GOING FUTURE TODAY.

OEMTX

Optical direct modulated transmitters

DRAFT VERSION

Operating Manual

Version 06-2017A

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 OEMTX module is only 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 transmitters 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:

- ☐ OEMTX direct modulated transmitter
- ☐ Operating manual

Front:
[1] optical output connector (always clean patchcord before connection)
[2] indication LEDs (power, AGC, RF input signal, laser)
[3] LC display for information and control
[4] push buttons
[5] key lock (laser off/on)
[6] RF testport (-20 dB to RF input signal)

Back:
[7] grounding connection
[8] hot plug power supply
[9] fan
[10] RF main input
[11] RS232 (only for R & D purposes)
[12] LAN interface

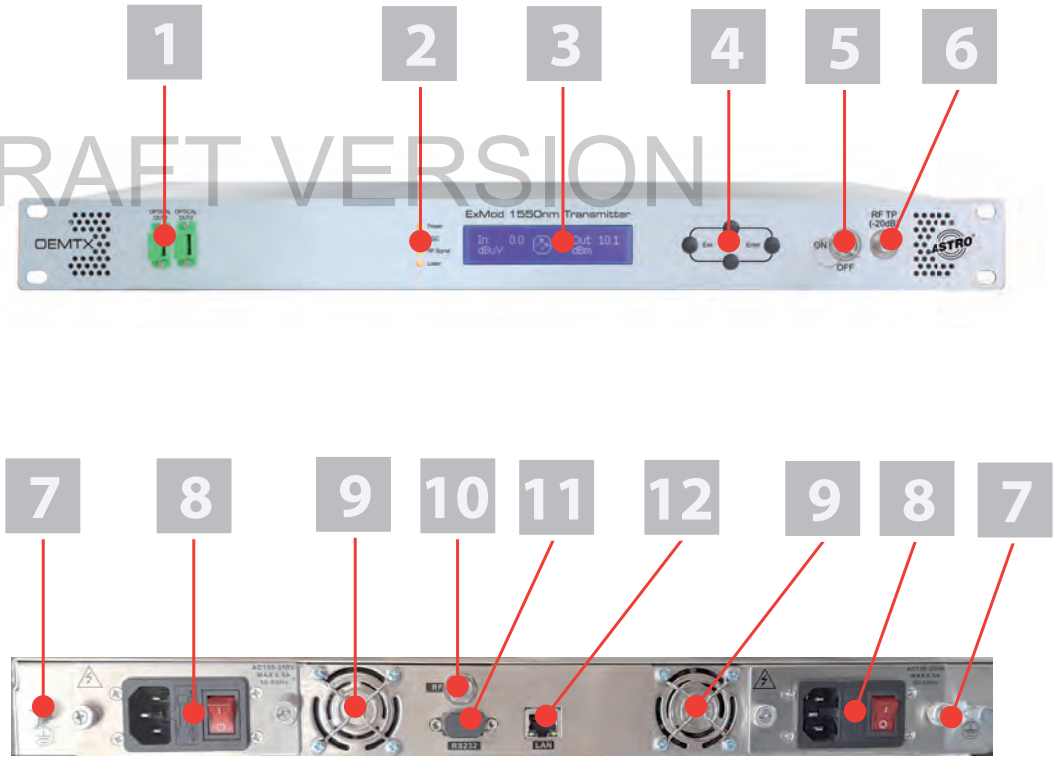


Figure 1: OEMTX front and rear side

LED indicators

- `Power LED:`
  yellow: only one working power supply
  green: both power supplies working in good condition
- `AGC indicator:`
  green: transmitter is running in AGC mode
  off: transmitter is running in MGC mode
- `RF signal LED:`
  green: RF input in valid range (modulation normal)
  flashing red: RF input not in valid range (modulation out of normal range). Please note: The transmitter only measures the total RF input power, Therefore: For a channel load with a low number of channels, the RF input power could be higher. For a channel load with very high number of channels, the RF input power per channel could be lower. If only digital channels, set the transmitter in the settings to “digital” channels only.
- `Laser indicator:`
  green: bias current,cooling current and output power are all norma
  flashing red: At least one of the following parameter is out of its working range:
  -bias current
  -cooling current
  -output power is too low

The device can be equipped with either AC power supplies or DC power supplies (see figure below).

[1] power cord connection (150 - 250 VAC)
[2] fuse holder with one spare fuse inside (fuse type: T3.15 A/250 V)
[3] manual power switch
[4] to remove the hot plug power supply, first open the screws on the left and right side of the power supply unit

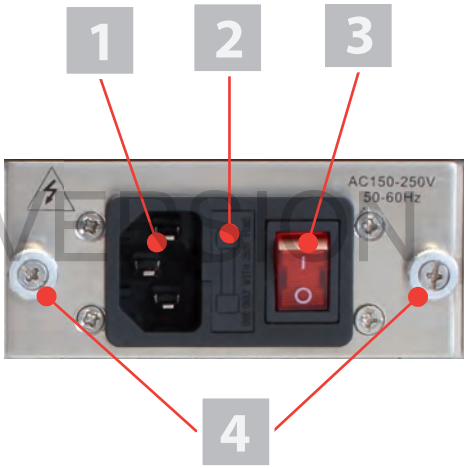


Figure 2: AC power supply (rear side)

[1] 0 VDC connection
[2] -48 VDC connection
[3] to remove the hot plug power supply, first open the screws on the left and right side of the power supply unit

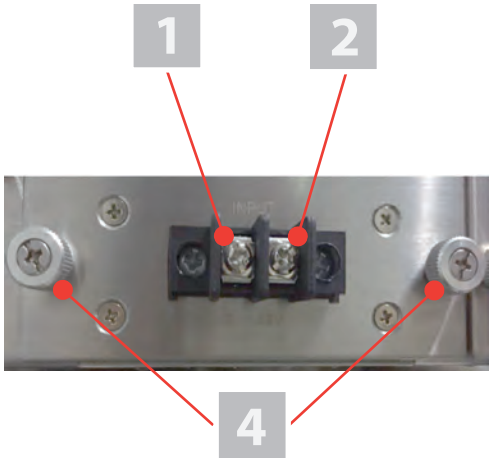


Figure 3: DC power supply (rear side)

The OEMTX module features a CE marking. This confirms that the product conforms 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.
- ☐ 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

The optical transmitter OEMTX is a high class external modulated 1550nm transmitter, suitable for distribution of analogue modulated TV and Data services via optical fibre networks.External modulated transmitters are used for long haul transmission of HF modulated signals, such as TV broadcast and Digital TV Broadcast, as well as DOCSIS downstream signals. Also to supply service to a large number of FTTH customers, the better choice in terms of performance is an external modulated transmitter.

The device is developed and manufactured according the requirements for HFC or FTTH Networks and can be combined with optical amplifiers, such as EDFAs (Erbium Doped Fibre Amplifier or YEDFAs (Ytterbium cladding pumped high power EDFAs).It is suitable for networks for long distance transmission up to typically 30 ..100km from the transmitters station, amplified with EDFAs and serving several optical fibre segments. Another application is for or for large scale FTTH Networks with a high number of end customers getting 1550nm optical RF signals as Video Overlay combined with optical data networks or via direct connection.

Features

- 19“,1-U Rack mounted 1550nm optical external modulated transmitter
- automatic gain control or manual gain control
- optical output power 2x7.0dBm / 2x8.0dBm / 2x10.0dBm
- advanced SBS suppression, setting in 0.5dB steps in range 13.0dBm ..19.0dBm
- optical wavelength +/- one ITU channel (+/- 50GHz)
- external Modulator
- SNMP / Web-Interface / LCD panel
- 2 redundant hot plug power supplies
- AGC shifting to reduce OMI via setting
- very low power consumption

Applications

- high performance long distance transmission for analogue and digital broadcast signals
- CATV& HFC Networks forward path transmission
- RF-Overlay transmission in FTTX Networks
- RFoG Networks
- DWDM utilized Broadcast Networks

AGC,MGC – Automatic/Manual Gain Control

The RF preamplifier stage of the Transmitter incorporates an AGC (automatic gain control) stage.This AGC circuit will make sure that the RF input level is stabilizing the RF signal feeding the optical modulator (Mach-Zehnder Modulator) and ensures a constant OMI (optical modulation index).The OMI specifies the deepness of modulation and is responsible at the optical receiver side to get a certain RF output power.The higher the OMI, the higher the RF output level on the optical receivers and vice versa.Therefore,the OMI must be kept constant, to ensure the RF level is stable at the optical receiver’s output.

The AGC can be switched of and set to an MGC (manual gain control).In MGC mode the automatic control is switched off, and the user has to specify the RF input attenuation via the parameter “MGC Att” (0..15dB).If input attenuation is set wrong with the MGC mode, the optical modulator will be either under modulated (CNR will not reach the maximum reachable value) or over modulated (clipping occurs which causes CSO/CTB).

ASTRO recommends to use always AGC mode.MGC mode shall be applied only for very experienced users.

For a standard channel load to ensure the AGC is in the correct working range, the RF input value shall be in the range of 78 ..96dBµV per analogue channel.

Rule of the thumb: If very less number of channels, the RF Input shall be higher, if big numbers of channels, the RF input could be lower.

In any case, if the RF Signal LED is showing green light, the RF levels are in the correct range for the AGC to work in normal condition and the modulator gets the optimum signal strength and the OMI is optimized according CNR,CSO and CTB performance.

MI Calculation according channel plan

In AGC ON mode the transmitter will always set the Transmitter to the specific
OMI (totrms) = 19,4% (which is the total RMS OMI in percent for the complete channel load).

To calculate the OMI/channel for each service (PAL,QAM64,QAM256 etc), the following sections will describe how to calculate.

A. Calculate the equivalent PAL channel count out of the total analogue and digital channels with the following formula:

channel count = $n * 10^{-4/10} + x/10 + y/4 + z/5$

where

n = number PAL or NTSC channels (modulated correction with -4dB as in formula above)

x = number of QAM64 channels with backoff to PAL of 10dB

y = number of QAM256 channels with backoff to PAL of 6dB

z= number of FM channels with backoff to PAL of 7dB

B. Calculate the OMI for PAL or NTSC

OMI per PAL channel = $19,4\ \% * 2^{1/2}$ / channel count$^{1/2}$

C.Calculate the OMI for QAM64 and for QAM256

OMI per QAM64 channel = $10^{-10/20} * 19,4\ \% * 2^{1/2}$ / (channel count$^{1/2}$)
OMI per QAM256 channel = $10^{-6/20} * 19,4\ \% * 2^{1/2}$ / (channel count$^{1/2}$)

assumption:

Backoff for QAM64 = -10 dB

Backoff for QAM256 = -6 dB

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

To install or commission the device, please follow the steps in the sequence as mentioned below.

Mounting the device in the rack / grounding to protective earth

Mount the device in the 19” rack. Make sure that supporting bars or any shelf supports the device. Do not mount solely on the front panel.

After physical installation in the rack, connect the protective earth cable (PE) to one of the device grounding points, with an appropriate eyelet connection. 2 grounding screws on the rear side of the device are marked with the grounding symbol.

Attach power cord

Make sure that the key lock on the front is in position “off” before switching on the device. For mains power supply the power on switch is located beside the mains connector.

In case of DC Voltage connect the supply cables to the power supply. Make sure to connect the cables with the right polarity and the sufficient diameter.

Check RF input level and signal quality

Check the RF input level and signal quality at the input of the optical transmitter with an appropriate measurement equipment.

Connect the output before switching on with key lock

To prevent a possible damage to the surface of the optical output connectors, it is recommended to connect the optical patch cords to the output before the device is turned on with the key lock.

HINWEIS: If there is the need to connect any optical connector to the output ports, switch off the laser by any of the 2 different possibilities:

- with key lock turn to off position (preferred solution !)

- switch off the complete device at the power supply

Never make any optical connection on ports, where you are not sure about the optical powers. Optical powers >16dBm may cause burn-in of the surface of the optical connection, if plugged under optical power. This connection is permanently not usable anymore, since burned connectors will have a very high attenuation.
If there is the need to test direct the optical output, before connection of the test device to the output switch off in any case. If connected you can switch on the laser again. Another method is testing after the subsequent optical splitter (normally there is low optical power).

Switching on the Transmitter with key lock

If the key lock is in position off, there is no entering with the push buttons on the front possible. With the „ESC“ button the LED display will be lightening up.

In order to protect the device, there is a time-delay function to switch it on. After turning the device on with the key lock On/Off switch, the transmitter will start to operate after about 15 to 20 seconds.

If the device operates normally, the LEDs shall show the following status:

- Power LED green shows both power supplies operate normally
- Status LED blinking green indicate that the device is active and operating normally
- RF signal LED green, shows that RF input power is in the good condition and the AGC is in the working range
- To ensure that the device is running properly, with the „Enter“ button it is possible to show the device menu options on the LCD panel. Under “3. Alarm status” (selected with the ? down key and confirmed „Enter“ button) the actual present alarms can be displayed. To exit the menu, press „Exit“ button until reaching the main display.

Check on LC Display if any alarm

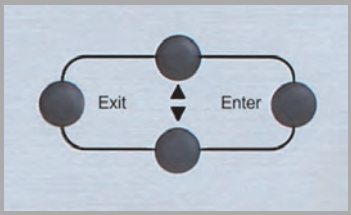
Make sure that the key lock on the front is in position “off” before switching on the device. For mains power supply the power on switch is located beside the mains connector.

In case of DC Voltage connect the supply cables to the power supply. Make sure to connect the cables with the right polarity and the sufficient diameter.

In case of device problem

In case of any problems please contact ASTRO Strobel Kommunikationssysteme GmbH or resend the device with the established valid RMA Procedure (RMA code/ Error description).

LC display and settings



Using the push buttons

When pressing the “Enter” button for a short time, this will light up the display and show the different menus which are selectable with the up and down keys and confirmed by pressing “Enter” again. To exit a menu, press the “ ESC” button.
To modify any value, press the up button to increase a value respectivley the down button to decrease a value. Confirm your selection by pressing the „Enter“ button. In case the field shall not be modified, exit by clicking the “ ESC” button.
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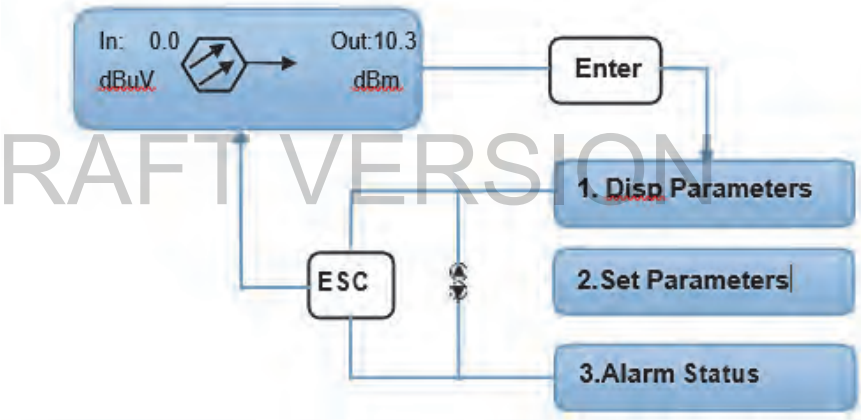
LCD panel menus

The following flow chart shows the different screens that can be seen when stepping through the different menus:

- Boot display (start screen)
- Display parameters
- Set parameters
- Alarm status



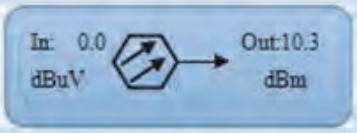
Displayed parameters	Comments
	Boot display
1. Disp Parameters	Display parameters of Transmitter
2. Set Parameters	Set parameters of the Transmitter
3. Alarm Status	Showing active alarms of the Transmitter

Figure 4: LCD panel

The „Display parameters“ menu

The following flow chart shows the different parameters, that can be edited via the front panel display:

Figure 5: „Display parameters“ menu

- `Laser Output:` displays the Laser output optical power
- `Laser Bias:` shows the information about the BIAS current
- `RF CSO:` shows the voltage for CSO circuit
- `Laser Cooling:` shows the TEC cooler current
- `OMI (rms):` shows the total optical OMI (rms)
- `RF Mode:` shows if AGC (Automatic Gain Control) or MGC (Manual Gain Control) is used (recommendation: use AGC)
- `AGC MGC Att:` in AGC mode this value shows the AGC shift from standard (0..-3dB); in MGC mode the value shows the input attenuation settings for RF input signal, before going to modulator.
- `+5 V Read:` monitoring of +5 VDC power
- `-5 V Read:` monitoring of -5 VDC power
- `+24 V Read:` monitoring of +24 VDC power
- `+12 V Read:` monitoring of +12 VDC power

- `-12 V Read:` monitoring of -12V DC power
- `Laser:` displays laser status: ON or OFF
- `SBS Temp:` displays temperature of SBS circuit
- `BOX Temp:` displays temperature of sensor inside the device
- `MCU Temp:` displays temperature of processor board inside the device
- `SW:` displays SW version of the device

The „Modify parameters“ menu

The following figure shows the menu entries. Enter pressing entering a submenu to change the value. Exit to exit the menu without changing the values. All changes can be confirmed by pressing enter. You can change the entries by using the up and down buttons.

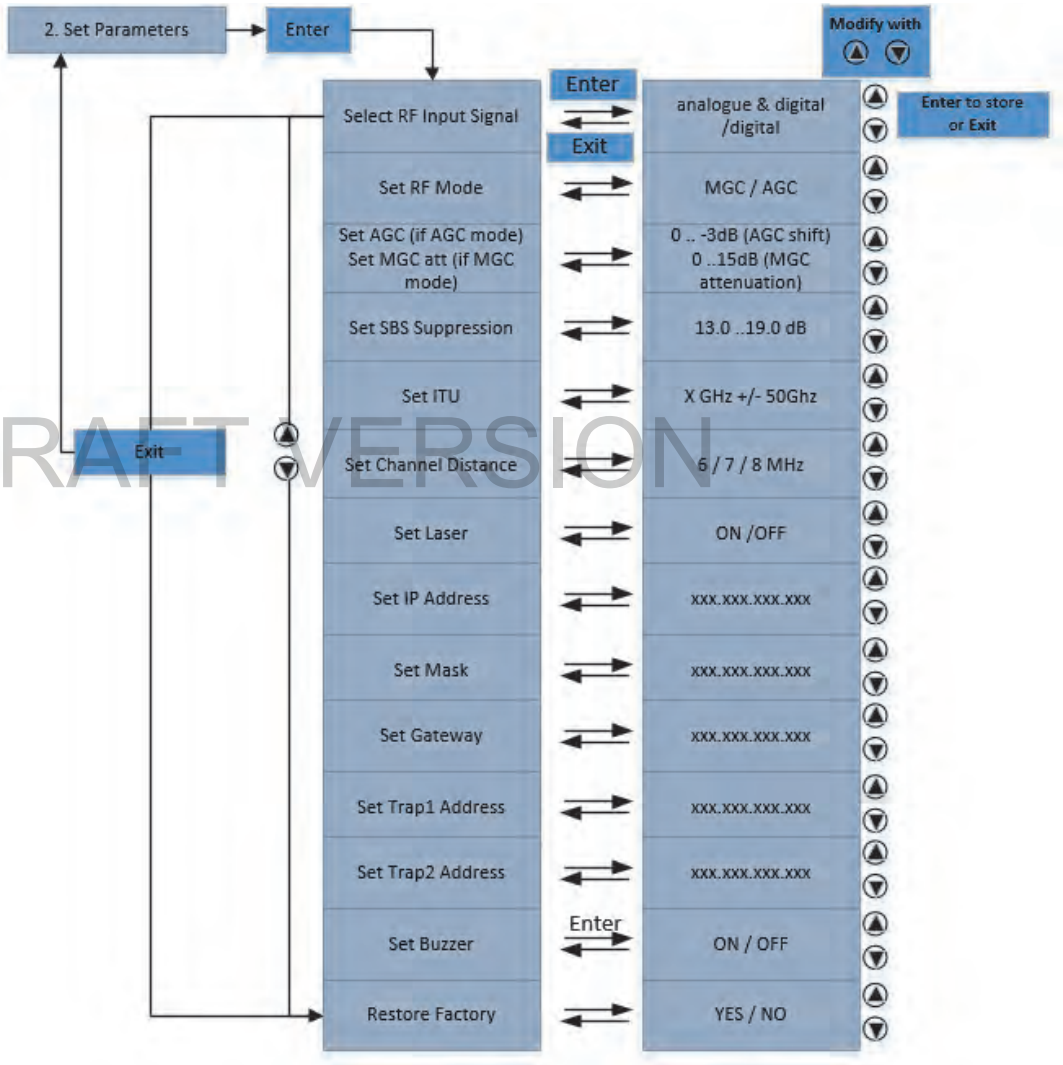


Figure 6: „Modify parameters“ menu

- `Set RF Input Signal:` Choose depending your channel allocation. If service with analogue channels,then use Analogue & Digital setting
- `Set RF Mode:` Standard setting is recommended to use AGC for optimum performance and best OMI for the transmitter. (AGC (automatic gain control) or MGC (manual gain control) selectable)
- `Set AGC:` With this option the transmitters OMI could be lowered in AGC mode by reducing total power to the modulator. 3dB reduction will cause about 3dB less at the optical receiver's RF output. Note: If OMI drops,SNR performance will drop also. (adjustable range 0...-3 dB)

- `Set MGC Att:` If MGC mode is set, the parameter Set MGC Att allows to adapt the RF input signal before the modulator to adjust the RF power to the modulator. Only experienced users should apply this mode, since the OMI can be easily be over or under modulated and causing performance loss. (adjustable range 0...15 dB)
- `Set SBS Suppression:` Depending on the Distance and launch power of the EDFAs in the fibre network, the SBS could be modified to achieve an optimum for long haul transmission with CNR/CSO/CTB. Standard setting is 16dB SBS threshold, which will allow on 65 km transmission a maximum launch power of 16 dBm and on short fibre networks higher than 16 dBm. Fine tune with this parameter could help for improvement, depending on physical characteristics of the network.
- `Set ITU:` Tune the laser to +/- 50 GHz of the standard wavelength
- `Set Channel Distance:` To optimize CSO performance of the transmitter, the channel distance should be configured in a way, that the transmitter finds CSO peaks. (6 / 7 / 8 MHz selectable)
- `Set Laser:` Switch the laser manually OFF or ON.
- `Set IP Address:` This parameter is the transmitters IP address.
- `Set Mask:` This parameter is the transmitters network mask.
- `Set GateWay:` This parameter is the gateway IP address.
- `Set Trap1 Address:` This parameter is the trap receiver 1 IP address.
- `Set Trap2 Address:` This parameter is the trap receiver 2 IP address.
- `Set Buzzer:` Switch on audible indication if the device shows an alarm (ON / OFF)
- `Restore Factory:` Restore factory settings. (Yes or No)

The „Alarm Status“ display

The following alarm messages are displayed:

- `RF In Status:` RF low level alarm
- `Laser Temp:` laser temperature alarm
- `Laser Bias:` laser bias current alarm
- `Laser Tec:` laser cooling current alarm
- `Output Alarm:` optical output power alarm
- `Power Invalid:` power supply (left or right) failure
- `+5 V Alarm:` +5 V alarm
- `-5 V Alarm:` -5 V alarm
- `+24 V Alarm:` +24 V alarm

Configuring the device via web interface

Logging in

To login in the web interface, check first the IP address of the device. The device IP address could be set or viewed via the LCD front panel.

Connect your computer to the same IP subnet as the transmitter. With a ping test make sure that physical connection via the IP Network is obtained.
With any Web browser you can type in the address line of the browser the IP address of the transmitter.

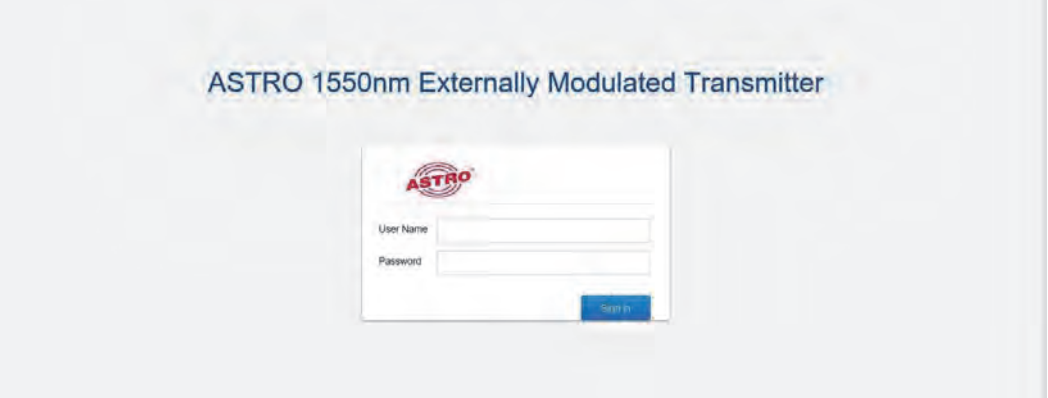


Figure 7: Login

Log in with the following data:

User name: admin
Password: 123456

Display parameters via web interface

On the „Display Parameters“ page the device status and data will be displayed, such as:

- device indication, serial number and MAC address
- laser power and internal parameters such as Laser Bias, Laser temperature and TEC cooler current
- the optical modulation index: OMI (rms)
- internal voltage information for the internal DC power generation
- device temperature, SBS board temperature, MCU board temperature

Module Parameter

Parameter	Value	Parameter	Value
Device Model:	OEMTX-08	Serial Number:	160621005100
Optical Power:	8.4 dBm	Laser Bias:	127.1 mA
Laser TEC:	-40 mA	OMI(rms):	0.4%
Laser Control:	ON	+5V:	4.9 V
-5V:	-5.0 V	+24V:	23.2 V
+12V:	11.9 V	-12V:	-11.6 V
MCU Temperature:	46.7 °C	SBS Temperature:	32.6 °C
Device Temperature:	28.7 °C	MAC Address:	30.71.b2.40.ec.f6

Figure 8: Parameters displayed

Modify parameters via web interface

On the „Modify Parameters“ page the device setting can be changed such as:

Figure 9: Modifying parameters

- `Channel Distance:` A channel distance of 6/7/8 MHz is selectable. This is used for the CSO to find the CSO peaks (which depends on the channel distance) and can optimize the performance.
- `RF Mode:` In most cases the user does not need to adjust the RF mode.The setting that can be applied to nearly all applications is the AGC mode.
  In the AGC mode the RF input signal will be attenuated by the optical transmitter in a way, that the OMI will be the maximum regarding the physical performance optimization of the transmitter .In AGC mode the laser will not be under modulated nor over modulated.
  In the MGC mode the user has the responsibility to setup input RF attenuation via the parameter “MGC ref” from 0dB ..15dB in a way, that the laser will operate in a good condition. MGC could be applied for example, if the user wants to reduce the OMI in advance, since later some more channels will be added, which would cause the OMI to be lower in AGC mode. This is to avoid the readjustment of fibre nodes RF output level.
- `AGC Ref:` With the AGC reference, the OMI can be reduced (additional attenuation of 0 ..3dB of the input signal).
- `MGC Ref:` If the transmitter is running in manual gain control (MGC mode), the user can setup the attenuation of the RF signal between 0 ..15dB with MGC reference. In this case the user has direct influence to the transmitters OMI itself. Please be aware that with this mode the operator is fully responsible to achieve a good CSO/CTB and also CNR performance, since if set wrong, the performance of the transmitter will be low due to over or under modulation.
- `Laser Control:` With laser control the laser can be switched off (for example for installation or maintenance purposes) or switched on again.
- `Set ITU:` The laser can be tuned from its nominal frequency (or wavelength) 50 GHz higher or lower to the next ITU channel.
- `Set SBS:` The SBS threshold of the transmitter can be set in a range from 13.0 dBm to 19.0 dBm. Standard factory setting is 16.0 dBm, which will be fine for most applications and network concepts. In the rare case of Ultra-Long Haul Transmission, it is always better to run the fibre with a low optical power (EDFAs with 13dBm). In this case the transmitter can have a better performance, if SBS is set to a lower value than the 16.0 dBm nominal value. In terms of FTTH networks, where very high optical powers >16 or 17 dBm is fed in the optical fibre, the transmitter can reach a higher performance if the value of the SBS threshold is increased. In principle SBS depends very much on physical network parameters, such as
  - total optical fibre length for all segments (a segment is meant here amplifier +fibre length)
  - attenuation within the network due to patching or splicing
  - inserted optical power of a link span (EDFA power and segment length)
  - number of cascaded segments
  - etc.

  so that a prediction is very hard to be calculated in advance. If the user experiences a performance problem within such a special network, it is recommended to try to achieve a higher performance via the SBS setting.

Modifying the password

This panel is used to modify the user name or password. Type in the current user name and password to modify this.
Confirmation of the new password is required.

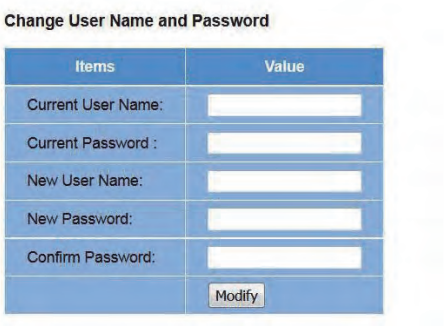


Figure 106: Modifying the password

Troubleshooting

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

- ☐ Check whether the device is connected to the required mains voltage (230 V~, 50 Hz).
- ☐ Check whether the signal cable is connected correctly, and that there are no breaks or short circuits in the connectors.

If the problem cannot be resolved, please contact the ASTRO customer service.

Maintenance and repair

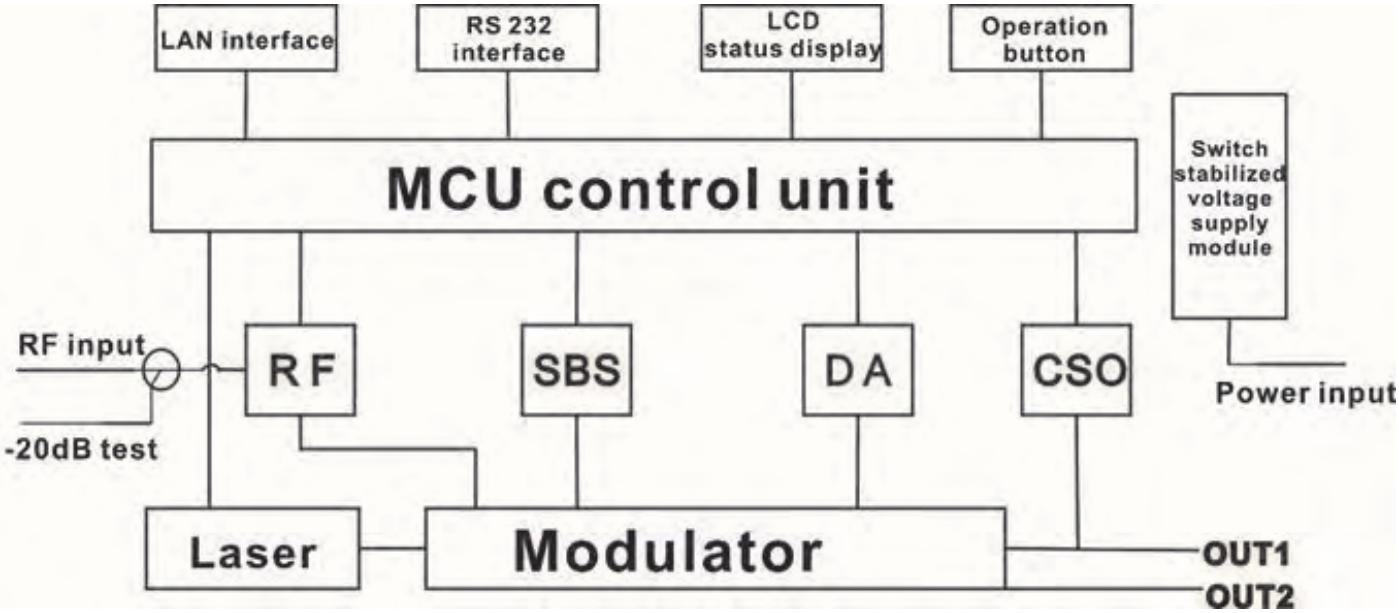
ACHTUNG: ***The following safety information must be observed when performing maintenance and repair work. Failure to observe this safety information may result in personal injury due to electrical and thermal dangers!***

- ☐ 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.
- ☐ Housing components near the cooling fins at the rear, or actual the cooling fins, may become very hot.
- ☐ 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.

Service tasks

HINWEIS: *The device must only be operated with the original power module!*

Block diagram



Technical data

Type		OEMTX-1550-07	OEMTX-1550-08	OEMTX-1550-10
Order number		212 007	212 008	212 009
EAN-Code		4026187193010	4026187193027	4026187193034
RF and optical characteristics				
Optical output power	[dBm]	2 x 7,0	2 x 8,0	2 x 10,0
Optical input wavelength	[nm]	1550nm (or according ITU grid 1545 .. 1560 nm)		
Relative intensity noise	[dB/Hz]	≤ -160		
Laser linewidth	[MHz]	0,3		
SBS suppression	[dBm]	13,0...19,0 in 0,5 dB steps		
Modulation type		external modulated		
Wavelength adjustment range	[GHz]	± 50		
Peak OMI/channel for PAL84 signal	[%]	3		
Number of optical output ports		2		
Flatness over total frequency band	[dB]	± 0,75		
Optical connector type		2 x SC/APC (other on request)		
Frequency range	[MHz]	47 - 1006		
RF input level range (AGC working range)	[dBµV]	78 - 96 (in AGC mode with modulated signal, AGC offset = 0)		
Rated input RF signal level	[dBµV]	80		
RF Input Impedance	[Ω]	75		
RF input return loss	[dB]	≥ 16		
CTB*	[dB]	≥ 65		
CSO*	[dB]	≥ 63		
C/N*	[dB]	≥ 53		
Common data				
Management		SNMP and web interface		
Chassis type		1 RU, 19" rack mounted		
Power supply	[pcs]	2 hot plug / AC or DC		
AC Power supply	[VAC]	90 - 265		
DC Power supply	[VDC]	-36 .. 72 (on request)		
Power consumption	[W]	≤ 60		
Dimensions (W x H x D)	[mm]	483 x 44 x 380 (1 RU)		
Ambient temperature	[°C]	-5 .. +55 (ETSI EN 300019-3 Class 3.2)		
Relative humidity	[%]	0 -95 no condensing		

*) measured at 65km fibre length, one EDFA with 16dBm, optical receiver input level 0d Bm with 8 pA/Sqrt Hz, 42 analogue channels (CENELEC42)

ASTRO Strobel Kommunikationssysteme GmbH

These operating instructions have been written by:
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