# VBS 2020 TX and VBS 2050 TX

Stand-alone optical video transmitters

**USER MANUAL**

## 1. General Description

An optical video baseband transmitter VBS 2020 or 2050 TX converts an electrical composite video signal into an optical, intensity modulated equivalent, using AM techniques. The VBS 2020 TX uses an optical wavelength of 850 nm and needs a multimode optical fiber connection, whereas the VBS 2050 TX transmits at 1300 nm and works with single-mode or multimode fiber. In the latter case, at least 10 dB link attenuation is required.

VBS 2020 TX and 2050 TX stand-alone transmitters are designed for use in combination with TKH Security optical receiver modules from the VBS 2000 series – that is, the VBS 2010/2020 and VBS 2040/2050 single and triple receivers, respectively.

The units may be powered with TKH Security's PSA 12 DC power supply; for applications in harsh environments, a PSU 12 DC is recommended.

Other technical specifications are listed in section 4.

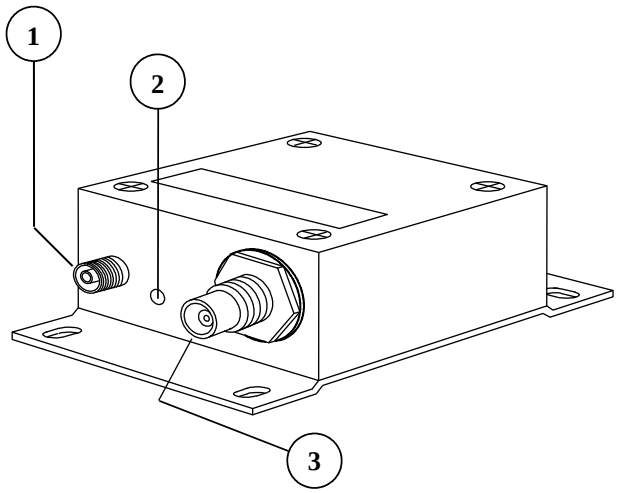


*Figure 1.*
*Stand-alone transmitter VBS 2020 or 2050 TX, perspective view. See section 2 for explanation.*

## 2. Indicators and connectors

Figure 1 shows the signal connection facilities and the indicator on the signal I/O side of a VBS stand-alone transmitter. The green LED (2) signals POWER ON. The optical output has an ST connector (1), while a 75 Ω BNC connector (3) is used for input.

The other side of the unit carries a DC power connector (4, see figure 2). The negative terminal is tied to the housing.

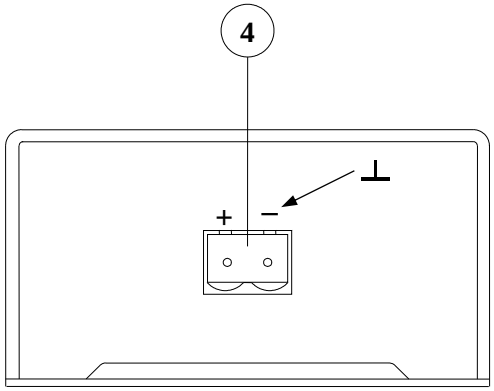


*Figure 2.*
*Stand-alone transmitter VBS 2020 or 2050 TX, with DC power connector. Note that the negative terminal is tied to the housing*

## 3. Installation and maintenance

In some cases, the unit can be fitted inside a camera housing. Use the correct power supply voltage (see section 4, Technical Specifications).

To maintain reliable operation of the module, observe the following:

- Prevent dust from collecting on the unit
- Protect the module against moisture.

*If the output from an optical connection fed by this module is too low, check the optical link first.*

Safety and EMC information is found in the final section of this document.

## 4. Technical specifications

| | VBS 2020 TX | VBS 2050 TX | |
|---|---|---|---|
| ***Optical*** | | | |
| Wavelength | 850 | 1300 | nm |
| Source | LED | LED | |
| Fiber type | 62.5, 50 | 62.5[(1)], 50[(1)], 9 | µm |
| Output level | >-18 | >-28[(2)] | dBm |
| System link budget[(3)] | 16 | 12[(2)] | dB |
| ***Video*** *(with corresponding VBS RX)* | | | |
| Video system | PAL/SECAM/NTSC | | |
| Bandwidth (-3 dB) | 10 | | MHz |
| Differential gain | <5 | | % |
| Differential phase | <5 | | ° |
| Input impedance | 75 | | Ω |
| Input level | 1 (±3 dB) | | Vpp |
| ***Electrical*** | | | |
| Power supply voltage | 12 ± 1 | | Vdc |
| Power consumption | 0.5 | 0.75 | W |
| ***Environmental*** | | | |
| Ambient temperature | | | |
| Full performance | +5 to +45 | | °C |
| Operation | -40 to +74 | | °C |
| Relative humidity | <95 (no condensation) | | % |
| 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) | | |
| ***Mechanical*** | | | |
| Outer dimensions | 33 x 60 x 90 | | mm |
| Weight | 0.140 | | kg |
| Optical connector | ST | | |
| Video connector | BNC | | |
| Power connector | Combicon (2-pin) | | |

[1] Certain restrictions apply, see section 1
[2] Into 9 µm fiber
[3] With matching VBS receivers

*Table 1. Technical specifications of stand-alone optical transmitters VBS 2020 TX and 2050 TX*

## 5. 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.
Siqura 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.

**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 Siqura comply with these SELV requirements.

## 6. 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.

## 7. EU Declaration of Conformity

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

**Accessory**:
- 2-pin Combicon connector