



DLC 8410



USER MANUAL



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1 HARDWARE CHARACTERISTICS

This chapter describes the hardware characteristics of “DLC_8410” :

1.1 Electric Characteristics

ELECTRIC CHARACTERISTICS	
Power supply voltage	24 Vdc +/- 10 %
Maximum Permitted Power Supply	27 Vdc
Current Consumption	Under 50 mA without loads [Power Supply = 24 Vdc]
Microprocessor	Hitachi H8
Digital Inputs	4 digital inputs PNP 24 Volts including 2 fast (until 2 KHz for encoder reading)
Analog Inputs	8 analog inputs with 10 bits resolution [0 ... 1023] for voltage (0 ... 10 V) or current (0 ... 20 mA)
Digital Outputs	x
Analog Outputs	1 analog output 0 ... 10 V with 14 bit resolution [0 ... 16383]
Serial Lines	1 Serial Line : RS_422 / RS_485 Supports the communication protocols : KERNEL / KNP and MODBUS RTU
Leds	4 green leds, one for each digital input 2 red leds for communication signalling
Addressing	8 Dip-switches (of which only 4 for the addressing from 1 to 15)

1.2 Mechanics Characteristics

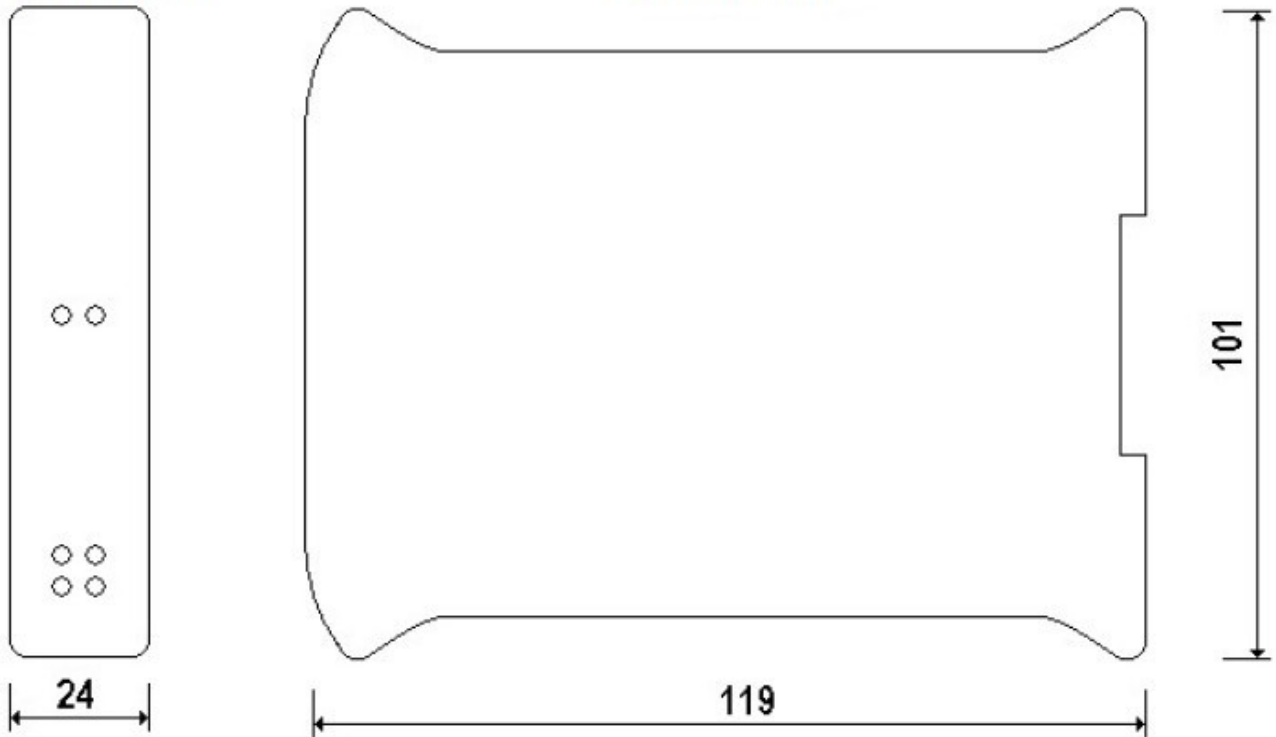
MECHANICS CHARACTERISTICS	
Temperature Range	From -10 ^C to +70^C
Humidity Range	From 10 % to 90 % (non-condensing)
Operating Atmosphere	Without corrosive gas
Noise Immunity	According to rules in force
Fixing System	On din rail
Weight	150 g
Keyboard	No Keyboard
Display	No Display

1.3 Dimensions

Front View 24x101 ; Depth 119 mm

FRONT VIEW

SIDE VIEW

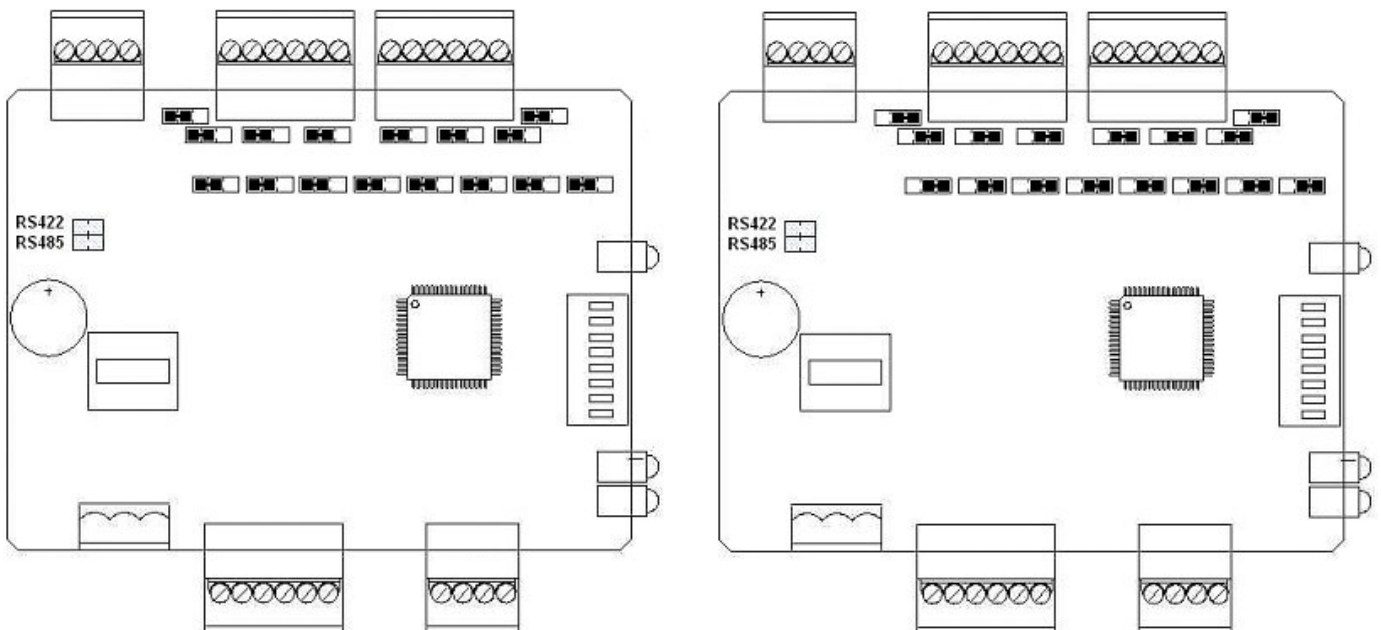


1.4 Selecting types of inputs

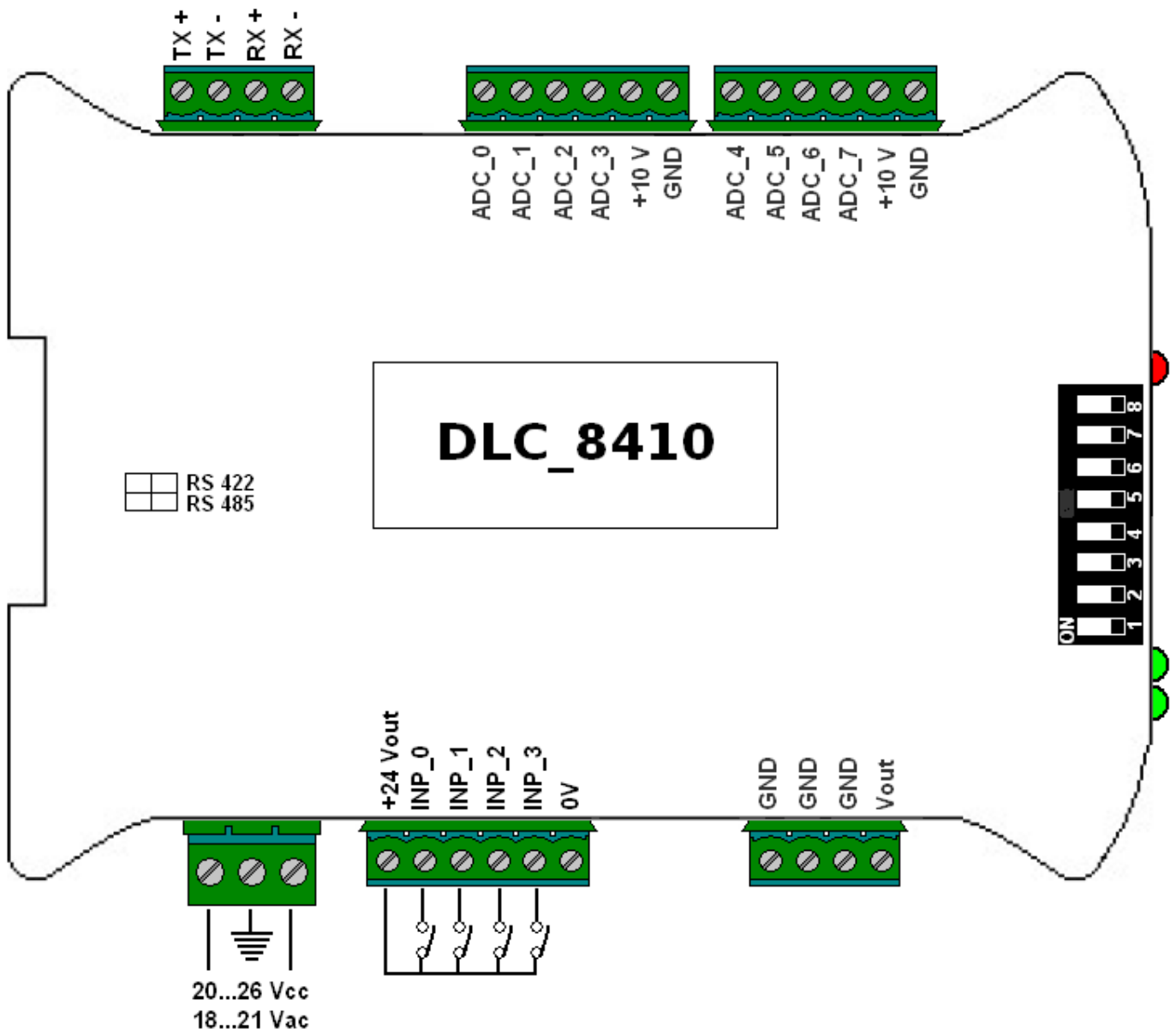
Is possible select the analog inputs as voltage inputs (0...10V) or current inputs (0...20mA), through some internal jumpers. To change the jumper position like in the following image, is necessary open the DLC_8410 cover. Each analog input has a couple of dedicated jumpers.

Current Inputs 0 ... 20 mA

Voltage Inputs 0 ... 10 V



1.5 I/O Connections



2 GENERAL NOTES

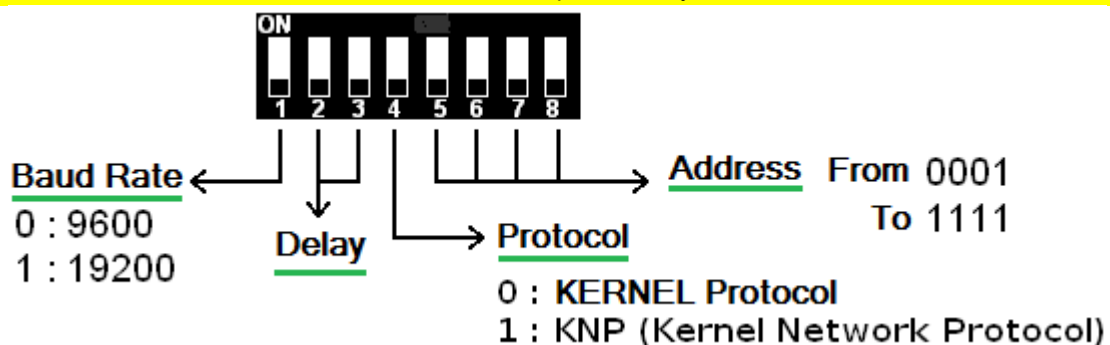
To have a complete idea about the DLC_8410 use, and about how work with this device, is necessary give some general notes. The DLC_8410 is an expansion module which can be connected to Kernel Sistemi devices (or even other devices) and its have eight analog 10 bits inputs for current (0 ... 20 mA) or voltage (0 ... 10 V). Is possible select the input type through an internal jumper. The DLC_8410 expansion write the 10 bits value of each analog input on eight different DATA MEMORY on the internal memory map. Furthermore with a 4 bits addressing system, is possible give at DLC_8410 a node address from 1 to 15.

2.1 Addressing

Is possible give a node address to each DLC_8410 with the dip-switches (look "Hardware Characteristics" or the following image) from 0001 to 1111 (from 1 to 15). If the fourth dip-switch is ON, or rather the KNP protocol is selected, the first three dip-switches are not used (baud rate and delay).

The CONFIGURATION OF DIP-switch changes depending on the VERSION of the FIRMWARE loaded on the DLC_8410:

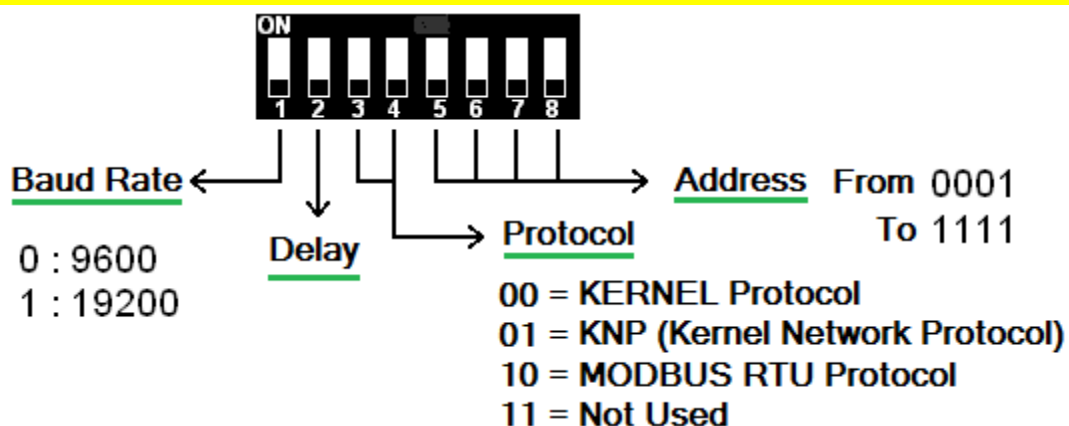
Firmware Version 1.6



Delay = Introduces a small delay in serial communication :

- 0 = 10 msec
- 1 = 20 msec

Firmware Version 1.7 and 1.8 onward ...



Delay = Introduces a small delay in serial communication :

- 0 = 01 msec
- 1 = 10 msec

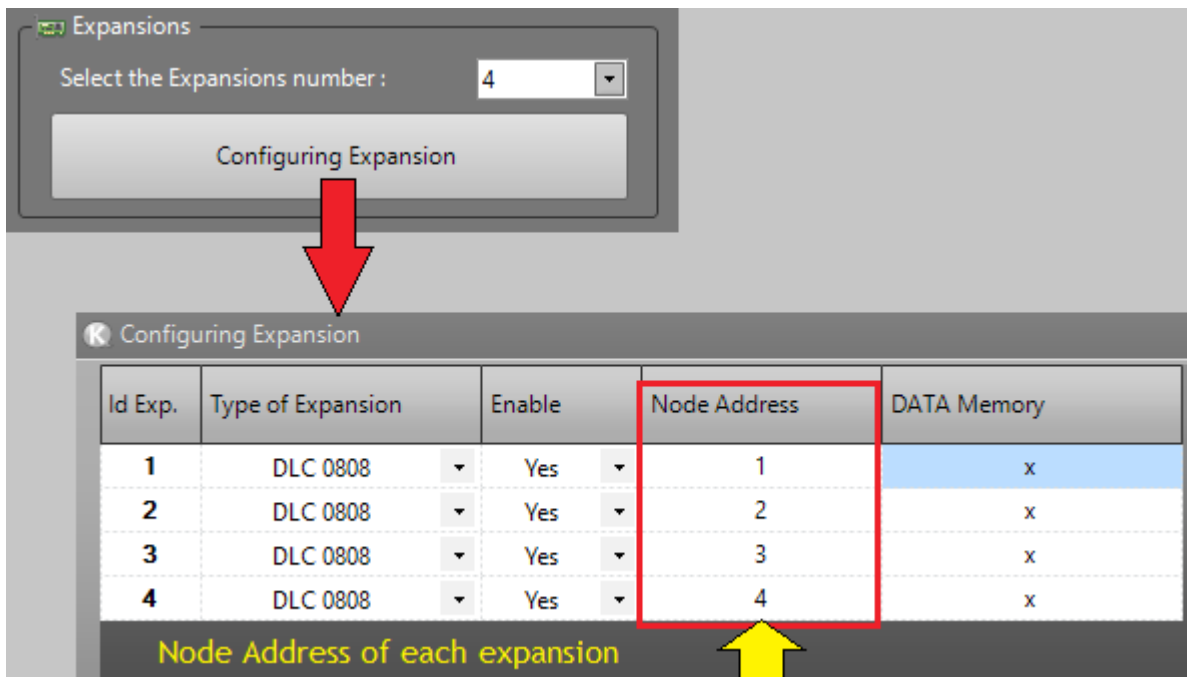
From firmware version 1.8 onwards have changed the baud rate that can be set :

- 0 = 19200
- 1 = 38400

In the application program of the Kernel Sistemi PLC, you need to set the NUMBER and the TYPE of EXPANSIONS that are connected. To do this it's necessary to open the project and go into the menu "Project Options" >> table

"Serials" to set the number of expansions; click on the button "Configuring Expansion" to choose the type of expansions connected.

IMPORTANT : the node address of each expansion set with the dip-switches must **MATCH** the one assigned automatically by the application program of the Kernel Sistemi PLC [see figure below] :



2.2 Communication

The serial communication occurs via RS_422 or RS_485.

With the dip-switches 3 and 4 you select the COMMUNICATION PROTOCOL and with the dip-switch 1 you choose the BAUD RATE; according to the protocol set with the dip-switches, you need to select the corresponding protocol (within the PLC project) in the COM used between PLC and expansions. Also in this case it's necessary to open the PLC project and go to the menu "Project Options" >> table "Serials" to select the correct protocol :

DIP-SWITCH 3 e 4	- Project Options >> "Serials" of the PLC project
00 = KERNEL Protocol	- KERNEL
01 = KNP (Kernel Network Protocol)	- KNP MASTER
10 = MODBUS RTU Protocol	- RTU MASTER

Also the Baud Rate set with the dip-switches must obviously coincide with the one selected in the "Project Options" >> table "Serials" in the COM used between PLC and expansions.

3 Memory Map

DLC_8410 has a series of internal memory locations, anyone at 16 bits (1 WORD). These locations are intended to contain the variables of the program in execution and are named by DATA_40 to DATA_59. Some DATA memory are only reading or only writing or both two.

Each DATA in this table is a 16 bits DATA, each DATA which isn't in this table don't exists.

Operand	Description	
DATA.40 (Modbus - 40041)	DAC : Bit Value of the analog output [0...16383]	WO
...	...	
DATA.50 (Modbus - 40051)	ADC 0 Instantaneous Instantaneous bits value, read by the analog input 0	RO
DATA.51 (Modbus - 40052)	ADC 1 Instantaneous Instantaneous bits value, read by the analog input 1	RO
DATA.52 (Modbus - 40053)	ADC 2 Instantaneous Instantaneous bits value, read by the analog input 2	RO
DATA.53 (Modbus - 40054)	ADC 3 Instantaneous Instantaneous bits value, read by the analog input 3	RO
DATA.54 (Modbus - 40055)	ADC 4 Instantaneous Instantaneous bits value, read by the analog input 4	RO
DATA.55 (Modbus - 40056)	ADC 5 Instantaneous Instantaneous bits value, read by the analog input 5	RO
DATA.56 (Modbus - 40057)	ADC 6 Instantaneous Instantaneous bits value, read by the analog input 6	RO
DATA.57 (Modbus - 40058)	ADC 7 Instantaneous Instantaneous bits value, read by the analog input 7	RO
DATA.58 (Modbus - 40059)	Status of the 4 digital inputs Resting on bits 0, 1, 2 and 3	RO
DATA.59 (Modbus - 40060)	Encoder current value	RW

Legend	
Comment	Icon
Write Only DATA	WO
Read Only DATA	RO
Read / Write DATA	RW

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