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APL46
OFN46-WDx-ALC

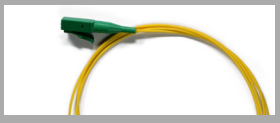
Optical Interconnection Point
OFN46-WDx-ALC with CATV receiver

Operating manual

Version 02-2023A

Contents

Device description



The device packaging contains the following:

- ☐ Optical interconnection point APL46 or interconnection point with CATV receiver OFN46-WDx-ALC
- ☐ only OFN46-WDx-ALC: plug-in power supply unit
- ☐ Set with screws and dowels
- ☐ Fibre pigtail
- ☐ Instruction leaflet with safety informations

APL46

Bild 1: APL46 (passiver Teil)

[1] gapfor connection of fibre tray and lid
[2] optical output

OFN46-WDx-ALC

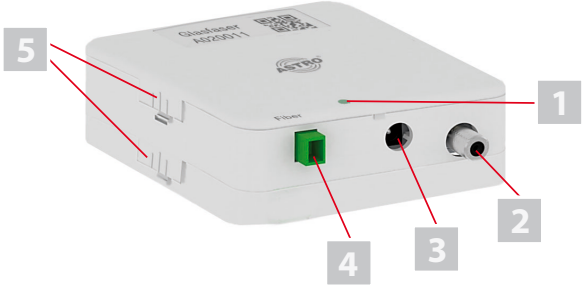


Figure 1: OFN46-WDx-ALC

[1] status LED
[2] RF output jack
[3] input for power supply unit
[4] optical output jack
[5] gap for attaching or detaching the receiver and the lid of the housing

Lower part of housing with fibre tray

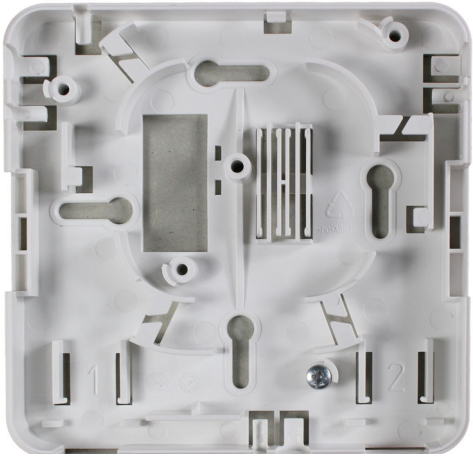


Figure 3: Fibre try (lower part of housing)

Middle plate with RF receiver

Figure 3: Fibre try (lower part of housing)

Before operating the device

HINWEIS: Read this operating manual through carefully! It contains important information about installation, ambient conditions and maintenance of the device. Keep this operating manual for future use and for handover in the event of a change of owner or operator.
The ASTRO company confirms that the information in this manual was correct at the time of printing, but it reserves the right to make changes to the specifications, the operation of the device and the operating manual without prior notice.

Symbols and conventions used

Symbols used in this manual

Pictograms are visual symbols with specific meanings. You will encounter the following pictograms in this installation and operating manual:

Warning about situations in which electrical voltage and non-observance of the instructions in this manual pose a risk of fatal injuries.

Warning about various dangers to health, the environment and material.

Recycling symbol: indicates components or packaging materials which can be recycled (cardboard, inserts, plastic film and bags). Used batteries must be disposed of at approved recycling points. Batteries must be completely discharged before disposal.

This symbol indicates components which must not be disposed of with household rubbish.

Intended use

The optical interconnection point APL46 and the interconnection point with RF receiver OFN46-WDx-ALC are designed exclusively for use in fibre networks.
Modification of the devices or use for any other purpose is not permitted and will immediately void any guarantee provided by the manufacturer.

Intended audience for this manual

Installation and starting operation

The target group for installation and starting operation of the ASTRO optical transmission technology products are qualified experts who have training enabling them to perform the work required in accordance with EN 60728-11 and EN 62368-1:2014. Unqualified persons are not permitted to install and operate the device.

Device configuration

Target group for the configuration of the optical receivers are persons who have received instructions and have training enabling them to perform a configuration. Knowledge of EN 60728-11 and EN 62368-1:2014 is not necessary for configuration.

Important safety information

To avoid any potential risks to the greatest extent possible, you must observe the following safety information:

ACHTUNG: ***Failure to observe this safety information may result in physical injury due to electrical and thermal dangers!***

Intended use

- ☐ Only use the device at approved operating sites and under approved ambient conditions (as described in the following), and only for the purpose described in the section “Proper use”.

Before operating the device

HINWEIS: *Read this operating manual through carefully! It contains important information about installation, ambient conditions and maintenance of the device. Keep this operating manual for future use and for handover in the event of a change of owner or operator.*

- ☐ Check the packaging and the device for transport damage immediately. Do not operate a device that has been damaged.
- ☐ Carrying the device by the power supply cable may damage the power supply cable or the strain relief and is therefore not permitted.

Danger of optical radiation

The device is part of a laser facility for connection to an optical fiber communication system of hazard level 1 (according to DIN EN 60825 part 1 and part 2). A number of safety measures must therefore be taken.

HINWEIS: *The device does not have a built-in laser and therefore does not emit any optical radiation itself. However, it must also be noted that the optical fibers to be connected to the device may emit invisible optical radiation and that appropriate precautions - as described below - must also be taken in this regard. Even if no radiation is visible to the human eye, it may still be present and pose a risk.*

- ☐ Both the operator and the end customer of the fiber optic communication system (FOCS) must ensure that an open optical connector (fiber optic connector) can ONLY result in

optical radiation that is Class 1.

- If more than one wavelength is transmitted via the same optical fiber, the powers of the wavelengths used may add up and increase the radiation level (see EN 60825-2). The connection of further components to this device, e.g. by the end customer/consumer using optical fibers, must not result in access to optical radiation above the limits for Class 1 radiation.only.
- Dangerous invisible optical radiation can escape from damaged glass fibers.
- Optical connectors (fiber optic connectors) can emit hazardous invisible optical radiation when opened.
- Do not view optical connectors (fiber optic connectors) directly with optical instruments.
- Unacceptably high levels of invisible optical radiation and improperly made fiber optic connections on optical equipment can pose risks to operating and maintenance personnel as well as to end customers.
- Never look into a direct or reflected beam!
- Do not point the laser beam at persons.
- Manipulations (changes) to the laser equipment are not permitted.

HINWEIS: Make absolutely certain that optical fibre cables are free of optical radiation during the connection work! Optical radiation above the permissible limit can cause irreparable eye damage.

Installation, operation, maintenance

- The device may only be installed and operated by qualified persons (in accordance with EN 62368-1:2014) or by persons who have been instructed by qualified persons. Maintenance work may only be carried out by qualified service personnel.
- An installation site must be provided that prevents children from playing with the device and its connections.
- To avoid inadmissible operating conditions, only the components described in these instructions or the components approved for the device by the manufacturer may be used.
- The electrical connection conditions must match the specifications on the nameplate of the device and the external power

supply.

- The electrical system for supplying power to the device, e.g. house installation, must contain protective devices against excessive currents, short circuits and ground connections in accordance with EN 60950-1.
- To avoid damage due to overheating, the device may only be mounted on vertical surfaces. Operating position: Device vertical, with RF sockets as well as external DC power supply connection at the bottom.
- The mounting surface should be level and flame retardant.
- The device and its cables may only be mounted and operated away from radiant heat and other heat sources.
- The permissible ambient temperatures specified in the technical data must be maintained, even if the climatic conditions change (e.g. due to solar radiation). Overheating of the device can damage insulations which serve to insulate the mains voltage.
- To avoid accumulated heat, free ventilation must be ensured on all sides. (20 cm minimum distance to other objects).
- According to EN62368-1, a mounting height of ≤ 2m above floor level should be aimed for to avoid injuries.
- Niche mounting and covering the ventilation openings are not permitted.
- In the case of cabinet mounting, sufficient air convection must be possible to ensure that the maximum permissible ambient temperature of the device is maintained.
- No objects may be placed on the device or on the external power supply unit.
- The device may only be operated when fully assembled and with the original or specified type of power supply.
- The cable or subscriber network must be and remain included in the equipotential bonding system of the building in accordance with EN 60728-11, section 6.2 a) and i), even if the device is removed. Devices in the manual range must be included in the equipotential bonding between each other. Operation without connection to a protective equipotential bonding conductor (EN 60728-11, section 6.2 c)) or device grounding or device equipotential bonding is not permitted.
- Also follow all applicable national safety regulations and standards.
- If there is no information available on the intended use (e.g.

operating location, ambient condition) or if the operating instructions do not contain any corresponding notes, you must contact the manufacturer of these devices to ensure that the device can be installed. If you do not receive any information from the manufacturer in this regard, the device must not be put into operation.

- The mains plug of the external power supply unit serves as a disconnecting device from the mains voltage in the event of service or danger and must therefore be accessible and usable at all times. After connection to the mains voltage, the external power supply unit is in operation. If the power supply unit is also connected to the DC socket of the device, the device is also in operation.
- The device may only be powered by the external power supply unit supplied (12V= 0.5A Pmax: ≤ 15W Type: UES12LV-120050SPA). The supplied external power supply unit may only be used to supply the device that was supplied with the external power supply unit.
- The device and the external power supply unit are not protected against water and may therefore only be connected and operated in dry rooms. The device and the external power supply unit must not be exposed to splashing water, dripping water, condensation or similar water influences, as this may impair the insulation of the mains voltage.
- Do not install the device in places with excessive dust, as this may affect the insulation of the mains voltage.
- Excessive mechanical stress (e.g. falling, impact, vibration) can damage insulations that serve to isolate the mains voltage or protect against laser radiation.
- High overvoltages (lightning strike, overvoltages in the power supply system of the energy provider) can damage insulations that serve to protect against the mains voltage.

Maintenance

- ☐ The OFN46-WDx-ALC and the original plug-in power supply unit form a functional unit and can only be sent in for repair together. Devices sent in without the original plug-in power supply unit cannot be processed.
- ☐ Read carefully: EN 60728-11 – Part 1, Safety requirements/No service work during electrical storms!

Repair

- ☐ Repairs may only be performed by the manufacturer. Improperly performed repairs may result in considerable dangers for the user.
- ☐ If malfunctions occur, the device must be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.

Warranty conditions

The general terms and conditions of ASTRO Strobel GmbH apply. They can be found in the current catalogue or on the Internet under “www.astro-kom.de”.

Performance description

Both interconnection points are used to merge and transmit optical signals to GPON end devices.
The OFN46-WDx-ALC type and the OR46-WDx-ALC (retrofittable to the APL46, order number 212 248) offer additionally the option to loop through optical signals transparently and filter a CATV signal that can be led out via a seperate F-jack.

Interconnection points APL46 and OFN46-WDx-ALC:

- Plastic lid housing for up to 4 splices with the option of pure passive or RF optical receiver (plug-in) for CATV, locking screw

RF receiver OR46-WDx-ALC (included in interconnection point OFN46-WDx-ALC):

- AGC range for CATV -8 dBm … +2dB m, maximum range -12 dBm .. +2 dBm
- Plastic housing with or without optical CATV receiver
- CATV range (pass: 1550 .. 1560 nm)
- RF frequency range 45 - 1218 MHz
- AC adapter plug-in power supply +12 VDC with ECO, EMC and Product Safety Certificates
- Plastic lid housing for 4 splices with the option of pure passive or RF optical receiver (plug-in) for CATV, locking screw

Disposal

All of our packaging materials (cardboard boxes, inserts, plastic film and bags) are completely recyclable. Electronic devices must not be disposed of with household waste, but rather – according to DIRECTIVE 2012/19/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL from 4 July 2012, on waste electrical and electronic equipment – must be properly disposed of. When it is no longer of use, please bring the device for disposal to one of the public collection points for this purpose.

ASTRO Strobel is a member of the Elektro system solution for the disposal of packaging materials. Our contract number is 80395.

Fitting options

Vorbereitung:

Before assembling the different parts of the device, you shoul mount the lower plate on the desired surface. Therer are four options for mounting to choose from:

- ☐ Mounting on a wall
- ☐ Mounting on a standard wall outlet with a diameter of 60 mm
- ☐ Mounting on wall outlet with a diameter of 67 mm
- ☐ Mounting on a perforated plate

Please use appropriate screws depending on the chosen type of mounting.

Mounting the lower plate

Please use the slotted holes shown in figure 5 for mounting the lower plate.

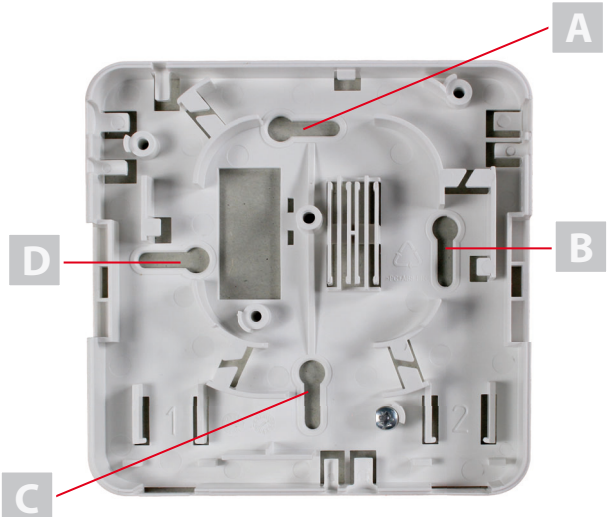


Figure 5: slotted holes in the lower plate:

Mounting on a wall:
First prepare four drill holes in the wall you want to mount the device on. Hold the lower plate in place and mark the position for each drill hole with a pen. After drilling put appropriate dowels into the holes. Now fix the lower plate by pulling the scres through the slotted holes.
Adjust the plate and tighten the screws.

Mounting on a wall outlet:
Figure 6 (below) shows the the mounting of the lower plate on a wall outlet. To tighten the screws use the sanme slotted holes as described on page 12 before.

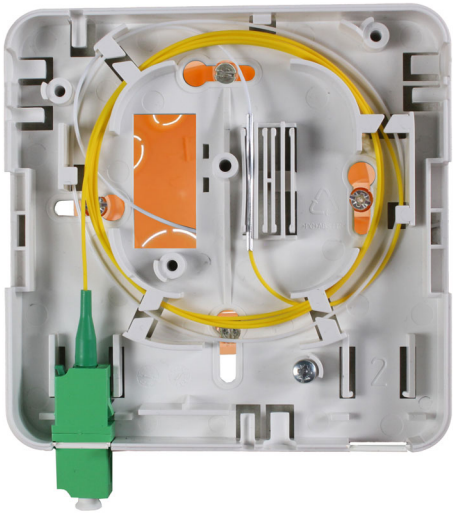


Figure 6: mounting on a wall outlet

First adjust the lower plate on the wall. Then tighten the screws.

Connection and start-up

HINWEIS: Make absolutely certain that optical fibre cables are free of optical radiation during the connection work! Optical radiation above the permissible limit can cause irreparable eye damage!

Preparing the fibre

Before starting to connect and start-up the OFN46-WDx-ALC, first prepare the fibre as shown in figure 7 below.

Figure 4 shows the different options of leading the fibres into the housing of the device:

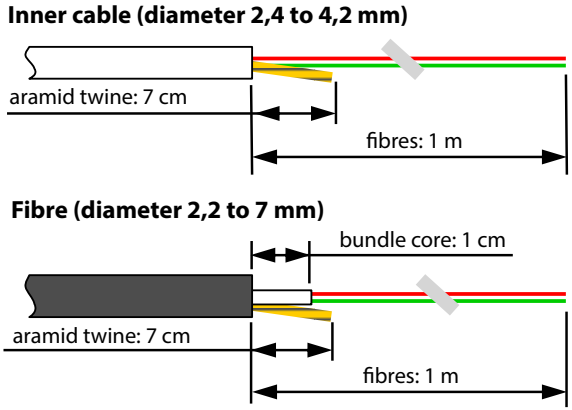


Figure 7: Preparing the fibre

Feeding in the fibre and strain-relief

You can feed up to 4 fibres into the device via a wall outlet or via the accesses in the lower plate (fibre tray).

You can wind fibres around the guiding lashes 9] (see figure 4). Use the splice lock [2] for applications where fibres must be connected by fusion splicing.

Mounting optical output jacks

You can attach up to two optical output jacks to the lower housing part (Duplex LC or Simplex SC). To mount a sceond output you must remove the lashes [7] (see figure 4) and place the output jack into the gap.

Figure 8 shows the different options of feeding fibres into the decvice.

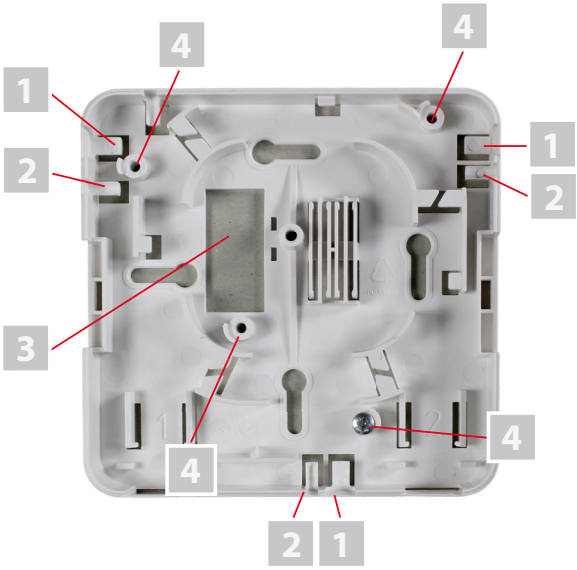


Figure 8: Options for feeding fibre into the device

You can feed fibres with a diameter of 2-3 mm through inputs [2]. Fibres with a diameter of 7 mm can be fed through inputs [1].
When mounting on a wall you must build a strain-relief fot the fibre. This can be achieved by using cable ties on the pins above the inputs or by fixing the aramid fibre of the cable with a screw into drill [4].
Figure 9 (below) shows the fixing of the aramid fibre:

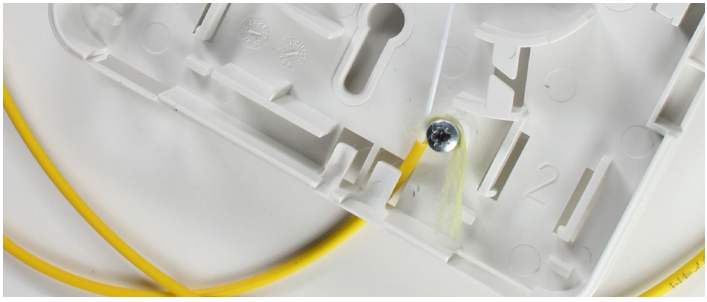


Figure 9: Strain-relief with aramid fibre

Pulling in the fibre and fibre tray

You can pull the fibres around the fibre tray (see figure 10). The example shows a cable inlet from a wall outlet.
Use the tray [A] for applications where fibres are spliced together.

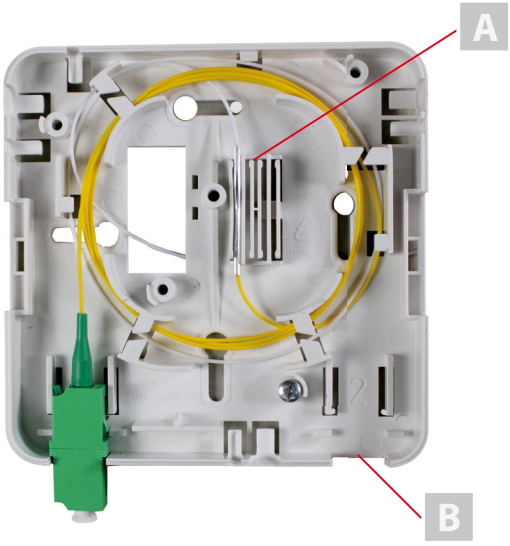


Figure 10: Fibre connections in the lower part of housing

Mounting optical connectors

You can install up to output jacks (Duplex LC or Simplex SC) in the lower plate of the device. To install a second connector, you must break away flap [B] (see figure 10) and place the connector into the gap.

The following instruction is only relevant for the OFN46-WDx-ALC or when retrofiiting the APL46 with the optional RF receiver:

Connecting an optical fibre with the RF receiver

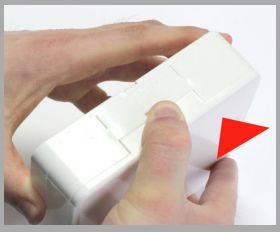
The plastic housing of the RF receiver has gaps where you can lead the fibre through from the lower part of the housing
By using the LC coupling you can then join the fibre with the plug (see figure 11) of the input of the RF receiver.

Figure 11: Middle part of the housing with RF receiver

The RF receiver is equipped with an optical output jack which outputs the transparent looped through optical signal as well as an F-jack that outputs the filtered CATV signal.

A three color LED indicates the output level of the RF receiver:

- Orange (no or low input signal): < -8 dBm
- Green (normal input signal): -8...+2 dBm
- Rot (high input signal): > +2 dBm



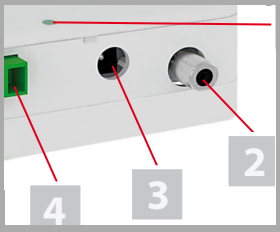
Connecting the middle part to the lower part

Now connect the receiver to the lower part of the housing.
Lay the middle part on the lower part of the housing and press with both hands on the planes and press both parts togehter until they latch.

Connecting middle part and lid

After connecting the RF recieverand putting into the plastic shell, you can connect the shell to the lid.
Lay the lid on the middle part of the housing with the RF receiver. Press with each hand on the corrugated planes and press both parts together until they latch.

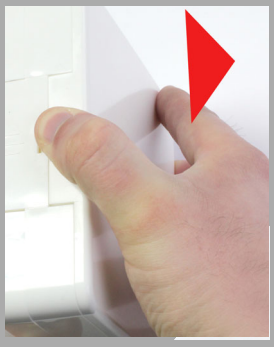
HINWEIS: Lid, middle part and lower part are designed in a way that they can only be connected in one direction to each other. This is to ensure that the LED of the receiver can be seen through the lid. Please keep this in mind and don‘t try to connect the parts forcibly.



Plugging in the power supply unit

At last connect jack [3] of the device to its power supply unit and the PSU to the mains voltage.
The device is now ready for use.

Expanding the APL46 with the RF receiver



You can expand the passive APL46 with an additional RF receiver. After the conversion the device will be identical to the OFN46-WDx-ALC.
To expand the APL46, proceed as follows:

Removing the lid

Remove the lid by pressing on the corrugated planes. Then pull the lis off from the middle part of the housing..

Connecting the RF receiver

Connecting the RF receiver is described on page 17.

Connecting the middle part with the lid

Connecting the middle part is describes on page 18.

Connecting the middle part with the lower part

This is also described on page 18.

Removing the RF receiver again

To remove the RF receiver, proceed as follows:

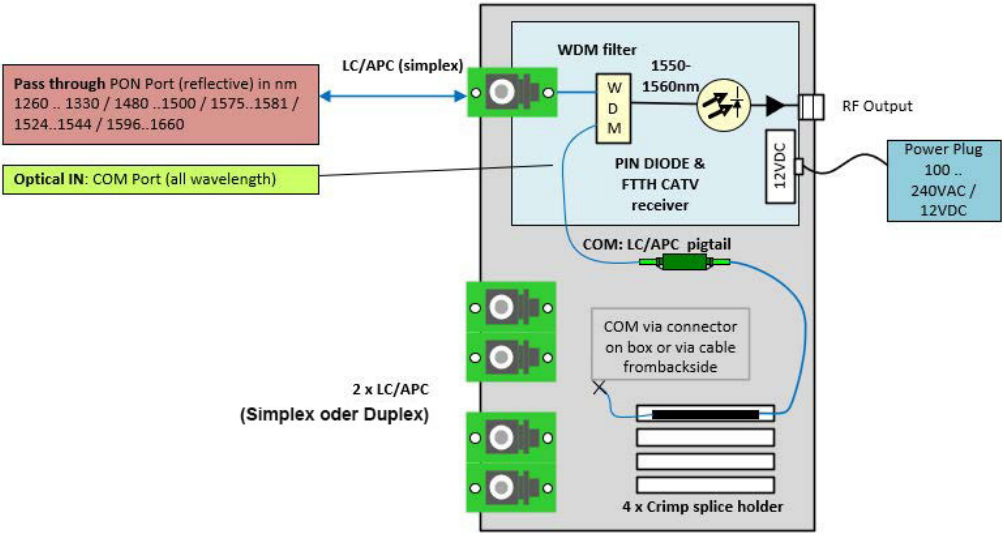
- ☐ Remove the lid (see above)
- ☐ seperate the middle part from the lower part (press the corrugated planes with both hands)
- ☐ disconnect the fibre from the LC coupling of the RF receiver
- ☐ connect the lid to the lower part of the housing (press the corrugated planes with both hands)

Maintenance and repair

ACHTUNG: ***It is essential that the following safety information be observed when performing maintenance and repair work. Failure to observe this safety information may result in physical injury due to electrical and thermal dangers!***

- ☐ Read carefully: EN 60728 – Part 1 Safety requirements: No service work during thunderstorms.
- ☐ A defective device may only be repaired by the manufacturer to ensure that components with the original specification are used (e.g. power cable, fuse). Improperly performed repairs may result in considerable dangers for the user or installer. If malfunctions occur, the device must therefore be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.

Block diagram



Block diagram of the RF receiver

Technical data

Type		OFN46-WDx-ALC
Order number		212 250
EAN-Code		4026187270292
Housing		compact
Connector type		COM Pigtail LC/APC, PON Coupler LC/APC
Optical parameters		
CATV operating wavelength (WDM pass channel)	[nm]	1550…1560
PON Port operating wavelength: GPON / XG-PON /XGS-PON / NG-PON/measurement	[nm]	1260 .. 1330 / 1480 ..1500 / 1575..1581 / 1524..1544 / 1596..1660
Isolation CATV (pass channel) to 1310 nm to 1490 nm to 1577 nm	[dB]	 35 35
Optical input power	[dBm]	-12…+2
Nominal optical input power (AGC range)	[dBm]	-8…+2
Multicolor LED		Orange (no input) Orange (low input): -8.0 dBm Green (normal): -8.0 dBm .. +2.0 dBm Red (high): > +2.0 dBm
Isolation PON Port to 1550 nm	[dB]	18
Insertion loss CATV Port on filter	[dB]	< 1.0
Insertion loss PON Port on filter	[dB]	< 1.0
Optical return loss	[dB]	> 40
Fibre type		Single Mode Fibre 9/125
RF parameters		
Frequency range	[MHz]	45 … 1000
Flatness	[dB]	±0,75
RF level (OMI 3,5 %)*	[dBµV]	≥ 76 (@ Pin -8.0 dBm..+2.0 dBm within AGC), OMI ≥ 1,8 %
RF port return loss	[dB]	≥ 18
Output impedance	[Ω]	75
RF connector type		F-jack
Common data		
Power supply unit	[VDC]	Primary: 100 .. 240 VAC - 50/60 Hz - 0,5 A Secondary: +12,0 VDC / 0,5 A Max. operating temperature: 55 °C
Power consumption	[W]	≤ 2

Housing type		Plastic wall mount housing, with or without plug in RF optical receiver
Protection		IP 20
Fire protection classification		UL94 V-0
Dimensions inner FTTH receiver (L x W x H)	[mm]	80 x 50 x 22
Dimensions plastic tray with locking screw (L x W x H)	[mm]	95 x 95 x 37
Ambient temperature	[°C]	-10…+55
Relative humidity	[%]	maximum 95, not condensing

ASTRO Strobel Kommunikationssysteme GmbH

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