

Warren & Brown Technologies

www.wbnetworks.com.au

# Wireless / Mobile Networks Infrastructure Solutions





### **About Warren & Brown Technologies**

Warren & Brown Technologies (WBT) was originally established in 1921 as a tool-making factory in Melbourne, Australia. Since then, the company has evolved to become a leader in precision tools and telecommunications network connectivity infrastructure.

WBT has remained wholly Australian owned and operated for 100 years. This commitment to the local design, manufacturing and technology industry has created hundreds of jobs and world leading solutions.

The main facility in Maidstone, Melbourne currently comprises of over 48,000sqm of office, manufacturing, R&D and warehouse space. In addition, WBT has expanded operations to include a presence in other states around Australia.

Recently the company has also expanded its global reach by opening up many regional offices and manufacturing facilities. These operations are overseen and integrated with WBT Australia.

We pride ourselves on being a global leader in the supply and manufacture of optical fibre and copper communications equipment, as well as torque setting equipment for automotive and industrial applications.



### **Our capabilities**

As an innovative company, Warren & Brown Technologies is commited to designing and developing new solutions, as well as striving to go above and beyond to meet and exceed the needs of our customers. With state of the art facilities, manufacturing plants and an agile R&D department, we have a fast product development cycle to produce solutions in weeks, not months.

Being a supplier to the major telecommunications network operators in Australia and around the world for over 35 years, we have been recognised for our expertise in the telecommunications industry by being selected as an official supplier to the Australian National Broadband Network (NBN). In addition to being a long-term supplier to Telstra, other leading carriers and for many structured cabling networks.

We provide the ideas and solutions behind the telecommunications infrastructure which powers our connected society. By investing in new technologies such as 3D printing, WBT is able to offer innovative manufacturing, solution design and deliver new concepts.

ICT solution design - 3D printing & prototyping, product development, design & support

Data centre, enterprise & telecom network expertise

High-tech fibre termination, sheetmetal, plastic extrusion & product assembly

Fully customised solutions

E-commerce websites - fast, secure & convenient online shopping

Customer support & service - ongoing technical support, WB TelAssist App

Mass-scale warehouse & distribution facilities



### World leading product quality and reliability

WBT is a company of **Quality**, with our deep culture of quality stemming from the company's origins of Precision Tool manufacturing 100 years ago. We recognize the need for precision in manufacturing optical fibre solutions and our ISO 9001 certification, as well as our preferred supplier status with Telco's throughout the world is clear evidence of this commitment.



### World leading customer service and support

WBT is a company of **service** that goes above and beyond the needs of customers. Our customer focused approach to design, manufacturing, delivery and support always ensures a high level of customer satisfaction. By providing a consistent level of quality service, we are able to develop long term, mutually beneficial relationships with our clients.

- Fast manufacturing and delivery times
- Dedicated customer support teams
- Development of mobile application to provide world leading product information, training, support and installation assistance to field staff
- Proven track record of providing quality service and fast delivery lead times on major projects & contracts with thousands of individual product items







### Optimising wireless infrastructure to meet network demands

The telecommunications industry has been one of the greatest drivers of innovation in the 21st century. The ever changing dynamics of this market, brought on by advancements in technology, coupled with consumer demands, has presented a challenge for most network operators. With the advancements in smartphone technology, as well as the increase in smartphone penetration, mobile networks must quickly adapt to meet the increased demand for higher transmission speeds and bandwidth.

With the demand from consumers to be constantly connected and able to access applications on the go, including online banking, mobile app's, games, social media, video content, voice and data, traffic flow over a mobile network continues to evolve and increase on a daily basis.

This presents a challenge for mobile network operators around the world who want to deliver the quality and consistency of service to their customers and users of their networks. Whether the challenge involves investing in 4G capacity upgrades or new 5G network deployments, having the right infrastructure in place is essential.

However, the need to meet consumer requirements must be balanced with finding and deploying highly reliable and cost effective solutions that support highly efficient signal transmission. Additionally, mobile network operators must also look for ways to obtain CAPEX and OPEX savings.

Warren and Brown Technologies (WBT) provides a complete wireless infrastructure solution that enables cost effective network deployment, whilst continuing to ensure reliable and efficient network operation.

Based on market leading product development, innovation, reliability and knowledge, WBT's wireless infrastructure solutions provide outstanding benefits, including optimized network performance and network longevity.



### Innovative cabling and connectivity solutions

WBT's innovative approach to wireless infrastructure cabling and connectivity has proven to reduce CAPEX and OPEX for network builders. By simplifying cable construction and utilising streamlined connection devices and interface boxes, WBT has a total solution that allows for easy and cost effective installation.

Most modern wireless networks utilise a distributed base station architecture which physically separates the Remote Radio Unit (RRU)/Remote Radio Head (RRH) and Base Band Unit (BBU). The RRU which is now generally positioned at the top of the tower, just below the antenna, generally feature power and digital (optical) interfaces. Optical fibre cable has become the preferred choice for connecting RRU and BBU equipment as it provides high bandwidth, low latency and reliable transmission.

Power also needs to be transmitted and distributed to the top of the tower. However, instead of deploying a separate power cable, WBT's hybrid cable incorporates both optical fibre and power into the same cable design. This minimises operational and installation costs and also provides a secure way of quickly installing and upgrading the wireless network. A range of interface boxes provides secure protection from environmental and harsh outdoor conditions as well as providing a reliable means of quickly deploying additional network capacity.

Furthermore, a range of RF jumper cables and accessories are also available, providing an end to end solution.





### Optimising your network

WBT's state of the art wireless infrastructure solutions simplify and optimise operations when replacing or upgrading traditional base station configurations to the latest distributed base station architectures and provide many advantages to network operators. Providing a high level of service reliability while balancing wireless infrastructure capital and operational costs is always a challenge for network operators. WBT understand that each network has its own unique set of circumstances and we work closely with every customer to ensure that the network solution offered is nothing short of a perfect fit.



Wireless architectures and deployment methods are generally adopted to industry best standards and practices, WBT understand that wireless networks have variables and WBT go above and beyond to ensure that the final product is exactly right for your network. As well as standard product offerings, the WBT product development team focuses on designing innovative custom solutions in a matter of **weeks not months.** 

### Quality

Quality products ensure reliable network operation and all WBT products have undergone rigorous testing in real world, harsh environments. State of the art manufacturing facilities and a stringent QA process ensure that all products deployed in a wireless network, are ready to operate trouble free from the beginning.

Due to the products being fully assembled and connectorised in a controlled factory environment, the products are ready for plug and play installation as soon as they arrive on site.



### Adaptability

In addition to the various customisation options, WBT products and solutions are adaptable to all network configurations. Standardised components and connectivity ensure product compatibility and inter-operability. Connectivity options are available to suit all major RRU brands and interfaces including Ericsson, Nokia, Huawei and ZTE. In addition, rather than only providing standard cable lengths in large metre increments, WBT offer the flexibility of providing <u>exact cable lengths</u> for connecting to the RRU. This reduces material cost and wastage and removes the need to store and manage excess cable lengths.

### Scalability

WBT products are designed to enable wireless networks to be quickly and cost-effectively built or upgraded by deploying a plug and play system. New wireless infrastructure can be quickly deployed with hybrid cable and inter-connection boxes as the plug and play system allows for rapid deployment of single or multi sector RRU's.

The multi feed hybrid cable systems provide the option of deploying either multiple RRU's at the time of initial installation or a single RRU with the possibility of future RRU additions. This scalable solution provides a cost-effective and efficient means of connecting additional RRU's without disrupting pre-existing network services.



### Optimising wireless infrastructure with hybrid cable

Wireless infrastructure hybrid cable is a specially designed composite cable that contains optical fibre and DC power distribution in a single cable. By replacing traditional multi-cable deployments which require longer installation times with hybrid cable, network operators are able to reduce installation times and cable congestion. In addition, due to the overall lighter weight of hybrid cable when compared to multi-cable deployments, tower load is also greatly reduced by approximately 30%.

### **Faster installation**

Deploying a single cable with integrated optical fibre and power feeds is much more cost effective than deploying individual cables. By minimising cable runs, costs are saved and installation time is improved. WBT hybrid cable combines both DC power and optical fibre into a single, sturdy yet highly flexible cable.

### Reduced cable congestion

Due to the reduced diameter of hybrid cables, congestion is reduced on the pole, allowing more room for additional RRU and cable deployments. A  $\frac{1}{2}$ " hybrid cable can support one mobile sector. In addition, the  $\frac{7}{8}$ " hybrid cable can support up to 4 RRU's, and the 1  $\frac{1}{4}$ " hybrid cable can support up to 9 RRU's.

### Easier network upgrades

The hybrid cabling systems for multiple RRU's only needs to be installed once. Even if it is initially servicing 1 RRU, it has spare capacity for additional upgrades for up to 9 RRU's. Rather than deploying extright angle cable up the pole, a simple hybrid jumper cable from the interface box to the RRU is connected to provide an extright angle service.

WBT hybrid cable is available in a ½" diameter for single sector deployment, 7/s" diameter for multi-sector deployment of 4 RRU's or 1 ¼" diameter for up to 9 RRU's

WARREN AND BROWN TECHN

### Optimising wireless infrastructure with plug and play pre-connectorised products

Factory terminated pre-connectorised products provide a faultless plug and play solution for wireless network operators. Each solution utilises industry standard connector interfaces to ensure reliable compatibility. This approach removes risk and intensive labour time from the field and instead improves reliability and efficiency.



# System 1 Single RRU solution - 1/2" hybrid cable

The ½" hybrid cable, single RRU solution from WBT utilises a weather-proof outdoor junction box and connects to the RRU via ½" hybrid tail cables. This system includes WBT ½" hybrid trunk cable which is provided as a pre-terminated solution and is supplied with the interfacing junction box. Single fibre or dual fibre tail cables are available to suit various RRU configurations.

In addition, a number of variations are available to also suit installations with pre-existing trunk cables. Custom hybrid trunk cable lengths can be ordered to exact metre requirements, ensuring no cable wastage and eliminating excess cable management.

🛜 Spare fibre pair provides backup / redundancy option

Pre-connectorised for rapid deployment

Custom hybrid trunk and tail cable lengths

### Products in system

- TC4039-95-XX:
   ½" Hybrid trunk cable assembly with Junction box (note XX\* = length of cable (in m). Includes TC4039MOBILE01 - Junction box, for Single Remote Radio Unit (RRU) applications
- TC4039-417-XX:
   2 pair fibre ½" hybrid tail cable (note XX\*= length of cable (in m)
- TC4039-416-XX:
   Single pair fibre ½" hybrid tail cable (note XX\*= length of cable (in m)

#### Variation:

 TC4029CWDM3: Junction box, for Single Remote Radio Unit (RRU) applications (variation to main solution) TC4039-95 Series: **1/2" Hybrid cable junction box and tail cable** 



This junction box is used as an enclosure for both optical fibre cords and 48V DC power cables as well as serving as a connection interface between the  $\frac{1}{2}$ " hybrid trunk cable and hybrid tail cables. The internal connections feature a 4 x SC/A connector patch panel and 48 volt DC power connector pair. It is supplied with pre-terminated trunk cable for rapid deployment.

- Weather-proof enclosure, IP66 rated
- 4 x SC/A through adaptors
- 1 x 48V DC power connector pair
- Removable cover
- Includes Junction Box (P/N TC4029MOBILE01)

Compatible with 1/2" hybrid trunk cable

Connects to RRU's via ½" hybrid jumper cable Supplied with pre-configured ½" trunk cable

The ½" trunk cable is provided with every **TC4029MOBILE01 junction box** as part of a pre-terminated solution to allow for fast and easy installation. Custom trunk cable lengths can be specified for every junction box, ensuring precise cable lengths and no material wastage.

Provided pre-terminated and connected to every TC4029MOBILE01 Junction box

Custom trunk cable lengths to suit every site

#### Ordering Information

P/N - TC4039-95-xxA - Junction box with pre-terminated ½" hybrid cable assembly - (note \*xx = length of cable (in m) For example : TC4039-95-30A is a Junction box assembly with a 30 metre ½" hybrid trunk cable

### TC4029CWDM3: Junction box, for single RRU applications



An IP65 weather-proof enclosure, typically installed on a pole at a Remote Radio Unit site. The enclosure also allows the RRU radio equipment to be connected to the optic fibre cable using a composite cable, and the 2 x A/SC position patch panel provided. A twin power connector position is provided, to enable connection between two power cables.

- Contains a secure, removal cover
- IP65 rating Suitable for harsh weather environments
- All optics and power accessible via a single compartment

Compatible with most pre-installed ½" hybrid trunk cable Connects to RRU via ½" hybrid tail cable

# 1/2" hybrid cable single RRU application



TC4039-417-XX, 2 pair fibre ½" hybrid tail cable

> Juction box end 4 x SC/A fibre connectors and Anderson power connectors

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RRU end 2 x Full AXS LC fibre connectors & DC power connector

1/2" hybrid cable

RRU end Full AXS LC fibre connector & DC power connector

1

### TC4039-416-XX Single pair fibre ½" hybrid tail cable

Juction box end 2 x SC/A fibre connectors and Anderson power connectors

> TC4039-95-XX 1/2" hybrid trunk cable assembly with junction box

> > **BBU Room**

TC4039MOBILE01 Junction box

**BBU side end** <sup>▲</sup> 4 x LC connectors 1 x DC power pairs (no connectors)



Fibre cable is connected into fibre optic trays within a fibre termination rack and DC power cables are connected to the power distribution board



SC/A • Through Adaptors

> Junction box side end 4 x SC/A connectors 1 x DC power pairs with connectors supplied preconfigured in junction box

# System 2 **Multi RRU** solution - 7/8" hybrid cable

The hybrid multi RRU system utilises a weather-proof outdoor junction box and connects to the RRU via 1/2" hybrid tail cable. This system includes WBT 7/8" hybrid trunk cable which is provided as a pre-terminated solution and is supplied with the interfacing junction box. MPO connectors are provided at each end of the trunk cable along with the DC power interfaces. Custom hybrid 7/8" cable lengths can be ordered to exact metre requirements, ensuring no cable wastage and eliminating excess cable management.

### Products in system

- TC4039-15-XX\*: 7/s" Hybrid trunk cable with junction box (note XX\* = length of cable (in m). Includes TC4039MOBILE02 - Junction box, for multi Remote Radio Unit (RRU) applications
- TC4039-417-XX: 2 fibre pairs 1/2" Hybrid tail cable (note XX\*= length of cable (in m)
- TC4039-416-XX: 2 fibres 1/2" Hybrid tail cable (note XX\* = length of cable (in m)

TC4039-15 Series: **Junction Box** with preterm trunk cable, weather-proof, for up to 4 RRU's



This junction box is used as an enclosure for both optical fibre cords and 48V DC power cables as well as serving as a connection interface between the hybrid trunk cable and hybrid tail cables. The internal connections feature a pivot opening MPO cassette, a 16 position SC/A connector patch panel and 4 x positions for 48 volt DC power connectors. It is specifically designed for connecting up to 4RRU's and provides a guick and effective means of adding extright angle wireless sectors. It is supplied with pre-terminated trunk cable for rapid deployment.

- Weather-proof enclosure, IP65 rated
- Contains a pivoting MPO cassette, with a 16 position A/SC patch panel
- Contains connectors for 4 x 48V DC power systems

#### Suitable for connecting up to 4 RRU's Optical Fibro RRU Compatible with 7/8" hybrid trunk cable High Density, scalable solution Connects to RRU's via 1/2"

hybrid jumper cable

Supplied with pre-configured trunk cable

The <sup>7</sup>/<sub>8</sub>" multi feed trunk cable is provided with every TC4039MOBILE02 junction box as part of a pre-terminated solution to allow for fast and easy installation. Custom trunk cable lengths can be specified with every junction box.

Provided pre-terminated and connected to every TC4039MOBILE02 Junction box

Custom trunk cable lengths to suit every site







### Ordering Information

P/N - TC4039-15-xxA\* - Junction box with pre-terminated 7/8" hybrid cable assembly (note xx\*= length of cable (in m) For example : TC4039-15-30A is a Junction box assembly with a 30m long <sup>7</sup>/s" hybrid trunk cable



# System 34G/5G4 x RRUSolution - 7/8"hybrid cable

This hybrid <sup>7</sup>/s" multi feed trunk cable with hybrid junction box is used as part of pre-terminated solution to allow for fast and easy installation. The hybrid junction box provides 4 x hybrid terminal port connections, combining optical and DC power in one hybrid plug-and-play connector, designed to provide 4F MPO and 8F MPO RRU connections.

### Products in system

- TC4039-198-XXA\*:
   7/s" Hybrid cable junction box and trunk cable (note XX\* = length of cable (in m). Includes TC4039MOBILE08 - Junction box, MPO connections, pole mounted
- TC4039-422-XX\*:
   2 fibres Hybrid jumper cable (note XX\*= length of cable in meters)
- TC4039-419-XX\*:
   4 fibres Hybrid jumper cable (note XX\*= length of cable in meters)

#### Variation:

TC4039-98-XXA:
 Hybrid <sup>7</sup>/s" cable (without junction box), optical
 MPO - MPO, Power Connections (variation to main solution)

### **BBU Room**

- HXTS32U1W1:
   **1RU modular patch panel, 4 slot**
- HXCS02SPEC0002:
   MPO to LC singlemode cassette, 24 fibre
- TC3093M:
   **1RU Optical fibre cable storage tray (optional)**

### TC4039-198-XXA: 7/s" hybrid trunk cable with junction box



On one end of the hybrid trunk cable is the BBU, preterminated with 2 x 12F MPO connectors (A & B) and 4 pair of unterminated copper cables, whereas the other end is connected to the RRU via the 2 x pluggable bulkhead 4-pin DC power connections, and 2 x 12F MPO connectors (A & B), located at the bottom part of the hybrid junction box. This feature facilitates the ease of installation of the 7/s'' hybrid cable to the junction box, allowing separate access of the main trunk cable, without disturbing the internal optical and power wiring of the junction box.

Hybrid Junction box



- Plug-and-play
- IP65 weather-proof and UV-resistant enclosure
- Hybrid MPO plug connectors
- Ports 1 & 2: 1 x 4F MPO and 1 x DC power pair Ports 3 & 4: 1 x 8F MPO and 1 x DC power pair
- Molex MultiCAT male power connectors
- Pole mountable using standard "band-it" straps, on stainless steel mounting brackets
- Wall mountable
- Meets all mobiles optical and physical performance criteria

### Hybrid Cable



- 2 x 12 fibre MPO optical connections
- 2 x Molex MultiCAT female power connectors
- Wall and pole mountable using standard "band-it" SS style straps
- Custom trunk cable lengths to suit every site (available in: 25, 30, 40, 50, 60, 70, 80, 90,100 and up to 200m)



### 4 x RRU solution - 7/8" Hybrid cable application

TC4039-198-XXA **Trunk cable with junction box** (TC4039MOBILE08)

BBL



MPO to LC singlemode cassette

Modular patch panel with cable storge tray

### TC4039-98-XXA: Hybrid <sup>7</sup>/s" cable, optical MPO – MPO, power connections without junction box

This 7/8" multi feed trunk cable is used as part of pre-terminated solution to allow for fast and easy installation. The cable is used with a Junction Box (Part No: TC4039MOBILE08); which is available separately. This pre-terminated solution is specifically designed for connecting up to 4 RRU's and provides a quick and effective means of adding extright angle wireless sectors at a Mobiles base station.



- Plug and play solution
- 2 x 12 fibre MPO optical connections
- 2 x Molex MultiCAT female power connectors
- Wall and pole mountable using standard "band-it" SS style straps
- Custom trunk cable lengths to suit every site (Available in: 25, 30, 40, 50, 60, 70, 80, 90,100 and up to 200m)

# Hybrid jumper cables for system 1 & 2

Hybrid jumper cables are required to provide the final connection from the junction box to the RRU. These cables provide both optical fibre and power connection. In addition, the RRU connection side can also be customised to suit a variety of RRU vendor interfaces. The following hybrid tail cables are suitable for system 1 & system 2 applications. The RRU connectivity side features a weatherproof DC power connector and a fully sealed, IP rated Full AXS LC duplex connector.

### Products

- TC4039-416-XX: **1 fibre pair hybrid jumper cable**
- TC4039-417-XX: 2 fibre pairs hybrid jumper cable

Junction Box End RRU

End

### RRU End



Ordering Information

LC connectors

For example - Hybrid Cable P/N - TC4039-30-XX XX = length of cable (in m), e.g. TC4039-30-5.0 (5m long)

### TC4039-416-XX\*: 1 fibre pair hybrid jumper cable from Junction Box to RRU

- Weather-proof jumper cable connects from an Interface box to an RRU
- Full AXS (LC duplex) connectors, for RRU port connection
- 2 Fibre SC/A connectors, and 48V DC connectors for Junction box connection
- Provided with an earth kit
- Flexible cable supplied in a corrugated jacket



XX = 2.5, 5.0, 7.5m

### TC4039-417-XX\*: 2 fibre pairs hybrid tail cable to suit RRU dual system

- RRU end has 2 x Full AXS LC connectors and a single DC power connector
- Junction box / enclosure end has 2 pairs of SC/A optic fibre connectors (send/receive) and Anderson power connectors

XX = 2.5, 5.0, 7.5m



# Hybrid jumper cables for system 3

These Hybrid Jumper Cables are used to connect from an Interface Box to an Ericsson RRU.

One end contains an optical fibre MPO Connector, plus a 48V DC power connector. These items feed through a protective corrugated sheath to other end. Here a connector pair of LC Duplex connectors for connecting to RRU's.

Different break-out lengths for the various cords and cables are provided. These Hybrid Jumper Cables are available in different lengths.

### Products

- TC4039-422-XX\*:
   2 fibres hybrid jumper cable (note XX\*= length of cable in meters)
- TC4039-419-XX\*:
   4 fibres hybrid jumper cable (note XX\*= length of cable in meters)

### TC4039-422-XX\*: **2 fibres, 1 power, hybrid jumper cables**

- 2 fibre hybrid jumper cable
- Weather-proof jumper cable connects from an Interface Box to an RRU
- Low loss, high performance optical connectors are used e.g. LC Duplex and MPO
- Cable provides a 48V DC power feed
- Flexible cable supplied in a corrugated jacket

XX=2.5, 5.0, 7.5



### TC4039-419-XX\*: **4 fibres, 1 power, hybrid jumper cables**

- 4 fibre Hybrid Jumper Cable
- Weather-proof jumper cable connects from an Interface Box to an RRU
- Low loss, high performance optical connectors are used e.g. LC Duplex and MPO
- Cable provides a 48V DC power feed
- Flexible cable supplied in a corrugated jacket

XX=2.5, 5.0, 7.5



# System 4 Direct connection hybrid feeder cables

The direct connection hybrid feeder cables have been designed to enable fast deployment and to provide a reliable connection by means of weather sealed connectors.

Typically, the cable will run from the RRU at the top of the tower to the BBU located in the communications room at the base of the tower. This solution provides a direct connection method, eliminating the need for a junction box. A number of cable options are available including custom lengths.

- Plug and play solution
- Length of cords from breakout area is 800mm for <sup>1</sup>/<sub>2</sub>" cable
- Length of cords from breakout area is 2000mm for <sup>7</sup>/s" cable
- Available in any custom length

### Products in system

- TC4039-90 Series: 3 fibre pairs, 2 DC power pairs - <sup>7</sup>/s" hybrid feeder cable
- TC4039-91 Series: 1 fibre pair, 1 DC power pair - ½" hybrid feeder cable
- TC4039-92 Series: 2 fibre pairs, 1 DC power pair 1/2" hybrid feeder cable
- TC4039-93 Series: 3 fibre pairs, 1 DC power pair - 1/2" hybrid feeder cable
- TC4039-19-XXA Series: 4 fibre, LC
   singlemode duplex, ½" hybrid trunk cable

#### **Ordering Information**

P/N - TC4039-19-XXA\* Note - XX\* = length of cable (in m), e.g. TC4039-19<u>-85A</u> (85m long)

### Direct connection hybrid feeder cables application

TC4030-19-XXA Hybrid trunk cable, 4-fibre, LC singlemode duplex

XX = custom length available (e.g. 85m)



### TC4039-90 Series: 3 fibre pairs, 2 DC power pairs - 7/8" hybrid feeder cable

- 3 fibre pairs with pre-terminated weather-proof / sealed LC Duplex connectors
- 2 DC power pairs (6mm<sup>2</sup> or 8mm<sup>2</sup> power cable with crimp bootlace connectors)
- 2 pairs of spare fibre available for maintenance purposes
- Identical cable configuration at RRU and BBU ends

### TC4039-91 Series: 1 fibre pair, 1 DC power pair - 1/2" hybrid feeder cable

- 1 fibre pair with pre-terminated weather-proof / sealed LC Duplex connector
- 1 DC power pair (6mm<sup>2</sup> or 8mm<sup>2</sup> power cable with crimp bootlace connectors)
- Identical cable configuration at RRU and BBU ends

### TC4039-92 Series: 2 fibre pairs, 1 DC power pair - 1/2" hybrid feeder cable

- 2 fibre pairs with pre-terminated weather-proof / sealed LC Duplex connectors
- 1 DC power pair (6mm<sup>2</sup> or 8mm<sup>2</sup> power cable with crimp bootlace connectors)
- Identical cable configuration at RRU and BBU ends



### TC4039-93 Series: 3 fibre pairs, 1 DC power pair - 1/2" hybrid feeder cable

- 3 fibre pairs with pre-terminated weather-proof / sealed LC Duplex connectors
- 1 DC power pair (6mm<sup>2</sup> or 8mm<sup>2</sup> power cable with crimp bootlace connectors)
- 2 pairs of spare fibre available for maintenance purposes
- Identical cable configuration at RRU and BBU ends



### TC4030-19-XXA Series: 4 fibre, LC singlemode duplex, 1/2" hybrid trunk cable

- 4 optical cables with LC duplex connectors and 1 pair DC cable (Red and Blue)
- Connects RRU to BBU, at a mobile radio site
- Custom lengths available, as per customer's requirements
- Low loss, high performance optical connectors are used
- Field terminated DC cable provides a 48V DC power feed
- Weather-proof and bird-proof





# System 5 **6 x RRU** Solution

Hybrid cable 6 DC and 2 x 12 MPO Assembly

### Products in system

- VAC4036MOBILE02:
   Mobile junction box, 24 LCD, 6 x RRU
- VAC4036-51-XXA: Hybrid cable 6 DC, 2 x 12 MPO assembly
- VAC4036-03-XA3: Hybrid jumper cable 4F / 1 pair DC power (for Huawei RRU)
- TC4030-18-XX: Hybrid jumper cable 4F, 1 pair DC power (for Nokia RRU)
- VAC4030-60-XX: Hybrid jumper cable 4F, 1 pair DC power (for Nokia 4G/5G RRU with standard flexible boots)
- VAC4030-61-XX: Hybrid jumper cable 4F, 1 pair DC power (for Nokia 4G/5G RRU)
- VAC4036-65-XX: Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing (for Nokia RRH)
- VAC4036-66-XX: Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing (for Nokia RRH)
  - (note XX\*= length of cable (in m)

### **BBU Room**

- HXTS02U1W1:
   **1RU modular patch panel, 4 slot**
- VACS02K4G2V2P6:
   MPO cassette, 2 x MPO to 24 x LC
- TC3093M:
   **1RU Optical fibre cable storage tray (optional)**

### VAC4036MOBILE02: **Mobile junction box, 24 LCD, 6 x RRU**



This terminal box, with MPO connectors is installed at a Remote Radio Unit (RRU) site and can feed 6 x RRU. The box is an externally mounted enclosure, allows for an optical connection between the mobiles base station and 6x RRU.

- Plug and play
- IP66 weather-proof, UV resistant, enclosure
- Weather-proof cable gland entries
- Features high density MPO connectors
- Pole mountable using standard "band-it" straps, on stainless steel mounting brackets
- Wall mountable
- Meets all mobiles optical and physical performance criteria



### VAC4036-51-XXA: **Hybrid cable 6 DC, 2 x 12 MPO assembly**



This 1 ¼" (Ø38.5mm) hybrid trunk cable on drum is preterminated as a part of 6 RRU hybrid junction box. The 6 pair DC power connector is terminated in staggered length with cable lugs for quick and easy installation to the 6 RRU hybrid junction box. This pre-terminated solution is specifically designed for connecting up to 6 RRUs and provides a fast and effective means of adding extright angle wireless sectors at mobile base station.

- 2 x 12 fibre MPO Optical connections
- 12 x DC copper cables (10mm<sup>2</sup>)
- Pre-terminated copper cables with lugs for quick and easy installation to Mobile junction box
- Custom trunk cable lengths to suit every site





**MPO to LC singlemode** 

Hybrid jumper cables

cassette

### 6 x RRU Solution - Hybrid cable 6 DC and 2 x 12 MPO assembly application

VAC4036MOBILE02: Mobile junction box, 24 LCD, 6 x RRU



VAC4036-51-XXA: Hybrid cable 6
 DC, 2 x 12 MPO assembly

Modular patch panel with cable storge tray

VAC4036-03-XA3: **Hybrid jumper cable 4F, 1 pair DC power** (for Huawei RRU)

TC4030-18-XX: **Hybrid jumper cable 4F, 1 pair DC power** (for Nokia RRU)

VAC4036-60-XX: **Hybrid jumper cable 4F, 1 pair DC power** (for Nokia 4G/5G RRU with standard flexible boots)

VAC4036-61-XX: **Hybrid jumper cable 4F, 1 pair DC power, LC Duplex** (for Nokia 4G/5G RRU)

VAC4036-65-XX: **Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing** (for Nokia RRH)

VAC4036-66-XX: **Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing** (for Nokia RRH)



## System 6 9 x RRU Solution Hybrid cable 9 DC an

Hybrid cable 9 DC and 3 x 12 MPO Assembly

### Products in system

- VAC4036MOBILE03: Mobile junction box, 36 LCD, 9 x RRU
- VAC4036-52-XXA: Hybrid cable 9 DC, 3 x 12 MPO assembly
- VAC4036-03-XA3: Hybrid jumper cable 4F / 1 pair DC power (for Huawei RRU)
- TC4030-18-XX: Hybrid jumper cable 4F, 1 pair DC power (for Nokia RRU)
- VAC4036-60-XX:
   Hybrid jumper cable 4F, 1 pair DC power (for Nokia 4G/5G RRU with standard flexible boots)
- VAC4036-61-XX: Hybrid jumper cable 4F, 1 pair DC power (for Nokia 4G/5G RRU)
- VAC4036-65-XX: Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing (for Nokia RRH)
- VAC4036-66-XX: Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing (for Nokia RRH)

(note XX\*= length of cable (in m)

### **BBU Room**

- HXTS02U1W1:
   **1RU modular patch panel, 4 slot**
- VACS01K4G2V2P6: MPO cassette, 3 x MPO to 36 x LC
- TC3093M:
   **1RU Optical fibre cable storage tray (optional)**

### VAC4036MOBILE03: **Mobile junction box, 36 LCD, 9 x RRU**



This hybrid terminal box, with MPO connectors is installed at a Remote Radio Unit (RRU) site and can feed up to a maximum of 9 RRU. The box is an externally mounted enclosure, allows for an optical connection between the mobiles base station and 9 x RRU.

- Connects up to a maximum of 9 x RRUs
- IP66 weather-proof, UV
   resistant, enclosure
- 9 x weather-proof cable gland entries
- MPO connectors and DC power system connections
- Swing-up torque hinged cassette for easy access to connection terminals
- Pole mountable using standard "band-it" straps, on stainless steel mounting brackets
- Wall mountable



### VAC4036-52-XXA: **Hybrid cable 9 DC, 3 x 12 MPO assembly**



This 1 ¼" (Ø40mm) multi-feed trunk cable on drum is preterminated as a part of 9 RRU mobile junction box. The 9-pair DC power connector is terminated to length with cable lugs for quick and easy installation to the 9 RRU mobile junction box. This pre-terminated solution is specifically designed to accommodate connections up to 9 RRUs and provide a fast and effective means of adding straight angle wireless sectors at mobile base station. 9 RRU hybrid terminal box (VAC4036MOBILE03) is sold separately.

- 6 x 12F MPO/APC singlemode
- 18 x DC copper cables (10mm<sup>2</sup>)
- Comes with cable hoisting kit for easy cable hauling
- Pre-terminated copper cables with lugs for quick and easy installation to Mobile junction box
- Custom trunk cable lengths to suit every site (available in 5m increment from 15m to 150m)





VAC4036-03-XA3: **Hybrid jumper cable 4F, 1 pair DC power** (for Huawei RRU)

TC4030-18-XX: **Hybrid jumper cable 4F, 1 pair DC power** (for Nokia RRU)

VAC4036-60-XX: **Hybrid jumper cable 4F, 1 pair DC power** (for Nokia 4G/5G RRU with standard flexible boots)

VAC4036-61-XX: **Hybrid jumper cable 4F, 1 pair DC power, LC Duplex** (for Nokia 4G/5G RRU)

VAC4036-65-XX: **Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing** (for Nokia RRH)

VAC4036-66-XX: **Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing** (for Nokia RRH)





# Hybrid jumper cables for system 5 & 6

The Hybrid Jumper Cables are used to connect VAC Hybrid Junction Boxes (P/Ns VAC4036MOBILE02 & VAC4036MOBILE03) and the RRHs/RRUs at the mobile radio sites.

### Products

- VAC4036-03-XA3: Hybrid jumper cable 4F, 1 pair DC power (for Huawei RRU)
- TC4030-18-XX: Hybrid jumper cable 4F, 1 pair DC power (for Nokia RRU)
- VAC4036-60-XX: Hybrid jumper cable 4F, 1 pair DC power (for Nokia 4G/5G RRU with standard flexible boots)
- VAC4036-61-XX: Hybrid jumper cable 4F, 1 pair DC power, LC Duplex (for Nokia 4G/5G RRU)
- VAC4036-65-XX: Hybrid jumper cable 4F, LC Duplex, R2CT connectors with birdproof housing (for Nokia RRH)
- VAC4036-66-XX: Hybrid jumper cable 4F, LC Duplex, R2CT connectors with birdproof housing (for Nokia RRH)

### VAC4036-03-XA3: **Hybrid jumper cable 4F, 1 pair DC power** (for Huawei RRU)

This 1⁄2" hybrid jumper cable allows connection from a hybrid junction box to the Huawei RRU. Comes with 4 optical cable with LC duplex connectors and 1 pair DC cable (Red and Blue). The jumper cable is available in several standard lengths.

- Connects RRU to Junction Box at a mobile radio site
- Available in standard lengths of 2.0m, 3.0m, 5.0m
- Bird-proof
- Field terminated DC cable



### TC4030-18-XX: **Hybrid jumper cable 4F, 1 pair DC power** (for Nokia RRU)

This ½" hybrid jumper cable allows connection from a hybrid junction box to the Nokia RRU. Comes with 4 optical cable with LC duplex connectors and 1 pair DC cable (Red and Blue). On one end, the optical fibre cables are housed in a protective corrugated rubber sock with the main purpose of protecting the optical cable-to-RRU connections against birds and other outdoor elements and adding flexibility to the connections. The jumper cable is available in several standard lengths.

- Connects RRU to Junction Box at a mobile radio site
- Available in standard lengths of 2.0m, 3.0m, 5.0m, and 10.0m
- Bird-proof
- Field terminated DC cable



## VAC4036-60-XX: **Hybrid jumper cable 4F, 1 pair DC power** (for Nokia 4G/5G RRU with standard flexible boots)

The fibre and DC power cables are fed through a Ø21mm flexible corrugated tube connected to a central member (Ø42mm outer corrugated tube) where it breaks out into 3x individual tubes (2 of which contains the optical fibre cables, and the other contains the DC power cable that is terminated to a 2-pin, 48V DC power connector).

- Connects Hybrid Junction Boxes to Nokia RRH at a mobile radio site
- Available in standard lengths of 2.0m, 3.0m, 5.0m, and 7.0m
- Bird-proof and weather-proof
- Pre-terminated DC cables
- Low loss, high performance optical connectors are used
- Cable provides a 48V DC power feed
- Flexible cable supplied in a corrugated jacket

### VAC4036-61-XX: **Hybrid jumper cable 4F, 1 pair DC power, LC Duplex** (for Nokia 4G/5G RRU)

The fibre and DC power cables are fed through a Ø21mm flexible corrugated tube connected to a central member (Ø42mm outer corrugated tube) where it breaks out into 3x individual tubes (2 of which contains the optical fibre cables with LC duplex connectors, and the other contains the DC power cable that is terminated to a 2-pin, 48V DC power connector).

- Connects Hybrid Junction Boxes to Nokia RRH at a mobile radio site
- Available in standard lengths of 2.0m, 3.0m, 5.0m, and 7.0m
- Bird-proof and weather-proof
- Pre-terminated DC cables
- Low loss, high performance optical connectors are used e.g. LC Duplex
- Cable provides a 48V DC power feed
- Flexible cable supplied in a corrugated jacket

### VAC4036-65-XX: **Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing** (for Nokia RRH)

- Connects Hybrid Junction Boxes to Nokia RRH (e.g. AIR Antenna Integrated Radio for 5G) at a mobile radio site
- Pre-terminated fibre and DC Cables
- Pre-installed IP67 R2CT housing; for easy and quick installation and removal
- Bird-proof hard plastic housing
- Low loss, high performance optical connectors are used
- Cable provides a 48V DC power feed
- Flexible cable supplied in a corrugated jacket

### VAC4036-66-XX: **Hybrid jumper cable 4F, LC Duplex, R2CT connectors with bird-proof housing** (for Nokia RRH)

- Connects Hybrid Junction Boxes to Nokia RRH at a mobile radio site
- Pre-terminated fibre and DC Cables
- Pre-installed IP67 R2CT housing; for easy and quick installation and removal.
- Bird-proof hard plastic housing
- Low loss, high performance optical connectors are used e.g. LC Duplex
- Cable provides a 48V DC power feed
- Flexible cable supplied in a corrugated jacket









# System 7 SMALL CELL (Radio Head 2.5G SFW <10km)

## Optical Fibre Do Not Disturb Fibre Interface Box WBT PIN: TC4929MOBILE03

### TC4029MOBILE03: **Optical interface box, SC/A connections, pole mounted**

This Remote Radio Site Unit (RRU), externally mounted enclosure, allows for an optical connection between the Mobiles base station and the RRU. The module provides a patching connection for  $4 \times A/SC$  optical connectors. The enclosure allows connection for  $4 \times RRU$ 's.

- Plug and play
- IP65 weather-proof, UV resistant, enclosure
- 2 x weather-proof cable gland entries
- Fixed 4 position A/SC patch panel
- Pole mountable using standard "band-it" straps, on stainless steel mounting brackets
- Wall mountable

## TC4039-113-XX: Jumper cable LC - SC/A full AXS (single LC) with bird-proof housing



A simplex LC to SCA cable is used to connect the radio 2217 to the fibre interface box.

- Weather-proof & bird-proof
- Full AXS Simplex connector
- Available in different length

### Products

- TC4029MOBILE03: Optical interface box, SC/A connections, pole mounted
- TC4039-113-XX: Jumper cable LC SC/A full AXS (single LC) with bird-proof housing
- TC4039-304-XX: **Rim tail cable with 4 SC/A connector & U cable gland**
- TC4039-302-XX: **Rim tail cable with 2 SC/A connector & U cable gland**



### TC4039-304-XX: Rim tail cable with 4 SC/A connector & U cable gland

This Rim tail cable with 4 SC/A angled connector is used to connect from the Fibre Interface box to the Fibre Access Point (FAP).



### TC4039-302-XX: Rim tail cable with 2 SC/A connector & U cable gland

This Rim tail cable with 2 SC/A angled connector is used to connect from the Fibre Interface box to the Fibre Access Point (FAP).



# System 8 SMALL CELL (Macro Lite GE SFW <10km)

### Products

- TC4029MOBILE03: Optical interface box, SC/A connections, pole mounted
- TC4039-112-XX: Jumper cable LC LC full
   AXS with bird-proof housing
- TC4039-301-XX: Small cell jumper cable LC SC/A
- TC4039-304-XX: **Rim tail cable with 4 SC/A connector & U cable gland**
- TC4039-302-XX: Rim tail cable with 2 SC/A connector & U cable gland



### TC4029MOBILE03: **Optical interface box, SC/A connections, pole mounted**

This Remote Radio Site Unit (RRU), externally mounted enclosure, allows for an optical connection between the Mobiles base station and the RRU. The module provides a patching connection for  $4 \times A/SC$  optical connectors. The enclosure allows connection for  $4 \times RRU$ 's.

- Plug and play
- IP65 weather-proof, UV resistant, enclosure
- 2 x weather-proof cable gland entries
- Fixed 4 position A/SC patch panel
- Pole mountable using standard "band-it" straps, on stainless steel mounting brackets
- Wall mountable

## TC4039-112-XX: Jumper cable LC - LC full AXS with bird-proof housing



A simplex LC to LC cable use to connect the radio 2217 to the compact baseband (RBS 6302).

- Weather-proof & bird-proof
- Full AXS Simplex connector
- Available in different length



### TC4039-301-XX: Small cell jumper cable LC - SC/A

A single fibre cable use to connect from the fibre interface box (SCA connector) to the baseband unit RBS6302.

- Weather-proof & bird-proof
- SCA to LC
- Available in different length

### TC4039-304-XX: Rim tail cable with 4 SC/A connector & U cable gland



### TC4039-302-XX: Rim tail cable with 2 SC/A connector & U cable gland

This Rim tail cable with 2 SC/A angled connector is used to connect from the Fibre Interface box to the Fibre Access Point (FAP).



# System 9 Plug & play system using hybrid connector

This plug and play system utilises hybrid fibre optic and power cable as well as an innovative hybrid connector. The hybrid connector provides both fibre optic and DC power connectivity. This method of connectivity reduced installation times and provides a secure and reliable means of rapidly deploying additional services.

### **Efficient and Reliable**

The hybrid connectors provide both fibre optic and power connectivity, are IP rated and are fully weather and dust proof. These connectors connect directly to the distribution enclosure, while the other end (RRU side) can be customised to suit various RRU interfaces. The hybrid connector and cable solution removes the need to install seperate fibre optic and power feeds, which reduces installation time, material wastage and cost.

### Expandable

The hybrid plug and play enclosure and hybrid tails are designed to offer full flexibility for future expansion. Hybrid tail or jumper cables can be easily installed at the same time when additional RRU's are deployed. This is due to the single hybrid connection structure that allows the tail cables to connect via the distribution enclosure.

### Products in system

- TC4039MOBILE10: Plug and play hybrid junction box
- TC4039-107-XXA: Hybrid <sup>7</sup>/s" multi feed trunk cable
- TC4039-522-XX: 1 fibre pair, 1 power pair, hybrid tail cables
- TC4039-519-XX: 2 fibre pairs, 1 power pair, hybrid tail cables to suit RRU dual system

### **BBU** Room

- HXTS32U1W1: **1RU modular patch panel**, **4 slot**
- HXCS02SPEC0002: MTP®/MPO to LC singlemode cassette, 24 fibre
- TC3093M: **1RU Optical fibre cable storage tray** (optional)

### Plug & play hybrid junction box (TC4039MOBILE10) and hybrid <sup>7</sup>/s" multi feed trunk cable (TC4039-107-XXA)

The IP rated enclosures are designed to simplify deployment and provide an effective way of upgrading and installing additional RRU's.

The Hybrid 7/8" multi feed trunk cable is used as part of preterminated solution to allow for fast and easy installation. The cable is used with the hybrid junction box which is available separately. This pre-terminated solution is



specifically designed for connecting up to 4 RRU's and provides a quick and effective means of adding extright angle wireless sectors at a Mobiles base station.



### <u>Hybrid Cable</u>

- IP67 weather-proof
- 2 x 12 fibre MPO optical connections
- 2 x Molex MultiCAT female power connectors
- Wall and pole mountable using standard "band-it" SS style straps
- Custom trunk cable lengths to suit every site (available in: 25, 30, 40, 50, 60, 70, 80, 90,100 and up to 200m)



Plug-and-play solution Compact and durable design



### TC4039-522-XX: Hybrid jumper cable, 2 fibres x "L" m, from junction box to RRU

This 2-fibre plug-and-play hybrid jumper cable allows connection from a junction box to an RRU. On one end (Detail A) is a hybrid MPO

connector, which contains combined optical and DC power cable, fed through a protective corrugated sheath, to a canister where the cable breaks out to 1 x pair of LC duplex connectors (Full AXS), + 1 x DC connector (Detail B).

- Weather-proof and bird-proof
- Hybrid plug-and-play MPO connectors
- Full AXS LC duplex connectors
- Amphenol DC power connector
- Low loss, high performance optical connectors are used e.g. LC duplex and MPO
- Cable provides a 48V DC power feed
- Flexible cable supplied in a corrugated jacket
- Available in different lengths

# n a bair of DETAIL A DETAIL A

### TC4039-519-XX: Hybrid jumper cable, 4 fibres x "L"m, from junction box to RRU

This 4-fibre plug-and-play hybrid jumper cable allows connection from a junction box to an RRU. On one end (Detail A) is a hybrid MPO connector, which contains combined optical and

connector, which contains combined optical and DC power cable, fed through a protective corrugated sheath, to a canister where the cable breaks out to  $2 \times pairs$  of LC duplex connectors (Full AXS), +  $1 \times DC$  connector (Detail B).

- Weather-proof and bird-proof
- Hybrid plug-and-play MPO connectors
- Full AXS LC duplex connectors
- Amphenol DC power connector
- Low loss, high performance optical connectors are used e.g. LC duplex and MPO
- Cable provides a 48V DC power feed
- Flexible cable supplied in a corrugated jacket
- Available in different lengths



### System 10

# Coarse wave division multiplexing (CWDM) Solution

CWDM allows the use of a single fibre to transmit up to 40 Km between the main radio unit and the remotes, utilising different wavelengths for transmission over a single fibre. This reduces the need to lay extright angle fibre cables in the field, which can be labour and material intensive. Additionally, it also enables mobiles equipment to be housed in the telecom exchange rather than in a hut or base station. This may be practical for remote locations or other areas which lack the necessary infrastructure or security. The various interconnection boxes, cables, SFP's and other hardware offered by WBT, provides mobile network operators with a smooth upgrade path and helps to future proof for upcoming capacity requirements.

General benefits:

- Reduction in high cost and labour intensive installation of additional optical fibre or coaxial cable
- Allows for quick fit out if upgrading RRU
- Line speed can potentially be upgraded to 5Gb/s and 10Gb/s with alternative SFP modules
- Allows the use of a single exchange fibre for transmission of up to 40 Km between the main radio unit and the remote radio unit on the antenna.
- Up to 18 channels can be made available on CWDM over a single fibre transmission.
- Economical way of increasing capacity and speed of a mobile network
- Bidirectional online monitoring without service interruption

### Rooftop or Remote site

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1. Outside plant cable is terminated in an optical fibre subrack, generally installed in a small cabinet.

2. The fibre optic cable is then connected to the TC4029CWDM1 coupler junction box and the signal is divided into the original wavelengths.

3. The coupler junction box then connects directly to the individual TC4029CWDM2 RRU junction box. Up to 3 can be connected. Power is supplied directly to the TC4029CWDM2 junction box via a power cable from the power distribution board.

4. The TC4029CWDM2 junction box connects directly to the RRU's via a hybrid fibre and power cable. SFP's are also installed on the RRU to complete the CWDM link.

Ideal for remote site applications

### Telecom exchange / Base station

1. SFP's are plugged into the BBU and are connected to the CWDM coupler tray via patch cords. CWDM coupler tray combines multiple wavelengths for transmission over a single fibre.

2. CWDM ports are connected via patch cords to the front patch panel of an optical fibre subrack, generally installed in an ODF.

3. Optic fibre cable is terminated in the subrack and distributes the outside plant cable to the remote site, up to 40km away.

Long distance transmission - up to 40km Multiple wavelength transmission over a single fibre

### **CWDM Products and solutions**

A variety of junction boxes / enclosures and accessories are available for the CWDM mobile solution along with the appropriate hybrid cable. A full range of fibre optic cable management solutions for the exchange / base station provide a true end to end solution.

### Products in system

- TC27102CWDM1 CWDM Coupler tray
- 109x4XX SFP optical transceivers
- 60063221125081L 48 port SC/A optical fibre subrack splice and patch (note: other variations and options are available)
- TC4029CWDM1 Coupler junction box
- TC4029CWDM2 Junction box for single RRU
- Optical fibre patch cords

# 

### Telecom exchange / Base station



### TC4029CWDM1: Coupler junction box, for 3 RRUs (remote end site applications)

This IP67 rated weather-proof coupler enclosure is generally used at remote end radio sites to provide a connection point for a single fibre, three wavelength transmission up to 3 x RRU sectors back to the Exchange. A single Coupler Box contains a CWDM Mux/Demux module and is used to interconnect with up to 3 TC4029CWDM2 enclosures.

- Compact IP67 rated weather-proof enclosure
- Has internal 8 position SC/A optical patch field
- Removable, screw secured cover

### TC4029CWDM2: Junction box for single RRU (remote end site applications)

This IP67 rated weather-proof enclosure is typically used at Remote End Radio sites, to provide a connection point for a single fibre and a 48V DC power connection. Up to three of these boxes are used with TC4029CWDM1 (main) coupler box to provide dual wavelength transmission from 3 x RRU sites back to the exchange over a single optical fibre. This product is part of the CWDM mobile front haul solution where there transmission equipment is located in the Exchange (up to 40km away).

- Compact IP67 rated weather-proof enclosure
- Has internal twin SC/A optical patch field and 48V DC power connector
- Removable, screw secured cover

### TC27102CWDM1: CWDM coupler tray

This CWDM coupler subrack is a 1RU sliding drawer, short depth module and provides patching facilities in an optical fibre equipment or termination rack. The subrack holds a single MUX/DEMUX module, that allows 3 x CWDM systems (of both transmit and receive optical signal streams) to be sent and received on a single fibre.

- Front, mid or rear mount in a 19" or 21" rack
- Allows 3 x RRU to be connected from the exchange on a single fibre
- Internal fibres maintained at an MBR of 30mm
- Subrack slides open 95mm
- Is able to monitor all wavelengths in transmit and receive directions without the need to break working services

### 109x4XX series: SFP optical transceivers

- Multi-rate Operation for 2.488/2.125/1.25/1.063 Gb/s
- 18-Wavelength CWDM DFB LD Transmitter from 1270 nm to 1610 N connector male, with step 20nm
- Minimum 19dB power budget
- Minimum range dB 23dB

### 6006 Series: 1RU Optical fibre subracks

6006 series optical fibre subracks are available in splice & patch, patch only and splice only variations. However, for the mobiles application, generally a splice and patch subrack is suitable for use in the telecom exchange and also at a remote site for CWDM applications. In addition, it provides an excellent all round optic fibre management solution in any network. The swing out design provides easy installation / maintenance of fibre without disturbing fusion splices of fibre cord connections and ensures minimal fibre movements and better protection, when the tray is opened and closed. Many variations and customisable options are available for this subrack series.

- Splice & patch, splice only and patch only options
- 1RU capacity of up to 48LC fibres or 24 SC/A fibres
- Rear, mid or front mount option
- Choice of connector interface
- Available with low loss Grade A connector options
- High density 6008 series 2RU subrack also available up to 144LC









### **Fibre connectivity**

Every connector assembly supplied by WBT is made using quality parts in a high quality termination facility, according to recognised and approved international standards. The quality and inspection procedures employed, ensure only high quality, individually inspected and approved pigtails and patch cords are supplied. Therefore, customers can have confidence knowing that the product supplied will perform reliably to a high standard in the telecommunications and data networks for many years. Each patch cord is individually inspected and tested at the time of production.

- Singlemode G657A2, G652D or multimode OM4 fibre options
- Simplex, duplex as well as multi-fibre patch cord options
- LSZH sheath
- Complies with ANSI, Bellcore, TIA / EIA, IEC standards
- Factory terminated and tested
- Choice of connector types LC, LC duplex, SC/UPC, SC/APC, etc
- Reduced diameter LC duplex uniboot patch cord options
- LC-LC Duplex uniboot, push/pull tab patch cords
- Lower profile patch cords
- Various patch cord lengths
- Fast delivery and stock availability





#### Multimode connectors performance information:

|                  | SC                       | ST                       | FC                       | LC                       |
|------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Ferrule          | 2.5 mm dia<br>Zirconia   | 2.5 mm dia<br>Zirconia   | 2.5 mm dia<br>Zirconia   | 1.25 mm dia<br>Zirconia  |
| Standard polish  | UPC                      | UPC                      | UPC                      | UPC                      |
| Insertion loss   | 0.2 dB typ<br>0.3 dB max | 0.2 dB typ<br>0.4 dB max | 0.2 dB typ<br>0.3 dB max | 0.2 dB typ<br>0.3 dB max |
| Return loss      | 35 dB                    | 35 dB                    | 35 dB                    | 35 dB                    |
| Terminations     | >500                     | >500                     | >500                     | >500                     |
| Service temp. °C | -20 to +60               | -20 to +60               | -20 to +60               | -20 to +60               |

#### Singlemode connectors performance information:

|                  | SC                       | ST                       | FC                       | LC                       | LC/A                                 | SC/A                                |
|------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------------------|-------------------------------------|
| Ferrule          | 2.5 mm dia<br>Zirconia   | 2.5 mm dia<br>Zirconia   | 2.5 mm dia<br>Zirconia   | 1.25 mm dia<br>Zirconia  | 1.25 mm dia Zirconia<br>end angle 8° | 2.5 mm dia Zirconia<br>end angle 8° |
| Standard polish  | UPC                      | UPC                      | UPC                      | UPC                      | APC                                  | APC                                 |
| Insertion loss   | 0.2 dB typ<br>0.3 dB max | 0.2 dB typ<br>0.4 dB max | 0.2 dB typ<br>0.3 dB max | 0.2 dB typ<br>0.3 dB max | 0.2 dB typ                           | 0.2 dB typ                          |
| Return loss      | ≤50-55 dB                | ≤50-55 dB                | ≤50-55 dB                | ≤50-55 dB                | ≤60-65 dB                            | ≤60-65 dB                           |
| Terminations     | >500                     | >500                     | >500                     | >500                     | >500                                 | >500                                |
| Service temp. °C | -20 to +70                           | -20 to +70                          |

# **BBU Comm's** room / mobile base station fibre optic management solutions

Optical fibre cable management and termination is extremely important within the mobile hut or base station. Solutions are provided to ensure end to end cable management to suit  $\frac{1}{2}$ " or  $\frac{7}{8}$ " hybrid trunk cable. Additionally, the products offered by WBT are a true plug and play solution which enables rapid deployment of fibre optic management trays in the mobile base station.

The MPO solution is specifically tailored for 7/8" cable deployment and the high density cable and connector configuration is all factory pre-terminated in a controlled environment.

### Products

- HXT series: 1RU modular patch panel, standard,
- 4 slot. Other options available
- HXA series: MTP<sup>®</sup>/MPO to LC singlemode cassette, 24 fibre. Other options available
- TC3093M: 1RU Optical fibre cable storage tray (optional)
- Full range of **fibre optic patch cords** for interconnecting equipment and systems are also available.

WBT provide a full end to end connectivity solution from the antenna to the communications room. A range of optical fibre subracks, patch cords and cable management solutions are available. In addition, the fibre optic ducting raceway is beneficial for safely routing and managing optical fibre cords in the telecoms exchange.



This 1RU sliding drawer module is used to house patching facilities in an optical fibre termination rack. It may be front or rear mounted in a 19" rack. Mounting hardware is supplied and the unit is configured ready to install. The unit has a universal rear entry for the external cable, which allows entry from either side.

- High-density 48LC connections in 1RU of space (24 x LC duplex adaptors installed)
- Singlemode optical fibre

4-slot

- Easy to install and configure
- Splice and patch versions also available
- 1RU 12LC Duplex (24 port) version also available



### HXC Series: **MTP cassettes**

HypaFOX MTP®/MPO cassette modules provide secure transition between MTP®/MPO and LC or SC connectors. They are used to interconnect MTP®/MPO trunk cables with LC or SC patching. These flexible cassette modules can cater for ultright angle high density applications of up to 36LC fibres per cassette or for low to medium densities of 12 or 24 fibres.

The modular system allows for rapid deployment of high density data centre infrastructure, as well as improved troubleshooting and reconfiguration during MAC's. Cassettes can be mounted in 1RU or 3RU HypaFOX patch panels. The slim design cassettes allow for rapid deployment with its innovative quick release install method.

# Fibre management at the mobile base station



### TC3093M: 1RU Optical fibre cable storage tray

This optical fibre cable storage tray is used to route and store excess optical fibre patch cord lengths . The open top provides easy access to cable management area and me and the front edge has been lowered and the mounting brackets slotted to assist the installer with the optical cable installation in the commonly very crowded existing equipment racks. Optical cable entry into the tray is via 1 of 4 entry points, 1 on the LHS, 1 on the RHS and 2 on the rear. All cable entries have provision for tying off the cables.

- Stores excess optical fibre patch cord lengths
- 1RU front mount in a 19" rack
- Mounting screws and cage nuts included .



# RF connectors

# RF tails & jumpers



### RF External tail, weather/bird-proof



- 1⁄2″ super flexible coaxial cable
- Excellent Voltage Standing Wave Ratio (V.S.W.R.) performance
- Low and stable PIMD
- Weather-proof assembly
- Bird-proof Ø21.2mm polyamide conduit
- Available in different length: 1.5m, 3m, 5m

### Connector types:

- RF tails with straight 7-16 (DIN) male connector at one end, and straight 7-16 (DIN) male connector at the other end
- RF tails with straight 4.3-10 male connector at one end, and straight 4.3-10 male connector at the other end
- RF tails with straight 4.3-10 male connector at one end, and straight 7-16 (DIN) male connector at the other end

| WBT P/N        | Description  |
|----------------|--|
| TC4039-B1-1.5P | 1.5m RF tail, straight 4.3-10 male - straight<br>4.3-10 male, ½" superflex weather-proof bird-<br>proof        |
| TC4039-B2-1.5P | 1.5m RF tail, straight 4.3-10 male - straight<br>7-16 (DIN) male, ½″ superflex weather-proof<br>bird-proof     |
| TC4039-B3-1.5P | 1.5m RF tail, straight 7-16 (DIN) male -<br>straight 7-16 (DIN) male, ½″ superflex<br>weather-proof bird-proof |
| TC4039-B1-3.0P | 3m RF tail, straight 4.3-10 male - straight<br>4.3-10 male, ½" superflex weather-proof bird-<br>proof          |
| TC4039-B2-3.0P | 3m RF tail, straight 4.3-10 male - straight<br>7-16 (DIN) male, ½″ superflex weather-proof<br>bird-proof       |
| TC4039-B3-3.0P | 3m RF tail, straight 7-16 (DIN) male - straight<br>7-16 (DIN) male, ½″ superflex weather-proof<br>bird-proof   |
| TC4039-B1-5.0P | 5m RF tail, straight 4.3-10 male - straight<br>4.3-10 male, ½" superflex weather-proof bird-<br>proof          |
| TC4039-B2-5.0P | 5m RF tail, straight 4.3-10 male - straight<br>7-16 (DIN) male, ½″ superflex weather-proof<br>bird-proof       |
| TC4039-B3-5.0P | 5m RF tail, straight 7-16 (DIN) male - straight<br>7-16 (DIN) male, ½″ superflex weather-proof<br>bird-proof   |

### RF Internal tail, weather-proof

- 1/2" Super flexible cable assembly
- Excellent Voltage Standing Wave Ratio (V.S.W.R.) performance
- Low and stable intermodulation
- Weather-proof assembly
- High pull-off strength
- Available in different length: 1m, 1.5m, 2.5m, 3m, 5m



#### Connector types:

- RF tails with straight 7-16 (DIN) male connector at one end, and straight 7-16 (DIN) male connector at the other end
- RF tails with straight 4.3-10 male connector at one end, and straight 4.3-10 male connector at the other end
- RF tails with straight 4.3-10 male connector at one end, and straight 7-16 (DIN) male connector at the other end

| WBT P/N        | Description   |
|----------------|---|
| TC4039-A1-1.0P | 1.0m RF tail, straight 4.3-10 male - straight 7-16 (DIN) male, ½" superflex                       |
| TC4039-A2-1.0P | 1.0m RF tail, 90 deg. right angle 4.3-10 male - 90 deg. right angle 7-16 (DIN) male, ½" superflex |
| TC4039-A3-1.0P | 1.0m RF tail, straight 7-16 (DIN) male - straight 7-16 (DIN) male, ½" superflex                   |
| TC4039-A5-2.0P | 2.0m RF tail, 90 deg. right angle 4.3-10 male - straight 7-16 (DIN) male, ½" superflex            |
| TC4039-A4-2.5P | 2.5m RF tail, 90 deg. right angle 4.3-10 male - straight 4.3-10 male, ½" superflex                |
| TC4039-A5-2.5P | 2.5m RF tail, 90 deg. right angle 4.3-10 male - straight 7-16 (DIN) male, ½" superflex            |
| TC4039-A6-2.5P | 2.5m RF tail, 90 deg. right angle 7-16 (DIN) male - straight 7-16 (DIN) male, ½" superflex        |
| TC4039-A7-1.5P | 1.5m RF tail, straight 4.3-10 male - straight 4.3-10 male, ½″ superflex                           |
| TC4039-A1-1.5P | 1.5m RF tail, straight 4.3-10 male - straight 7-16 (DIN) male, ½" superflex                       |
| TC4039-A3-1.5P | 1.5m RF tail, straight 7-16 (DIN) male - straight 7-16 (DIN) male, ½" superflex                   |
| TC4039-A7-3.0P | 3m RF tail, straight 4.3-10 male - straight 4.3-10 male, ½" superflex                             |
| TC4039-A1-3.0P | 3m RF tail, straight 4.3-10 male - straight 7-16 (DIN) male, ½" superflex                         |
| TC4039-A3-3.0P | 3m RF tail, straight 7-16 (DIN) male - straight 7-16 (DIN) male, ½" superflex                     |
| TC4039-A7-5.0P | 5m RF tail, straight 4.3-10 male - straight 4.3-10 male, ½" superflex                             |
| TC4039-A1-5.0P | 5m RF tail, straight 4.3-10 male - straight 7-16 (DIN) male, ½" superflex                         |
| TC4039-A3-5.0P | 5m RF tail, straight 7-16 (DIN) male - straight 7-16 (DIN) male, ½" superflex                     |

### RF superflex laser welded jumper, bird-proof, internal/external

le & connector

- <sup>1</sup>/<sub>2</sub>" Super flexible cable
- Unmatched dynamic PIM performance at 160 dB
- Optical process ensures accurate & consistent fusion between the cable & connector
- Approved by major carriers worldwide
- Minimum return loss (VSWR): > -28 dB (1.08) 0-2 GHz | > -25 dB (1.12) 2-3 GHz
- Moisture protection
- Corrosion resistance
- Cable Bird-proof / WPS (Weather-proof system) BP (Bird-proof): 21mm / 48mm diameter
- Available in different length

### THE LASER WELDED DIFFERENCE

Wireless laser welded jumpers excel where traditional jumpers fall short. What sets it apart from traditional jumper manufacturing?

### **MOISTURE SEALING**

Laser welded jumpers use internal and external seals to provide redundant moisture sealing in addition to our Weather Protection Systems which are available with any jumper order. **PRODUCTION CONSISTENCY** 

Our patented laser welding technology utilizes a vision system for accurate and consistent fusion of the outer conductor to the connector.

Γ

Our laser welding process uses a very focused beam to eliminate any chance of melting the dielectric due to excessive heat. Our laser welded jumpers pass ALL enhanced testing including moisture, vibration, thermal shock and dynamic PIM.

### Laser welded superflex jumpers, external, straight, bird-proof with WPS BP

### Laser welded low loss jumpers, external, straight, bird-proof with WPS BP

**MECHANICAL STABILITY** 

| WBT P/N        | Description  |
|----------------|--|
| TC4036-07-1.0P | 1m laser welded jumper, straight DIN male<br>- straight DIN male, ½″ superflex WPS (Bird-<br>proofing connector both sides)  |
| TC4036-07-2.0P | 2m laser welded jumper, straight DIN male<br>- straight DIN male, ½" superflex WPS (Bird-<br>proofing connector both sides)  |
| TC4036-07-3.0P | 3m laser welded jumper, straight DIN male<br>- straight DIN male, ½″ superflex WPS (Bird-<br>proofing connector both sides)  |
| TC4036-07-4.0P | 4m laser welded jumper, straight DIN male<br>- straight DIN male, ½″ superflex WPS (Bird-<br>proofing connector both sides)  |
| TC4036-07-5.0P | 5m laser welded jumper, straight DIN male<br>- straight DIN male, ½" superflex WPS (Bird-<br>proofing connector both sides)  |
| VAC4036-7-10P  | 10m laser welded jumper, straight DIN male<br>- straight DIN male, ½" superflex WPS (Bird-<br>proofing connector both sides) |

| WBT P/N | Description   |
|---------|---|
|         | 1m laser welded low loss jumper, straight DIN male -<br>straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)   |
|         | 1.5m laser welded low loss jumper, straight DIN male<br>- straight DIN male, ½" WPS (Bird-proofing connector<br>both sides) |
|         | 2m laser welded low loss jumper, straight DIN male -<br>straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)   |
|         | 2.5m laser welded low loss jumper, straight DIN male<br>- straight DIN male, ½" WPS (Bird-proofing connector<br>both sides) |
|         | 3m laser welded low loss jumper, straight DIN male -<br>straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)   |
|         | 4m laser welded low loss jumper, straight DIN male -<br>straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)   |
|         | 5m laser welded low loss jumper, straight DIN male -<br>straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)   |
|         | 6m laser welded low loss jumper, straight DIN male -<br>straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)   |
|         | 7m laser welded low loss jumper, straight DIN male -<br>straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)   |
|         | 8m laser welded low loss jumper, straight DIN male -<br>straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)   |
|         | 9m laser welded low loss jumper, straight DIN male -<br>straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)   |
|         | 10m laser welded low loss jumper, straight DIN male<br>- straight DIN male, ½" WPS (Bird-proofing connector<br>both sides)  |

### Laser welded superflex jumpers, internal, straight

| WBT P/N        | Description  |
|----------------|--|
| VAC4036-9-1.0P | 1m laser welded jumper, straight DIN<br>male - straight DIN male, ½" superflex |
| VAC4036-9-2.0P | 2m laser welded jumper, straight DIN<br>male - straight DIN male, ½″ superflex |
| VAC4036-9-3.0P | 3m laser welded jumper, straight DIN<br>male - straight DIN male, ½″ superflex |
| VAC4036-9-4.0P | 4m laser welded jumper, straight DIN<br>male - straight DIN male, ½″ superflex |
| VAC4036-9-5.0P | 5m laser welded jumper, straight DIN<br>male - straight DIN male, ½″ superflex |

### Laser welded superflex jumpers, internal, straight/right angle

| WBT P/N         | Description  |
|-----------------|--|
| VAC4036-10-1.0P | 1m laser welded jumper, straight DIN<br>male - straight DIN right angle, ½"<br>superflex   |
| VAC4036-10-2.0P | 2m laser welded jumper, straight DIN<br>male - straight DIN right angle, ½"<br>superflex   |
| VAC4036-10-3.0P | 3m laser welded jumper, straight DIN<br>male - straight DIN right angle, ½"<br>superflex   |
| VAC4036-10-4.0P | 4m laser welded jumper, straight DIN<br>male - straight DIN right angle, ½"<br>superflex   |
| VAC4036-10-4.5P | 4.5m laser welded jumper, straight<br>DIN male - straight DIN right angle, ½"<br>superflex |
| VAC4036-10-5.0P | 5m laser welded jumper, straight DIN<br>male - straight DIN right angle, ½"<br>superflex   |
| VAC4036-10-6.0P | 6m laser welded jumper, straight DIN<br>male - straight DIN right angle, ½"<br>superflex   |
| VAC4036-10-7.5P | 7.5m laser welded jumper, straight<br>DIN male - straight DIN right angle, ½"<br>superflex |

### Laser welded superflex jumpers, internal, right angle

| WBT P/N         | Description   |
|-----------------|---|
| VAC4036-25-1.0P | 1m laser welded jumper, DIN right<br>angle - DIN right angle, ½" superflex  |
| VAC4036-25-2.0P | 2m laser welded jumper, DIN right angle - DIN right angle, ½" superflex     |
| VAC4036-25-3.0P | 3m laser welded jumper, DIN right<br>angle - DIN right angle, ½" superflex  |
| VAC4036-25-4.0P | 4m laser welded jumper, DIN right angle - DIN right angle, ½" superflex     |
| VAC4036-25-5.0P | 5m laser welded jumper, DIN right<br>angle - DIN right angle, ½" superflex  |
| VAC4036-25-1.0P | 6m laser welded jumper, DIN right<br>angle - DIN right angle, ½" superflex  |
| VAC4036-25-7.5P | 7.5m laser welded jumper, DIN right angle - DIN right angle, ½" superflex   |
| VAC4036-25-10P  | 10m laser welded jumper, DIN right<br>angle - DIN right angle, ½″ superflex |

### Laser welded low loss jumpers, internal, straight

| WBT P/N | Description  |
|---------|--|
|         | 1m laser welded low loss jumper, straight DIN male - straight DIN male, $\ensuremath{\sc v}\xspace^{\prime\prime}$ |
|         | 1.5m laser welded low loss jumper, straight DIN male - straight DIN male, $1\!\!/\!\!2''$                          |
|         | 2m laser welded low loss jumper, straight DIN male - straight DIN male, ½"   |
|         | 2.5m laser welded low loss jumper, straight DIN male - straight DIN male, $1\!\!/\!\!2''$                          |
|         | 3m laser welded low loss jumper, straight DIN male - straight DIN male, $\frac{1}{2}$ "                            |
|         | 4m laser welded low loss jumper, straight DIN male - straight DIN male, ½"   |
|         | 5m laser welded low loss jumper, straight DIN male - straight DIN male, ½"   |

### Laser welded low loss jumpers, internal, straight/right angle

| WBT P/N | Description   |
|---------|---|
|         | 1m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½"   |
|         | 1.5m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½" |
|         | 2m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½"   |
|         | 2.5m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½" |
|         | 3m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½"   |
|         | 3.5m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½" |
|         | 4m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½"   |
|         | 4.5m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½" |
|         | 5m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½"   |
|         | 6m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½"   |
|         | 7m laser welded low loss jumper, straight DIN male - straight DIN right angle, ½"   |

### Laser welded low loss jumpers, internal, right angle

| WBT P/N | Description   |
|---------|---|
|         | 1m laser welded low loss jumper, DIN right angle - DIN right angle, ½"                |
|         | 1.5m laser welded low loss jumper, DIN right angle - DIN right angle, ½"              |
|         | 2m laser welded low loss jumper, DIN right angle - DIN right angle, ½"                |
|         | 2.5m laser welded low loss jumper, DIN right angle - DIN right angle, $\frac{1}{2}$   |
|         | 3m laser welded low loss jumper, DIN right angle - DIN right angle, $1\!\!/\!\!2''$   |
|         | 3.5m laser welded low loss jumper, DIN right angle - DIN right angle, $\frac{1}{2}$   |
|         | 4m laser welded low loss jumper, DIN right angle - DIN right angle, ½"                |
|         | 4.5m laser welded low loss jumper, DIN right angle - DIN right angle, $\frac{1}{2}$   |
|         | 5m laser welded low loss jumper, DIN right angle - DIN right angle, ½"                |
|         | 5.5m laser welded low loss jumper, DIN right angle - DIN right angle, $\frac{1}{2}$   |
|         | $6m$ laser welded low loss jumper, DIN right angle - DIN right angle, $1\!\!/\!\!2''$ |
|         | 6.5m laser welded low loss jumper, DIN right angle - DIN right angle, $\frac{1}{2}$   |
|         | 7m laser welded low loss jumper, DIN right angle - DIN right angle, ½"                |
|         | 8m laser welded low loss jumper, DIN right angle - DIN right angle, ½"                |
|         | 8.5m laser welded low loss jumper, DIN right angle - DIN right angle, $\frac{1}{2}$   |
|         | 9m laser welded low loss jumper, DIN right angle - DIN right angle, $\frac{1}{2}$ "   |
|         | 9.5m laser welded low loss jumper, DIN right angle - DIN right angle, $\frac{1}{2}$   |
|         | 10m laser welded low loss jumper, DIN right angle - DIN right angle, ½"               |

### **RF connectors**

The coaxial RF connectors (radio frequency connectors) are electrical connectors designed to work at radio frequencies in the multi-megahertz range. RF connectors are typically used with coaxial cables and are designed to maintain the shielding that the coaxial design offers.

### **UXP connectors**

| WBT P/N         | Description   |
|-----------------|---|
| VAC4036-UXP-01P | UXP Connector, 50 OHM, 7-16 (DIN), DIN female, universal, ½" annular                |
| VAC4036-UXP-02P | UXP Connector, 50 OHM, 7-16 (DIN), DIN female, universal, ½" superflex              |
| VAC4036-UXP-03P | UXP Connector, 50 OHM, 7-16 (DIN), DIN male, universal, ½" annular                  |
| VAC4036-UXP-04P | UXP Connector, 50 OHM, 7-16 (DIN), DIN male, universal, ½" superflex                |
| VAC4036-UXP-05P | UXP Connector, 50 OHM, 7-16 (DIN), DIN right angle, universal, ½" annular           |
| VAC4036-UXP-06P | UXP Connector, 50 OHM, 7-16 (DIN), DIN right angle, universal, ½" superflex         |
| VAC4036-UXP-07P | UXP Connector, 50 OHM, 7-16 (DIN), N connector female, universal, ½" annular        |
| VAC4036-UXP-08P | UXP Connector, 50 OHM, 7-16 (DIN), N connector female, universal, ½" superflex      |
| VAC4036-UXP-09P | UXP Connector, 50 OHM, 7-16 (DIN), N connector male, universal, ½" annular          |
| VAC4036-UXP-10P | UXP Connector, 50 OHM, 7-16 (DIN), N connector male, universal, ½" superflex        |
| VAC4036-UXP-11P | UXP Connector, 50 OHM, 7-16 (DIN), N connector right angle, universal, ½" annular   |
| VAC4036-UXP-12P | UXP Connector, 50 OHM, 7-16 (DIN), N connector right angle, universal, ½" superflex |
| VAC4036-UXP-13P | UXP Connector, 50 OHM, 7-16 (DIN), DIN female, universal, 7/8" annular              |
| VAC4036-UXP-14P | UXP Connector, 50 OHM, 7-16 (DIN), DIN male, universal, 7/8" annular                |
| VAC4036-UXP-15P | UXP Connector, 50 OHM, 7-16 (DIN), N connector female, universal, 7/8" annular      |
| VAC4036-UXP-16P | UXP Connector, 50 OHM, 7-16 (DIN), N connector male, universal, 7/8" annular        |
| VAC4036-UXP-17P | UXP Connector, 50 OHM, 7-16 (DIN), DIN female, universal, 1 ¼" annular              |
| VAC4036-UXP-18P | UXP Connector, 50 OHM, 7-16 (DIN), DIN male, universal, 1 ¼" annular                |
| VAC4036-UXP-19P | UXP Connector, 50 OHM, 7-16 (DIN), DIN female, universal, 1 ⁵/ଃ" annular            |
| VAC4036-UXP-20P | UXP Connector, 50 OHM, 7-16 (DIN), DIN male, universal, 1 5/8" annular              |
| VAC4036-UXP-21P | UXP Connector, 50 OHM, 7-16 (DIN), 4.3-10 male right angle, universal, ½" annular   |
| VAC4036-UXP-23P | UXP Connector, 50 OHM, 7-16 (DIN), 4.3-10 male, universal, 7/8" annular             |
| VAC4036-UXP-24P | UXP Connector, 50 OHM, 7-16 (DIN), 4.3-10 female, universal, 7/8" annular           |

#### **CXP connectors**

| WBT P/N         | Description   |
|-----------------|---|
| VAC4036-CXP-01P | CXP Connector, 50 OHM, 7-16 (DIN), DIN male, universal, ½" annular                  |
| VAC4036-CXP-02P | CXP Connector, 50 OHM, 7-16 (DIN), DIN female, universal, ½" annular                |
| VAC4036-CXP-03P | CXP Connector, 50 OHM, 7-16 (DIN), N connector male, universal, 1⁄2" annular        |
| VAC4036-CXP-04P | CXP Connector, 50 OHM, 7-16 (DIN), N connector female, universal, ½" annular        |
| VAC4036-CXP-05P | CXP Connector, 50 OHM, 7-16 (DIN), DIN male, universal, ½" superflex                |
| VAC4036-CXP-06P | CXP Connector, 50 OHM, 7-16 (DIN), DIN female, universal, ½" superflex              |
| VAC4036-CXP-07P | CXP Connector, 50 OHM, 7-16 (DIN), N connector male, universal, 1⁄2" superflex      |
| VAC4036-CXP-08P | CXP Connector, 50 OHM, 7-16 (DIN), N connector female, universal, ½" superflex      |
| VAC4036-CXP-09P | CXP Connector, 50 OHM, 7-16 (DIN), DIN right angle, universal, ½" annular           |
| VAC4036-CXP-10P | CXP Connector, 50 OHM, 7-16 (DIN), N connector right angle, universal, ½" annular   |
| VAC4036-CXP-11P | CXP Connector, 50 OHM, 7-16 (DIN), DIN right angle, universal, ½" superflex         |
| VAC4036-CXP-12P | CXP Connector, 50 OHM, 7-16 (DIN), N connector right angle, universal, ½" superflex |
| VAC4036-CXP-13P | CXP Connector, 50 OHM, 7-16 (DIN), DIN male, universal, 7/8" annular                |
| VAC4036-CXP-14P | CXP Connector, 50 OHM, 7-16 (DIN), DIN female, universal, 7/s" annular              |
| VAC4036-CXP-15P | CXP Connector, 50 OHM, 7-16 (DIN), N connector male, universal, 7/8" annular        |
| VAC4036-CXP-16P | CXP Connector, 50 OHM, 7-16 (DIN), N connector female, universal, 7/s" annular      |
| VAC4036-CXP-17P | CXP Connector, 50 OHM, 7-16 (DIN), 4.3-10 male, universal, ½" superflex             |

### **Tool kits**

| WBT P/N | Description  |
|---------|--|
|         | HCG-CC RIGID COMPRESSION GUN ANZ CHARGER, HCG-FRAMESET-78, HCGFRAMESET-12, TQ-114-F18, SP-½"<br>SUPERFLEX, SPLDF4D SP-78 RDCUTTER, RDCUTTER-S. TOOL SET FOR CORRUGATED COPPER CABLES 50 OHM            |
|         | HCG-CC RIGID COMPRESSION GUN ANZ CHARGER, HCG-FRAMESET-114, HCGFRAMESET-78, HCG-FRAMESET-158, TQ-<br>114-F18, SP-114, SP-78, SP-158 RDCUTTER, RDCUTTER-S. TOOL SET FOR CORRUGATED COPPER CABLES 50 OHM |





We're here in Australia, providing local technical support, stock availability, as well as fast production and delivery times.

#### Europe

#### WBT Europe BV

Energieweg 45, 1271 EC Huizen, The Netherlands

> Phone: +31 35 208 5653 Email: htovar@wbt.biz dkoning@wbt.biz

### Philippines

#### Warren & Brown Fiber Systems Corporation

BDG Building 2, Block 1, Lot 1, Solid Street. LIIP, Mamplasan, Binan 4024, Laguna, Philippines

Phone: +63 2 584 4617 | +63 2 584 4510 Fax: +63 49 508 0011 Email: deoperff@warrenandbrown.com.au

#### Vietnam

#### Warren & Brown Technologies Pty Ltd

R.02-11, 2nd Floor, D2 Building, Mandarin Garden, Hoang Minh Giam Str., Cau Giay District, Hanoi 10000, Vietnam

Phone: +84 4 6664 3388 Fax: +84 4 6664 3888 Email: wbtvn@warrenandbrown.com.au New Zealand

AC-WB Technologies

7 Old Wairoa Road, Papakura, Auckland

**Phone:** +64 9 302 2668 **Fax:** +64 9 302 2678 **Email:** sales@actechnologies.co.nz



#### Warren & Brown Technologies Pty Ltd

108 Mitchell Street, Maidstone, Victoria 3012

Phone: (613) 9317 6888 Fax: (613) 9318 6091 Email: sales@wbt.com.au

www.wbt.com.au