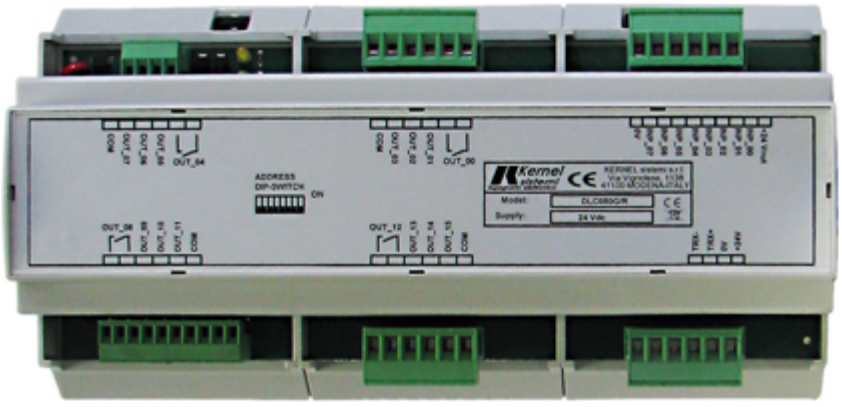
DLC 080G

USER MANUAL



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1 HARDWARE CHARACTERISTICS

This chapter describes the hardware characteristics of “DLC_080G” :

1.1 Electric Characteristics

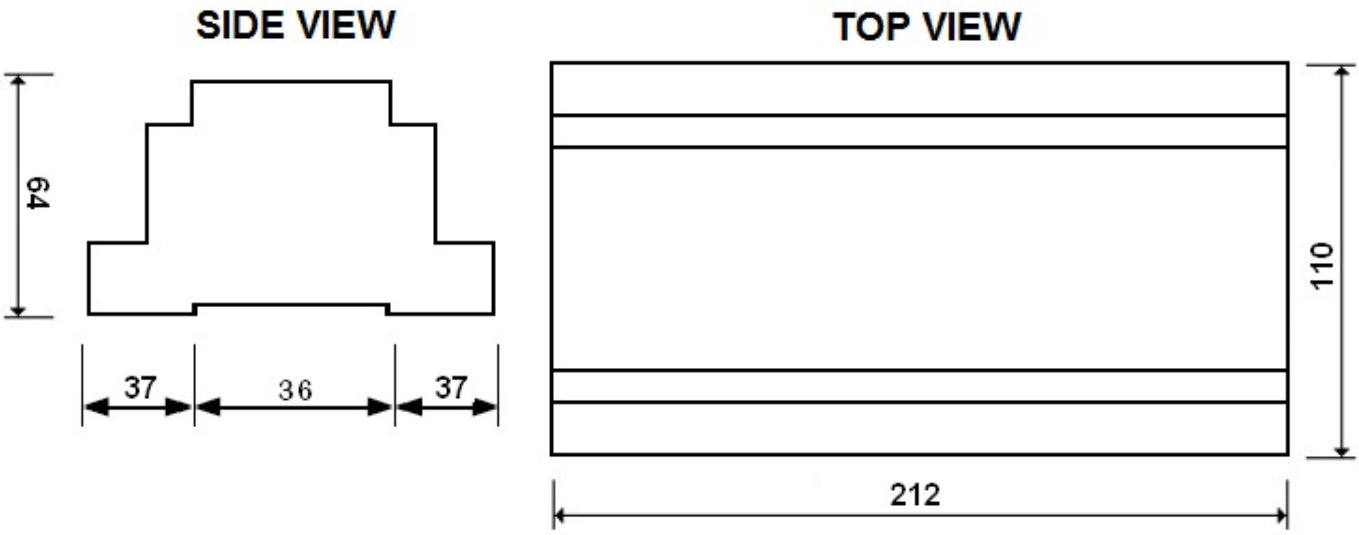
ELECTRIC CHARACTERISTICS	
Power supply voltage	**24** Vdc +/- 10 %
Maximum Permitted Power Supply	**27** Vdc
Current Consumption	Under **50** mA without loads [Power Supply = 24 Vdc]
Microprocessor	**Hitachi H8**
Digital Inputs	**8** digital inputs PNP 24 V
Analog Inputs	**x**
Digital Outputs	**16** relay output
Analog Outputs	**x**
Serial Lines	**1** Serial Line : RS 485 Supports the communication protocols : KERNEL / KNP / EXPA and MODBUS RTU
Leds	**2** yellow leds, for signalling the transmission and reception of data from serial
Addressing	**8** Dip-switches (of which only **5** for the addressing from 1 to 31)

1.2 Mechanics Characteristics

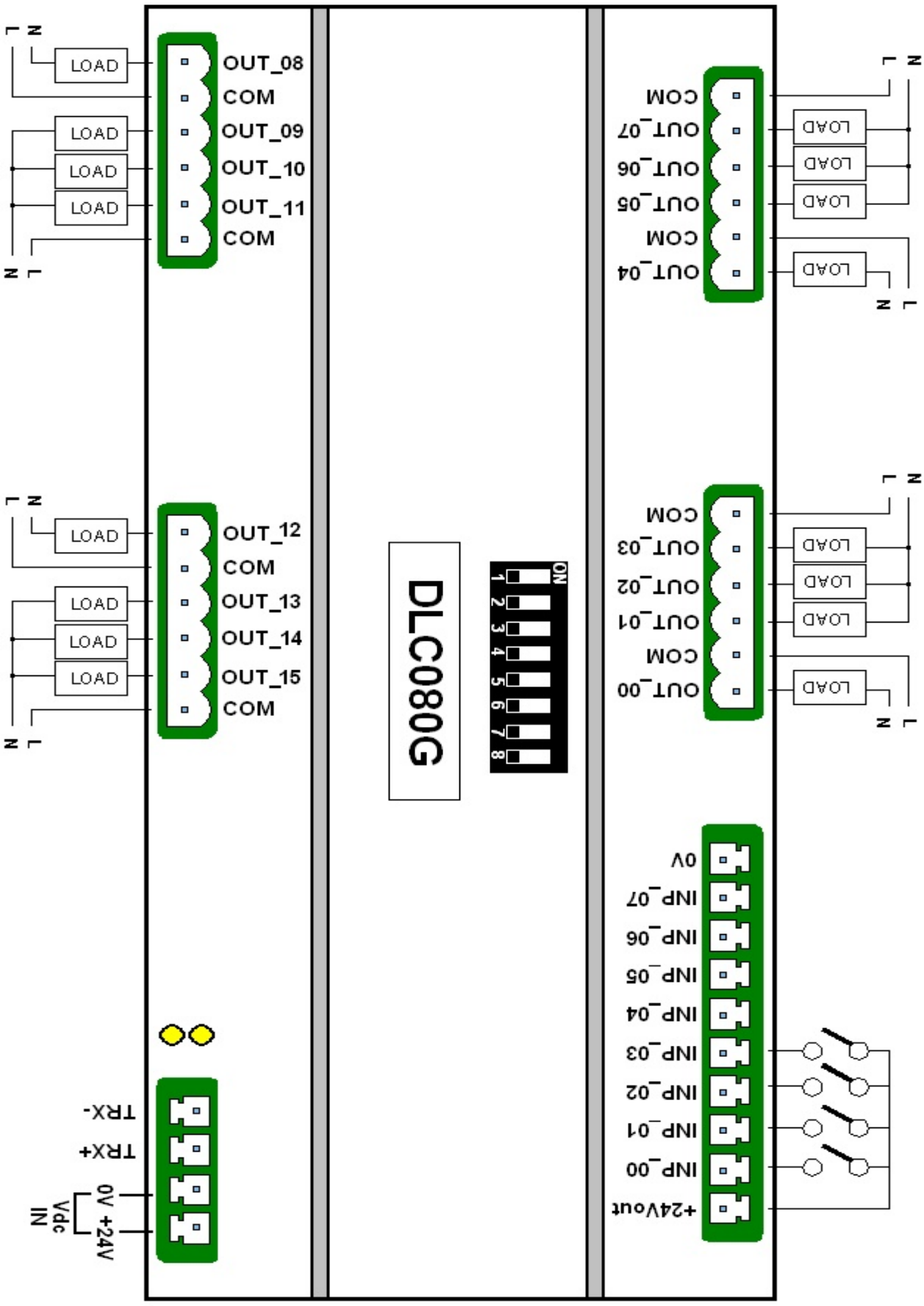
MECHANICS CHARACTERISTICS	
Temperature Range	From -10 ^C to +70^C
Humidity Range	From 10 % to 90 % (non-condensing)
Operating Atmosphere	Without corrosive gas
Noise Immunity	According to rules in force
Fixing System	On din rail
Weight	450 g
Keyboard	No Keyboard
Display	No Display

1.3 Dimensions

Front View 212x110 ; Depth 64 mm



1.4 I/O Connections

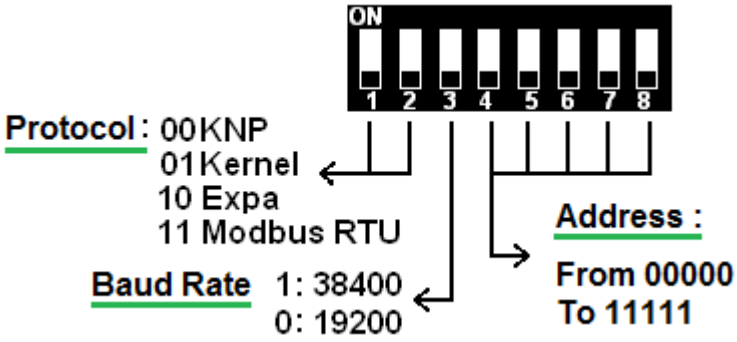


2 GENERAL NOTES

In order to have a correct and complete picture on the use of DLC_080G and how to work with this object, it's appropriate to give some general information. The DLC_080G is a digital expansion module can be connected to Kernel devices, used mainly in building automation systems. Each individual module mounts 8 digital inputs (24 V) and 16 relay outputs; correctly configuring the application on the PLC and the addresses of the modules, it's possible to connect up to thirty! This allows a maximum of 240 digital inputs and 480 relay outputs in more than those which the PLC Kernel systems used, mounts already on board. Once established by software the number of modules DLC_080G that you want to connect, the I/O of those modules will be processed by the PLC Kernel exactly as normal I/O onboard PLC.

2.1 DIP-SWITCHES

You can configure for each DLC_080G its own node address, baud rate and protocol, through the 8 suitable dip-switches (see hardware characteristics and the following figure).



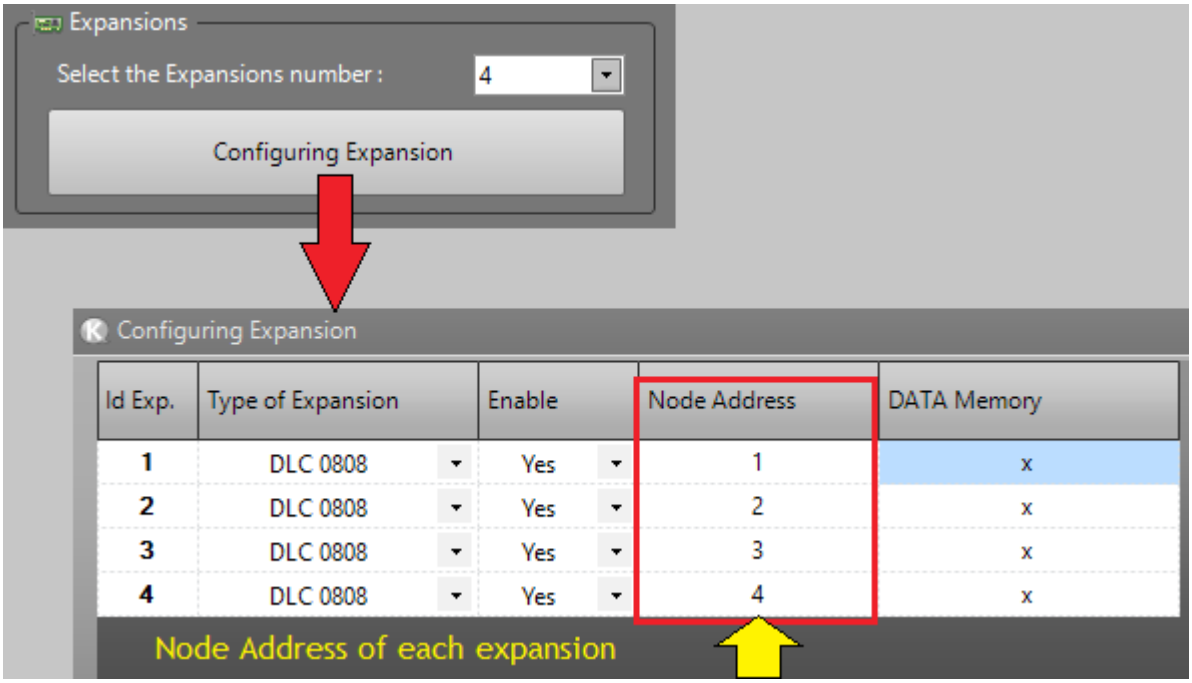
Here are some examples that help to understand :

ATTENTION

The "**Expa**" protocol (switch code "10") serves for the connection of the expansion with the STANDARD PLC!
For more clarification on this particular protocol, directly consult the technical office of the KERNEL Sistemi s.r.l.

In the application program of the PLC of the Kernel Sistemi 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 "Serial" 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-switch must MATCH the one assigned automatically by the application program of the PLC of the Kernel Sistemi [see figure below] :



2.2 Communication

The serial communication occurs only via RS 485. It will be necessary to set the protocol KNP_MASTER 19200, N, 8, 1, on the PLC Kernel Sistemi.

With the dip-switches 1 and 2 you select the COMMUNICATION PROTOCOL and with the dip-switch 3 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 "Serial" to select the correct protocol :

```
DIP-SWITCH 1 e 2                    - Project Options >> "Serials" of the PLC project
-------------------------------------------------------------------------------
00 = KNP (Kernel Network Protocol) - KNP MASTER
01 = KERNEL Protocol                - KERNEL
10 = EXPA Protocol                  - x
11 = MODBUS RTU Protocol            - RTU MASTER
```

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

2.3 I/O Management

Once you have entered the correct number of expansions in the menu "Project Options" of the application program for the PLC Kernel which will be linked (see figure above), will be available the inputs and the outputs in blocks of 8 elements (8 I/O), clearly in the case of expansion 080G having it 16 outputs will use 2 blocks of 8 elements [starting from the I/O 32].
See example :

```
Expa. 080G Addr. 1 : Inputs from INP_32 to INP_39 + Outputs from OUT_32 to OUT_47
Expa. 080G Addr. 3 : Inputs from INP_48 to INP_55 + Outputs from OUT_48 to OUT_63
Expa. 080G Addr. 5 : Inputs from INP_64 to INP_71 + Outputs from OUT_64 to OUT_79
Expa. 080G Addr. 7 : Inputs from INP_80 to INP_87 + Outputs from OUT_80 to OUT_97
ecc...
```

In the case in which the expansions aren't controlled by a PLC Kernel, but from any other device with the different protocol from KNP, to manage I/O, you will not be able to act on the INP / OUT from 32 forward; it will be necessary to act on the 16 bit DATA Memory 00 for inputs and 01 for the outputs. These are 2 WORD_WIDE DATA (16 Bit) and each bit corresponds an input or an output :
INPUTS :

DATA.00 = Will contain the status of INPUTS from 00 to 07

OUTPUTS :

DATA.01 = Will contain the status of OUTPUTS from 00 to 15

2.4 Time Active Communication

The expansion has a time called "Time Active Communication", i.e. a waiting time within which, if an output of the expansion is high and within the fixed time isn't received by the module another command that puts high that output, it's brought to zero. This system mainly represents a security, because in the case in which the expansion was connected to a PLC Kernel and for some reason the communication between the two devices is interrupted, the outputs of the expansion after a time "X" would be placed at 0. The PLC Kernel, therefore, sends in continuation a command strings to the outputs expansions.
In the case you want to send only once the string of ignition of the outputs, it will be necessary to go to exclude this time; to do this it's possible to manipulate this value within the DATA memory 16 of the expansion.
The DATA.16 has default value equal to 10, i.e. 1 second; it's possible to vary as desired, and placing this value to 0 will exclude the "Time Active Communication".

3 CONTACTS

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