assumes that you are confident in sending a program to the PIC via the Multiprogrammer.

This program was not available for this revision of the document. Please visit our E-blocks Members

area at www.matrixmultimedia.com/eblocks

Using the following user name and password

User name: eblocks

Password: halifax

You will now have access to up-to-date information that you require.

5 Circuit description

The circuit as can be seen in the block schematic in Chapter 2 the systems is made up of three main components: the TTL Interface module, the control circuit and the patch system.

5.1 TTL Interface module

The TTL Interface module is an interface between the electrical system of the build and the Up-stream device. The device has internal opto-isolators that are required to ensure safety. The TTL Interface module will modulate and demodulate signals to and from the electrical systems and the Up-stream device.

5.2 Control circuit

The control circuitry is used as signal conditioning. This part of the circuit ensures that the signals are compatible with both the up-stream device logic levels and the TTL Interface Logic levels.

5.3 Patch System

The design of this product is to enable you to use this device with many Up-stream devices. The three relevant signals that are used on the Home Automation Board are the Zero crossing, transmit and Receive signals.

When using the board with jumper setting A the Zero crossing, transmit and Receive signals are hardwired to Bit 0, Bit 1 and Bit 4 respectfully. When using jumper setting B the signals are available at P1 to allow the user to route to any of the 8 bits on the D-type that they require.

The following table (Table 2) shows the settings that can be used for Zero crossing, Transmit and Receive.

Jumper Setting 1			Jumper Setting 2		
Zero Crossing	Transmit	Receive	Zero Crossing	Transmit	Receive
Bit 0	Bit 1	Bit 4	Patch	Patch	Patch

Table 2. Connections for Zero crossing, Transmit and Receive selection

THIS SYSTEM INCLUDES:-

Patch System:
Allows Receive, Transmit and Zero Crossing to be connected to any of 8 connections of the 9 way D-type connector.

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