



# ESA STUDY CARDS

Electro Systems Associates Private Limited (ESA) manufactures trainers for most of the popular microprocessors and microcontrollers like 8085, Z-80, 8031, 8086/88, 68000, 80196 and ARM trainers etc. ESA offers a variety of modules, which can be interfaced to these trainers. These modules can be effectively used for teaching/training in the academic institutions and R&D Laboratories.

ESA has designed four types of study cards based on 8251/8253, 8255 PPI, 8259 and 8279 peripherals. These study cards are developed to study in depth features of these peripherals. These study cards can be interfaced with ESA trainer models such as MPS 85-3, ESA 85-2, ESA 86/88-3, ESA 86/88-2, ESA 86E, ESA 51, ESA 31 and ESA 51E. Using these study cards, user can perform experiments to understand basic programming technique involved in these peripherals.

## **Common Features:**

- \* All the study cards operate on single +5V power supply; no external power source is required.
- \* The study cards are provided with 26 pin & 50 pin FRC connectors for signal expansion and for easy operation.
- \* The study cards are accompanied by a user's manual which provides detailed installation and operational instructions. Theory of the study card and sample programs to illustrate different features of the peripherals are also included.

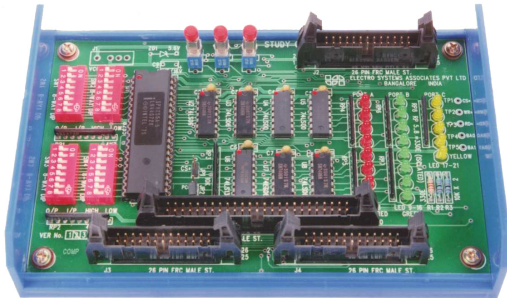
## **8251/8253 Study Card:**

- \* This study card is designed to explain all the features of 8251 and 8253 peripherals.
- \* 6.144MHz crystal is provided to derive 1.5 MHz Clock.
- \* This interface can operate in asynchronous mode for serial data communication.
- \* RS232 Cable provided for data receive & transmit through PC communication port (COM Port).
- \* User can program all three counters/timers available in 8253.



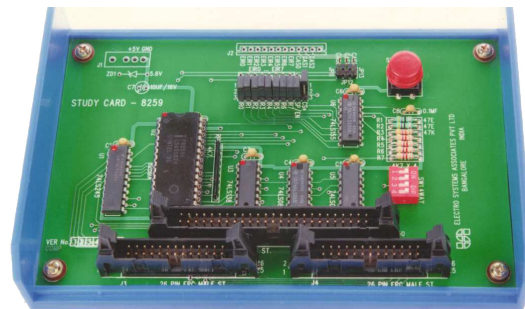
## **8255 Study Card:**

- \* This study card is designed to explain all the features of 8255.
- \* It has four 8-way dipswitches to configure the 8255 Port lines in different modes of operation.
- \* 8 RED, 8 GREEN and 5 YELLOW LEDs are provided to read the status of port A, port B and port C lines respectively.
- \* Switches S1, S2 & S3 are provided to stimulate STB\* or ACK\* signals in Mode 1 and Mode 2.



## **8259 Study Card:**

- \* This study card is designed to demonstrate different modes of operation of 8259 Programmable Interrupt Controller.
- \* The on-board interrupt source uses a 4-way dipswitch to select the 8 different interrupts and the push button switch is to trigger the interrupt.
- \* Interrupts to 8259 can be given from on-board or from external sources through jumper.



## **8279 Study Card:**

- \* This study card explains all the features of 8279.
- \* Study card provides 6 nos. of 8-Digit, 7-Segment display and 4x4 matrix Hex Keypad. The keypad includes shift and control keys for scanning option.
- \* ENCODE and DECODE modes of operation through on-board jumpers.

## Peripheral core features

### **8251A Programmable Communication Interface**

- \* Synchronous and Asynchronous Operation
- \* Synchronous Baud Rate – DC to 64K baud
- \* Asynchronous Baud Rate – DC to 19.2K baud
- \* Full Duplex, Double Buffered, Transmitter and receiver
- \* All Inputs and Outputs are TTL Compatible
- \* Single +5V Supply, Single TTL Clock

### **8255A Programmable Peripheral Interface**

- \* 24 Programmable I/O Pins
- \* Completely TTL Compatible
- \* Improved DC Driving Capability
- \* Reduces System Package Count

### **8279 Programmable Keyboard/Display Interface**

- \* Simultaneous Keyboard Display Operations
- \* Scanned Keyboard Mode & Sensor Mode
- \* Strobed Input Entry Mode
- \* 8-Character Keyboard FIFO
- \* 2-Key Locked or N-Key Rollover with Contact Debounce
- \* Dual 8 or 16-Numerical Display
- \* Single 16-Character Display
- \* Right or Left Entry 16-Byte Display RAM
- \* Mode Programmable from CPU
- \* Programmable Scan Timing
- \* Interrupt Output or Key Entry

### **8253 Programmable Interval Timer**

- \* 3 Independent 16-Bit Counters
- \* Programmable Counter Modes
- \* Count Binary or BCD
- \* Single +5V Supply
- \* DC to 2 MHz

### **8259 Programmable Interrupt Controller**

- \* Eight-Level Priority Controller
- \* Expandable to 64 Levels
- \* Programmable Interrupt Modes
- \* Individual Request Mask Capability
- \* Single +5V Supply (No Clocks)

## GENERAL

**Dimensions** : (L) 167 mm x (B) 100 x  
(H) 35 mm approx.

**Weight** : 300 gms approx.

**Housed in ABS Plastic moulded Cabinet**

## SCOPE OF SUPPLY

1. Study Card Module (*Depending on the Module ordered*)
2. FRC Cables Compatible to Trainers.
3. User's Manual

## NOTE:

**For ESA 86/88-2, ESA 86/88-3, ESA 31 & ESA 51 Trainer Kits, requires optional Study Card Adapters additionally.**

(Specifications are subject to change without prior notice.)

**OUR PRODUCT RANGE :** Microprocessor Trainers for 8085, Z80, 8086/88, 68000; Microcontroller Trainers for 8051, 80C196, PIC Trainers, and Interface Modules; DSP Trainers ; In-Circuit Emulators; ROM Emulators; Microcomputer Development Systems; Universal Device Programmers; UV Erasers; PC compatible systems and Add-on Cards, AD/DA cards, DIO cards, Logic Analyzers, etc.; Microprinters and Software Development Tools.



## **ELECTRO SYSTEMS ASSOCIATES PVT LTD**

### **Works :**

# 4215 J K Complex Subramanyanagar P O Box : 2139  
BANGALORE - 560 021 Phone: +91 80 23577924 Fax: +91 80 23475615

### **Corporate Office :**

# 37, 'Embedded Home', 36th Cross, II Block, Rajajinagar,  
BANGALORE - 560 010, INDIA. Phone : +91 80 23126100  
Fax : +91 80 23130630 e-mail : esaindia@vsnl.com www.esaindia.com

## **Dealer / Distributor**