

## CDTS-2048 Copper wire Distributed Transmission System



Single line CDTS system



Dual line CDTS system

### Introduction

The CDTS-2048 system enables computer systems to be connected by means of copper cables over long distances at high data rates. The system was specially designed for high-speed data transmission over long-stretched networks such as common alongside motorways and railways. The transmission system is based on 2-wire SDSL technology and creates a transparent backbone network for devices equipped with an Ethernet port.

### Features

- Transparent Ethernet Wide Area Network using a single copper wire pair
- Standard 10baseT interface for attached devices or computer systems
- Statistical multiplexing method for efficient bandwidth usage
- Transmission rates from 64 Kbit/s up to 2.048 Kbit/s
- Transmission distance up to 10 km at 0,5 mm, 22 km at 0,9 mm diameter
- Reach at 2048 kbps: 6 km at 0,5 mm, 8km at 0,9 mm diameter
- Redundant system (back-up) by utilising 2nd cable
- Automatic Longitudinal and Transversal back-up
- Minimal configuration: network behaves like an Ethernet bus
- Remote monitoring & control

## Description

The CDTS system offers a unique means for simplifying high-speed communication alongside motorways and railways. In such environments usually one master station interrogates multiple remote stations. When using the traditional multipoint network system to address the remote stations, the communication is handled by means of a special, non-standard, communications protocol, which has to be implemented in all attached information systems. This implementation usually is quite cumbersome and time consuming. The CDTS Network system however, uses a standard Ethernet protocol supported by various machines ranging from Personal Computers to advanced industrial computer systems and video surveillance systems. Multiple CDTS units can be linked together to build a wide area network alongside motorways, railways or similar infrastructures. In other words: The CDTS network can be seen as an Ethernet LAN, which is spread out over a wide area.



Single line CDTS system

The Ethernet protocol allows all attached devices to send data without the intervention of a master station. Nowadays many industrial computer systems are equipped with TCP/IP networking facilities and standard Ethernet interfaces. This enables such equipment to communicate in a standardised manner, which is essential for compatibility between systems from different vendors.

The CDTS system uses a reliable SDSL transmission technology in combination with an efficient statistical multiplexing system to distribute the data packets of each station over the network. For the connection between the stations only one single copper wire pair is needed. The maximum distance between the stations depends on the transmission rate and copper wire diameter.

The CDTS unit offers a standard 10baseT Ethernet interface to attached systems or Ethernet Local Area Networks. Because of the transparency of the system, the need for configuration of each unit is kept to a minimum.

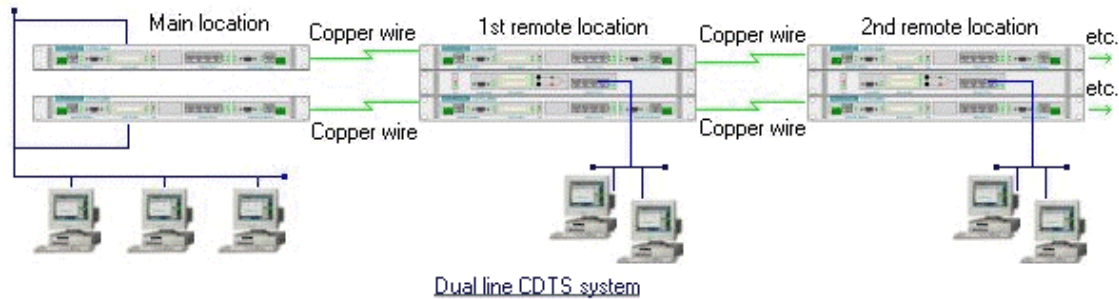
The CDTS units are equipped with a bypass system that automatically creates a direct connection between the next upstream and downstream CDTS systems should the power of an intermediate CDTS fail.

For building a fail-safe network system, a second cable (e.g. at the other side of the rail or motorway) can be used to create a back-up network.



## Back-up operation

The CDTS back-up unit connects the two systems at each location and automatically selects an alternative route should one cable section or CDTS unit fail. Switching-over between the regular and the back-up network section takes place within 3 seconds; short enough to sustain TCP/IP connections.



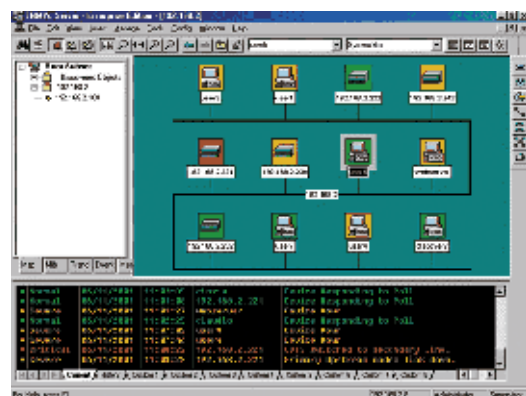
The various network sections may operate at different transmission rates. This enables the regular network sections to operate at the maximum data rate feasible between two CDTS nodes, while the back-up network sections can be configured for the extended cable length, should the power at a CDTS node location fail.

The network built with the CDTS system also allows forking, so connection to "sidetracks" can be made easily.

## Remote management

For alarm reporting and remote status reporting the CDTS units support the SNMP, Telnet and HTTP internet protocol. The unit can be configured to send SNMP traps (alarms) to a central Network Management station such as IBM Tivoli or HP OpenView.

For character-based access of the internal Modem Management unit the internet Telnet Protocol can be used. The built-in web server can be accessed by means of a standard Web Browser but can also be used for a Graphical User Interface to be integrated in the Network Management station.



## Technical Specifications

### Copper wire transmission

- Line type: Single unloaded copper pair
- Modulation type: Carrierless Amplitude/Phase modulation (CAP)
- Transported data rate: 128 .. 2048 kbps
- Line data rate: 144 .. 2064 kbps
- Line signalling rate: 72 .. 344 kbaud
- Line impedance: 135 Ohms
- Used bandwidth (max): 4kHz .. 400kHz
- Transmit power (4 .. 400kHz): +7.4 .. 13 dBm (@135 Ohms)
- Connector type: RJ-45

### Transmission Distances

	0.5 mm Copper / Low Noise	0.9 mm Copper / Low Noise
128 kbit/s	9.8 km	22.5 km
256 kbit/s	9.5 km	19.2 km
384 kbit/s	9.1 km	17.6 km
512 kbit/s	8.5 km	16.1 km
768 kbit/s	7.5 km	14.5 km
1024 kbit/s	6.9 km	13.1 km
1536 kbit/s	6.4 km	10.4 km
2048 kbit/s	5.9 km	8.3 km

### Device connection ports

- 10baseT Multiport repeater interface (HUB)
- Conforms to the IEEE 803.2 specification (section 9)
- Integrated elastical buffer and polarity detect/correct logic
- Automatic partition/reconnection function to isolate a faulty segment or device port.

### Network management

- SNMP for Alarm reporting and main system parameters.
- SNMP MIB II and MuLogic enterprise CDTS MIB
- Alarm Notifications by means of SNMP traps
- Telnet for configuration and status reporting
- WebBased management for Browser access and easy integration in existing Network management stations. (optional)

### General

- Dimensions: 450x482x43 mm LxWxH (19", 1 unit high)
- Weight: 5.8 kg
- Power requirement: 85~265 Vac, 47-63Hz
- Power consumption: 25 Watt
- Temperature range: normal: 0~50 C, extended: -20~60 C Humidity: 5~95%
- Environmental Conditions: Conforms to EN 50125-3 (T1 Shelter)
- EM emission and immunity: Conforms to ENV 50121-4