

FTTA, LTE NETWORKS

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Mobile telephony and mobile data access is a regular part of our daily lives. Rapid development of advanced telecommunication systems and the growing demand for data, forces the equipment manufacturers and operators to use the innovative technologies. Beginning in the early nineties, the development of wireless access networks started with the GSM systems and was followed by UMTS, CDMA and HSPA standards further evolving towards LTE. Another wireless data transmission technique that was developed independently was WiMax (802.16d -> 802.16m). The increasing demand for data transfer speeds as well as the increase of broadcast frequencies from the range of 850 MHz to 1900 MHz for GSM to up to 3.5 GHz, forced operators to increase the number of transmitting devices. Due to the signal propagation loss increases with the broadcast frequency rise the new systems require a dense network of radio cells to provide consistent access to the network. The consequence of this is the increase of the number of antennas and base stations. In case of WiMax system the increase of the density of transmitters is even more important. The operators are therefore forced to build denser networks in order to ensure a good mobile services quality. The denser network requires more antennas and the currently used technologies using coaxial feeder cables and base stations for each antenna may prove to be unprofitable. OPTOMER offers a range of FTTH dedicated products and solutions which are presented in this part of the catalogue.

OPTICAL FIBRE IN WIRELESS RADIO NETWORKS

FTTA (Fiber To The Antenna) is a modern technology, enabling the delivery of signal to the Remote Radio Head (RRH, located near the antenna) through an optical fibre. The solution is employed in LTE, WiMAX and GSM transmission systems. Inside the RRH, optical signal is converted to a high frequency electrical signal ready to be emitted by the antenna.



FTTH solution installation scheme:

- 1 – optical fibre cables with Heavy Duty connectors or hermetically sealed
- 2 – fibre optic distribution boxes
- 3 – multi-fibre cables, UV stabilised, terminated with connectors
- 4 – spare length optical fibre cable boxes
- 5 – base station

OPTICAL FIBRE IN WIRELESS RADIO NETWORKS

Base stations, thanks to FTTA technology, are able to feed multiple antennas, while signal transmission through optical fibre is independent of transmitted frequency levels. There is also no limitation on the distance between a base station and antennas (for coaxial feeders 50 m distance means over 30% signal loss).

Network expansion will require more antennas, which can be fed by one base station with the aid of FTTA technique. Centralization of base stations will be advantageous in terms of occupying area (security, permissions, tenancy, etc.). The network will be more legible and easier to manage. Such a solution is definitely less expensive than building and operating multiple smaller base stations. Additionally, in comparison with rigid coaxial feeder cables, optical fibre cables are more flexible, smaller in outer diameter, cheaper to buy and install.

Increasing the density of antenna arrangement enforces utilization of various architectural objects, not only antenna towers. That will make it difficult to use thick coaxial cables. The solution is again optical fibre technology.

Main advantages of FTTA solutions over traditional coaxial cable:

- lower price of optical fibre cable in comparison with expensive coaxial feeders
- lower energy consumption implying lower operating costs
- lower demand for signal amplification
- convenient installation
- less problems with electromagnetic compatibility
- environmental-proof

OPTOMER offer suitable products and solutions, necessary for modern FTTA networks. We may provide outdoor fibre optic cables terminated with HeavyDuty connectors of high environmental protection (RDC, ODVA). There are also available cables terminated with E 2000, F-3000, SC or LC connectors, equipped with PG cable glands to seal distribution box cable entries.

The choice of appropriate fibre optic cable termination is dependent on active devices (RRH). They may be equipped with HeavyDuty connectors or support universal SFP plugs where LC connectors can be plugged in.

In order to conveniently manage optical fibres in FTTA technology, we offer branch boxes for branching multi-fibre cable from base station to connect the fibres to the consecutive Radio Heads. The cable length and number of fibres are chosen each time for particular solutions.

As a supplement to the FTTA offer, the following standard optical fibre products are also applicable:

- distribution frames, street cabinets PU-5, PU-10, PU-20
- 19" Patch Panels as the equipment for distribution frames
- excess cable racks
- high connector density cabinets - PSU-1, STP in special design dedicated for telecomm containers

Fibre optic equipment, employed in FTTA systems, is dependent on active devices used in each specific case. We offer full support and counselling in the choice of appropriate FTTA equipment.

PSH-4 FIBRE OPTIC OUTDOOR DISTRIBUTION FRAME

FEATURES:

- mounted on LTE, WiMAX radio antenna poles
- possibility of installation of hermetic Heavy Duty connectors
- IP66 rated housing
- compatible with SC or LC connectors
- possibility of sealing the cable entries
- possibility of installation of cable glands with the diameter range of 5 mm to 12 mm
- possibility of passing the SC and LC connectors through cable glands

EQUIPMENT:

- cable organisers
- PG 13.5 cable entry - cable diameter 8-12 mm
- triple PG 21 cable entry - cable diameter 5-8 mm
- wall mounting brackets with screws (optional, purchased separately)
- installation and handling instructions
- installation kit

TECHNICAL SPECIFICATIONS:

	PSH-4
number of patching fields	6*
connector standard	E-2000, SC, LC
number of outdoor cable entries	1x PG 13.5, 2x PG 21
max. diameter of input cable [mm]	5-12
dimensions: width/height/depth [mm]	180/255/63
weight [kg]	1
housing material/colour	PC/RAL 7035
mechanical protection IK	IK 08
environmental protection IP	IP66

* istnieje możliwość podwojenia liczby pól komutacji poprzez zastosowanie złączy LC

ORDERING:

PSH-4/6/LC - outdoor distribution frame, equipped with 6 LC connectors, designed for FTTH systems



*PSH-4 Fibre Optic Outdoor
Distribution Frame*

FTTA SYSTEM PATCHCORDS

FEATURES:

- connectivity between base station and distribution box on RHH antenna pole
- signal transmission up to RRH
- possibility of installation of PG cable glands on connectorised cable
- self-centering connector body with connection assist keying
- compliant with EN 50516-2-1 standard
- durable construction
- environmentally sealed optical fibre connection system
- hermetically sealed connection
- connectors for cables of 2 up to 12 fibres
- IP67 protection
- applicable in distribution boxes and RRH Radio Heads

TECHNICAL SPECIFICATIONS:

	Heavy Duty 1000	Heavy Duty 600	Heavy Duty 200-400	Heavy Duty SC-RJ	Heavy Duty RDC	ODVA
ferrule	12 x 2,5 mm, MM, SM PC or ceramic APC	6 x 2,5 mm, MM, SM PC or ceramic APC	2 lub 4 x 2,5 mm, MM, SM PC or ceramic APC	2 x 2,5 mm, MM, SM PC or ceramic APC	2 x 1,25 mm ceramic	2 x F-3000 connectors or 2 x LC connectors with 1,25 mm MM, SM PC or hybrid APC ferrule
electric connectors	2 x 1,5 mm		-	-	-	-
fibre type	9/125, 50/125, 62.5/125, 200/230 – 1 mm					9/125
housing material	nickel brass			plastic	nickel brass	plastic
cable	hybrid breakout or loose tube - 6-16 mm simplex 1,7-2,2 mm	hybrid breakout or loose tube - 4-10 mm simplex 1,7-2,2 mm	ø 6-10 mm	ø 5-8 mm	mini breakout 4-7 mm patchcords 1,7 or 2,1 mm	patchcords 1,7 lub 2,1 mm
insertion loss [dB]	0,3/max. 0,6	0,2/max. 0,4	0,25/max. 0,6	0,25/max. 0,5	0,25	0,2/max. 0,5
return loss [dB]	>40 for PC SM >55 for APC SM		>40 for PC SM	>40 for PC SM	>50 for SM	>40 for PC MM >50 for PC SM >70 for SM APC
temperature of operation [°C]	-40 to +60		-40 to +125	-40 to +75	-40 to +125	-40 to +85

ORDERING:

ODVA - hermetic connector on 2-fibre cable, equipped with 2 LC connectors
 RDC - hermetic connector RDC on 2-fibre cable with a socket terminated by LC connectors



Heavy Duty 200-400



Heavy Duty 1000



Heavy Duty 600



Heavy Duty SC-RJ



Heavy Duty RDC



ODVA