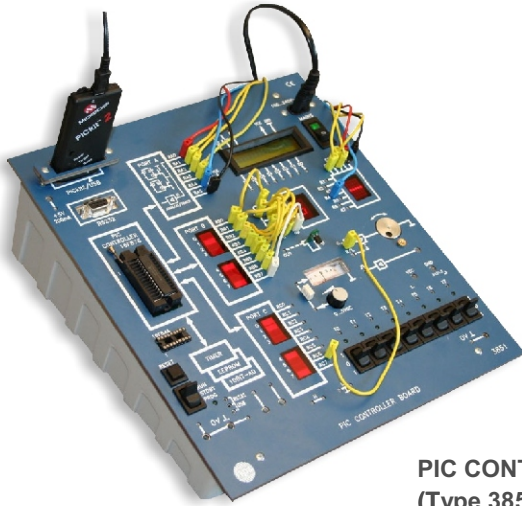


### PIC CONTROLLER BOARD

Type 3851



PIC CONTROLLER BOARD  
(Type 3851)

- Universal training system for microcontroller technology
- Usually with varying PIC Controllers (16F84A, 16F876A,...)
- Programming in Assembler, only 35 commands necessary
- Communication with an PC over RS 232 interface, optional over USB interface
- Plugging of the PIC Controller with a external socket
- Output for pulse-width modulation (16F876A)
- Many applications are integrated on the PIC CONTROLLER BOARD:
  - Adjustable DC-generator
  - Spring-loaded switch
  - LCD-display in 2 lines
  - 7-segment display
  - Dot matrix display
  - LED-display
  - Sensor for temperature
  - DC-motor
  - Analogue measuring instrument
  - Optional rotation speed measurement
- Suitable for PAL experiments (16F84A)

With the PIC CONTROLLER BOARD hps SystemTechnik has developed a training system, which is perfectly suitable to introduce into PIC microcontrollers, which are used throughout the industry.

The trainings system uses the following PIC Controller:

- 16F84A  
(8bit microcontroller with 2 ports)  
Brand: Microchip

- 16F876A  
(8bit Microcontroller with 3 Ports)  
Brand: Microchip

To conduct experiments a PC with a serial port is needed (optional a USB in-

terface can be used, in that case a module USB Interface PICKit2 (Type 3851.4) is required).

The advantage of the PIC CONTROLLER BOARD is, that many applications are integrated on the board.

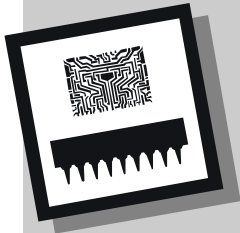
The student can immediately execute and test his written programs.

The applications are clearly arranged and the applications are practice-oriented placed on the PIC CONTROLLER BOARD.

Samples of programmes are provided for the built-in applications.

The system is especially suited to schools and company where apprentices are trained.

For the most used PIC Controller 16F876A a fast clamping device is built in, therefore the controller can easily be exchanged.



## PIC CONTROLLER BOARD

Type 3851

## Digital Technology / Microcontroller Technology

### Software

Following easy to handle software is used:

- MPLAB (Brand: Micro-tech) Assembler, Editor, Compiler, instruction set with 35 commands
- ProgPIC2  
Software for download from a PC on the PIC CONTROLLER BOARD

- Examples of programs for the PIC Controller (16F84A/16F876A)
- Optional for use of the USB-PICkit2-Interface
  - PICkit2 Download-software

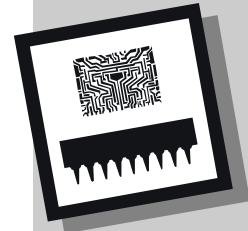
for every application an example of programs provided.

The software is part of the scope of delivery

### Technical Data for the used PIC Controller

	<u>PIC 16F84A</u>	<u>PIC 16F876A</u>
Housing:	18 pin	28 pin
Microcontroller:	8 bit	8 bit
CPU:	RISC	RISC
Commands for programs:	35	35
Oscillator:	4 MHz	4 MHz
Sources of interrupts:	4	13
Watchdog timer:	1	1
PORTS:	2	3
Port A (RA0-RA4/5):	5 I/O-pins bi-directional – RA4 as timer	6 I/O-pins bi-directional – 1 timer – 5 inputs analogue
Port B (RB0-RB7):	8 I/O-pins bi-directional – 1 external interrupt – RB6/7 for programming	8 I/O-Pins bi-directional – 1 external interrupt – RB6/7 for programming
Port C:	not provided	8 I/O-pins bi-directional – 1 timer – 2-PWM-outputs (pulse-width modulation) – USART port inputs/outputs

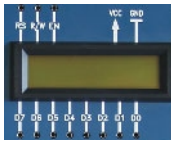
## Digital Technology / Microcontroller Technology



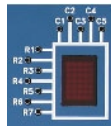
**PIC  
CONTROLLER  
BOARD**

**Type 3851**

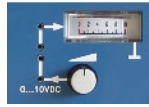
### Integrated applications on the PIC CONTROLLER BOARD



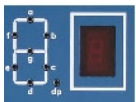
LCD-display



Dot matrix display



Analogue measuring  
instrument and adjustable  
DC-Generator



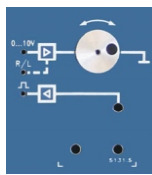
7-segment- display



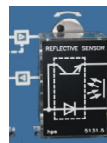
Temperature sensor



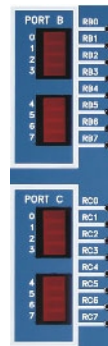
Spring-loaded switches



DC-Motor and  
with rotation speed  
measurement



Optional with  
reflective sensor  
(type 5131.5)



LED-display of the  
I/O switch states

### Mechanical Data

- Material of the front panel:  
Laminate (5 mm thick), matt blue
- Rear front: Grey plastic cover (angled)
- Dimensions: 266 x 297 x 125 mm (w x h x d)
- Weights: approx. 2.2 kg

### Accessories Included

- Freeware-CD
  - Software MPLAB (Brand: Microchip)
  - Software ProgPIC2 (english)
  - Software PICKit2 (Brand: Microchip)
  - Examples of programs
- Serial interface cable, 9-pin (SUB-D), length: 2 m

### Accessories Necessary

- PC with a RS-232 interface (up to Windows 98)
- Optional: For the use of an USB interface the modul PICKit2 (Type 3851.4) is required.
- Optional: hps reflective sensor (Type 5131.5) for the rotation speed measurement of the motor

Subject to technical modifications.

### Technical Data

#### Mains Connection

- Mains voltage: 110 ... 240 V AC
- Mains frequency: 50 ... 60 Hz
- Power consumption: 10 VA

#### Power supply (for connection external units)

- 5 V / 100 mA
- Connection through 2 mm or 4 mm jacks (secured with PCT against short-circuit)

#### Applications

All connections are fed through 2 mm jacks.

- DC generator with potentiometer adjustable
- 8 spring-loaded switches: 5-V-signal with LED
- LCD-display: two line LCD-display, operated with 4-bit or 8-bit; D0-D7, RS, RW, EN
- 7-segment- display:  
LEDs directly operated with the I/O Ports
- Dot matrix display:  
LEDs 5x7 directly operated with the I/O Ports
- LED-display: for indication of the switch states all inputs and outputs (Port B and C)
- Temperature sensor (PTC): -50 °C ... 150 °C
- DC motor with fly wheel and markings for rotation speed measurement: Input 0 ... 5 V TTL-input for right-handed and left-handed rotation
- Analogue measuring instrument: 0 ... 5 V
- Optional: hps reflective sensor (Type 5131.5) for the rotation speed measurement of the motor (TTL-level)

