Challenging the rules, Changing the game, Making better connections

Making the impossible, possible

Over 30 years **design manufacture** and **supply** experience in **Communication** connectivity

Research and development of **pioneering products** and systems

UK Technology strategy board award winners

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Capabilities

UK Manufacturing

- Injection Moulding
- Induction soldering
- Resistance soldering
- Fibre polishing
- Fibre splicing
- Fibre terminating
- Rapid prototyping
- Testing

Sino Manufacturing

- Volume contract manufacturing

Products

- Pre-terminated coax
- Pre-terminated fibre
- Frequency optimised Jumpers
- Complex cable assemblies
- Attenuators
- Loads
- Cross media Baluns

Services

- Fibre splicing on site
- Design and development
- Build and kitting services

Logistical Capabilities

Stock holding capability

- 3,000 sq ft dedicated warehousing space, Central London
- >10000 sq ft co-locational warehousing space, Dartford UK
- Anticipated buffer stock - 120 sites

Couriers and fleet

- Fedex/TNT
- DHL
- Own fleet electric vehicles for London area (Same Day)

Supply chain risk planning

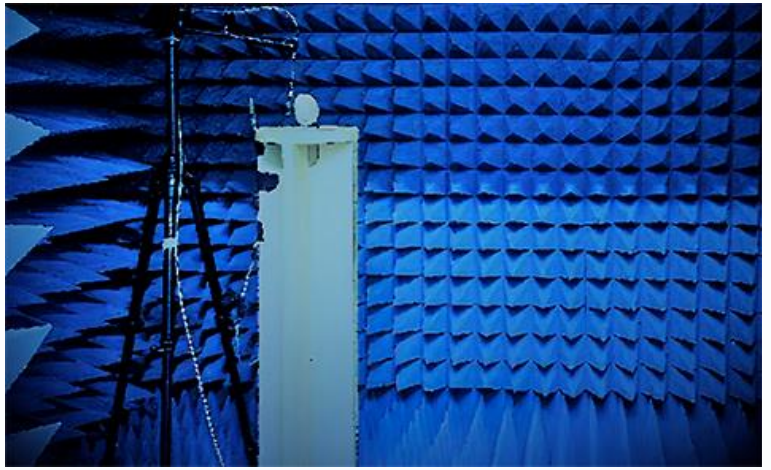
- Brexit immunity; all products and components UK, Sino or Ex-Europe manufactured
- Multiple suppliers for every product

Research

Special access to principal university resources for our research and development programs

Robotics research facilities - 3m robotic arm

23ft environmental chamber



20ft anechoic chamber

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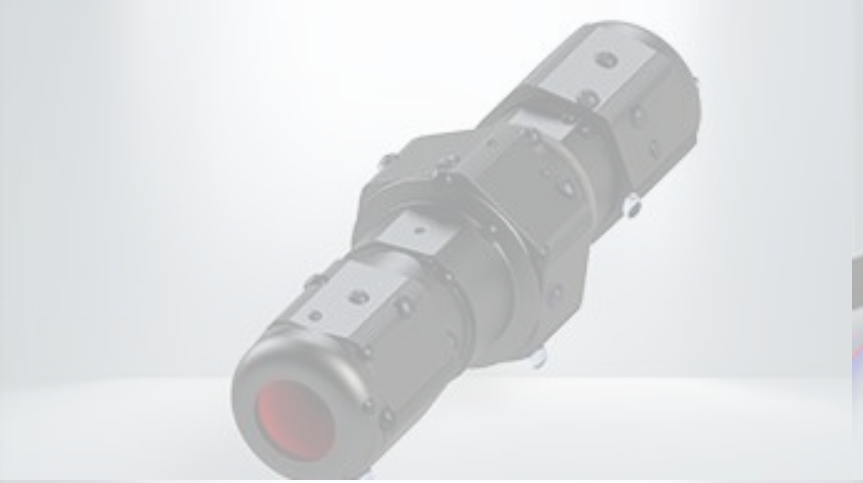
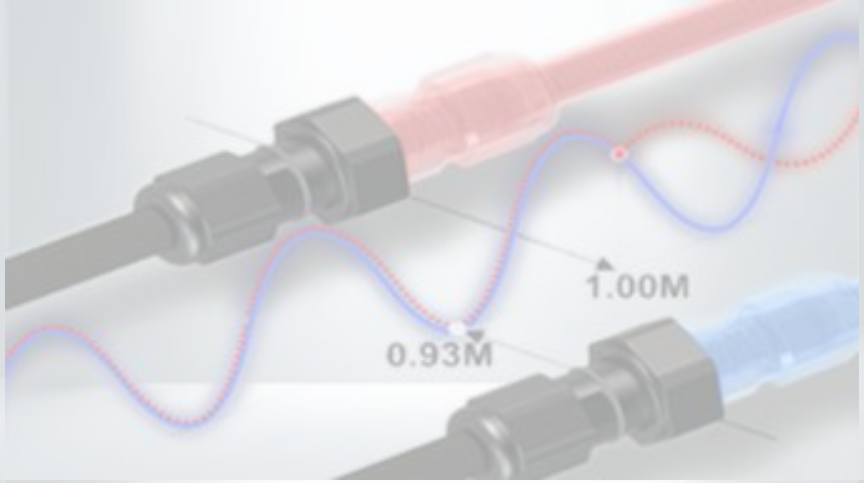
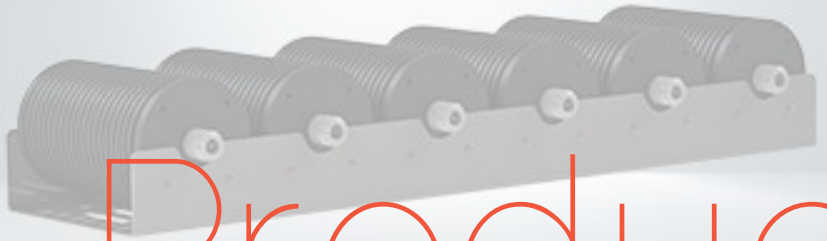
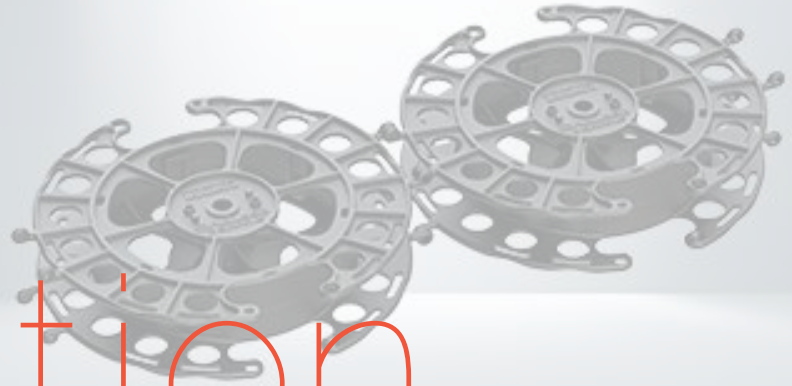
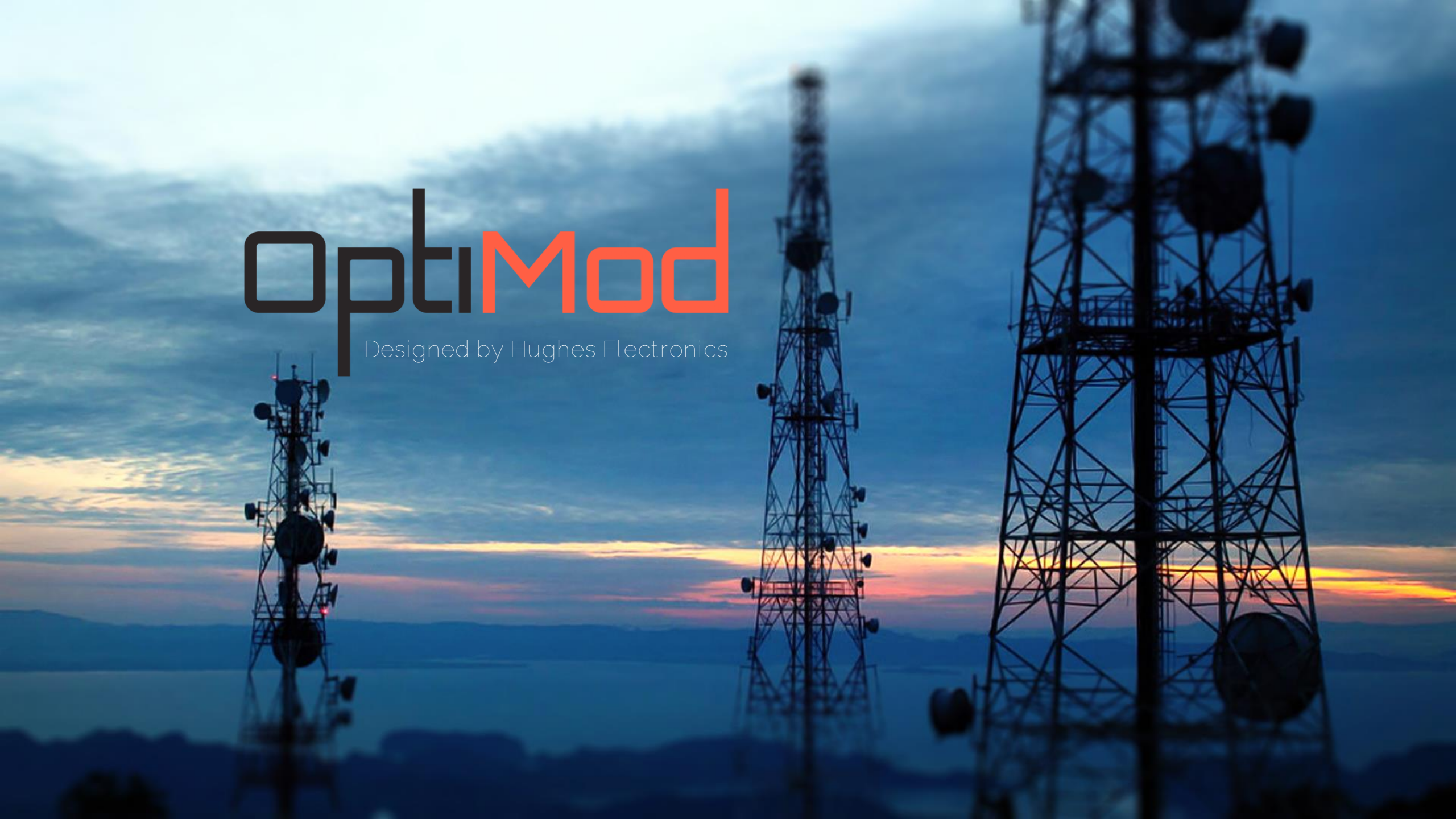





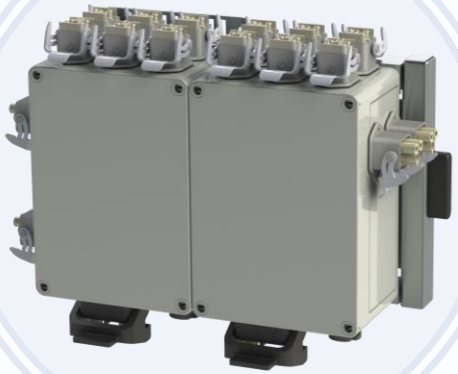



Product innovation

Changing the game - making better products



OptiMod
Designed by Hughes Electronics

The proposed OptiMod system consists of:



OneBox

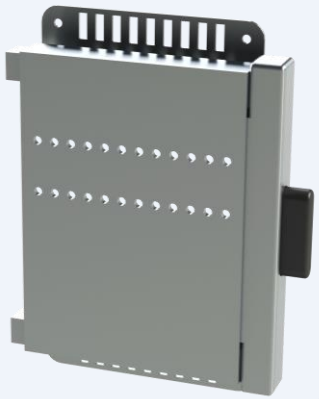
The connection interchange (bulkhead)

Fibre system cables

Pre terminated system cable

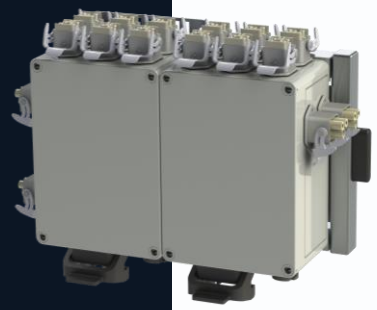
Power system cables

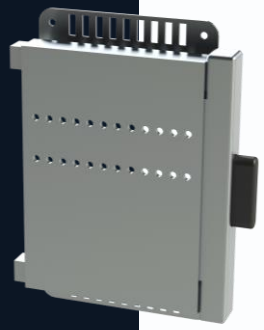
Pre terminated system cable



Telescopic mounting rail

Grows with the system





OptiMod

The first integrated fibre and power transmission system with authentic plug-and-play functionality is intentionally robust especially for the cellular telephone industry

- Authentic plug-and-play functionality
- Expandable , agile and entirely modular
- Configurable for fibre, power or hybrid
- No technical skills required
- Simply plug, latch and play

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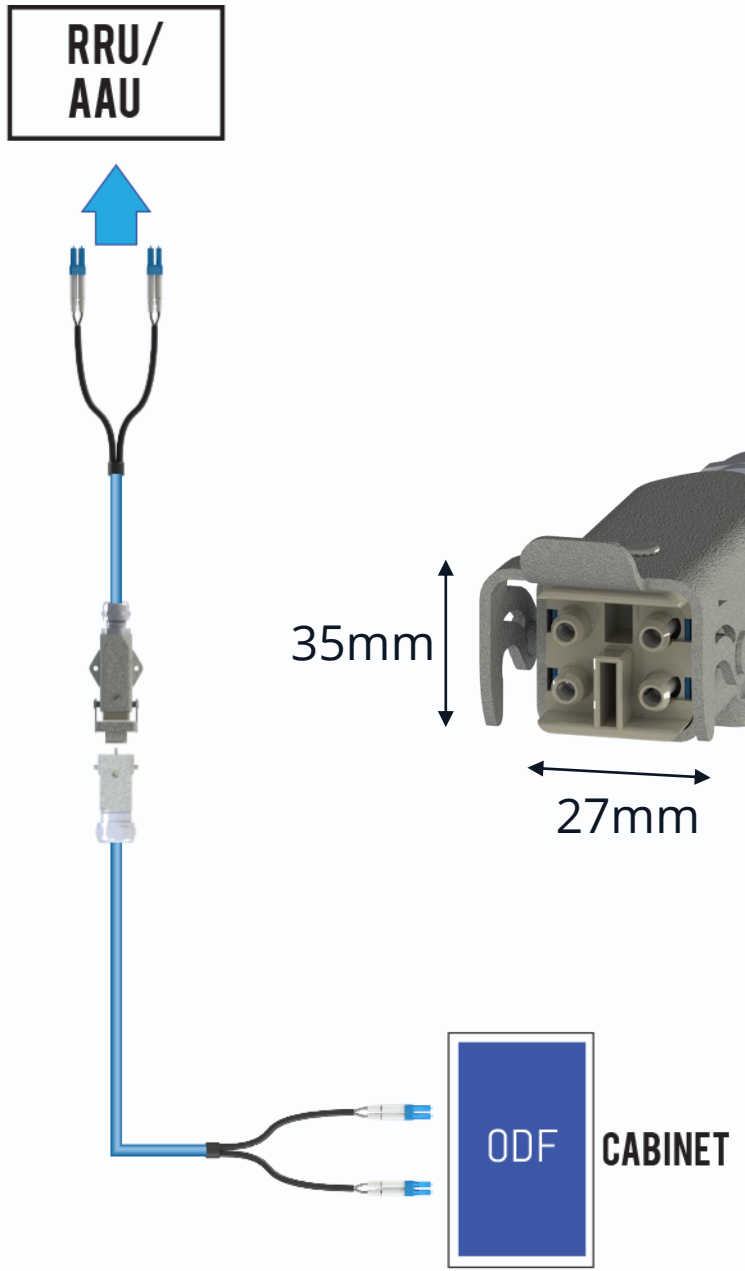
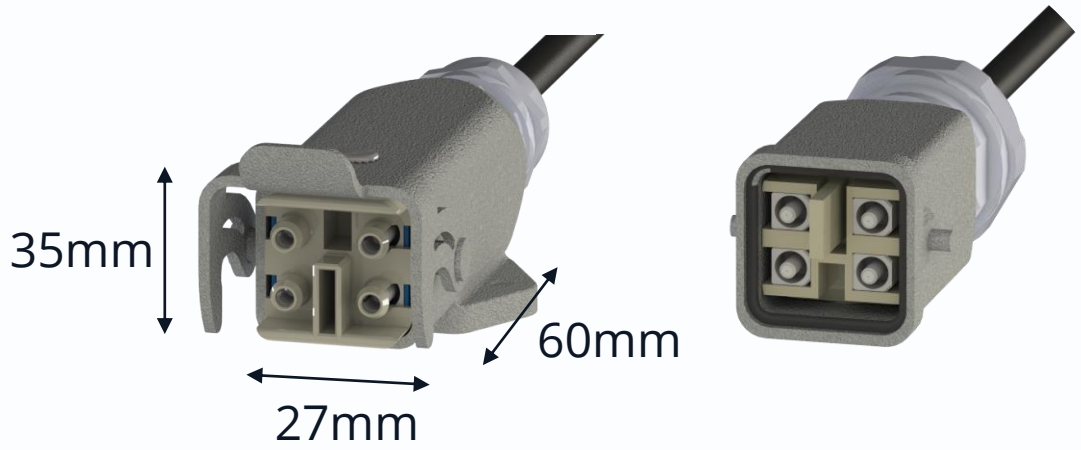
System cables

Streamline installation practices

H-Mod

In it’s simplest form, system cables terminated with H-Mod to LC connections can be deployed discretely to create multiple connections in seconds





H-Mod connections are modular

IP68 connection hoods house either fibre modules, power modules or a combination of both fibre and power modules (to create hybrid connections) in a series of sizes from 1 to 6 modules

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Less connections needed

The largest H-Mod connection is capable of making up to 36 connections (18 pairs) of fibre or 12 pairs of power

A pair of mated system cables can provide up to 9 discrete fibre transmission circuits or 12 discrete power transmission circuits

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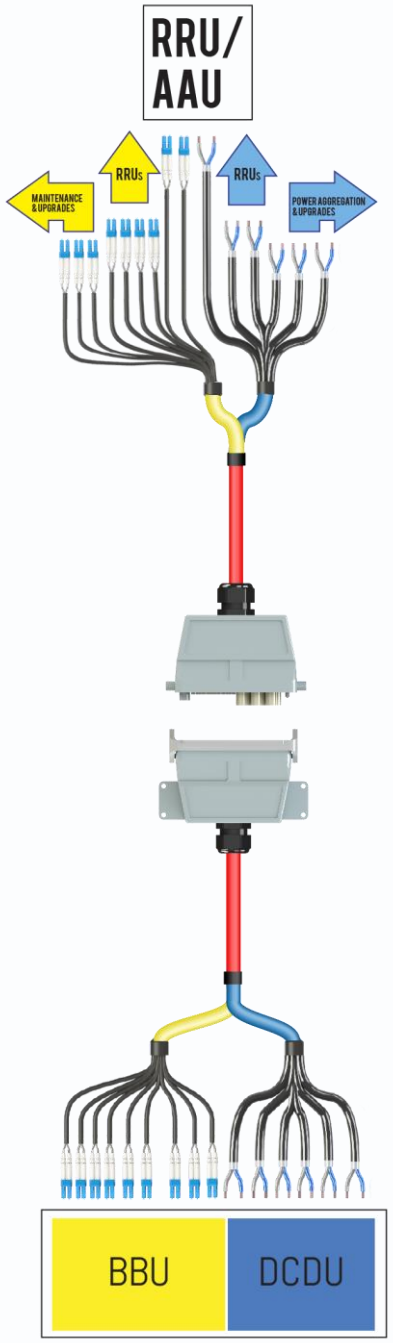
Hybrid system cables

A combination of both power and fibre can be housed together to easily create a hybrid system cable providing 3 hybrid transmission circuits - 3 x 2 fibre pairs, and 3 DC pairs*

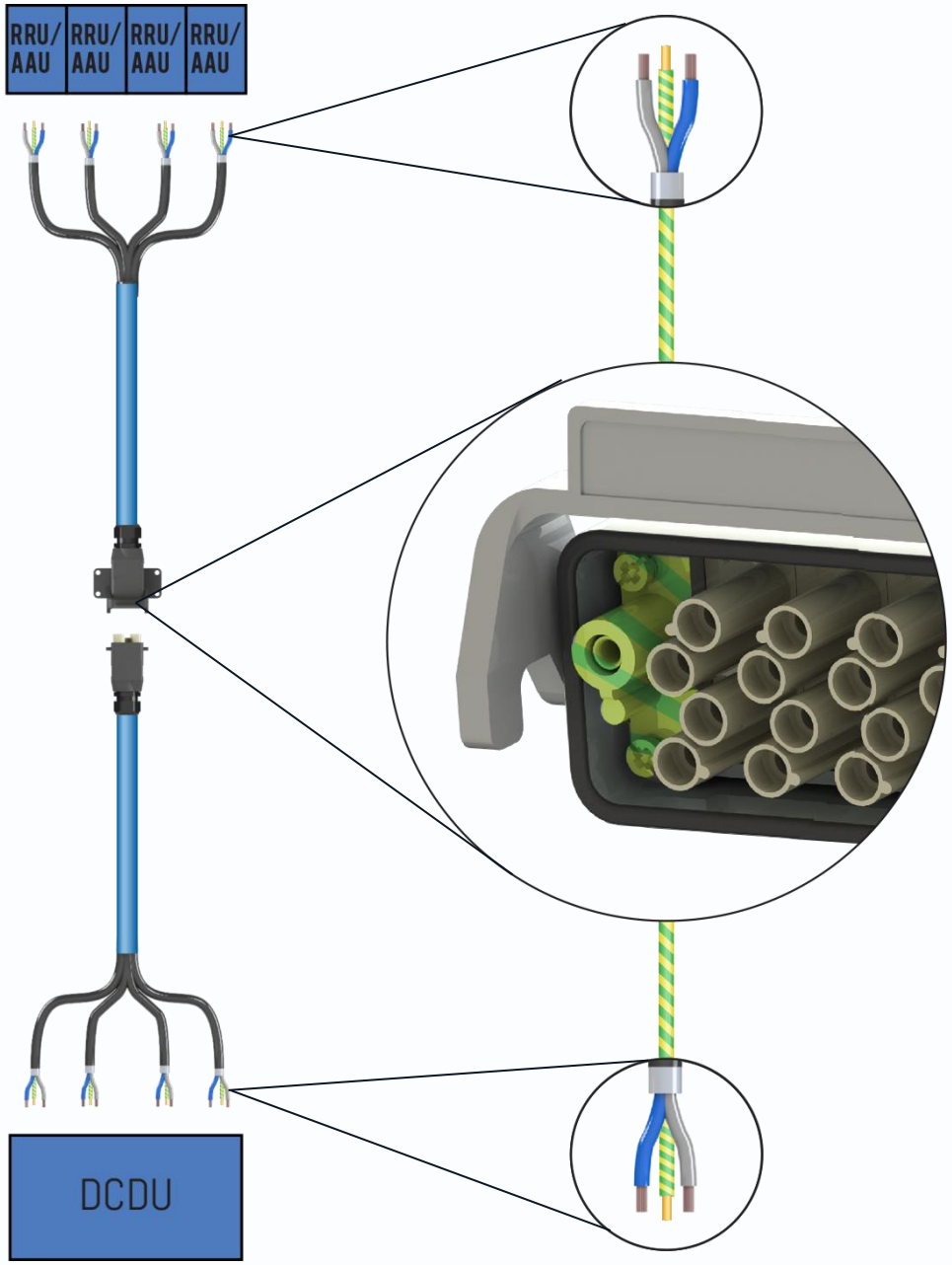
*Plus 3 extra DC pairs for power aggregation and 3 extra fibre pairs for maintenance and upgrades



Functional clean earth to ground

A functional earth (direct to ground) module is also available for use with 2 core plus earth DC cables to prevent eddy currents* within the mast structure

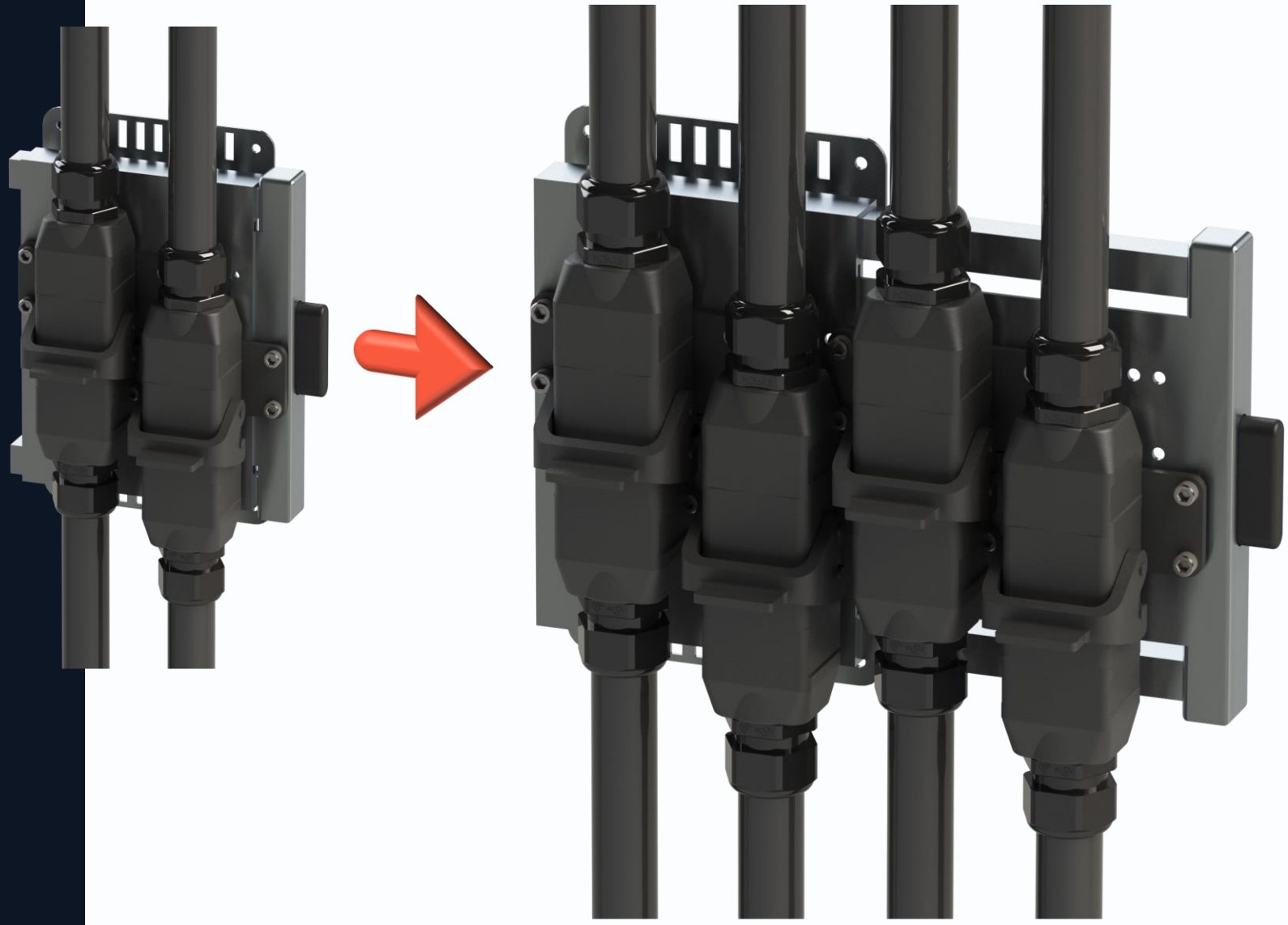
*Steelwork earthed return path causes degradation of environmental protective coatings and corrosion



Deployment of system cables

H-Mod connections can be fitted in the systems bulkhead rail

The rail is telescopic so more H-Mod system cables can be multiplexed as and when desired



OneBox

Authentic plug-and-play passive infrastructure

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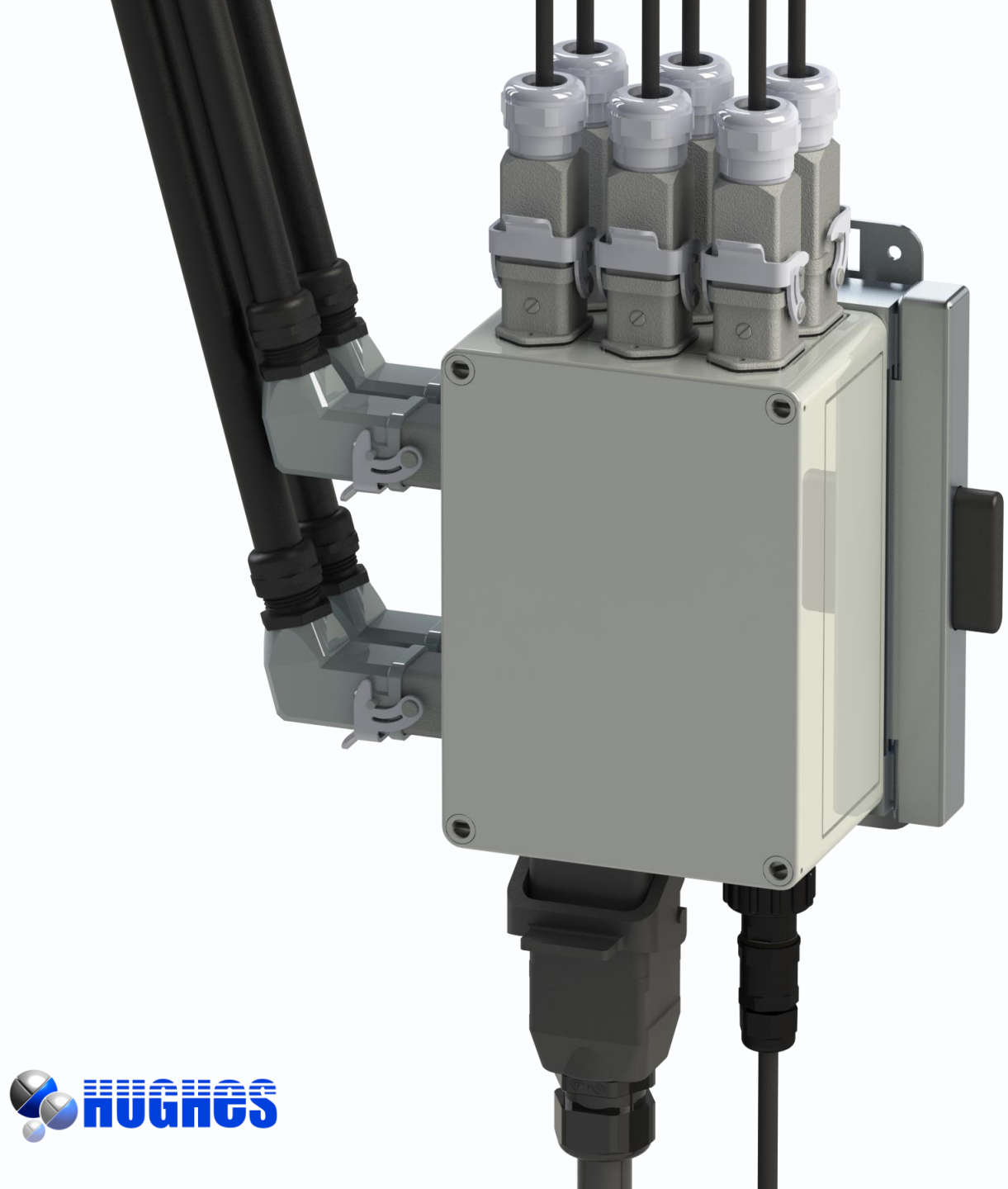
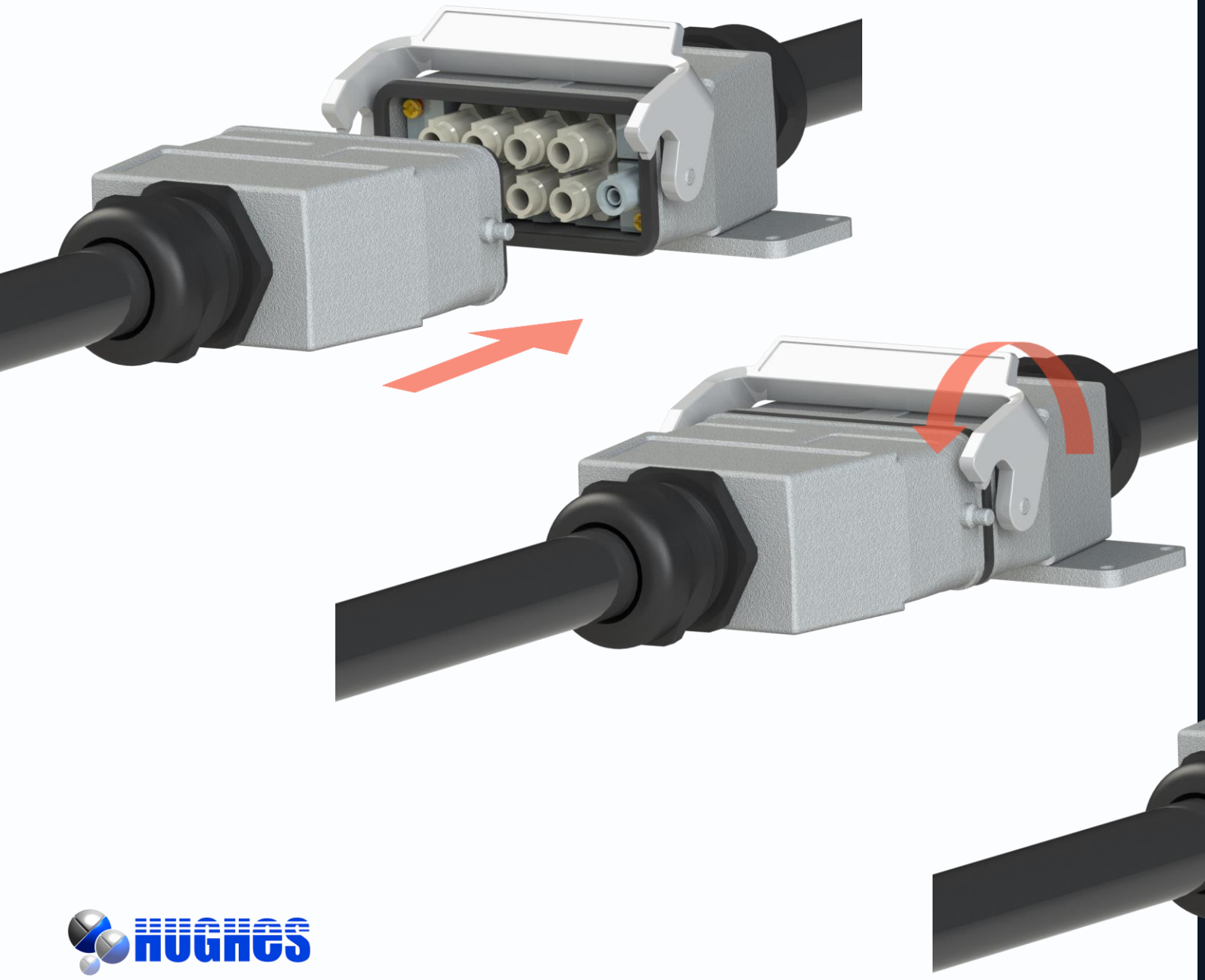


OneBox

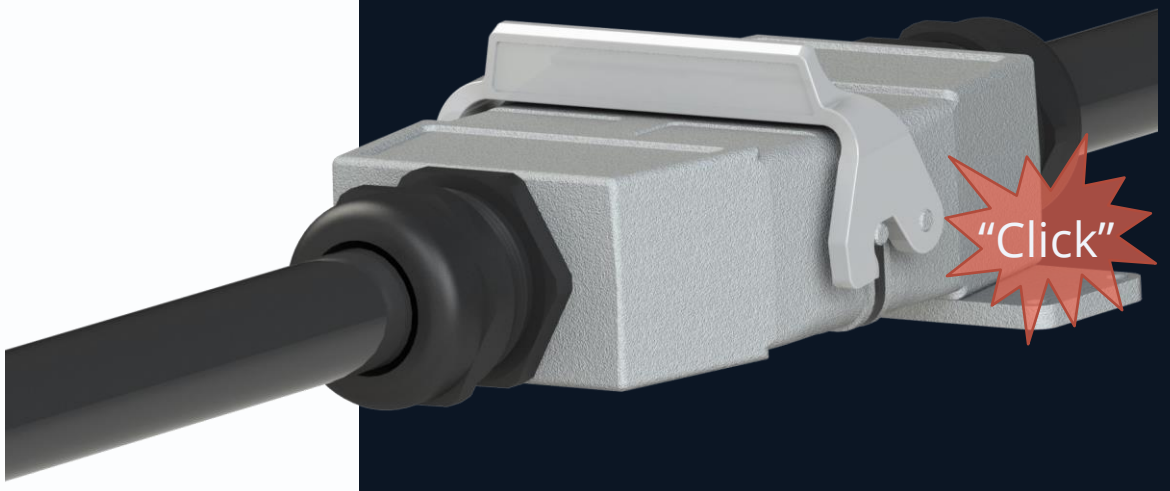
OneBox is the system's agile connection interchange enclosure

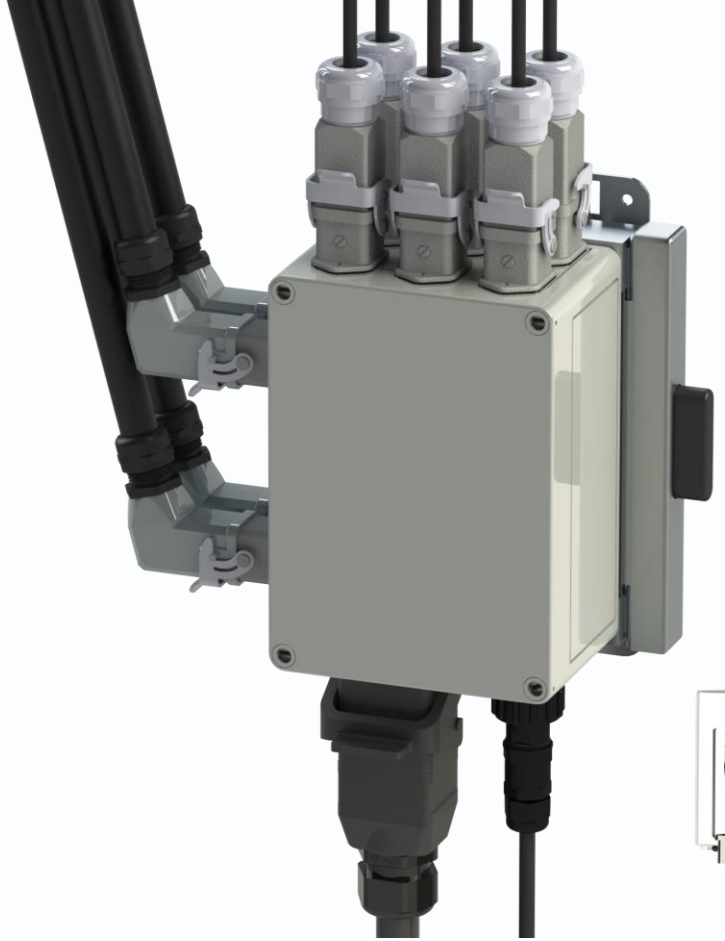
Robust weatherproof connections are positioned on the **outside** of the enclosure, not on the **inside**, creating authentic plug-and-play functionality for system cables



Plug-Latch-Play

Connecting H-Mod system cables to OneBox is a simple plug, latch and play process, no specialist fibre or electrical skills are required





Multiple configurations

OneBox is multi-configurable

Separate power, fibre or hybrid systems or a mix of all three protocols can all be distributed through OneBox

Complex configurations such as separates in, hybrid out, can all be easily created too

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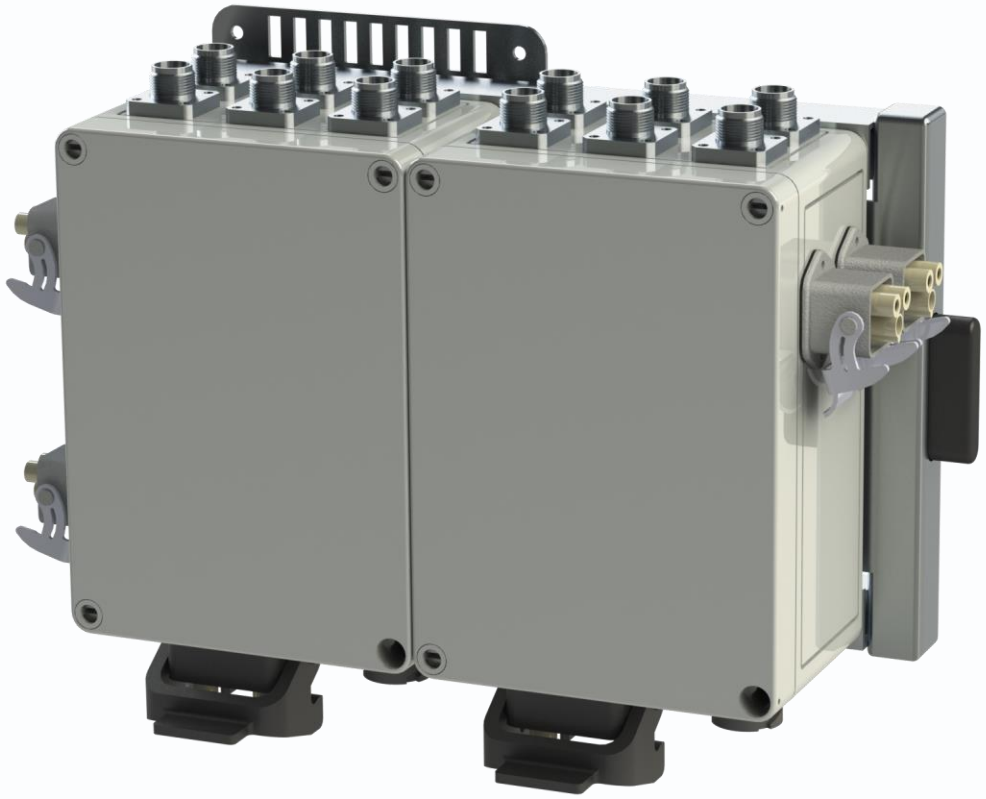
Incorporated functionality

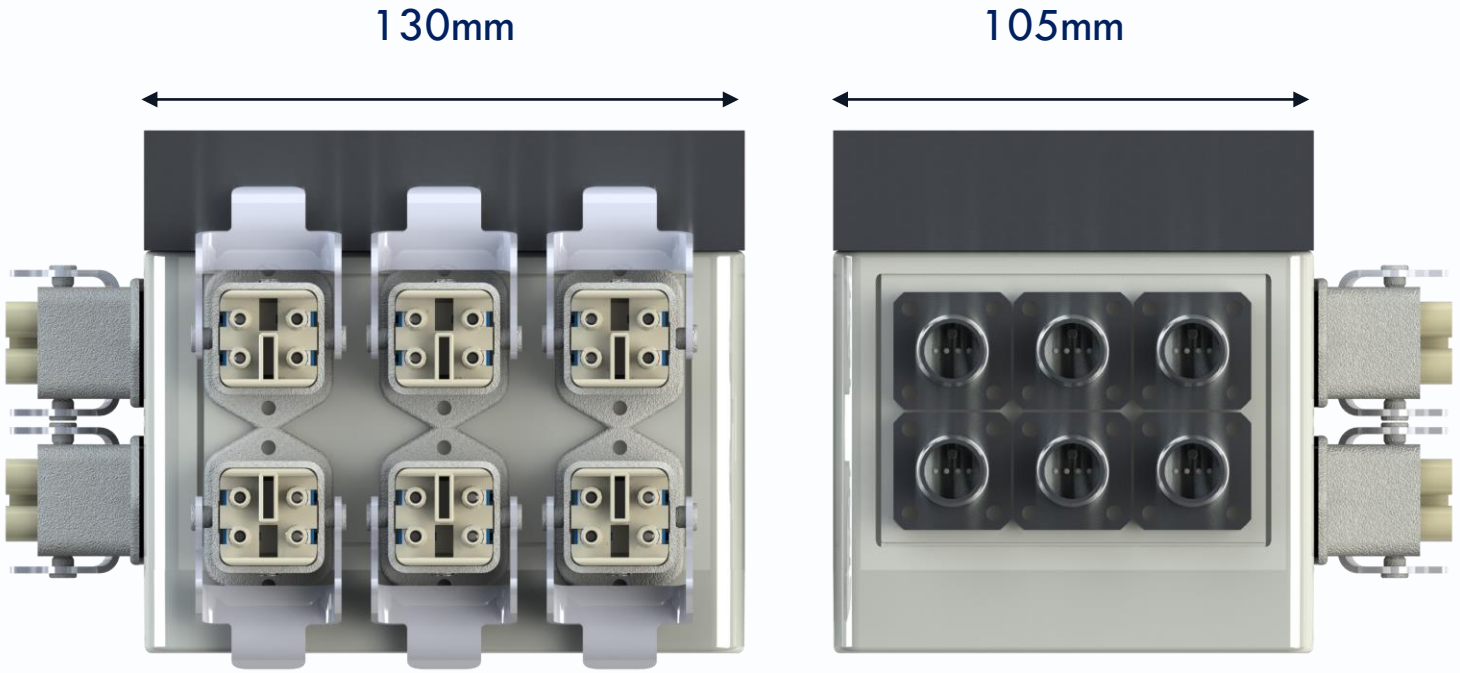
Additionally, different waterproof fibre connections such as MPO, ODC or Hughes High Density ODC can be incorporated for increased functionality



Increased connector density

High Density ODC (HDODC) bulkhead connections can make sense in some applications

They reduce space and labour requirements whilst increasing connector density by **50%** compared to standard ODC connections (one connector carries 2 fibre pairs)



H-Mod Fibre

HDODC

Making it possible

Such a system becomes viable due to Hughes' HDODC to ODC2 break out adaptors

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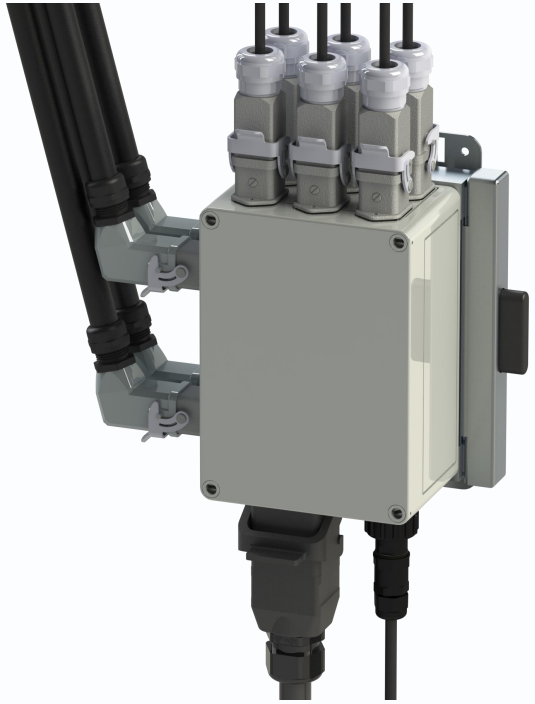
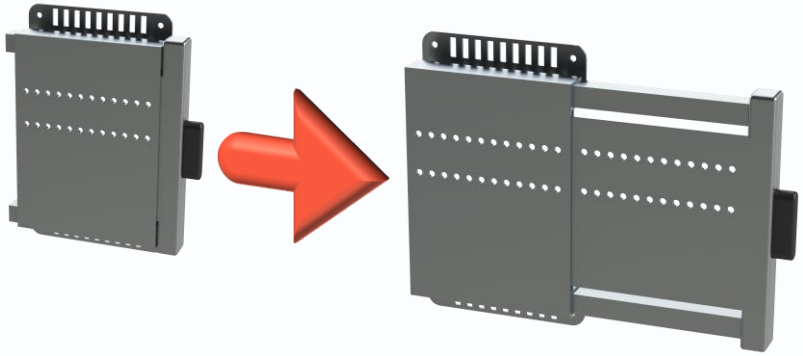




OneBox deployment

OneBox is designed to fit on Hughes' telescopic rail

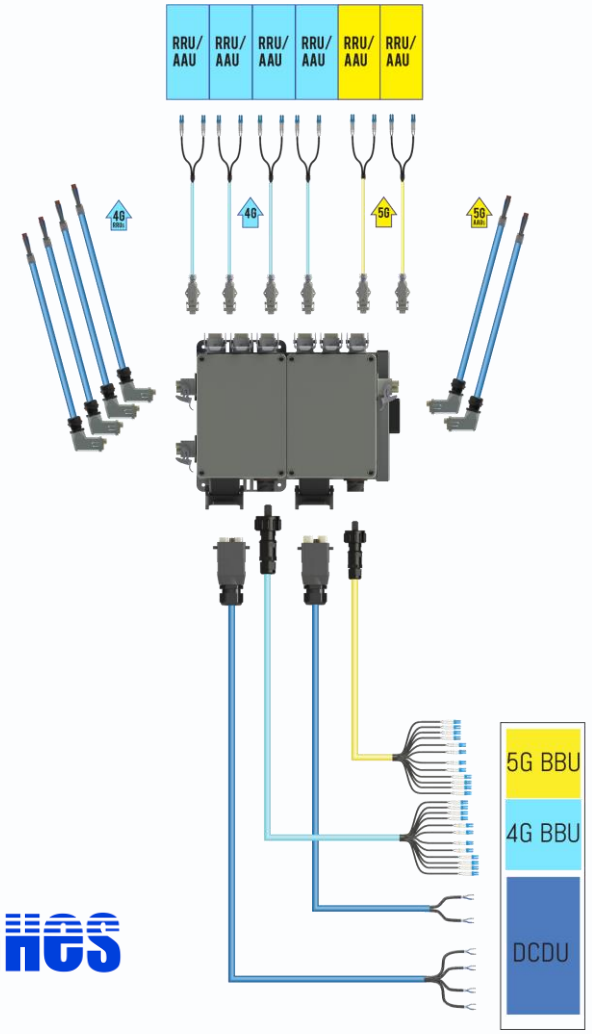
OneBox can be multiplexed as and when desired

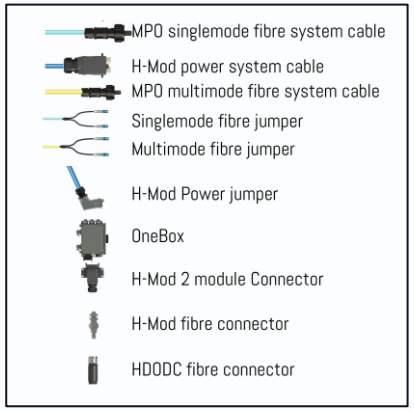
Example distribution systems

Innovative solutions in practice

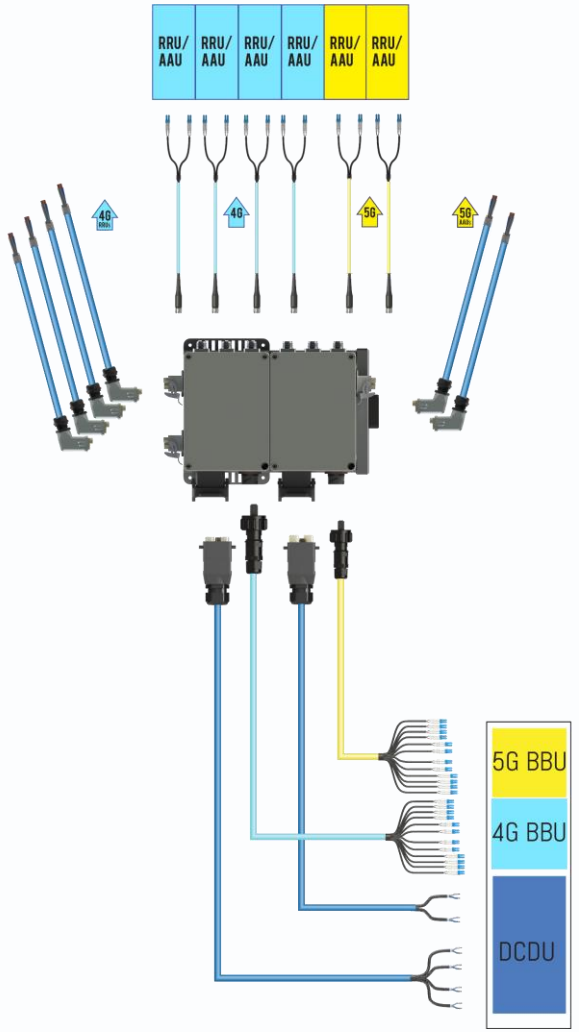
Typical distribution for HA sites

H-MOD SOLUTION



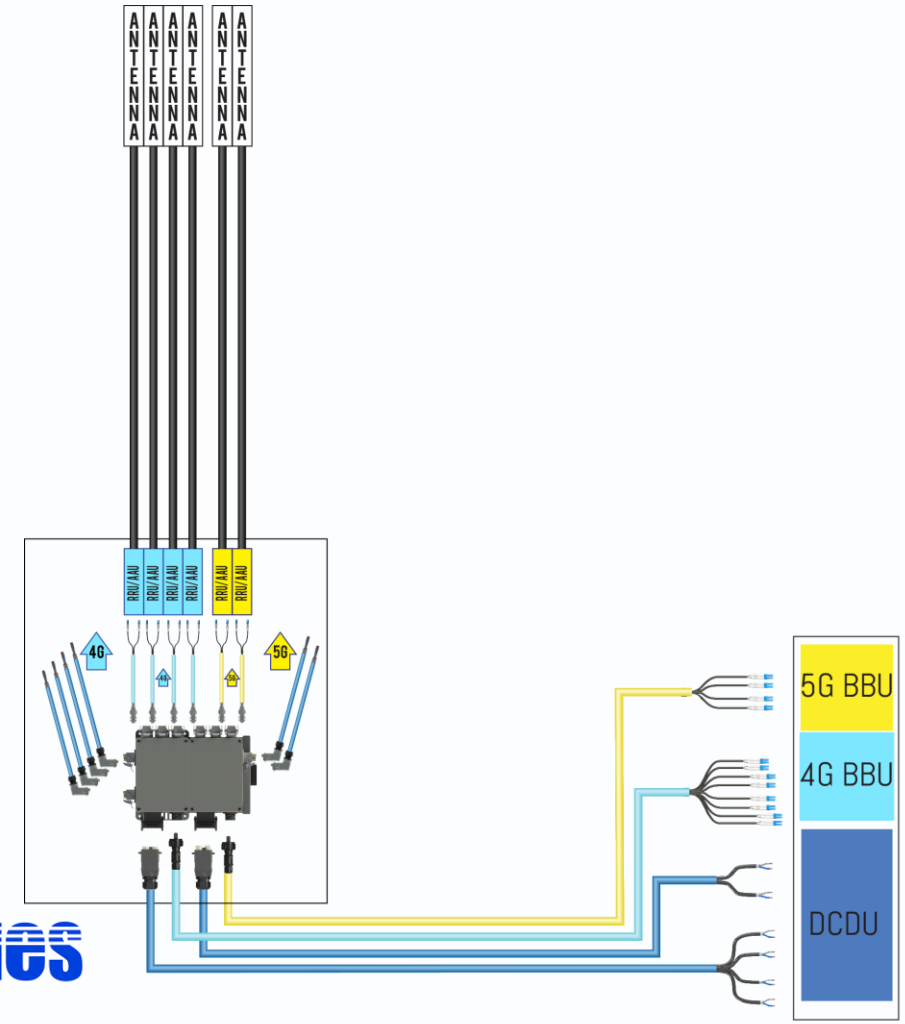


HDODC SOLUTION

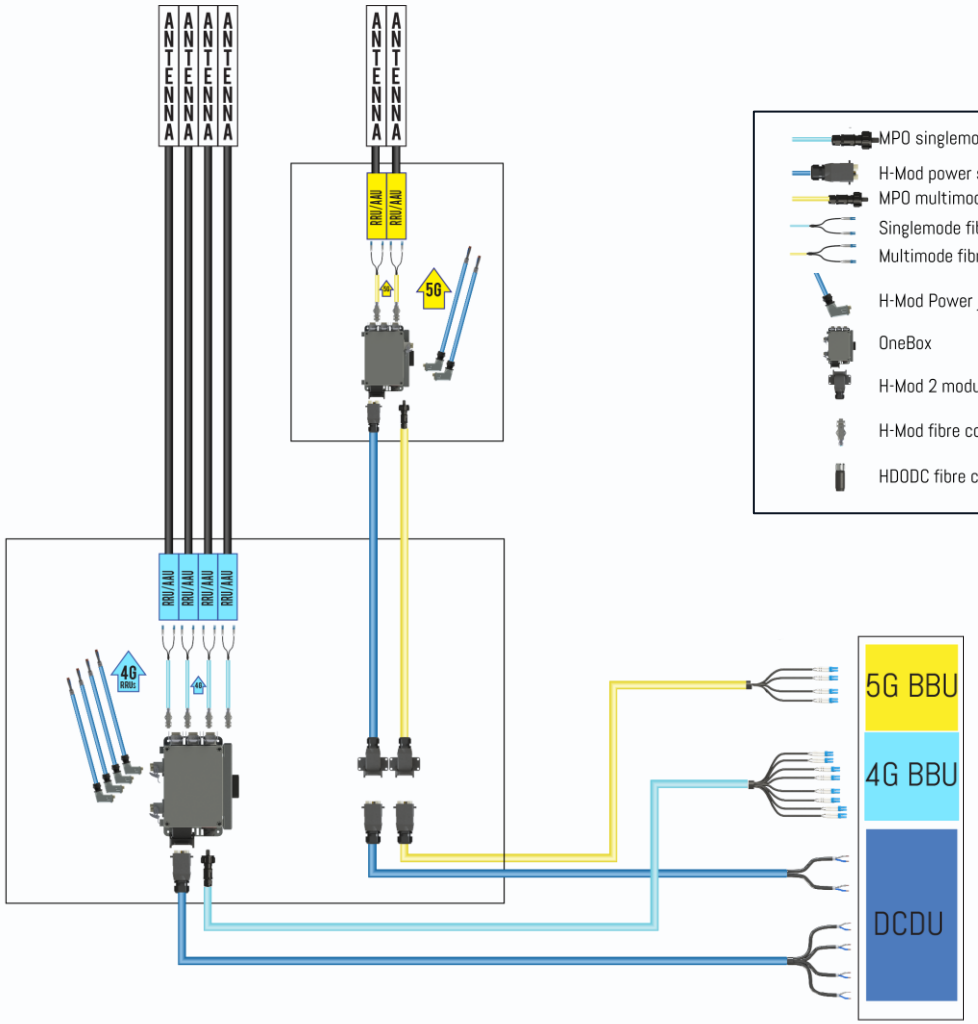


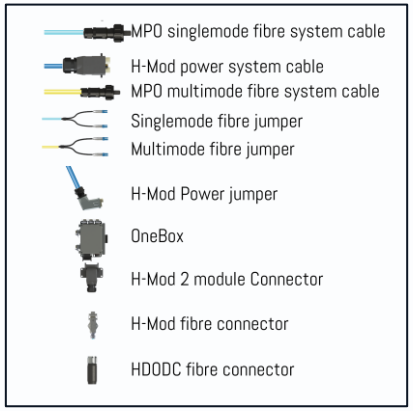
Typical distribution for HB and HAB sites

HB SOLUTION



HAB SOLUTION





Technical data

The not-so-small print

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Technical data (see annexes for full spec)

Fibre system cables

MM and SM 4 core H-Mod Male to LC fibre jumper cable	
General Specifications For Multimode	
Insertion Loss	LC/UPC ≤≤0.3dB λ: 850nm, 1300nm * Insertion loss is measured according to the IEC 61300-3-34 [20] method 1
Return Loss	LC/UPC ≥35dB λ: 850nm, 1300nm * Return loss is measured according to the IEC 61300-3-6 [17]
General Specifications for Singlemode	
Insertion Loss	LC/UPC ≤0.25dB λ: 1310&1550nm * Insertion loss is measured according to the IEC 61300-3-34 [20] method 1
Return Loss	LC/UPC ≥50dB λ: 1310&1550nm * Return loss is measured according to the IEC 61300-3-6 [17]
Environmental & other	
Operating Temperature	-40ºC to +85ºC
Compliance	CE;
	RoHS V2 directive 2011/65/EU;
	WEEE directive 2002/96/EC;
	REACH;
Connector housing type	3A Male
Material (hood/housing)	Aluminium die-cast
Surface (hood/housing)	Powder-coated
Cable gland	M20x1.5mm, cable OD 6-12mm,
	IP68, Black Polyamide (PA)
H-mod connector IP rating	IP67

Power system cables

H-Mod power jumper power cable 10mm2	
Connector	
Connector housing type	3A Male angled
Material (hood/housing)	Aluminium die-cast
Surface (hood/housing)	Powder-coated
Material (contacts)	Copper alloy
Surface (contacts)	Silver plated
Cable gland	M25x1.5mm, cable OD 9-18mm,
	IP68, Black Polyamide (PA)
Conductor cross-section	4 to 10 mm²
Rated current	40 A
Rated voltage	400 V
Rated impulse voltage	6 kV
Cable	
Type	0.6/1KV Flexible CU/XLPE/Shield/PVC Power Cable, ROV-K 2x16mm2
Rated Voltage	600/1000V
Conductor Shape	round
Conductor Material	Stranded Annealed Copper, Class5
Appr. Weight	395kg/km
Max: DC Resistance(20˚C)	1.91Ω/Km
Operating temperature	≤90 °C
Test voltage	3.5kV
Environmental & other	
Assembly weight	4.05kg (10m cable)
Operating temperature	-40 °C to +80 °C
Standard	IEC60502-1
IP rating	IP67
RoHS	Compliant

Technical data

OneBox

General	
Input Connectors	
Power	1 x shielded H-Mod power connector (for up to 4 circuits)
Fibre	1 x 24 core MPO ODVA (SM or MM fibre)
Output connectors	
Power	2 or 4 x 2 core shielded H-mod jumper connectors
Fibre	6 x 4 core H-mod LC fibre jumper connectors
Rated current	40A per circuit
Number of power circuits	2 or 4
Fibre type	24 core MPO to LC fibre connectors (single or multimode)
IP rating	IP67
Weight	3.15kg (Single 4G enclosure with mounting bracket) 4.0kg (4G and 5G enclosure with mounting bracket)
Operating temperature	-40 °C to +80 °C

Telescopic rail

Mounting bracket	
Bracket type	Telescopic rail bracket
Materials:	
Bracket and locking mechanism	Stainless steel, zinc plated
Button	Polycarbonate (PC), UL94 V-0, UV protected
Mounting type	Universal Pole and wall mount
Size	
Closed	220mm x 175mm x 34mm
Extended	220mm x 295mm x 34mm
Weight	2.0kg
Operating Temperature	-40°C to +85°C

Technical Compliance

The components presented are compliant with BS7671

The cabling presented is UV Resistant and LS0H

The components presented are IP67 rated or higher

Make the move to modular

Minimise overall costs of site installation

Minimise installation time, streamline installation practices

De-skill the installation, adopt plug-and-play infrastructure

Improve H&S, minimise climbing time and use of tools

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Take your pick

Configure OptiMod to suit your application

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In passive technology, it's the details that matter

Hughes take care of those details!