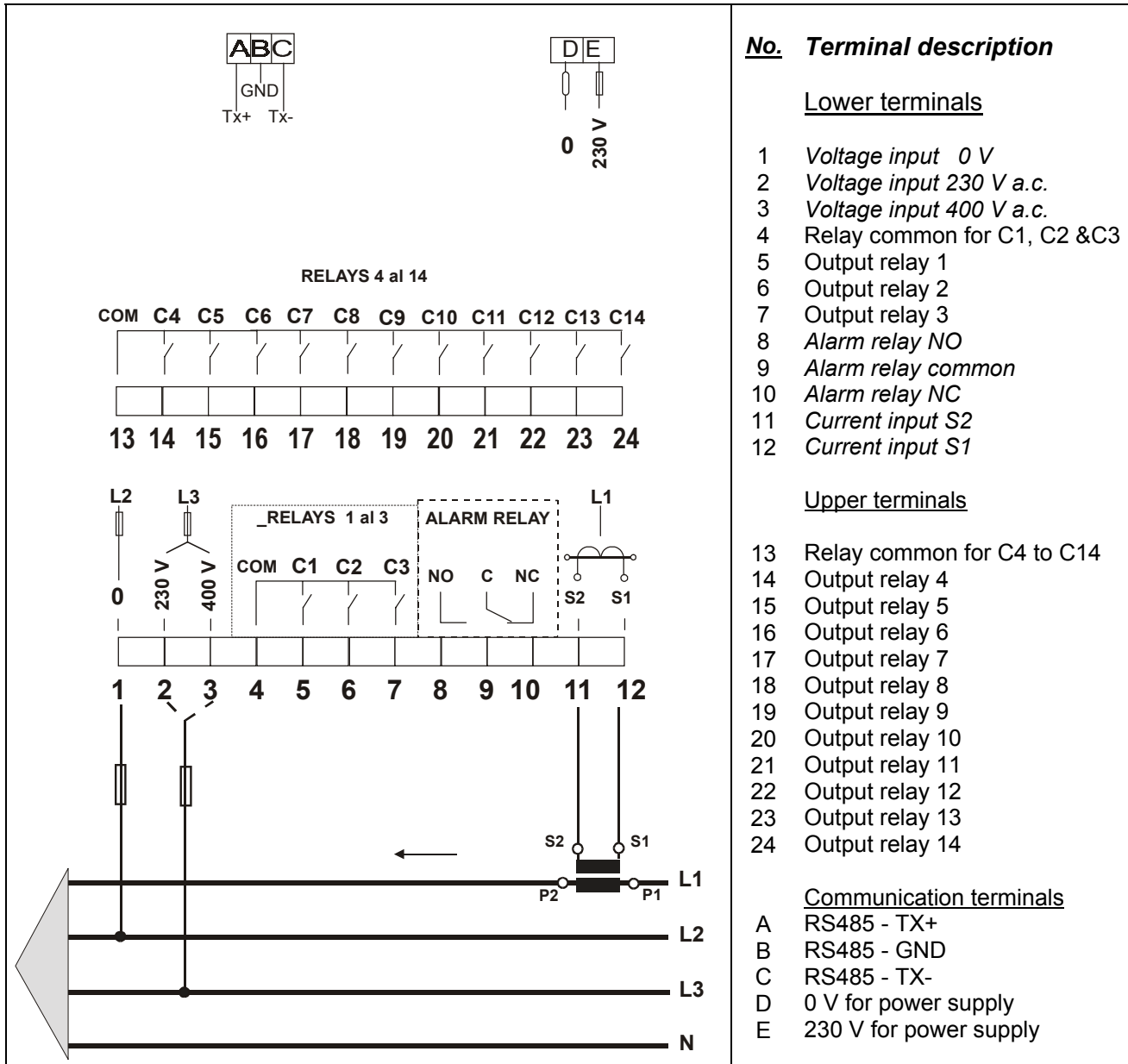


COMPUTER-14d REGULATOR WITH COMMUNICATION MODULE

1.- Connection terminals



2.- Setting communication parameters

The communication setup mode of the Computer 14D can be accessed by preceding as follows:



- Being the Computer 14D powered off, simultaneously press keys [Function Key] and [Arrow Key].
- Keeping these keys pressed, power the Computer 14D on.

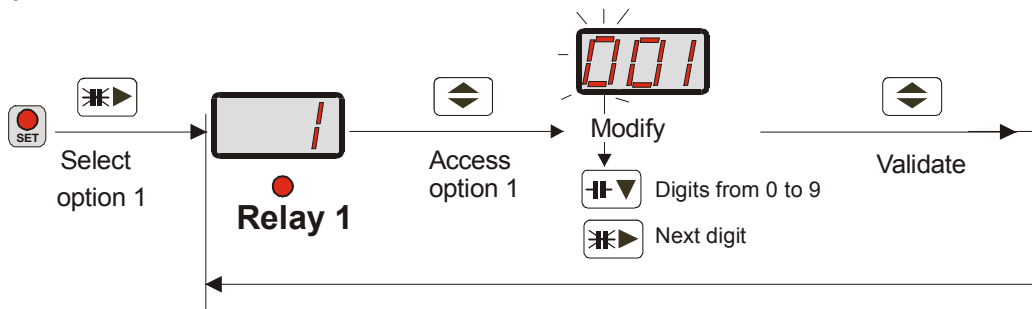
In case of correct action, the message "rS" will be shown on display and the led "Set" will be on to indicate that the setting mode has been enabled.

Now diverse setting option can be already accessed:

- Use the key [Function Key] to move to the parameter to be set.
- Use the key [Arrow Key] to confirm to enable the modification of the selected parameter.
- Use keys [Function Key] to [Arrow Key] to modify the present value on display.
- Once desired modification have been done just press [Arrow Key] to validate changes and exit back to the Setup general menu.

2.1.- Peripheral number (Led of relay 1 on)

Use this option to set the peripheral number to be assigned to the regulator for its identification within the whole RS 485 network.



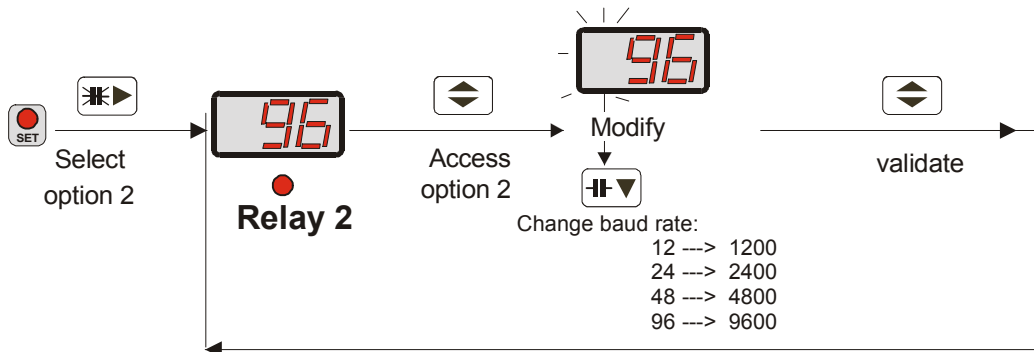
You can read on display the previously set peripheral number. The first digit of this value is blinking.

- Use keys [Function Key] and [Arrow Key] to modify the value on display:
 - By repeatedly pressing the key [Arrow Key] the value of the blinking digit is increased.
 - Press the key [Function Key] to pass to next digit.
- Press [Arrow Key] to exit this menu option and to validate modifications General SET-UP menu is again accessed.

Note : The maximum admissible value to be set for the peripheral number is 255.

2.2.- Baud rate (Led of relay 2 on)

Use this option to set the Computer 14D baud rate for communication purposes.



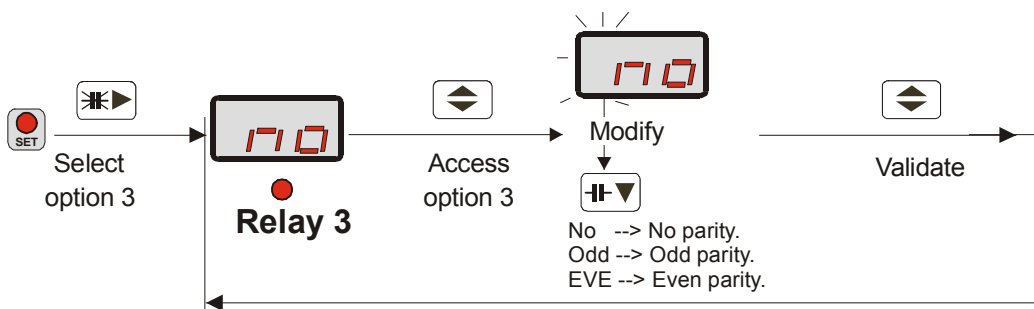
You can read on display the previously set baud rate. The first digit of this value is blinking.

- a) Use the key to modify the value on display:
- 12 → 1200 bauds
 - 24 → 2400 bauds
 - 48 → 4800 bauds
 - 96 → 9600 bauds

- b) Press to exit this menu option and to validate modifications General SET-UP menu is again accessed.

2.3.- Parity (Led of relay 3 on)

Use this option to set the parity for Computer 14D communication.



You can read on display the previously set parity. The whole text is blinking.

- a) Use the key to modify the value on display:

No → No parity
 Odd → Odd parity
 EVE → Even parity

- b) Press to exit this menu option and to validate modifications General SET-UP menu is again accessed.

3.- MODBUS © Protocol - COMPUTER-14d REGULATOR

The **computer-14d** regulator can communicate by means of the **MODBUS ©** protocol, as it is following described:

For the communication of this regulator is necessary to equip it with a **computer-14d / com-RS-485** communication card.

Terminal No.	A	B	C	D	E
Description	Tx +	GND	Tx --	0 V	220 V

When the Computer-14d communicates with MODBUS protocol, it uses the **RTU mode** (Remote Terminal Unit). Each 8-bits byte in a message contains two 4-bits hexadecimal characters (1 byte = 2 4-bits hexadecimal characters) .

The format for each byte in RTU mode is :

- * *Code* : **8-bits binary**, hexadecimal 0-9, A-F
Two hexadecimal characters
contained in each 8-bits field of the message.
- * *Bits per byte* : 8 data bits.
- * *CHECK-ERROR field* : Cyclical Redundancy Check (**CRC type**) .

MODBUS FUNCTIONS:

FUNCTION 4

Reading of n Words (16 bits-2 bytes). This function permits to read all the electrical parameters measured by the C-14D. Each parameters is a 32-bits long, hence two words are required to inquiry for a parameter (2 words = 2 bytes - XX XX).

Registers assigned to different parameters measured by the *computer-14d*:

PARAMETER	REGISTERS		ANSWERS
	DECIMAL	HEXA-DECIMAL	
Cos φ	01	0001	XX0402ZZZZ CRC ZZZZ equals: Cos φ x 100
RMS current	02	0002	XX0402ZZZZ CRC ZZZZ equals: Current
Distortion d %	03	0003	XX0402ZZZZ CRC ZZZZ equals: value of d %
Energy quadrant (to identify an inductive or capacitive cos φ, as well as a power generating or consuming facility condition)	04	0004	XX0402ZZZZ CRC ZZZZ equals: 0000 : Consuming energy and Cos φ = 1 (0°) 0001 : Capacity system. Consuming energy. 0002 : Inductive system. Consuming energy. 0004 : Generating energy and Cos φ =1 (180°) 0005 : Capacity system. Generating energy. 0006 : Inductive system. Generating energy.
Instrument version	05	0005	XX0402ZZZZ CRC ZZZZ equals: Version
Alarm activated	07	0007	XX0402ZZZZ CRC ZZZZ equals: 0000 : No alarm is activated 0001 : Wrong compensation alarm (-CE) 0002 : Overcurrent alarm. (-AE) 0004 : Distortion alarm. (-dE) 0008 : Alarm by setup error. 0010 : Alarm by communication module failure. 0020 : Alarm by reference voltage.
Active relays	113	0071	XX0402ZZVV CRC ZZVV = hexadecimal value transferred to binary: VV : bit 0 = relay 1 up to bit 7 = relay 8 ZZ : bit 0 = relay 9 up to bit 5 = relay 14 bit 7 = alarm relay Bits are valued 0 or 1: value = 1 → relay activated valor = 0 → relay deactivated

Bit no.	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Relay no.	Alarm	--	14	13	12	11	10	9	8	7	6	5	4	3	2	1

