



DLC 0808C



USER MANUAL



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1 HARDWARE CHARACTERISTICS

This chapter describes the hardware characteristics of “DLC_0808C” :

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	8 static digital outputs PNP 24Vdc at 500 mA
Analog Outputs	x
Serial Lines	1 Serial : RS 422 or RS 485 Supports the communication protocols : KERNEL - KNP - EXPA - MODBUS RTU
Leds	8 green leds, one for each digital input 2 red leds, for signalling the transmission and reception of data from serial 8 yellow leds, one for each digital output
Addressing	8 Dip-switches (of which only 5 for the addressing from 1 to 31)

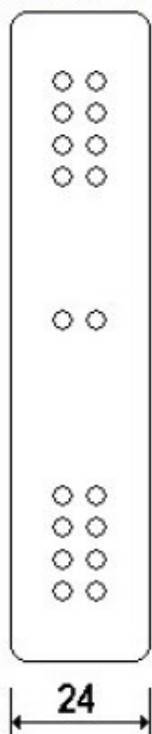
1.2 Mechanics Characteristics

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	150 g
Keyboard	No Keyboard
Display	No Display

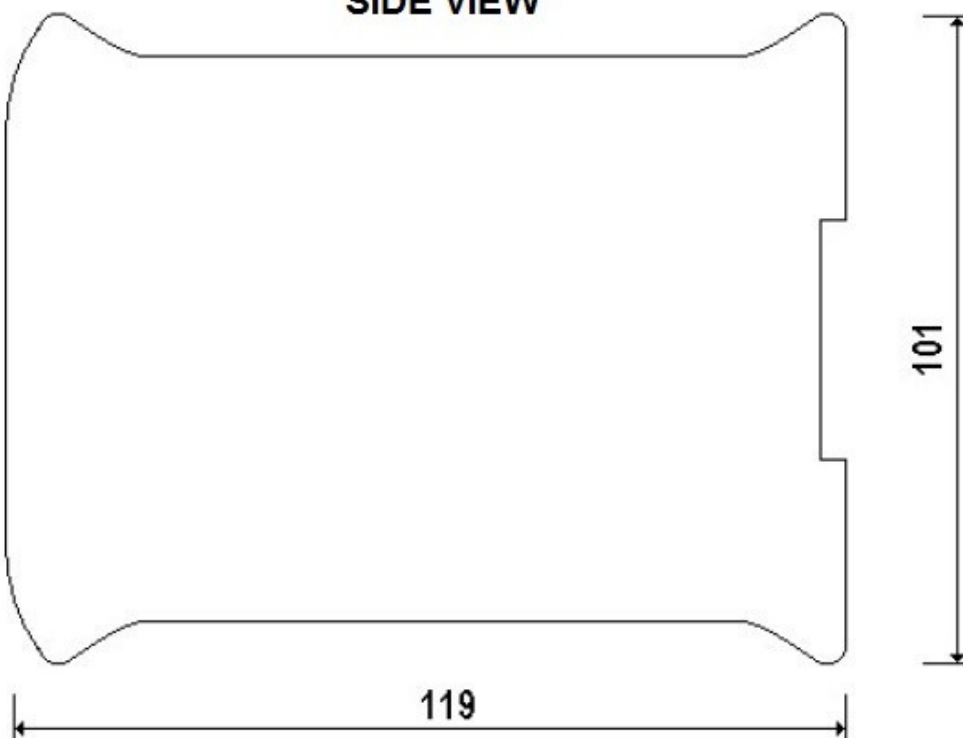
1.3 Dimensions

Front View 24x101 ; Depth 119 mm

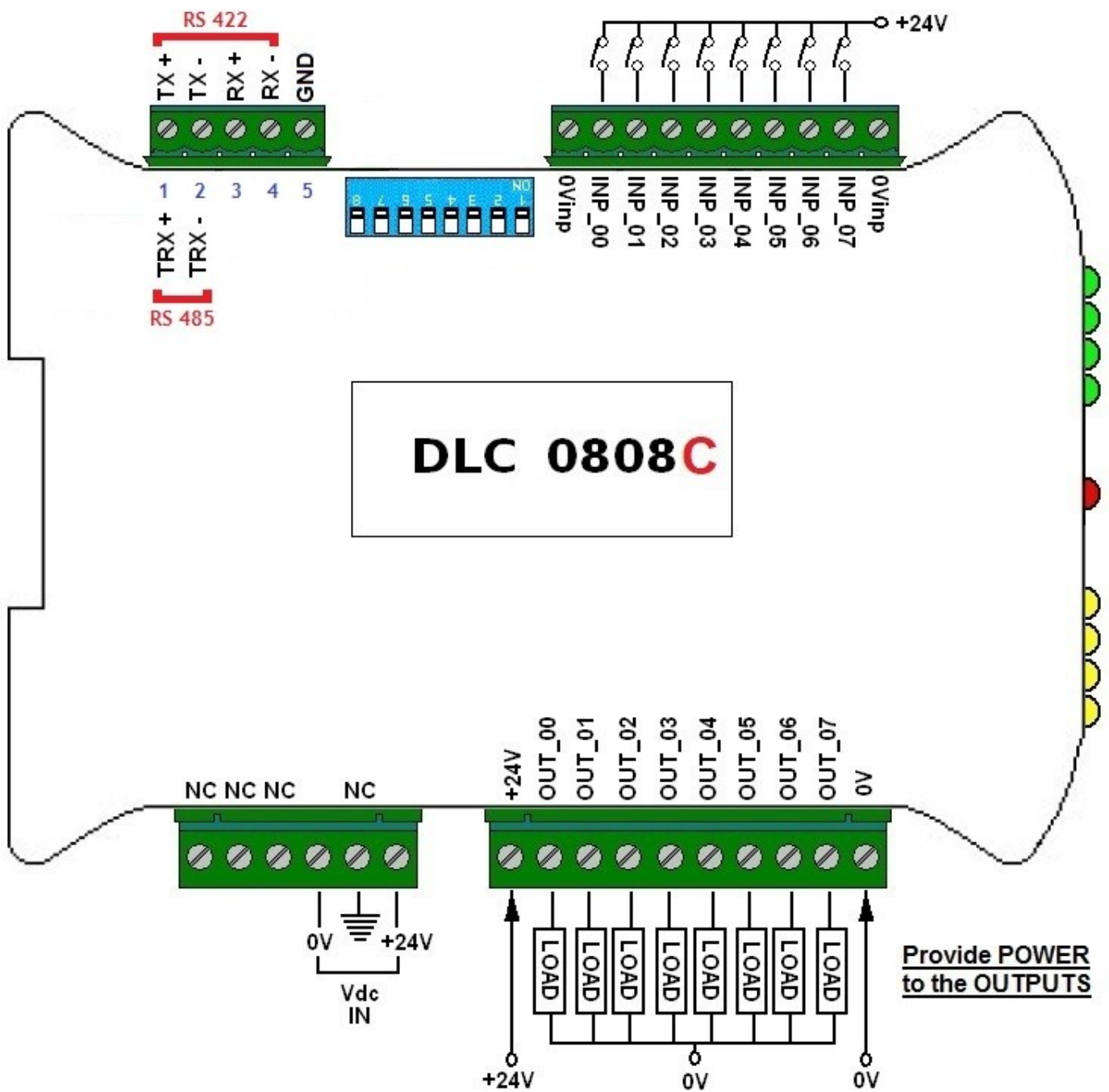
FRONT VIEW



SIDE VIEW



1.4 I/O Connections



2 PLC OPERATING SYSTEMS

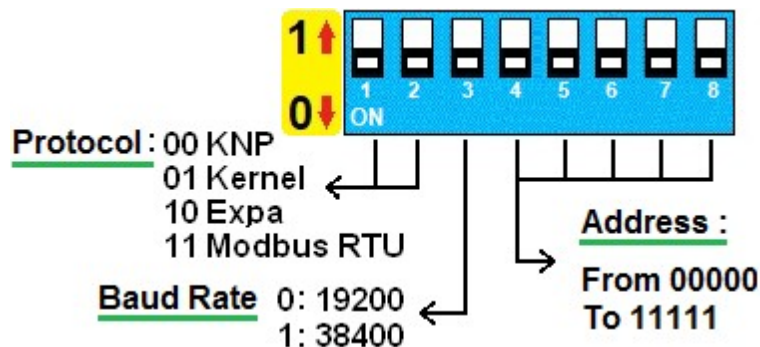
PLC Operating Systems							
STANDARD	D	FUJITSU	36109	ARM Series 100	ARM Series 200	ARM Series 400	ARM Series 700
DMX_16	DMX_16D	GTP_80	KS381C	DR_112R	DP_120	DP_364	KS_574
DMX_19	DMX_19D	KS_392	KS381M	DR_120R	DP_216	KS_521	KS_593
DMX_20	DMX_30DR	KS_392B	KS381N	KS_483	DP_232	KS_544	TP_740
DMX_30R	DMX_30DS	KS_392I	KS381S	KS_497	KS_531	TP_320	
DMX_30S	DMX_32D	KS_392M	KS391	KS_522	KS_550	TP_430	
DMX_32	DMX32D	KS_407	KS391M	KS_546	KS_553		
GTP_64	GTS_128D	KS_408	KS391N	KS_551	KS_556		
GTP_128	GTS_240D	KS_412B	KS391O	T_322	KS_628		
TSP_128	KS_367D	KS_412R	KS_413	VP_116	DMX_16N		
VTP_322	KS_395D	TSP_240	KS_433Q		VTP_323		
VTP_402	KS_405AD	TSP_350	KS_433R				
VTP_403	KS_405D	TSP_570	KS_433S				
	KS_405M		KS_441				
	KS_405P		KS_444				
	KS_414A						
	KS_414P						
	KS_427						
	KS_438						
	KS_443						
	KS_443R						
	KS_456						
	KS_457						
	KS_467						
	PAN_16D						
	TSP_128D						
	VTP_403D						

3 GENERAL NOTES

In order to have a correct and complete picture on the use of DLC_0808C and how to work with this object, it's appropriate to give some general information. The DLC_0808C 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 8 static outputs; correctly configuring the application on the PLC and the addresses of the modules, it's possible to connect up to 31! This allows a maximum of 248 digital inputs and 248 static outputs in more than those which the PLC Kernel systems used, mounts already on board. Once established by software the number of modules DLC_0808C 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.

3.1 DIP-SWITCHES

It's possible to give any DLC_0808C its own node address via the appropriate dip-switches (see hardware characteristics and the following figure), in this way it will be possible to connect to a PLC Kernel up to 31 digital expansions DLC_0808C. You can select the number of expansions to be connected to the PLC, in the menu "Project Options" of the program for the PLC.



The only selectable parameters are the Communication Protocol, Baud Rate and Node Address! Parity, Bits and Stop bit will be fixed : **N, 8, 1**.

IMPORTANT

In the dip-switches the "0" position is downwards, in the direction indicated by the arrow next to the word "ON". Position "1", on the other hand, is upwards (in the opposite direction)!
See image above

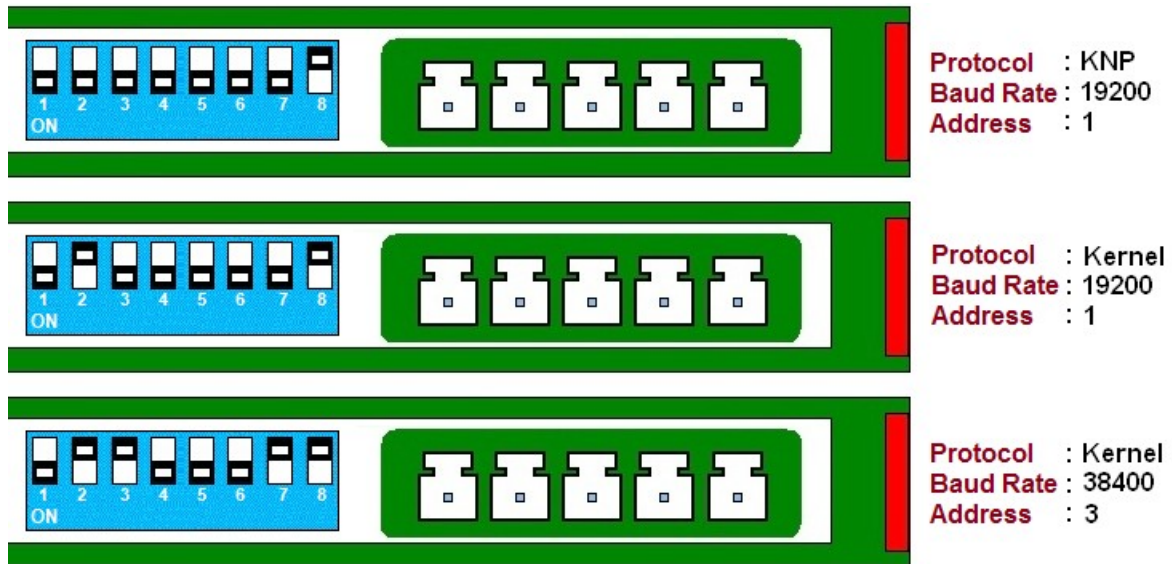
ATTENTION

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.

3.2 Connection to KERNEL PLCs that DO NOT HAVE a STANDARD Operating System

To connect a DLC_0808C expansion to a KERNEL PLC that does not have a STANDARD operating system (ie ARM, Fujitsu, 36109 or D)(see Chapter 2), the following steps must be followed :

- Provide power to the **OUTPUTS** (connecting +24 Vdc and 0 V).
- Bring the 0 V also to the **INPUT** connector.
- Connect the **RS485 / RS422 SERIAL** (see "Paragraph 1.4 - I / O Connections")
- Set, using the dip-switches, the **KNP protocol** and the expansion address (the address must be unique) :



In the communication between PLC Kernel with NON STANDARD operating system and one or more DLC_0808C it will be necessary to open the PLC application program (LogicPaint) and set :

1. The **KNP_MASTER** communication **PROTOCOL**
2. The **NUMBER** of connected **EXPANSIONS**
3. The **TYPE** of **EXPANSIONS**

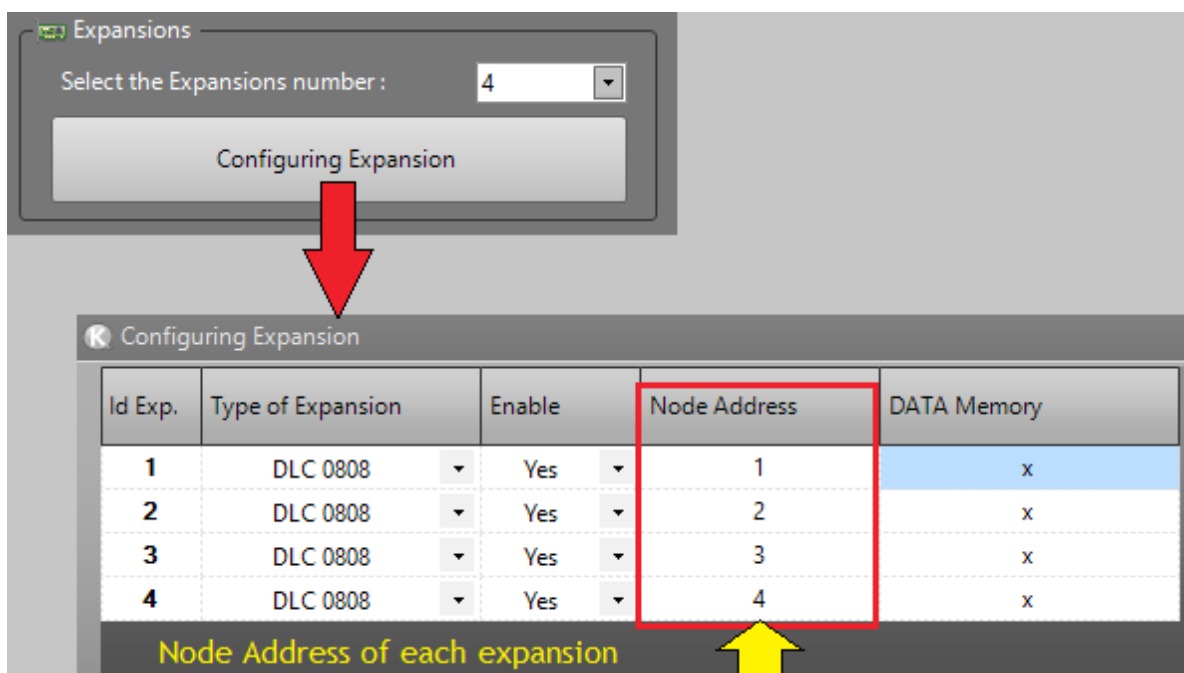
To do this, open the menu: "Project Options" >> "Serial" Table

To set the **KNP_MASTER** protocol just select it in the PLC COM where the DLC_0808C expansions are connected :



To set the number of expansions, simply select it in the relevant box. Finally, click on the "Configuring Expansion" button to choose the type of connected expansions.

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



3.3 Connection to KERNEL PLCs that HAVE a STANDARD Operating System

The expansions can only be connected to COM_0 in RS485 / RS422 of PLCs with a STANDARD operating system and the KERNEL [Master] protocol must be set on COM_0; it will be possible to connect up to a maximum of 3 modules, and the COM_0 of the PLC will be dedicated to communication with these expansions and it will not be possible to connect anything else.

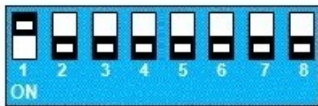
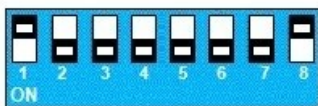
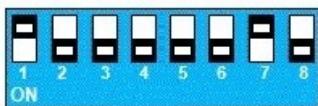
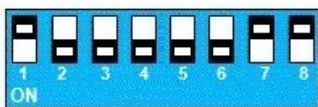
To connect a DLC_0808C expansion to a KERNEL PLC that has a STANDARD operating system (see Chapter 2), the following steps must be followed :

- Provide power to the **OUTPUTS** (connecting +24 Vdc and 0 V).
- Bring the 0 V also to the **INPUT** connector.
- Connect the **RS485 / RS422 SERIAL** (see "Paragraph 1.4 - I / O Connections")
- Using the dip-switches, set the **KERNEL** protocol and the expansion address (the address must be unique):

IMPORTANT

If there is **ONLY ONE** DLC_0808C connected, the expansion node address (set with the dip-switches) must be **0**.

If there are **MORE than ONE** DLC_0808C connected, the node address of the expansions (set with the dip-switches) must go **from 1 to 2 (if there are 2 expansions) or up to 3 (if there are 3 expansions)** :

Connection to Kernel Sistemi PLC which have STANDARD* O.S	
	<p>Protocol : EXPA Baud : 19200 Address : 0</p> <p>only if there is <u>only one</u> DLC0808 connected to a Kernel Sistemi PLC with STANDARD* operative system</p>
	<p>Protocol : EXPA Baud : 19200 Address : 1</p> <p>only if there is <u>more than one</u> DLC0808 connected to a Kernel Sistemi PLC with STANDARD* operative system</p>
	<p>Protocol : EXPA Baud : 19200 Address : 2</p> <p>only if there is <u>more than one</u> DLC0808 connected to a Kernel Sistemi PLC with STANDARD* operative system</p>
	<p>Protocol : EXPA Baud : 19200 Address : 3</p> <p>only if there is <u>more than one</u> DLC0808 connected to a Kernel Sistemi PLC with STANDARD* operative system</p>

In the communication between PLC Kernel with STANDARD operating system and one or more DLC_0808C it will be necessary to open the PLC application program (LogicPaint) and set :

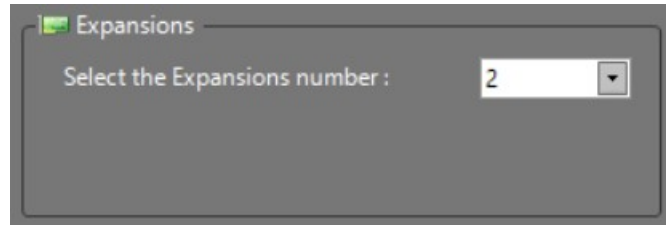
1. The **KERNEL** communication PROTOCOL
2. The **NUMBER** of connected EXPANSIONS

To do this, open the menu: "Project Options" >> "Serial" Table

To set the **KERNEL** protocol just select it in the PLC COM where the DLC_0808C expansions are connected :



To set the number of expansions, simply select it in the relevant box :



3.4 I/O Management

Once you have entered the correct number of expansions in the menu "Project Options" of the application program for the Kernel Sistemi PLC which will be connected, will be available inputs and outputs the following :

1 expansion connected : Inputs and Outputs from 32 to 39
2 expansions connected : Inputs and Outputs from 32 to 47
3 expansions connected : Inputs and Outputs from 32 to 55
4 expansions connected : Inputs and Outputs from 32 to 63
5 expansions connected : Inputs and Outputs from 32 to 71
6 expansions connected : Inputs and Outputs from 32 to 79
 ecc...

In the case in which the expansions aren't controlled by a PLC Kernel, but from any other device with the different protocol, 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 07

3.5 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.

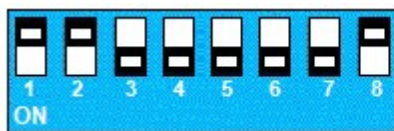
This system mainly represents a security, because in the case in which the expansion was connected to a PLC Kernel and for some reason the communication between the two devices is interrupted, the outputs of the expansion after a time "X" would be placed at 0.

The PLC Kernel, therefore, sends in continuation a command strings to the outputs expansions.

The "Time Active Communication" has a value of 1 second.

3.6 Modbus RTU protocol

It is offered the opportunity to communicate with the DLC_0808C expansion even with the Modbus RTU protocol :



Protocol : MODBUS
Baud Rate : 19200
Address : 1

Below are some examples of dip-switch configuration :

You will be able to read and write two Holding Registers to see the input status and change the status of the outputs :

MODBUS REGISTER : 0

This register allows you to read the status of the 8 inputs associated with the first 8 bits of the word

MODBUS REGISTER : 1

On this register you can write the status of the 8 outputs associated with the first 8 bits of the word

4 CONTACTS

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