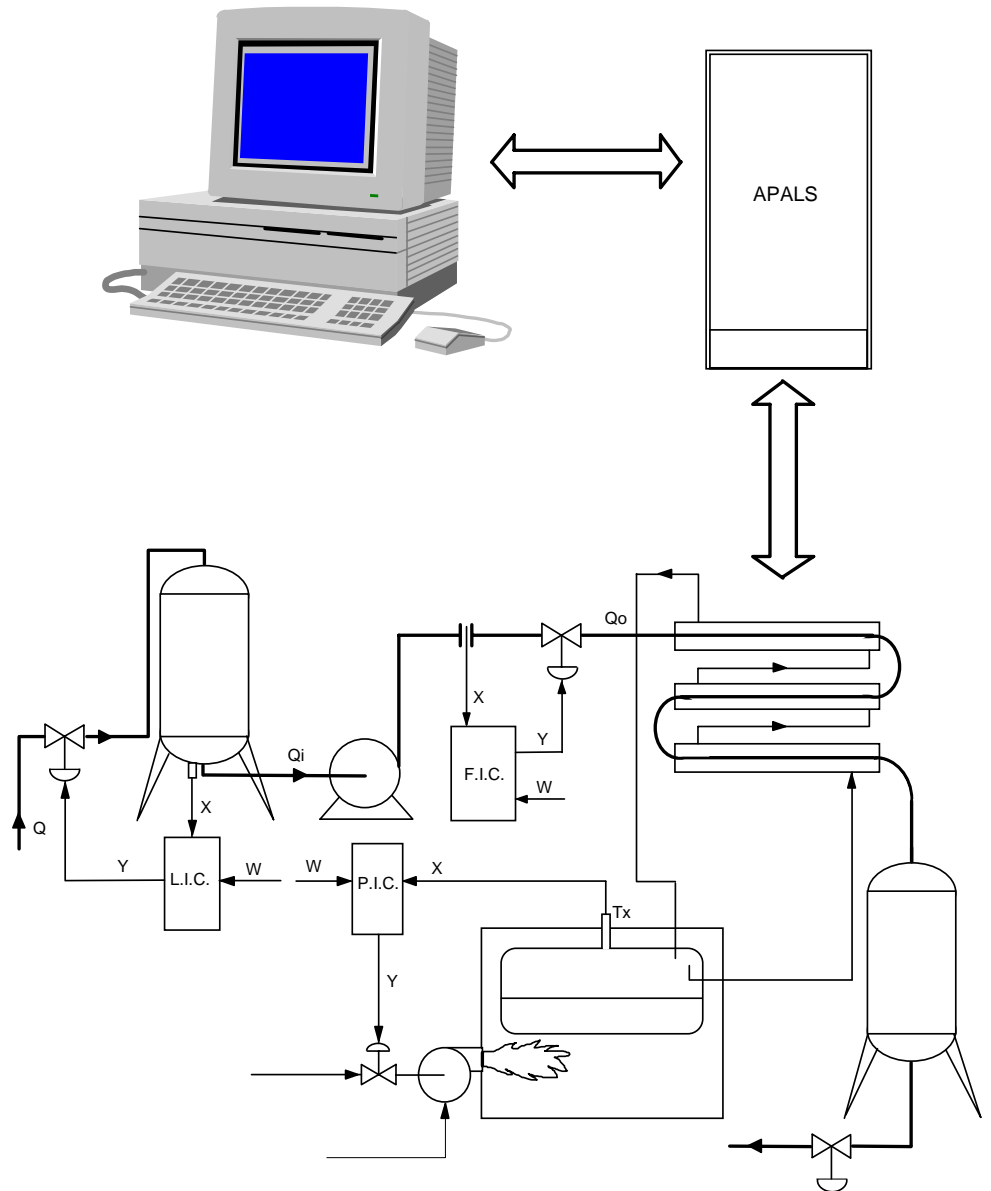


Traffic concentrator and serial interface adapter APALS series



Instruction Manual
M.I.U. - APALS - 2 / 96.1
Cod. J30 - 154 - 1AAS



Ascon Tecnologic S.r.l.

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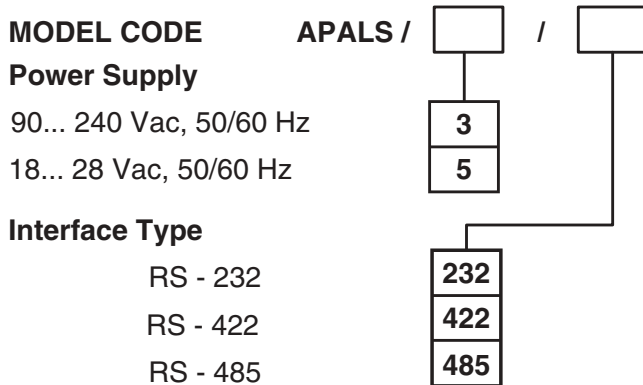
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General Description

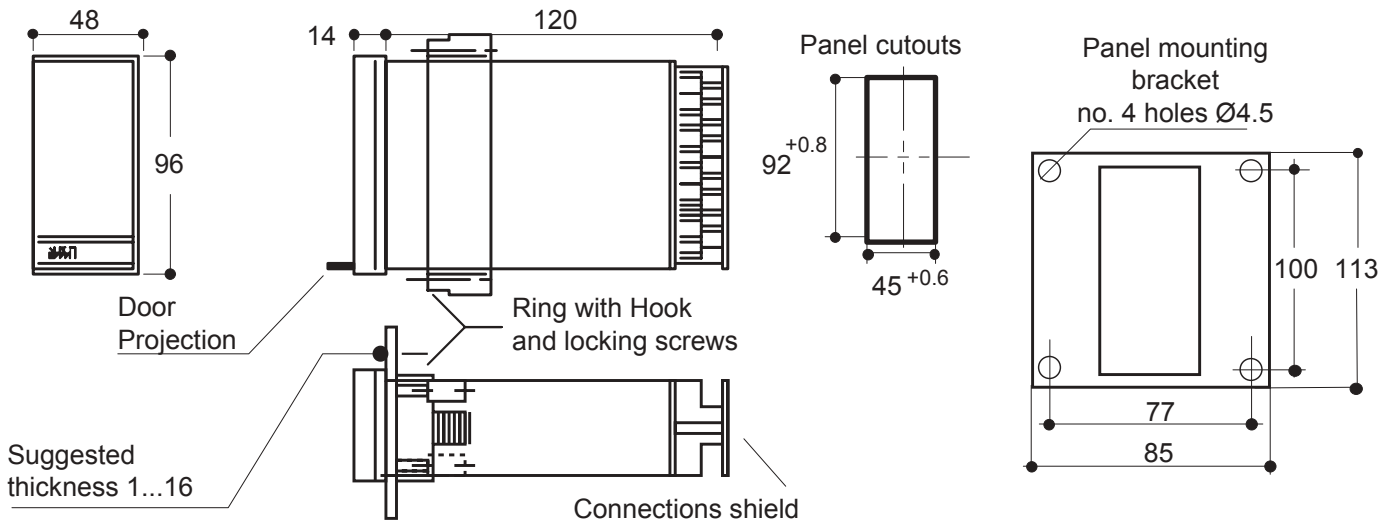
The APALS Traffic Concentrator has been designed for interfacing ASCON parallel Current Loop (connection of "X", "Y", "PY", "XE", "XS", "XP", "XF", "MS", "MF" and "ML" series instruments) and/or SCI2 (connection for "MS" and "MF" series) serial lines and lines with interface-to-supervisor standards selected among RS232C, RS422 and RS485. APALS enables connection of 64 instruments distributed along the ASCON lines. An interface-to-supervisor standard can be selected by a set of microswitches when installing. Five readouts on the terminal strip enable checking of proper operation or faulty line.

1. Model Code

On the external side, a label reports the instrument identification code which is the order number of the instrument. The code has the following meaning:



2. Dimensions



3. Parallel current loop interface

This is the interface implemented on ASCON "X", "Y", "PY", "XE", "XS", "XP", "XF", "MS", "MF" and "ML" series instruments. Unlike the standard Current Loop Interface, it enables disconnection of one or more elements without breaking the line. The APALS Adapter enables connection of 64 instruments max with all outputs parallel-connected to terminals 19 (+) and 20(-) and inputs seriesconnected to terminals 13...18 in groups of 16 instruments max..

4. SCI2 Interface

This is the interface implemented on ASCON "MS" and "MF" series controller. The Adapter enables connection of 64 instruments maximum to terminals 9(+) and 10(-) through two wires only.

5. Connection to the supervisor

The interface-to-supervisor standard can be selected by a set of incorporated microswitches among:

- RS232C
- RS422
- RS485

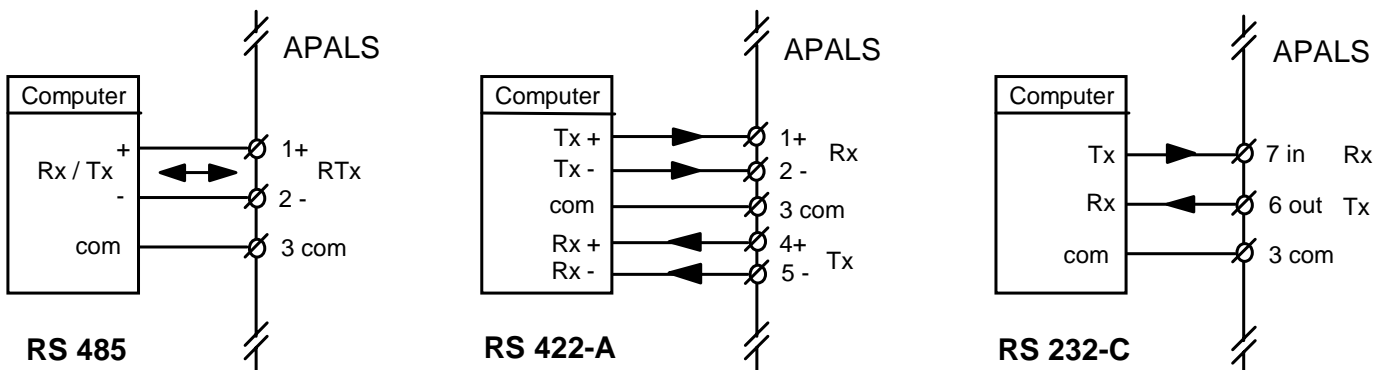
Also communication rate (not required for RS232C and RS422), line and termination and biasing to rise the noise threshold, can be determined for RS485 through microswitches.

5.1 Interface type selection table

STANDARD	SW102		
	4	5	6
RS232C	OFF	OFF	ON
RS422	OFF	ON	OFF
RS485 (note)	ON	ON	OFF

Note: For more details on configuring the RS-485 inetface, see Chapter 8 of this manual.

5.2 Electrical connections to the supervisor

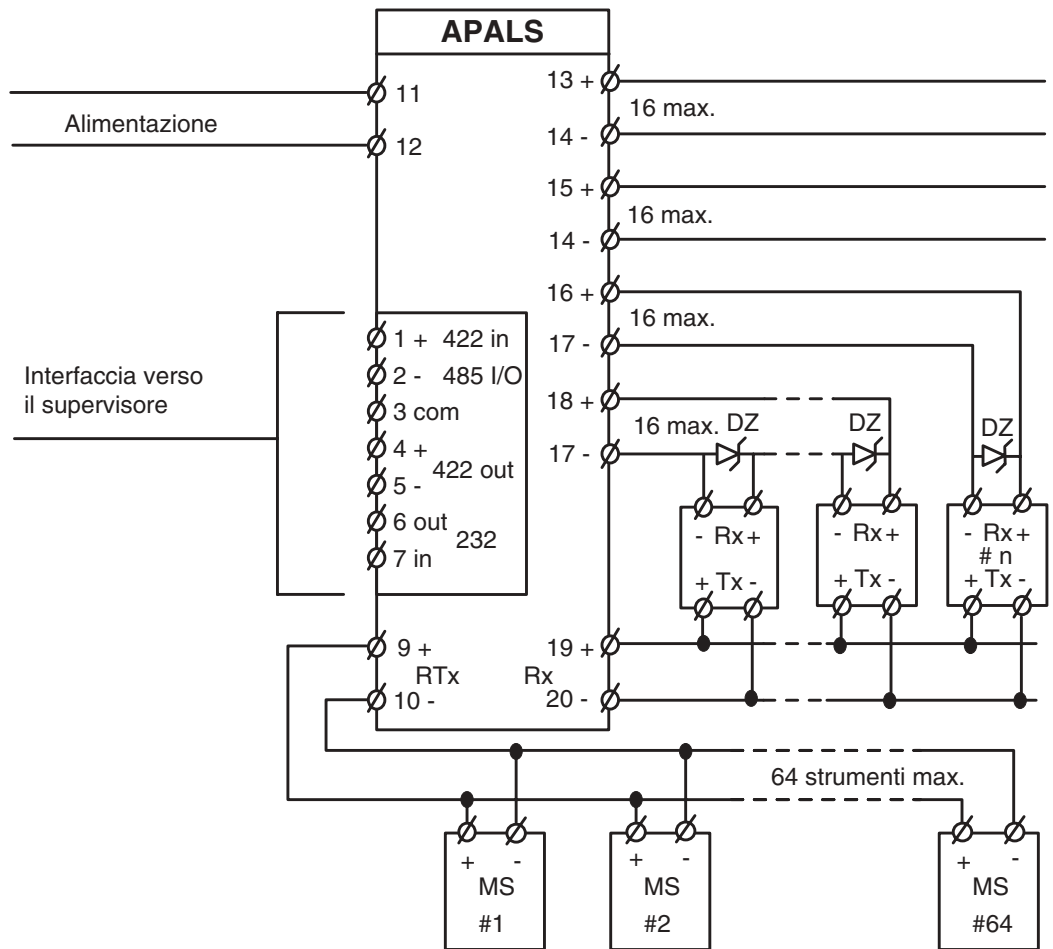


5.3 Personal Computer RS-232 serial port pinout

Connections and signals of the RS-232 interface.

Signal Name	Connector DB9S	Connector DB25P	Signals used by AT
DCD (Data Carrier Detect)	1	8	No
RX (Receive Data)	2	3	Yes
TX (Transmit Data)	3	2	Yes
DTR (Data Terminal Ready)	4	20	No
GND (Signal Ground)	5	7	Yes
SGND (Shield Ground)	-	1	No
DSR (Data Set Ready)	6	6	No
RTS (Request To Send)	7	4	No
CTS (Clear To Send)	8	5	No
RI (Ring Indicator)	9	22	No

6. Connection to ascon tecnologic instruments



Note: The maximum number of instruments can not exceed 64 (also with a theoretical max. of 128). **DZ** is a 2.7 V zener diode placed on the rear of the instrument. Its purpose is to allow the communications with other controllers on the line even when the instrument is extracted from its sleeve.

7. Routing the communications cables

In order to minimize external interferences to the serial communication with regard to obtaining the maximum efficiency between supervisor and controllers, you must take some small but essential technical features.

The most important and least expensive of all is to physically separate cables or power supply from those of communication and pass them off as far away as possible from contactors, solenoids, motors, high power, etc.. etc.. Even within the cabinet must be respected so that this condition is perfectly useless to wire an electrical panel in a workmanlike manner and then "throw" the wires into the ducts where it happens! In case of extension of the communication wires to another framework or other equipment is a good idea to reserve a space in the terminal, isolated from all other wiring (usually to the sides).

The type of cable is crucial for the functioning of the whole system. The most important is the ability to meet meters (pF/m). The more cable capacity is low and may be the longest line. In this respect, power cables, coaxial cables and shielded cables cabling generic channel are absolutely not recommended as they have a capacity / meters high. In addition to having a high noise rejection, the wires must be twisted on themselves (twisted) and possibly provided with metal shield to be connected to a good earth ground (one side).

A titolo di esempio si riportano le caratteristiche di due tipi di cavo della società Belden:

A) Belden Code 9729 Z = 100W pF/m = 41

B) Belden Code 9502 Z = 150W pF/m = 98

Considering that the maximum capacity applicable to APALS concentrator receiving terminals is about 20000 pF for a speed of 4800 baud, knowing the capacity per meter of cable can be used to determine the maximum length that can be online. If you use the cable type, length, "global" line may be about 500 meters, while in case B the length of the "global" line is reduced to about 200 meters.

We remind here that you can accomplish with the concentrator APALS, 4 distinct branches of communication. The 4 APALS transmission loops are independent of each other but the reception line of type being "parallel" is one for all (see the connections on page 5). So for distance "global" means the total length of the receiving line and not that of the single arm transmission. The line dedicated to the series regulators SCI2 MS or M # is to be considered separately from the current loop. The total length of this two-wire line can be traced back to the 2 examples given above. The table below reports the maximum distances between supervisor and concentrator according to the type of interface used:

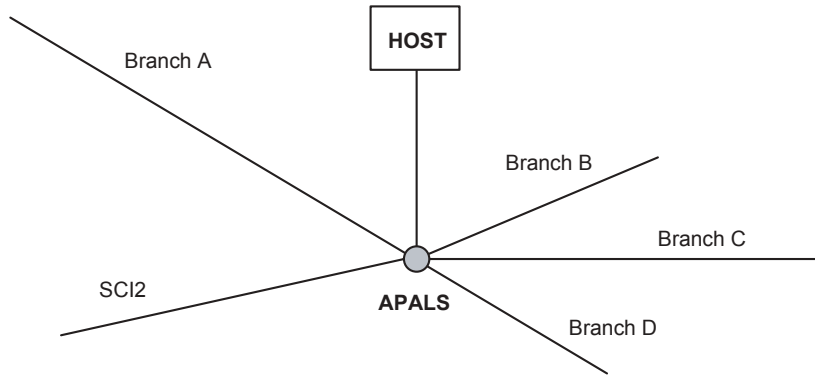
Interface type	Max. distance between HOST and APALS
RS - 232-C	15 m
RS - 422-A	1200 m
RS - 485	1200 m

The length of the communications line between HOST and APALS depends on the type of interface selected. The maximum length is obtained from table previously exposed.

The length of the Current Loop line between APALS and ascon tecnologic instruments, is the sum of the branches:

Overall length = A + B + C + D.

The length of the SCI2 interface line depends on the capacity/meter of cable used (see drawing below).



8. RS485 interface jumper configuration

8.1 RS485 interface Communication Speed

When configured for RS485 interface, APALS concentrator requires the same communication speed for the instruments and the supervisor.

BAUD RATE	SW102					
	1	2	3	4	5	6
150	OFF	OFF	OFF	OFF	OFF	OFF
300	OFF	OFF	OFF	OFF	OFF	ON
600	OFF	OFF	OFF	OFF	ON	OFF
1200	OFF	OFF	OFF	ON	OFF	OFF
2400	OFF	OFF	ON	OFF	OFF	OFF
4800	OFF	ON	OFF	OFF	OFF	OFF
9600	ON	OFF	OFF	OFF	OFF	OFF

8.2 RS485 interface termination

The RS485 interface standard provides connection of 32 devices to a line with two terminated ends. The APALS Traffic Concentrator incorporates proper termination impedance to be used when the concentrator is connected at the end of the line.

TERMINATION	SW102
	1
NO	OFF
SI	ON

8.2 RS485 interface polarization

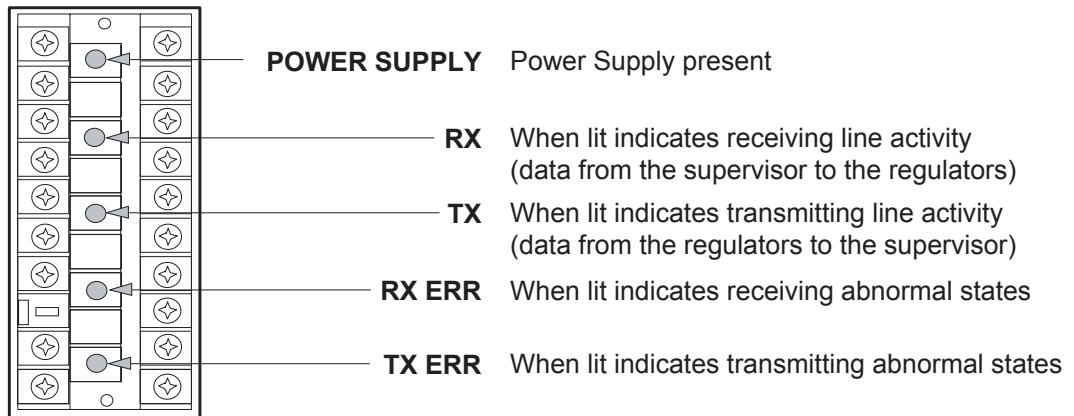
Although not provided for by the standard, in industry applications RS485 lines are often biased to improve noise rejection. ASCON recommends to bias all applications where no troubles can be caused to communication of the other devices on the line.

However, one point only must be biased.

BIAS	SW102	
	2	3
NO	OFF	OFF
SI	ON	ON

9. Indicators functions

Between the terminals there are some LED indicators having the following 5 functions:



10. Technical specification

Host side interface	Selectable between RS-232C, RS-422, RS-485
ascon tecnologic side interface	4 wire, 17 mA isolated Current Loop
SCI2 interface	2 wire, 17 mA isolated Current Loop
Power supply	90... 240 Vac, 48... 63Hz, -1.5... +10% (250Vac max.) 18... 28 Vac, 48... 63Hz or 20... 30 Vdc
Isolation group	C as for VDE 0110
Climatic group	KWF as for DIN 40040
Operating temperature	0... 50°C (operating surrounding temperature)
Relative humidity	35... 85% RH
Enclosure protection	IP 30
Terminal protection	IP 20
Enclosure material	UL 94V1
Weight	About 480 g
Dimensions	48 x 96 depth 120 mm as for DIN 43700