

## 10GBASE-T FACTS AND BASIC OVERVIEW

OCTOBER-09

### WHAT IS 10GBASE-T?

10GBase-T is IEEE standard 802.3an, ratified in 2006. The IEEE 802.3an specification outlines the technology to run **10 Gbps Ethernet over standard, structured cabling**.

### DOES 10GBASE-T REQUIRE SPECIAL, NEW CABLING?

The IEEE 802.3an standard specifies **operation over existing and new cabling**. 10GBase-T will run over standard, structured 4-pair twisted-pair copper cables.

The standard specifies: Category 6 (screened and unshielded), Category 6A (Augmented Category 6), and Category 7 (Class F) cables. Additionally, existing Category 5e cables will support 10GBase-T as long as link segment requirements are met.

### **IEEE 802.3AN-2006 10GBASE-T SUPPORTED CABLING**

Cable	Link Segment Distance	Cabling Reference
Class E / Category 6	55 to 100 meters	ISO/IECTR-24750, TIA/EIA TSB-155
Class E / Category 6 unshielded	55 meters	ISO/IECTR-24750, TIA/EIA TSB-155
Class E / Category 6 shielded	100 meters	ISO/IECTR-24750, TIA/EIA TSB-155
Class F	100 meters	ISO/IECTR-24750
New Class E / Augmented Category 6	100 meters	ISO/IEC 11801 ed2.1, TIA/EIA-568-B.2-10

### DOES 10GBASE-T REQUIRE SPECIAL, NEW CONNECTORS?

The 10GBase-T technology calls for standard, structured cabling. Class D and Class E cables (the primary install base) utilize **standard RJ-45 connectors**. RJ-45 connectors are ubiquitous among the Ethernet standard, thus enabling **plug-and-play capability** and maintaining legacy support.

### WHAT ARE THE REACHES THAT 10GBASE-T SUPPORTS?

As shown in the table, IEEE 802.3an specifies operation of 10GBase-T for up to **100 meters**. Specific distances supported on different cable types are subject to meeting link segment requirements. The standard also specifies an optional short-reach mode for 30 meter support.

All device vendors design 10GBase-T to meet full reach requirements.

### CAN MY INSTALL BASE RUN 1G AND 10G, SO I CAN GROW MY BANDWIDTH AS NEEDED?

The standard, structured cables supported by the 802.3an standard are **backward compatible** with 1000Base-T Ethernet cabling requirements; thus preserving the investment in existing structured, copper infrastructures.

#### HOW CAN I DETERMINE WHETHER I CAN RUN 10GBASE-T OVER MY INSTALL BASE?

There should be no major obstacles in upgrading to 10Gbase-T. The structured cabling supported by 10Gbase-T is inherently backwards compatible, enabling ease of upgradability of the install base.

To be safe, you should have a formal certification performed utilizing a Field Test tool to determine the frequency range of your cable plants as well as any impact of Alien Cross Talk in your copper bundle installation. This test tool will encompass six-around-one configurations to single cables, as well as cable plants constructed with different lengths on various types of cable. As long as your cable plant meets link segment specification, you may upgrade seamlessly from 1 Gigabit Ethernet to 10 Gigabit Ethernet.

For formal certifications, please see Fluke Networks White Paper: How to Certify or Re-certify Twisted-Pair Cabling for 10 Gb/s Ethernet (<https://www.flukenetworks.com/fnet/en-us/MyAccount/literegistration?ReturnUrl=%2ffnet%2fen-us%3fotc%3dDTXWWWP001>)

#### ABOUT TERANETICS

Teranetics is a leading provider of silicon solutions that enable significantly higher data rates over structured copper cabling than are currently available in today's Ethernet network environments. Led by a team with exceptional expertise and experience in the development and application of mixed-signal semiconductor solutions and digital communication technologies, Teranetics is the first company to ship a production-ready 10GBASE-T semiconductor designed for next generation network applications. Teranetics is backed by a strong consortium of venture investors with in-depth experience and success in the semiconductor and data networking markets.

For More Information: [www.teranetics.com](http://www.teranetics.com)