

VDS 2200 TX, VDS 2210 TX and VDS 2240 TX

Optical Video Transmitters/Data Transceivers

USER MANUAL

1. General description

A VDS 22x0 TX unit converts a composite video signal into an optical equivalent to be transmitted over optical fibre. Additionally, it will optically receive and transmit data signals, converting these into respectively from the electrical equivalents. Optical data transmission does not depend on the presence of a video signal. All signal transmission is transparent; video signal levels are held in check by video clamping.

The VDS 2200 TX, working with an optical wavelength of 850 nm over multimode optical fibre, and the VDS 2240 TX, which works with 1300 nm over single-mode fibre, use separate fibres for video/data transmission and data reception respectively.

One multimode optical fibre only is used by the VDS 2210 TX. This unit transmits video-optical and data signals at 850 nm and receives data-optical signals at 1300 nm.

Electrical data I/O is full-duplex RS-485 (RS-422, current loop/TTY and biphase compatible) using four wires, or half-duplex using two; tri-state detection is automatic. Apart from setting up and wiring for one of these connection types, no adjustments need be made on installation.



A status LED indicates the operational status of the optical data input.

These stand-alone units need a PSA 12 DC; for harsh environments a PSU 12 DC is recommended.


2. Indications and connectors

VDS 22x0 TX indications (on top of the housings) and connectors, distributed over a 'front' and a 'rear' panel (see also figure 1) are listed in table 1.

VDS 2200, 2240 TX front

 (ST connector)	Optical video/data output
 (ST connector)	Optical data input
2-pin mini-Combicon connector	DC power supply

VDS 2210 TX front

 (ST connector)	Optical video out & data I/O
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Rear panel, all models:




 VIDEO (BNC connector)	Composite video output
 DATA (Combicon conn.)	RS-4xx out
 (Combicon conn.)	RS-4xx in
Status indicator LEDs:	
*DC (green)	Power supply OK
*DR (green)	Data received (optical)

Table 1. VDS 22x0 TX indicators and connectors

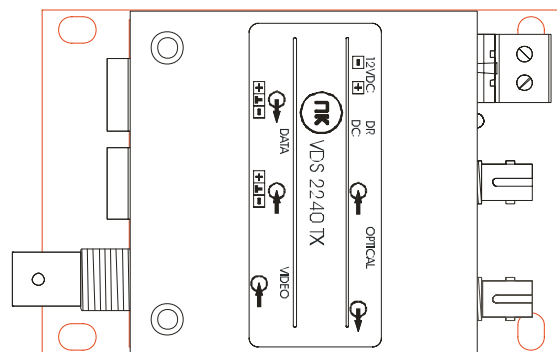
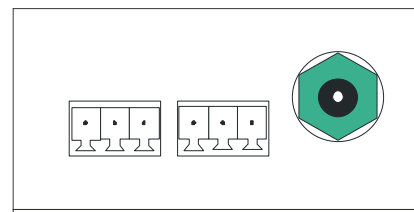
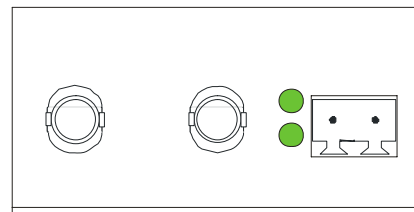


Figure 1, top to bottom: VDS TX front (2-fibres), rear, and plan (2-fibres). One-fibre units do not have the outer optical connector.



3. Configuration and installation

Before installing the system, RS-485 connections must be configured for 2-wire or 4-wire. This involves opening the housing by taking out the two top screws indicated in figure 1, taking off the cover and setting a jumper (strap). Figure 2 details the positions of this jumper on the board and the associated serial connection types. The jumper is factory set for 4-wire connections.

For 2-wire RS-485 connections, DATA **in+** should be tied to **out+**, and also DATA **in-** to **out-**.

Current loop applications should use the non-inverting I/O lines and signal ground, without connecting inverting inputs and outputs.

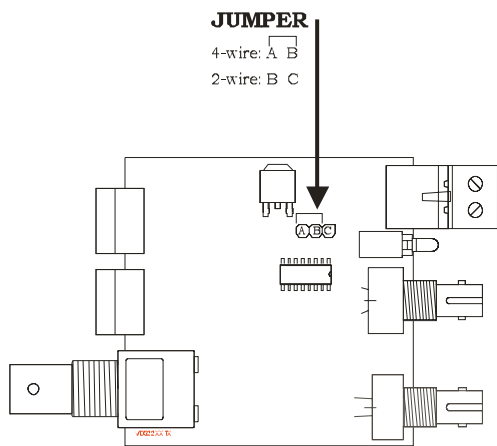


Figure 2.
Jumper positions on a VDS 22x0 circuit board; they are similar for a one-fibre unit.

The closed unit then can be mounted on any flat surface, for instance in camera housings or other outdoor cabinets. After connecting cabling (see figure 1 for pin assignments) and powering up, at least the green DC LED should light.

4. Care and maintenance

VDS modules are designed to be maintenance free. In order to guarantee reliable operation of the unit, please observe the following precautions:

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

5. Technical specifications

The technical specifications of VDS 22x0 TX units are given in table 2 below.

VDS TX type →	2200	2210	2240	
Optical				
No. of fibres/fibre type	2/MM	1/MM	2/SM	
(fibre thickness)	(50 μ)	(50 μ)	(9 μ)	
Optical wavelengths	850/	850/	1300/	nm
video/data	850	1300	1300	
Optical budget to RX	12*	10*	10	dB
* +4 dB w. 62.5 μ fibre	(system)	(system)	(system)	
TX min. input level	-42	-47	-47	dB
Video				
Format	PAL, NTSC, SECAM			
Input level	1 ± 3 dB			V _{pp}
Bandwidth (±3dB)	6			MHz
Differential gain	<5			%
Differential phase	<5			°
Group delay	50			ns
SNR over budget	>60 .. 45			dB
Data				
Format	RS-485 (RS-422), biphas, CL/TTY			
Rate	DC .. 64**			kbit/s
Environmental and safety				
Temperature				
Full performance	-15 .. 55			°C
Operational	-30 .. +70			°C
Humidity	<90			%
EMC	EN 50081-1, 50082-1			
Electrical				
Power requirements	1.1			W
Current	0.15			A
Power voltages	+12			V _{DC}
Mechanical				
Optical connector(s)	ST (2x)	ST	ST (2x)	
Video connector	BNC 75 Ω			
Data connectors	3-pin mini-Combicon (2x)			
Power connector	2-pin mini-Combicon			
Dimensions (h x w x d)	32.5 x 60 x 90			mm
Weight	0.120			kg

** Manchester/biphase: 32 kbit/s max.

Table 2. VDS 22x0 TX 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.

Optelecom-NKF 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 fibre 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.

EMC

The equipment has been tested and found to meet the CE-regulations relating to EMC, and complies with the limits for a Class B device, pursuant to Part 15 of the FCC rules.

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.

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

Non-video signal lines must use appropriate shielded CAT5 cabling (S-FTP), or at least an equivalent.

If system components, such as cabling (e.g. coaxial cable, data/audio/cc wiring) and/or the units, are used outdoors, 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, <60V_{DC} output, output voltage galvanically isolated from mains. All power supplies or power supply cabinets available from Optelecom-NKF 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.

