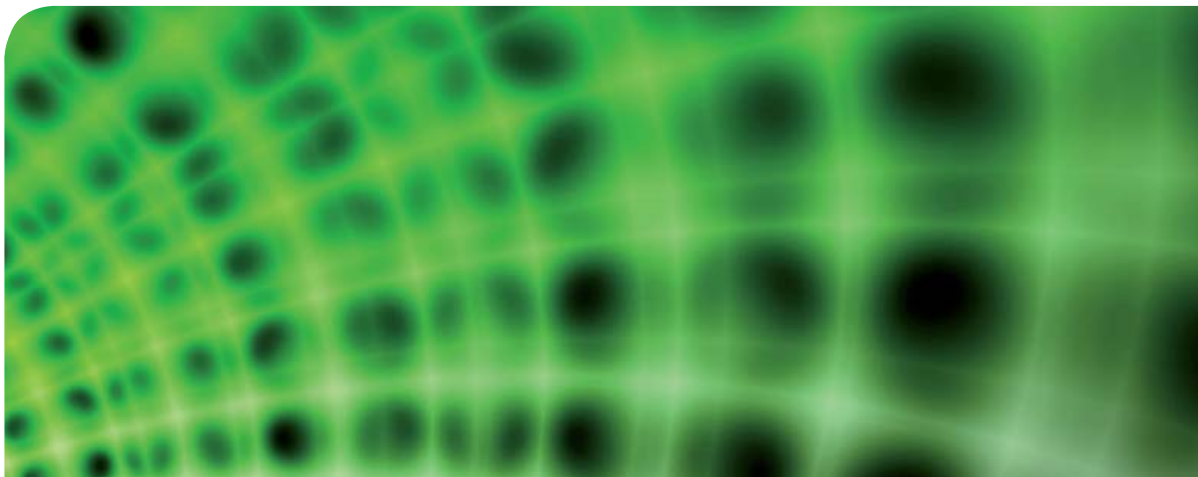


TrueNet® Blown Fibre Solution

Lighting up your network





TrueNet[®] Blown Fibre Solutions

Enabling optical networks to adapt to changing business requirements

Introduction

In the last few years we have seen a great increase in internet access, multimedia services, video on demand and voice over IP. These new applications are characterised by high bandwidth consumption requiring more capacity for the Enterprise Network environment.

At the same time, many international standardisation groups have worked to define the standards for applications in the local area such as FDDI, Token Ring, Fast Ethernet, Gigabit Ethernet and 10 Gigabit Ethernet. All the standards can work with optical fibre as the physical medium with 10 Gigabit Ethernet specified exclusively for an optical layer. Optical Fibre is a flexible medium that can universally support all of these applications.

- Standard 62.5/125µm or 50/125µm fibre
- Laser optimised (OM3 and OM3e grade) fibre
- Singlemode fibre
- A combination of any of the above

With a blown fibre infrastructure, comes the added benefit of only installing the fibres when they are actually needed. The only consideration at the planning stage is providing sufficient capacity of the tubing.

The TrueNet® Blown Fibre system from ADC KRONE

The TrueNet Blown Fibre system from ADC KRONE provides a simple solution to manage evolving network demands without the need for high initial capital expenditure or extensive network planning. Blown Fibre enables optical networks to adapt to changing business requirements.

The TrueNet solution allows optical fibres to be deployed on demand from one point of a network to another (internal or external) using compressed air to blow optical fibre into pre-installed tubes.

Building your network using the TrueNet® Blown Fibre system could realise the following benefits:

> Simplified Planning

- Network is built according to today's needs
- Fibre count can be increased as demand grows

> Cost Effective

- Pay as you grow – install empty tubes and only pay for fibre as and when required, spreading capital investment over time
- Reduced splicing – minimises branching and splicing of traditional networks, which reduces engineering costs
- Deployment of fibres is related to actual requirement
- Elimination of unlit fibre and the associated up front investment

> Increased Flexibility

- Future proof network build
- Networks are easily upgraded, branched or extended, giving maximum flexibility and uninterrupted fibre blowing right to the destination
- Simplified emergency restoration
- Latest and emerging fibre technologies can be deployed

> Speed of Customer Connections

- Equivalent performance for first connections, significantly reduced timescales and costs for subsequent connections
- Existing tube routes can be interrupted at any place, allowing rapid network upgrades

“The flexibility offered by a blown fibre solution can substantially minimise network build costs. Given the uncertainty of trends in technology, demand growth, people movement and financial confidence, Blown Fibre provides a flexible, low total life cost and complete solution.”

Alastair Waite, Head of Enterprise Product Management, EMEA

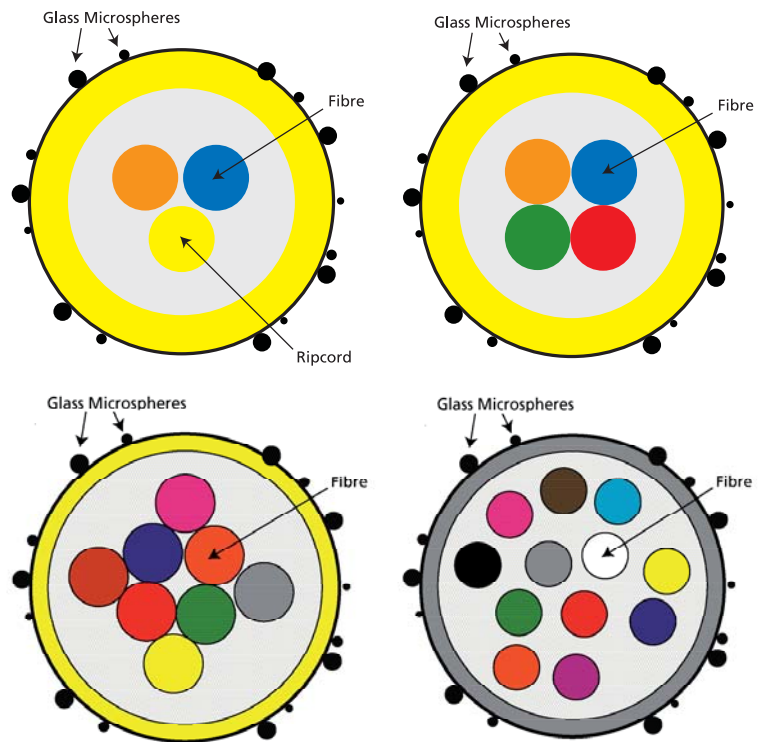


TrueNet® Blown Fibre Products

Blown Fibre

Singlemode – Blown Fibre Unit

Singlemode Blown Fibre Units meet the OS1 industry standard as set out in ISO/IEC 11801:2002. Ideally suited for deployment in metro area, campus and building backbone environments, singlemode blown fibre allows for maximum network design flexibility. Each blown fibre unit has an external coating of glass microspheres which assist in blowing fibres over large distances.

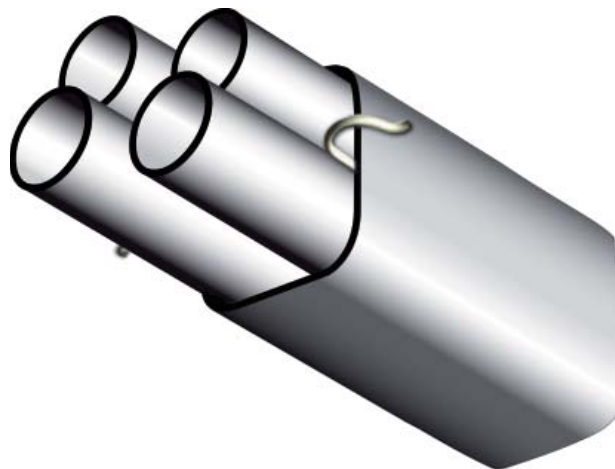


Blown Tube

Blown Tube – Internal

Small diameter low friction tubes provide the dedicated pathway for the optical fibre units are integral to the ADC KRONE blown fibre solution. Empty High Density Polyethylene (HDPE) tubes are available in a variety of sizes, combinations, and protective systems. The tubes have all been rigorously tested and enable the blown fibre units to be blown the optimum distance within the tube network. A comprehensive range of joining accessories is available for tube-to-tube connections, reducing, gas and water blocking.

The indoor range of products is available in reduced fire hazard/Low Smoke Zero Halogen (LSZH) options.



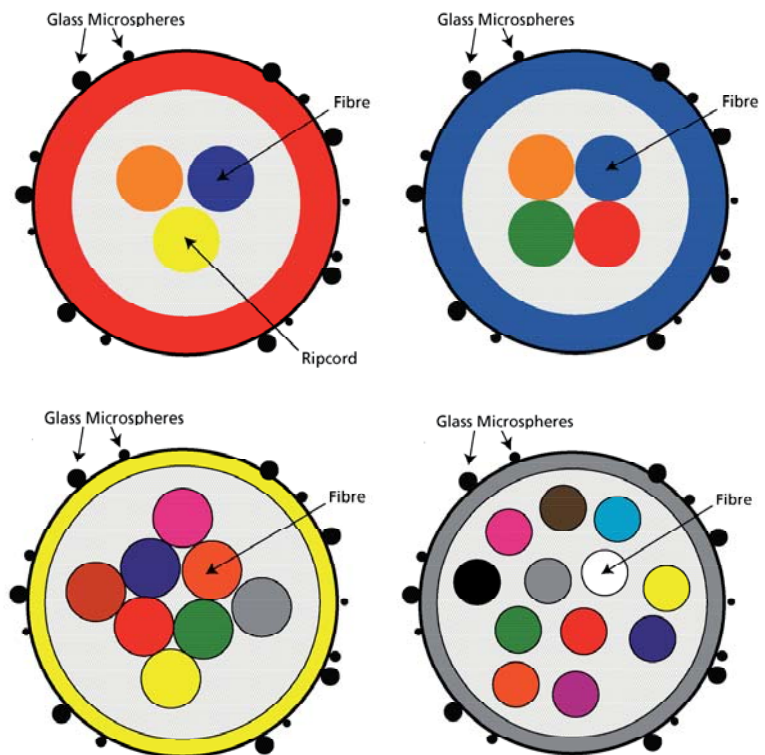
Multimode – Blown Fibre Unit

Multimode Blown Fibre Units are available in 62.5/125µm (OM1) and 50/125µm (OM2 & OM3) industry standard variants for use in Local Area Networks and other premises applications.

All Optical Fibre Units are specifically engineered for Blown Fibre applications. The small diameter units have surface modifications to facilitate installation with the Blowing Head. The units are approved by British Telecom to the Specification CW 1574.

The Blown Fibre unit comes in the following variants:

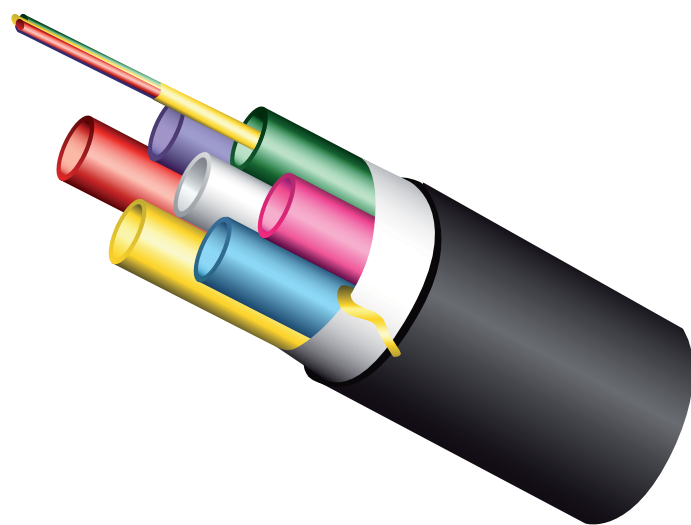
- 2 fibre singlemode
- 4 fibre singlemode
- 8 fibre singlemode
- 12 fibre singlemode
- 2 fibre 50/125µm multimode
- 4 fibre 50/125µm multimode
- 8 fibre 50/125µm multimode
- 2 fibre 62.5/125µm multimode
- 4 fibre 62.5/125µm multimode
- 8 fibre 62.5/125µm multimode



Blown Tube – External

The outdoor range of products is available in standard sub-duct, heavy duty, anti-rodent, or armoured versions.

The tubing products (for both internal and external applications) are available in 1, 2, 4, 7, 12 or 19 way variants, each containing 5mm OD, 3.5mm ID sub-units in an outer sheath.



TrueNet® Blown Fibre Products

Internal Plant



Gas Seal Unit

The Blown Fibre Gas Seal Unit can be used at all customer entry points. A wall mounted unit, it is positioned internally at the cable entry point. Gas sealing connectors facilitate the transition of the incoming external blown fibre tubing to the internal blown fibre tubing. These connectors are used to seal both populated (with blown fibre bundle) and unpopulated blown tubing. The unit is used for internally fed cable or with a Customer Lead-In Unit for cables entering through the fabric of the wall.



Customer Lead-In Unit

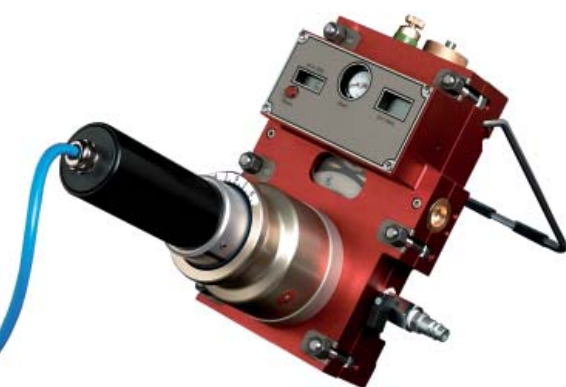
The Customer Lead In Unit enables external Blown Tube to be passed through the building fabric from an outside wall and can be used to enter any type of building whether office, factory or residential. The Customer Lead-In Unit comprises two separate units mounted either side of the wall and connected by a length of conduit. This product can also be used to manage the entry of conventional cable.



Internal Tube Distribution Unit

The Internal Tube Distribution Unit (Internal TDU) has been designed to allow maximum flexibility within building applications. The Internal TDU accepts a range of Indoor tube assemblies up to 19 tube capacity. The units allow individual tube breakout, re-routing or gas/water sealing. The tubes are positively managed to prevent excessive tube bending.

Installation Equipment



Blowing Head

The Blowing Head has been designed and developed specifically for the installation of ADC KRONE blown fibre units. It can accommodate the full range of fibre units available from ADC KRONE (2, 4, 8, and 12). The unit is suitable for use within an external or internal environment, and can be used with a wide range of blown tube sizes. The fibre unit is installed in to a tube using compressed air, with the assistance from drive wheels. The typical installation speed achieved with the blowing head is 30m/min. A range of compatible equipment is also available from ADC KRONE. It is necessary for an installer to attend the Blown Fibre Installation Training Course (booked through ADC KRONE UK) prior to using this equipment.

Compressor

The Compressor is designed to deliver clean dry air for the installation of the TrueNet® range of blown fibre units in conjunction with the Blowing Head. The standard compressor is a portable, electrical unit, and produces 120 ltr/min of pulse free treated air at a working pressure of 10 bar. It is necessary for an installer to attend the Installation Training Course (booked through ADC KRONE UK) prior to using this equipment.





Fibre Outlet

The fibre outlet was specifically designed for blown fibre applications. Tubing enters the back-box where the fibres are fully managed. The splice cassette on the front of the unit also houses the adaptors (ST, SC or MT-RJ) for both single mode and multimode applications. Fibres can be terminated either by means of direct termination or by the fusion splicing of pigtails.



Connectivity Products

A full range of connectors and adaptors are available for single mode and multimode applications. Standard connector types, such as ST and SC, are complemented by small form factor (SFF) connectivity (MT-RJ and LC) for high density applications. Pigtails and patch cords are available in a range of standard lengths with optical performance exceeding industry standards.



Plastic Patch Panel

The 19" 1U plastic patch panel was specifically developed for blown fibre applications. Tubing enters the rear of the unit and the fibres blown directly into the panel. The integral fibre management reduces the number of accessories required to install the fibre and the unit can be used to terminate fibres either by direct termination or fusion splicing of pigtails. The panel comes with a variety of connector types (ST, SC, MT-RJ, and LC) for both single mode and multimode applications. The panel is also available in grey or black and can be used for standard cabling as well as blown fibre terminations.

Other Installation Equipment

The installation process for the blown fibre units requires the use of additional equipment items in conjunction with the blowing head and compressor. This range of equipment includes the Regulator, Pan Guide, Pan Support Frame, Fibre Inversion Pan, Pan Inversion Ring, and Blowing Beads. The full range of equipment is available from ADC KRONE. It is necessary for an installer to attend the Installation Training Course (booked through ADC KRONE UK) prior to using this equipment.



Accessories

An integral part of the ADC KRONE Blown Fibre Solution is the tube connection and tube sealing products. A wide range of products is available which enable tubes to be connected together, sealed from water or gas ingress, or reduced from one tube size to another. This range of accessories is fully compatible with the Blown Fibre Units and Blown Fibre Tube supplied by ADC KRONE.



Frequently Asked Questions

Can I blow more than one blown fibre unit into a tube?

No, only one blown fibre unit can be installed in an individual tube. If a greater fibre capacity is required and no spare tubes are available along the same pathway then simply remove the existing fibre unit, and replace with a higher fibre count unit. When blowing a unit into the last remaining tube, consider the risk of future capacity limitations. A planned strategy of installing a higher fibre count unit in the fibre tube could overcome this.

What is the typical blowing distance of each fibre unit?

The distance that each blown fibre unit will blow is dependent upon the tube route topology, the size of the unit, the installation equipment and the quality of the blown tube low friction inner. In some cases the climatic conditions may also alter the blowing distance. The system has been rigorously tested in a variety of climatic conditions, and all typical blowing distances are detailed on the product datasheets. It is also essential that all installers are trained to enable optimum performance of the products in the field.

How do I install the blown fibre units?

The blown fibre units are installed using the approved installation equipment. The installation methodology can be acquired by ADC KRONE TrueNet® Partners and Authorised Integrators by attending the installation training course available through ADC KRONE UK.

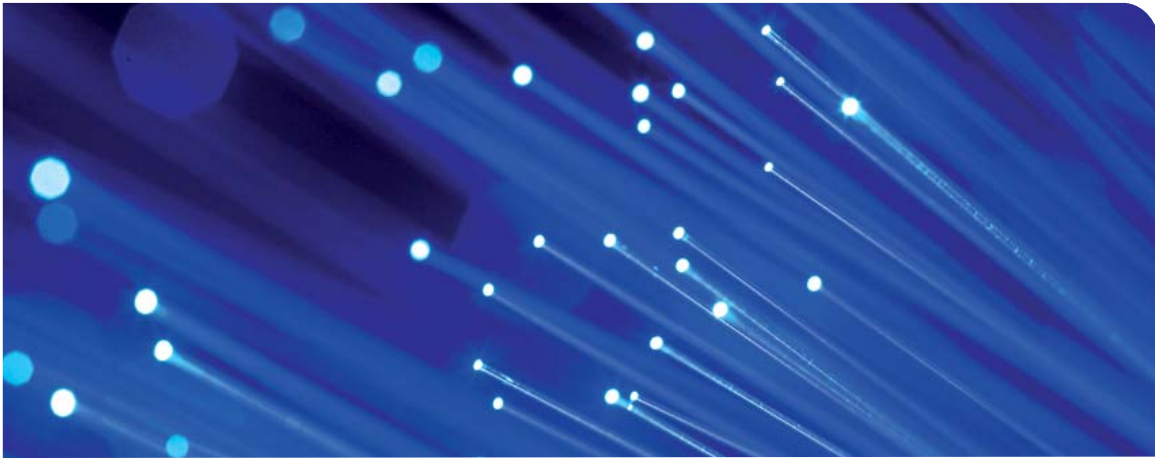
Can I connect one tube to a tube of another size?

Lengths of 5 or 8mm tube can be interconnected using the appropriate reducer connectors. These will support installation through tubes of different dimensions with minimal reduction in installation performance. However, the blown fibre installation should commence at the route end with the largest tube size, and blown through progressively smaller tube sizes.

For what applications can this range of products be used?

The product range has been used in many applications within metropolitan access networks or premises networks. Typical installation projects include Campus Networks, WANs, LANs as well as Fibre to the User applications.





In what climatic conditions can the products be installed?

Blown fibre systems have been installed as far and wide as Australia, South Africa, Scandinavia and SE Asia. With wide deployment in Europe as well, all global climatic conditions have been met and overcome.

If I need more capacity can I pull out one unit and blow in another?

All Blown Fibre Units can be easily “blown-out” of the tube and recovered into a Blown Fibre pan. Once removed, another Blown Fibre Unit can be installed conventionally.

Can I re-use a blown fibre unit once it has been withdrawn?

All withdrawn units can be readily used either immediately or at a later date providing the storage conditions are adhered to, and the unit was not damaged on removal from the tube. Consideration needs to be given to the length of the second route (it must obviously be no longer than the original connection).

How do I save money by using blown fibre?

The principal cost saving result from the deferment of fibre costs from the outset of a planned network roll-out. Installing empty tubes and subsequent installation of fibre on demand will result in a fibre lean network deployment strategy. In addition, blown fibre can be installed from an outdoor location, into external tubing, through the building external / internal transition, into indoor tubing to the internal presentation point. Blowing through, avoids the need to splice at building entry (indoor and outdoor tubes are simply plugged together with connectors in a Gas Seal Unit).

If you have a specific question you would like to ask us, please contact the relevant Technical Assistance Centre :

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+32 2 712 6542
euro.tac@adckrone.com

South Africa
+27 11 466 3333
infos@adckrone.com

United Kingdom
0800 960236
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Training

Blown Fibre Installation Course (1 Day Course)

Start Time

9:00 hrs

Finish

17:00 hrs

Delegate Numbers

Minimum 4 - Maximum 8

Overall Aim

This event is designed to enable delegates to be trained to install Blown Fibre into the network and to become installation familiar with Range Extending techniques.

Prerequisite

The delegate has had prior training on the safety of optical fibre.

Delegates will be taught as follows: Practical 100% and Theory 80%.

The delegates will be able to identify and describe key aspects of:

- Blown Fibre (EPFU)
- Blown Fibre Equipment
- Range Extending Equipment
- Jointing Enclosure
- Customer Entry & Gas Seal Units

The delegates will be assessed to the satisfaction of the trainer using a combination of:

- Written question paper
- Practical assessment
- Verbal question and answer

1 Day Training Course

Session 1

- 1) Introduction
- 2) Training area and site safety
- 3) Course objectives
- 4) Blown Fibre health and safety
- 5) EPFU
- 6) Blown Fibre Cable

Session 2

- 7) Blown Fibre equipment
- 8) Route testing demonstration
- 9) Route testing practical exercise
- 10) Blown Fibre demonstration: Point – point blowing

Session 3

- 11) Blown Fibre practical exercise: Point – point
- 12) Blown Fibre demonstration: Centre blowing
- 13) Blown Fibre practical exercise: Centre blowing

Session 4

- 14) Applications
- 15) Repair procedure
- 16) Problem solving
- 17) Review of CD
- 18) Review of course

N.B. If translation is required the course duration is extended to 1.5 days

Teaching Points

A Blown Fibre (EPFU) and Cable (BFT)

- 1 Blown Fibre Pan
- 2 Single Mode 8/125 (yellow)
- 3 Multi Mode 50 & 62.5 / 125 (blue and magenta)
- 4 Glass Micro-spheres
- 5 Blown Fibre Cable Preparation
- 6 1, 2, 4, 7 and 19 tube (MK 3)
- 7 Tube identification
- 8 Indoor & Outdoor
- 9 EPFU preparation

B Blown Fibre Equipment

- 1 Sirocco Blowing Head
- 2 Compressor
- 3 Pressure Regulator
- 4 Flow Meter
- 5 Pan
- 6 Pan Guide
- 7 Blown Fibre beads

C Range Extending Equipment

- 1 Inverter Pan
- 2 Sleeve 1A
- 3 Coiler
- 4 Communications

D Jointing Enclosure

- 1 Cable Preparation
- 2 Jointing gap
- 3 Recovery of Closure

E Labeling and Cable Coding

- 1 Numbering conventions
- 2 Risers
- 3 Distribution Points
- 4 Joints

F Customer Premise Points

- 1 Customer Lead-in Unit
- 2 Gas Seal Unit
- 3 Gas Blocking

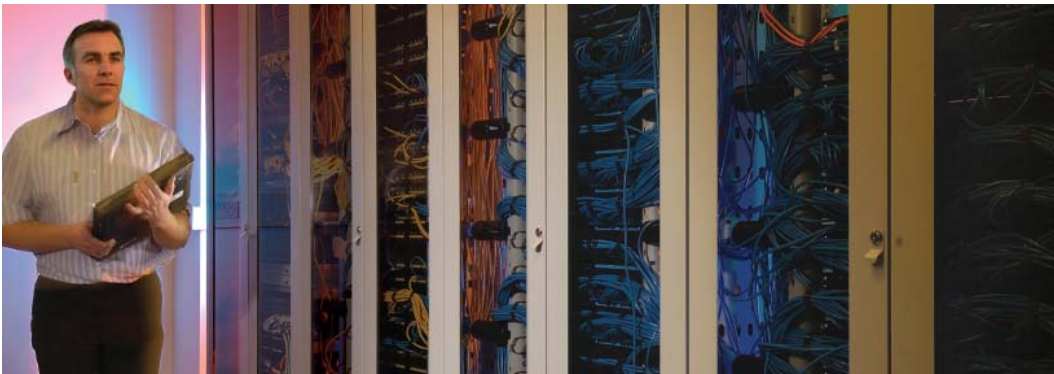
TrueNet®

The TrueNet® Structured Cabling System is the integrated portfolio of high-performance copper and fibre cable, connectivity, and cable management products from ADC KRONE.

The precisely tuned TrueNet system exceeds ISO and EN standards and provides a clear path for uninterrupted data throughput within the entire network.

True End-to-End Solutions

The TrueNet system delivers proven cable, connectivity, and cable management solutions for fibre, 10 Gigabit Ethernet copper, and Category 5e/6 from the comms room/Data Centre to the desktop.



TrueNet System Warranty

The TrueNet System warranty assures that applications specified in the cabling standards will run on a TrueNet system and that the potential bit errors resulting from the structured cabling system will effectively be zero. To benefit from the TrueNet System warranty the system must be installed by a certified TrueNet Integrator.

Full service

With a fully trained team of Field Engineers throughout EMEA, ADC KRONE is committed to both Customers and its Channel Partners, providing all the necessary training and support required to deliver 'Best in Class' Managed Solutions.

For further information, contact ADC KRONE customer support on 01242 264400 or visit our website www.adckrone.com/en

TrueNet® Blown Fibre Solutions

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KRONE



Web Site: www.adckrone.com

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