DLC 1200SG

USER MANUAL

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1 HARDWARE CHARACTERISTICS

This chapter describes the hardware characteristics of “DLC_1200SG” :

1.1 Electric Characteristics

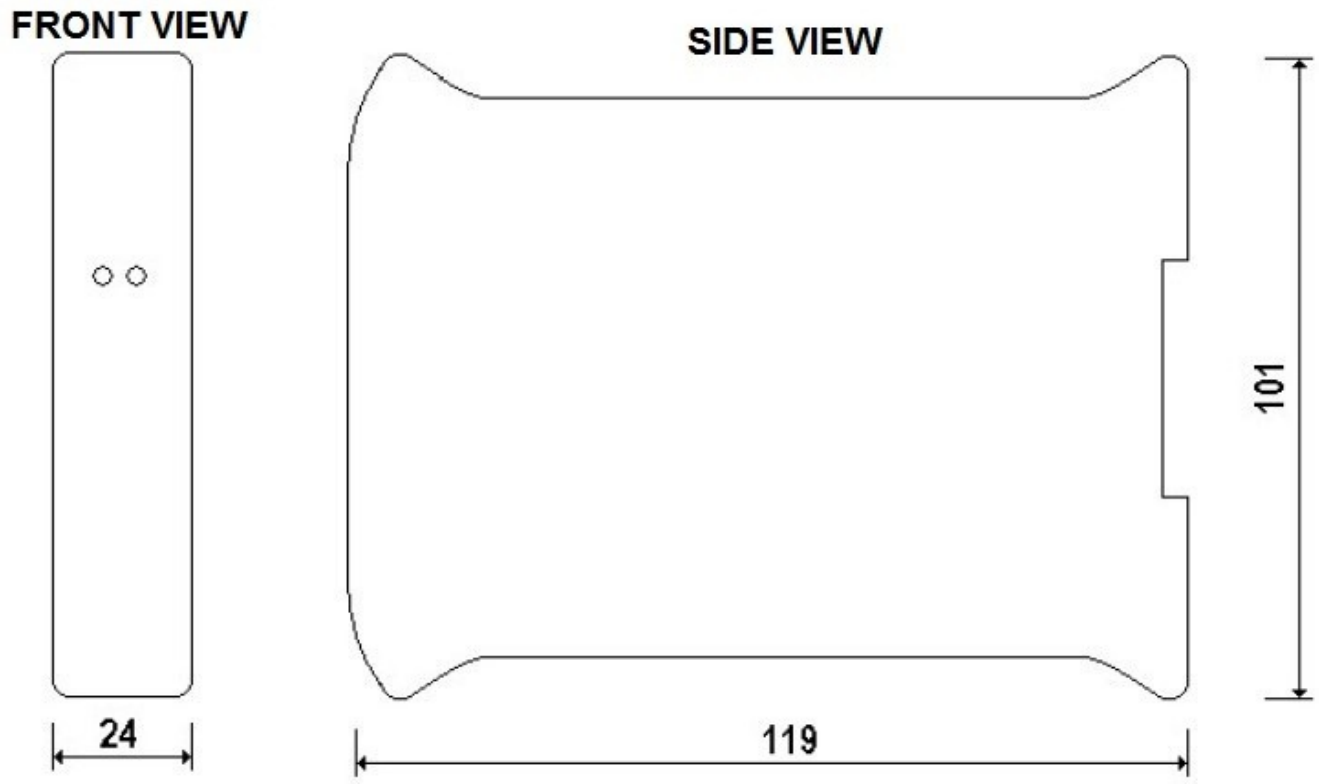
ELECTRIC CHARACTERISTICS	
Power supply voltage	**24** Vdc +/- 10 %
Maximum Permitted Power Supply	**27** Vdc
Current Consumption	Under **50** mA without loads [Power Supply = 24 Vdc]
Microprocessor	ARM STM 100
Digital Inputs	**4** fast inputs for 2 bi-directional encoder
Analog Inputs	**1** analog input for strain gauge 16 Bit
Digital Outputs	**x**
Analog Outputs	x
Serial Lines	**1** Serial Line : RS 485 Supports the communication protocols : KERNEL, KNP and MODBUS RTU
Led	**2** red led for communication signalling
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	130 g
Keyboard	No Keyboard
Display	No Display

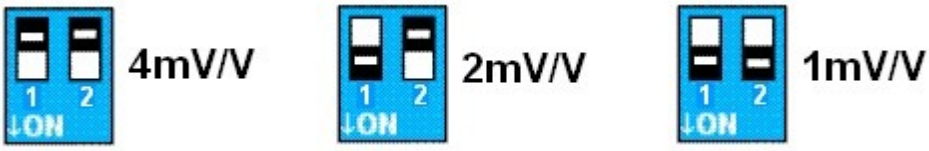
1.3 Dimensions

Front View 24x101 ; Depth 119 mm

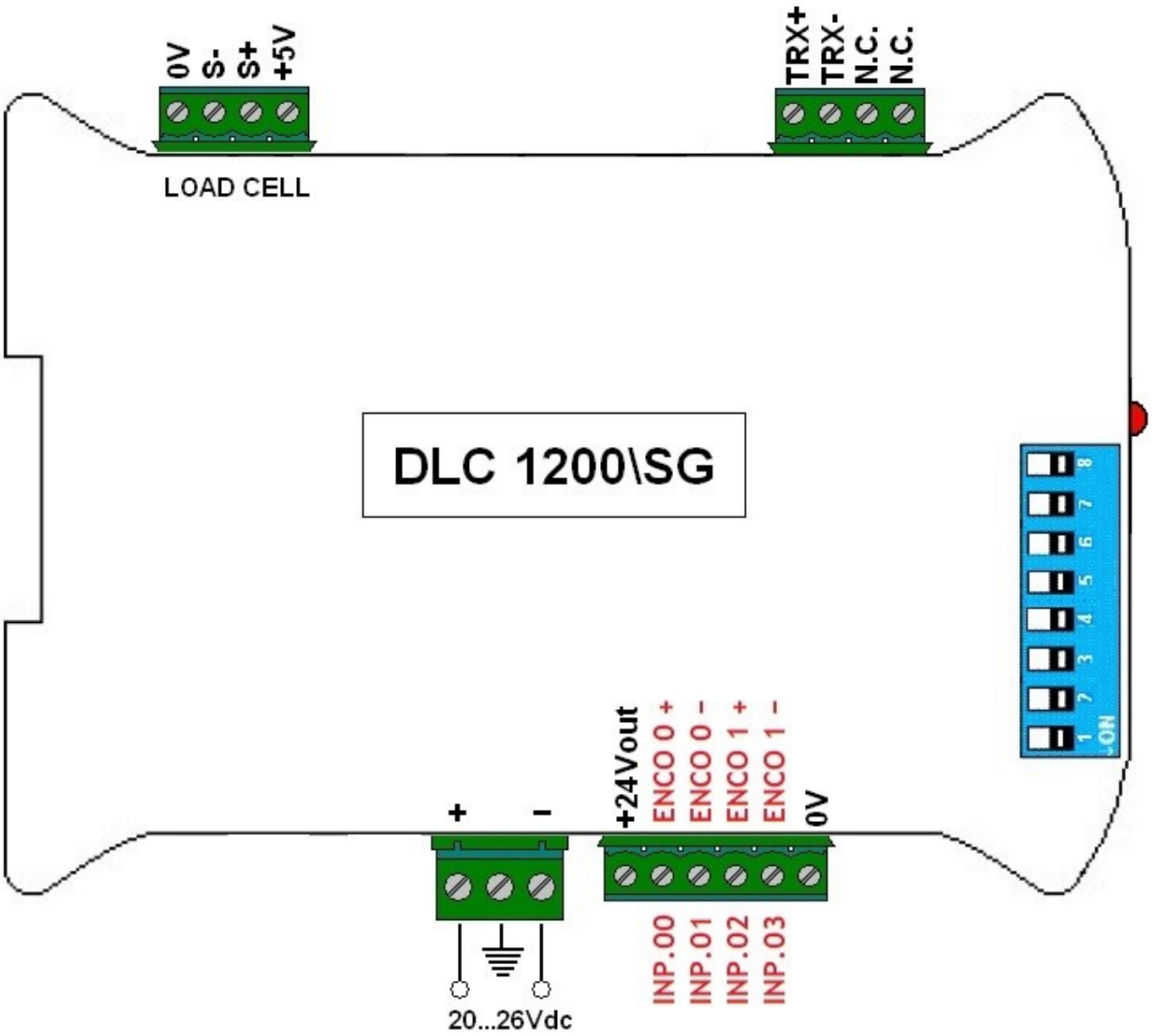


1.4 Strain gauge resolution

Is possible change the strain gauge resolution (in according to the model) with the two dedicated dip-switches, look following image :



1.5 I/O Connections

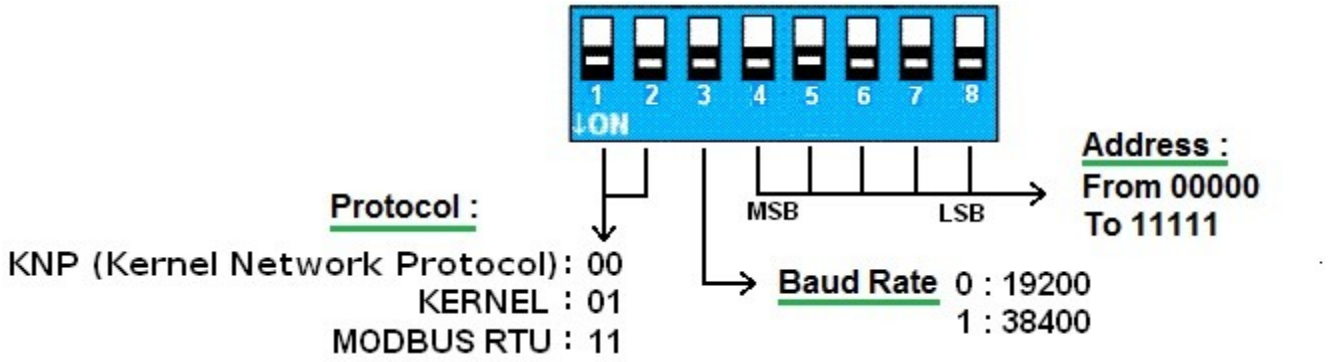


2 GENERAL NOTES

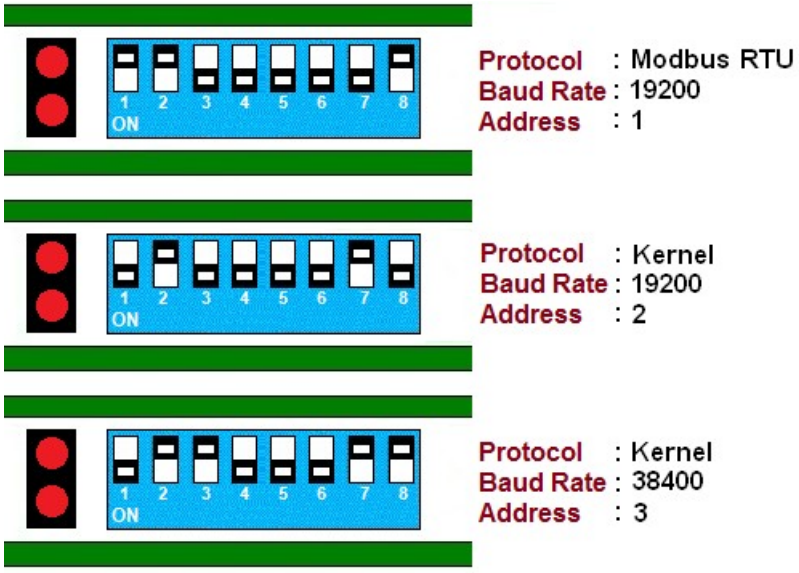
In order to have a correct and complete picture on the use of DLC_1200SG and how to work with this object, it is appropriate to give some general information. The DLC_1200SG is an expansion module, that can be connected to Kernel devices, whose main characteristic is that they have 1 analog strain gauge input at 16 bits. Moreover, thanks to an addressing system to 5 bit you can give to each expansion node address from 1 to 31.

2.1 DIP-SWITCHES

You can configure for each DLC_1200SG 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 :



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

To connect a DLC_1200SG expansion to a KERNEL PLC that does not have a STANDARD operating system (ie ARM, Fujitsu, 36109 or D), the following steps must be followed :

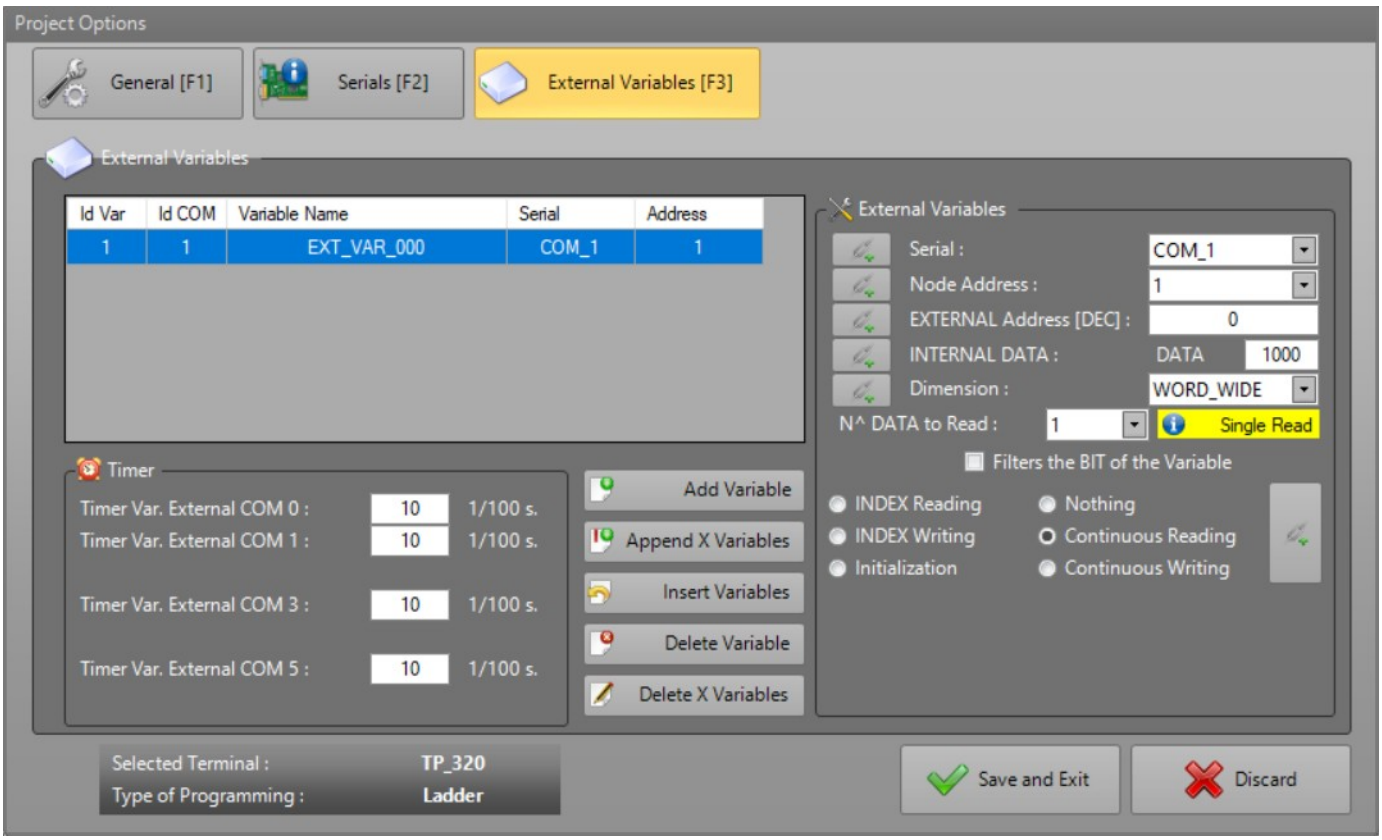
- Provide power to DLC_1200SG (connecting +24 Vdc and 0 V).
- Connect the **RS485 SERIAL** (see "*Paragraph 1.4 - I / O Connections*")
- Set, using the dip-switches, the correct **protocol** and the expansion address (the address must be unique) :

In the communication between PLC Kernel with NON STANDARD operating system and one or more DLC_1200SG it will be necessary to open the PLC application program (LogicPaint) and set :

1. The communication **PROTOCOL : KNP / KERNEL / MODBUS RTU**
2. The **BAUD RATE**
3. The **EXTERNAL VARIABLES**

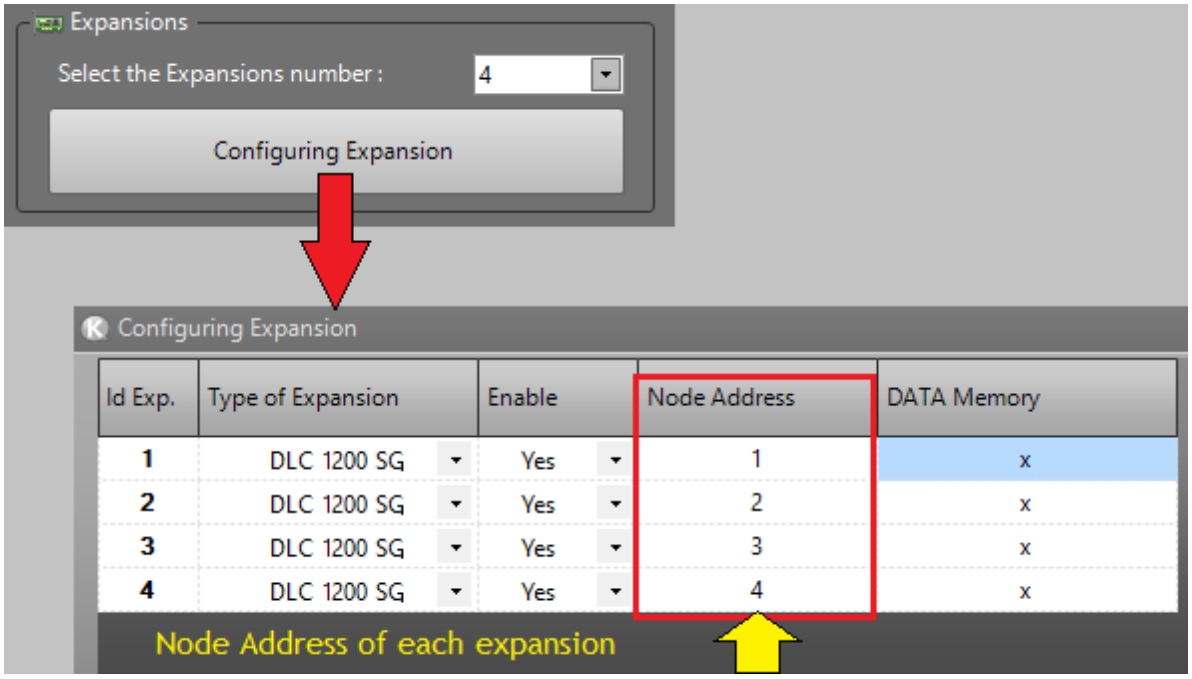
To do this, open the menu: "**Project Options**" >> "**Serial [F2]**" Table
To set the protocol just select it in the PLC COM where the DLC_1200SG expansions are connected. For example :

While to set the EXTERNAL VARIABLES you need to go to : **"Project Options"** >> **"External Variables [F3]"** table.
In the example shown below, the External Variable **"EXT_VAR_000"** reads the DLC_1200SG with address "1" via COM 1 of the PLC.
From this address, REGISTER "0" is read (which contains the "*Status*"... see chapter 3) and is copied to the DATA.1000 of the PLC :



2.3 KNP Protocol

If you select the KNP Protocol through the dip-switch number 1 and 2, the node address of each expansion will be shown automatically in the menu "Project Options" >> "Serial" >> "Configuration Expansion" Application Program Kernel PLC systems [see figure] :



2.4 Communication

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-SWITCHES 1 e 2                  - Project Options >> "Serials" of the PLC project
-------------------------------------------------------------------------------
00 = KNP (Kernel Network Protocol) - KNP MASTER
01 = KERNEL Protocol               - KERNEL
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.

3 Memory Map

Currently the DLC1200SG has two 16 bit (1 WORD) memory location called DATA which allow to read the current strain gauge value.

Operand	Description	
DATA.00	***STATUS*** Bit 1 = It's sampling... Bit 2 = Sampling finished	**RO**
DATA.01	***COMMANDS*** ***If set = to 5 sampling starts***	**RW**
DATA.02	***Strain gauge value*** AVERAGE 16 Bit Value	**RO**
DATA.05	***Strain gauge value*** INSTANT 16 Bit Value	**RO**
DATA.40	***Number of Samples***	**RW**
DATA.64	***Beginning of the sampling area. From this DATA there are the executed samples***	**RO**

Comment	Icon
Read Only DATA	**RO**
Read / Write DATA	**RW**

3.1 Sampling

In order to be able to carry out a sampling of the load cell values, the following digital inputs must be used :

- **INP.00** = ZERO notch
- **INP.01** = UNIDIRECTIONAL encoder. Sampling is performed with each pulse of this encoder.

At this point follow the steps below :

4. First of all it is necessary to set in **DATA.40** the number of samples to be carried out.
5. Subsequently it is necessary to write "**5**" in the **DATA.01** (Commands) to start the sampling.
6. At this point the sampling effectively starts when the ZERO notch (**INP.00**) arrives.
7. Once the zero notch is reached, a sample is stored at each encoder pulse (**INP.01**).
   These samples are written from **DATA.64** onwards. **During sampling, Bit 1 of DATA.00 (Status) is at 1.**
8. Once the sampling is finished, **Bit 1 of DATA.00 (Status) goes to 0 and Bit 2 of DATA.00 is activated.**

IMPORTANT
The maximum sampling frequency is 200 Hz (i.e. 200 samples per second).

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