ET100AE (10/100 Mbps) INTERFACE CARD

Introduction

Thanks to it's design, OTN can handle nearly all existing communication standards for voice, data, LAN and video. The ET100AE card is only one of the many interfaces presently available for OTN. For more information, contact the address overleaf.

Description

The ET100AE interface card is fully compliant with the IEEE 802.3 standard and allows creating fully transparent Ethernet networks through the OTN. The OTN management software (OMS) allows ET100AE cards mounted in the OTN nodes to be easily interconnected and to operate in half or full duplex Ethernet mode.

This card supports 5 independent Ethernet segments over an OTN network. The 5 front panel ports can be configured for separate operation, each over its own Ethernet segment via OTN, and can also be interconnected in different modes.

In OTN networks, the bandwidth through the OTN is selectable from 1 Mbps to 147 Mbps or 196 Mbps via the OMS, depending of the OTN network type.
OTN-150/600:   147 Mbps (aggregate)
OTN-X3M: 196 Mbps (aggregate)
This is the data throughput per card, which can be subdivided over the (maximum) 5 totally independent Ethernet segments that this card can support.

Features

Compliant with IEEE 802.3

Physical connection:
4 x 10/100 BASE-T
1 x 10/100/1000 BASE-T

5 Switched Ethernet ports via RJ45 connector

Ports can be enabled/disabled

Support for 5 independent Ethernet segments on a single interface card

Eliminates distance limitations of conventional Ethernet networks

Bandwidth through the OTN selectable from
1 - 196* Mbps per Ethernet network (aggregate)

Fully transparent for all higher layer protocols

MAC address learning and filtering

Half / full duplex Ethernet operation (10, 100 Mbps)

Auto-negotiation (can be disabled via the management system)

IEEE 802.1Q Tag Based VLAN compatible or VLAN transparent*

IEEE 802.1p Priority queuing supported

IEEE 802.3x Flow control

Extensive alarm and fault indicators

* depending on OTN type

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Each of the independent Ethernet segments on this card can be used in point-to-point and multipoint configurations.

Point-to-point connections can be set up between two cards connected via OTN, implying both will be using the same segment bandwidth on the OTN ring. The complete transmission path can operate in full duplex mode.

In order to realize a multipoint configuration (network), ET100AE cards in other OTN nodes belonging to the same Ethernet segment also have access to the OTN bandwidth.

This way, a maximum of one ET100AE card belonging to the same Ethernet segment may be configured in each node of the OTN ring. One OTN node can be equipped with several ET100AE cards, provided that each segment on these cards belongs to a different Ethernet service. In an OTN-X3M node, all interface slots can access the same Ethernet segment if required.

Multipoint connections between ET100AE cards installed in different OTN nodes of the same Ethernet segment use the same bandwidth. The interface between the interface card and the connected device operates in half or full duplex mode.

The ET100AE card offers bandwidths of 100 Mbps or 10 Mbps (selectable via the OTN Management System (OMS) or via auto negotiation) to the connected devices. However, the bandwidth used through the OTN network is allocated by the OTN management system, and is selectable stepwise. This way, the OTN network allows saving bandwidth for 100 Mbps (resp. 10 Mbps) Ethernet networks that are not fully loaded. One port can work in 10/100/1000 BASE-T mode. The bandwidth setting applies to the entire Ethernet segment, and can be changed via the OTN network management system at all times.
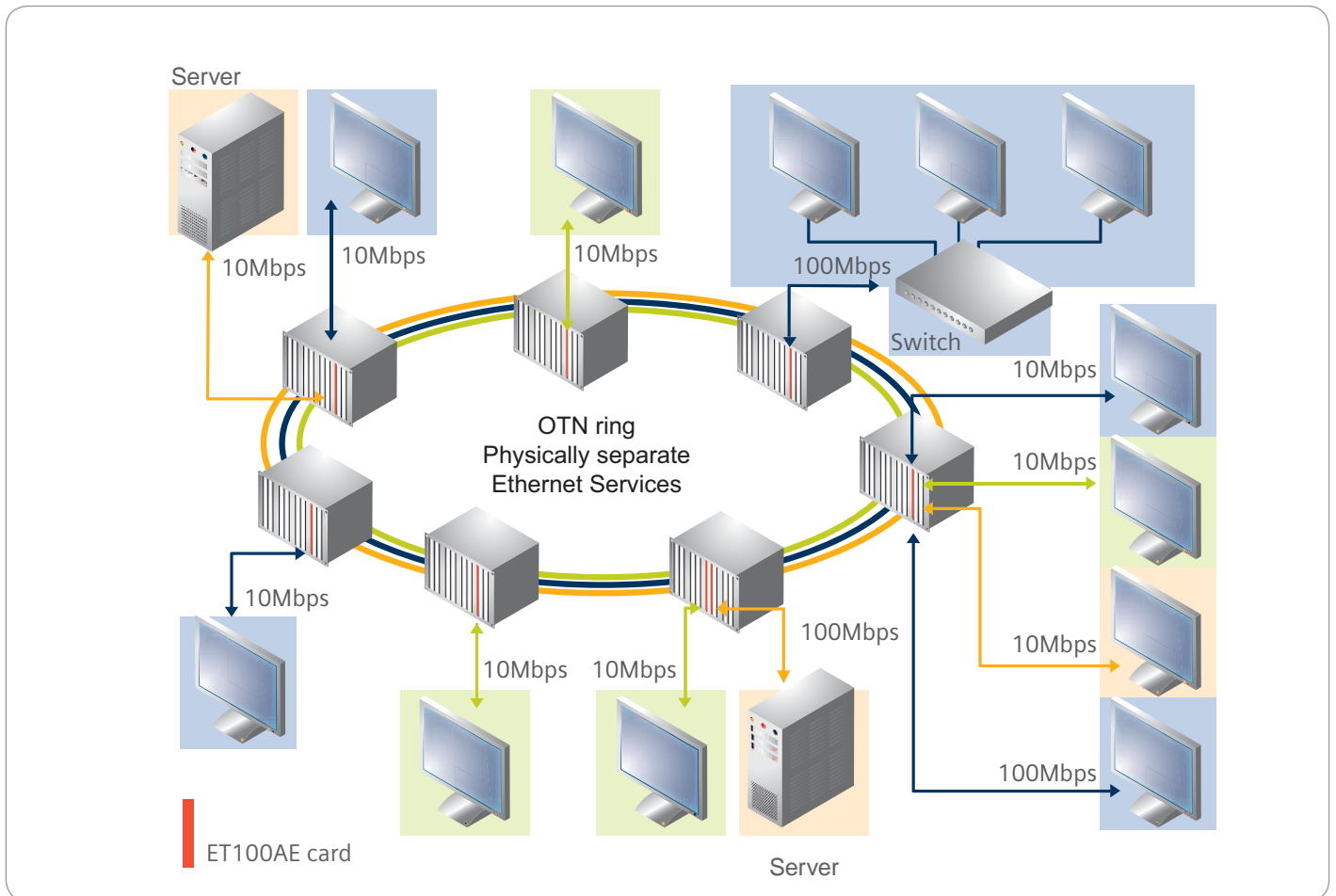
Consequently, the maximum number of Ethernet segments that can be configured in an OTN network depends on their OTN bandwidth settings.

The Ethernet ports of the ET100AE cards in an OTN-X3M network can be set to VLAN transparent, or to VLAN compatible by giving them a VLAN ID. When confi gured in VLAN compatible mode, the Ethernet ports will fi lter on their VLAN IDs.

On the ET100AE card, the IEEE802.1p priority standard is implemented with a low and a high priority traffic buffer.

OTN allows creating Fast Ethernet networks covering more than one hundred kilometers without affecting the network performance. This unique feature of OTN makes it very useful in stretched networks.

Server

10Mbps
10Mbps
10Mbps
100Mbps
Switch
10Mbps
10Mbps
10Mbps
10Mbps
10Mbps
100Mbps
100Mbps

OTN ring
Physically separate
Ethernet Services

ET100AE card

Server

Specifications

Standards
Available in all OTN types:
- IEEE 802.3:
  10Base-T Ethernet
- IEEE802.3u:
  100Base-TX Fast Ethernet
- IEEE802.3ab:
  1000Base-T Gigabit Ethernet
- IEEE802.3x: Flow control
- IEEE802.1p: Priority queuing

Available in OTN-X3M:
- IEEE802.1Q: VLAN

Performance certification
available for IEC 60870-5-104

CE marking
EMC directive 2004/108/EC
LVD directive 2006/95/EC

Circuits
- 5 Switched ET ports
- 5 independent and interconnectable Ethernet segments

Line data rate (selectable via the OMS or through auto negotiation)
- 4 x 10/100 Mbps
- 1 x 10/100/1000 Mbps

Connectors
- 4 x RJ45 (10/100 BASE-T)
- 1 x RJ45 (10/100/1000 BASE-T)

Card size
Double Eurocard
200 x 233.4 mm

Weight
Approx. 420 g

Reliability (MTBF) at 25°C (77°F)
66.3 years

Operation

The ET100AE card houses a sophisticated buffering mechanism guaranteeing maximum performance and transparency.

Each ET100AE card on the OTN network has an address that is added to all packets originating from the connected equipment and to be forwarded to the OTN ring. The packets circulate on the OTN ring and are copied to all the ET100AE cards being addressed, meaning that only packets sent to the equipment located in other OTN nodes are transported on the OTN ring. Local traffic is blocked in the port switch.

When the addressed card receives its packets, it will remove these from the ring upon recognizing the address.

Applications

Parallel networks
For several reasons a number of LANs may coexist in a single organization. Multiple parallel LANs allow each application or department to grow and change its functions without affecting the LANs of other applications or departments. Using standard Ethernet equipment such as fiber optic repeaters and switches makes the networks quite complicated and requires extra hardware and cabling. Using the OTN allows the different LANs to coexist in a single OTN network, which is not only a cost effective solution, but also makes network management easier.

Stretched networks
Today, applications tend to shift from low-speed data interfaces, e.g. V.24, to LAN interfaces. Some of these applications, e.g. ticket vending and SCADA (Supervisory Control And Data Acquisition) in a railway environment cover a large geographical area. OTN's Ethernet interface allows spanning long distances without any loss of performance which makes it is ideally suited for this type of application.

Factory automation
Various types of interfaces are available to interconnect PLC (Programmable Logic Controller) equipment. Low-speed PLCs are equipped with RS232 interfaces, whereas medium-speed equipment uses the RS485-Fieldbus (see RS485 specification sheet), and high-speed buses run on Ethernet. The fact that OTN is fiber based makes it very reliable and allows it to span very long distances which is very useful in plant automation applications.

Ordering information

Card
- ET100AE
  S30824-Q118-X101

OMS Software
- OMS V4.4 and up