# DVBus 8050-16, 8050-24 and 8050-32

Multiplexer and demultiplexer assemblies for 16-32 video channels

**USER MANUAL**

## 1. Description

DVBus 8050 systems transmit 10-bit digitized video signals over one optical fibre in point-to-point configurations. The systems feature a modular construction, with each video module handling 8 signals; the maximum attainable number of video signals is 64. DVBus 8050 systems with 8, and with 40-64 video channels, are described in separate manuals.

Each multiplexer/demultiplexer module pair uses one optical fibre channel or pipe, running in parallel with others sharing the same optical fibre, with separate access (transmitter) and exit (receiver) fibres. Therefore, a DVBus 8050 system may be regarded as a number of superimposed point-to-point links sharing a common fibre segment. A minimum optical attenuation is required (see table 4).

All optical and power supply equipment needed for a given configuration is built into the packages. DVBus 8050 systems with 16, 24 or 32 video channels come in the form of 19", 3 HU power supply cabinets (MC 11 EB-2) with 7TE and 14TE components installed; only optical fibres (included), power supply cords (included) and video signal cabling need to be connected to a get a system working (see section 3 and the Appendix).

Table 1 below lists the standard 16-32 video channel DVBus 8050 systems available, with their building blocks. The receivers are all identical. For extended ranges, a high-sensitivity RX model (/HS option) is available.

The MC 11 EB-2 power supply cabinet allows for SNM management, for instance using the SNA (SmartNet Agent). For a description of the power supply cabinets themselves, please refer to the MC 11 EB-2 manual.

## 2. Indicators and system connections

The external connection facilities and indicators on the DVBus 8050 TX (transmitter assemblies) and RX (receiver assemblies) are listed in table 2.

The TX front panels also indicate the optical channel used by each transmitter.

OFC units carry type/model identification on their cassette labels.

| | | |
|---|---|---|
| **DVBus 8050 TX units** | | |
| (SC connector) | | Optical video out |
| (BNC connector) 1-8 | | Composite video in |
| **DVBus 8050 RX units** | | |
| (SC connector) | | Optical video in |
| (BNC connector) 1-8 | | Composite video out |
| **Status indicator LEDs** | | |
| ***SYNC** (RX) | (red) | No sync from opt. in |
| ***SYNC** (TX) | (red) | or no internal sync |
| | (green) | All sync OK |
| ***DC** | (green) | DC power good |
| ***NV** | (red) | TX: no video on input<br>RX: no video on output |
| **OFC M and D** | | |
| 2, 3 | | -16: optical I/O channels d,e |
| 2, 3, 4 | | -24: optical channels d,e,f |
| 1, 2, 3, 4 | | -32: channels c,d,e,f |
| COMMON | | common optical input or output |

*Table 2. DVBus 8050-16-32 module front panel features*

## 3. Installation

Figures 1-3 (Appendix) show the internal optical cabling for DVBus 8050-16, -24 and -32 assemblies. The TX and RX OFCs (M and D) are not identical.

- Install the DVBus assemblies in 19" racks.
- *To avoid eye injury, please connect all optical cabling before powering the as follows:*
- Install the optical interconnection cabling supplied as shown in the relevant figures mentioned in table 1 (figures in Appendix).
- Connect optical cabling for the optical link to the COMMON I/O ports on the OFC units.
- Connect the power supply cords supplied to the units and to power outlets.

| Type/no of video chans. | No. of optical sublinks | Optical transmitters (Tx) used | Other equipment | Figures (in Appendix) |
|---|---|---|---|---|
| 16 | 2 | Td, Te | 2xRX[/HS], 2xMC 11 EB-2, 2xOFC | 1a,b |
| 24 | 3 | Td, Te, Tf | 3xRX[/HS], 2xMC 11 EB-2, OFC4-M, OFC4-D | 2a,b |
| 32 | 4 | Tc, Td, Te, Tf | 4xRX[/HS], 2xMC 11 EB-2, OFC4-M, OFC4-D | 3a,b |

*Table 1. DVBus 8050-16/24/32 components. []= optional; for optical wiring see the relevant figures in the Appendix.*

Please manage slack optical cable carefully, so as to avoid mechanical load on the optical connectors.
The multiplexer system now should be active, as shown by DC LEDs glowing green (they may initially flash for a short period of time). The LEDs should appear as follows (table 3):

| *LED* | *Color* |
|---|---|
| DC | green |
| SYNC TX, RX | green |
| NV | red: no good video signal, off: good signal |

*Table 3. LEDs with modules operating correctly.*

SYNC LEDs glowing green indicate correct synchronization information in the optical signal. If a TX SYNC LED glows red, that unit is faulty.

## 4. Technical Specifications

Table 4 below lists the main specifications of DVBus 8050 systems.

| | | | | |
|---|---|---|---|---|
| **Optical** | | | | |
| Wavelengths | 8050-16 | d,e | 1530, 1550 | nm |
| | 8050-24 | d,e,f | 1530, 1550, 1570 | nm |
| | 8050-32 | c,d,e,f | 1510, 1530, 1550, 1570 | nm |
| No. of fibres, fibre type | | | 1, SM | |
| System budget | | | 19 (/HS: 27) | dB |
| Output power TX modules | | | +3 | dBm |
| Min. input power RX modules | | | -20 (/HS: -28) | dBm |
| Max. input power RX modules | | | -1 (/HS: -10) | dBm |
| OFC-4 attenuation | | | <2 | dB |
| Minimum link attenuation | | | 4-2*$Att_{OFC}$ (/HS: 13-2*$Att_{OFC}$) | |
| **Video** | | | | |
| No. of channels | | | 16, 24 or 32 | |
| Video format | | | PAL/SECAM/NTSC | |
| In-/output level | | | 1 (±3 dB) | Vpp |
| DC restore(clamping) | | | On or off (software selectable) | |
| Bandwidth (-3 dB) | | | 6 | MHz |
| Sampling res @ freq. | | | 10 bit @13.5 MHz (per ch.) | |
| Differential gain | | | 1 | % |
| Differential phase | | | 1 | ° |
| Group delay | | | <10 | ns |
| SNR (wtd.) | | | >67 | dB |
| **Environmental and Safety** | | | | |
| Operating temp. | | | -40 to 74 | °C |
| Full perf. temp. | | | -15 to +55 | °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) | |
| **Electrical** | | | | |
| Supply voltages modules | | | +15 (/HS: +15/- 15) | $V_{DC}$ |
| Tot. power consumption | | | see MC 11 EB-2 manual | |
| **Mechanical** | | | | |
| Optical connectors | | | SC/APC (others optional) | |
| Video connectors (16,24,32x) | | | BNC 75 Ω | |
| Dimensions (hxwxd) | | | see MC 11 EB-2 manual | |
| Weight (approx.) per side | | | 4 + 0.8*n *) | kg |

*) n= number of TX or RX video modules

*Table 4. DVBus 8050-16/24/32 technical specifications*

## 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 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**

**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$V_{DC}$ 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.

## Accessories

- 2x power cords for power supply cabinets
- 2x2 (-16), 2x3 (-24) or 2x4 (-32) SM optical patch cords

## APPENDIX. DVBUS 8050-16, -24 and -32 TX and RX optical connections

*Figure 1a,b. DVBus 8050-16 TX (left) and RX (right).*

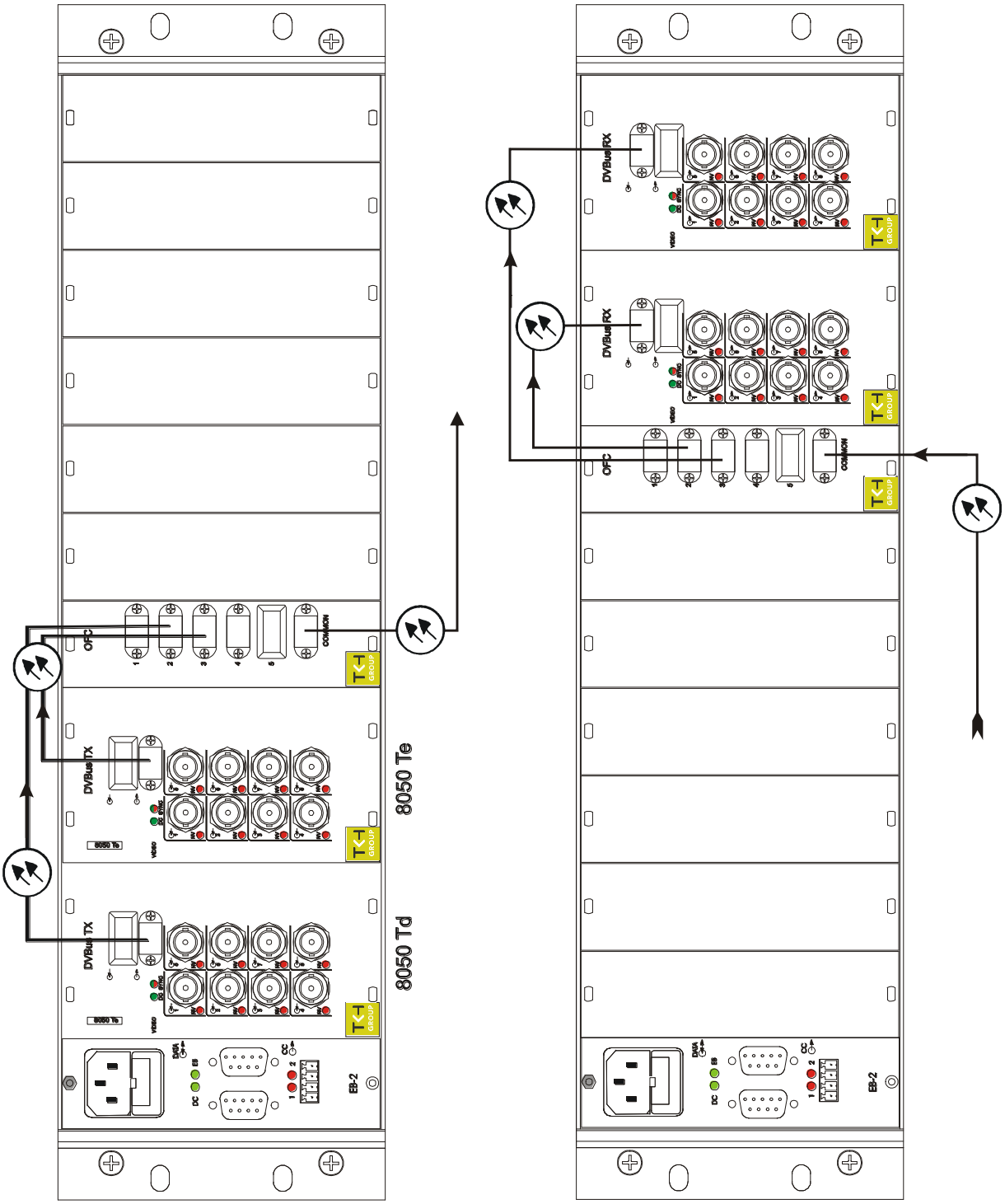

*Figure 2a,b. DVBus 8050-24 TX and RX. See tables 2 and 4*

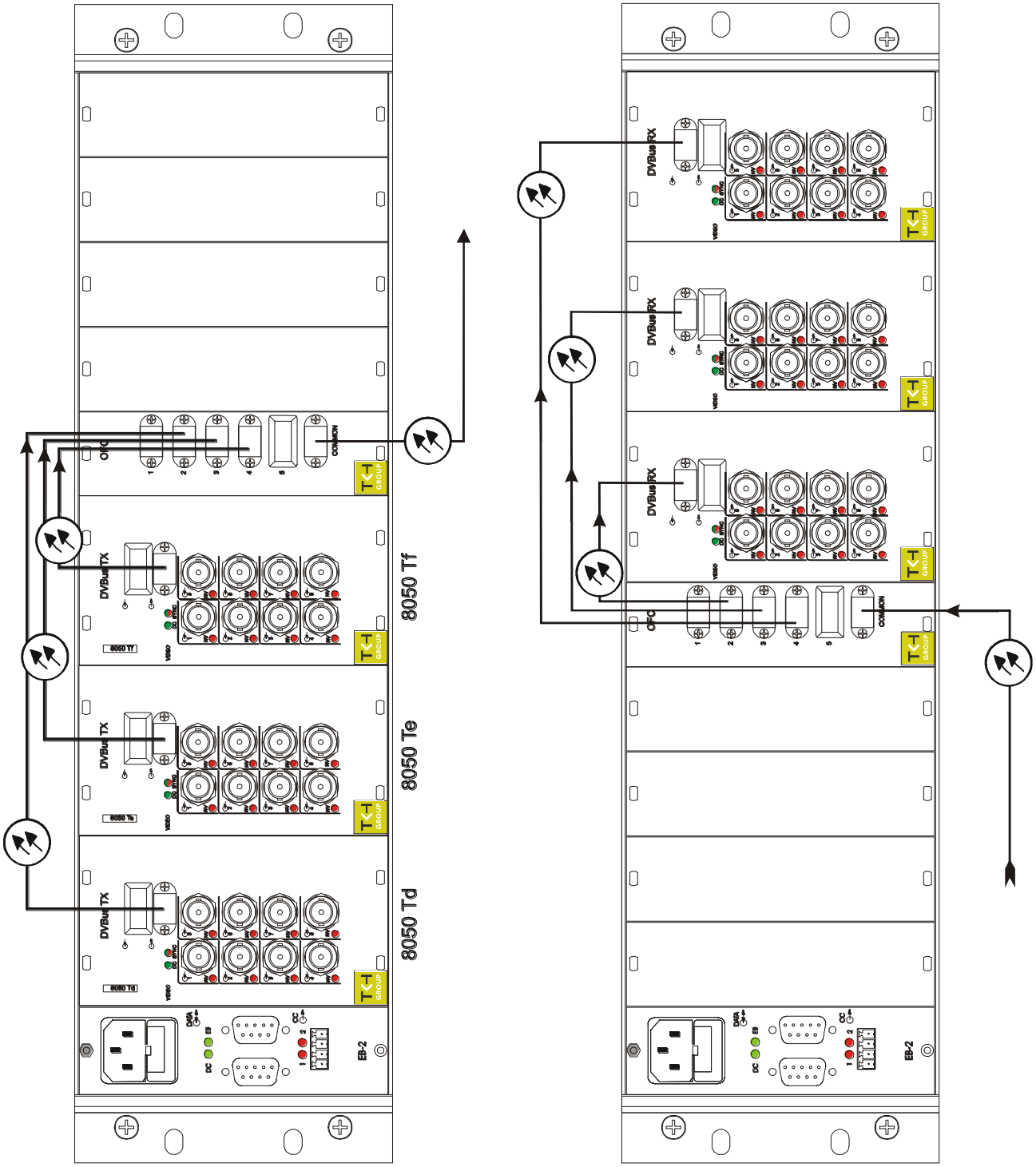

*Figure 3a,b. DVBus 8050-32 TX and RX. See tables 2 and 4*