

TETRA 40x0

Four Channel Digital Video Multiplexer

USER MANUAL

1. General description

TETRA 40x0 (4010 for multimode, and 4050 for single-mode) digital optical multiplexer/demultiplexer systems can transmit four unidirectional, independent composite video signals via one optical fiber. The video input signals are sampled and digitised with 10-bit accuracy.

The TETRA 40x0 TX unit receives input via the four BNC connectors. It then converts and combines the four composite video channels into one serial digital data stream. This, in turn, is converted into an optical signal. The composite video channels are digitally clamped after being AC coupled at the inputs. The digital clamp is compatible with NTSC and PAL sync timing. The video channels are not compatible with non-video (NTSC and PAL) signals.

The TETRA 40x0 RX unit receives, converts and decodes the incoming optical signal to recover the four individual composite video channels. The output is disseminated via the four BNC connectors

Front panel LEDs indicate the status of DC power OK, video signal presence and link synchronisation (RX only).

TETRA 40x0 units are single-width (7E), Eurocard-sized modules and should be used in combination with MC 11 or similar power supply cabinets.

Stand-alone models (/SA option, see supplementary /SA-2 manual) need separate 12 Vdc power supplies. A TKH Security PSA 12 DC-25 would be suitable.

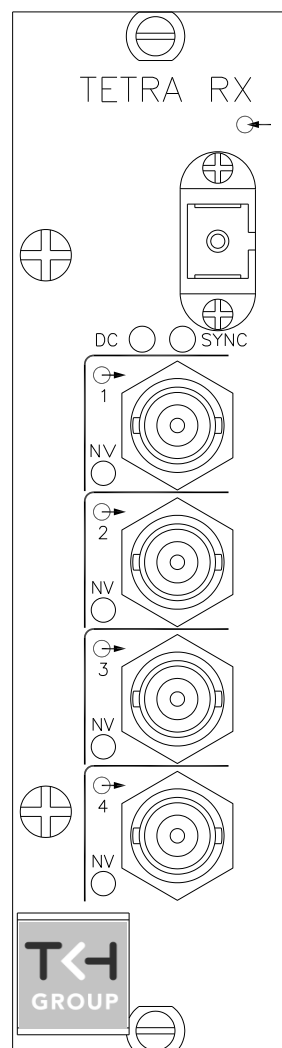


Figure 1. TETRA 40x0 RX Front Panel TX panels look similar, with video inputs instead of outputs. See Table 1.

2. Indications and connectors

Table 1 lists the front panel features of TETRA40x0 modules (refer to figure 1).






TETRA40x0 TX		
	(SC/UPC connector)	Optical out
	(BNC connector) 1-4	Composite video input
TETRA40x0 RX		
	(SC/UPC connector)	Optical in
	(BNC connector) 1-4	Composite video output
TETRA40x0 TX and RX		
	(2x)	Front panel screws
Status indicator LEDs		
SYNC (RX only)	(red)	No sync from optical in, or no internal sync
	(green)	All sync OK
DC	(green)	DC power OK
NV	(red)	TX: no video in RX: no video out

Table 1. TETRA 40x0 TX/RX front panel features

3. Installation

1. Plug the modules into the appropriate power supply cabinet (or hook up the /SA-2 models to corresponding power supplies) and connect suitable video and optical fiber equipment using appropriate cabling.

CLEAN THE OPTICAL FIBER CONNECTORS PRIOR TO INSERTION INTO THE OPTICAL PORT. Equipment and cabling should be installed and earthed such that protection is provided against lightning and similar influences.

2. Upon powering up, the green DC LEDs and SYNC LED (on the RX) should glow green, indicating link integrity. If the RX SYNC LED shines red, there is no link synchronisation. If SYNC problems occur after powering up, first check the received optical power arriving at the RX unit using an optical power meter.

3. With the optical link in good order, connecting a video signal should make the corresponding channel's TX and RX NV (no video) LEDs go out.

An RX NV LED still lit would indicate that no decodable video signal is arriving through the associated channel.

4. Care and maintenance

For reliable operation of TETRA 40x0 modules, observe the following precautions:

- Prevent dust from collecting on the equipment
- Protect the equipment against moisture
- Maintain sufficient free space around the equipment for cooling.

5. Technical specifications

In the following Optical specifications section:

- 4010 refers to a TETRA 4010 TX / RX pair for multimode operation.
- 4050 refers to a TETRA 4050 TX / RX pair for single-mode operation

Optical	4010	4050	Unit
TX Output Wavelength	1310	1310	nm
TX Output Power	>-4	>-4	dBm
No. of fibers, fiber type	1, MM	1, SM	
RX Min.Input Power	-24	-31.5	dBm
System Link Budget	20	27.5	dB
Link Length, Max	4*	62	km

*Due to fiber bandwidth, the maximum transmission distance may be limited.

Table 2. TETRA 40x0 TX/RX Optical Specifications

The technical specifications of the TETRA40x0 system are listed in Table 3 below.

TETRA type	4010	4050	
Video			
No. of channels	4		
Video format	PAL/NTSC		
Input/Output level	1, nominal		Vpp
DC restore (clamping)	Yes		
Bandwidth (-3 dB)	6		MHz
Sampling res @ freq.	10 bit @56 MHz		
Differential gain	<2		%
Differential phase	<1		°
Group delay	<20		ns
SNR	>63 (wtd.)		dB
Environmental and Safety			
Operating temp.	-40 to +74		°C
Relative humidity	< 95% (no condensation)		
MTBF	>200,000		hrs
Electrical safety	AL / IEC / EN 60950-1		
UL recognition file	E242498		
Laser safety	IEC 60825-1, IEC 60825-2		
EMC immunity	EN 55024, EN 50130-4, EN 61000-6-2		
EMC emission	EN 55022 (Class B) FCC 47 CFR 15 (Class B)		
Electrical			
Supply voltages	12-15 (/SA)		Vdc
Power consumption	2.1 typ., 2.6 max.		W
Current	175 @ 12 V		mA
Mechanical			
Optical connector	ST/PC	SC/UPC	
Video connector	BNC 75 Ω		
Dimensions	HxWxD =128 x 35 x 190		mm
Weight (approx.)	490		g

Table 3. TETRA40x0 TX/RX Technical Specifications

6. Safety, EMC, ESD

General

The safety information contained in this section, and on other pages of this manual, must be observed whenever this unit is operated, serviced, or repaired. Failure to comply with any precaution, warning, or instruction noted in the manual is in violation of the standards of design, manufacture, and intended use of the unit.

Installation, adjustment, maintenance and repair of this equipment are to be performed by trained personnel aware of the hazards involved. For correct and safe use of the equipment and in order to keep the equipment in a safe condition, it is essential that both operating and servicing personnel follow standard safety procedures in addition to the safety precautions and warnings specified in this manual, and that this unit be installed in locations accessible to trained service personnel only.

Sigura assumes no liability for the customer's failure to comply with any of these safety requirements.

UL/IEC/EN 60950-1: General safety requirements

The equipment described in this manual has been designed and tested according to the UL/IEC/EN 60950-1 safety requirements.

If there is any doubt regarding the safety of the equipment, do not put it into operation. This might be the case when the equipment shows physical damage or is stressed beyond tolerable limits (e.g. during storage and transportation).

Before opening the equipment, disconnect it from all power sources. The equipment must be powered by a SELV[®] power supply.

When this unit is operated in extremely elevated temperature conditions, it is possible for internal and external metal surfaces to become extremely hot.

Optical safety

This optical equipment contains Class 1M lasers or LEDs and has been designed and tested to meet IEC 60825-1:1993+A1+A2 and IEC 60825-2:2004 safety class 1M requirements.

Optical equipment presents potential hazards to testing and servicing personnel owing to high levels of optical radiation. When using magnifying optical instruments, avoid looking directly into the output of an operating transmitter or into the end of a fiber connected to an operating transmitter, or there will be a risk of permanent eye damage. Precautions should be taken to prevent exposure to optical radiation when the unit is removed from its enclosure or when the fiber is disconnected from the unit. The optical radiation is invisible to the eye.

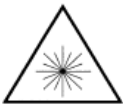
Use of controls or adjustments or procedures other than those specified herein may result in hazardous radiation exposure.

The installer is responsible for ensuring that the label depicted below (background: yellow; border and text: black) is present in the restricted locations where this equipment is installed.



The locations of all optical connections are listed in the Indications and Connectors section of this manual.

Optical outputs and wavelengths are listed in the Technical Specifications section of this manual.



LASER RADIATION
DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS (MAGNIFIERS).
CLASS 1M LASER PRODUCT

CAUTION:
DISCONNECTED OPTICAL CONNECTORS MAY EMIT OPTICAL ENERGY.
DO NOT VIEW BEAM WITH OPTICAL INSTRUMENTS (MAGNIFIERS).

This product contains Class 1M lasers or LEDs.

- Class 1M laser product according to IEC60825-1:1993+A1+A2
- **CAUTION: Use of controls or adjustments or procedures other than those specified herein may result in hazardous radiation exposure.**
- Precautions should be taken to prevent exposure to optical radiation when the unit is removed from its enclosure or when the fiber is disconnected from the unit.
- Laser radiation may be present on a fiber connection to this unit even when the power has been removed from the unit.
- This unit is intended for installation in locations where only trained service personnel have access to the fiber connections.
- The locations of all optical connections are listed in the Connection Locations and Function section of this manual.
- Optical outputs and wavelengths are listed in the Specifications section of this manual.

EMC

Warning: Operation of this equipment in a residential environment could cause radio interference.

This device has been tested and found to meet the CE regulations relating to EMC and complies with the limits for a Class A device, pursuant to Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. These limits are designed to provide reasonable protection against interference to radio communications in any installation. The equipment generates, uses, and can radiate radio frequency energy; improper use or special circumstances may cause interference to other equipment or a performance decrease due to interference radiated by other equipment. In such cases, the user will have to take appropriate measures to reduce such interactions between this and other equipment.

Note that the warning above does not apply to TKH Security products which comply with the limits for a Class B device. For product-specific details, refer to the EU Declaration of Conformity.

Any interruption of the shielding inside or outside the equipment could make the equipment more prone to fail EMC requirements.

To ensure EMC compliance of the equipment, use shielded cables for all signal cables including Ethernet, such as CAT5E SF/UTP or better, as defined in ISO IEC 11801. For power cables, unshielded three wire cable (2p + PE) is acceptable. Ensure that *all* electrically connected components are carefully earthed and protected against surges (high voltage transients caused by switching or lightning).

ESD

Electrostatic discharge (ESD) can damage or destroy electronic components. Proper precautions should be taken against ESD when opening the equipment.

^{*)} SELV: conforming to IEC 60950-1, < 60 Vdc output, output voltage galvanically isolated from mains. All power supplies or power supply cabinets available from Siquira comply with these SELV requirements.

7. Product Disposal

Recycling



The unit contains valuable materials which qualify for recycling. In the interest of protecting the natural environment, properly recycling the unit at the end of its service life is imperative.

8. EU Declaration of Conformity

The EU Declaration of Conformity for this product is available at <http://www.tkhsecurity.com/support-files>.