

MICROCONTROLLER PROGRAMMING

The Microcontroller Panel is an ideal training system for the basic understanding of microcontrollers and to learn its programming. The training system bases on the ATmega168 as ATMEL is a leading manufacturer for microcontrollers.

Programming can be done in Assembler, C / C++ and Bascom although the manual supports Assambler and Bascom. The panel is clearly arranged in I-P-O principle. For **Input** there are 6 switches and 3 potentiometers, the ATmega168 for **Processing** and an RGB LED, 12 LEDs and a Piezo buzzer as **Output** elements.

Learning Content:

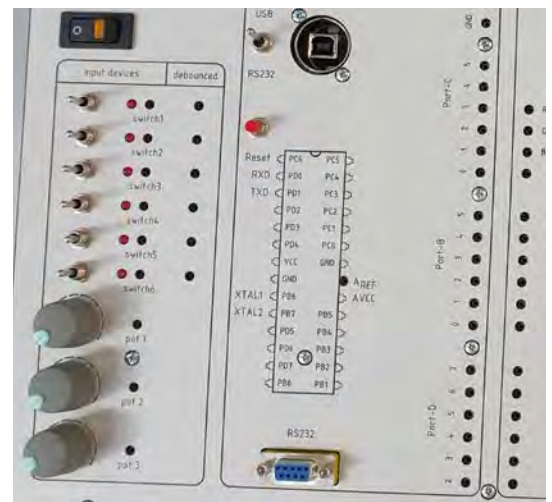
- Basics to Microcontrollers
- Programming in Assembler and C, Commands
- Bit Manipulation, Ports, Timer, Include Files
- Hardware PWM
- AD-Converter, Watchdog, Interrupt, I²C Bus
- Basic Structure of a Program
- Programming an In- and Output Test
- Programming a LED Flasher
- Programming a RGB-LED with PWM
- Programming an external interrupt

Depending on the learning content, the panel can be used as basic version for programming the standard output elements or it can be enhanced with LC-Display, Real Time Clock, external EEPROM and Temperature Sensor.

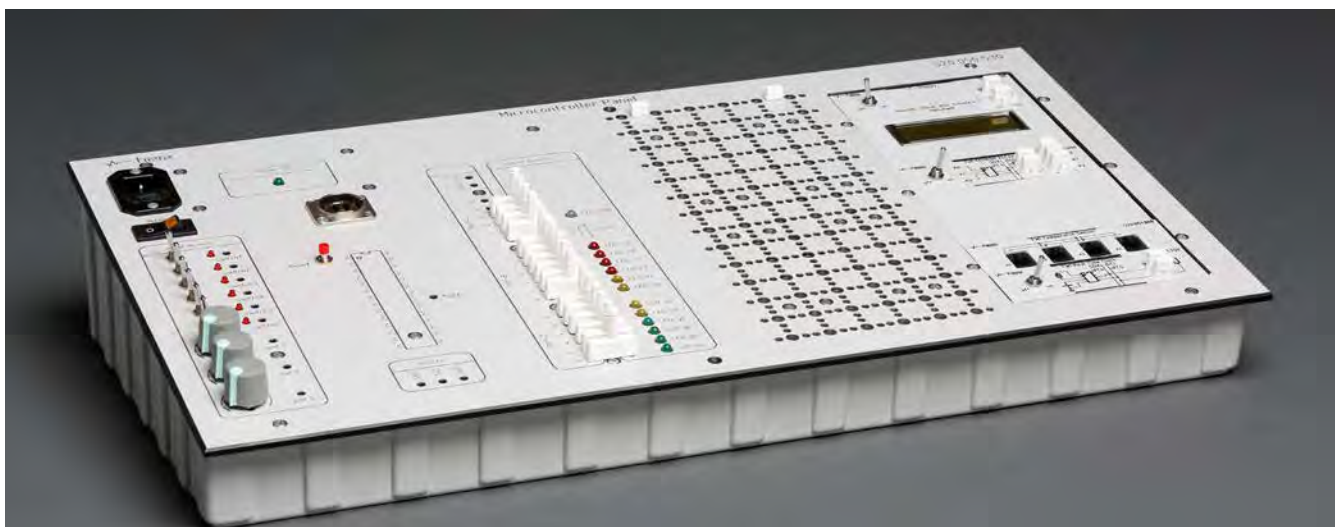
For even more flexibility an integrated plug-board allows to add flexible configurations with plug-components to the microcontroller circuit, e.g. transistor circuits. Integrated TTL ports allow to connect the Digital Panel, the Digital Socket Panel, the Step Motor Panel or the Sensor Test Panel for more advanced applications.

The panel is with USB interface for communication with the PC, a bootloader is pre-installed.

Operating voltage: 110...230V, 50/60Hz
 Dimensions: 532 x 297mm (WxH)



Input - Processing - Output Elements



Microcontroller Panel with ATmega168 with all options: LC-Display, Real Time Clock, EEPROM and Temperature Sensor

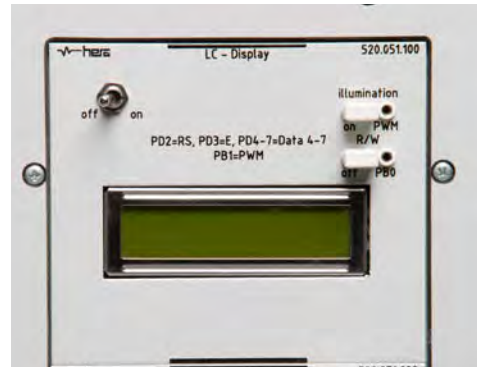
Microcontroller Programming			
520.050.530	Microcontroller Panel	520.051.000	Set of Cables and Connectors
520.058.001	Manual with CD, Basics to Microcontroller		

OPTIONS FOR MICROCONTROLLER PANEL

The right side of the Microcontroller Panel in basic version is covered with blank panels or it can be equipped with a variable selection of following options:

Option LC-Display

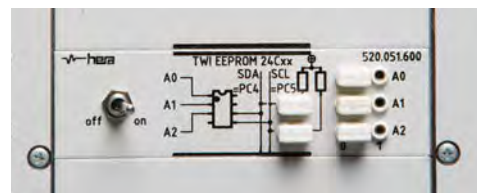
The LC-Display is an optional module, that can be integrated for the programming of a digital display, it is also the base for more experiments where a comfortable status display might be useful.



Option: LCD Display 520.051.100

Option EEPROM

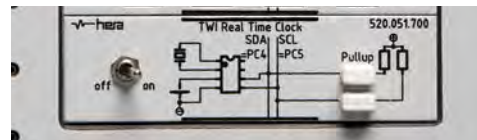
The EEPROM is an option, that allows the integration of extra memory by I²C bus into the microcontroller circuit. Data can be stored in an external memory and the full procedure is imparted in a comprehensive way.



Option: TWI EEPROM 520.051.600

Option Real Time Clock

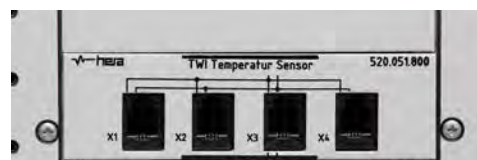
The Real Time Clock is an option, that allows the integration of real-time-clock ICs by I²C bus into the microcontroller circuit. The serial real time clock possess a decimal calendar with seconds, minutes, hours, days, month, year and leap year. 24h or 12h mode is available. Address and data transfer is done with a bi-directional serial bus.



Option: TWI Real Time Clock 520.051.700

Option Temperature Sensor

The Temperature Sensor allows the measurement of the ambient temperature and its measurement can be indicated in the LC display. Instead of the common PTC - or NTC resistor, the sensor is a LM75 sensor. The LM75 measures temperatures with 0,5 degree resolution and the results are transmitted by I²C bus, also included is a thermostat with adjustable threshold value and hysteresis.



Option: TWI Temperature Sensor 520.051.800

Options to Microcontroller Panel

520.051.100	LC-Display	520.051.600	TWI EEPROM
520.051.700	TWI Real Time Clock	520.051.800	TWI Temperature Sensor

PANEL CASE FOR TRANSPORT OR STORAGE

The panel case is a convenient possibility to transport the standard panels from room to room or for storage. One or two training panels (532 x 297mm) can be firmly installed in the case or the lid can be prepared for the acceptance of the manual and cables.

For a comfortable training the case and lid can be separated. The case comes with lock and 2 keys.

Dimensions:
555 x 390 x 250mm (WxDxH).



Panel Case

509.002.000

Panel Case

509.010.001

Flap for Lid