

Unifiber™

Transmitting system

IDLF-TX6001-WXXXX-OPR

Item 6111 / 6112 / 6116 / 6117 / 6118 / 6119

User manual

1 .The transmitting system

OPTICAL TRANSMITTER: 6111 (1550NM) / 6112 (1310NM)
DTT PROCESSING UNITS: 6118 (UHF 470-790 MHZ) / 6119 (UHF 470-694 MHZ)
WIDEBAND LNB: 6116 (10.40 GHZ LO) / 6117 (10.41 GHZ LO)

SYSTEM DESCRIPTION

The optical transmitter (6111/6112) is intended to distribute SAT IF and DTT, FM, DAB signals through a fiber optic. Transmitted SAT IF signal 290-2350 MHz is collected from wideband LNB, DTT, FM, DAB signals are collected from DTT processing units (6118/6119).

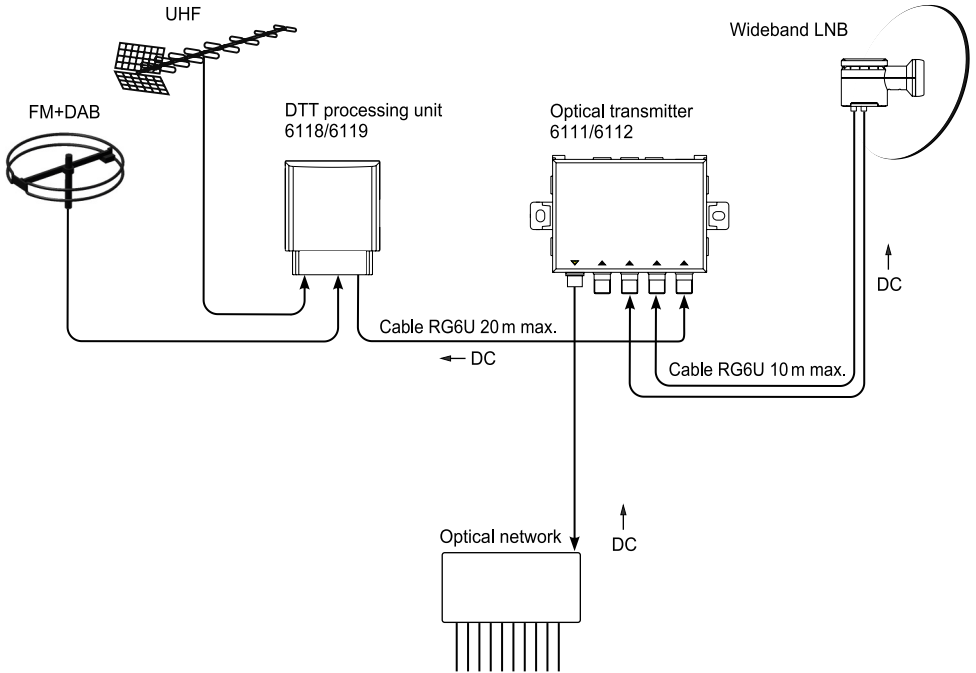


Figure 1. - Application

This optical transmission system is not compatible with optical receivers of other manufacturers with similar functionality. The transmitting system is only compatible with Inverto optical receivers.

SAFETY INSTRUCTIONS

Installation of the products must be done according IEC60728-11 and national safety standards. The products are powered from 10 - 20 V DC. This voltage is not dangerous to life. Any repairs must be done by a skilled personnel.

To ensure safe operation of the products follow these instructions:

- Do not supply power until all cables have been connected correctly.
- To disconnect the products completely, disconnect plug of power supply from the mains socket.
- The mains socket must be easily accessible.
- Avoid placing the products next to central heating components, near highly combustible materials and in areas of high humidity.
- The ventilation should not be impeded by covering the products with items, such as newspapers, table-cloths, curtains.
- From top, front and bottom of installed products must be at least 5 cm free space.
- The products should be mounted with connectors underneath to avoid the water ingress inside.

SAFETY OF LASER PRODUCT



Optical transmitter module contains laser diode sources. These devices are rated under IEC60825-1:

“Safety of Laser Products”, Part 1: Equipment classification and requirements as CLASS 1M laser product.

When operating the equipment note the following:

- Most fiber optic laser wavelengths are totally invisible to the eye and will cause permanent eye damage. Never look into the end of a fiber on a powered device through a magnifying device (microscope, eye loupe, magnifying glass, etc.). Before using such devices always double check that power is disconnected or, if possible, completely disconnect the unit from any power source.
- To verify the light output always use an instrument, such as an optical power meter.
- Operate only with the proper optical fiber installed in the device optical connector.
- Whenever the optical connector is empty the laser transmitter should be turned off.
- Before applying power always connect a fiber to the output of the device.
- Never leave equipment with radiating bare fibers accessible - always cap the connectors.



This product complies with the relevant clauses of the European Directive 2012/19/EC. The unit must be recycled or discarded according to applicable local and national regulations.



Equipment intended for indoor usage only.



Functional grounding. Connect to the main potential equalization.



This product is in accordance to following norms of EU: EMC norm EN50083-2, safety norm EN62368-1 and RoHS norm EN50581.



This product is in accordance with Custom Union Technical Regulations: “Electromagnetic compatibility of technical equipment” CU TR 020/2011, “On safety of low-voltage equipment” CU TR 004/2011.



The product has integrated LTE filter.



The UKCA mark which is attached to these products means it conforms to the essential requirements of the UK Electromagnetic Compatibility Regulations 2016, Electrical Equipment (Safety) Regulations 2016 and UK RoHS Regulations 2012.

2. Optical transmitter

PRODUCT DESCRIPTION

The optical transmitter 6111 (1550nm) / 6112 (1310nm) is intended to convert SAT IF and DTT, FM, DAB to optical signals for future distribution through a fiber optic. The transmitter is compatible with Inverto optical receivers.

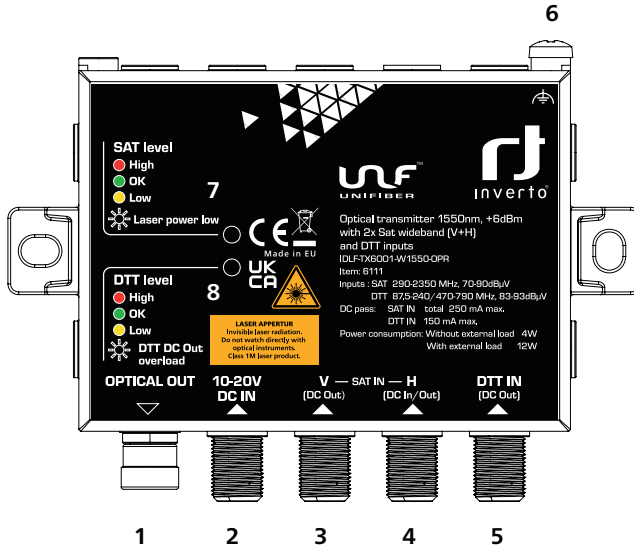


Figure 2. External view of the transmitter


1. OPTICAL OUT - optical output. FC/UPC connector.
2. DC IN - +10...+20 V DC powering input and communication port with programmer. F socket.
3. V, DC OUT- SAT IF vertical polarization input, DC output. F socket.
4. H, DC IN/OUT- SAT IF horizontal polarization input, DC input/output. F socket.
5. DTT, DC OUT - DTT input from 6118/6119, DC output. F socket.
6. Functional grounding clamp
7. SAT input level and laser status indicator:

Red – too high
 Green – correct (AGC range)
 Yellow – too low
 Blinking any color - laser aging or failure.

8. DTT input level and DTT DC output status indicator:

Red – too high
 Green – correct (AGC range)
 Yellow – too low
 Blinking any color - DTT DC output overload.

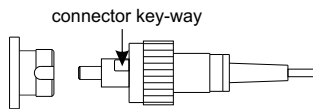
REQUIREMENTS FOR EXTERNAL POWER SUPPLY UNIT (PSU)

- Output voltage 10 - 20V DC
- Output current Recommended to use PSU with 50% extra power reserve
- Ripple at single and/or double mains frequency < 10 mV p-p
- Ripple & noise < 200 mV p-p
- Short circuit protection
- Double insulated (marked )
- Meet EN 55022 class B conducted emissions requirements, measuring with grounded load

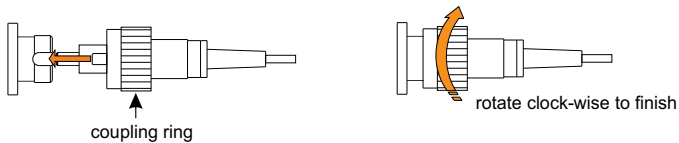
OPTICAL CONNECTIONS

Note: All optical connectors and adaptors should be cleaned before connecting them. If optical reception power of the receiver decrease, fiber connection should be cleaned and maintained. Reel cleaners or prepackaged lint free wipes or swabs with alcohol are the most convenient means of cleaning optical connectors. Fiber connectors should never be left uncovered.

1. Align the FC/UPC connector key-way (type R) with the receptacle key-way.



2. Push firmly to locate the key-ways and then rotate the coupling ring.



3. Do not exceed the minimum bending radius of fibers: must be not less 30 mm when connecting optic cable to the system.

INSTALLATION INSTRUCTIONS

Read the safety instruction first.

The unit is dedicated for indoor installation and shall not be exposed to dripping or splashing water. For outdoor installation use appropriate box. We recommend to put this box in shadow of the SAT dish to protect from direct sun radiation. The laser is highly sensitive to overheating.

TECHNICAL SPECIFICATIONS

Item	6111 (1550nm) / 6112 (1310nm)	
Satellite inputs		
Frequency range	V input	290-2350 MHz
	H input	290-2350 MHz
Input return loss / impedance		> 12 dB / 75 Ω
RF input level (AGC range) for 60 transponders		70-90 dBμV (per carrier)
LNB remote feeding		10-20 V 250 mA max. total
Terrestrial input		
System frequency range**		87.5-240 / 470-790 MHz
RF input level***		83 dBμV / 83-93 dBμV (per channel)
Input return loss / impedance		> 12 dB / 75 Ω
Remote feeding		10-20 V 150 mA max.
Optical output		1550nm (item 6111) / 1310nm (item 6112)
Optical return loss		> 50 dB (without connector)
Main characteristics		
Supply voltage		10 - 20 V
Power consumption*		4W max.
Operating temperature range		-20 ÷ + 40 °C
Dimensions/Weight (packed)		116x84x25.5 mm/0.28 kg

* Without remote feeding

** The set with 6118/6119

*** FM level the same like DTT, DAB level 12 dB below

Remotely monitored parameters (requires an optional programmer sold separately).

- DC voltages on V,H and DTT inputs
- Internal temperature
- Laser status
- V polarity RF power per channel (average)
- DTT input UHF RF power per channel (average)

Parameters of connected 6118/6119:


- Supply voltage
- Internal temperature
- UHF input RF power per channel (average)
- Number of UHF channels

When the 6118/6119 rotary switches are set to position "0", the number of DTT channels in the UHF band can be set remotely.

3. DTT processing units

PRODUCT DESCRIPTION

Masthead DTT processing units 6118/6119 are intended for operation with optical transmitter 6111/6112.

The units are converting UHF DTT channels and through pass FM and DAB signals and feature a built-in LTE 700/800 suppression filter . The units can be used in outdoor conditions as well.

External view of 6118/6119

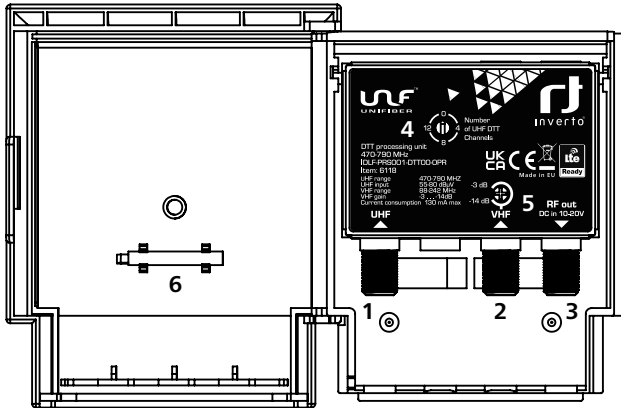




Figure 3. - External view of the units

1. UHF - DTT input
2. VHF - FM, DAB/DTT input
3. RF OUT / DC IN - RF output / +10...+20 V DC powering input
4. UHF DTT channels number setting rotary switch
5. FM, DAB level regulator
6. Screwdriver

INSTALLATION INSTRUCTIONS

- Read the safety instruction first.
- For outdoor installation.
- The length of the cable between the DTT processing unit (6118/6119) and the optical transmitter (6111/6112) must be less than 20 m of RG6U type.
- Set the number of DTT channels in UHF band with rotary switch (pos. 4, Figure 3) before fitting unit on mounting place. Good equalization of UHF DTT channels improve system performance.
- Using regulator 5 (see Figure 3) set the DAB and FM signals level on 6111/6112 input precisely.

TECHNICAL CHARACTERISTICS

Item	6119	6118
RF inputs		
VHF gain / input level	87.5-240 MHz	-3...-14 dB adjustable, passive min. 86 dB μ V, max. 97 dB μ V**
UHF input level	470-694 MHz	55-80 dB μ V* 
	470-790 MHz	55-80 dB μ V* 
UHF noise figure		< 5 dB
UHF AGC range		25 dB
RF output		
Output level UHF, AGC range, 8 DTT channels		93 dB μ V
Main characteristics		
Return loss		> 10 dB
Supply voltage		10 - 20 V
Current consumption		130 mA max.
Operating temperature range		-20° \pm +50° C
Dimensions/Weight (packed)		89x107x432 mm/0.18 kg

* AGC range

** See requirements for 6111/6112 DTT input

Remotely monitored parameters are:

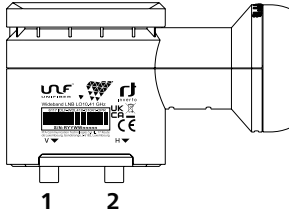
- Supply voltage
- Internal temperature
- UHF input RF power per channel (average)
- Number of UHF channels set by rotary switch if it is not in position "0". If rotary switch is in position "0", the number of UHF channels can be set by a programmer device (sold separately).

4. Wideband LNB

PRODUCT DESCRIPTION

Wideband 40 mm low noise down converter units 6116 (LO 10.40 GHz)/6117 (LO 10.41 GHz) are dedicated for operation with the Inverto optical transmitter (item 6111 for 1550nm or 6112 for 1310nm).

External view of wideband LNB:



- 1. V - SAT IF V polarization output, DC input
- 2. H - SAT IF H polarization output, DC input

Figure 4. External view of the wideband LNB

INSTALLATION INSTRUCTIONS

- Read the safety instruction first.
- For outdoor installation.
- The length of the cable between the Wideband LNB and optical transmitter must be less than 10 m of RG6U type.
- We recommend to use relatively bigger dishes to ensure better MER value of the transmitted signals.

TECHNICAL CHARACTERISTICS

Item		6116	6117
Input frequency range		10.7 - 12.75 GHz	
Noise figure		0.7 dB typical, 1.0 dB max.	
LO frequency		10.4 GHz	10.41 GHz
LO initial accuracy		± 500 kHz	
LO temperature drift		± 250 kHz	
LO phase noise		< - 75 dBc/Hz @ 10 kHz	
Conversion gain, typical		55 dB	
Gain variation full band		4 dB max.	
Gain variation over 27 MHz		± 0.5 dB	
Image rejection		40 dB min	
Cross-pol isolation, typical		22 dB	
Output impedance/return loss		75 Ω / 12 dB	
Output frequency range	V output	300-2350 MHz	290-2340 MHz
	H output	300-2350 MHz	290-2340 MHz
Supply voltage		20 V 0.1 A	
Power consumption		2 W max.	
Operating temperature range		-30° ÷ + 60° C	
Dimensions/Weight (packed)		141x89x63 mm / 0.35 kg	

Notes

A series of horizontal dotted lines for writing notes.



For purpose of brevity, some product descriptions in this sheet remain at platform level and may not be referred to as detailed datasheets of the products. Inverto Digital Labs reserves the right to amend, omit or add products, product-lines, and / or features without notice. As product specifications may change without notice, always contact Inverto to obtain the latest product specification sheets.

For further details contact: sales@inverto.tv

FTA Communication Technologies S.à.r.l | Tel. +352 264 367 1 | Fax. +352 264 313 68
17 Route de Luxembourg, Gonderange, L-6182, Luxembourg

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