

Providing Connectivity at Railway Platforms

Application Note No. AN-PF-01. Release 1. Date 6 July 2015.
Circulated by Cygnus Microsystems (P) Limited, Hyderabad

Solutions for connecting ATVMs and other user devices at railway stations using Optical Fiber to improve for safety and immunity against electrical disturbances

Providing connectivity for ATVMs and other user devices distributed at various places in a railway station is a tricky issue. These devices may have to be located all over the station and its surroundings - e.g., at various platforms, entrance gates, parking lots etc. Copper circuits, which are traditionally used to provide connectivity in such applications, are vulnerable to induction effects from high voltage traction lines and other electrical sources which can cause data errors, or even damage equipment. A solution based on Optical Fiber is superior as it is immune to such disturbances and safety hazards. Cygnus has pioneered the development of several fiber based connectivity solutions for such applications.

The CYGNUS 894 Ring network consists of nodes interconnected in a ring fashion using optical fiber segments. There are two types of CYGNUS 894 nodes. CYGNUS 894C is the central site node. CYGNUS 894R is a remote site node. Fig 1 shows how a network is formed by connecting CYGNUS 894 nodes.

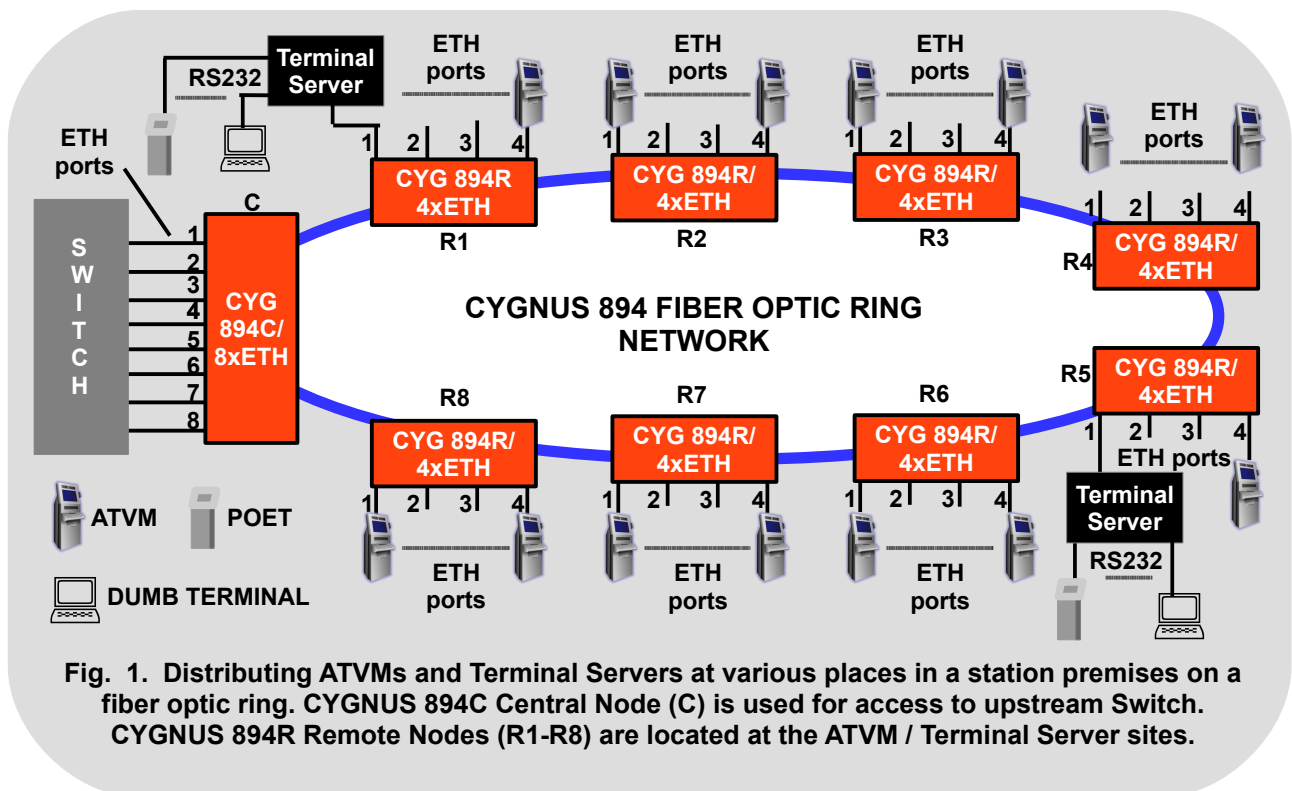
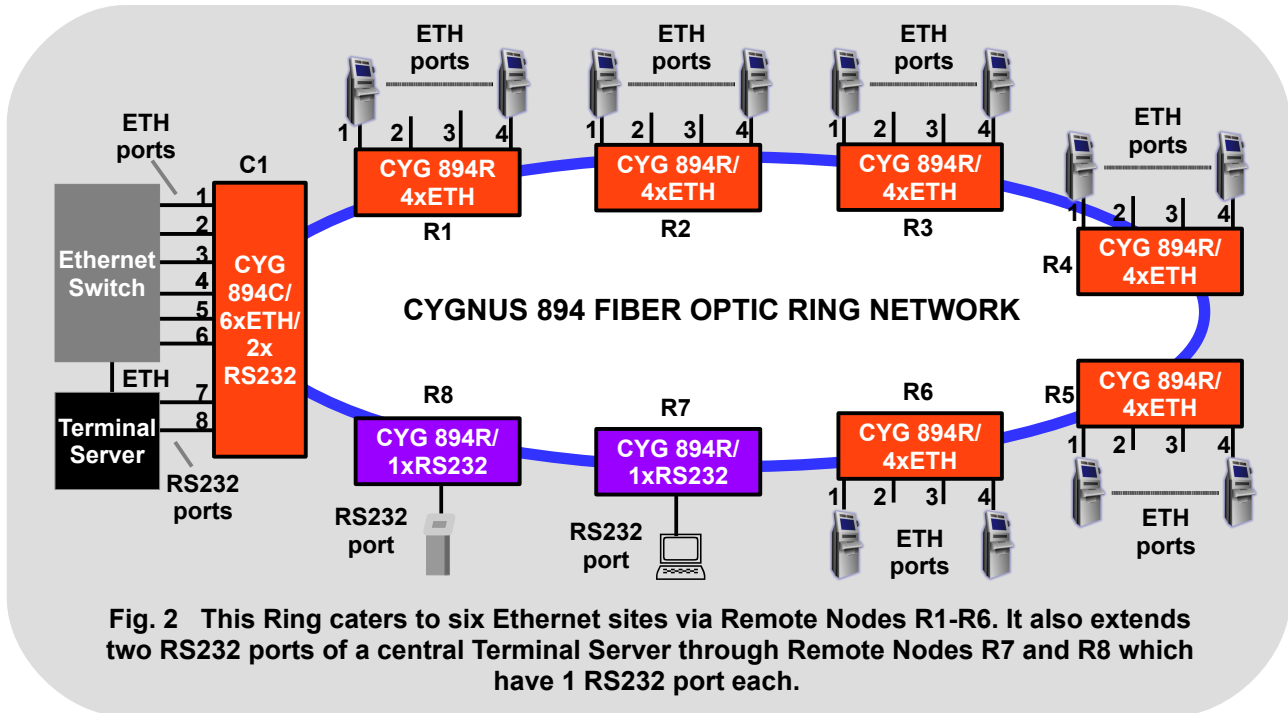


Fig. 1. Distributing ATVMs and Terminal Servers at various places in a station premises on a fiber optic ring. CYGNUS 894C Central Node (C) is used for access to upstream Switch. CYGNUS 894R Remote Nodes (R1-R8) are located at the ATVM / Terminal Server sites.

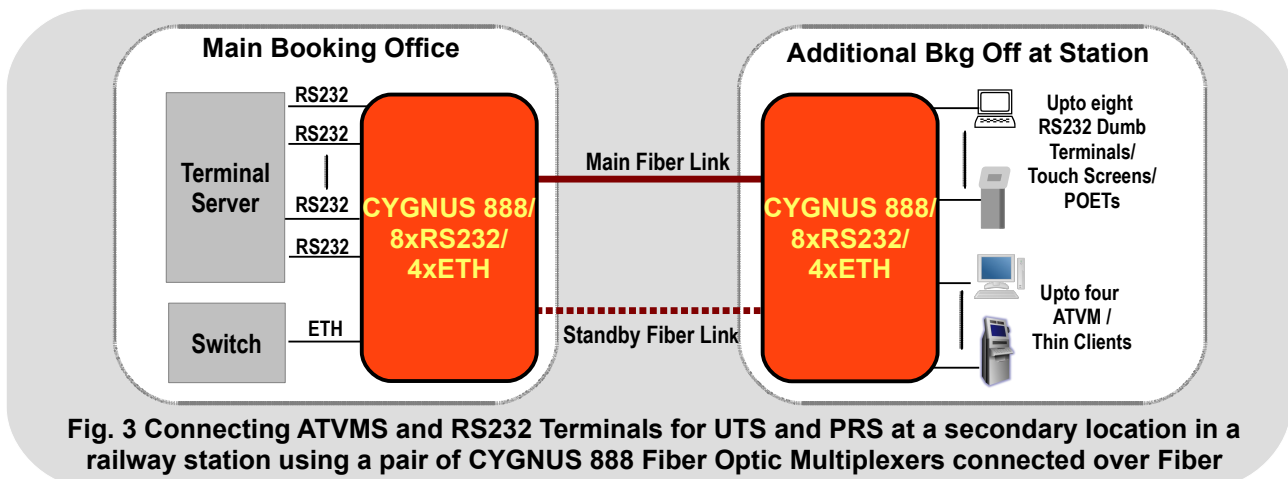
A CYGNUS 894 Ring Network can be used to connect ethernet hosts such as ATVMs, Thin Clients, etc., to a central site server or switch. Terminal Servers, which have ethernet ports, can also be present on the the network, allowing RS232 devices to be connectd. The network offers “ring protection” - i.e., if a fiber segment or a CYGNUS 894 node fails, traffic on either side of the failed device/fiber segment is automatically re-routed. The CYGNUS 894 Ring may span distances of as much as a few kilometers. The cabling scheme is simple. Also, a network with less than 8 nodes can be expanded at a later date simply by opening the ring at a suitable point, extending optical fiber cable from there to the new site, placing a new CYGNUS 894R node there, and closing the ring with another optical fiber segment to the next node.

It is not compulsory to close the ring - the nodes can also be interconnected in a linear fashion. Ring protection will of course not be available in this scenario. However the advantage of easy expandability is there, since addition of a new node later on does not require a fresh link from there to the central node.

To provide connectivity to RS232 devices another approach is also available. A special CYGNUS 894R node with RS232 interface is available. This is shown in Fig 2. This approach is suitable when only a few RS232 devices are to be connected in the ring.



At times extension of ATVMs and RS232 devices is needed to a single isolated location in the station. CYGNUS 888 Fiber Optic Multiplexer is ideal for such applications. It offers the benefits of fiber optics such as range and immunity from electrical disturbance. Fig 3 shows a typical setup.



Contact Cygnus today for further information