SOLIFOS HYBRID CABLE SYSTEMS

Hybrid Cables for Data and Power Transmission

BRUpowermil | BRUpowerfield | Hybrid Connector A | BRUMIL 451

Solifos Authorized Representative in Korea

SOLIFOS FIBER OPTIC SYSTEMS

WiT (주)위트솔루션즈 Wise Industrial Technology

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BRUpowermil

3_7_12

Hybrid tactical FO/Cu field cable for harsh environment use. With its coaxial and compact cable structure for data and electrical power transmission it has outstanding characteristics.

Applications:

- Tactical military and field applications where flexible robust combined power and communication lines are required
- Drone Tethering
- Rapid deployment in harsh environment
- Indoor and outdoor

Description:

- FO-Cu-Hybrid-Cable for power and data transmission
- Central non-metallic loose tube construction for up to 4 fibers single-mode or multi-mode
- Two isolated coaxial layers of copper wire stranding. The outer layer has additional aramid reinforced plastic strands.
- High crush resistance
- High tensile strength
- 100% rodent proof
- Longitudinally watertight FIMT
- Compact structure allowing larger quantities per drum
- Low weight
- Robust sheath halogen-free

Construction

- Outer sheath constructed of PA sheath with extra abrasion resistance as requested
- Stainless steel strain bearing elements for armoring and strain relief
- Outer layer: copper wires and/or ARP rods (aramid reinforced plastic)
- Inner layer: copper wires
- Gel filled non-metallic loose tube
- Up to 4 bend optimized fibers with primary coating

Temperature range:

- Operating temperature -55 - +85
- Storage temperature -60 - +85

Jacket color

- Black similar to RAL 9005
- Labeling on request, individual per reel

Standards

- IEC 60794
- MIL-PRF-M85045

Power transmission;

U_{max}: 1000VAC/1500VDC

Test voltage: 3500VAC

$I_{max.}$: 16A

Remarks

Accessories offered

- Pre-assembly with military hybrid-lens-connectors
- Delivery on various reel sizes for easy deployment, as hand-reels, backpack or vehicle reels
- Adapting cables lens connector to standard connectors
- Deployment aids such as wedge clamps, masts, etc.
- Training for deployment, repair and testing
- Solution engineering and system design

Technical data 20 °C:

Type	No. of fibers	cable ø mm	Weight Kg/km	Max crush resistance N/cm	Max. tensile strength Short term N	Long term N
BRUpowermil 4F	4	5,8	68	1000	2800	1750

Type	Min. bending radius With tensile mm	Without tensile mm	Cu cross section area mm²	Nominal current A	Voltage ratings kV (AC)	kV (DC)
BRUpowermil 4F	87 (15xD)	58 (10xD)	1.6	16	1,0	1,5

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BRUpowerfield

Optimized Hybrid field cable for harsh environments, with reinforced loose tube that holds up to 4 fibers and two coaxial layers of electrical conductors for electrical power transmission.

Application:

- Combination of power transmission and fiber optic communication over long distances.
- Tactical military or civil applications: temporary robust communication lines with power supplying to remote communication equipment
- Rapid deployment in harsh surroundings
- Indoor and outdoor

Description:

- Excellent crush resistance
- High permissible tensile strength
- Good rodent protection
- Compact structure, high flexibility
- Very low weight
- Robust sheath halogen free

Construction:

- Fibers with primary coating
- Gel filled stainless steel loose tube
- Internal stranded copper conductor
- PA sheath
- External stranded copper conductor
- Armoring and strain relief made of aramid yarns
- Outer PE sheath (optional PA)

Temperature range:

- Operating temperature: -45...+85°C
- Storage temperature: -55...+85°C

Jacket color:

- Anthracite similar to RAL 9011

Standards:

- IEC 60794
- MIL-STD-810F
- EN 61984:2001

Deployment:

- When installing this cable, the appropriate installation and application guidelines should be respected and abided by. These guidelines and further questions can be obtained at the Brugg Cables Engineering Department.

Accessories and Services offered:

- Pre-assembling with special hybrid military lens connectors, delivered on various reels for easy deployment
- Adapting cables to standard connectors
- Hand-reels, backpack- or vehicle reels
- Deployment aids, like wedge clamps, masts etc.
- Training for deployment, repair and cable testing
- Solution engineering and system design

Technical data:

Type	Cable	Weight	Electrical resistance	Rated current	Operating voltage	
	mm	kg/km	Ohm/km	A	kV (AC)	kV (DC)
LLK-BPF 4F	4.6	36	34	6	1.0	1.5

Type	Max. no. of fibres	Min. bending radius		Max. tensile strength		Max. Crush resistance
	units	with tensile mm	without tensile mm	short term N	long term N	N/cm
LLK-BPF 4F	4	15xD	10xD	1500	1200	1000

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Hybrid Connector A for Optical- and Power Connection

Ruggedized, fully sealed hermaphroditic construction with four single mode fiber optic channels combined with 2x 2 MIL-C-39029 power contacts

Applications:

- Tactical deployment of hybrid cables, power and data communication in one cable with harsh military hybrid connectors
- A hybrid connector terminates both, optical fibers and electrical power at the same time
- For supplying remote communication equipment with both power and fiber optic connection using BRUpowermil cable
- Long distance power transmission with special, high voltage remote power supply

Description:

- 4 fiber optic channels, single mode or multi mode
- up to 4 MIL-C power contacts
- Ruggedized, fully sealed hermaphroditic construction
- Field termination capability for plug and bulkhead connectors
- Compatible with hybrid cables with an outer diameter of up to 7.5 mm

Optical Performance:

- Insertion loss: 9/125 fiber at 1310 or 1550 nm, typical < 2 dB
- Return loss: typical 25 dB

Electrical Performance:

- Contact resistance: <4 mΩ
- Operating voltage: 1000 VAC/1500 VDC
- Operating current: 5 A (short term 15 A)
- Test voltage: 3500 V/50 Hz 1 min EN 61984

Environmental Performance:

- Operation: -40°...+85° C MIL-STD-810F-501.4-II MIL-STD-810F-502.4-II
- Storage -60°...+85° C MIL-STD-810F-501.4-I MIL-STD-810F-502.4-I
- Water immersion: 5 m, 48 h MIL-STD-810F-512.4
- Humidity: 95% rel. H, 72 h MIL-STD-810F-507.4

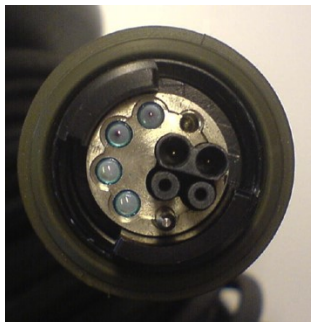
Mechanical Performance:

- Crush resistance: 1200 N, based upon IEC 60794-1-E3
- Cable retention: 1500 N, cable dependent
- Drop: 500 drops from 1.2 m MIL-STD-810F-516.5-IV

Connector Dimensions:

approx. ∅ 31 mm, length with cap 170 mm, weight 0.145 kg

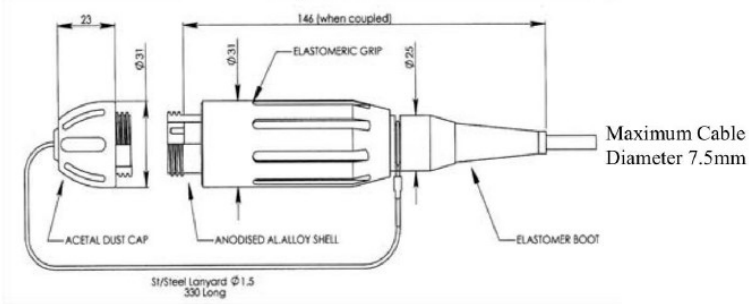
Hybrid connector plug



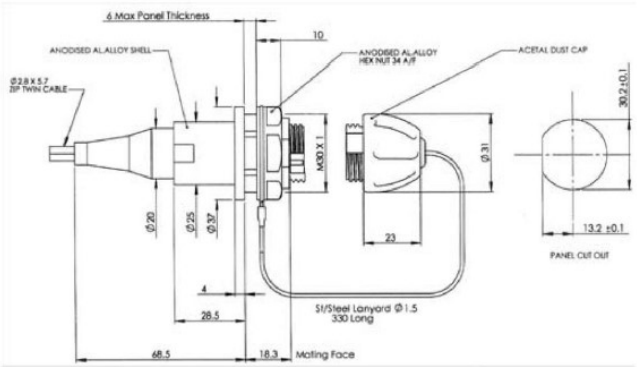
Details of hybrid connector plug

Hybrid connector bulkhead, jam nut receptacle. Square flange available too

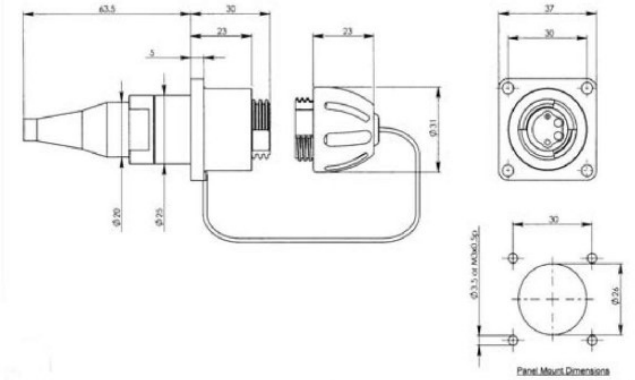
Plug Outline



D-Hole Mount Bulkhead Outline



Square-Flange Mount Bulkhead Outline



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BRUMIL 451 DPD – Data and Power Distributor
BRUMIL 451 OMC – Optical Media Converter

The Data and Power Distributor (DPD) is a field-deployable converter and distributor, designed for End-to-End connectivity. The DPD converts long-range and fast fiber optic to copper-based Ethernet at the same time as it distributes power to remote consumers with a fiber optic copper hybrid cable.
The 451 is available as data only and Data and Power Distributor: A hardened device for up to 10km fiber connections and up to 1km power distribution.

Applications:

- Temporary long-distance Ethernet-data-links e.g. between military checkpoints, command posts and headquarters in harsh environmental conditions
- Expanding an Ethernet connection over long distance with tactical fiber optical cable
- Distribution of power and data over long distances to remote power consumer
- DPD: Outdoor to indoor use
- OMC: For indoor and outdoor use
- Easy integration & operation

Description:

- The BRUMIL 451 is available in two different variants:
  - Optical Media Converter, converts optic to copper based communication.
  - Data and Power Distribution, converts optic to copper based communication and distributes power over the hybrid tactical field cable of up to 1kW over max. 1000m
- The BRUMIL 451 can be equipped to cover FO/electrical-media-converter function for TCP/IP protocols. The function is used to extend the data transmission of an Ethernet channel by fiber optical lines. It is especially designed for the use in harsh environmental conditions. At the front panel there are MIL-grade connectors available to interface with tactical optical-fiber-cable, copper-data-cable and power connections (AC or DC or both).
- The standard configuration includes one HMA compatible optical interface and one electrical MIL-grade-RJ-45-interface (10/100/1000BaseT) for bit rates up to 1 Gb/s, with automatic sensing. Crossed or uncrossed wire cables are detected automatically by the BRUMIL 451. The FO-interface is fixed to 1Gb/s bit rate.
- The maximal cable length:
  - 10 km data only
  - 1 km data and power

Technical data:

Power supply:
AC power: 100 … 240 VAC / 50…60 Hz +/- 10%
DC power: 12 … 45 VDC on (optional)
DC and AC power (one interface for both, DC or AC is automatically selected by the connecting cable type). This is an optional feature.
Power consumption: approx. 10W
Power cord with special ruggedized connector

Connections:

Ethernet port RJ-45
Port with auto-sensing 10/100/1000 BaseT
Fiber port 1000 Base-LX, single mode, 1310 nm
Fiber port 1000 Base-FX multi-mode 1300 nm (option).
Expanded beam bulkhead (HMA compatible) with two lenses for two optical fibers.
A1=Rx; B1=Tx
Expanded beam hybrid connectors with 4 optical fibers and 2+2 1.6mm² copper

Textile bag:

The textile bag is containing the media converter box to protect it during transportation and operation against shock and the effects of sun exposure. Side bags are made for grounding tools and adapting cables.

Environmental conditions:

Operation:	-35 … +50º C
Storage:	-40 … +85º C
Humidity:	5 … 95% relative humidity, non-condensing
Immersion Protection:	IP 65 (standard)
Upgradeable up to:	IP 67 (optional)

Options:

The BML 451 can be customized according to specific requirements and customer's needs, e.g. for multimode cables or for other fiber-optic connectors.

Optional as repeater with two fiber-optic interfaces and two copper-data interfaces.

A customized textile bag may contain customer specific accessories.

Extended Temperature range: -40…+60°C

Supported Standards:

IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
IEEE 802.3x for Flow Control

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Technical data:

Variant: BRUmil 451 FO – OMC Optical Media Converter

Mechanical data		**User Interface**	
Size (WxHxD)/mm	220x110x210	Electrical data	10/100/1000BaseT
Weight approx.	3kg (net) 4kg (gross)	Status indication	LEDs for: • Ethernet: data and link • FO: data and link • 230VAC: voltage
Power supply	230 VAC	**External I/O**	
Input voltage	230VAC/16A/50Hz ± 10%	Electrical Ethernet	10/100/1000BaseT M38999
Output voltage	230VAC/50Hz ± 3% (regulated)	230VAC In	Binder plug, series 693, 4pol pin
Max. output power	2.3 kVA permanent	230VAC Out	Binder plug, series 693, 4pol socket
Power consumption	10 W	Fiber optic	HMA compatible
Environment		**Options**	
Operation temperature	-35..+50°C	• Adapter cable Binder to country specific power supply • BRUmil 220/230 Lightning and EMP protection (LEMP and NEMP)	
Storage temperature	-40..+85°C		
Relative humidity (closed interfaces)	95%		
Waterproof	IP65		

Variant: BRUmil 451 Hyb – DPD Data and Power Distributor

Mechanical data		**User Interface**	
Size (WxHxD)/mm	220x110x210	Electrical data	10/100/1000BaseT
Weight approx.	3kg (net) 4kg (gross)	Status indication	LEDs for: • Ethernet: data and link • FO: data and link • 230VAC: voltage
Power supply	230 VAC	**External I/O**	
Input voltage	230VAC/16A/50Hz ± 10%	Electrical Ethernet	10/100/1000BaseT M38999
Output voltage	230VAC/50Hz ± 3% (regulated)	230VAC In	Binder plug, series 693, 4pol pin
Max. output power (master)	2.3 kVA permanent	230VAC Out	Binder plug, series 693, 4pol socket
Max. output power (remote)	1.2 kVA permanent	Fiber optic	HMA compatible
Max current for distribution	6A	FO-Cu hybrid	Similar HMA, 4 fibers 2+2 with 1.6mm²
Power consumption	16 W	Grounding	M12 grounding screw
Environment		**Options**	
Operation temperature	-35..+50°C	• Adapter cable Binder to country specific power supply • BRUmil 220/230 Lightning and EMP protection (LEMP and NEMP)	
Storage temperature	-40..+85°C		
Relative humidity (closed interfaces)	95%		
Waterproof	IP65		

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