GOING FUTURE TODAY.

ASTRO®

Optical Fibre Nodes

OFN50-C
OFN50-WD
OFN50-WF

DRAFT VERSION

Operating Manual

Version 07-2017A

Contents

Before starting operation of the device

HINWEIS: *Read this operating manual attentively! 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. A PDF version of this manual is available to download on the ASTRO website (there may be a more recent version).*

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, without prior notice, to the specifications, the operation of the device and the operating manual.

Symbols and conventions used

Symbols used in these instructions

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.

Warning about thermal dangers (risk of burns).

Warning about high laser radiation emitted from a device, connector or adapter (risk of eye damage).

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 being disposed of.

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

Proper use

The OFN50 Fibre Node can only be used for transmitting analogue modulated TV and Data services via optical 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.

Target group of this manual

Installation and starting operation

The target group for installation and starting operation of the ASTRO optical transmission technology are qualified experts who have training enabling them to perform the work required in accordance with EN 60728-11 and EN 60065. Unqualified person are not allowed to install and start operation of the device.

Device configuration

Target group for the configuration of the ASTRO fibre nodes are persons who have received instructions and have training enabling them to perform a configuration. Knowledge of EN 60728-11 and EN 60065 is not necessary for configuration.

Device description

The delivery consists of the following parts:

- ☐ Optical Fibre Node OFN50-C, OFN50-WD respectively OFN50-WF
- ☐ Operating Manual

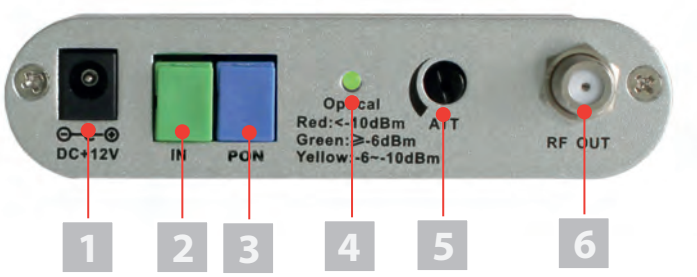


Figure 1: Fibre Node OFN50-WD (other types similar)

[1] DC 12 V power input port
[2] optical signal input port (SC/APC)
[3] optical signal output port for connection of GPON/EPON ONU (SC/PC)
(only OFN50-WD and WF)
[4] optical power indication LED
[5] ATT, 20 dB
[6] RF output port (male or female)

Colours of status LED

- ☐ `Green:`
  Input optical power is OK (> -6 dBm); best working condition, regarding optical input
- ☐ `Orange:`
  Input optical power -6...-10 dBm; still OK, but quality loss may occur
- ☐ `Red:`
  Input optical power is low (< -10 dBm); big performance loss for analogue TV; if the optical level is too high (> +2 dBm) the input PIN diode may be damaged permanently)
- ☐ `LED doesn‘t light up at all:`
  power supply isn‘t mounted properly or the device is broken

The OFN50 Fibre Nodes feature a CE marking. This confirms that the products conform to the relevant EC directives and adheres to the requirements specified therein.

Important safety information

To avoid any hazardous situations to the extent possible, you must adhere to the following safety information:

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

Proper use

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

Before starting operation of the device

HINWEIS: Read this operating manual attentively! 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. A PDF version of this manual is available to download on the ASTRO website (there may be a more recent version).

- ☐ Check the packaging and the device for transport damage immediately. Do not start operation of a device that has been damaged.
- ☐ Transporting the device by the power cable may damage the mains cable or the strain relief, and is therefore not permitted.

Danger of optical radiation

This product is laser class 1M (according IEC 60825-1 Safety of Laser Products) and therefore several safety precautions must be applied.

- ☐ Exposure to class 1M laser radiation is possible on open connectors or connected fibre patch cords. Do not view exposed fibre or connector ends when handling or maintaining optical equipment. Do not view with optical instruments into open connectors or fibre ends on switched on devices. Make sure all wherever a fibre inspection is required, that the inspected fibre or connector is completely optical radiation free.
- ☐ Due to the high optical radiation and improper handling of optical fibre connections and devices, there could be risks for the operating and service personnel. Access should be restricted to trained personnel only.

- Never look directly or with optical inspection tools into the end of a fibre which is connected to a transmitter or optical amplifier and which is in operation. If the eyes are exposed to optical radiation, which are above the acceptable maximum, this could cause permanent damage to the eye.

Installation, operation, maintenance

- The device may only be installed and operated by qualified persons (in accordance with EN 60065) or by persons who have been instructed by qualified persons. Maintenance work may only be carried out by qualified service personnel.
- The installation site must be planned in a way that prevents children from playing with the device and its connections.
- Dangerous voltages and the threat of optical laser radiation are present within the powered on unit at all times.
- Always replace protective caps on optical connectors and patch cords when not in use to avoid dust intake. Before connecting clean connectors with lint free cloth and pure alcohol or with any professional tools for cleaning connectors and adapters. The typical connectors fitted are SC/APC 8° or LC/APC 8° (green couplers).

- The electrical connection conditions must correspond to the specifications on the device type plate.
- To avoid damage due to overheating, the device may only be installed on vertical surfaces. The installation basis should be level and non-flammable. Operating position: Device vertical, with power cable outlet at the bottom.
- The ambient temperatures specified in the technical data must be complied with, even when climatic conditions change (e.g. due to sunlight). If the device overheats, the insulation used to isolate the mains voltage may be damaged.
- The device and its cable may only be operated away from radiant heat and other sources of heat.
- To avoid trapped heat, ensure there is good ventilation on all sides. Installing the device in recesses or covering the installation location, e.g. with curtains, is not permitted. Ventilation openings may not be covered.
- If the device is installed in a cabinet, ensure adequate air convection is possible to avoid exceeding the maximum ambient temperature permitted for the device.
- No objects may be placed on the device.

- The subscriber network must be earthed in accordance with EN 60728-11, and must remain earthed even when the device is removed. Furthermore, the earth connection on the device can be used. Devices within hand's reach must be integrated into the potential equalisation together. Operating the device without an earth conductor, without earthing the device or without using device potential equalisation is not permitted.
- The device does not feature protection against water and may therefore only be operated and connected in dry rooms. It must not be exposed to spraying or dripping water, to condensation, or to similar sources of moisture.
- The electrical system supplying current to the device, e.g. a house installation, must incorporate safety devices against excessive current, earth leakages and short-circuiting in accordance with EN 60950-1.
- To operate the device (protection class I), it must be connected to mains power sockets with a protective earth conductor.
- All adhere to all applicable national safety regulations and standards.
- The mains plug is used as a mains voltage disconnect unit in the event of servicing and danger, and must therefore be accessible and be able to be operated at any time. The device is operational when connected to the mains power.

- Excess mechanical loads (e.g. falling, impacts, vibrations) may damage insulation used to provide protection from mains voltage.
- High excess currents (lightning strike, surges in the power utility grid) may damage insulation used to provide protection from mains voltage.
- Do not insert any objects through the ventilation slots.
- If there is no information about intended use (e.g. operating site, ambient conditions), or the operating manual does not include the corresponding information, then you must consult the manufacturer of this device to ensure that the device may be installed. If you do not receive any information on this from the manufacturer, do not start operating the device.

Maintenance

- The operating display only shows whether the DC current, which supplies the device components, has been disconnected. However, operating displays (on the power supply unit or the device) that are not lit up in no way indicate that the device is completely disconnected from the mains.
- Read carefully: EN 60728 - Part 1 Safety requirements: No service work during thunderstorms.

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.

Description of performance

Features

- forward path optical receiver for analogue and digital CATV in range of 1540 ..1560 nm
- wide optical input range -10 dBm …0d Bm (MGC – manual gain control)
- RF output level can be adjusted manually with the adjustment screw (0 ..-20 dB)
- OFN50-WD: with pass through port for connection GPON/EPON ONU
- OFN50-WF: with blocking filter for GPON/EPON data
- compact metal housing for wall mounting
- RF frequency range 45 - 1003 MHz
- power supply 12 VDC
- very low power consumption

Warranty conditions

The general terms and conditions of ASTRO Strobel GmbH apply. You will find these in the current catalogue or on the Internet under “www.astro-kom.de”.

Disposal

All of our packaging material (cardboard boxes, inserts, plastic film and bags) is 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.

Installing the device

Before putting the device into operation you must read the advices concerning installation and opaation in chapter „Important safety information“.

- ☐ Install the external connection for coax cables, power supply and optical patch cord safely. Ensure that the optical cable is not bent or pinched as this will cause damage to the optical fiber. The typical minimum bending radius of standard optical cable is 3 cm.
- ☐ Make sure that only APC (8° angled – normally green colored) optical patch cord are used to connect the device to ensure the high return loss required for analogue based signal such as analogue TV and digital TV. For the PON optical port use an PC optical connection (0° - blue connector).
- ☐ Ensure that the minimum bending radius for fibre installation is maintained (for normal single mode G.652D fibre we recommend 30mm minimum radius, for high bending fibers such as G.657A check the fiber specification for minimum bending radius).

Troubleshooting

If the device is not functioning correctly, please perform the following checks:

- `No RF output signal / No TV channel:`
  Indicates either a connection problem with coax cable, no TV service from central side or damage of the device.
  A: Check optical signal LED. If the LED is not working, then check the power connection of the device. If 12 VDC power is okay, then replace the device.
  B: If the LED is showing red colour, then the optical input level is too low to receive a good signal. Check the network towards the central station for TV service.

- `No LED light on optical receivery:`
  Indicates no DC supply voltage or receiver damaged.
  A: Check, if mains power on wall socket is present.
  B: Check power supply or replace power supply.
  C: If all does not solve the issue, replace the optical receiver.

- `Bad TV signal performance:`
  A: Make sure using for input connection SC/APC (green 8° connector)
  B: Check optical input level if in optimum range of -6 .. 0 dBm (green LED light). Too low optical signal or too high optical signal can quality problems. Never connect higher optical power than +2 dBm / 1550 nm to the optical receiver to avoid damage.
  C: Check the RF output level, since too high levels will cause distortion (stripes), too low RF levels with cause noise in the picture. Adjust with front screw the attenuation to a good value (TV sets for analogue PAL TV requests normally 60-70 dBµV for analogue channel, digital channels are 6 ..10 dB below).
  D: If all does not work, replace the optical receiver and adjust ATT.

- `No GPON signal at GPON Port:`
  A: Make sure GPON service is distributed in the PON network
  B: Check if SC/PC pigtail is connected in a good way without any bends or pinches. Check the optical patch cord.
  C: Measure GPON signal strength with optical measurement device.
  D: If all does not solve the issue, replace the optical receiver.

Maintenance and repair

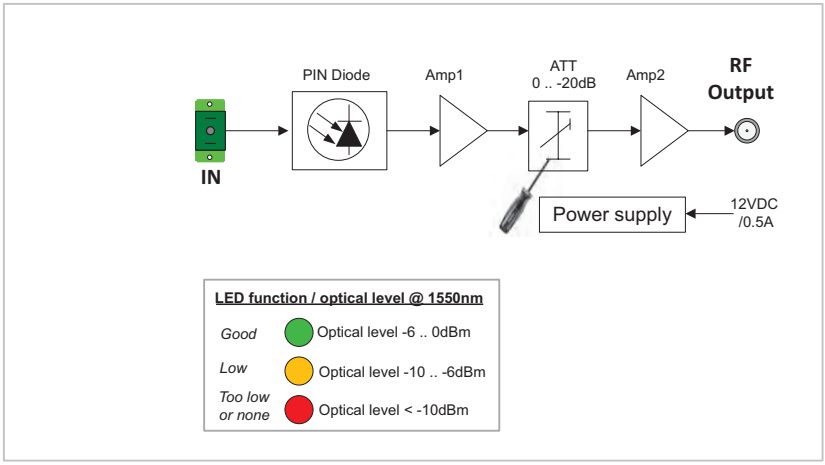
ACHTUNG: The following safety information must be observed when performing maintenance and repair work. Failure to observe this safety information may result in personal injury due to electrical and thermal dangers!

- The operating display only shows whether the DC current, which supplies the device components, has been disconnected from the mains voltage. If the operating display (for the power supply unit or the device) does not light up, this does not mean that the device has been fully disconnected from the mains voltage. There may still be voltages in the device that are dangerous to touch. You may therefore not open the device.

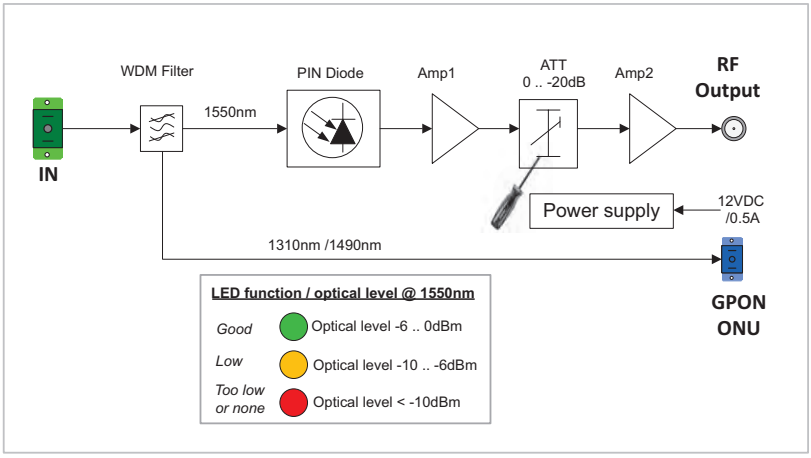
- The cover for the power supply unit is designed to prevent accidental contact with voltages that are dangerous to touch, and must not be removed.
- Read carefully: EN 60728 - Part 1 Safety requirements: No service work during thunderstorms.
- A defective device may only be repaired by the manufacturer 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

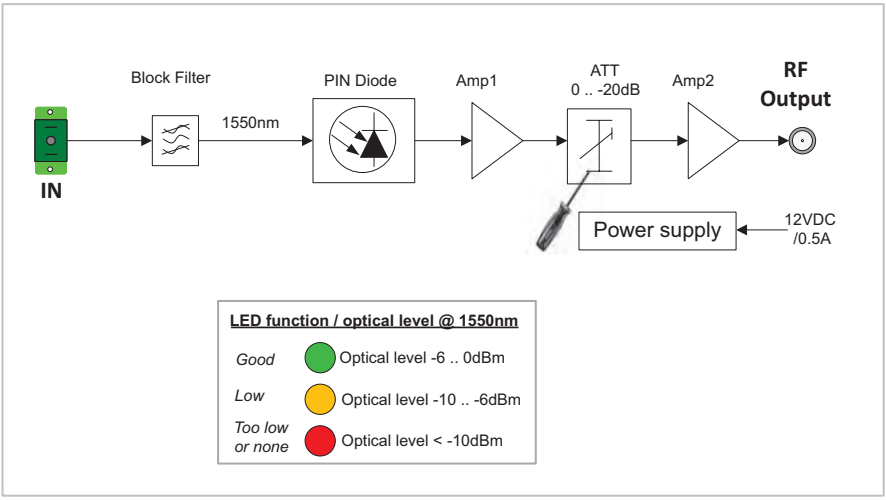
OFN50-C:



OFN50-WD:



OFN50-WF:



Technical data

Type		OFN50-C	OFN50-WF	OFN50-WD
Order number		212 113	212 114	212 115
EAN-Code		4026187192907	4026187192914	4026187192921
Optical node type		Optical compact receiver for CATV	Optical compact receiver with blocking filter for GPON/EPON data	Optical compact receiver with pass through port for GPON/EPON data
Optical characteristics				
Optical input wavelength	[nm]	1100…1600	1530…1620	CATV: 1530 .. 1620 PON: 1310/1490
Optical input power	[dBm]	-10… +2		
Optical return loss	[dB]	> 45		
Optical connector type		SC/APC	SC/APC	COM: SC/APC PON: SC/PC
Fibre type		Single mode 9/125		
RF characteristics				
Frequency range	[MHz]	45…1006		
Flatness	[dB]	± 0,75		
RF level (OMI 3,5 %)	[dBµV]	≥ 78 @ -6 dBm		
Output return loss	[dB]	> 14		
Output Impedance	[Ω]	75		
Manual RF adjustment	[dB]	0…-20		
CSO for Cenelec 42	[dB]	> 60 @-6 dBm		
CTB	[dB]	> 60 @-6 dBm		
Receiver Noise Current	[pA/SQRT(Hz)]	4.5		
Common data				
Power plug	[VDC]	12		
Housing		compact housing		
Power consumption	[W]	≤ 3		
Dimension (L x W x H)	[mm]	109 x 80 x 26		
Ambient temperature	[°C]	-20…+55		

DRAFT VERSION

ASTRO Strobel Kommunikationssysteme GmbH

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