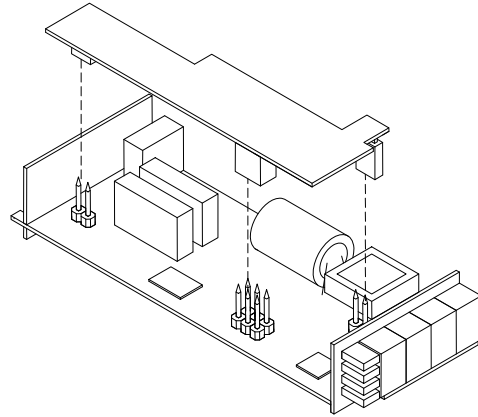
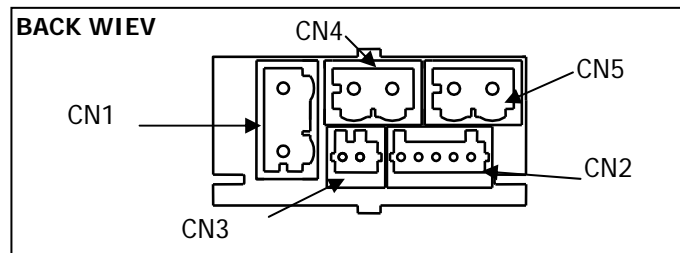


INSTALLATION

Extract the electronic set of the box and insert the three connectors of the option in the corresponding pins of the base of the PICA100, to extract the electronic set must rise simultaneously the upper and lower eyelashes of the back part of the instrument's box and throw of the connectors towards outside.
ATTENTION. Before returning to introduce the set in the box, verify the correct positioning of the connectors option in the pins of the base.

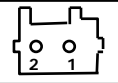


CONNECTIONS

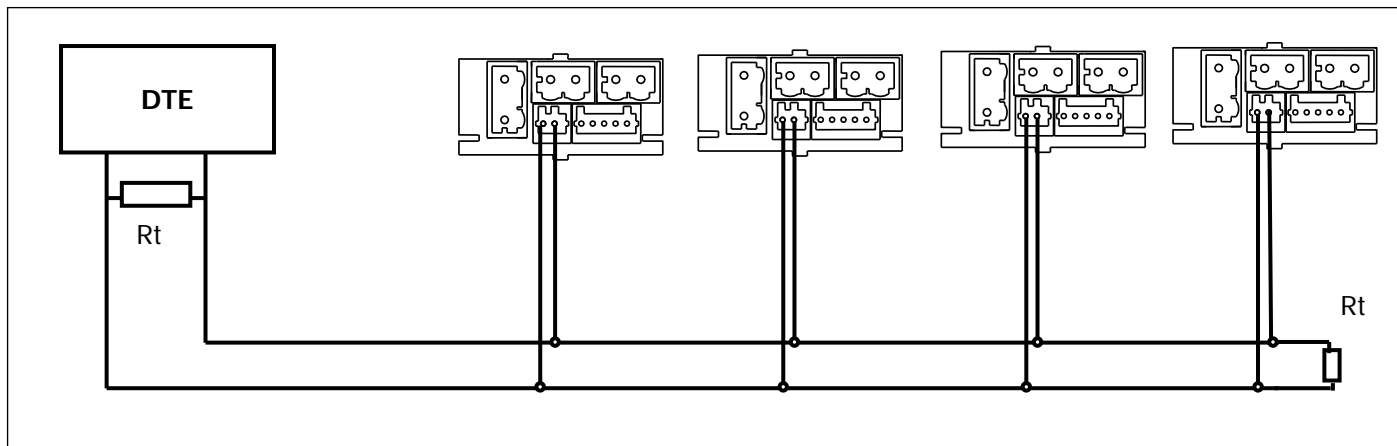


OUTPUT CONNECTOR DESCRIPTION RS485

CN3 OUTPUT RS485
 PIN 1 = TxD+ / RxD+
 PIN 2 = TxD- / RxD-



CONNECTION OF SEVERAL INSTRUMENTS TO A D.T.E.



Up to 31 indicators can be connected on the same bus with a D.T.E. by giving each unit different address numbers from 00 to 99. The address 00 is common to all the instruments on the line and can be used to send commands that have no response such as tare display, reset the peak, valley or tare memories or change setpoints values. A command sent to the address 00 is executed by all the instruments simultaneously. The connection of multiple instruments via the RS485 interface requires a (Rt) 120 Ohm resistor be connected at both ends of the communication line. The KOSMOS series indicators provide the Rt resistor which is internally connected between terminals 3 y 4 of the CN5 connector by placing the jumper J1 in the output circuit of RS4 card. Signal connections and the Rt value at the D.T.E. side may depend on the card type. It is recommended to consult the corresponding technical manual.
 Note: D.T.E. Data Terminal Equipment

OPERATION DESCRIPTION

Three communication modes are provided; The ASCII mode utilizes an easy to use protocol, compatible with several models of instruments. The ISO mode, according to the ISO 1745 standard, permits a more safe communication in noisy environments since the data transfer is verified at the transmission and reception ends. In addition can be used a third protocol: MODBUS RTU (see manual on www.ditel.es) As it can be seen in the Functions TABLE, the ASCII protocol uses 1 or 2 bytes commands depending of the command type while the ISO 1745 protocol forces the use of two bytes per command.

ASCII PROTOCOL

The Transmission format is: 1 START bit, 8 DATA bits, NO parity bit and 1 STOP bit.

MESSAGE RECEPTION

A message sent from the master device to the instrument must be composed of the following sequence of ASCII characters:

*	D	d	C	C	X.....X	CR
---	---	---	---	---	---------	----

- One " * " byte [ASCII 42] of start of message.
- Two address bytes (from 00 to 99).
- One or two ASCII characters corresponding to the desired command according to the Functions TABLE.
- In case that the command request for a modification of parameters, the new value shall be transmitted with one byte of sign (+ [ASCII 43] or - [ASCII 45]) followed by a block of N ASCII characters, including the decimal point.
- "CR" [ASCII 13] End of message.

MESSAGE TRANSMISSION

The data sent from the instrument as a response to a data request type command from the master device is the following:

SP	X.....X	CR
----	---------	----

- One byte of blank space [ASCII 32].
- One text (requested values) consisting of a byte of sign (+ [ASCII 43] or - [ASCII 45]) followed by a block of N ASCII characters including the decimal point.
- "CR" [ASCII 13] End of message.

If the command belongs to "orders" or "changing parameters", the instruments gives no response.

PROTOCOL ISO 1745

The transmission format is: 1 START bit, 7 DATA bits, 1 EVEN PARIDAD bit and 1 STOP bit

MESSAGE RECEPTION

The message format, as sent from the master device, must consist of the following sequence of characters:

SOH	D	d	STX	C	C	X.....X	ETX	BCC
-----	---	---	-----	---	---	---------	-----	-----

- One byte SOH of start of message [ASCII 01].
- Two bytes corresponding the first to the tens and the second to the units of the instrument address number.
- One byte STX of start of text [ASCII 02].
- Two commands bytes according to the functions table.
- In case of commands that change parameters, a block of N bytes corresponding to the new value including sign and decimal point.
- Un byte ETX de final de texto [ASCII 03].
- One control byte BCC calculated in the following manner: Perform an exclusive-OR with all bytes between the STX (not included) and the ETX (included).
- If the obtained byte (in ASCII format) is higher than 32, it can be taken as the BCC.
- If the obtained byte (in ASCII format) is lower than 32, the BCC byte will be obtained by adding 32.

MESSAGE TRANSMISSION

The format of a message as sent from the instrument in response to a command from the master device is the following:

1./ In case of commands that ask for transmission of a value (data request type):

SOH	D	d	STX	X.....X	ETX	BCC
-----	---	---	-----	---------	-----	-----

- One byte SOH of start of message [ASCII 01].
- Two address bytes.
- One byte STX of start of text [ASCII 02].
- N bytes corresponding to the requested value (including the sign and decimal point).
- One byte ETX of end of text [ASCII 03].
- One control byte BCC calculated with the method described.

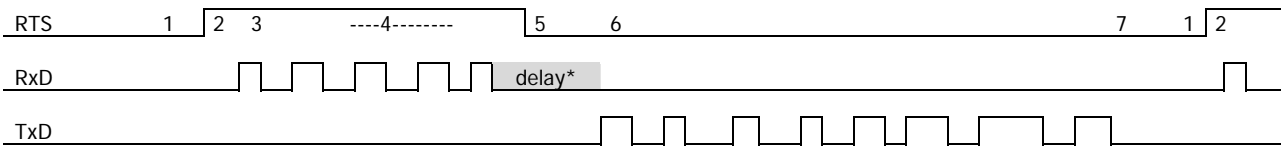
2./ In case of commands that do not imply the return of a value (command type or changing parameter):

D	d	ACK	ó	D	d	NAK
---	---	-----	---	---	---	-----

The instrument sends a confirmation to the master device when it receives a message. If the message has been correctly received and interpreted, the response will consist of two address bytes and one "ACK" [ASCII 06] If the received message has not been well interpreted or it has been detected as to have errors, the response will be two address bytes and a "NAK" [ASCII 21]
 Note: If a message with the "00" address is sent, the command will be received by all the instruments, but no answer will be given. e.g. Reset of peak memory.
 It's recommended don't program any instrument with "00" address because it will never give an answer.

CONTROL CONVERTER RS232C to RS485 Type IC485S

Time diagram
Signal evolution (example with ASCII protocol)



Pos.	RTS	Direction	Data	Explanation
1	0	←		PC initial situation (RS-485 Data converter-Direction PC)
2	1	→		PC starts transmission (RS-485 Data converter-Direction Ditel instrument)
3	1	→	RxD	Start signal(*), Direction(xx), Command(y), final signal (CR) send to the Ditel instrument)
4	1	→		Waiting time to assure that all buffer has been sent.
5	0	←		Change direction of converter to input data (Data Direction to PC)
6	0	←	TxD	Data stored into PC buffer
7	0	←		Pause

* Note:
Between points 4 and 6 Ditel instruments add a dLY (delay) indicated with label delay. Delay is between the last bit of the last byte of sent message and the first bit of the answer sent by the instrument (not related with RTS signal edge).

PICA100	Delay	30 ms	60 ms	100 ms	300 ms
---------	-------	-------	-------	--------	--------

If there is no possibility to control de RTS signal on your PC with your software, have to use a RS232C to RS485 converter called **automatic**, available into the market.
As standard is recommended using a 30 ms delay.

AVAILABLE COMMANDS WITH PROTOCOL ASCII AND ISO1745

COMMAND		FUNCTION	Function type
ASCII	ISO		
V	ØV	Valley value transmission	Petition
P	ØP	Peak value transmission	
T	ØT	Tare value transmission	
D	ØD	Display value transmission	
L1	L1	Setpoint 1 value transmission	Order
L2	L2	Setpoint 2 value transmission	
v	Øv	Reset MIN memory	
p	Øp	Reset MAX memory	Modification
r	Ør	Reset TARE memory	
t	Øt	Put display value as Tare	
M1	M1	Setpoint 1 value modification	
M2	M2	Setpoint 2 value modification	



DISEÑOS Y TECNOLOGIA, S.A.
Polígono Industrial Les Guixeres
C/ Xarol 8 C
08915 BADALONA-SPAIN
Tel : +34 - 93 339 47 58
Fax : +34 - 93 490 31 45
E-mail : dtl@ditel.es
www.ditel.es

This manual does not constitute a contractual commitment. All the information that appear in this manual are subject to modifications without previous warning.

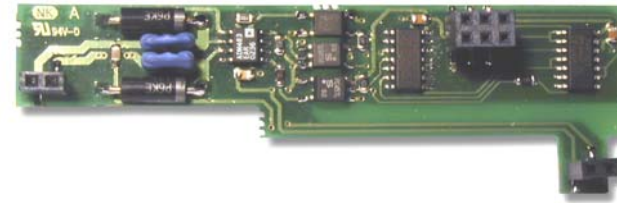
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RS4P

RS485 COMMUNICATION OPTION FOR PICA100

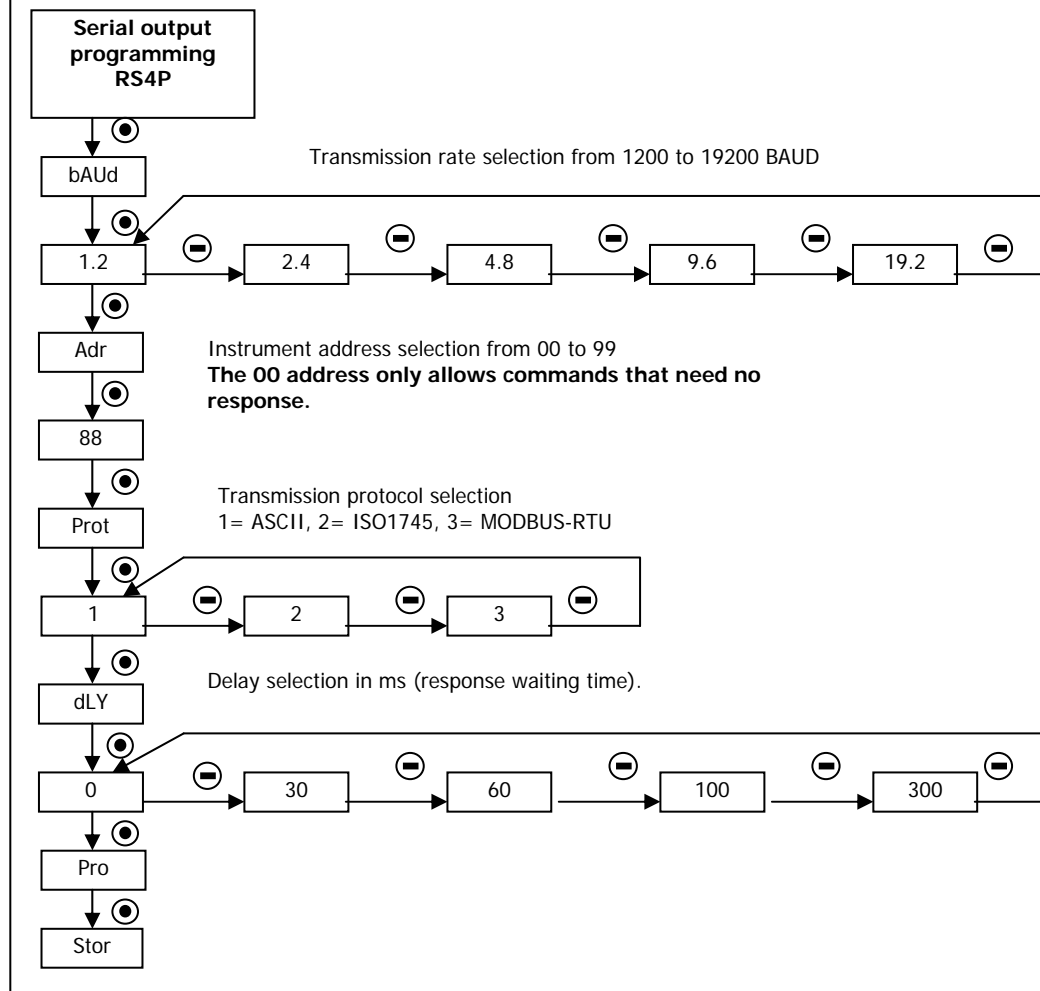
INSTRUCTIONS MANUAL



INTRODUCTION

The RS485 output option consists of an additional card (reference RS4P) that is installed according to the picture, plug it in the special connector.
The serial output permits to construct a communication line through which a master device can request to one or more instruments the transmission of data such as de display value, setpoint values, peak, valley, tare and to perform operations such as tare of the display, reset of the peak, valley or tare memories and update setpoint values.
The output option is totally software configurable as for the transmission rate (1200, 2400, 4800, 9600 ó 19200 Baud), the instrument's address (from 00 to 99), the protocol (ASCII, ISO 1745 and ModBus) and the delay applied to the meter's response time. The RS485 option allows up to 31 instruments be connected to a master device with RS485 output.
The operating mode is half-duplex and the serial channel does only function when the instrument is in the run mode, and it normally stands in data reception mode until reception of a message, always in **slave mode**.
A valid data transmission may cause the immediate execution of an action (tare, reset of peak, valley or tare memories modification of setpoint values) or the transmission of a response from the instrument (display value, one of the setpoints value, peak, valley, tare / offset)
In the website www.ditel.es you can find a free software that allows to connect the instruments to a PC and program them all, verify the communication and even make a data acquisition.

RS4P OPTION PROGRAMMING DIAGRAM



Keyboard detail (bottom view)

