

# Providing Connectivity Using Terminal Servers

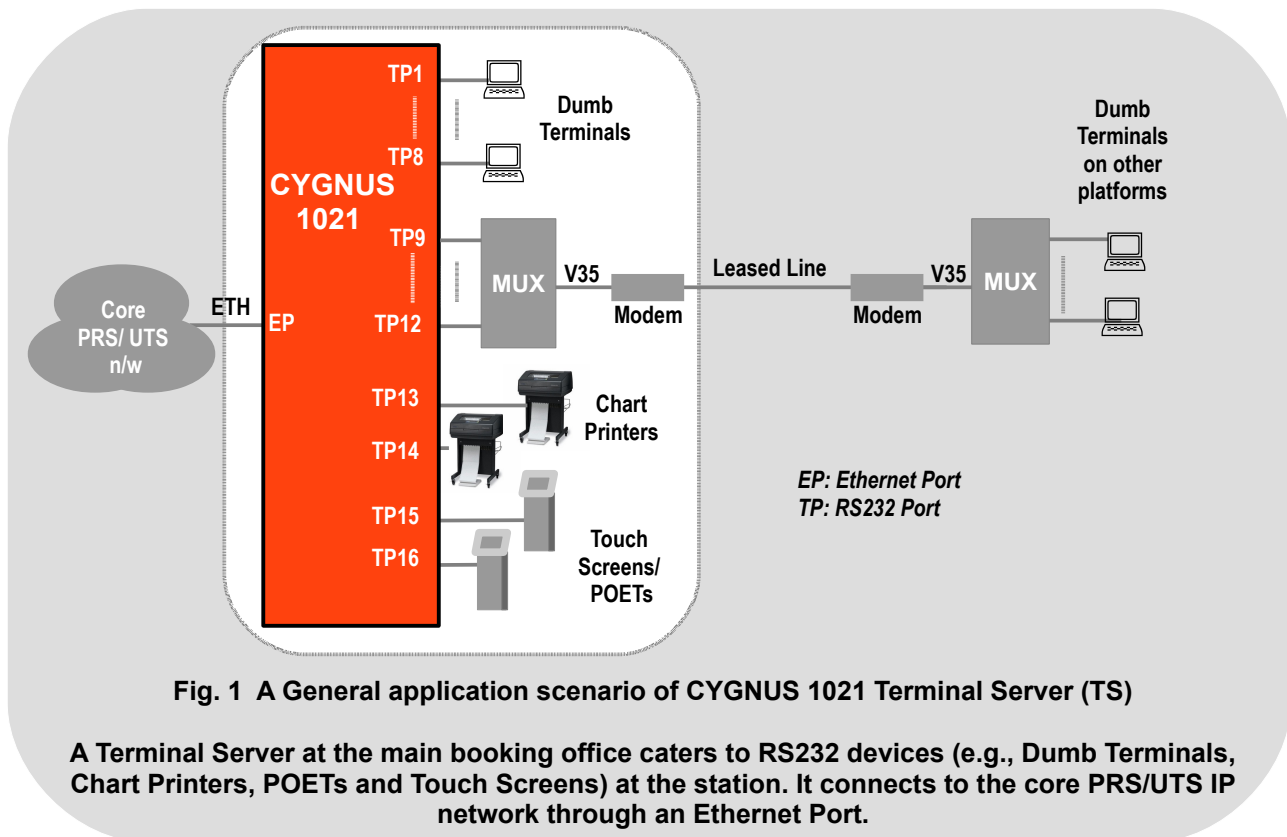
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## Terminal Server Solutions for connecting RS232 Terminals and Ethernet based devices to Railway's PRS/UTS network using TCP/IP

Terminal Servers are a fundamental component of the Railways' ticketing network, where they have traditionally been used for converting traffic from dumb terminals and other RS232 devices to TCP/IP format.

The ticketing application and the state of product technology have changed dramatically over the past three decades. For instance, today's booking offices may be at smaller locations, and have fewer terminals (which may be not just RS232 terminals but a mix of RS232 and Ethernet devices). Also the sites are increasingly at small rail-head or non rail-head locations where the electrical installation may be poor, posing the danger of high voltage surges to equipment. Combining its in-depth knowledge of Railways' ticketing applications, its product development capability, and the latest advances in semiconductor technology, Cygnus now offers a range of Terminal Servers to suit every need in today's ticketing network.

Fig. 1 shows the widely used CYGNUS 1021 Terminal Server. It allows up to 16 RS232 devices to connect to the TCP/IP network through an Ethernet interface. Typically the Ethernet port of CYGNUS 1021 is connected to a Router or a LAN Switch. CYGNUS 1021 fully complies with all requirements of PRS/UTS - including support for Answerback codes (programmable on a per-port basis), support for up to 8 simultaneous sessions from each connected terminal (useful if a single terminal is used to offer both PRS and UTS services to customers), support for "Implicit" connections (for devices such as POETs, RAPID controllers, etc., which do not have an operator to initiate connections to Servers), support for TCP connections (for chart printers), etc.





CYGNUS 1021 makes use of latest advances in semiconductor technology to provide another badly needed feature - Isolation protection on all 16 RS232 Terminal Ports (TPs). 1500 VAC isolation on each RS232 port protects the port against damage caused by electrical surges on the port, which are a major cause of port failure in earlier products. Surges cannot be eliminated, and can be caused by several reasons, such as:

- fault in the terminals connected to RS232 ports
- poor quality earthing at the site
- heavy fluctuations in power supply because of switching loads (such as traction loads) being supplied by the same power line
- lightning strikes

**Isolation protection on RS232 ports can lead to dramatic reduction in port and unit failures, and much improved up time.**

A 4-port model of CYGNUS 1021, suitable for sites where a small number of user devices is to be connected in a localized way, is also available. Since booking offices are increasingly being set up at small locations availability of a 4-port model avoids the cost overkill of a 16-port model at such sites.

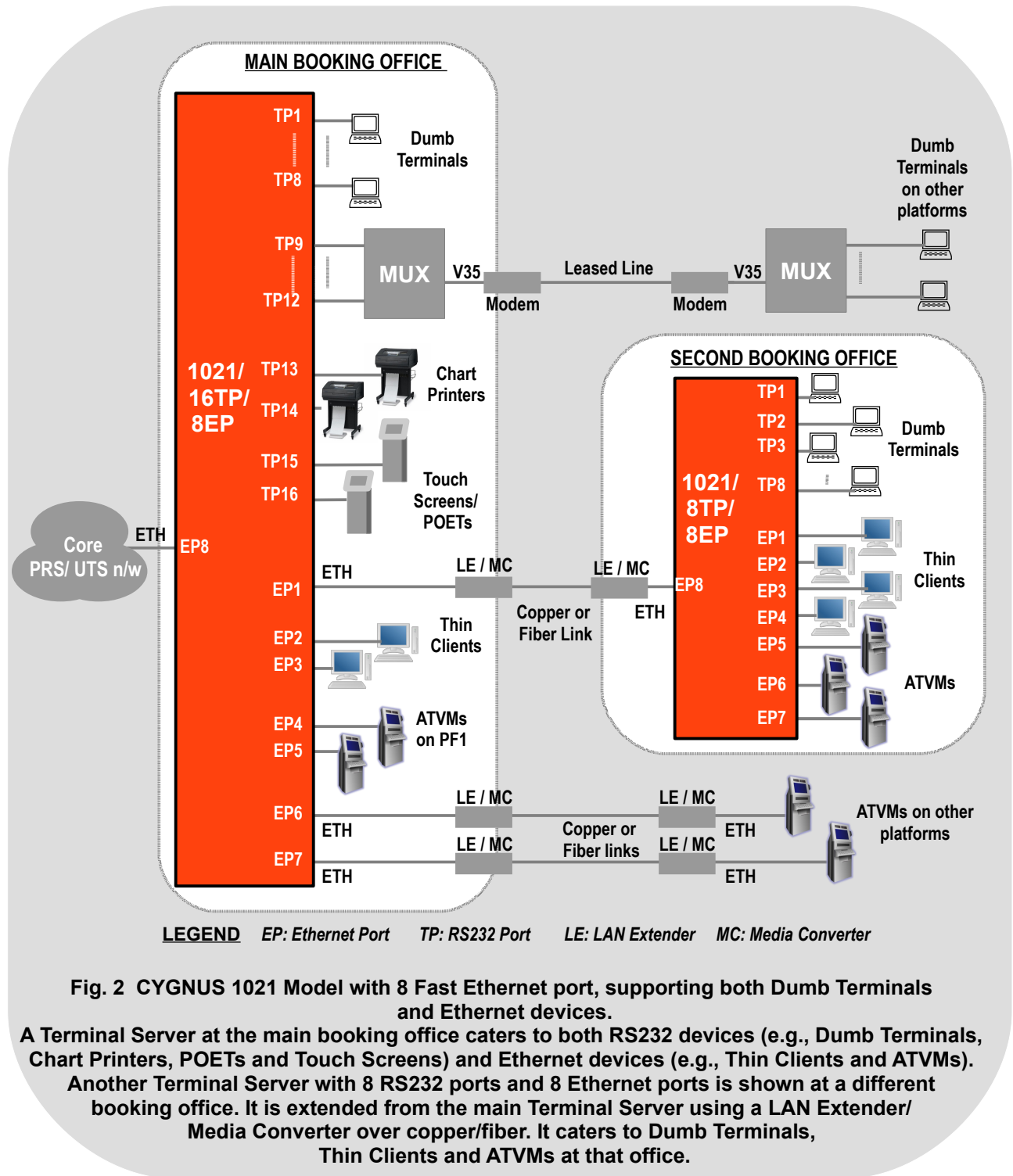
Railway's ticketing network today uses not only RS232 terminals, but also an increasing number of Ethernet devices such as Thin Clients, Automatic Ticket Vending Machines (ATVMs), etc. The traditional connectivity solution for ticket booking offices uses Terminal Servers to connect RS232 devices and Switches to connect Ethernet devices. Both these devices have to be procured and maintained separately. Suppliers are different, spares have to be separately provided for each, and operations and maintenance staff have to be separately trained on each product. Separate housing space and power supply arrangements have also to be made, and interconnecting cables are required between the two equipments.

To simplify the task of connecting both RS232 and ethernet devices to the network, a model of CYGNUS 1021 is available, which adds 8 Fast Ethernet Ports (EPs) to the standard 8 or 16 TPs in the CYGNUS Terminal Server described earlier. **CYGNUS 1021 16TP/8EP** or **CYGNUS 1021 8TP/8EP** models are therefore single box, cost-effective solutions for connecting both RS232 and Ethernet devices to the core network.

Fig. 2 on the next page shows a typical installation. A 16TP/8EP (i.e., 16 RS232 Terminal Port/8 Ethernet Port) unit at main booking office is shown supporting RS232 and Ethernet user devices there, and also on other platforms.

One of the Ethernet ports of this unit is extended to an auxiliary booking office using a pair of copper or fiber LAN Extenders. A 8TP/8EP unit is deployed at the auxiliary booking office to support RS232 and Ethernet devices there.

This model also provides built-in 1500VAC isolation protection on its RS232 ports.



**Fig. 2 CYGNUS 1021 Model with 8 Fast Ethernet port, supporting both Dumb Terminals and Ethernet devices.**

A Terminal Server at the main booking office caters to both RS232 devices (e.g., Dumb Terminals, Chart Printers, POETs and Touch Screens) and Ethernet devices (e.g., Thin Clients and ATMs). Another Terminal Server with 8 RS232 ports and 8 Ethernet ports is shown at a different booking office. It is extended from the main Terminal Server using a LAN Extender/ Media Converter over copper/fiber. It caters to Dumb Terminals, Thin Clients and ATMs at that office.

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