

Automation and Network Solutions

FiberINTERFACES

Long distances are hardly a problem.

**Optical communications take you far beyond the point
where conventional transmission systems bite the dust.**



Gone are the days when you could choose operating conditions. In today's world of highly demanding process, transport and factory automation, you take what you can get: extreme temperature variations, high moisture levels, electromagnetic interference, shock and vibration (even in explosion endangered areas) — tough working conditions are now routine. Given these circumstances, weak links in data transmission, even over long distances, are not an option, and redundancy mechanisms and a total absence of interference are required even where high transmission speeds and large ranges are involved.

Optical transmission technology therefore offers obvious advantages in the manufacturing and offshore sector, in process and traffic control technology, alarm and signaling systems in control rooms, and inter-building networks: FiberINTERFACES makes it possible to transmit data over several miles/kilometers. They connect terminal devices such as computers, image-processing devices, programmable logic controllers (PLCs) and peripheral devices together. And, with their high availability and redundancy, they are able to hold their own in the harsh world of industrial applications. Fiber optic cables can be laid directly on high-power equipment or parallel to power cables, reducing planning and commissioning costs due to highly flexible topologies, integrated diagnostics and remote monitoring.



It is good to know that there is a optical communications manufacturer you can trust — one who has been active in optics since 1980 and who, with a world's first in 1984, launched its revolutionary fiber optic-based ETHERNET. And it's even better if you can rely on a versatile and comprehensive modular system of digital modules, field bus components, hybrid components and OptoQuick components, audio and video. FiberINTERFACES are just one important aspect of our work in the Automation and Network Solutions area — the Hirschmann product range extends from electrical interconnection technology to industrial ETHERNET components.

We can therefore give our customers the following unique benefit: under one roof, they obtain an open, highly accessible solution that covers the entire range from the field to the management level. The right product solution for every application.

Optical communication is used wherever the interference-free transmission of high bandwidth signals over large distances is required.

FiberINTERFACES eliminate inductive, capacitive or galvanic interference.

Interference factors that don't interfere.

Temperature extremes, moisture, electromagnetic fields, as well as shock and vibration – fiber optic cables give you the best under the worst of conditions.

As a pioneer in industrial communications and inter-building network technology and a technology leader in FiberINTERFACES, Hirschmann places its many years of industrial experience at the disposal of the client. It should therefore come as no surprise that such renowned solutions providers such as Siemens, Rockwell and Schneider Automation use Hirschmann products in their system solutions. Every user can benefit from our continuous and reliable product policy, the conceptualization of which encompasses much more than the current component system for digital modules, field bus components, hybrid components and OptoQuick components, audio and video, and related accessories. As a member of international standardization organizations, we actively participate in shaping the future of field bus systems. This ensures that you receive more than the advantages of a state-of-the-art optical transmission technology for your process, transport and factory automation application. You too can harvest the savings potential!

Reliable transmission of field bus signals in spite of RFI/EMI interference.

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Field buses

Field buses transmit relatively small amounts of data over large distances quickly and reliably. However, as a result of various legacy systems, there is a wide diversity of protocols and standards in use all over the world. Hirschmann therefore offers a whole range of high-quality optical fiber cable modules for various systems.

- Universal and optimized devices for PROFIBUS, Modbus, Geniusbus, WorldFIP, among others
- Any desired topology (line, star, ring)
- All types of fibers (POF, HCS, Gradients 62.5 μ and 50 μ , Single mode)
- Hard real time capability
- Extremely fast redundancy capability
- Preventive maintenance possibilities
- Ex-Class permits (Class 1, Div 2)
- Extended temperature and moisture ranges
- DIN rail mechanism





Digital modules

Clip-on modules utilize the fundamental advantages of fiber optic cables to set-up connections between the computer's COM ports and peripheral devices in automation systems – they make RFI/EMI transmission of serial communication feasible without the influence of added ground potential.

- Ranges of up to 17 km for clip-on modules
- All types of fiber, including easy-to-use polymer/plastic fibers

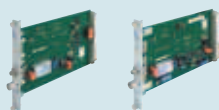


Video

Signal transmission of high bandwidth over large distances – where the electrical signal transmission fails, Hirschmann media converters provide comprehensive service from glass fiber video interfaces over various signal bandwidths and ranges, and remain unaffected even by interference factors such as lightning or electromagnetic fields.

- Image transmission – standard or high resolution
- Ranges up to 26 km (standard)
- Transmission of RGB and VGA signals with analog bandwidths of up to 150 MHz (high-resolution)
- Compact metal housing
- Stand-alone devices for flexible installation
- 19" slide-in modules for high port densities

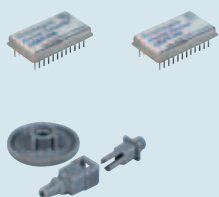




Audio

Fiber optic audio systems allow interference-free transmission of sound signals over large distances and offer special advantages to stadiums, stations, studios, theatres and other public buildings, with the complete absence of humming and the possibility of placing installations in the immediate vicinity of mains and high-voltage cables.

- **Totally secure against eavesdropping**
- **Ranges of up to 14 km**
- **Harmonic distortion level < 0.1 %**
- **Linear distortion < 0.5 dB**
- **Large bandwidths from 10 Hz – 30 kHz**



Hybrid components and OptoQuick devices

Hybrid components in various versions are integrated directly on the PCB and are intended to upgrade circuits to handle optic fiber transmission technology at the lowest possible costs. The F-SMA socket is suitable for installation on a front cover. Diode brackets, optical fiber connectors and couplings complete the range of offerings.

- **High-class audio converters**
- **Fast digital converters**
- **Fast connecting optical equipments**





Accessories

As a system provider, we always aim to offer you a solution that is both comprehensive as well as practical. Our products are complete only if original accessories are used. Hirschmann accessories have been developed specially for Hirschmann FiberINTERFACES according to the requirements of practice and the concrete wishes of our clients.

- DIN rail adapters
- Mechanical adapters for clip-on modules
- DIN rail power supply units
- Slide-in power supply units
- 19" mounting racks



Information in series

Even a comprehensive catalog like FiberINTERFACES will sooner or later reach its limits – but you have no need to worry: we can send you independent catalogs that contain detailed technical information plus the complete Hirschmann range of Industrial ETHERNET and Industrial Connectors products, at your request and at no cost. Even a phone call will suffice. Or why don't you simply visit our website at www.hirschmann.com!



Passing the ultimate hardness test: Field bus components with Ex-Class clearance.

Hirschmann devices easily handle the most demanding environmental conditions.



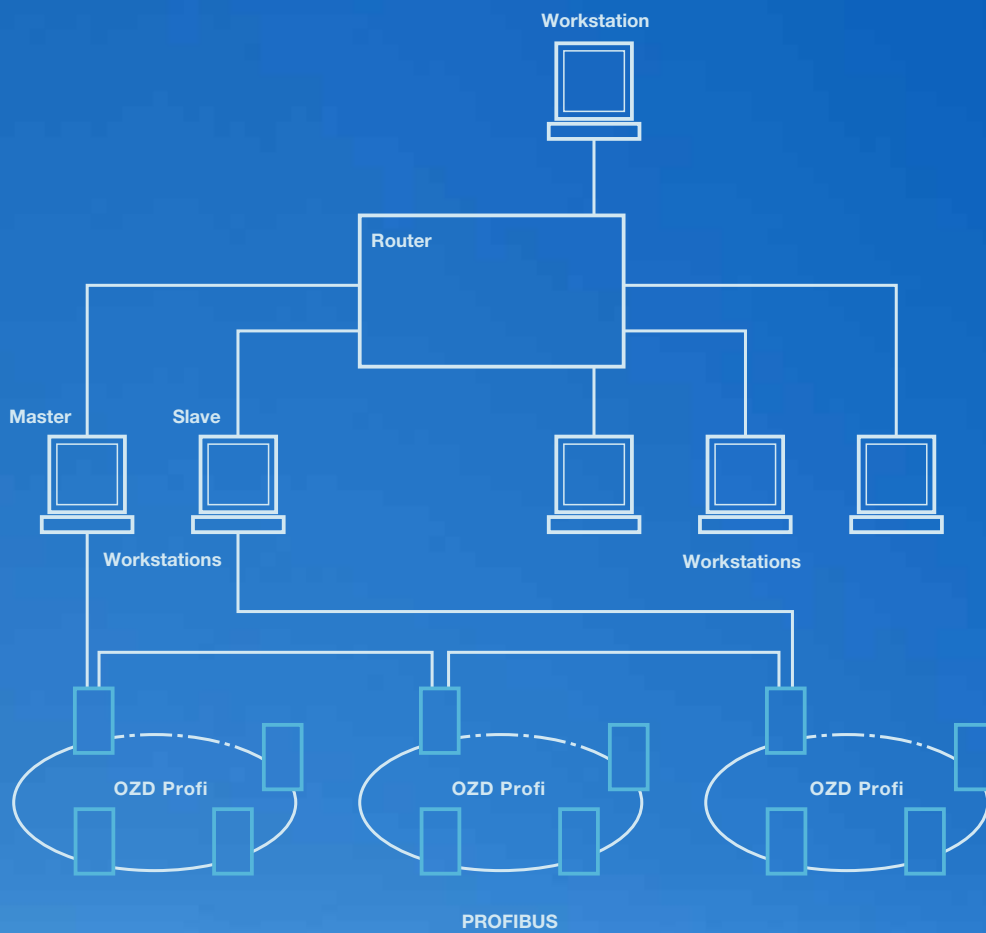
Harsh application environments such as oil platforms, ships, driverless trains, semiconductor factories, pipelines, steel and power plants place extreme requirements on automation solutions in terms of temperature and moisture resistance, shock and vibration handling capacity. Permits for explosion-endangered areas and for nuclear power plants are issued only to the most robust devices — like the high-quality Hirschmann optical fiber modules with metal casing for different field bus systems.

You are therefore free to choose the topology. The HIPER-Ring also makes an important contribution to providing high availability of the installation and secure data transport: due to the constant dynamic ring monitoring, the reconfiguration time in the event of a network fault is only a few bus telegrams (even for long distance applications).

Optical transmission technology closes the gap between the process computers and controllers/PLCs and the operating personnel who are located at a safe distance.

Robust metal housings offer high levels of immunity to electromagnetic interference fields.





FiberINTERFACES

Field Bus



PROFIBUS Fiberoptic Repeaters

Product description		
Description	interface converter electrical/optical for PROFIBUS-field bus networks; repeater function; for plastic FO; short-haul version; approval for Ex-zone 2 (Class 1, Div. 2)	
Port type and quantity	1 x optical: 2 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to EN 50170 part 1	
Type	OZD Profi 12M P11	
Order No.	943 728-221	
Electrical interface		
Signal type	PROFIBUS	
Bit rate	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s; 1.5; 3; 6; 12 Mbit/s (automatic setting)	
Signal delay time (optional input/output)	≤ 6.5 bit times	
Input/output signal	RS 485 level	
Input voltage range	-7 V ... +12 V	
Galvanic isolation	no	
Optical interface		
Wavelength	660 nm	
Launchable optical power in single-mode fiber (SM) 9/125		
Launchable optical power in multi-mode fiber (MM) 50/125		
Launchable optical power in multi-mode fiber (MM) 62.5/125		
Launchable optical power in multi-mode fiber (MM) HCS 200/230	-17 dBm (transmitting power default)	
Launchable optical power in multi-mode fiber (MM) POF 980/1000	-10 dBm (transmitting power reduced), -5 dBm (transmitting power default)	
Optical input power	min. -25 dBm, max. -3 dBm	
Cascadability	not limited	
More Interfaces		
Power supply	5-pin terminal block, screw mounting	
Signaling contact	5-pin terminal block, screw mounting	
Measuring outputs "Optical input power"	2 mm sockets	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm		
Multimode fiber (MM) 50/125 µm		
Multimode fiber (MM) 62.5/125 µm		
Multimode fiber HCS (MM) 50/125 µm	400 m 8 dB link budget at 660 nm and transmitting power default A = 8 dB/km, 2 dB reserve	
Multimode fiber POF (MM) 980/1000 µm	50 m 15 dB link budget at 660 nm and transmitting power reduced 80 m 20 dB link budget at 660 nm and transmitting power default A = 0.2 dB/m, 2 dB reserve	
Power requirements		
Operating voltage	18 ... 32 VDC, typ. 24 VDC	
Galvanic isolation	yes	
Current consumption	max. 200 mA	
Power consumption	4.8 W	
Output voltage/output current (pin6)	5 VDC +5%, -10%, short circuit-proof/90 mA	
Redundancy		
Redundancy functions	HIPER-Ring (ring structure), redundant 24 V infeed	
Displays		
LED red/green (system)	monitoring operating voltage and bit rate	
LED red/yellow (CH 1)	monitoring electrical channel	
LED red/yellow (CH 2, CH 3)	monitoring optical channels	
Ambient conditions		
Operating temperature	0 °C to +60 °C	
Storage/transport temperature	-40 °C to +70 °C	
Relative humidity	< 95% (non-condensing)	
Mechanical construction		
Dimensions (W x H x D)	40 x 140 x 77.5 mm	
Mounting	DIN rail or mounting plate	
Weight	500 g	
Protection class	IP 40	
Housing material	die-cast zinc	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 6 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
EN 61000-4-6 conducted immunity	10 V (0.15 - 80 MHz)	
EMC emitted immunity		
EN 55022	EN 55022 limit class A	
Approvals		
Issued approvals	FM Class 1, Div. 2; ATEX Zone 2; C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, 2 optical BFOC (ST®) plugs, start-up instructions	
Accessories to order separately	manual, order no. 039 629-001	



	interface converter electrical/optical for PROFIBUS-field bus networks; repeater function; for plastic FO; short-haul version; approval for Ex-zone 2 (Class 1, Div. 2)	
	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to EN 50170 part 1	
	OZD Profi 12M P12	
	943 728-321	
	PROFIBUS	
	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s; 1.5; 3; 6; 12 Mbit/s (automatic setting)	
	≤ 6.5 bit times	
	RS 485 level	
	-7 V ... +12 V	
	no	
	660 nm	
	-17 dBm (transmitting power default) -10 dBm (transmitting power reduced), -5 dBm (transmitting power default) min. -25 dBm, max. -3 dBm	
	not limited	
	5-pin terminal block, screw mounting	
	5-pin terminal block, screw mounting	
	2 mm sockets	
	400 m 8 dB link budget at 660 nm and transmitting power default A = 8 dB/km, 2 dB reserve	
	50 m 15 dB link budget at 660 nm and transmitting power reduced 80 m 20 dB link budget at 660 nm and transmitting power default A = 0.2 dB/m, 2 dB reserve	
	18 ... 32 VDC, typ. 24 VDC	
	yes	
	max. 200 mA	
	4.8 W	
	5 VDC +5%, -10%, short circuit-proof/90 mA	
	HIPER-Ring (ring structure), redundant 24 V infeed	
	monitoring operating voltage and bit rate	
	monitoring electrical channel	
	monitoring optical channels	
	0 °C to +60 °C	
	-40 °C to +70 °C	
	< 95% (non-condensing)	
	40 x 140 x 77.5 mm	
	DIN rail or mounting plate	
	500 g	
	IP 40	
	die-cast zinc	
	contact discharge: 6 kV, air discharge: 8 kV	
	10 V/m (80 - 1000 MHz)	
	power line 2 kV, data line: 1 kV	
	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
	10 V (0.15 - 80 MHz)	
	EN 55022 limit class A	
	FM Class 1, Div. 2; ATEX Zone 2; C-Tick	
	device, 4 optical BFOC (ST®) plugs, start-up instructions	
	manual, order no. 039 629-001	

FiberINTERFACES

Field Bus



PROFIBUS Fiberoptic Repeater

Product description		
Description	interface converter electrical/optical for PROFIBUS-field bus networks; repeater function; for quartz glass FO; approval for Ex-zone 2 (Class 1, Div. 2)	
Port type and quantity	1 x optical: 2 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to EN 50170 part 1	
Type	OZD Profi 12M G11	
Order No.	943 727-221	
Electrical interface		
Signal type	PROFIBUS	
Bit rate	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s; 1.5; 3; 6; 12 Mbit/s (automatic setting)	
Signal delay time (optional input/output)	≤ 6.5 bit times	
Input/output signal	RS 485 level	
Input voltage range	-7 V ... +12 V	
Galvanic isolation	no	
Optical interface		
Wavelength	860 nm	
Launchable optical power in single-mode fiber (SM) 9/125		
Launchable optical power in multi-mode fiber (MM) 50/125	-15 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	-13 dBm	
Launchable optical power in multi-mode fiber (MM) HCS 200/230	-10 dBm (transmitting power default)	
Launchable optical power in multi-mode fiber (MM) POF 980/1000		
Optical input power	min. -28 dBm, max. -3 dBm	
Cascadability	not limited	
More Interfaces		
Power supply	5-pin terminal block, screw mounting	
Signaling contact	5-pin terminal block, screw mounting	
Measuring outputs "Optical input power"	2 mm sockets	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm	3000 m	
Multimode fiber (MM) 50/125 µm	13 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	
Multimode fiber (MM) 62.5/125 µm	3000 m 15 dB link budget at 860 nm; A = 3.5 dB/km, 3 dB reserve	
Multimode fiber HCS (MM) 50/125 µm	1000 m 18 dB link budget at 860 nm; A = 8 dB/km, 3 dB reserve	
Multimode fiber POF (MM) 980/1000 µm		
Power requirements		
Operating voltage	18 ... 32 VDC, typ. 24 VDC	
Galvanic isolation	yes	
Current consumption	max. 200 mA	
Power consumption	4.8 W	
Output voltage/output current (pin6)	5 VDC +5%, -10%, short circuit-proof/90 mA	
Redundancy		
Redundancy functions	HIPER-Ring (ring structure), redundant 24 V infeed	
Displays		
LED red/green (system)	monitoring operating voltage and bit rate	
LED red/yellow (CH 1)	monitoring electrical channel	
LED red/yellow (CH 2, CH 3)	monitoring optical channels	
Ambient conditions		
Operating temperature	0 °C to +60 °C	
Storage/transport temperature	-40 °C to +70 °C	
Relative humidity	< 95% (non-condensing)	
Mechanical construction		
Dimensions (W x H x D)	40 x 140 x 77.5 mm	
Mounting	DIN rail or mounting plate	
Weight	500 g	
Protection class	IP 40	
Housing material	die-cast zink	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 6 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
EN 61000-4-6 conducted immunity	10 V (0.15 - 80 MHz)	
EMC emitted immunity		
EN 55022	EN 55022 limit class A	
Approvals		
Issued approvals	FM Class 1, Div. 2; ATEX Zone 2; C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, start-up instructions	
Accessories to order separately	manual, order no. 039 629-001	



	interface converter electrical/optical for PROFIBUS-field bus networks; repeater function; for quartz glass FO; approval for Ex-zone 2 (Class 1, Div. 2)	interface converter electrical/optical for PROFIBUS-field bus networks; repeater function; for quartz glass FO; approval for Ex-zone 2 (Class 1, Div. 2); extended temperature and humidity range
	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to EN 50170 part 1	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to EN 50170 part 1
	OZD Profi 12M G12	OZD Profi 12M G12 EEC
	943 727-321	943 730-321
	PROFIBUS	PROFIBUS
	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s; 1.5; 3; 6; 12 Mbit/s (automatic setting)	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s; 1.5; 3; 6; 12 Mbit/s (automatic setting)
	≤ 6.5 bit times	≤ 6.5 bit times
	RS 485 level	RS 485 level
	-7 V ... +12 V	-7 V ... +12 V
	no	no
	860 nm	860 nm
	-15 dBm	-15 dBm
	-13 dBm	-13 dBm
	-10 dBm (transmitting power default)	-10 dBm (transmitting power default)
	min. -28 dBm, max. -3 dBm	min. -28 dBm, max. -3 dBm
	not limited	not limited
	5-pin terminal block, screw mounting	5-pin terminal block, screw mounting
	5-pin terminal block, screw mounting	5-pin terminal block, screw mounting
	2 mm sockets	2 mm sockets
	3000 m 13 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	3000 m 13 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve
	3000 m 15 dB link budget at 860 nm; A = 3.5 dB/km, 3 dB reserve	3000 m 15 dB link budget at 860 nm; A = 3.5 dB/km, 3 dB reserve
	1000 m 18 dB link budget at 860 nm; A = 8 dB/km, 3 dB reserve	1000 m 18 dB link budget at 860 nm; A = 8 dB/km, 3 dB reserve
	18 ... 32 VDC, typ. 24 VDC	18 ... 32 VDC, typ. 24 VDC
	yes	yes
	max. 200 mA	max. 200 mA
	4.8 W	4.8 W
	5 VDC +5%, -10%, short circuit-proof/90 mA	5 VDC +5%, -10%, short circuit-proof/90 mA
	HIPER-Ring (ring structure), redundant 24 V infeed	HIPER-Ring (ring structure), redundant 24 V infeed
	monitoring operating voltage and bit rate	monitoring operating voltage and bit rate
	monitoring electrical channel	monitoring electrical channel
	monitoring optical channels	monitoring optical channels
	0 °C to +60 °C	-20 °C to +60 °C
	-40 °C to +70 °C	-40 °C to +70 °C
	< 95% (non-condensing)	100% (condensing)
	40 x 140 x 77.5 mm	40 x 140 x 77.5 mm
	DIN rail or mounting plate	DIN rail or mounting plate
	500 g	500 g
	IP 40	IP 40
	die-cast zinc	die-cast zinc
	contact discharge: 6 kV, air discharge: 8 kV	contact discharge: 6 kV, air discharge: 8 kV
	10 V/m (80 - 1000 MHz)	10 V/m (80 - 1000 MHz)
	power line 2 kV, data line: 1 kV	power line 2 kV, data line: 1 kV
	power line 0.5 kV (line/line, line/earth), data line: 1 kV	power line 0.5 kV (line/line, line/earth), data line: 1 kV
	10 V (0.15 - 80 MHz)	10 V (0.15 - 80 MHz)
	EN 55022 limit class A	EN 55022 limit class A
	FM Class 1, Div. 2; ATEX Zone 2; C-Tick	FM Class 1, Div. 2; ATEX Zone 2; C-Tick
	device, start-up instructions	device, start-up instructions
	manual, order no. 039 629-001	manual, order no. 039 629-001

FiberINTERFACES

Field Bus



PROFIBUS Fiberoptic Repeater

Product description		
Description	interface converter electrical/optical for PROFIBUS-field bus networks; repeater function; for quartz glass FO; long-haul version; approval for Ex-zone 2 (Class 1, Div. 2)	
Port type and quantity	1 x optical: 2 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to EN 50170 part 1	
Type	OZD Profi 12M G11-1300	
Order No.	943 729-221	
Electrical interface		
Signal type	PROFIBUS	
Bit rate	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s; 1.5; 3; 6; 12 Mbit/s (automatic setting)	
Signal delay time (optional input/output)	≤ 6.5 bit times	
Input/output signal	RS 485 level	
Input voltage range	-7 V ... +12 V	
Galvanic isolation	no	
Optical interface		
Wavelength	1310 nm	
Launchable optical power in single-mode fiber (SM) 9/125	-19 dBm	
Launchable optical power in multi-mode fiber (MM) 50/125	-17 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	-17 dBm	
Launchable optical power in multi-mode fiber (MM) HCS 200/230		
Launchable optical power in multi-mode fiber (MM) POF 980/1000		
Optical input power	min. -29 dBm, max. -3 dBm	
Cascadability	not limited	
More Interfaces		
Power supply	5-pin terminal block, screw mounting	
Signaling contact	5-pin terminal block, screw mounting	
Measuring outputs "Optical input"	2 mm sockets	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm	15000 m 10 dB link budget at 1310 nm; A = 0.5 dB/km, 2 dB reserve	
Multimode fiber (MM) 50/125 µm	10000 m 12 dB link budget at 1310 nm; A = 1 dB/km, 2 dB reserve	
Multimode fiber (MM) 62.5/125 µm	10000 m 12 dB link budget at 1310 nm; A = 1 dB/km, 2 dB reserve	
Multimode fiber HCS (MM) 200/230 µm		
Multimode fiber POF (MM) 980/1000 µm		
Power requirements		
Operating voltage	18 ... 32 VDC, typ. 24 VDC	
Galvanic isolation	yes	
Current consumption	max. 200 mA	
Power consumption	4.8 W	
Output voltage/output current (pin6)	5 VDC +5%, -10%, short circuit-proof/90 mA	
Redundancy		
Redundancy functions	HIPER-Ring (ring structure), redundant 24 V infeed	
Displays		
LED red/green (system)	monitoring operating voltage and bit rate	
LED red/yellow (CH 1)	monitoring electrical channel	
LED red/yellow (CH 2, CH 3)	monitoring optical channels	
Ambient conditions		
Operating temperature	0 °C to +60 °C	
Storage/transport temperature	-40 °C to +70 °C	
Relative humidity	< 95% (non-condensing)	
Mechanical construction		
Dimensions (W x H x D)	40 x 140 x 77.5 mm	
Mounting	DIN rail or mounting plate	
Weight	500 g	
Protection class	IP 40	
Housing material	die-cast zink	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 6 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
EN 61000-4-6 conducted immunity	10 V (0.15 - 80 MHz)	
EMC emitted immunity		
EN 55022	EN 55022 limit class A	
Approvals		
Issued approvals	FM Class 1, Div. 2; ATEX Zone 2; C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, start-up instructions	
Accessories to order separately	manual, order no. 039 629-001	



	interface converter electrical/optical for PROFIBUS-field bus networks; repeater function; for quartz glass FO; long-haul version; approval for Ex-zone 2 (Class 1, Div. 2)	interface converter electrical/optical for PROFIBUS-field bus networks; repeater function; for quartz glass FO; long-haul version; approval for Ex-zone 2 (Class 1, Div. 2); extended temperature and humidity range
	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to EN 50170 part 1	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to EN 50170 part 1
	OZD Profi 12M G12-1300	OZD Profi 12M G12-1300 EEC
	943 729-321	943 256-321
	PROFIBUS	PROFIBUS
	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s; 1.5; 3; 6; 12 Mbit/s (automatic setting)	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s; 1.5; 3; 6; 12 Mbit/s (automatic setting)
	≤ 6.5 bit times	≤ 6.5 bit times
	RS 485 level	RS 485 level
	-7 V ... +12 V	-7 V ... +12 V
	no	no
	1310 nm	1310 nm
	-19 dBm	-19 dBm
	-17 dBm	-17 dBm
	-17 dBm	-17 dBm
	min. -29 dBm, max. -3 dBm	min. -29 dBm, max. -3 dBm
	not limited	not limited
	5-pin terminal block, screw mounting	5-pin terminal block, screw mounting
	5-pin terminal block, screw mounting	5-pin terminal block, screw mounting
	2 mm sockets	2 mm sockets
	15000 m 10 dB link budget at 1310 nm; A = 0.5 dB/km, 2 dB reserve	15000 m 10 dB link budget at 1310 nm; A = 0.5 dB/km, 2 dB reserve
	10000 m 12 dB link budget at 1310 nm; A = 1 dB/km, 2 dB reserve	10000 m 12 dB link budget at 1310 nm; A = 1 dB/km, 2 dB reserve
	10000 m 12 dB link budget at 1310 nm; A = 1 dB/km, 2 dB reserve	10000 m 12 dB link budget at 1310 nm; A = 1 dB/km, 2 dB reserve
	18 ... 32 VDC, typ. 24 VDC	18 ... 32 VDC, typ. 24 VDC
	yes	yes
	max. 200 mA	max. 200 mA
	4.8 W	4.8 W
	5 VDC +5%, -10%, short circuit-proof/90 mA	5 VDC +5%, -10%, short circuit-proof/90 mA
	HIPER-Ring (ring structure), redundant 24 V infeed	HIPER-Ring (ring structure), redundant 24 V infeed
	monitoring operating voltage and bit rate	monitoring operating voltage and bit rate
	monitoring electrical channel	monitoring electrical channel
	monitoring optical channels	monitoring optical channels
	0 °C to +60 °C	-20 °C to +60 °C
	-40 °C to +70 °C	-40 °C to +70 °C
	< 95% (non-condensing)	100% (condensing)
	40 x 140 x 77.5 mm	40 x 140 x 77.5 mm
	DIN rail or mounting plate	DIN rail or mounting plate
	500 g	500 g
	IP 40	IP 40
	die-cast zink	die-cast zink
	contact discharge: 6 kV, air discharge: 8 kV	contact discharge: 6 kV, air discharge: 8 kV
	10 V/m (80 - 1000 MHz)	10 V/m (80 - 1000 MHz)
	power line 2 kV, data line: 1 kV	power line 2 kV, data line: 1 kV
	power line 0.5 kV (line/line, line/earth), data line: 1 kV	power line 0.5 kV (line/line, line/earth), data line: 1 kV
	10 V (0.15 - 80 MHz)	10 V (0.15 - 80 MHz)
	EN 55022 limit class A	EN 55022 limit class A
	FM Class 1, Div. 2; ATEX Zone 2; C-Tick	FM Class 1, Div. 2; ATEX Zone 2; C-Tick
	device, start-up instructions	device, start-up instructions
	manual, order no. 039 629-001	manual, order no. 039 629-001

FiberINTERFACES

Field Bus



Modbus Plus Fiberoptic Repeater

Product description		
Description	interface converter electrical/optical for Modbus Plus-field bus networks; repeater function; for quartz glass und PCF (HCS) FO; approval for Ex-zone 2 (Class 1, Div. 2)	
Port type and quantity	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to Modbus Plus-Standard	
Type	OZD Modbus Plus G12	
Order No.	943 740-021	
Electrical interface		
Signal type	Modbus Plus	
Bit rate	1 Mbit/s	
Signal delay time (optional input/output)	< 1 µs	
Input/output signal	Modbus Plus Bus	
Length of Modbus cable	100 m	
Connection capability	max. 31 terminal devices	
Terminator	external	
Galvanic isolation	shielding/housing: no; data lines/housing: yes	
Optical interface		
Wavelength	860 nm	
Launchable optical power in single-mode fiber (SM) 9/125		
Launchable optical power in multi-mode fiber (MM) 50/125	-15 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	-14 dBm	
Launchable optical power in multi-mode fiber (MM) HCS 200/230	-10 dBm	
Optical input power	min. -25 dBm, max. -3 dBm	
Cascadability	not limited	
More Interfaces		
Power supply	5-pin terminal block, screw mounting	
Signaling contact	5-pin terminal block, screw mounting	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm		
Multimode fiber (MM) 50/125 µm	2300 m 10 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	
Multimode fiber (MM) 62.5/125 µm	2300 m 11 dB link budget at 860 nm; A = 3.5 dB/km, 3 dB reserve	
Multimode fiber HCS (MM) 50/125 µm	1500 m 16 dB link budget at 860 nm; A = 8 dB/km, 3 dB reserve	
Power requirements		
Operating voltage	24 VDC -20% ... 48 VDC +10% non-interchangeable, safety extra-low voltage	
Current consumption	120 mA at +24 VDC; 65 mA at + 48 VDC	
Power consumption	3.1 W	
Redundancy		
Redundancy functions	HIPER-Ring (ring structure), redundant 24 V infeed	
Displays		
LED red/green (system)	monitoring operating voltage and data traffic	
LED green/orange (Port 1)	differentiated monitoring electrical channel	
LED green/orange (Port 2,3)	differentiated monitoring optical channels	
Ambient conditions		
Operating temperature	0 °C to +60 °C	
Storage/transport temperature	-40 °C to +70 °C	
Relative humidity	< 95% (non-condensing)	
Mechanical construction		
Dimensions (W x H x D)	40 x 111 x 73.5 mm	
Mounting	DIN rail or mounting plate	
Weight	620 g	
Protection class	IP 40	
Housing material	die-cast zink	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
EN 61000-4-6 conducted immunity	10 V (0.15 - 80 MHz)	
EMC emitted immunity		
EN 55022	EN 55022 limit class A	
Approvals		
Issued approvals	cUL Class 1, Div.2; C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, start-up instructions	
Accessories to order separately	manual, order no. 933 989-901	



	interface converter electrical/optical for Modbus Plus-field bus networks; repeater function; for quartz glass FO; long-haul version	
	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, female, pin assignment according to Modbus Plus-Standard	
	OZD Modbus Plus G12-1300	
	943 821-021	
	Modbus Plus	
	1 Mbit/s	
	< 1 µs	
	Modbus Plus Bus	
	100 m	
	max. 31 terminal devices	
	external	
	shielding/housing: no; data lines/housing: yes	
	1310 nm	
	-19 dBm	
	-17 dBm	
	-17 dBm	
	min. -27 dBm, max. -3 dBm	
	not limited	
	5-pin terminal block, screw mounting	
	5-pin terminal block, screw mounting	
	8000 m 8 dB link budget at 1310 nm; A = 0.5 dB/km, 2 dB reserve	
	7000 m 10 dB link budget at 1310 nm; A = 1 dB/km, 3 dB reserve	
	7000 m 10 dB link budget at 1310 nm; A = 1 dB/km, 3 dB reserve	
	24 VDC -20% ... 48 VDC +10% non-interchangeable, safety extra-low voltage	
	120 mA at +24 VDC; 65 mA at + 48 VDC	
	3.1 W	
	HIPER-Ring (ring structure), redundant 24 V infeed	
	monitoring operating voltage and data traffic	
	differentiated monitoring electrical channel	
	differentiated monitoring optical channels	
	0 °C to +60 °C	
	-40 °C to +70 °C	
	< 95% (non-condensing)	
	40 x 111 x 73.5 mm	
	DIN rail or mounting plate	
	620 g	
	IP 40	
	die-cast zink	
	contact discharge: 4 kV, air discharge: 8 kV	
	10 V/m (80 - 1000 MHz)	
	power line 2 kV, data line: 1 kV	
	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
	10 V (0.15 - 80 MHz)	
	EN 55022 limit class A	
	C-Tick	
	device, start-up instructions	
	manual, order no. 933 989-901	

FiberINTERFACES

Field Bus



Genius Bus Fiberoptic Repeater

Product description		
Description	interface converter electrical/optical for Genius field bus networks; repeater function; for quartz glass und PCF (HCS) FO; approval for Ex-zone 2 (Class 1, Div. 2)	
Port type and quantity	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: 4-pin connector with self-locking mechanism	
Type	OZD Genius G12	
Order No.	933 989-021	
Electrical interface		
Signal type	Geniusbus	
Bit rate	38.4; 76.8; 153.6 kbit/s	
Signal delay time (optional input/output)	800 ns	
Input/output signal	Geniusbus	
Genius cable	length: > 250 m attenuation at 1 MHz: < 8 dB for 150 Ohm cable < 5 dB for 100 Ohm cable	
Connection capability	max. 32 terminal devices	
Terminator	external	
Galvanic isolation	shielding in/shielding out: yes; data lines/housing: yes	
Optical interface		
Wavelength	860 nm	
Launchable optical power in single-mode fiber (SM) 9/125		
Launchable optical power in multi-mode fiber (MM) 50/125	-15 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	-14 dBm	
Launchable optical power in multi-mode fiber (MM) HCS 200/230	-10 dBm	
Optical input power	min. -26 dBm, max. -9 dBm	
Cascadability	not limited	
More Interfaces		
Power supply	5-pin terminal block, screw mounting	
Signaling contact	5-pin terminal block, screw mounting	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm		
Multimode fiber (MM) 50/125 µm	2700 m 11 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	
Multimode fiber (MM) 62.5/125 µm	2600 m 12 dB link budget at 860 nm; A = 3.5 dB/km, 3 dB reserve	
Multimode fiber HCS (MM) 50/125 µm	1500 m 16 dB link budget at 860 nm; A = 8 dB/km, 3 dB reserve	
Power requirements		
Operating voltage	24 VDC (19 ... 35 VDC), non-interchangeable, safety extra-low voltage	
Current consumption	130 mA	
Power consumption	3.1 W	
Redundancy		
Redundancy functions	HIPER-Ring (ring structure), redundant 24 V infeed	
Displays		
LED red/green (system)	monitoring operating voltage and data traffic	
LED green/orange (Port 1)	differentiated monitoring electrical channel	
LED green/orange (Port 2,3)	differentiated monitoring optical channels	
Ambient conditions		
Operating temperature	0 °C to +55 °C	
Storage/transport temperature	-40 °C to +80 °C	
Relative humidity	< 95% (non-condensing)	
Mechanical construction		
Dimensions (W x H x D)	40 x 111 x 73.5 mm	
Mounting	DIN rail or mounting plate	
Weight	500 g	
Protection class	IP 40	
Housing material	die-cast zink	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV, HCP/VCP: 4 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
EN 61000-4-6 conducted immunity	10 V (0.15 - 80 MHz)	
EMC emitted immunity		
EN 55022	EN 55022 limit class A	
Approvals		
Issued approvals	cUL Class 1, Div.2; C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, start-up instructions	
Accessories to order separately	manual, order no. 933 989-901	



	interface converter electrical/optical for Genius field bus networks; repeater function; for quartz glass FO; approval for Ex-zone 2 (Class 1, Div. 2); long-haul version	
	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: 4-pin connector with self-locking mechanism	
	OZD Genius G12-1300	
	934 233-021	
	Geniusbus	
	38.4; 76.8; 153.6 kbit/s	
	800 ns	
	Geniusbus	
	length: > 250 m attenuation at 1 MHz: < 8 dB for 150 Ohm cable < 5 dB for 100 Ohm cable	
	max. 32 terminal devices	
	external	
	shielding in/shielding out: yes; data lines/housing: yes	
	1310 nm	
	-19 dBm	
	-17 dBm	
	-17 dBm	
	min. -27 dBm, max. -10 dBm	
	not limited	
	5-pin terminal block, screw mounting	
	5-pin terminal block, screw mounting	
	10000 m 8 dB link budget at 1310 nm; A = 0.5 dB/km, 2 dB reserve	
	7000 m 10 dB link budget at 1310 nm; A = 1 dB/km, 3 dB reserve	
	7000 m 10 dB link budget at 1310 nm; A = 1 dB/km, 3 dB reserve	
	24 VDC (19 ... 35 VDC), non-interchangeable, safety extra-low voltage	
	130 mA	
	3.1 W	
	HIPER-Ring (ring structure), redundant 24 V infeed	
	monitoring operating voltage and data traffic	
	differentiated monitoring electrical channel	
	differentiated monitoring optical channels	
	0 °C to +55 °C	
	-40 °C to +80 °C	
	< 95% (non-condensing)	
	40 x 111 x 73.5 mm	
	DIN rail or mounting plate	
	500 g	
	IP 40	
	die-cast zink	
	contact discharge: 4 kV, air discharge: 8 kV, HCP/VCP: 4 kV	
	10 V/m (80 - 1000 MHz)	
	power line 2 kV, data line: 1 kV	
	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
	10 V (0.15 - 80 MHz)	
	EN 55022 limit class A	
	cUL Class 1, Div.2; C-Tick	
	device, start-up instructions	
	manual, order no. 933 989-901	

FiberINTERFACES

Field Bus



FIP Bus Fiberoptic Repeaters

Product description		
Description	interface converter electrical/optical for FIP-field bus networks; repeater function; for quartz glass und PCF (HCS) FO	
Port type and quantity	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, male, pin assignment acc. to French Standard NF-C 46-604	
Type	OZD FIP G3	
Order No.	933 847-421	
Electrical interface		
Signal type	World FIP	
Bit rate	1 Mbit/s	
Signal delay time (optional input/output)	< 1 µs	
Input/output signal	FIP Bus	
Length of FIP cable	100 m	
Connection capability	max. 16 terminal data devices	
Terminator	no	
Galvanic isolation	shielding/housing: no; data lines/housing: yes	
Optical interface		
Wavelength	860 nm	
Launchable optical power in multi-mode fiber (MM) 50/125	-15 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	-14 dBm	
Launchable optical power in multi-mode fiber (MM) HCS 200/230	-10 dBm	
Optical input power	min. -26 dBm, max. -9 dBm	
Cascadability	40 at a maximal line attenuation of the optical network with fiber G 50/125: 0 ... 60 dB with fiber G 62.5/125: 0 ... 75 dB with fiber S 200/230: 0 ... 60 dB	
More Interfaces		
Power supply	5-pin terminal block, screw mounting	
Signaling contact	5-pin terminal block, screw mounting	
Network size - length of cable		
Multimode fiber (MM) 50/125 µm	2500 m 11 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	
Multimode fiber (MM) 62.5/125 µm	2500 m 12 dB link budget at 860 nm; A = 3.5 dB/km, 3 dB reserve	
Multimode fiber HCS (MM) 50/125 µm	1500 m 16 dB link budget at 860 nm; A = 8 dB/km, 3 dB reserve	
Power requirements		
Operating voltage	24 VDC -20% ... 48 VDC +10% non-interchangeable, safety extra-low voltage	
Current consumption	150 mA at +24 VDC; 85 mA at + 48 VDC	
Power consumption	4.1 W	
Redundancy		
Redundancy functions	HIPER-Ring (ring structure), redundant 24 V infeed	
Displays		
LED red/green (system)	monitoring operating voltage and data traffic	
LED green/orange (Port 1)	differentiated monitoring electrical channel	
LED green/orange (Port 2,3)	differentiated monitoring optical channels	
Ambient conditions		
Operating temperature	0 °C to +60 °C	
Storage/transport temperature	-40 °C to +70 °C	
Relative humidity	< 95% (non-condensing)	
Mechanical construction		
Dimensions (W x H x D)	40 x 111 x 73.5 mm	
Mounting	DIN rail or mounting plate	
Weight	500 g	
Protection class	IP 40	
Housing material	die-cast zink	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV, HCP/VCP: 4 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
EN 61000-4-6 conducted immunity	10 V (0.15 - 80 MHz)	
EMC emitted immunity		
EN 55022	EN 55022 limit class A	
Approvals		
Issued approvals	C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, start-up instructions	
Accessories to order separately	manual, order no. 933 847-901	



	interface converter electrical/optical for FIP-field bus networks; repeater function; for quartz glass und PCF (HCS) FO; integrated bus termination	
	2 x optical: 4 sockets BFOC 2.5 (ST®) 1 x electrical: Sub-D 9-pin, male, pin assignment acc. to French Standard NF-C 46-604	
	OZD FIP G3 T	
	933 847-521	
	World FIP	
	1 Mbit/s	
	< 1 µs	
	FIP Bus	
	100 m	
	max. 16 terminal data devices	
	yes, 150 Ohm	
	shielding/housing: no; data lines/housing: yes	
	860 nm	
	-15 dBm	
	-14 dBm	
	-10 dBm	
	min. -26 dBm, max. -9 dBm	
	40 at a maximal line attenuation of the optical network with fiber G 50/125: 0 ... 60 dB with fiber G 62,5/125: 0 ... 75 dB with fiber S 200/230: 0 ... 60 dB	
	5-pin terminal block, screw mounting	
	5-pin terminal block, screw mounting	
	2500 m 11 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	
	2500 m 12 dB link budget at 860 nm; A = 3.5 dB/km, 3 dB reserve	
	1500 m 16 dB link budget at 860 nm; A = 8 dB/km, 3 dB reserve	
	24 VDC -20% ... 48 VDC +10% non-interchangeable, safety extra-low voltage	
	150 mA at +24 VDC; 85 mA at + 48 VDC	
	4.1 W	
	HIPER-Ring (ring structure), redundant 24 V infeed	
	monitoring operating voltage and data traffic	
	differentiated monitoring electrical channel	
	differentiated monitoring optical channels	
	0 °C to +60 °C	
	-40 °C to +70 °C	
	< 95% (non-condensing)	
	40 x 111 x 73.5 mm	
	DIN rail or mounting plate	
	500 g	
	IP 40	
	die-cast zink	
	contact discharge: 4 kV, air discharge: 8 kV, HCP/VCP: 4 kV	
	10 V/m (80 - 1000 MHz)	
	power line 2 kV, data line: 1 kV	
	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
	10 V (0.15 - 80 MHz)	
	EN 55022 limit class A	
	C-Tick	
	device, start-up instructions	
	manual, order no. 933 847-901	

FiberINTERFACES

Field Bus



Universal RS 485 Fiberoptic Repeaters

Product description		
Description	interface converter electrical/optical for RS 485 field bus networks; repeater function; for quartz glass FO; electrical full duplex or semi-duplex mode	
Port type and quantity	1 x optical: BFOC 2.5 (ST®) socket 1 x electrical: Sub-D 9-pin, female or 9-pin terminal block	
Type	OZD 485 G2 BFOC	
Order No.	943 290-021	
Electrical interface		
Signal type	RS 485 (Modbus, ...)	
Input resistance	10 kOhm	
Input voltage range	-7 V ... +12 V	
Jitter	max. 35 ns _{pp}	
Distortion of bit duration	max. 20 ns _{pp}	
Bit rate	max. 2 Mbit/s	
Optical interface		
Wavelength	860 nm	
Launchable optical power in single-mode fiber (SM) 9/125		
Launchable optical power in multi-mode fiber (MM) 50/125	-18 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	-14 dBm	
Launchable optical power in multi-mode fiber (MM) HCS 200/230		
Launchable optical power in multi-mode fiber (MM) POF 980/1000		
Optical input power	-27 dBm	
More Interfaces		
Power supply	9-pin Sub-D connector, female or 9-pin terminal block	
Signaling contact		
Voltage output		
Network size - length of cable		
Single mode fiber (SM) 9/125 µm		
Multimode fiber (MM) 50/125 µm	2000 m 9 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	
Multimode fiber (MM) 62.5/125 µm	2800 m 13 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	
System delay time	1.5 µs	
Power requirements		
Operating voltage	5 VDC ±5% or 18 ... 32 VDC	
Current consumption	max. 500 mA at 5 VDC, max. 300 mA at 18 ... 32 VDC	
Power consumption	3 W	
Redundancy		
Redundancy functions	hot standby link	
Displays		
LEDs	signalling of operating status; transmitting data; receiving data	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +70 °C	
Relative humidity	< 95% (non-condensing)	
Mechanical construction		
Dimensions (W x H x D)	40 x 117.5 x 92 mm	
Mounting	DIN rail or mounting plate	
Weight	400 g	
Protection class	IP 40	
Housing material	die-cast zinc	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV, HCP/VCP: 4 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line 0.5 kV (line/line, line/earth), data line: 1 kV	
EN 61000-4-6 conducted immunity	10 V (0.15 - 80 MHz)	
EMC emitted immunity		
EN 55022	EN 55022 limit class A	
Approvals		
Issued approvals	C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, start-up instructions	
Accessories to order separately	manual, order no. 943 290-902	



	interface converter electrical/optical for RS 485 field bus networks; repeater function; for quartz glass FO; electrical full duplex or semi-duplex mode	interface converter electrical/optical for RS 485 field bus networks; repeater function; for quartz glass FO; electrical full duplex or semi-duplex mode; long-haul version
	1 x optical: FSMA socket 1 x electrical: Sub-D 9-pin, female or 9-pin terminal block	1 x optical: BFOC 2.5 (ST®) socket 1 x electrical: Sub-D 9-pin, female or 9-pin terminal block
	OZD 485 G2 FSMA	OZD 485 BFOC-1300
	943 290-001	943 405-021
	RS 485 (Modbus, ...)	RS 485 (Modbus, ...)
	10 kOhm	10 kOhm
	-7 V ... +12 V	-7 V ... +12 V
	max. 35 ns _{pp}	max. 35 ns _{pp}
	max. 20 ns _{pp}	max. 20 ns _{pp}
	max. 2 Mbit/s	max. 2 Mbit/s
	860 nm	1300 nm
	-18 dBm	-15 dBm
	-14 dBm	-12 dBm
	-27 dBm	-28 dBm
	9-pin Sub-D connector, female or 9-pin terminal block	9-pin Sub-D connector, female or 9-pin terminal block
		22000 m 13 dB link budget at 1300 nm; A = 0.5 dB/km, 2 dB reserve
	2000 m 9 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	14000 m 16 dB link budget at 1300 nm; A = 0.5 dB/km, 2 dB reserve
	2800 m 13 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	9300 m 16 dB link budget at 1300 nm; A = 0.5 dB/km, 2 dB reserve
	1.5 us	1.5 us
	5 VDC ±5% or 18 ... 32 VDC	5 VDC ±5% or 18 ... 32 VDC
	max. 500 mA at 5 VDC, max. 300 mA at 18 ... 32 VDC	max. 500 mA at 5 VDC, max. 300 mA at 18 ... 32 VDC
	3 W	3 W
	hot standby link	hot standby link
	signalling of operating status; transmitting data; receiving data	signalling of operating status; transmitting data; receiving data
	0 °C to +50 °C	0 °C to +50 °C
	-20 °C to +70 °C	-20 °C to +70 °C
	< 95% (non-condensing)	< 95% (non-condensing)
	40 x 117.5 x 92 mm	40 x 117.5 x 92 mm
	DIN rail or mounting plate	DIN rail or mounting plate
	400 g	400 g
	IP 40	IP 40
	die-cast zink	die-cast zink
	contact discharge: 4 kV, air discharge: 8 kV, HCP/VCP: 4 kV	contact discharge: 4 kV, air discharge: 8 kV, HCP/VCP: 4 kV
	10 V/m (80 - 1000 MHz)	10 V/m (80 - 1000 MHz)
	power line 2 kV, data line: 1 kV	power line 2 kV, data line: 1 kV
	power line 0.5 kV (line/line, line/earth), data line: 1 kV	power line 0.5 kV (line/line, line/earth), data line: 1 kV
	10 V (0.15 - 80 MHz)	10 V (0.15 - 80 MHz)
	EN 55022 limit class A	EN 55022 limit class A
	C-Tick	C-Tick
	device, start-up instructions	device, start-up instructions
	manual, order no. 943 290-902	manual, order no. 943 290-902

FiberINTERFACES

Field Bus



Universal RS 485 Fiberoptic Repeaters

Product description		
Description	interface converter electrical/optical for RS 485 field bus networks; repeater function; for quartz glass FO; electrical full duplex or semi-duplex mode	
Port type and quantity	2 x optical: BFOC 2.5 (ST [®]) socket 1 x electrical: 12-pin terminal block	
Type	OZD 485 G12	
Order No.	943 776-321	
Electrical interface		
Signal type	RS 485 (Modbus, ...)	
Input resistance	10 kOhm	
Input voltage range	-7 V ... +12 V	
Jitter	typ. 10 ns _{pp}	
Distortion of bit duration	typ. 1 ns _{pp}	
Bit rate	0 to 1,5 Mbit/s NRZ	
Optical interface		
Wavelength	860 nm	
Launchable optical power in single-mode fiber (SM) 9/125		
Launchable optical power in multi-mode fiber (MM) 50/125	-20 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	-16 dBm	
Launchable optical power in multi-mode fiber (MM) HCS 200/230		
Launchable optical power in multi-mode fiber (MM) POF 980/1000		
Optical input power	-30 dBm	
More Interfaces		
Power supply	5-pin terminal block	
Signaling contact	5-pin terminal block	
Voltage output	3-pin terminal block	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm		
Multimode fiber (MM) 50/125 µm	2300 m 10 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	
Multimode fiber (MM) 62.5/125 µm	3100 m 14 dB link budget at 860 nm; A = 3 dB/km, 3 dB reserve	
System delay time	< 1,33 us	
Power requirements		
Operating voltage	18 ... 32 VDC (typ. 24 VDC)	
Current consumption	190 mA at 18 VDC, 110 mA at 32 VDC	
Power consumption	3.4 W at 18 VDC, 3.5 W at 32 VDC	
Redundancy		
Redundancy functions	redundant ring, redundant power supply	
Displays		
LEDs	system (operating status, signaling contact); supply voltage; redundancy mode; input signal/input power/receiving data	
Ambient conditions		
Operating temperature	-25 °C to +60 °C	
Storage/transport temperature	-25 °C to +70 °C	
Relative humidity	< 95% (non-condensing)	
Mechanical construction		
Dimensions (W x H x D)	40 x 140 x 90 mm	
Mounting	DIN rail or mounting plate	
Weight	650 g	
Protection class	IP 30	
Housing material	die-cast zinc	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line 1 kV/2 kV (line/line, line/earth), data line: 1 kV	
EN 61000-4-6 conducted immunity	10 V (0.15 - 80 MHz)	
EMC emitted immunity		
EN 55022	EN 55022 limit class A	
Approvals		
Issued approvals		
Scope of delivery and accessories		
Scope of delivery	device, start-up instructions	
Accessories to order separately	manual, order no. 039 516-001	



	interface converter electrical/optical for RS 485 field bus networks; repeater function; for quartz glass FO; electrical full duplex or semi-duplex mode; long-haul version	
	2 x optical: BFOC 2.5 (ST [®]) socket 1 x electrical: 12-pin terminal block	
	OZD 485 G12-1300	
	943 777-321	
	RS 485 (Modbus, ...)	
	10 kOhm	
	-7 V ... +12 V	
	typ. 10 ns _{pp}	
	typ. 1 ns _{pp}	
	0 to 1,5 Mbit/s NRZ	
	1310 nm	
	-18 dBm	
	-13 dBm	
	-13 dBm	
	-31 dBm	
	5-pin terminal block	
	5-pin terminal block	
	3-pin terminal block	
	22000 m 13 dB link budget at 1310 nm; A = 0,5 dB/km, 2 dB reserve	
	16000 m 18 dB link budget at 1310 nm; A = 0,5 dB/km, 2 dB reserve	
	16000 m 18 dB link budget at 1310 nm; A = 0,5 dB/km, 2 dB reserve	
	< 1,33 us	
	18 ... 32 VDC (typ. 24 VDC)	
	190 mA at 18 VDC, 110 mA at 32 VDC	
	3,4 W at 18 VDC, 3,5 W at 32 VDC	
	redundant ring, redundant power supply	
	system (operating status, signaling contact); supply voltage; redundancy mode; input signal/input power/receiving data	
	-25 °C to +60 °C	
	-25 °C to +70 °C	
	< 95% (non-condensing)	
	40 x 140 x 90 mm	
	DIN rail or mounting plate	
	650 g	
	IP 30	
	die-cast zink	
	contact discharge: 4 kV, air discharge: 8 kV	
	10 V/m (80 - 1000 MHz)	
	power line 2 kV, data line: 1 kV	
	power line 1 kV2 kV (line/line, line/earth), data line: 1 kV	
	10 V (0.15 - 80 MHz)	
	EN 55022 limit class A	
	device, start-up instructions	
	manual, order no. 039 516-001	

The shortest data link between office and factory.

Clip-on modules connect two different worlds together.



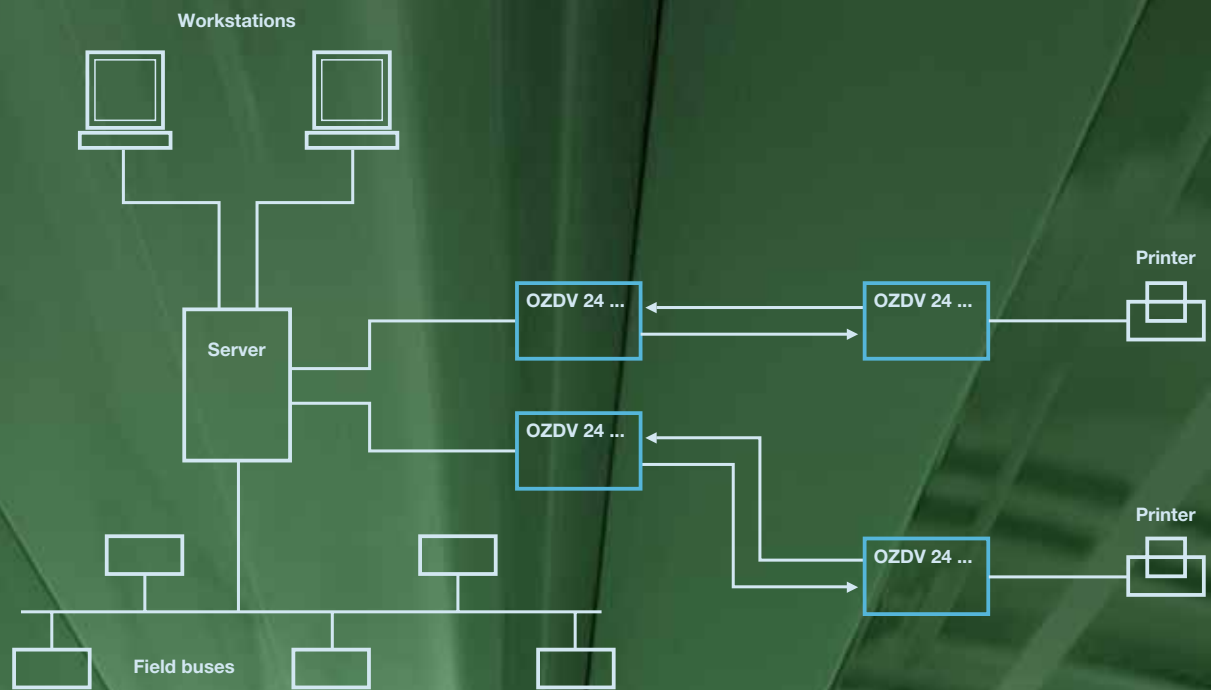
Hirschmann's digital modules are perfectly suited for all situations requiring the interference-free transmission of classical RS 232/serial signals under highly demanding operating conditions over long distances between computers and peripheral devices such as printers, terminals and machines in automation technology.

Optical fiber transmission systems effectively eliminate the risk of RFI/EMI. At the same time, they protect valuable terminal devices against possible damage through optical isolation, thereby contributing to the protection of investments.




In large companies where data is centrally collected, the switch to Hirschmann FiberINTERFACES will extend the transmission paths and permit the placement of cables in interference-prone environments.

The modules, in compact clip-on housings made of stable centrifugal cast zinc, can be placed directly on the terminal device or mounted on a DIN rail via an adapter. Some of the modules obtain their voltage supply from the data signal and are therefore not dependent on an external voltage source.





Overview V.24/RS 232 Single-Channel Modules.

Fiber S 980/1000 ¹⁾	650 nm		
		OZDV 2451 P	OZDV 2471 P
		0 – 60 m	0 – 50 m
	OZDV 2451 P	17 dB	14 dB
		0 – 50 m	0 – 100 m
	OZDV 2471 P	14 dB	29 dB



860 nm



OZDV 2451 G

OZDV 2471 G

0 – 1500 m	0 – 800 m
7.5 dB	5.5 dB
0 – 800 m	0 – 6 700 m
5.5 dB	23 dB



OZDV 2451 G



OZDV 2471 G

Fiber G 50/125 ²⁾

860 nm



OZDV 2451 G

OZDV 2471 G

0 – 2 000 m	0 – 1 400 m
10 dB	8 dB
0 – 1 400 m	0 – 6 600 m
8 dB	26 dB



OZDV 2451 G



OZDV 2471 G

Fiber G 62.5/125 ³⁾

¹⁾ with fiber S 980/1 000 m (0.25 dB/m attenuation and 2 dB system reserve)

²⁾ with fiber G 50/125 m (3 dB/km attenuation and 3 dB system reserve)

³⁾ with fiber G 62.5/125 m (3.5 dB/km attenuation and 3 dB system reserve)

FiberINTERFACES

Digital



V.24/RS 232 single-channel modules

Product description		
Description	interface converter electrical/optical for V.24; power supply through data signal; for plastic FO; for plugging onto the Sub-D socket provided on the terminal or mounting onto a DIN rail (with DIN rail adapter accessories)	
Port type and quantity	1 electrical port: 25-pin Sub-D connector, male; 1 optical port: 2 sockets BFOC 2.5 (ST®)	
Setting possibilities	DTE- or DCE operating mode external voltage supply via pin 11 or internally from the data signal shield ground galvanically connected or not connected to signal ground	
Type	OZDV 2451 P	
Order No.	943 316-021	
Electrical interface		
Signal type	V.24 (RS 232 D) interface level	
Bit rate	DC to 20 kbit/s (DC coupling)	
Bit error frequency	< 10 ⁻⁹	
Terminal assignment data	pin 1: PGND; pin 7: GND; pin 11: Vcc; pin 4+5 and pin 6+8+20 bridged DTE operation: pin 2 TxD, pin 3 RxD DCE operation: pin 2 RxD, pin 3 TxD	
Optical interface		
Wavelength	665 nm	
More Interfaces		
Power supply	from the data signal (electrical interface) or 25-pin Sub-D connector (pin 11)	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm		
Multimode fiber (MM) 50/125 µm		
Multimode fiber (MM) 62.5/125 µm		
Multimode fiber HCS (MM) 200/230 µm		
Multimode fiber POF (MM) 980/1000 µm	0 - 60 m 17 dB link budget, A = 0.25 dB/m, 2 dB reserve combination with other modules see page 28 and 29	
Power requirements		
Operating voltage	no external power supply required; with supply via pin 11: -20 V ... -5 V or +5 V ... +20 V	
Current consumption	3.3 mA (max. 3.8 mA) via data signal	
Power consumption	20 mW at 4.5 V	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +70 °C	
Relative humidity	10% to 90%	
Mechanical construction		
Dimensions (W x H x D)	56.5 x 18 x 76 mm	
Mounting	plugging onto the terminal unit	
Weight	110 g	
Protection class	IP 40	
Housing material	die-cast zinc	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)		
EN 61000-4-5 surge voltage		
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Approvals		
Issued approvals	C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, operating instructions, 2 BFOC (ST®) optical plugs	
Accessories to order separately	DIN rail adapter OZDV HA	



	interface converter electrical/optical for V.24; power supply through data signal; for quartz glass FO; for plugging onto the Sub-D socket provided on the terminal or mounting onto a DIN rail (with DIN rail adapter accessories)	
	1 electrical port: 25-pin Sub-D connector, male; 1 optical port: 2 sockets BFOC 2.5 (ST®)	
	DTE- or DCE operating mode external voltage supply via pin 11 or internally from the data signal shield ground galvanically connected or not connected to signal ground	
	OZDV 2451 G	
	943 299-021	
	V.24 (RS 232 D) interface level	
	DC to 20 kbit/s (DC coupling) < 10-9	
	pin 1: PGND; pin 7: GND; pin 11: Vcc; pin 4+5 and pin 6+8+20 bridged DTE operation: pin 2 TxD, pin 3 RxD DCE operation: pin 2 RxD, pin 3 TxD	
	860 nm	
	from the data signal (electrical interface) or 25-pin Sub-D connector (pin 11)	
	0 - 1500 m 7.5 dB link budget, A = 3.0 dB/km, 3 dB reserve combination with other modules see page 28 and 29	
	0 - 2000 m 10 dB link budget, A = 3.5 dB/km, 3 dB reserve combination with other modules see page 28 and 29	
	no external power supply required; with supply via pin 11: -20 V ... -5 V or +5 V ... +20 V	
	3.3 mA (max. 3.8 mA) via data signal 20 mW at 4.5 V	
	0 °C to +50 °C -20 °C to +70 °C 10% to 90%	
	56.5 x 18 x 76 mm plugging onto the terminal unit 110 g IP 40 die-cast zinc	
	contact discharge: 4 kV, air discharge: 8 kV 10 V/m (80 - 1000 MHz)	
	EN 55022 limit class B	
	C-Tick	
	device, operating instructions DIN rail adapter OZDV HA	

FiberINTERFACES

Digital



V.24/RS 232 single-channel modules

Product description		
Description	interface converter electrical/optical for V.24; for plastic FO; for plugging onto the Sub-D socket provided on the terminal or mounting onto a DIN rail (with DIN rail adapter accessories)	
Port type and quantity	1 electrical port: 25-pin Sub-D connector, male; 1 optical port: 2 sockets BFOC 2.5 (ST [®])	
Setting possibilities	DTE- or DCE operating mode voltage supply internally via pin 11/pin 18 Sub-D socket or externally via low voltage socket shield ground galvanically connected or not connected to signal ground	
Type	OZDV 2471 P	
Order No.	943 340-021	
Electrical interface		
Signal type	V.24 (RS 232 D) interface level	
Bit rate	DC to 115 kbit/s (DC coupling)	
Bit error frequency	< 10 ⁻⁹	
Terminal assignment data	pin 1: PGND; pin 7: GND; pin 11: Vcc; pin 4+5 and pin 6+8+20 bridged DTE operation: pin 2 TxD, pin 3 RxD DCE operation: pin 2 RxD, pin 3 TxD	
Optical interface		
Wavelength	665 nm	
More Interfaces		
Power supply	4-pin low voltage plug, M8 shape according to IEC 947-5-2 or 25-pin Sub-D connector (pin 11/pin 18)	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm		
Multimode fiber (MM) 50/125 µm		
Multimode fiber (MM) 62.5/125 µm		
Multimode fiber HCS (MM) 200/230 µm	0 - 2100 m 20 dB link budget, A = 8.0 dB/km, 3 dB reserve combination with other modules see page 28 and 29	
Multimode fiber POF (MM) 980/1000 µm	0 - 100 m 29 dB link budget, A = 0.25 dB/m, 2 dB reserve combination with other modules see page 28 and 29	
Power requirements		
Operating voltage	+5 VDC via PSW 5-24 plug-in power supply or + 5 VDC +-5% external supply or +8 ... +15 VDC external supply	
Current consumption	90 mA (max. 120 mA)	
Power consumption	0.6 W/1.8 W	
Ambient conditions		
Operating temperature	-20 °C to +50 °C	
Storage/transport temperature	-20 °C to +70 °C	
Relative humidity	10% to 90%	
Mechanical construction		
Dimensions (W x H x D)	56.5 x 18 x 76 mm	
Mounting	plugging onto the terminal unit	
Weight	110 g	
Protection class	IP 40	
Housing material	die-cast zink	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	2 kV (plug-in power supply 220 V side)	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line), 2 kV (line/earth) (plug-in power supply 220 V side)	
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Approvals		
Issued approvals	C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, operating instructions, 2 BFOC (ST [®]) optical plugs	
Accessories to order separately	plug-in power supply PSW 5-24 DIN rail adapter OZDV HA	



	interface converter electrical/optical for V.24; for quartz glass FO; for plugging onto the Sub-D socket provided on the terminal or mounting onto a DIN rail (with DIN rail adapter accessories)	interface converter electrical/optical for V.24; for quartz glass FO; for plugging onto the Sub-D socket provided on the terminal or mounting onto a DIN rail (with DIN rail adapter accessories); long-haul version
	1 electrical port: 25-pin Sub-D connector, male; 1 optical port: 2 sockets BFOC 2.5 (ST®)	1 electrical port: 25-pin Sub-D connector, male; 1 optical port: 2 sockets BFOC 2.5 (ST®)
	DTE- or DCE operating mode voltage supply internally via pin 11/pin 18 Sub-D socket or externally via low voltage socket shield ground galvanically connected or not connected to signal ground	DTE- or DCE operating mode voltage supply internally via pin 11/pin 18 Sub-D socket or externally via low voltage socket shield ground galvanically connected or not connected to signal ground
	OZDV 2471 G	OZDV 2471 G-1300
	943 341-021	933 990-021
	V.24 (RS 232 D) interface level	V.24 (RS 232 D) interface level
	DC to 115 kbit/s (DC coupling) < 10-9	DC to 115 kbit/s (DC coupling) < 10-9
	pin 1: PGND; pin 7: GND; pin 11: Vcc; pin 4+5 und pin 6+8+20 bridged DTE operation: pin 2 TxD, pin 3 RxD DCE operation: pin 2 RxD, pin 3 TxD	pin 1: PGND; pin 7: GND; pin 11: Vcc; pin 4+5 and pin 6+8+20 bridged DTE operation: pin 2 TxD, pin 3 RxD DCE operation: pin 2 RxD, pin 3 TxD
	860 nm	1300 nm
	4-pin low voltage plug, M8 shape according to IEC 947-5-2 or 25-pin Sub-D connector (pin 11/pin 18)	4-pin low voltage plug, M8 shape according to IEC 947-5-2 or 25-pin Sub-D connector (pin 11/pin 18)
		0 - 32000 m 18 dB link budget, A = 0.5 dB/km, 2 dB reserve
	0 - 6700 m 23 dB link budget, A = 3.0 dB/km, 3 dB reserve combination with other modules see page 28 and 29	0 - 19000 m 21 dB link budget, A = 1.0 dB/km, 2 dB reserve
	0 - 6600 m 26 dB link budget, A = 3.5 dB/km, 3 dB reserve combination with other modules see page 28 and 29	0 - 12000 m 21 dB link budget, A = 1.5 dB/km, 2 dB reserve
	0 - 3100 m 28 dB link budget, A = 8.0 dB/km, 3 dB reserve combination with other modules see page 28 and 29	
	+5 VDC via PSW 5-24 plug-in power supply or + 5 VDC +-5% external supply or +8 ... +15 VDC external supply	+5 VDC via PSW 5-24 plug-in power supply or + 5 VDC +-5% external supply or +8 ... +15 VDC external supply
	90 mA (max. 120 mA) 0.6 W/1.8 W	90 mA (max. 120 mA) 0.6 W/1.8 W
	-20 °C to +50 °C	-20 °C to +50 °C
	-20 °C to +70 °C	-20 °C to +70 °C
	10% to 90%	10% to 90%
	56.5 x 18 x 76 mm plugging onto the terminal unit	56.5 x 18 x 80 mm plugging onto the terminal unit
	110 g	135 g
	IP 40	IP 40
	die-cast zink	die-cast zink
	contact discharge: 4 kV, air discharge: 8 kV	contact discharge: 4 kV, air discharge: 8 kV
	10 V/m (80 - 1000 MHz)	10 V/m (80 - 1000 MHz)
	2 kV (plug-in power supply 220 V side)	2 kV (plug-in power supply 220 V side)
	power line: 1 kV (line/line), 2 kV (line/earth) (plug-in power supply 220 V side)	power line: 1 kV (line/line), 2 kV (line/earth) (plug-in power supply 220 V side)
	EN 55022 limit class B	EN 55022 limit class B
	C-Tick	C-Tick
	device, operating instructions plug-in power supply PSW 5-24 DIN rail adapter OZDV HA	device, operating instructions plug-in power supply PSW 5-24 DIN rail adapter OZDV HA

FiberINTERFACES

Digital



V.24 Multiplexer

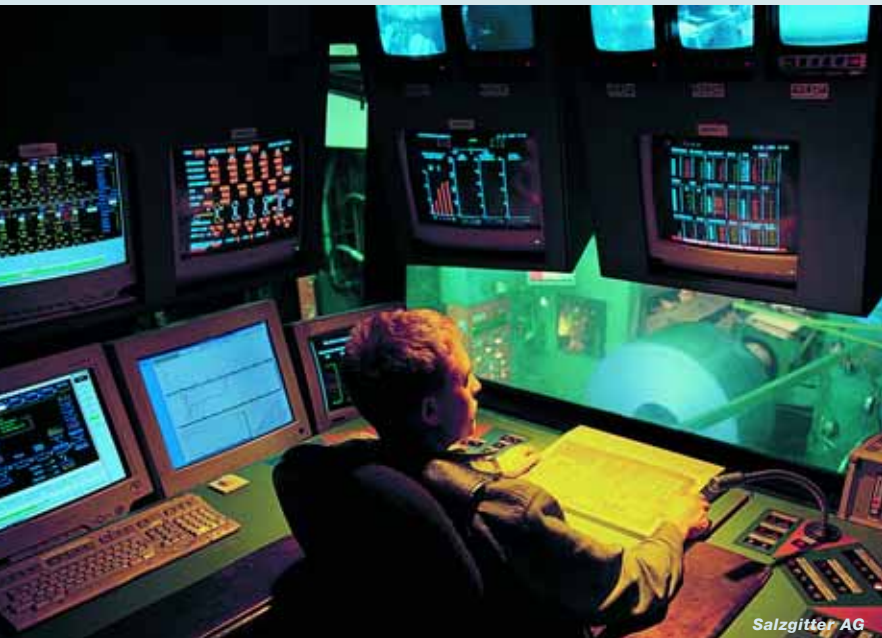
Product description		
Description	4-channel multiplexer optical/electrical for V.24; for plastic FO; for plugging onto the Sub-D socket provided on the terminal or mounting onto a DIN rail (with DIN rail adapter accessories)	
Port type and quantity	1 electrical port: 25-pin Sub-D connector, male; 1 optical port: 2 sockets OVKS (Hirschmann)	
Setting possibilities	DTE- or DCE operating mode 1-channel operation or multi-channel operation voltage supply internally via pin 11 of the Sub-D-socket or externally via low-voltage socket shield ground galvanically connected or not connected to signal ground	
Type	OMDV 2404 P OV	
Order No.	943 305-001	
Electrical interface		
Signal type	V.24 (RS 232 D) interface level	
Bit rate	1-channel operation: DC to 66 kbit/s (at <10% jitter), DC to 200 kbit/s (at <30% jitter) 4-channel operation: DC to 20 kbit/s (at <10% jitter), DC to 60 kbit/s (at <30% jitter)	
Edge jitter	1-channel operation: 1.5 µs 4-channel operation: 5 µs	
Bit error frequency	< 10-9	
Terminal assignment data	pin 1: PGND; pin 7: GND; pin 11: Vcc; 1-channel operation: pin 4+5, pin 6+20 and pin 17+24 bridged DTE operation: inputs: pin 2, 4, 20, 24; outputs: pin 3, 5, 6, 17 DCE operation: inputs: pin 3, 5, 6, 17; outputs: pin 2, 4, 20, 24	
Optical interface		
Wavelength	665 nm	
More Interfaces		
Power supply	4-pin low voltage socket, M8 shape according to IEC 947-5-2 or 25-pin Sub-D connector (pin 11)	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm		
Multimode fiber (MM) 50/125 µm		
Multimode fiber (MM) 62.5/125 µm		
Multimode fiber HCS (MM) 200/230 µm		
Multimode fiber POF (MM) 980/1000 µm	>=40 m 13 dB link budget, A = 0.25 dB/m, 2 dB reserve	
Power requirements		
Operating voltage	+5 VDC via PSW 5-24 plug-in power supply or +5 VDC +5% external supply	
Current consumption	max. 300 mA	
Power consumption	1.5 W	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +70 °C	
Relative humidity	10% to 90%	
Mechanical construction		
Dimensions (W x H x D)	56.5 x 18 x 74.5 mm	
Mounting	plugging onto the terminal unit or the adapter cable	
Weight	130 g	
Protection class	IP 40	
Housing material	die-cast zinc	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	2 kV (plug-in power supply 220 V side)	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line), 2 kV (line/earth) (plug-in power supply 220 V side)	
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Approvals		
Issued approvals	C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, operating instructions, 2 OVKS 2,2 optical plugs	
Accessories to order separately	plug-in power supply PSW 5-24 DIN rail adapter OZDV HA	



	4-channel multiplexer optical/electrical for V.24; for quartz glass and PDF (HCSR) FO; for plugging onto the Sub-D socket provided on the terminal or mounting onto a DIN rail (with DIN rail adapter accessories)	4-channel multiplexer optical/electrical for V.24; for quartz glass FO; long-haul version; for plugging onto the Sub-D socket provided on the terminal or mounting onto a DIN rail (with DIN rail adapter accessories)
	1 electrical port: 25-pin Sub-D connector, male; 1 optical port: 2 sockets BFOC 2.5 (ST®)	1 electrical port: 25-pin Sub-D connector, male; 1 optical port: 2 sockets BFOC 2.5 (ST®)
	DTE- or DCE operating mode 1-channel operation or multi-channel operation voltage supply internally via pin 11 of the Sub-D-socket or externally via low-voltage socket shield ground galvanically connected or not connected to signal ground	DTE- or DCE operating mode 1-channel operation or multi-channel operation voltage supply internally via pin 11 of the Sub-D-socket or externally via low-voltage socket shield ground galvanically connected or not connected to signal ground
	OMDV 2404 G BFOC	OMDV 2404 G BFOC-1300
	943 315-021	943 315-121
	V.24 (RS 232 D) interface level	V.24 (RS 232 D) interface level
	1-channel operation: DC to 66 kbit/s (at <10% jitter), DC to 200 kbit/s (at <30% jitter) 4-channel operation: DC to 20 kbit/s (at <10% jitter), DC to 60 kbit/s (at <30% jitter)	1-channel operation: DC to 66 kbit/s (at <10% jitter), DC to 200 kbit/s (at <30% jitter) 4-channel operation: DC to 20 kbit/s (at <10% jitter), DC to 60 kbit/s (at <30% jitter)
	1-channel operation: 1.5 µs 4-channel operation: 5 µs	1-channel operation: 1.5 µs 4-channel operation: 5 µs
	< 10-9 pin 1: PGND; pin 7: GND; pin 11: Vcc; 1-channel operation: pin 4+5, pin 6+20 and pin 17+24 bridged DTE operation: inputs: pin 2, 4, 20, 24; outputs: pin 3, 5, 6, 17 DCE operation: inputs: pin 3, 5, 6, 17; outputs: pin 2, 4, 20, 24	< 10-9 pin 1: PGND; pin 7: GND; pin 11: Vcc; 1-channel operation: pin 4+5, pin 6+20 and pin 17+24 bridged DTE operation: inputs: pin 2, 4, 20, 24; outputs: pin 3, 5, 6, 17 DCE operation: inputs: pin 3, 5, 6, 17; outputs: pin 2, 4, 20, 24
	860 nm	1300 nm
	4-pin low voltage socket, M8 shape according to IEC 947-5-2 or 25-pin Sub-D connector (pin 11)	4-pin low voltage socket, M8 shape according to IEC 947-5-2 or 25-pin Sub-D connector (pin 11)
		22000 m 13 dB link budget, at +25 °C, A = 0.5 dB/km, 2 dB reserve 14000 m 9 dB link budget, at +50 °C, A = 0.5 dB/km, 2 dB reserve
	>=2000 m 9 dB link budget, A = 3.0 dB/km, 3 dB reserve	4000 m 15 dB link budget, at +25 °C, A = 3.0 dB/km, 2 dB reserve
	>=2500 m 12 dB link budget, A = 3.5 dB/km, 3 dB reserve	3400 m 15 dB link budget, at +25 °C, A = 3.5 dB/km, 2 dB reserve
	>=1500 m 16 dB link budget, A = 8.0 dB/km, 3 dB reserve	
	+5 VDC via PSW 5-24 plug-in power supply or +5 VDC +-5% external supply	+5 VDC via PSW 5-24 plug-in power supply or +5 VDC +-5% external supply
	max. 300 mA	max. 300 mA
	1.5 W	1.5 W
	0 °C to +50 °C -20 °C to +70 °C 10% to 90%	0 °C to +50 °C -20 °C to +70 °C 10% to 90%
	56.5 x 18 x 76 mm plugging onto the terminal unit 130 g IP 40 die-cast zink	56.5 x 18 x 80 mm plugging onto the terminal unit 130 g IP 40 die-cast zink
	contact discharge: 4 kV, air discharge: 8 kV 10 V/m (80 - 1000 MHz) 2 kV (plug-in power supply 220 V side) power line: 1 kV (line/line), 2 kV (line/earth) (plug-in power supply 220 V side)	contact discharge: 4 kV, air discharge: 8 kV 10 V/m (80 - 1000 MHz) 2 kV (plug-in power supply 220 V side) power line: 1 kV (line/line), 2 kV (line/earth) (plug-in power supply 220 V side)
	EN 55022 limit class B	EN 55022 limit class B
	C-Tick	C-Tick
	device, operating instructions plug-in power supply PSW 5-24 DIN rail adapter OZDV HA	device, operating instructions plug-in power supply PSW 5-24 DIN rail adapter OZDV HA

Safety that perfectly suits the image.

Secure, interference-free image transmission of video signals over fiber optic cables.

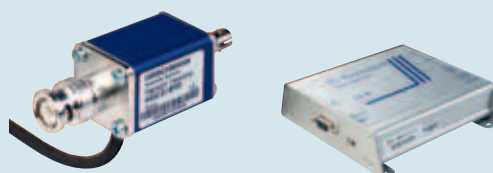


Hirschmann fiber optic video converters are available for various signal bandwidths and ranges enabling optimum adaptation to specific environments and situations — from building monitoring and traffic monitoring in tunnels to highly demanding quality and medical monitoring equipment applications.

The advantages of FiberINTERFACES for video are obvious: optical transmission technology is impervious to RFI/EMI influences and can cover distances extending over many kilometers/miles. In medical devices, an uncorrupted image could save lives. And in mobile technology, there is no need for adjustment to the high signal frequencies as required in conventional equipment using coaxial cable transmission.

Video FiberINTERFACES are intended for use in monitoring, security and safety equipments in environments with electromagnetic noise. In chemical factories and in high-voltage installations.

Optical transmission technology can considerably increase the range of video transmitters and receivers in comparison to conventional cabling – without using expensive intermediate amplifiers.



Workstation



OTV 80 M2








Camera



Winding unit










Overview Composite Video Transmitter/Receiver.

Fiber G 50/125 ¹⁾	Transmitter					
	Receiver	OSV 052 ...	OSV 052-E ...	OSVC 01 ...		
		0 – 3 300 m	0 – 3 300 m	0 – 3 200 m		
	OEV 052 ...	7 MHz	7 MHz	7 MHz		
		0 – 3 300 m	0 – 3 300 m	0 – 3 200 m		
	OEV 052-E ...	7 MHz	7 MHz	7 MHz		
		0 – 1 300 m	0 – 1 300 m	0 – 1 200 m		
	OEV 801-E ...	50 MHz	50 MHz	30 MHz		
		0 – 1 300 m	0 – 1 300 m	0 – 1 200 m		
	ORVC G1 BFOC	50 MHz	50 MHz	30 MHz		

Larger distances can be covered by using higher quality fibers.

¹⁾ with fiber G 50/125 m (3.0 dB/km attenuation and 3 dB system reserve)

²⁾ with fiber G 62.5/125 m (3.5 dB/km attenuation and 3 dB system reserve)

Transmitter				
Receiver		OSV 052 ...	OSV 052-E ...	OSVC 01 ...
	OEV 052 ...	0 – 3 400 m	0 – 3 400 m	0 – 3 300 m
		7 MHz	7 MHz	7 MHz
	OEV 052-E ...	0 – 3 400 m	0 – 3 400 m	0 – 3 300 m
		7 MHz	7 MHz	7 MHz
	OEV 801-E ...	300 – 1 700 m	300 – 1 700 m	300 – 1 400 m
		50 MHz	50 MHz	30 MHz
	ORVC G1 BFOC	0 – 1 700 m	0 – 1 700 m	0 – 1 400 m
		50 MHz	50 MHz	30 MHz

Fiber G 62.5/125²⁾

FiberINTERFACES

Video



Composite Video Transmitters/Receivers

Product description		
Description	composite video transmitter 50 MHz; can be combined with the receivers OEV 052 BFOC, OEV 052-E BFOC, OEV 801-E ..., ORVC G1 BFOC	
Port type and quantity	1 x electrical: BNC socket 1 x optical: BFOC 2.5 (ST®) socket	
Type	OSV 052 BFOC	
Order No.	943 016-021	
Electrical interface		
Signal type	composite	
Input voltage	1 V _{pp}	
Input resistance	75 Ohm	
Output voltage		
Output resistance		
Pulse tilt (horiz. and vert.)		
Differential amplification	typ. 10%	
Differential phase		
Upper limiting frequency (-3 dB)	50 MHz	
Optical interface		
Wavelength	860 nm	
Launchable optical power in single-mode fiber (SM) 9/125		
Launchable optical power in multi-mode fiber (MM) 50/125	> 15 µW _{pp} , -18 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	> 25 µW _{pp} , -16 dBm	
Launchable optical power in multi-mode fiber (MM) HCS 200/230		
Launchable optical power in multi-mode fiber (MM) POF 980/1000		
Optical input power		
Laser protection class	1 according to DIN EN 60825	
More Interfaces		
Power supply	low voltage socket, device polarity: pin: +V _s /socket: ground	
Signaling contact		
Network size - length of cable		
Single mode fiber (SM) 9/125 µm		
Multimode fiber (MM) 50/125 µm	3300 m 13 dB link budget, A = 3.0 dB/km, 3 dB reserve with OEV 052 BFOC, OEV 052-E BFOC combination with other receivers see page 38 and 39	
Multimode fiber (MM) 62.5/125 µm	3400 m 15 dB link budget, A = 3.5 dB/km, 3 dB reserve with OEV 052 BFOC, OEV 052-E BFOC combination with other receivers see page 38 and 39	
Power requirements		
Operating voltage	7.5 ... 15 V	
Current consumption	110 mA	
Power consumption	1.7 W	
Ambient conditions		
Operating temperature	-20 °C to +50 °C	
Storage/transport temperature	-20 °C to +80 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Mounting	stand-alone unit	
Dimensions (W x H x D)	100 x 24.1 x 50 mm	
Weight	210 g	
Protection class	IP 40	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line: 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line)	
EN 61000-4-6 conducted immunity		
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	ready-to-connect transmitter, operating instructions	
Accessories to order separately	plug-in power supply SNT 012	
Notes		
Picture signal	To ensure correct operation, the controller requires a degree of whiteness of 0.5% in the picture signal.	



	composite video transmitter 50 MHz; can be combined with the receivers OEV 052 BFOC, OEV 052-E BFOC, OEV 801-E ..., ORVC G1 BFOC	Composite video receiver 7 MHz; can be combined with the transmitters OSV 052 BFOC, OSV 052-E BFOC, OSVC 01 BFOC
	1 x electrical: BNC socket 1 x optical: BFOC 2.5 (ST [®]) socket	1 x optical: BFOC 2.5 (ST [®]) socket 1 x electrical: BNC socket
	OSV 052-E BFOC	OEV 052 BFOC
	933 965-021	943 017-021
	composite	composite
	1 V _{pp}	
	75 Ohm	
		1 V _{pp} at 75 Ohm
		75 Ohm
		typ. 2%
	typ. 10%	
		typ. 2.5°
	50 MHz	7 MHz
	860 nm	860 nm
	> 15 µW _{pp} , -18 dBm	
	> 25 µW _{pp} , -16 dBm	
		≥ 0.8 µW _{pp} , -31 dBm with S/N > 45 dBw
	1 according to DIN EN 60825	1 according to DIN EN 60825
	plug connector according to DIN EN 60603-2; pin 1: ground, pin 32: +V _s	low voltage socket, device polarity: pin: +V _s /socket: ground
	3300 m 13 dB link budget, A = 3.0 dB/km, 3 dB reserve with OEV 052 BFOC, OEV 052-E BFOC combination with other receivers see page 38 and 39	3300 m 13 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSV 052 BFOC, OSV 052-E BFOC combination with other transmitters see page 38 and 39
	3400 m 15 dB link budget, A = 3.5 dB/km, 3 dB reserve with OEV 052 BFOC, OEV 052-E BFOC combination with other receivers see page 38 and 39	3400 m 15 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSV 052 BFOC, OSV 052-E BFOC combination with other transmitters see page 38 and 39
	14,5 ... 24 V	12 ... 15 V
	110 mA	120 mA
	2.6 W	1.8 W
	-20 °C to +50 °C	-20 °C to +50 °C
	-20 °C to +80 °C	-20 °C to +80 °C
	10% to 90%	10% to 90%
	19" plug-in card	stand-alone unit
	30 (6 PU) x 128.5 (3 HU) x 185 mm	100 x 24.1 x 50 mm
	450 g	210 g
		IP 40
	contact discharge: 4 kV, air discharge: 8 kV	contact discharge: 4 kV, air discharge: 8 kV
	10 V/m (80 - 1000 MHz)	10 V/m (80 - 1000 MHz)
	power line: 2 kV, data line: 1 kV	power line: 2 kV, data line: 1 kV
	power line: 1 kV (line/line)	power line: 1 kV (line/line)
	EN 55022 limit class B	EN 55022 limit class B
	plug-in transmitter card, operating instructions	ready-to-connect receiver, operating instructions
	19" subrack ART 84	plug-in power supply SNT 012
	To ensure correct operation, the controller requires a degree of whiteness of 0.5% in the picture signal.	To ensure correct operation, the controller requires a degree of whiteness of 0.5% in the picture signal.

FiberINTERFACES

Video



Composite Video Transmitters/Receivers

Product description		
Description	Composite video receiver 7 MHz; can be combined with the transmitters OSV 052 BFOC, OSV 052-E BFOC, OSVC 01 BFOC	
Port type and quantity	1 x optical: BFOC 2.5 (ST®) socket 1 x electrical: BNC socket	
Type	OEV 052-E BFOC	
Order No.	933 964-021	
Electrical interface		
Signal type	composite	
Input voltage		
Input resistance		
Output voltage	1 V _{pp} at 75 Ohm	
Output resistance	75 Ohm	
Pulse tilt (horiz. and vert.)	typ. 2%	
Differential amplification		
Differential phase	typ. 2.5°	
Upper limiting frequency (-3 dB)	7 MHz	
Optical interface		
Wavelength	860 nm	
Launchable optical power in single-mode fiber (SM) 9/125		
Launchable optical power in multi-mode fiber (MM) 50/125		
Launchable optical power in multi-mode fiber (MM) 62.5/125		
Launchable optical power in multi-mode fiber (MM) HCS 200/230		
Launchable optical power in multi-mode fiber (MM) POF 980/1000		
Optical input power	≥ 0.8 μW _{pp} , -31 dBm with S/N > 45 dBw	
Laser protection class	1 according to DIN EN 60825	
More Interfaces		
Power supply	plug connector according to DIN EN 60603-2; pin 1: ground, pin 32: +V _S	
Signaling contact		
Network size - length of cable		
Single mode fiber (SM) 9/125 μm		
Multimode fiber (MM) 50/125 μm	3300 m 13 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSV 052 BFOC, OSV 052-E BFOC combination with other transmitters see page 38 and 39	
Multimode fiber (MM) 62.5/125 μm	3400 m 15 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSV 052 BFOC, OSV 052-E BFOC combination with other transmitters see page 38 and 39	
Power requirements		
Operating voltage	17.6 ... 24 V	
Current consumption	120 mA	
Power consumption	2.9 W	
Ambient conditions		
Operating temperature	-20 °C to +50 °C	
Storage/transport temperature	-20 °C to +80 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Mounting	19" plug-in card	
Dimensions (W x H x D)	30 (6 PU) x 128.5 (3 HU) x 185 mm	
Weight	450 g	
Protection class		
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line: 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line)	
EN 61000-4-6 conducted immunity		
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	plug-in receiver card, operating instructions	
Accessories to order separately	19" subrack ART 84	
Notes		
Picture signal	To ensure correct operation, the controller requires a degree of whiteness of 0.5% in the picture signal.	



	composite video transmitter 30 MHz; can be combined with the receivers OEV 052 BFOC, OEV 052-E BFOC, OEV 801-E ..., ORVC G1 BFOC	Composite video receiver 50 MHz; can be combined with the transmitters OSV 052(-E) BFOC, OSVC 01 BFOC, OSVR 80M2-E BFOC, OSVR 150M-PCI64 ...
	1 x electrical: BNC socket 1 x optical: BFOC 2.5 (ST [®]) socket	1 x optical: BFOC 2.5 (ST [®]) socket 1 x electrical: BNC socket
	OSVC 01 BFOC	ORVC G1 BFOC
	933 835-021	943 688-221
	composite	composite
	1 V _{pp}	
	75 Ohm	
		1 V _{pp} at 75 Ohm
		75 Ohm
		typ. 1%
	< 10%	
	typ. 3.5°	
	30 MHz	50 MHz
	860 nm	860 nm
	> 14 µW _{pp} , -18.5 dBm	
	> 20 µW _{pp} , -17 dBm	
		≥ 3 µW _{pp} , -25 dBm with S/N > 45 dBw
	1 according to DIN EN 60825	1 according to DIN EN 60825
	M8 plug according to IEC 947-5-2; 4-pin, with wire colour coding according to EN 50044.	5-pin terminal block, screw mounting
		5-pin terminal block, screw mounting
	3200 m 12.5 dB link budget, A = 3 dB/km, 3 dB reserve with OEV 801-E ... 1200 m 6.5 dB link budget, A = 3 dB/km, 3 dB reserve with ORVC G1 BFOC, OEV 052 BFOC, OEV 052-E BFOC	1300 m 7 dB link budget, A = 3 dB/km, 3 dB reserve with OSV 052 BFOC, OSV 052-E BFOC, OSVR 80M2-E BFOC 1200 m 6.5 dB link budget, A = 3 dB/km, 3 dB reserve with OSVC 01 BFOC 1000 m 6 dB link budget, A = 3 dB/km, 3 dB reserve with OSVR 150M-PCI64 ...
	3300 m 14 dB link budget, A = 3.5 dB/km, 3 dB reserve with OEV 801-E ... 1400 m 8 dB link budget, A = 3.5 dB/km, 3 dB reserve with ORVC G1 BFOC, OEV 052 BFOC, OEV 052-E BFOC	1700 m 9 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSV 052 BFOC, OSV 052-E BFOC, OSVR 80M2-E BFOC 1400 m 8 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSVC 01 BFOC
	+5 VDC or 8 ... 15 VAC/VDC any polarity	24 VDC (15 ... 26.4 VDC)
	DC: 80 mA, AC: 140 mA	max. 200 mA
	1.2 W	5.3 W
	-20 °C to +50 °C	0 °C to +50 °C
	-20 °C to +70 °C	-20 °C to +70 °C
	10% to 90%	< 95%
	miniature in-line housing	Robust metal housing for mounting onto a DIN rail or a mounting plate
	25.4 mm x 25.4 mm x 76.2 mm (1" x 1" x 3")	40 x 140 x 92 mm
	135 g	500 g
	IP 40	IP 40
	contact discharge: 4 kV, air discharge: 8 kV	contact discharge: 4 kV, air discharge: 8 kV
	10 V/m (80 - 1000 MHz)	10 V/m (80 - 1000 MHz)
	power line: 2 kV, data line: 1 kV	power line: 2 kV, data line: 1 kV
	power line: 1 kV (line/line)	power line: 1 kV (line/line)
	EN 55022 limit class B	EN 55022 limit class B
	ready-to-connect transmitter, operating instructions	ready-to-connect receiver, very-low voltage plug, operating instructions
	plug-in power supply PSW 5-24	DIN rail power supply RPS 30

FiberINTERFACES

Video



Optical Isolation Amplifier

Product description		
Description	optical isolation amplifier 80 MHz	
Port type and quantity	1 x electrical in: BNC socket 1 x electrical out: BNC socket	
Type	OTV 80M2	
Order No.	943 214-001	
Electrical interface		
Signal type	composite (RGB with 3 x OTV 80M2)	
Input voltage	typ. 1 V _{pp} , max. 1.7 V _{pp}	
Input resistance	75 Ohm	
Output voltage	typ. 1 V _{pp} , max. 1.7 V _{pp}	
Output resistance	75 Ohm	
Pulse tilt (horiz. and vert.)	< 3%	
Differential amplification	< 5%	
Upper limiting frequency (-3 dB)	80 MHz	
Signal-to-noise ratio	< 55 dB unweighted	
Amplification	1	
Insulating voltage between earths	1.5 kV	
Insulation voltage to network	4 kV (IEC 601.1, protection class 2)	
More interfaces		
Power supply	non-heating appliance plug	
Displays		
LED red	on: operating voltage present	
LED green	on: no video input signal	
Power requirements		
Operating voltage	230 VAC, +6%, -15%, 50-60 Hz	
Power consumption	6.5 W	
Heating-up time	5 min	
Ambient conditions		
Operating temperature	+10 °C to +40 °C	
Storage/transport temperature	-20 °C to +70 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Mounting	stand-alone unit	
Dimensions (W x H x D)	145 x 85 x 38 mm	
Weight	390 g	
Protection class	IP 20	
Housing material	ABS UL94V-0	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line: 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line)	
EN 61000-4-6 conducted immunity		
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	optical isolation amplifier, mains cable, operating instructions	

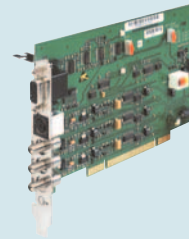
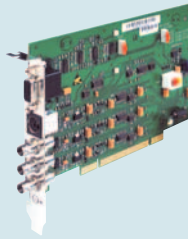
FiberINTERFACES

Video



RGB Video Transmitters/Receivers - High-Resolution

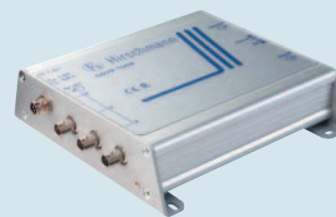
Product description		
Description	RGB video transmitter 80 MHz; can be combined with the receiver OEV 801-E ...	
Port type and quantity	5 x electrical: BNC sockets 3 x optical: BFOC 2.5 (ST®) sockets	
Type	OSVR 80M2-E BFOC	
Order No.	933 799-021	
Electrical interface		
Signal type	RGB (sync-in-green) or VGA (external synchronisation) switchable	
Input voltage	700 mV (VESA-external synchronisation) or 1 V _{pp} (sync-in-green) C/H-Sync: 0,2 ... 8 V _{pp} V-Sync :TTL level	
Input resistance	75 Ohm/10 kOhm - switchable for all 5 inputs	
PC slot		
Output voltage		
Output resistance		
Pulse tilt (horiz. and vert.)		
Differential amplification	< 10%	
Upper limiting frequency (-3 dB)	80 MHz	
Resolution	VESA standard: > 1020 x 768 visual: > 1280 x 1024	
Optical interface		
Wavelength	860 nm	
Launchable optical power in multi-mode fiber (MM) 50/125	> 8 µW _{pp} , -21 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	> 15 µW _{pp} , -18 dBm	
Optical input power		
Laser protection class	1 according to DIN EN 60825	
More Interfaces		
Power supply	plug connector according to DIN EN 60603-2; pin 1: ground, pin 32: +V _s	
Network size - length of cable		
Multimode fiber (MM) 50/125 µm	400 m 4.2 dB link budget, A = 3.0 dB/km, 3 dB reserve	
Multimode fiber (MM) 62.5/125 µm	1100 m, from 640 m bandwidth degradation 7 dB link budget, A = 3.5 dB/km, 3 dB reserve	
Power requirements		
Operating voltage	8 ... 24 V	
Power consumption	12 W	
Current consumption	500 mA	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +80 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Mounting	19" plug-in card	
Dimensions (W x H x D)	45 (9 PU) x 128.5 (3 HU) x 185 mm	
Weight	220 g	
Protection class		
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV (in ART 84)	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz) (in ART 84)	
EN 61000-4-4 fast transients (burst)	power line: 2 kV, data line: 1 kV (in ART 84)	
EN 61000-4-5 surge voltage	power line: 1 kV data line (line/line) (in ART 84)	
EN 61000-4-6 conducted immunity		
EMC emitted immunity		
EN 55022	EN 55022 limit class B (in ART 84)	
Scope of delivery and accessories		
Scope of delivery	plug-in transmitter card, operating instructions	
Accessories to order separately	19" subrack ART 84	



	RGB video transmitter 150 MHz; electrical output for the formation of star points or as a connection facility for a local monitor; can be combined with the receiver OEVR 150M Sync ...	RGB video transmitter 150 MHz; electrical output for the formation of star points or as a connection facility for a local monitor; can be combined with the receivers OEVR 150M FSMA, OEVR 150M Sync ...
	1 x electrical: Mini-DIN socket (VGA in) 1 x electrical: Sub-HD 15-pin, according to DIN 41652 (VGA off) 3 x optical: BFOC 2.5 (ST [®]) sockets	1 x electrical: Mini-DIN socket (VGA in) 1 x electrical: Sub-HD 15-pin, according to DIN 41652 (VGA off) 3 x optical: FSMA sockets
	OSVR 150M-PCI64 BFOC	OSVR 150M-PCI64 FSMA
	943 755-021	943 755-001
	RGB (sync-in-green) or VGA (external synchronisation) switchable	RGB (sync-in-green) or VGA (external synchronisation) switchable
	700 mV (VESA-external synchronisation) or 1 V _{pp} (sync-in-green) C/H-Sync: > 1.5 V V-Sync > 1.5 V	700 mV (VESA-external synchronisation) or 1 V _{pp} (sync-in-green) C/H-Sync: > 1.5 V V-Sync > 1.5 V
	PCI 32 or PCI 64 like input signal	PCI 32 or PCI 64 like input signal
	< 10%	< 10%
	150 MHz	150 MHz
	VESA standard: > 1280 x 1024 visual: > 1600 x 1200	VESA standard: > 1280 x 1024 visual: > 1600 x 1200
	860 nm	860 nm
	> 12 µW _{pp} , -19 dBm	> 12 µW _{pp} , -19 dBm
	> 24 µW _{pp} , -16 dBm	> 24 µW _{pp} , -16 dBm
	1 according to EN 60825	1 according to EN 60825
	PCI	PCI
	330 m 3 dB link budget, A = 3.0 dB/km, 2 dB reserve with OEVR 150M F-SMA, OEVR 150M Sync ...	330 m 3 dB link budget, A = 3.0 dB/km, 2 dB reserve with OEVR 150M F-SMA, OEVR 150M Sync ...
	1100 m 6 dB link budget, A = 3.5 dB/km, 2 dB reserve	1100 m 6 dB link budget, A = 3.5 dB/km, 2 dB reserve
	5 V from PCI slot	5 V from PCI slot
	3.1 W	3.1 W
	625 mA	625 mA
	0 °C to +50 °C	0 °C to +50 °C
	-20 °C to +80 °C	-20 °C to +80 °C
	10% to 90%	10% to 90%
	PCI card	PCI card
	18.5 x 121 x 151 mm	18.5 x 121 x 151 mm
	130 g	130 g
	contact discharge: 4 kV, air discharge: 8 kV (in PC housing)	contact discharge: 4 kV, air discharge: 8 kV (in PC housing)
	10 V/m (80 - 1000 MHz) (in PC housing)	10 V/m (80 - 1000 MHz) (in PC housing)
	data line: 1 kV (in PC housing)	data line: 1 kV (in PC housing)
	EN 55022 limit class B (in PC housing)	EN 55022 limit class B (in PC housing)
	PCI card transmitter, adapter cable 0.5 m for the connection of the video transmitter to the graphics card, operating instructions	PCI card transmitter, adapter cable 0.5 m for the connection of the video transmitter to the graphics card, operating instructions

FiberINTERFACES

Video



RGB Video Transmitters/Receivers - High-Resolution

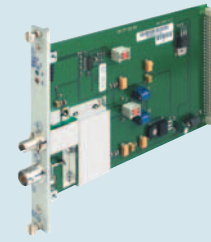
Product description		
Description	RGB video transmitter 150 MHz; can be combined with the receiver OEVR 150M Sync BFOC	
Port type and quantity	2 x electrical: HD-Sub 15-pin, according to DIN 41652 3 x optical: BFOC 2.5 (ST [®]) sockets	
Type	OSVR 150M BFOC	
Order No.	943 823-021	
Electrical interface		
Signal type	VGA (external synchronisation) or RGB (sync-in-green); switchable	
Input voltage	700 mV _{pp} with VGA operating mode 1 V _{pp} with Sync-in-G operating mode	
Input resistance	75 Ohm / 10 kOhm switchable for all inputs	
PC slot		
Output voltage	like input signal	
Output resistance		
Pulse tilt (horiz. and vert.)		
Differential amplification	8 %	
Upper limiting frequency (-3 dB)	150 MHz (at fiber lengths < 400 m)	
Resolution	VESA standard: > 1280 x 1024 visual: > 1600 x 1200	
Optical interface		
Wavelength	860nm	
Launchable optical power in multi-mode fiber (MM) 50/125	> 12 µW _{pp} , -19 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	> 20 µW _{pp} , -17 dBm	
Optical input power		
Laser protection class	1 according to EN 60825	
More Interfaces		
Power supply	4-pin low voltage plug, M8 shape according to IEC 947-5-2	
Network size - length of cable		
Multimode fiber (MM) 50/125 µm	1000 m 6 dB link budget, A = 3.0 dB/km, 3 dB reserve	
Multimode fiber (MM) 62.5/125 µm	1400 m 8 dB link budget, A = 3.5 dB/km, 3 dB reserve	
Power requirements		
Operating voltage	5 VDC ±5%, ripple < 50 mV _{pp}	
Power consumption	3.5 W	
Current consumption	650 mA	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +80 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Mounting	stand-alone unit in an aluminium section housing	
Dimensions (W x H x D)	129 x 34.9 x 130.7 mm	
Weight	340 g	
Protection class		
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line: 2 kV	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line)	
EN 61000-4-6 conducted immunity		
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	ready-to-connect transmitter, plug-in power supply PSW 5-24, HD Sub connecting cable, operating instructions	
Accessories to order separately		



	RGB video transmitter 150 MHz; can be combined with the receiver OEVR 150M Sync FSMA	
	2 x electrical: HD-Sub 15-pin, according to DIN 41652 3 x optical: FSMA sockets	
	OSVR 150M FSMA	
	943 823-001	
	VGA (external synchronisation) or RGB (sync-in-green); switchable	
	700 mV _{pp} with VGA operating mode 1 V _{pp} with Sync-in-G operating mode	
	75 Ohm / 10 kOhm switchable for all inputs	
	like input signal	
	8 %	
	150 MHz (at fiber lengths < 400 m)	
	VESA standard: > 1280 x 1024 visual: > 1600 x 1200	
	860nm	
	> 12 µW _{pp} , -19 dBm	
	> 20 µW _{pp} , -17 dBm	
	1 according to EN 60825	
	4-pin low voltage plug, M8 shape according to IEC 947-5-2	
	1000 m 6 dB link budget, A = 3.0 dB/km, 3 dB reserve	
	1400 m 8 dB link budget, A = 3.5 dB/km, 3 dB reserve	
	5 VDC ±5%, ripple < 50 mV _{pp}	
	3.5 W	
	650 mA	
	0 °C to +50 °C	
	-20 °C to +80 °C	
	10% to 90%	
	stand-alone unit in an aluminium section housing	
	129 x 34.9 x 130.7 mm	
	340 g	
	contact discharge: 4 kV, air discharge: 8 kV	
	10 V/m (80 - 1000 MHz)	
	power line: 2 kV	
	power line: 1 kV (line/line)	
	EN 55022 limit class B	
	ready-to-connect transmitter, plug-in power supply PSW 5-24, HD Sub connecting cable, operating instructions	

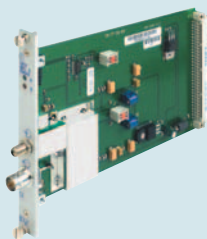
FiberINTERFACES

Video



RGB Video Transmitters/Receivers - High-Resolution

Product description		
Description	RGB video receiver 80 MHz; can be combined with the transmitters OSVR 80M2-E BFOC, OSVR 150M-PCI64 ..., OSV 052 BFOC, OSV 052-E BFOC, OSVC 01 BFOC	
Port type and quantity	1 x optical: BFOC 2.5 (ST®) socket 1 x electrical: BNC socket	
Type	OEV 801-E BFOC	
Order No.	933 798-021	
Electrical interface		
Signal type	composite	
Input voltage		
Input resistance		
PC slot		
Output voltage	1 V _{pp} at 75 Ohm	
Output resistance	75 Ohm	
Pulse tilt (horiz. and vert.)	< 3%	
Differential amplification		
Upper limiting frequency (-3 dB)	80 MHz (at fiber lengths < 600 m)	
Resolution		
Optical interface		
Wavelength	860 nm	
Launchable optical power in multi-mode fiber (MM) 50/125		
Launchable optical power in multi-mode fiber (MM) 62.5/125		
Optical input power	≥ 0.8 μW _{pp} , -31 dBm with S/N > 45 dBw	
Laser protection class		
More Interfaces		
Power supply	plug connector according to DIN EN 60603-2; pin 1: ground, pin 32: +V _s	
Network size - length of cable		
Multimode fiber (MM) 50/125 μm	1000 m 6 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSVR 150M ..., OSVR 150M PCI64 400 m 4.2 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSVR 80M2-E BFOC	
Multimode fiber (MM) 62.5/125 μm	1400 m 8 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSVR 150M ..., OSVR 150M PCI64 1100 m 7 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSVR 80M2-E BFOC	
Power requirements		
Operating voltage	17.6 ... 24 V	
Power consumption	3.8 W	
Current consumption	160 mA	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +80 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Mounting	19" plug-in card	
Dimensions (W x H x D)	15 (3 PU) x 128.5 (3 HU) x 185 mm	
Weight	150 g	
Protection class		
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV (in ART 84)	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz) (in ART 84)	
EN 61000-4-4 fast transients (burst)	power line: 2 kV	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line) (in ART 84)	
EN 61000-4-6 conducted immunity		
EMC emitted immunity		
EN 55022	EN 55022 limit class B (in ART 84)	
Scope of delivery and accessories		
Scope of delivery	plug-in receiver card, ready-to-connect, operating instructions	
Accessories to order separately	19" subrack ART 84	



	RGB video receiver 80 MHz; can be combined with the transmitters OSVR 80M2-E FSMA, OSVR 150M-PCI64 ..., ODR 150M 3 FSMA	
	1 x optical: FSMA socket 1 x electrical: BNC socket	
	OEV 801-E FSMA 933 798-001	
	composite	
	1 V _{pp} at 75 Ohm 75 Ohm < 3%	
	80 MHz (at fiber lengths < 600 m)	
	860 nm	
	≥ 0.8 μW _{pp} , -31 dBm with S/N > 45 dBw	
	plug connector according to DIN EN 60603-2; pin 1: ground, pin 32: +V _s	
	1000 m 6 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSVR 150M ..., OSVR 150M PCI64 400 m 4.2 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSVR 80M2-E BFOC	
	1400 m 8 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSVR 150M ..., OSVR 150M PCI64 1100 m 7 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSVR 80M2-E BFOC	
	17.6 ... 24 V	
	3.8 W	
	160 mA	
	0 °C to +50 °C	
	-20 °C to +80 °C	
	10% to 90%	
	19" plug-in card 15 (3 PU) x 128.5 (3 HU) x 185 mm 150 g	
	contact discharge: 4 kV, air discharge: 8 kV (in ART 84) 10 V/m (80 - 1000 MHz) (in ART 84) power line: 2 kV power line: 1 kV (line/line) (in ART 84)	
	EN 55022 limit class B (in ART 84)	
	plug-in receiver card, ready-to-connect, operating instructions 19" subrack ART 84	

FiberINTERFACES

Video



RGB Video Transmitters/Receivers - High-Resolution

Product description		
Description	RGB video receiver 150 MHz; can be combined with the transmitters OSVR 150M-PCI64 ..., OSVR 80M2-E ..., OSVR 150M Sync ..., ODR 150M 3 FSMA	
Port type and quantity	3 x optical: FSMA sockets 3 x electrical: BNC sockets	
Type	OEVR 150M FSMA	
Order No.	934 016-001	
Electrical interface		
Signal type	RGB (Sync in R, G und B)	
Input voltage		
Input resistance		
PC slot		
Output voltage	1 V _{pp} at 75 Ohm	
Output resistance	75 Ohm	
Pulse tilt (horiz. and vert.)	5%	
Differential amplification	8%	
Upper limiting frequency (-3 dB)	150 MHz (at fiber lengths < 400 m)	
Resolution	VESA standard: > 1280 x 1024 visual: > 1600 x 1200	
Optical interface		
Wavelength	860 nm	
Launchable optical power in multi-mode fiber (MM) 50/125		
Launchable optical power in multi-mode fiber (MM) 62.5/125		
Optical input power	≥ 6 µW _{pp} , -22 dBm with S/N > 46 dBw	
Laser protection class		
More Interfaces		
Power supply	3-pin low voltage plug, M8 shape according to IEC 947-5-2	
Network size - length of cable		
Multimode fiber (MM) 50/125 µm	330 m 3 dB link budget, A = 3.0 dB/km, 2 dB reserve with OSVR 150M ..., OSVR 150M-PCI64 ..., ODR 150M3 FSMA 660 m 4 dB link budget, A = 3.0 dB/km, 2 dB reserve with OSVR 80M2-E FSMA	
Multimode fiber (MM) 62.5/125 µm	800 m 5 dB link budget, A = 3.5 dB/km, 2 dB reserve with OSVR 150M ..., OSVR 150M-PCI64 ..., ODR 150M3 FSMA 1100 m 6 dB link budget, A = 3.5 dB/km, 2 dB reserve with OSVR 80M2-E FSMA...	
Power requirements		
Operating voltage	12 VDC, ripple < 100 mV _{pp}	
Power consumption	3.5 W	
Current consumption	280 mA	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +80 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Mounting	stand-alone unit in an aluminium section housing	
Dimensions (W x H x D)	129 x 34,9 x 130.7 mm	
Weight	420 g	
Protection class		
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line: 2 kV	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line)	
EN 61000-4-6 conducted immunity		
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	ready-to-connect receiver, plug-in power supply PSW 12-12, operating instructions	
Accessories to order separately		



	RGB video receiver 150 MHz; can be combined with the transmitters OSVR 150M-PCI64 ..., OSVR 80M2-E ..., OSVR 150M Sync ...	RGB video receiver 150 MHz; can be combined with the transmitters OSVR 150M-PCI64 ..., OSVR 80M2-E ..., OSVR 150M Sync ..., ODR 150M 3 FSMA
	3 x optical: BFOC 2.5 (ST [®]) sockets 1 x electrical: HD-Sub 15-pin, according to DIN 41652	3 x optical: FSMA sockets 1 x electrical: HD-Sub 15-pin, according to DIN 41652
	OEVR 150M Sync BFOC	OEVR 150M Sync FSMA
	934 016-521	934 016-501
	RGB, VGA	RGB, VGA
	1 V _{pp} at 75 Ohm with Sync-in-G operating mode 0.7 V _{pp} at 75 Ohm with VGA operating mode	1 V _{pp} at 75 Ohm with Sync-in-G operating mode 0.7 V _{pp} at 75 Ohm with VGA operating mode
	75 Ohm	75 Ohm
	5%	5%
	8%	8%
	150 MHz (at fiber lengths < 400 m)	150 MHz (at fiber lengths < 400 m)
	VESA standard: > 1280 x 1024 visual: > 1600 x 1200	VESA standard: > 1280 x 1024 visual: > 1600 x 1200
	860 nm	860 nm
	≥ 3 μW _{pp} , -25 dBm with S/N > 46 dBw	≥ 3 μW _{pp} , -25 dBm with S/N > 46 dBw
	4-pin low voltage plug, M8 shape according to IEC 947-5-2	4-pin low voltage plug, M8 shape according to IEC 947-5-2
	1000 m 6 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSVR 150M ..., OSVR 150M-PCI64 ..., ODR 150M3 FSMA 400 m 4.2 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSVR 80M2-E FSMA	1000 m 6 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSVR 150M ..., OSVR 150M-PCI64 ..., ODR 150M3 FSMA 400 m 4.2 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSVR 80M2-E FSMA
	1400 m 8 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSVR 150M ..., OSVR 150M-PCI64 ..., ODR 150M3 FSMA 1100 m 7 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSVR 80M2-E FSMA...	1400 m 8 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSVR 150M ..., OSVR 150M-PCI64 ..., ODR 150M3 FSMA 1100 m 7 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSVR 80M2-E FSMA...
	12 VDC, ripple < 50 mV _{pp}	12 VDC, ripple < 50 mV _{pp}
	6.5 W	6.5 W
	1.3 A	1.3 A
	0 °C to +50 °C	0 °C to +50 °C
	-20 °C to +80 °C	-20 °C to +80 °C
	10% to 90%	10% to 90%
	stand-alone unit in an aluminium section housing	stand-alone unit in an aluminium section housing
	129 x 34.9 x 130.7 mm	129 x 34.9 x 130.7 mm
	365 g	365 g
	contact discharge: 4 kV, air discharge: 8 kV	contact discharge: 4 kV, air discharge: 8 kV
	10 V/m (80 - 1000 MHz)	10 V/m (80 - 1000 MHz)
	power line: 2 kV	power line: 2 kV
	power line: 1 kV (line/line)	power line: 1 kV (line/line)
	EN 55022 limit class B	EN 55022 limit class B
	ready-to-connect receiver, plug-in power supply PSW 5-24, operating instructions	ready-to-connect receiver, plug-in power supply PSW 5-24, operating instructions

FiberINTERFACES

Video



Optical Video Distributor RGB

Product description		
Description	active optical star coupler; can be combined with the transmitters OSVR 150M-PCI64 ..., OSVR 80M2-E ..., OSVR 150M FSMA and the receivers OEVR 150M ..., OEVR 801-E ...	
Port type and quantity	1 x optical in: 3 FSMA sockets (R,G,B) 3 x optical out: 3 x 3 FSMA sockets (R,G,B)	
Type	ODR 150 M 3 FSMA	
Order No.	943 692-001	
Optical interfaces		
Wavelength	860 nm	
Optical input power	max. 6 μW_{pp} , -22 dBm with S/N > 46 dBw	
Overload limit	min. 50 μW_{pp} , -13 dBm	
Launchable optical power in multi-mode fiber (MM) 50/125	> 12 μW_{pp} , -18 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	> 20 μW_{pp} , -19 dBm	
Laser protection class	1 according to EN 60825	
More Interfaces		
Power supply	3-pin low voltage plug, M8 shape according to IEC 947-5-2	
System bandwidth		
System bandwidth -3 dB	140 MHz for OSVR 150M-PCI64 FSMA - ODR 150 M 3 FSMA - OEVR 150M ...	
Power requirements		
Operating voltage	12 VDC, ripple < 100 mV _{pp}	
Power consumption	10.2 W	
Current consumption	850 mA	
Ambient conditions		
Operating temperature	0 °C to +40 °C	
Storage/transport temperature	-20 °C to +80 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Mounting	stand-alone unit in an aluminium section housing	
Dimensions (W x H x D)	140 x 57 x 129 mm	
Weight	630 g	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line: 2 kV	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line)	
EN 61000-4-6 conducted immunity		
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	ready-to-connect star coupler, plug-in power supply PSW 12-12, optical RGB connecting cable F-SMA 2 m, operating instructions	

Listen-in on what's coming in.

No distortion, no hum: crystal-clear audio signals.

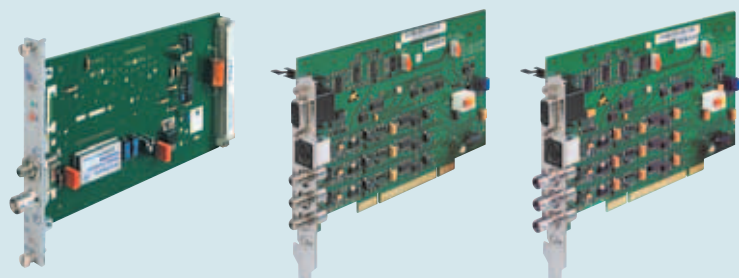


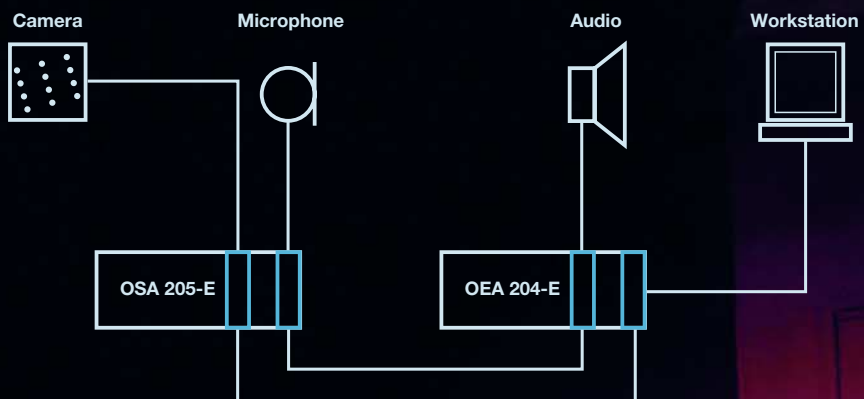
Speech and music are transmitted digitally over large distances via fiber optic cables, since analog signals require high levels of linearity and freedom from distortion. Audio FiberINTERFACES exclude humming and ground loops from sound signals. In addition, optical transmission technology is very secure and impervious to electromagnetic noise, providing electrical insulation between the transmitter and the receiver.

Different models of Hirschmann's transmitters and receivers can be combined together without any problems. This may be done wherever you want, for example to control active speaker boxes in sound studios, auditoriums and stadiums, or to transmit measurement and intercom signals without any RF/EMI interference, e.g. in high-tech medical equipment, such as computer tomographs.

In stadium sound systems, the cables can be laid parallel to the mains or high-voltage cables, and the auditory experience is not affected by lighting that may be connected.

Hirschmann Audio FiberINTERFACES ensure interference-free transmission of sound signals over many kilometers, with a harmonic distortion level of less than 0.1 % and linear distortion of less than 0.5 dBm.





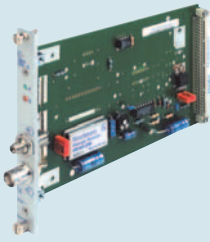
FiberINTERFACES

Audio



Multimode Audio Transmission System

Product description		
Description	audio transmitter 10 Hz to 30 kHz; can be combined with the receiver OEA 204-E	
Port type and quantity	1 x electrical: BNC socket 1 x optical: FSMA socket	
Type	OSA 205-E	
Order No.	943 075-003	
Electrical interface		
Signal type	Audio	
Input voltage	0 dBm = 0.775 V _{eff} , max. 9 dBm = 2.3 V _{eff} asymmetrical	
Input resistance	75 Ohm	
Output voltage		
Admissible load resistance at the output		
Linear distortion (30 Hz to 20 kHz)	≤ 0.5 dB	
Distorsion factor (at 0 dBm/1kHz)	≤ 0.1%	
Unweighted signal-to-noise-ratio (relative 0 dBm)	> 73 dB	
Noise voltage ratio (relative 0 dBm)	> 67 dB	
Bandwidth (-3 dB)	10 Hz to 30 kHz	
Audio interface	asymmetrical	
Optical interface		
Wavelength	860 nm	
Launchable optical power in multi-mode fiber (MM) 50/125	> 25 µW _{SS} , -16 dBm	
Launchable optical power in multi-mode fiber (MM) 62.5/125	> 40 µW _{SS} , -14 dBm	
Launchable optical power in multi-mode fiber (MM) HCS 200/230	> 80 µW _{SS} , -11 dBm	
Optical input power		
Laser protection class	1	
More Interfaces		
Power supply	plug connector according to DIN EN 60603-2; pin 1: ground, pin 32: +Vs	
Network size - length of cable		
Multimode fiber (MM) 50/125 µm	2600 m 11 dB link budget, A = 3.0 dB/km, 3 dB reserve with OEA 204-E	
Multimode fiber (MM) 62.5/125 µm	2800 m 13 dB link budget, A = 3.5 dB/km, 3 dB reserve with OEA 204-E	
Multimode fiber HCS (MM) 200/230 µm	1500 m 16 dB link budget, A = 8.0 dB/km, 3 dB reserve with OEA 204-E	
Power requirements		
Operating voltage	14.5 ... 24 V	
Current consumption	60 mA	
Power consumption	0.1 W	
Displays		
LED red	operating voltage	
LED green	audio input signal	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +80 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Mounting	19" plug-in card	
Dimensions (W x H x D)	15 (3 PU) x 128.5 (3 HU) x 185 mm	
Weight	150 g	
EMC interference immunity		
EN 61000-4-2 electrostatic discharge (ESD)	contact discharge: 4 kV, air discharge: 8 kV	
EN 61000-4-3 electromagnetic field	10 V/m (80 - 1000 MHz)	
EN 61000-4-4 fast transients (burst)	power line: 2 kV, data line: 1 kV	
EN 61000-4-5 surge voltage	power line: 1 kV (line/line)	
EN 61000-4-6 conducted immunity	10 V	
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	plug-in transmitter card, operating instructions	
Accessories to order separately	19" subrack ART 84	



	audio receiver 10 Hz to 30 kHz; can be combined with the transmitter OSA 205-E	
	1 x electrical: BNC socket 1 x optical: FSMA socket	
	OEA 204-E	
	943 073-003	
	Audio	
	0 dBm = 0.775 V _{eff} at 600 Ohm	
	> 2 kOhm	
	≤ 0.5 dB	
	≤ 0.1%	
	> 73 dB	
	> 67 dB	
	10 Hz to 30 kHz	
	asymmetrical	
	860 nm	
	≥ 2.0 μW _{pp} , -27 dBm	
	plug connector according to DIN EN 60603-2; pin 1: ground, pin 32: +Vs	
	2600 m 11 dB link budget, A = 3.0 dB/km, 3 dB reserve with OSA 205-E	
	2800 m 13 dB link budget, A = 3.5 dB/km, 3 dB reserve with OSA 205-E	
	1500 m 16 dB link budget, A = 8.0 dB/km, 3 dB reserve with OSA 205-E	
	14.5 ... 24 V	
	40 mA	
	0.1 W	
	operating voltage	
	optical input signal	
	0 °C to +50 °C	
	-20 °C to +80 °C	
	10% to 90%	
	19" plug-in card	
	15 (3 PU) x 128.5 (3 HU) x 185 mm	
	150 g	
	contact discharge: 4 kV, air discharge: 8 kV	
	10 V/m (80 - 1000 MHz)	
	power line: 2 kV, data line: 1 kV	
	power line: 1 kV (line/line)	
	10 V	
	EN 55022 limit class B	
	plug-in receiver card, operating instructions	
	19" subrack ART 84	

The upgradation training for transmission paths.

Hybrid components and OptoQuick components make circuits fit for fiber optic cables.



The upgrade to fiber optics can be as easy as this: hybrid components made by Hirschmann consist of a transmission and receiving unit, both installed in a compact metal housing. Together, they constitute a transmission system for digital data. Hybrid components are directly integrated on the printed circuit board of the user — that is all that is required. The advantages of optical fiber transmission technology are therefore

available — without the expenditure on optical fiber development, namely: no risk of RF/EMI, no disturbance from ground potential, increased transmission distances. Optical transmission and reception elements are also available from Hirschmann in the OptoQuick range. These also include optical coupling units and connectors with quick-connection optical technology.

The use of hybrid components makes it possible to reap the benefits of optical transmission technology such as distortion-free transmission in sensitive medical investigation devices – without high levels of expenditure.

All Hirschmann hybrid components offer reliable protection against electromagnetic radiation thanks to their compact metal housing and can be combined with each other, for example with models of FiberINTERFACES (plug-in cards and standalone modules) without any problems.





FiberINTERFACES

Hybrids modules and
OptoQuick components



Audio Hybrids

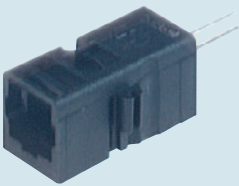
Product description		
Description	optical audio transmitter hybrid; PCB mounting	
Port type and quantity	1 electrical port: 1 pin	
Type	OSAH 200	
Order No.	943 043-001	
Electrical interface		
Input voltage	0 dBm = 0.775 V _{eff}	
Input resistance	> 10 kOhm	
Output voltage		
Admissible load resistance at the output		
Linear distortion (30 Hz to 20 kHz)	≤ 0.5 dB at 0 °C to +50 °C / ≤ 0.8 dB at -40 °C to +80 °C	
Distorsion factor (at 0 dBm/1kHz)	≤ 0.1% at 0 °C to +50 °C / ≤ 0.15% at -40 °C to +80 °C	
Unweighted signal-to-noise-ratio (relative 0 dBm)	> 73 dB at 0 °C to +50 °C / > 68 dB at -40 °C to +80 °C	
Bandwidth (-3 dB)	10 Hz to 30 kHz at 0 °C to +50 °C / 15 Hz to 30 kHz at -40 °C to +80 °C	
Optical interface		
Wavelength	660 nm with OVKD 01-B (LED 013) (accessories)	
Launchable optical power in multi-mode fiber (MM) POF 980/1000	> 500 µW _{pp} , -3 dBm at 0 °C to +50 °C with OVKD 01-B (LED 013) (accessories)	
Optical input power		
Network size - length of cable		
Multimode fiber POF (MM) 980/1000 µm	88 m 24 dB link budget, A = 0.25 dB/m, 2 dB system reserve with OVKD 01-B (LED 013) (accessories) and OEAH 200 with OVKD 01-B (SFH 203 P) (accessories)	
Power requirements		
Operating voltage	+12 VDC ±10%	
Current consumption	55 mA	
Power consumption	0.7 W	
Drawing		
Ambient conditions		
Operating temperature	-40 °C to +80 °C	
Storage/transport temperature	-40 °C to +80 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Dimensions (W x H x D)	see "Drawing"	
Mounting	on PCB	
Weight	15 g	
Protection class	IP 65	
Pin assignment	see "Drawing" pin 1: input; pin 2, 4-8, 10-12: GND; pin 3: gain setting; pin 9: LED pin 13-20: V _{CC} ; pin 21-24: N.C.	
Scope of delivery and accessories		
Scope of delivery	1 hybrid, 1 operating instructions	
Accessories to order separately	optical converter OVKD 01-B (LED 013), order no. 936 215-009 scope of delivery: 1 converter housing with integrated and adjusted transmitter element, type OVK for platic fiber On request, we will be pleased to supply a data sheet indicating the dimensions and terminal assignment of the converter housing.	



	optical audio receiver hybrid; PCB mounting	
	1 electrical port: 1 pin	
	OEAH 200	
	943 044-001	
	0 dBm = 0.775 V _{eff} (no load)	
	≥ 600 Ohm	
	≤ 0.5 dB at 0 °C to +50 °C / ≤ 0.8 dB at -40 °C to +80 °C	
	≤ 0.1% at 0 °C to +50 °C / ≤ 0.15% at -40 °C to +80 °C	
	> 73 dB at 0 °C to +50 °C / > 68 dB at -40 °C to +80 °C	
	10 Hz to 30 kHz at 0 °C to +50 °C / 15 Hz to 30 kHz at -40 °C to +80 °C	
	> 2.0 μW _{pp} , -27 dBm at 0 °C to +50 °C with OVKD 01-B (SFH 203 P) (accessories)	
	88 m 24 dB link budget, A = 0.25 dB/m, 2 dB system reserve with OSAH 200 with OVKD 01-B (LED 013) (accessories) and OVK 01-B (SFH 203 P) (accessories)	
	+12 VDC ±10%	
	35 mA	
	0.4 W	
	-40 °C to +80 °C	
	-40 °C to +80 °C	
	10% to 90%	
	see "Drawing"	
	on PCB	
	15 g	
	IP 65	
	see "Drawing" pin 1: pin diode; pin 2-10: GND; pin 11: output pin 12: gain setting; pin 13-24: V _{CC}	
	1 hybrid, 1 operating instructions	
	optical converter OVKD 01-B (SFH 203 P), order no. 936 215-037 scope of delivery: 1 converter housing with integrated and adjusted receiver element, type OVK for platic fiber On request, we will be pleased to supply a data sheet indicating the dimensions and terminal assignment of the converter housing.	

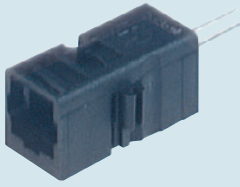
FiberINTERFACES

Hybrids modules and
OptoQuick components



OptoQuick Components

Product description		
Description	diode socket with optical transmitter element; for plastic FO	
Construction type	OVK OptoQuick	
Colour	black	
Type	OVKD 01-B (LED 013)	
Order No.	936 215-009	
Mechanical construction		
Mounting	on PCB	
Scope of delivery and accessories		
Scope of delivery	diode socket with integrated and adjusted transmitter element LED 013 1 operating instructions	



	diode socket with optical receiver element; for plastic FO	diode socket; for plastic FO
	OVK OptoQuick	OVK OptoQuick
	black	black
	OVKD 01-B (SFH 203 P)	OVKD 01
	936 215-037	936 205-001
	on PCB	on PCB
	diode socket with integrated and adjusted receiver element SFH 203 P 1 operating instructions	20 diode sockets 1 operating instructions

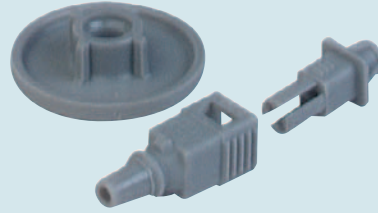
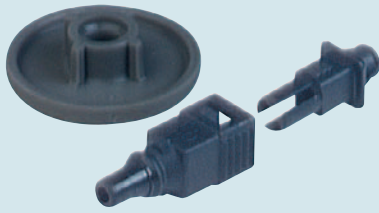
FiberINTERFACES

Hybrids modules and
OptoQuick components



OptoQuick Components

Product description		
Description	diode socket; for plastic FO	
Construction type	OVK OptoQuick	
Colour	grey	
Type	OVKD 01	
Order No.	936 205-002	
Mechanical construction		
Mounting	on PCB	
Scope of delivery and accessories		
Scope of delivery	20 diode sockets 1 operating instructions	



	fiber optic plug; for plastic fiber with an external diameter of 2.2 mm, strain relief 40 N	fiber optic plug; for plastic fiber with an external diameter of 2.2 mm, strain relief 40 N
	OVK OptoQuick	OVK OptoQuick
	black	grey
	OVKS 2,2	OVKS 2,2
	936 200-001	936 200-002
	20 fiber optic plugs, each consisting of a plug body and a strain relief 1 polishing tool 1 operating instructions	20 fiber optic plugs, each consisting of a plug body and a strain relief 1 polishing tool 1 operating instructions

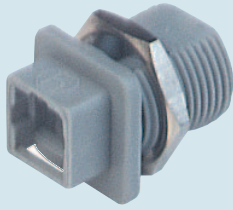
FiberINTERFACES

Hybrids modules and
OptoQuick components



OptoQuick Components

Product description		
Description	fiber optic coupling; for plastic FO	
Construction type	OVK OptoQuick	
Colour	black	
Type	OVKK 01	
Order No.	934 101-100	
Mechanical construction		
Mounting	for use in housing sidewalls and for use as an independent coupling	
Scope of delivery and accessories		
Scope of delivery	20 couplings, 20 retaining nuts 1 operating instructions	



	fiber optic coupling; for plastic FO	
	OVK OptoQuick	
	grey	
	OVKK 01	
	934 101-106	
	for use in housing sidewalls and for use as an independent coupling	
	20 couplings, 20 retaining nuts 1 operating instructions	

For a complete product solution, you need accessories.

Workable ideas for your application.



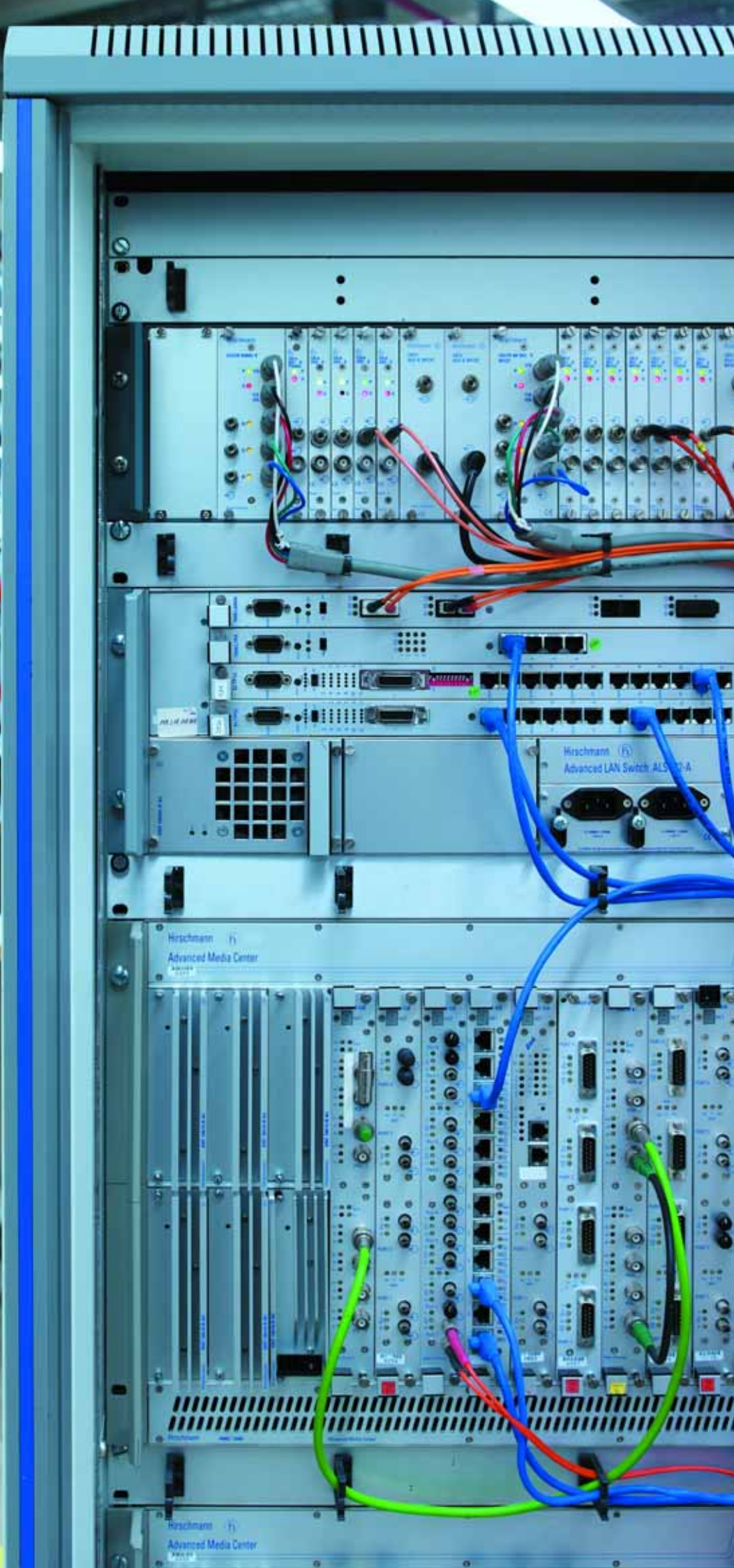
Hirschmann system accessories for FiberINTERFACES offer practical and workable solutions that are perfectly adapted to the product in question, enabling easy assembly while ensuring secure power supply. Several reasons why there is only one optimum addition to our field buses, digital modules, hybrid components and OptoQuick elements, video and audio systems: Hirschmann DIN rail adapters, mechanical adapters for clip-on modules, plug-in power supply units, DIN rail power supply units, slide-in power supply units and 19" mounting racks.

This is one-stop shopping that saves real money. You not only benefit from a complete solution that has been thought through to the last detail, but you also benefit from our worldwide distribution network. This way you don't just have the latest technology working for you, you also get time on your side.

Like every product from the comprehensive Hirschmann range, our accessories satisfy the high expectations of our clients in terms of material selection, processing quality, reliability and long life.

As the ideal supplement to Hirschmann FiberINTERFACES, our accessories not only offer solutions that have been thought-out down to the finest details, but also save valuable time during installation.





FiberINTERFACES

Accessories



Subrack

Product description		
Description	19" subrack with integrated power supply; usable width for plug-in cards: 84 TE (75 TE + 9 TE for redundant power supply)	
Type	ART 84	
Order No.	933 797-001	
Electrical interfaces		
Input voltage	90 to 260 VAC; 47 to 60 Hz or 100 to 300 VDC self-adjusting	
Current consumption	120 V: max. 2.5 A 230 V: max. 1.0 A	
Power consumption	depending on assembly	
Output voltage	+18 V \pm 0.5 V	
Output current	3.3 A; sustained short circuit proofing, overload safe, secondary side non-earthed	
More Interfaces		
Mains voltage	mains cable, plugable, 2 m long, with grounding-type attachment plug	
Power supply for the plug-in cards	socket connector according to DIN EN 60603-2; pin 1: ground, pin 32: +V _S (18 V)	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +85 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Dimensions (W x H x D)	483 (84 PU) x 132.5 (3 HU) x 345 mm	
Weight	4.7 kg	
Protection class	IP 20	
EMC interference immunity		
EN 61000-6-2 Immunity for industrial environments	EN 61000-6-2	
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Approvals		
Issued approvals	C-Tick	
Scope of delivery and accessories		
Scope of delivery	device, cover panels, slot-in legs, mains cable (plugable, 2 m long), operating instructions	
Accessories to order separately	redundant 18 V power supply unit RPS 1860	

FiberINTERFACES

Accessories



Slide-in Power Supply

Product description		
Description	18 V slide-in power supply unit for 19" subrack ART 84; to double the output current or for use as a redundant power supply unit	
Type	RPS 1860	
Order No.	933 830-001	
Electrical interfaces		
Input voltage	90 to 260 VAC; 47 to 60 Hz or 100 to 300 VDC self-adjusting	
Current consumption	120 V: max. 1.5 A 230 V: max. 0.5 A	
Power consumption	< 80 W	
Output voltage	+18 V ±1%	
Output current	3.2 A; sustained short circuit proofing, overload safe, secondary side non-earthed	
More Interfaces		
Mains voltage	socket connector	
Power supply for the plug-in cards	socket connector according to DIN EN 60603-2; pin 1: ground, pin 32: +V _S (18 V)	
Ambient conditions		
Operating temperature	0 °C to +50 °C	
Storage/transport temperature	-20 °C to +85 °C	
Relative humidity (non-condensing)	10% to 90%	
Mechanical construction		
Width	9 PU (pitch units) in subrack ART 84	
Weight	400 g	
Protection class	IP 20	
EMC interference immunity		
EN 61000-6-2 Immunity for industrial environments	EN 61000-6-2	
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	device, operating instructions	

FiberINTERFACES

Accessories



DIN Rail Power Supplies

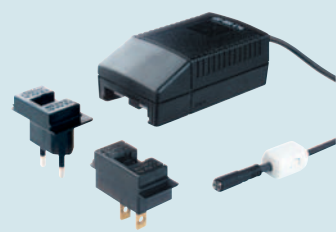
Product description		
Description	DIN rail power supply	
Type	RPS 30	
Order No.	943 662-003	
Electrical interfaces		
Selection of the operating voltage		
Input voltage	100 to 240 VAC; 47 to 63 Hz or 83 to 375 VDC	
Current consumption	max. 0,35 A at 296 VAC	
Power consumption	< 100 W	
Output voltage	+24 VDC +0.5%, -0.5%	
Output current	1.3 A at 100 to 240 VAC	
More Interfaces		
Mains voltage	3-pin terminal block	
Power supply for the plug-in cards	5-pin terminal block	
Ambient conditions		
Operating temperature	-10 °C to +70 °C (from 60 °C derating)	
Storage/transport temperature	-25 °C to +85 °C	
Relative humidity (non-condensing)	10% to 95%	
Mechanical construction		
Dimensions (W x H x D)	45 x 75 x 98 mm	
Mounting	DIN rail	
Weight	230 g	
Protection class	IP 20	
Housing material	metal housing with ventilation grate	
EMC interference immunity		
EN 61000-6-2 Immunity for industrial environments	EN 61000-6-2	
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	device, operating instructions	



	DIN rail power supply	DIN rail power supply
	RPS 60	RPS 120
	943 662-001	943 662-011
	selector switch 230 V / 115 V	selector switch 230 V / 115 V
	switch setting 230 V: 176 to 264 VAC; 47 to 63 Hz or 160 to 375 VDC	switch setting 230 V: 176 to 264 VAC; 47 to 63 Hz or 210 to 375 VDC
	switch setting 115 V: 85 to 132 VAC; 47 to 63 Hz	switch setting 115 V: 85 to 132 VAC; 47 to 63 Hz
	switch setting 230 V: max. 0.7 A at 264 VAC switch setting 115 V: max. 1.3 A at 264 VAC	switch setting 230 V: max. 1.4 A at 264 VAC switch setting 115 V: max. 2.6 A at 264 VAC
	< 185 W	< 370 W
	+24 VDC +5%, -1%	+24 VDC +5%, -1%
	switch setting 230 V: 2.5 A at 176 to 264 VAC 2.5 A at 160 to 375 VDC switch setting 115 V: 2.5 A at 85 to 132 VAC	switch setting 230 V: 5 A at 176 to 264 VAC 5 A at 160 to 375 VDC switch setting 115 V: 5 A at 85 to 132 VAC
	3-pin terminal block	3-pin terminal block
	5-pin terminal block	3-pin terminal block
	-10 °C to +70 °C (from 60 °C derating)	-10 °C to +70 °C (from 60 °C derating)
	-25 °C to +85 °C	-25 °C to +85 °C
	10% to 90%	10% to 90%
	50 x 125 x103 mm	65 x 125 x103 mm
	DIN rail	DIN rail
	460 g	620 g
	IP 20	IP 20
	metal housing with ventilation grate	metal housing with ventilation grate
	EN 61000-6-2	EN 61000-6-2
	EN 55022 limit class B	EN 55022 limit class B
	device, operating instructions	device, operating instructions

FiberINTERFACES

Accessories



Plug-in Power Supplies

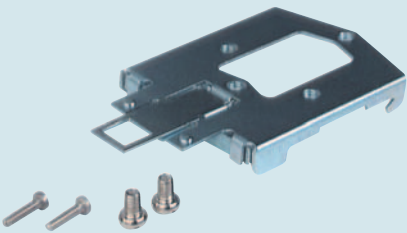
Product description		
Description	plug-in power supply	
Type	PSW 5-24	
Order No.	943 008-001	
Electrical interfaces		
Input voltage	90 to 260 VAC; 47 to 60 Hz	
Current consumption	400 mA	
Power consumption		
Output voltage	+5 V	
Output current	max. 2.4 A	
Ripple voltage	max. 75 mVpp	
More Interfaces		
Voltage output	extra-low voltage plug, design M8 acc. IEC 947-5-2	
Ambient conditions		
Operating temperature	0 °C to +40 °C	
Storage/transport temperature	-40 °C to +70 °C	
Relative humidity (non-condensing)	5% to 95%	
Mechanical construction		
Weight	200 g	
EMC interference immunity		
EN 61000-6-2 Immunity for industrial environments	EN 61000-6-2	
EMC emitted immunity		
EN 55022	EN 55022 limit class B	
Scope of delivery and accessories		
Scope of delivery	device	



	plug-in power supply	plug-in power supply
	SNT 012	PSW 12-12
	943 007-001	934 022-001
	230 VAC $\pm 5\%$	90 to 260 VAC; 47 to 60 Hz or 100 to 300 VDC
	6 W	400 mA
	+12 V	+12 V
	max. 130 mA	max. 1 A
	max. 5 mVpp	max. 100 mVpp
	extra-low voltage plug, appliance side polarity: pin: earth/socket: +V _S	extra-low voltage plug, design M8 acc. IEC 947-5-2
	0 °C to +40 °C	0 °C to +40 °C
	-20 °C to +70 °C	-40 °C to +70 °C
	5% to 95%	5% to 95%
	220 g	190 g
	EN 61000-6-2	EN 61000-6-2
	EN 55022 limit class B	EN 55022 limit class B
	device	device

FiberINTERFACES

Accessories



DIN Rail Adapter

Product description		
Description	mechanical adapter for the plug-on modules OZDV 2451 P, OZDV 2451 G, OZDV 2471 P, OZDV 2471 G, OZDV 2471 G-1300 OMDV 2404 P OV, OMDV 2404 G BFOC, OMDV 2404 G BFOC-1300	
Type	OZDV HA	
Order No.	933 920-001	
Scope of delivery and accessories		
Scope of delivery	1 device, 1 operating instructions	

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