



Video transmitter module 670TS0028

User/Installer Manual

Version 1.1

Revision history

1.0 : creation

1.1 : edited for FCC certification only

Table of Contents

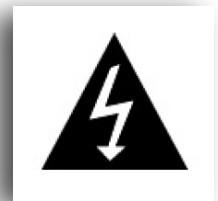
Safety Instructions	4
Caution.....	4
Overview.....	5
Product Description.....	6
Operating modes.....	7
Aerial mode.....	7
Multi-monitor mode.....	8
Installation.....	9
Transmitter.....	9
Receiver.....	9
Registration.....	10
Registering a transmitter to a receiver.....	10
Multi-system operation.....	11
Link drop.....	11
Technical Specifications.....	12
Specifications.....	13
Appendix.....	14
Important Notice.....	15
FCC caution.....	16

Safety Instructions

- When operating this equipment, read and follow all the instructions in this manual.
- Do not open unit.
- Do not block the air ventilation openings.
- Use only accessories specified or recommended by TRANSVIDEO.
- When devices are switched on keep away at least 20 cm from your body.
- Do not expose to moisture or excessive heat.
- Keep away from water
- Use the mains plug to disconnect the apparatus.
- Clean with a dry cloth only.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- To reduce the risk of fire or electric shock, refer servicing to qualified service personnel.
- Keep these instructions in a safe and accessible place for future use.

Explanation of graphical symbols:

High Voltage Sign: warns the user of the presence of uninsulated "dangerous voltage" within the product enclosure, which may be of sufficient magnitude to constitute a risk.



General Warning Sign: warns the user of the presence of important operating and maintenance (servicing) instructions in the product manual.



Caution

The 904TS0028 supports two types of power input connection:

One will be the 2-pin generic connector and the second should be soldering the 2 cables directly to the LEMO holes, **but do not connect them together.**



Overview

The 670TS0028 system was designed to establish wireless HD video signal transmission without any latency over large distances. Transvideo finally made this possible with revolutionary technology!

The 670TS0028 is a lightweight but still very powerful wireless HD system, which is the perfect solution for live streaming from your multicopter or from a steadycam system.

The 670TS0028 transmits encoded but uncompressed signals. Broadcasting is therefore possible without any delay (latency less than 1ms). This is the ideal live streaming equipment for sports events, movies and TV productions and also industrial and inspection and monitoring related applications.

Multicasting is supported - the signal of one transmitter can be received by multiple receivers at the same time, which allows parallel streaming and live preview for the camera operator during recording.

You have the possibility to set the used frequencies (according to the planned usage and the frequencies assigned by the Federal Network Agency) on location via USB port. The system allows you to have full control and you can follow the legal regulations of your country or region.

Product Description

1.1.1 904TS0028 - General Guidelines (Tx)

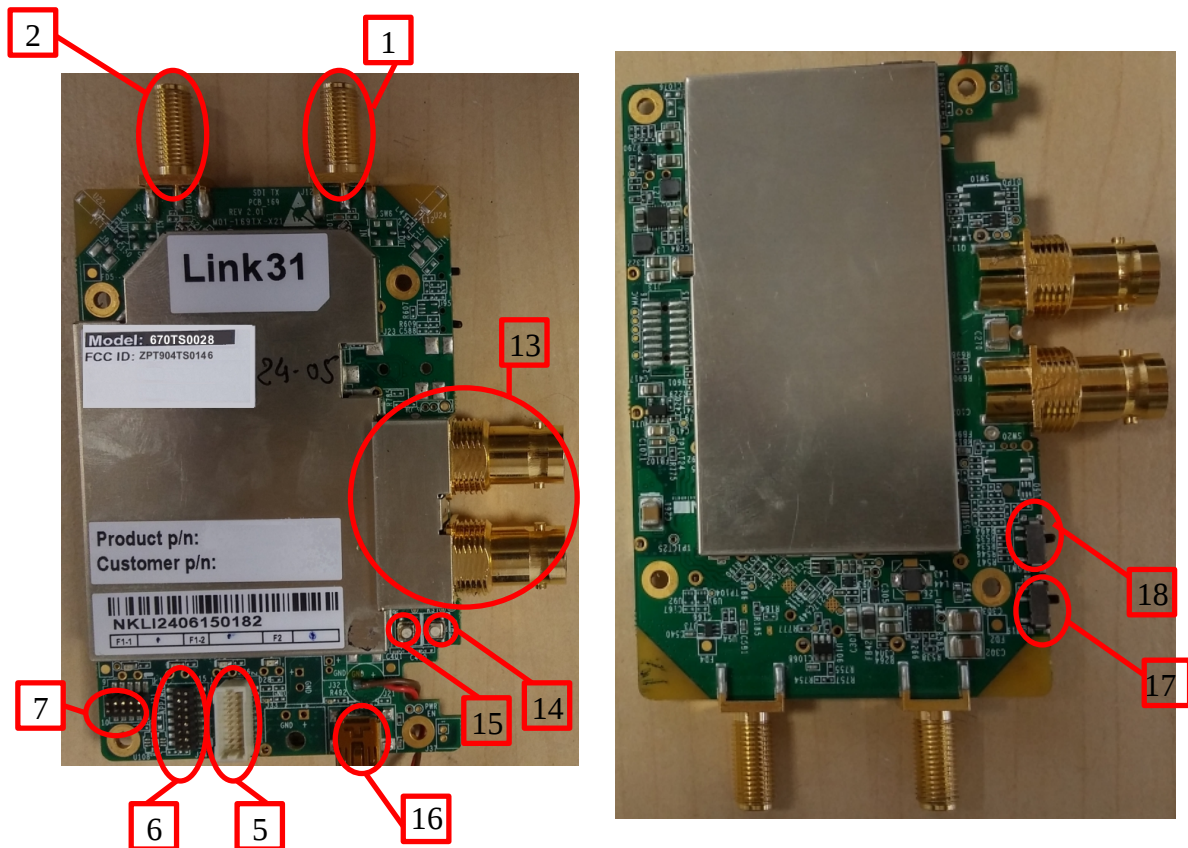


Figure 1 - Tx 904TS0028

Description of all connectors and their functionality including USB, Pass through, power conn pin out
debug connectors,

1.1.1.1 Parts description

01- Ext antenna RP-SMA connector CH#1	11- LED #2 - VIDEO status
02- Ext antenna RP-SMA connector CH#0	12- LED #3 - Low battery LED
	13- SDI BNC connectors
	14- Reset Button
05- 7-17v Input Voltage connector (2 Pin)	15- Registration & Boot button
06- APP debug Port	16- USB connector
07- External host connector	17- Slide switch #2 - Operation mode selector
	18- Slide switch #1 - Operation mode selector

Operating modes

Aerial mode

In this mode a link is established between a single receiver and a single transmitter. This mode uses DFS frequencies as well making it flexible and easy to adjust to all different fields of use and to meet the regional and national frequency requirements and laws.

For some version the message "please wait 60 seconds" may appear on the monitor when the link is first established to inform the user that the system is searching for a free DFS frequency. In this case this message will be followed by a second identical message to inform that the system is searching for an alternative DFS frequency. Upon completion the message "Ready" will appear on the monitor.

In Aerial mode a link can be established only if the systems are within close proximity to each other. If either receiver or transmitter is reset, both sides must be brought close together and reset in order to re-establish the link.

Operating Frequencies

FREQUENCIES [MHz]	DESCRIPTION
5190	Non-DFS
5230	Non-DFS
5270	DFS
5310	DFS
5510	DFS
5550	DFS
5590	DFS
5630	DFS
5670	DFS
5755	Non-DFS
5795	Non-DFS

Multi-monitor mode

In this mode a single transmitter can establish a link with several receivers. A link can be established even when the systems are not within close proximity to each other.

Operating Frequencies

FREQUENCIES [MHz]	DESCRIPTION
5190	Non-DFS
5230	Non-DFS
5755	Non-DFS
5795	Non-DFS

Switching between Aerial and Multi-monitor modes

Switching between Aerial and Multi-monitor will be done by toggling DIP switch #4 on the Rx side and sliding Mode Slide switch on the Tx side. Switching between modes will reset the systems.

Installation

Transmitter

See [Transmitter Product Description](#) for port location described in this section.

1. Switch on Source.
2. Connect the 670TS0028 transmitter to the HD video source via SDI input port (port #13).
3. Connect the 670TS0028 transmitter to the 7-17v power, via the Lemo connector (port #14).
4. Antenna orientation: It is recommended to separate the antennas so that they form a "V" (as shown in the picture).
Receiving antennas should be oriented in the same plane as the transmitting antenna.



Receiver

See [Receiver Product Description](#) for port location described in this section.

1. Switch on Monitor.
2. Connect the 670TS0029 receiver to the video sink (monitor) using a HD-SDI cable via HD-SDI output (port #23/#24).
3. Make sure all DIPs on DIP Switch are up (port #17).
4. Connect the 670TS0029 receiver to the "Input Voltage connector 7-17v", using the power supply (port #19).
5. Enable Power on by sliding the slide Switch #20 left.
6. Antenna orientation: It is recommended to separate the antennas to match the picture. Receiving antennas should be oriented in the same plane as the transmitting antenna.



Note: For maximal range

- Keep line of sight between the transmitter and the receiver.
- Avoid placing any obstacles besides the transmitter or the receiver.
- Position both transmitter and receiver in an upwards position, for enhanced antennas performance.
- Mount the 670TS0028 transmitter and the 670TS0029 receiver with proper air ventilation.
- Bring the transmitter and receiver closer together while trying to maintain at least 1 meter between them.

Registration

Transvideo products require registration between the transmitter and receiver, in order to establish a wireless link. The registration process includes keys exchange, for enhanced security

Sets of 670TS0028 transmitter and 670TS0029 receiver usually arrive pre-paired when purchased as pairs. In such case, video link will be established automatically after completing installation.

The registration is required only once, and after registration, the sets of transmitters and receivers will connect automatically upon boot up.

Important: Registration must be done when the system are in Aerial mode.

Registering a transmitter to a receiver

If there is no transmitter registered to the receiver, you should see an OSD menu on the monitor.

1. Connect the HD Source to the 670TS0028 transmitter.
2. Connect a HD-SDI cable from the 670TS0029 receiver to the HD display*.
3. Turn on the transmitter and receiver.
4. Long press the Registration button **[#18]** on the Rx.
5. The message "Please Activate the Registration on Transmitter Unit" will appear on the monitor.
6. Press the Registration button **[#5]** on the Tx until the "Network" LED starts blinking.
7. Wait for OSD message of "Adding [Tx name] Press OK to continue or Exit to cancel".
8. Press the Registration button **[#18]** on the Rx to confirm.
9. Wait until the registration process is complete. An OSD message of " Adding [Tx name]..."and progress bar will appear during the process.
10. Video link is established.

*The registration process can be done without HD source, an OSD message will appear to notify of missing video source.

Note: Once the registration process starts on the receiver side, it may take up to 30 seconds for the registration process to start on the transmit side. In case the registration process exceeds 30 seconds, re-start the registration process by going back to stage 4.

Multi-system operation

several pairs of receivers and transmitters can work simultaneously.

It is recommended to keep the pairs at least 1 meter away from each other

Link drop

Likely causes for this might be:

- 1. Exceeded Range**

To re-establish link bring systems back in to range.

- 2. Reset**

To re-establish link in case Tx/Rx have been reset, it is necessary to reset both sides. In Aerial mode both systems must be **within 30 meters** of each other. In Multi-monitor mode the systems must be within the operating range defined in the spec.

Technical Specifications

SPECIFICATION	DESCRIPTION	
Video Resolution:	1080p/50, 1080p/60, 1080/59.94i, 1080/50i, 1080/29.97p, 1080/23.98p, 720/59.94p, 720/50p, 525i/59.94, 625i/50, 1080/24p.	
Frequencies:	Non-DFS Frequencies : 5.170~ 5.250 GHz for EU 5.170 ~ 5.250 GHz and 5.735~5.815 GHz for US DFS Frequencies (used only in Aerial mode): 5.250-5.330 GHz and 5.490 ~ 5.690 GHz for EU 5.250-5.330 GHz and 5.490 ~ 5.590 GHz and 5.650 ~ 5.690 GHz for US ISM Frequencies: 5.725 ~ 5.875 GHz for EU	
Video Interface:	Tx: SDI	Rx: SDI with automatic detection (SD, HD and 3G) over 75 Ohm BNC.
Environment:	Operational - 0:40° C, 10%~90% humidity Storage - 0:55° C, 10%~90% humidity	
Range:	Up to 500m line of sight.	
Delay	Less than 1 msec.	
Product Regulation:	CE,FCC, RoHS, ESD +2Kv, , DFS	
FCC ID	ZPT904TS0146	

Specifications

670TS0028 transmitter and 670TS0029 receiver

	TRANSMITTER 670TS0028	RECEIVER 670TS0029
Video Interface	SDI connector	SDI splitter
Audio	Over SDI. Supports up to 2 channels.	Over SDI
Frequency Control	Automatic	Automatic
Antenna	2 transmitting 1 Receiving external using on-board RP SMA Connectors	5 receiving 1 transmitting Internal antennas
Voltage	7-17 $\pm 10\%$	7-17 V $\pm 10\%$
Size	Without case: 90mm x W60mm x H With case :	L130mm x W106mm x H
User Control	3 LEDs indicating Power, Video lock and Network lock USB connector for software update Registration button Reset button 2 Slide switches for mode selection External host connector UART	3 LEDs indicating Power, Video lock and Network lock USB connector for software update Hidden button for registration Reset button

Appendix

Tx without enclosure



Important Notice

TRANSVIDEO reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TRANSVIDEO's terms and conditions of sale supplied at the time of order acknowledgment.

TRANSVIDEO warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TRANSVIDEO's standard warranty. Testing and other quality control techniques are used to the extent TRANSVIDEO deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TRANSVIDEO assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TRANSVIDEO components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TRANSVIDEO does not warrant or represent that any license, either express or implied, is granted under any TRANSVIDEO patent right, copyright, mask work right, or other TRANSVIDEO intellectual property right relating to any combination, machine, or process in which TRANSVIDEO products or services are used. Information published by TRANSVIDEO regarding third-party products or services does not constitute a license from TRANSVIDEO to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TRANSVIDEO under the patents or other intellectual property of TRANSVIDEO.

Reproduction of information in TRANSVIDEO data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TRANSVIDEO is not responsible or liable for such altered documentation.

Resale of TRANSVIDEO products or services with statements different from or beyond the parameters stated by TRANSVIDEO for that product or service voids all express and any implied warranties for the associated TRANSVIDEO product or service and is an unfair and deceptive business practice. TRANSVIDEO is not responsible or liable for any such statements.

All company and brand products and service names are trademarks or registered trademarks of their respective holders.

FCC Caution

Any changes or modifications not expressly approved by the responsible party could void the user's authority to operate this equipment.

Notice:

This module in its final integration requires the end-product to continue to comply with DFS requirements. A class II permissive change may be required for operation not already described in the FCC Grant filing.

OEM Labelling Requirements

Notice: The OEM of final integrator must ensure that FCC labelling requirements are met.

For a host using this module, if (1) the module's FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straightforward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module should be used, with the following contents:

Contains FCC ID: ZPT904TS0146

The host OEM user manual must also contain clear instructions on how end users can find and/or access the module and the FCC ID. The applicable usage is to be used as a wireless device, connected to the back of a professional camera and transmitting live video, coming from BNC connectors

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not in-stalled and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment complies with 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.

THE ANTENNA USED FOR TRANSMISSION MUST BE INSTALLED TO PROVIDE A SEPARATION DISTANCE OF AT LEAST 20 CM FROM ALL PERSONS AND MUST NOT BE COLOCATED OR OPERATING IN CONJUNCTION WITH ANY OTHER ANTENNA OR TRANSMITTER