EID 210

32 bits – 68000 MICROCONTROLLER BASED SYSTEM

MAIN CHARACTERISTICS :

The **EID 210 B** System (including the EID 210 000 board and accessories) enable the study of microprocessors and micro controllers of the CPU32 range (68000 kernel, pipeline instructions, object optimised routine ...). It is a member of a full family of training tools on digital techniques :

♦ The **EDD 100** range, enabling the introduction to the basic wired logic (combinatory, flip-flops, counters, ALU),

♦ The **EDD 200** range, dealing with the programmable logic (EPLD circuits associated to the VHDL language),

♦ The **EID 100** range, microprocessors and micro controllers of the 8 bits Motorola and Intel ranges.

♦ The **EID 200** range, microprocessors and micro controllers of the 16 and 32 bits Motorola and Intel ranges.

♦ One complete range of actuators allows the student to be faced with an industrial development context (input/output simulator, traffic light simulator, stepping motor, speed and position servocontrol system, air flow and temperature control systems, multiplexed vehicle for studying CAN BUS), Ethernet board.

TOPICS :

The **EID 210 000** board enables the study of the architecture of a 16/32 bits 68332 microprocessor/ micro-controller based Microsystems, using: 16,7 MHz clock, RAM of 16 bits * 128 Kbytes, ROM of 128 Kbytes « flashes », USB Port, RS232, PC104 bus giving access to a wide range of available Inputs/Outputs boards, 24 bits // port, 6 Analog Inputs & 4 Outputs on 40pts HE10, SPI port & I2C on 10 pins HE10.

Version de base :
♦ One PC editor,
♦ One cross assembler,
♦ One debugger monitor,
Programmable failure functions allows the student to be trained to trouble shooting.
Optional hardware (not supplied):
♦ PC104 size extension industrial boards: Ethernet, CAN Bus interface,
Inputs/Outputs (ON/OFF, optoelectronics, relay...),
♦ Inputs/Outputs modules, remote on CAN network (8 ON/OFF I/O's, 4 power outputs, motor control),
Optional software:
One C/CC++ Cross compiler,
One real time kernel.

AREAS OF APPLICATION:

♦ **Professional Training Schools**,
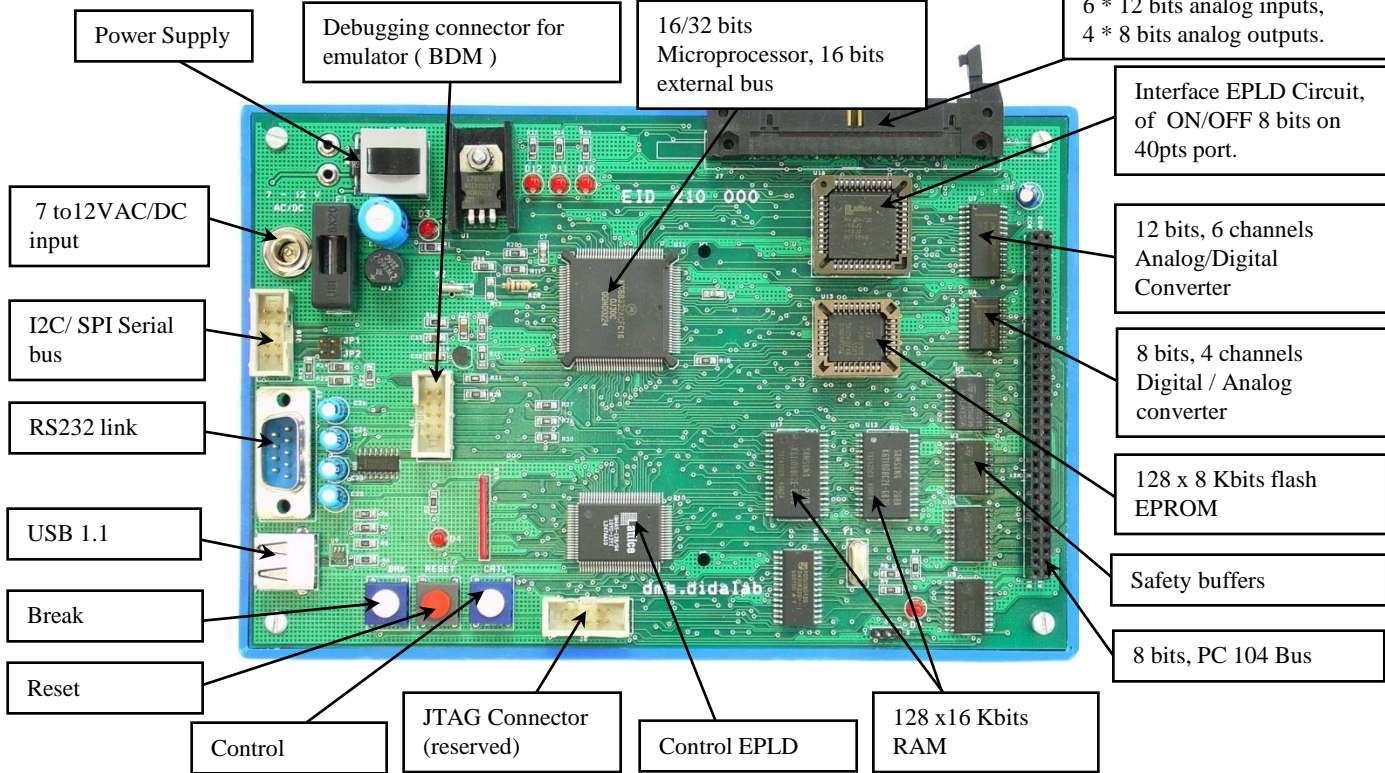Technical Colleges, Higher level Schools
♦ **Universities.**

SAFETY DEVICES :

♦ Πrotection of the board supply with fuse and transil
♦ Parallel port over voltage and short circuit electronic protection devices,
♦ Buffers protection of the PC 104 Bus Inputs /Outputs,
♦ Link via 4000 VDC insulated USB port (in accordance with the new safety regulations

Packing list
Werght: 2 kg
Dimensions :   200 x 132 x 45 mm

Electrical Engineering Range

EID 210 000 Motorola 68332 Micro controller 16/32 bits processor Board

40 pins I/O port:
 16 bits **TPU** + 8 bits On/Off TTL,
 1 IRQ
 6 * 12 bits analog inputs,
 4 * 8 bits analog outputs.

Power Supply

Debugging connector for emulator (BDM)

16/32 bits Microprocessor, 16 bits external bus

Interface EPLD Circuit, of ON/OFF 8 bits on 40pts port.

7 to12VAC/DC input

12 bits, 6 channels Analog/Digital Converter

I2C/ SPI Serial bus

8 bits, 4 channels Digital / Analog converter

RS232 link

128 x 8 Kbits flash EPROM

USB 1.1

Safety buffers

Break

8 bits, PC 104 Bus

Reset

Control

JTAG Connector (reserved)

Control EPLD

128 x16 Kbits RAM

Provided in basic version with operation program pack on Windows 95 to Windows XP, Seven or newer version including:

♦ Page mode editor on Windows®, with low level functions library,

♦ Cross Assembler for the generation of object files, at the Motorola S-record format,

♦ Debugger including the following functions :

• - Display and modification of registers,

• - CPU step mode operation, set break points,

♦ Technical Guide with electric diagrams, Ref.. EID 210 010.
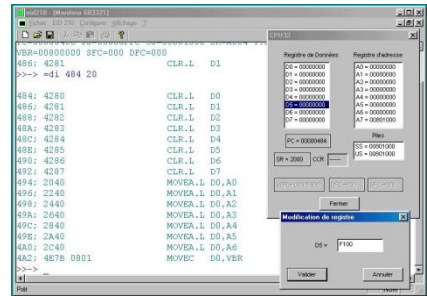
•**EID 210 100 : Development environment C, C++ Compiler, GNU, GDB**
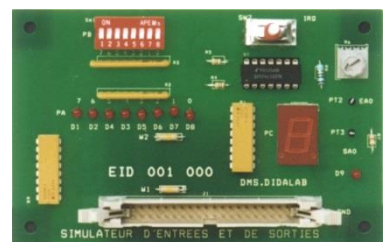
Characteristics:

•C/C++ Compiler, GNU with StDIO (Standard Data Input Output)libraries, String (string control), Math (floating point calculation),

• Business data structures of the EID 210 000 board (68332 registers, Analog/Digital Converters, BUS PC104,…) and of different controlled devices (Inputs/Outputs simulator, traffic lights, CAN and Ethernet network boards…),

• Low level functions library (interrupt control,USB port and RS232…),

• Specific linker for EID 210 000 board,

• GDB debugger.
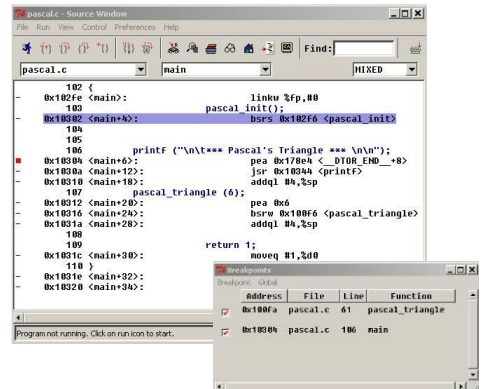
EID 001 000 Inputs Outputs Simulator

It is connected to the 40 pins Inputs/Outputs port of the EID 210 000 Board and enables the simulation of some operational parts:

• 8 display LED's on the port output,

• 8 Micro switches on the port input,

• 1 bounce-free pushbutton (interrupt input),

• 1 Potentiometer on analog input,

• 1 LED on analog output.

EID 005 000 Display Keyboard Board

It is connected to the PC104 extension bus of the EID 210 000
Board.Technical characteristics :
• 16 keys matrix keyboard,
•ASCII readout (7 to 20) x 16 characters and/or graphical
128 x 64 monochrome,
• 4 kHz Piezoelectric buzzer,
• Real time clock with alarm signal and saved 114 bits static RAM..

EID 003 000 10 Mbits/sec. Ethernet Board

At PC104 industrial format, this board can be plugged on the master board EID 210 000. It uses the
IP2022 micro controller (Internet Processor) designed by UBICOM :
• Study of 10 Mbits/sec. Ethernet network,
• Provided with TCP/IP stack, Sockets, Web server, SPI bus, I2C, Built_in « ping » function,
• RJ 45 Ethernet 10 base-T Connector, Connection to EID 210 000 master board by PC104,
• Control of port TELNET (PORT 23) and WEB server (port 80).

EID 004 000 CAN industrial Board

At PC 104 industrial format, this board can be plugged on the master board EID 210000.
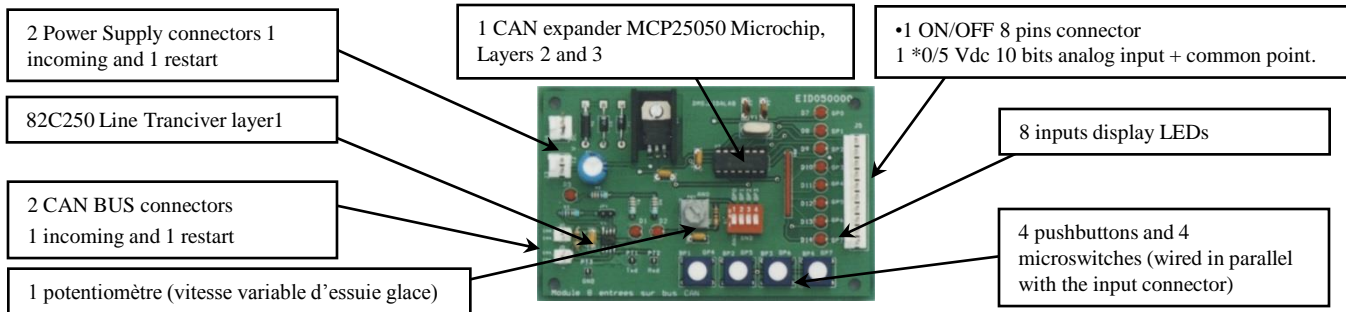It has been designed by ATON SYSTEM C°. Communication with the Microsystems is achieved in 8 bits
mode by bus PC104. It uses the Philips CAN SJA 1000 controller and has an optoelectronics-type interface.
CHARACTERISTICS :
• Communication speed up to 1 Mbits/sec., Provided with EID 210 000 drivers of FIFO circular buffers in
transmission/reception. The data structure enables the control of standard and extended CAN modes
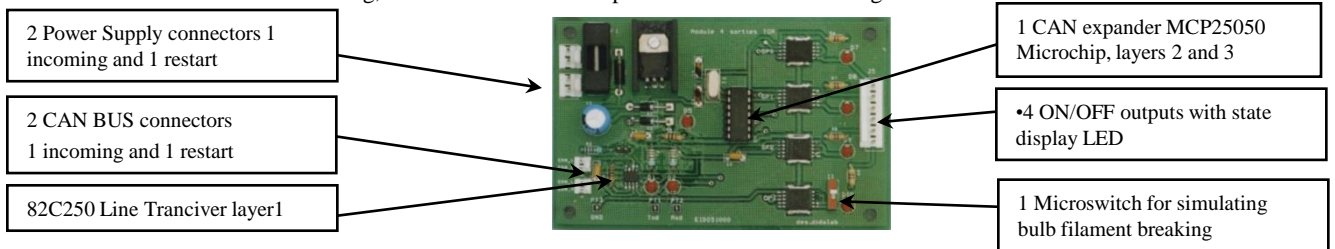(Practicals are based on the extended mode).

EID 050 000 ON/OFF 8 I/O CAN Module, (2 can be parameterised into analog input)

Enabling the readout of inputs variables, this board is self-operated, 4 microswitches, 4 pushbuttons enable the simulation of the
operator controls. One*10 pins connector enables the connection to automotive control handle (commodo.)
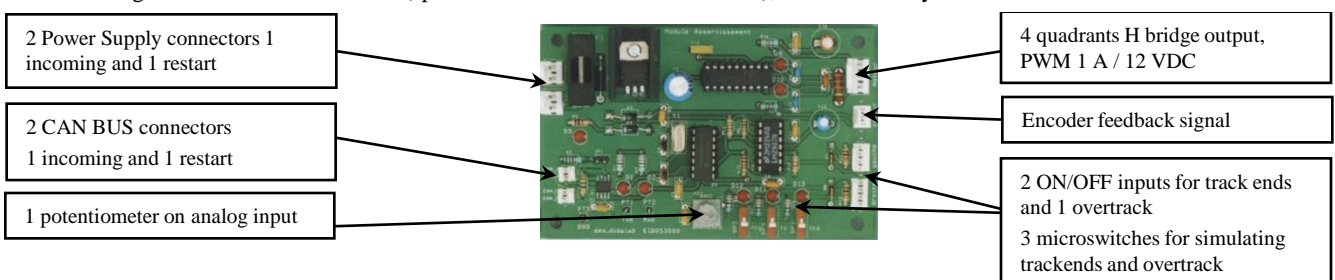
| 2 Power Supply connectors 1 incoming and 1 restart | 1 CAN expander MCP25050 Microchip, Layers 2 and 3 | •1 ON/OFF 8 pins connector 1 *0/5 Vdc 10 bits analog input + common point. |

82C250 Line Tranciver layer1

8 inputs display LEDs

2 CAN BUS connectors
1 incoming and 1 restart

4 pushbuttons and 4
microswitches (wired in parallel
with the input connector)

1 potentiomètre (vitesse variable d'essuie glace)

EID 051 000 4 ON/OFF outputs (12-V 12-A Power) CAN Module

Enabling the control of automotive optical blocks, with LEDs for the operation in simulate mode. One microswitch allows the
simulation of a bulb filament breaking, in order to allow the implementation of bulb testing software modules.

2 Power Supply connectors 1
incoming and 1 restart

1 CAN expander MCP25050
Microchip, layers 2 and 3

2 CAN BUS connectors
1 incoming and 1 restart

•4 ON/OFF outputs with state
display LED

82C250 Line Tranciver layer1

1 Microswitch for simulating
bulb filament breaking

EID 052 000 Motor servocontrol CAN module

Enabling the control of a DC motor (speed control of a windscreen motor), track end safety control.

2 Power Supply connectors 1
incoming and 1 restart

4 quadrants H bridge output,
PWM 1 A / 12 VDC

2 CAN BUS connectors
1 incoming and 1 restart

Encoder feedback signal

1 potentiometer on analog input

2 ON/OFF inputs for track ends
and 1 overtrack
3 microswitches for simulating
trackends and overtrack

EID 210 200 : MTR86 Real time kernel

Characteristics :

MTR86 is a real time multitask monitor specifically designed for INTEL and MOTOROLA microprocessors.
The version implemented into EID 210 controls the board own resources: (RS232 port control USB control),
One part of the kernel code is in flash EPROM, which allows to minimise the code size to be downloaded.

Functions :

- Tasks dynamic creation (32 max), priorities creations (32 max)
- Tasks immediate or cyclic release,
- Tasks destruction and suppression,
- Interrupt procedures control, Count semaphore control,
- Resources control (number of request : 24),
- Synchronisation by meeting,
- Communication by tubes, letter boxes and messages,
- Inputs / Outputs unlocking control,
- Statistic recording of the processor used resources,   •.
- Quantum duration dynamic / static modification from 1 to 50 millisecs,
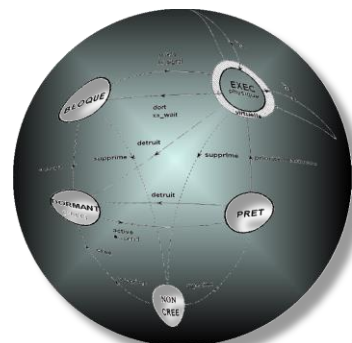
PRACTICAL WORK MANUALS.

Teacher's manuals, into which Practicals specifications are given following pedagogic progress. The solutions and analysis are detailed. The covered programs are provided in Assembler and C languages.

EID 210 040, discovery of the **EID 210 000** board, write into memory, store zone sorting... (62 pages, 2x5 Exercises)

EID 211 140 (EID210B pack and EID 001 000 Inputs / Outputs simulator), // port read / write and programming, A/D conversion, interrupt control...

EID 212 040 (EID210B pack and EID002B traffic lights simulator), yellow flashing, G/Y/R operation, pedestrians priority, vehicle detection, complete control of traffic lights,...(52 pages, 2x4 Exercises)

EID 051 040 CAN bus control, Inputs acquisition, Outputs control, filament breaking detection, motor speed control…(50 pages, 5 Exercises)

Operating units (cf specific documentation):

EID 002 000 : Traffic lights simulator, main road, secondary road, pedestrian call, car detection,

ESD 250 000 : 3-level hoist, with 21 I/O

CAN 01 A : Car lights control with CAN bus,
VMD 01 : Didactical Multiplexed Vehicle.

EID 060 000 : Speed & position servo-system of a DC motor by µcontroller

Standard configuration:

EID 210 B 16/32 bits 68000 Microcontroller based system, Pack made of : Basic Package « 16/32 bits MICROPROCESSOR/ MICROCONTROLLER SYSTEM, LANGUAGE C, C++», including		
Reference	Description	Qty
EID 210 000	Module for the study of a 16/32 bits 68332 microcontroller (CPU32), 16.7 MHz. Ports : USB 1.1, RS232, bus PC104, //port 24 bits, 6 Inputs and 4 Outputs, A/N, with editor, cross assembler linker, debugger, technical guide.	1
EID 210 100	C Compiler development environment, GNU C/C++ compiler (licence for one computer)	1
EID 001 000	Inputs Outputs simulator, with 40 pointslayer	1
EGD 000 003	DB9/DB9 F/F X modem serial lead	1
EGD 000 001	8-VAC, 2-A Power supply	1
EGD 000 021	USB/RS232 adaptator	1
EID 210 040	Book of experiments for EID210000 board, source files on CDRom	1
EID 211 040	Book of experiments for EID110000 board with applications on EID0010000 I/O board, source files on CDRom	1

Document non contractuel

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