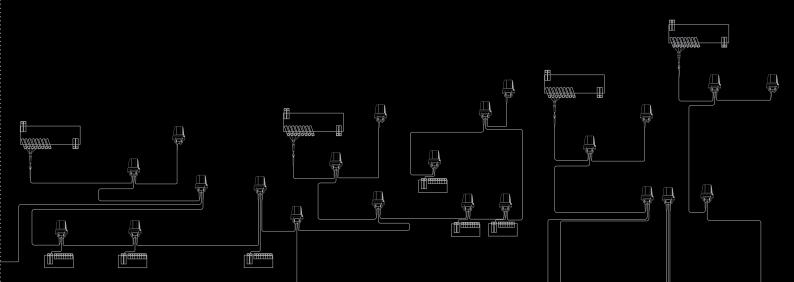


H3R0E

HARSH ENVIRONMENT RETICULATED OPTICS

CATALOGUE



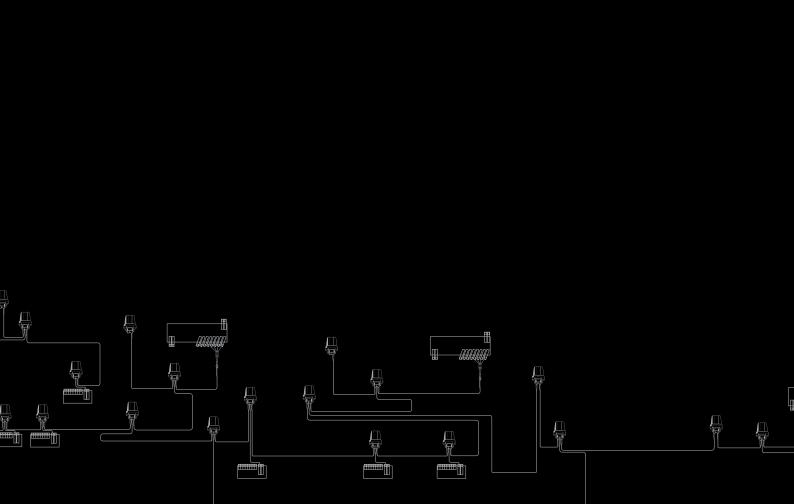


TABLE OF CONTENTS

INTRODUCTION	2
BOTS	3
CABLES	
Cable Types	11
Cable Adaptors	15
BULKHEADS	17
MOUNTING BRACKETS	21
ACCESSORIES	25
CUSTOM PROJECTS	27



With fibre optics becoming the absolute foundation of all industrial networking and cabled communications infrastructure, we've made things easier with H3RO – Harsh Environment Reticulated Optics.

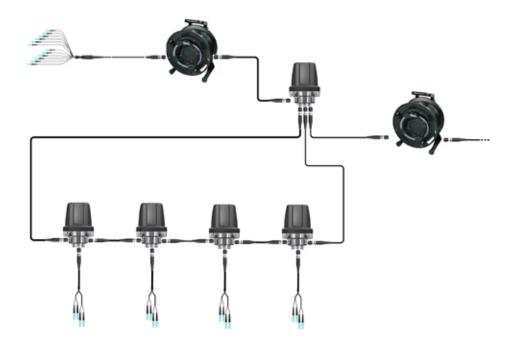


HARSH ENVIRONMENT RETICULATED OPTICS

H3RO is a pre-terminated modular fibre optics system which removes the requirement for specialised labour and simplifies installation. The plug and play modular system supports standardisation allowing reductions in cost, simplified rollout, consolidation of spares and consistent high quality system expansion within harsh environments.

Combining telco grade low loss industrial fibre optics connectors with fit for purpose industrial break out terminals (BOTs), glands and cable armour allows a reliable and robust industrial solution. The innovative BOTs replace large enclosures and minimise common failure points such as unnecessary through patching and unnecessary connector exposure to the harsh environmental elements.

Supporting traditional Ethernet as well as Passive Optical Network (PON) models the single mode fibre optics system removes the need for time consuming fibre optics terminations in the field and allows introduction of a standardised and future-proof fibre optic infrastructure.



H3ROE BOTS



The H3RO BOT (Break Out Terminal) is an IP68 rated harsh environment industrial FOBOT. Manufactured to the highest standards utilising robust industrial suitable materials and low loss high quality connectors. The BOTs are available in a range of configurations for Ethernet and PON applications.

H3RO BOTs reduce the cost, complexity and physical footprint of network installations. Common failure points are removed by not exposing all cores of the backhaul trunk fibre at every location.

The BOTs are passive devices and come in a variety of configurations to support standard network topologies, are fire resistant anti-static (FRAS) compliant, do not require fibre optics technicians to install and are supplied with a universal mounting bracket.











Robust, industrial tough, IP68, FRAS break out terminal

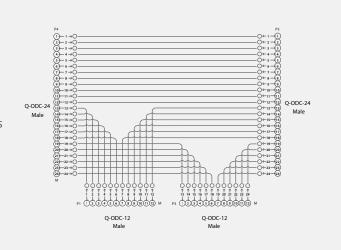
High quality, low loss IP68 connectors

Tool-less installation, universal mounting bracket

BOT CONFIGURATIONS

Trunk Distributor (TD)

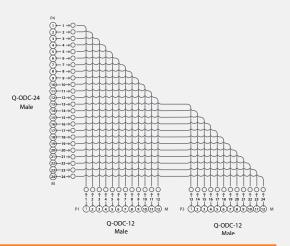
The H3RO IP68 Trunk Distributor (TD) is designed for backbone distribution of 24 core fibre optics. This unit suits standard Ethernet ring, linear and star networks. The top 12 cores are passed through to minimise loss and allow access further down stream.



Туре	Ordering code	Description	Connector ports, connector types and function				
	FOBOT Trunk	1	2	3	4	5	
TD	H3RO-BOT-TD	Distributor	Out Q-ODC-12		Out Q-ODC-12	In Q-ODC-24	Out Q-ODC-24

Trunk Fan Out (TF)

The H3RO IP68 Trunk Fan Out (TF) allows a 24 core cable to be split into two separate 12 core drops. The drops can be utilised close to the BOT location or run large distances into 12 core cables which can be in turn combined with other BOTs and cables to reticulate to network end devices in common linear, star or ring topogies.

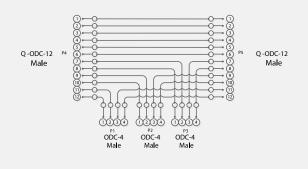


Туре	Ordering code	Description	Connector ports, connector types and function				
		FOBOT Trunk	1	2	3	4	5
TF	H3RO-BOT-TF	Fan Out	Out Q-ODC-12		Out Q-ODC-12	In Q-ODC-24	

Ring Distributor (RD)

The H3RO IP68 Ring Distributor (RD) is designed for the backbone distribution of 12 core networks.

Ideal for the coupling of Ethernet rings in various topologies the RD BOT provides the ability to easily loop off and bring back fibre pairs allowing the network to continue along the trunk cable backbone in a standardised fashion.

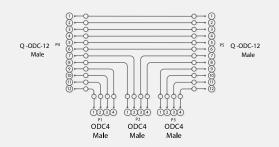


Туре	Ordering code	Description	Connector ports, connector types and function				
		FOBOT Ring	1	2	3	4	5
RD	H3RO-BOT-RD	Distributor	Loop: ODC-4	Loop: ODC-4	Loop: ODC-4	In: Q-ODC-12	Out: Q-ODC-12



Network Distributor (ND)

The H3RO IP68 Network Distributor (ND) is designed for the backbone distribution of 12 core fibre trunk cable and enables the dropping of three pairs via three 4 core ODC cables. Two pairs are dropped together on P1 and brought back on P3 while the remaining pair is dropped and brought back on P2 in a loop style allocation.

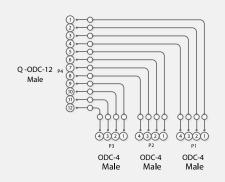


Туре	Ordering code	Description	Connector ports, connector types and function				
		FOBOT Network	1	2	3	4	5
ND	H3RO-BOT-ND	Distributor	Drop: ODC-4	Loop: ODC-4	Drop: ODC-4	ln: Q-ODC-12	Out: Q-ODC-12

Fan Out (FO)

The H3RO IP68 Fan Out (FO) allows a 12 core cable to be fanned out into three 4 core ODC drops. This BOT is ideal for cases where cores are to be dropped off to active equipment or other H3RO BOTs.

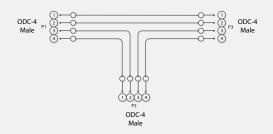
By combining two of these units the network can easily and effectively service three separate areas via 4 core cable and then bring the 4 core cables back into one 12 core trunk backbone.



Туре	Ordering code	Description	Connector ports, connector types and function			
			1	2	3	4
FO	H3RO-BOT-FO	FOBOT Fan Out	Drop: ODC-4	Drop: ODC-4	Drop: ODC-4	In: Q-ODC-12

Ring Access (RA)

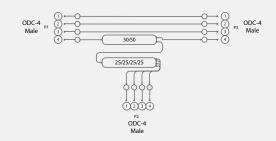
The H3RO IP68 Ring Access (RA) breaks out a fibre pair from 4 core cable to an active terminal equipment. RA BOTs are ideal for looping off a pair of fibre cores to active equipment and then passing the cores down the line for other equipment and ring redundancy.



Туре	Ordering code	Description	Connector ports, connector types and function			
		FOBOT	1	2	3	
RA	H3RO-BOT-RA	Ring Access	In: ODC-4	Loop: ODC-4	Out: ODC-4	

Trunk Splitter (TS)

The H3RO IP68 Trunk Splitter (TS) is a highly stable xPON optical splitter that splits a single trunk network core into four spur cable cores. The TS BOT allows the original network core to continue on after the split, providing a 50/50 split of the trunk core, and a further split evenly across the four spur cores.

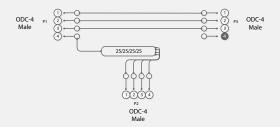


Туре	Ordering code	Description	Connector ports, connector types and function			
		FOBOT	1	2	3	
TS	H3RO-BOT-TS	Trunk Splitter	In: ODC-4	Drop: ODC-4	Out: ODC-4	



Trunk Terminator (TT)

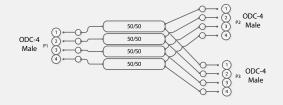
The H3RO IP68 Trunk Terminator (TT) is a highly stable xPON optical splitter that breaks out a trunk for the final time into four spur cable cores and terminating the trunk core for that network. The TT BOT evenly splits the trunk core across four spur cores allowing the network to branch out to additional nodes.



Туре	Ordering code	Description	Connector ports, connector types and function			
		FOBOT	1	2	3	
TT	H3RO-BOT-TT	Trunk Terminator	In: ODC-4	Drop: ODC-4	Out: ODC-4	

Spur Divider (SD)

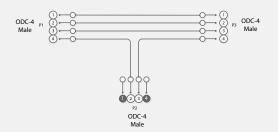
The H3RO IP68 Spur Divider (SD) is a highly stable xPON optical splitter that allows low insertion loss and splits the 4 core spur further into two equal subdivided 4 core spur cables.



Туре	Ordering code	Description	Connector ports, connector types and function			
		FOBOT	1	2	3	
SD	H3RO-BOT-SD	Spur Divider	In: ODC-4	Drop: ODC-4	Drop: ODC-4	

Drop Tap 4 (DT4)

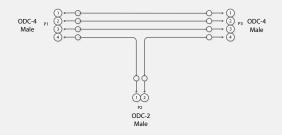
The H3RO IP68 Drop Tap 4 (DT4) Trunk Terminator drops out the xPON network to final access equipment (ONU/ONT). This BOT provides connection to companion xPON networks for Class C redundancy and drops off two cores in a 4 core ODC cable.



Туре	Ordering code	Description	Connector ports, connector types and function			
		FOBOT	1	2	3	
DT4	H3RO-BOT-DT4	Drop Tap 4	In: ODC-4	Drop: ODC-4	Out: ODC-4	

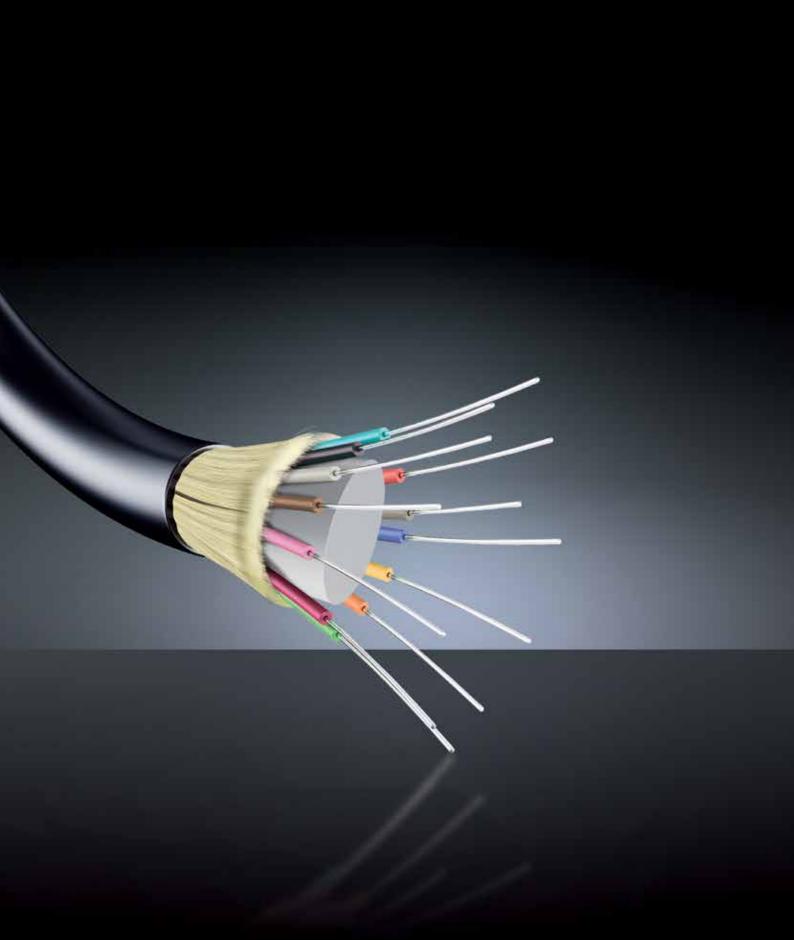
Drop Tap 2 (DT2)

The H3RO IP68 Drop Tap 2 (DT2) Trunk Terminator drops out the xPON network to final access equipment (ONU/ONT). This BOT provides connection to companion xPON networks for Class C redundancy and drops off two cores in a 2 core ODC cable.



Туре	Ordering code	Description	Connector ports, connector types and function			
		FOBOT	1	2	3	
DT2	H3RO-BOT-DT2	Drop Tap 2	In: ODC-4	Drop: ODC-2	Out: ODC-4	

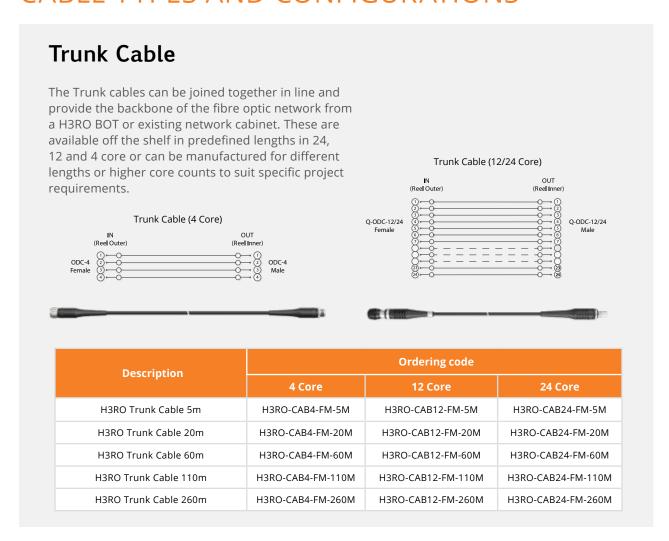
H3ROE CABLES



H3RO fibre optical cables are supplied pre-terminated in a variety of lengths with rugged IP68 connectors, with all longer runs supplied on mobile deployment reels. Breakouts are supported for SC, LC, ST and other common connectors.

The H3RO system utilises 24, 12 and 4 core quick connect industrial IP rated termination fittings. The cable connectors are the smallest and most robust connectors in their class and feature an outstanding low loss coupling mechanism. Custom larger core counts and cable lengths as well as alternative cable jackets are available for bespoke projects.

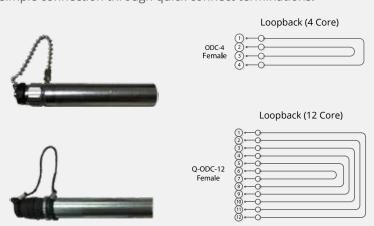
CABLE TYPES AND CONFIGURATIONS

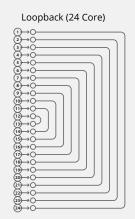




Loopback Cable

The Loopback cable allows fibre cores to be looped back through active equipment to terminate network topologies. The cable allows low loss insertion and simple connection through quick connect terminations.





Ordering code	Description
H3RO-Loop4-F	H3RO Loopback ODC-4
H3RO-Loop12-F	H3RO Loopback Q-ODC-12
H3RO-Loop24-F	H3RO Loopback Q-ODC-24

H3RO Cable

H3RO pre-terminated cables are developed for harsh environments with high water and oil resistance, high tension and torsion ratings, glass armouring and rodent protected sheath as standard.

All connectors are low loss IP68 tool-less connections, the standard trunk cables come on a high quality mobile reel allowing quick and easy deployment, an optional trolley pack adds an extension handle and wheels.

For further technical information and standards compliance please review the tabular data on the following page which outlines our standard cable. Other cable constructions are available on request.



Standard Cable Characteristics	Conditions	4 Core	12 Core	24 Core	Standard	
Metal Free Cable		Yes	Yes	Yes		
Rodent Protected, glass armoured		Yes	Yes	Yes		
UV-Protected, suitable for outdoor use		Yes	Yes	Yes		
Outer Jacket Colour		Black	Black	Blue		
Outer Jacket/TPU		5.6mm	7mm	7mm		
Optical Fibre Count		4	12	24		
Single Mode E9/125	Typ B1.3 + ITU G.652.D	Yes	Yes	Yes	IEC 60793-2-50	
		Mechanical Proper	ties			
Weight		26kg/km	44kg/km	44kg/km		
Tensile Strength	During installation	4000N	2500N	2500N	IEC 60794-1-2 E1	
	In service	2000N	1500N	1500N		
Min, Bending Radius	During installation	90mm	50mm	50mm	IEC 60794-1-2 E11	
	In service	45mm	70mm	70mm		
Crush Resistance	During installation	21,000N/dm	9000N/dm	9000N/dm	IEC 60794-1-2 E3	
	In service	6000N/dm	2000N/dm	2000N/dm		
Impact Resistance	Wp = 1.5J	300 impacts	100 impacts	100 impacts	IEC 60794-1-2 E4	
Repeated Bending	Radius = 50mm/Weight = 2kg	20,000 cycles	2,000 cycles	2,000 cycles	IEC 60794-1-2 E6	
Flexing	Radius = 120mm/Weight = 2kg/Velocity = 1.4m/s	100,000 cycles	100,000 cycles	100,000 cycles	IEC 60794-1-2 E8	
Coiling Capacity	Length = 100m/Radius = 45mm	5 cycles	5 cycles	5 cycles	Spooling capability	
Torsion	Angle = +/-1400°/Length = 1000mm	1000 cycles	1000 cycles	1000 cycles	IEC 60794-1-2 E7	
		Environmental Prope	erties			
Temperature Range	During installation	-45 up to +85 °C	-25 up to +70 °C	-25 up to +70 °C		
	In service	-60 up to +85 °C	-45 up to +85 °C	-45 up to +85 °C	IEC 60794-1-22F1	
	In storage	-60 up to +85 °C	-45 up to +85 °C	-45 up to +85 °C		
Fire Load		0.5 MJ/m	0.58 MJ/m	0.58 MJ/m		
2011/65/EC (RoHS)		Compliant	Compliant	Compliant		
Water Penetration	h-1m, 24h, p<3m	Not tested	Compliant	Compliant	IEC 60794-1-2 F5B	

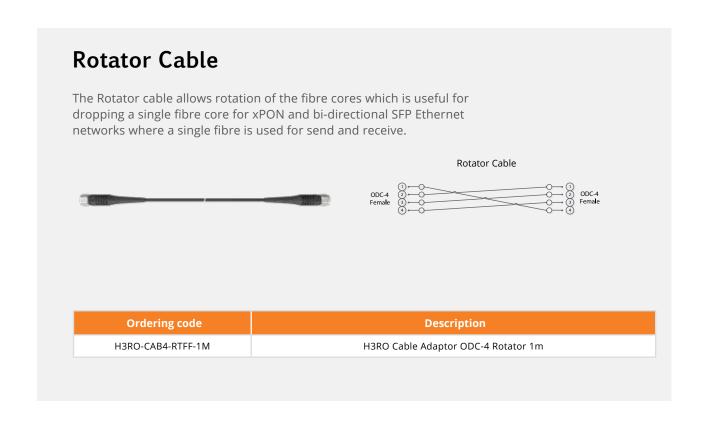


Connector Characteristics	4 Core	12/24 Core	Standard
Plug (female)			
Extension (male)	E III		
Rear mount bulkhead			
Front mount bulkhead	(313 y	5	
Technology	Full ceramic ferrule and sleeve	Plastic ferrule (PPS)	
Housing material	Nickel-plated brass	Nickel-plated brass	
Mating mechanism	Screwed locking mechanism	Push-pull with two clearly defined states	
Mechanical performance - plug	≤800N tensile load ≤30N static side load	≤500N tensile load	
Mechanical performance - socket	≤30N tensile load	≤30N tensile load	
Installation torque force	min. 1Nm - max. 2 Nm	n/a	
Operating temperature	- 40°C up to 85°C (depending on cable type)	- 40°C up to 85°C (depending on cable type)	IEC61300-2-22
Mating durability	1000 cycles (with repeated cleaning)	500 cycles (with repeated cleaning)	IEC61300-2-2
Ingress protection (mated)	IP68	IP68 (3m/30 days)	IEC60529
Salt mist	30 days passed	30 days passed	IEC61300-2-26
Vibration	Passed 10-500Hz/10g	Passed 10-500Hz/10g	IEC61300-2-1
Shock	Passed 100g	Passed 50g Passed category 1 & 2	IEC61300-2-9 IEC61373
Typical insertion loss	≤0.20dB	0.15dB	
Max insertion loss	≤0.45dB	0.35dB	
Return loss	≥50dB	≥60dB	

H3RO cable adaptors allow versatility by offering a range of options to change the order of the optical cores for both active Ethernet and xPON applications.

Inverting or rotating cores allows different cores to be dropped off to devices or network spurs whereas union cables allow two male connectors such as bulkheads to be joined.

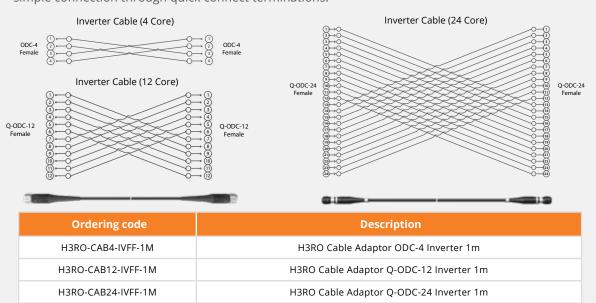
CABLE ADAPTORS





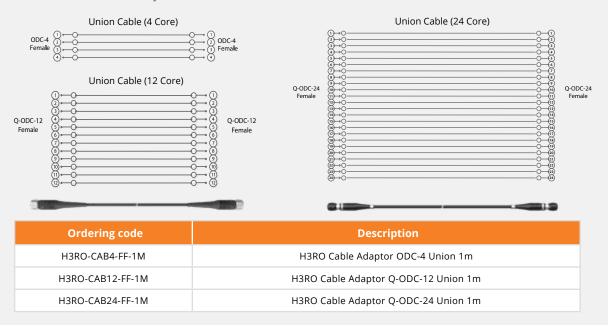
Inverter Cable

The Inverter cable allows the fibre cores to be reversed to access alternative network paths. The cable allows low loss insertion and simple connection through quick connect terminations.



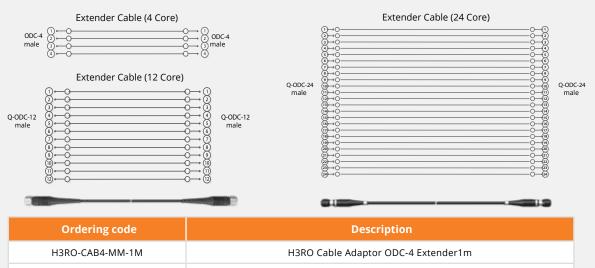
Union Cable

The H3RO Union cable provides a straight through connection between BOTs or between cables along the trunk backbone of the fibre network. The cable allows low loss insertion and simple connection through quick connect terminations. The Union cable has a female connector at both ends to allow for male connections to be joined.



Extender Cable

The H3RO Extender cable provides a straight through connection between BOTs or between cables along the trunk backbone of the fibre network. The cable allows low loss insertion and simple connection through quick connect terminations. The Extender cable has a male connector at both ends to allow for female connections to be joined.



Ordering code	Description
H3RO-CAB4-MM-1M	H3RO Cable Adaptor ODC-4 Extender1m
H3RO-CAB12-MM-1M	H3RO Cable Adaptor Q-ODC-12 Extender1m
H3RO-CAB24-MM-1M	H3RO Cable Adaptor Q-ODC-24 Extender 1m

H3ROE BULKHEADS



The H3RO system provides all accessories required for industrial applications including bulkheads. The bulkhead terminations allow for robust mounting in harsh environments and supports ease of installation and movement of equipment.

IP68 rated Bulkheads are available to convert from H3RO quick connect cables to SC, LC and ST terminations supporting easy integration into existing patch panels and network infrastructure.

BULKHEAD CONFIGURATIONS

Bulkhead Rear Mount

The H3RO rear mount bulkhead allows for rear mounting of the IP68 bulkhead. Connector tails are available for all common connectors as standard stocked items. Custom connector tails are also available on request.



Description	Ordering code		
Description	4 Core	12 Core	24 Core
H3RO Bulkhead Hex LC	H3RO-BH4-HXLC-1M	H3RO-BH12-HXLC-1M	H3RO-BH24-HXLC-1M
H3RO Bulkhead Hex SC	H3RO-BH4-HXSC-1M	H3RO-BH12-HXSC-1M	H3RO-BH24-HXSC-1M
H3RO Bulkhead Hex ST	H3RO-BH4-HXST-1M	H3RO-BH12-HXST-1M	H3RO-BH24-HXST-1M
H3RO Bulkhead Hex SCA	H3RO-BH4-HXSCA-1M	H3RO-BH12-HXSCA-1M	H3RO-BH24-HXSCA-1M
	4 Core	12/24 C	ore
Mounting Holes	19.4 ± 0.2	18.4 ± 0.2	6.4 = 0.2



Bulkhead Front Mount

The H3RO square flange bulkhead allows for front mounting of the IP68 bulkhead. Connector tails are available for all common connectors as standard stocked items. Custom connector tails are also available on request.



Description	Ordering code		
Description	4 Core	12 Core	24 Core
H3RO Bulkhead Square LC	H3RO-BH4-SQLC-1M	H3RO-BH12-SQLC-1M	H3RO-BH24-SQLC-1M
H3RO Bulkhead Square SC	H3RO-BH4-SQSC-1M	H3RO-BH12-SQSC-1M	H3RO-BH24-SQSC-1M
H3RO Bulkhead Square ST	H3RO-BH4-SQST-1M	H3RO-BH12-SQST-1M	H3RO-BH24-SQST-1M
H3RO Bulkhead Square SCA	H3RO-BH4-SQSCA-1M	H3RO-BH12-SQSCA-1M	H3RO-BH24-SQSCA-1M
		4/12/24 Core	
Mounting Holes	□ 18.25 M3 □ 16.3 03		

Bulkhead Flameproof

The H3RO flameproof bulkhead is a certified IECEx product for use in explosive atmospheres.

Type of Protection: Flameproof

Markings: Ex db I Mb

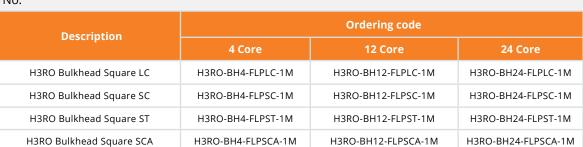
Ex db IIC Gb

Standards: IEC 60079.0-2017

IEC 60079.1-2014-06

Thread Dimensions: M25 x 6g Certificate IECEx ExTC 18.0017U

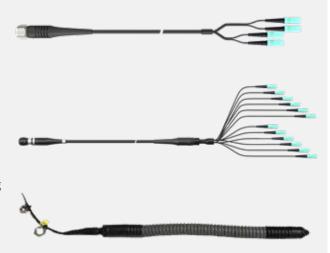
No:





Launch Lead

For situations where a metal bulkhead is not required the H3RO solution offers a launch lead cable. Unlike a traditional bulkhead the launch leads have an attachment point mid cable allowing it to be fed into the enclosure and secured by supplied nuts. This plastic threaded connector allows attachment through a 26mm circular opening and can be easily converted to a 16mm circular opening if required. The leads are provided with a casing for the tails, providing protection during installation.



Description	Ordering code		
Description	4 Core	12 Core	24 Core
H3RO Launch Lead Female LC	H3RO-LL4-FLC-5M	H3RO-LL12-FLC-5M	H3RO-LL24-FLC-5M
H3RO Launch Lead Male LC	H3RO-LL4-MLC-5M	H3RO-LL12-MLC-5M	H3RO-LL24-MLC-5M
H3RO Launch Lead Female SC	H3RO-LL4-FSC-5M	H3RO-LL12-FSC-5M	H3RO-LL24-FSC-5M
H3RO Launch Lead Male SC	H3RO-LL4-MSC-5M	H3RO-LL12-MSC-5M	H3RO-LL24-MSC-5M
H3RO Launch Lead Female ST	H3RO-LL4-FST-5M	H3RO-LL12-FST-5M	H3RO-LL24-FST-5M
H3RO Launch Lead Male ST	H3RO-LL4-MST-5M	H3RO-LL12-MST-5M	H3RO-LL24-MST-5M
H3RO Launch Lead Female SCA	H3RO-LL4-FSCA-5M	H3RO-LL12-FSCA-5M	H3RO-LL24-FSCA-5M
H3RO launch Lead Male SCA	H3RO-LL4-MSCA-5M	H3RO-LL12-MSCA-5M	H3RO-LL24-MSCA-5M

H3ROE MOUNTING BRACKETS



H3RO BOTs come with a universal mounting bracket supporting a number of different mounting options to suit any application.

With a common industrial mounting point and thumb screw bot attachment a suite of quick connect attachment options are available to securely mount the BOTs.

Common industrial mounting points include uni-strut, din rail, catenary wire, mesh and solid structure attachment.

MOUNTING BRACKET CONFIGURATIONS

Unistrut/Channel

H3RO BOTs can be mounted to existing infrastructure such as uni-strut, commonly found in harsh environment applications, using a stainless steel channel nut and M6 stainless steel bolt.

Ordering code	Description	
H3RO-KIT-BOT-UNISTRUT	H3RO Bot Unistrut Kit X10	





Din Rail

Din rail is commonly found in the industrial environment. The universal mount supports the din mount kit to easily clip onto Din rail, allowing H3RO BOTs to be mounted easily into existing infrastructure areas close to active equipment.

Ordering code	Description
H3RO-KIT-BOT-DIN	H3RO Bot Din Kit X5



Catenary Wire

The universal H3RO mount allows for mounting to catenary wire straight out of the box. Simply hook the angled top onto the wire and secure with a cable tie or other suitable locking component.



Wire Mesh

For quick installation to mesh structures the universal mount directly hooks on and can be secured with a cable tie or similar. The strategically placed mounting holes provide additional attachment points as required.

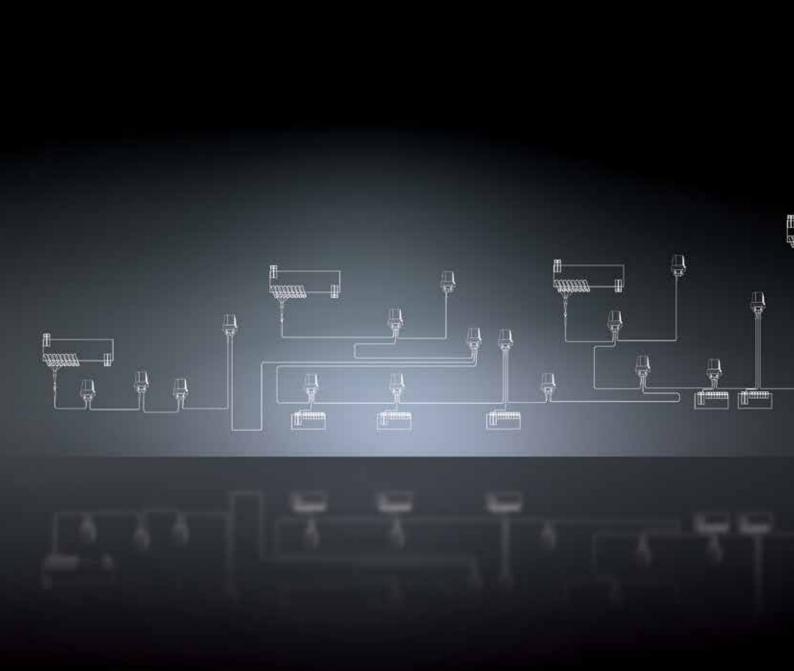


Solid Structure Attachment

Strategically placed holes in the bracket allows the H3RO universal mount to attach to any solid structure by simply securing the mount to a suitable location, sliding on the bot and tightening the thumb screw.



H3ROE ACCESSORIES



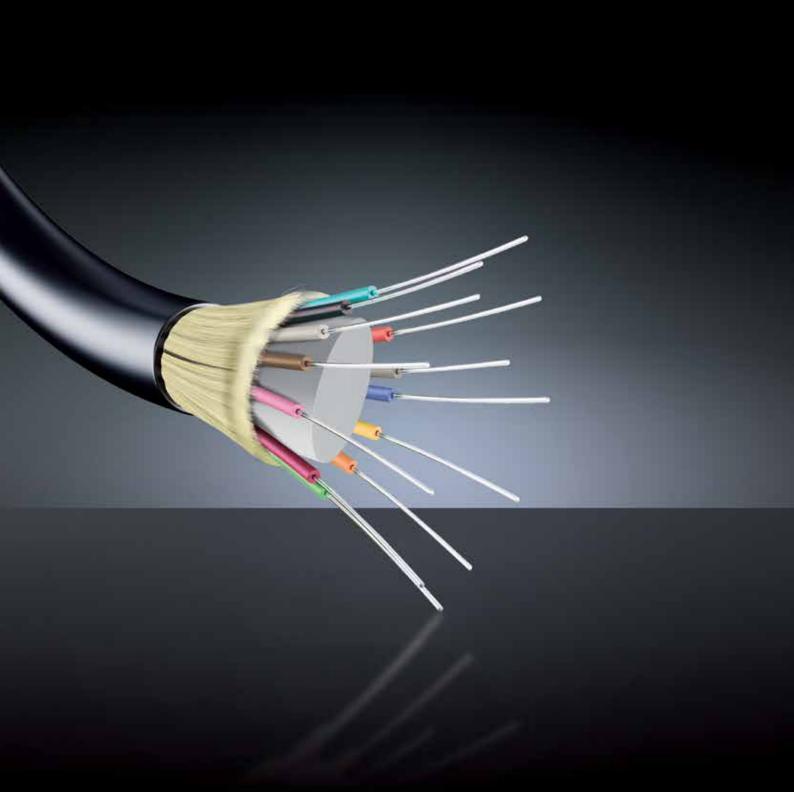
To support ease of use and maintenance of H3RO in the field we supply a range of accessories and fibre optic cleaning products.

ACCESSORIES



Ordering code	Description
H3RO-KIT-CLEAN	Kit Cleaner H3RO
H3RO-CLN-CLKLC	Cleaner H3RO ODC-4/LC 1.25mm Ferrules
H3RO-CLN-CLKSCST	Cleaner H3RO SC 2.5mm Ferrules
H3RO-CLN-CLKMTP	Cleaner H3RO Q-ODC-12/24 MTP Ferrules
H3RO-CLN-ADPM12	Cleaner H3RO Adaptor Q-ODC-12/24 Extension/Male
H3RO-CLN-ADPF12	Cleaner H3RO Adaptor Q-ODC-12/24 Plug/Female
H3RO-CLN-BRSHMTP	Cleaner H3RO Q-ODC-12/24 Brush MTP
H3RO-CLN-SWABMTP	Cleaner H3RO Q-ODC-12/24 MTP Swab x10
H3RO-CLN-SWABEXP	Cleaner H3RO Exposed Ferrule Swab x10
H3RO-CLN-SWABLC	Cleaner H3RO ODC-4 LC Swab x10
H3RO-CLN-SWABSCST	Cleaner H3RO SC/ST Swab x10
H3RO-CLN-FLUID	Cleaner H3RO Fluid Spray Can
H3RO-CLN-WIPE	Cleaner H3RO Wipes
H3RO-CLN-AIRCAN	Cleaner H3RO Canned Air

H3ROE CUSTOM PROJECTS



Whilst standardising on components allows a modular networking platform and consolidation of spares, there are often requirements in industrial environments and large projects for specific engineered solutions.

H3RO is available in custom lengths, core counts, and with a range of bespoke break-out connectors, all of which integrate seamlessly with the standard product portfolio and existing third party infrastructure.

In addition to the standard cabling, BOTs and core breakouts a complete suite of alternatives exist for those unique projects where specific cable sheaths, hardware attachments and connectors may be required.

H3RO is manufactured in state of the art facilities and all product tested and quality assured before leaving our premises.

CUSTOM PROJECTS

Made to Order Fibre Optics

Our state of the art fibre optics facilities allow us the agility and flexibility to manufacture small or large quantities and lengths of cable specifically for custom requirements. In addition our many warehouses and distribution points globally allow us to choose a location best fit to support your operation.

Talk to us about your custom fibre optic requirements.





