

TCP1RS+



The **TCP1RS+** is a communications gateway that converts the Ethernet physical environment to RS-485 serial communications.

This document provides the instructions for use and describes the operation of the TCP1RS+ device. If misplaced, the manual may be downloaded from the CIRCUTOR web site: www.circutor.com



Disconnect the device from the power supply source before undertaking any maintenance, modification of connections, repairs, etc. If you suspect an operational fault in the unit or in its protection system, remove the unit from service. The design of the unit makes it easy to replace in the event of a fault.

1.- DESCRIPTION

The **TCP1RS+** device is a serial physical environment to Ethernet communications converter that uses TCP/IP communication packages. The gateway is responsible for the transparent conversion under TCP or UDP connections. The operation is determined by the parameterisation carried out in the internal configuration web menu.

2.- COMMUNICATION

The device is equipped with a self-detecting 10BaseT / 100Base TX connection for the physical connection of the TCP1RS+ converter to an Ethernet network. For its configuration, the device has an internal web site from which the user can define the network protocol used to communicate with the management software or communications system master.

2.1.- Ethernet addressing

As the unit is connected to the master communication system by means of an IP connection, the addressing parameters must be configured. The configuration modes include the assignment of a fixed IP or configuration of a DHCP name.

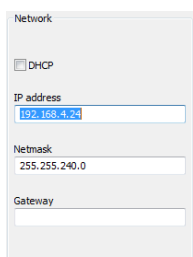
2.1.1.- Ethernet address assignment

To configure the IP address configuration in any of the available formats, run the **IPSetup.exe**, which can be downloaded in the link:

<http://docs.circutor.com/docs/ipsetup.zip>

2.1.2.- Fixed IP assignment

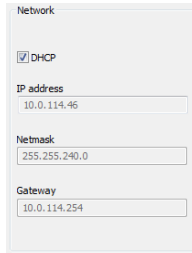
Run IPSetup and select the TCP1RS+ converter. To assign the fixed IP address, enter the **MAC** address shown on the permanent side label attached to the device, the format of which is 00:26:45:XX:XX:XX.



In the **IP Address** field, enter the IP address being configured; do the same with the **Netmask** and the **Gateway** if necessary. After entering the device configuration, press **“Configure”** to send the configuration to the unit.

2.1.3.- DHCP IP assignment

To assign the DHCP name, activate this option by clicking on the **DHCP** checkbox. Once the configuration fields have been enabled, enter the **MAC** address that can be seen on the permanent side label attached to the device, the format of which is 00:26:45:XX:XX:XX. In the **Address**, field, enter a free temporary IP address, which is within the working range of your computer.



2.2.- Configuration

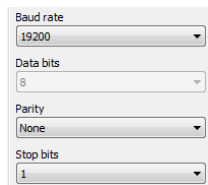
Once the unit is connected to the Local Area Network (LAN) and the IP address is configured or in the DHCP mode, the remaining configuration can be established in the IPSetup software console. When the unit has been fully configured, the configuration can be sent by clicking on **“Configure”**.

2.2.1.- Network protocol

The unit can be connected to the master communications system by means of three types of network protocols and to a configurable port (TCP, UDP or Modbus/TCP).

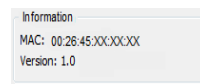
2.2.2.- Configuration of the Serial port

The communication parameters of the serial bus are fully configurable in terms of baud rate (1.2 bps to 115.2 kbps), data bits (7 or 8), parity (none, odd or even) and stop bits (1 or 2). The data will be configured by default to 8 by selecting the Modbus/TCP communications protocol.



2.2.3.- Device information

When the unit is connected with IPSetup, the top part of the screen shows the firmware version and the machine address of the device (the same address as that shown on the permanent side label).



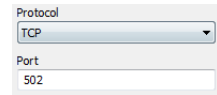
2.2.4.- Save changes

Once any change has been made to the aforementioned sections, the information must be saved using the **“Configure”** option. If you wish to return to the default configuration, select **“Load default”**.

2.3.- Configuration of network protocols

2.3.1.- TCP Protocol

In the TCP/IP protocol stack, TCP is the intermediate layer between the Internet protocol (IP) and the application. In general, applications need reliable communications. The IP layer offers an unreliable datagram service (no confirmation), so the TCP adds the functions required to offer a secure, error-free and zero loss service for the communications between two systems.

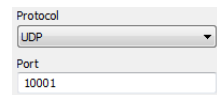


- **Protocol:** TCP Mode
- **Port:** Destination TCP Port number

2.3.2.- UDP Protocol

User Datagram Protocol (UDP) is a minimum transport level message-oriented protocol that has been documented in the RFC 768 of the IETF.

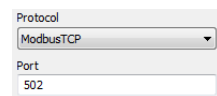
In the Internet protocol family, UDP provides a simple interface between the network layer and the application layer. UDP does not offer guarantees for the delivery of its messages and the UDP origin does not withhold the states of UDP messages sent to the network. UDP only adds the multiplexing functionality to the application and the verification sum of the header and useful load. Any type of guarantees for the transmission of information must be implemented in higher layers.



- **Protocol:** UDP Mode
- **Port:** Destination UDP Port number

2.3.3.- Modbus/TCP Protocol

Modbus/TCP is a variation or extension of the Modbus® protocol, which enables it to be used on the TCP/IP transport layer. Therefore, Modbus/TCP can be used throughout the Local Area Network or the Internet. This was one of the objectives that motivated its development (the specification of the protocol was submitted to the IETF, Internet Engineering Task Force).

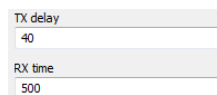


- **Protocol:** Modbus/TCP Mode
- **Port:** Fixed port number 502

2.3.4.- Tx Delay Rx Time

The TCP1RS+ converter uses two communication parameters to control the Modbus frames on the RS485 bus.

- **Tx Delay:** additional delay of the RS serial bus
- **Rx Time:** maximum bus waiting time

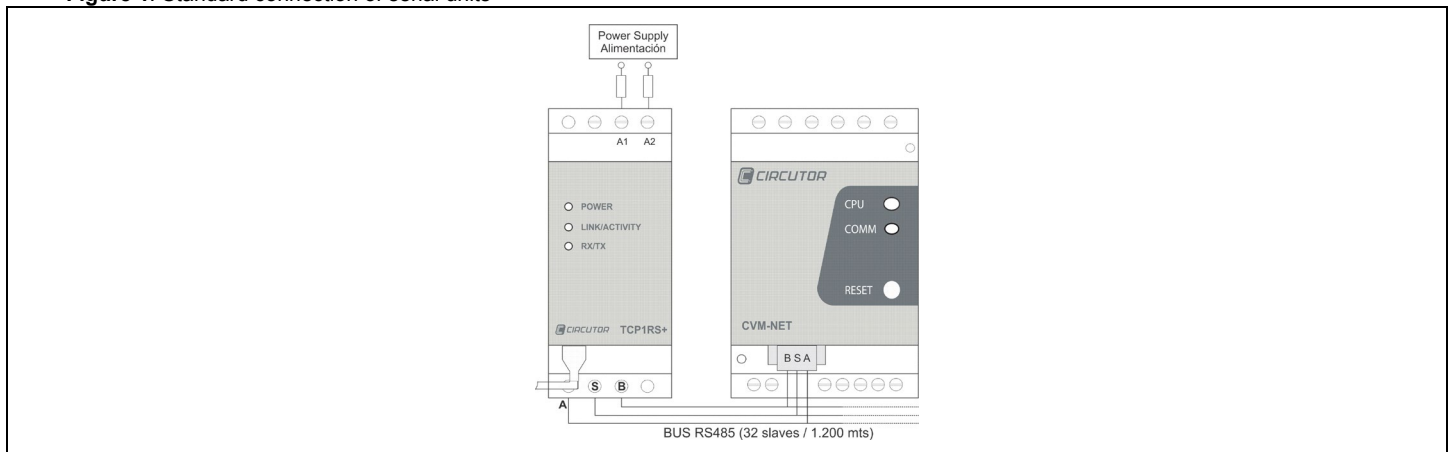


3.- TECHNICAL FEATURES

Power circuit: - Single-phase (A1 – A2) : - Frequency: - Maximum consumption: - Working temperature: - Humidity (no condensation) :	230 V _{ac} ± 15% 47...63 Hz 8 VA -10 ... +60 °C 5 ... 95%	LED symbols: - Flashing power LED - Flashing RX/TX - LINK/ACTIVITY	Powered unit and CPU activity RS-485 frame delivery and reception activity Flashing: Activity in the Ethernet bus Green: Speed 10/100 Mb/s
Mechanical features: - Case material: - Unit protection degree: - Dimensions (mm): - Weight: - Maximum operating height:	UL94 - V0 self-extinguishing plastic IP 20 35.4 x 73 x 84.68 mm (2 modules) 120 g 2,000 m	Standards: IEC 60664, VDE 0110, UL 94, EN61010-1, EN55011, EN 61000-4-2, EN 61000-4-3, 61000-4-11, EN 61000-6-4, EN 61000-6-2, EN 61000-6-1, EN 61000-6-3, EN 61000-4-5, CE	
Network interface: - Type: - Connector: - Network Protocols - Accesses:	Ethernet 10BaseT / 100BaseTX self-detecting RJ45 TCP / UDP / Modbus	Safety: Installation category: Category III / EN61010 double-insulated electric shock protection class II. The unit must be connected to a power circuit protected with type gI fuses, in compliance with IEC 269, or type M, with values from 0.5 to 1A. It must be fitted with a circuit breaker switch or equivalent device in order to be able to disconnect the unit from the power supply. The power supply cable must have a minimum cross-section of 1 mm ² . If the unit is not operated according to the manufacturer's specifications, its guaranteed degree of protection may be compromised.	
Serial interface: - Type: - Transmission speed (configurable): - Data bits: - Parity: - Stop bit	RS-485 three-wires (A/S/B) (RX/GND/TX) 1200, 2400, 4800, 9600, 19200, 34800, 57600, 115200 baud rate 7, 8 No parity, odd, even 1 or 2		

4.- CONNECTIONS

Figure 1. Standard connection of serial units



5.- TECHNICAL SERVICE

If you have any doubts about the operation of the unit or suspect any malfunction, contact our service staff at CIRCUITOR, SA

CIRCUITOR, SA - Technical Assistance Service

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