



Instruction Manual

**1T-CT-445, 1T-CT-454 and
1T-CT-458
Cat.5 Extenders**

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1.0 INTRODUCTION

Thanks for purchasing this Cat.5 Extender Product from TV One. This Product line is designed to transport RGBHV and RS-232 signals over great distances using CAT.5/5E or CAT.6 premium grade network cables. Our professional video conversion products have been serving the industry for over twenty years. TV One offers a full line of high quality Seamless Switchers, Video Scalers, Up/Down/Cross Converters, Analog-Digital Converters (SD/HD-SDI, HDMI, DVI), Format Converters, Standards Converters, TBC/Frame Synchronizers, Matrix Routing Switchers, Signal Distribution Amplifiers and Cat.5 Transmission Systems.

1.1 Liability Statement

Every effort has been made to ensure that this product is free of errors. TV One cannot be held liable for the use of this hardware or any direct or indirect consequential damages arising from its use. It is the responsibility of the user of the hardware to check that it is suitable for his/her requirements and that it is installed correctly. All rights reserved. No parts of this manual may be reproduced or transmitted by any form or means electronic or mechanical, including photocopying, recording or by any information storage or retrieval system without the written consent of the publisher.

TV One reserves the right to revise any of its hardware and software following its policy to modify and/or improve its products where necessary or desirable. This statement does not affect the legal rights of the user in any way.

All third party trademarks and copyrights are recognized. The TV One logo, TV One-task and CORIO are the registered Trademarks of TV One. All other trademarks are the property of their respective holders.

1.2 Features

This CAT.5 VGA Extender product line has many features that enable it to perform in a superior manner. Among those features you will find:

- Transmit PC Video content via Cat.5/5E or 6 Cable
- Resolutions to 1920x1200, 1080p @ 60Hz
- Range up to 300 meters (1000')
- Gain and equalization adjustments for both receivers
- 1T-CT-458 Receiver has built-in Skew Correction adjustment
- All Models have RS-232 Control Features

2.0 SPECIFICATIONS

2.1 General

Environmental	
Operating Temperature	0° to +70° C (+32° to +158° F)
Operating Humidity	10% to 90%, Non-condensing
Storage Temperature	-40° to +70° C (-40° to +158° F)
Storage Humidity	10% to 90%, Non-condensing
Warranty	
Limited Warranty	3 Years Parts and Labor
Regulatory Approvals	
Encoder/Decoder Unit	FCC, CE, RoHS
Power Supply	UL, CUL, CE, PSE, GS, RoHS
Cable Requirements	
CAT.5/5E or CAT 6	Network Grade, Premium Cables
Power Requirement	
1T-CT-445, 454 and 458	External Power Supply +5 VDC@2A, Locking DC
Accessories Included	
1x Power Adapter	US, UK or Euro
1x User Manual	

2.2 Transmitter

Video Input/Output	
RGBHV VGA Standard	1x RGBHV via HD-15
UTP Outputs	
Cat.5/5E - Cat.6	1x via RJ-45 Connector
RS-232 Inputs	
Full R/T RS-232 Control	1x via 9 pin RS-232 Connector
Video Performance	
Maximum Resolutions	Up to 1920x1200, 1080p / 60Hz
Video Bandwidth	350MHz
Input Signal Levels	Video 0.75mV, Sync 5V TTL
Horizontal Freq Range	15-70KHz
Vertical Freq Range	30-170Hz
Maximum Range	
1T-CT-445	Up to 300M (1000'), depending upon Receiver selected
Mechanical (H-W-D)	
1T-CT-445	88x141x32mm (1.26"x5.5"x3.5")
Weight	
1T-CT-445	240g (0.53 lbs)
Model Numbers	
1T-CT-445	Transmitter for RGBHV plus Stereo and RS-232
Optional Accessories	
RM-370T Rackmount	1T-CT-445

2.2 Receivers

UTP Inputs	
1T-CT-454, 458	1x via RJ-45 Connector
Video Outputs	
1T-CT-454, 458	1x RGBHV via HD-15
RS-232 Output	
1T-CT-454, 458	1x 9 pin RS-232 Connector
DDC2B/EDID Capability	
1T-CT-454, 458	Automatic Monitor Resolution Setting w/EDID Capable Monitors
Video Performance	
Maximum Resolutions	Up to 1920x1200, 1080p / 60Hz
Video Bandwidth	350MHz
Output Signal Levels	Video 0.75mV, Sync 5V TTL
Horizontal Freq Range	15-70KHz
Vertical Freq Range	30-170Hz
Maximum Range	
1T-CT-454	150M (500') for RGBHV Output
1T-CT-458	300M (1000') for RGBHV Output
Signal Adjustments	
1T-CT-454, 458	Equalization and Gain
1T-CT458 (Additional Capabilities)	R-G-B Skew Compensation in 32 steps per color
Mechanical (H-W-D)	
1T-CT-445, 454, 458	89x141x32mm (1.26"x5.5"x3.5")
Weight	
All Models	240g (0.53 lbs)
Model Numbers	
1T-CT-454	Receiver for RGBHV to 150M with Stereo and RS-232
1T-CT-458	Receiver for RGBHV to 300M with Stereo
Optional Accessories	
RM-370T Rackmount	All Receiver Models

3.0 CHECKING PACKAGE CONTENTS

Before attempting to use this unit, please check the packaging and make certain the following items are contained in the shipping carton:

- 1x Transmitter or Receiver unit
- 1x Power Adapter
- 1x Operations Manual

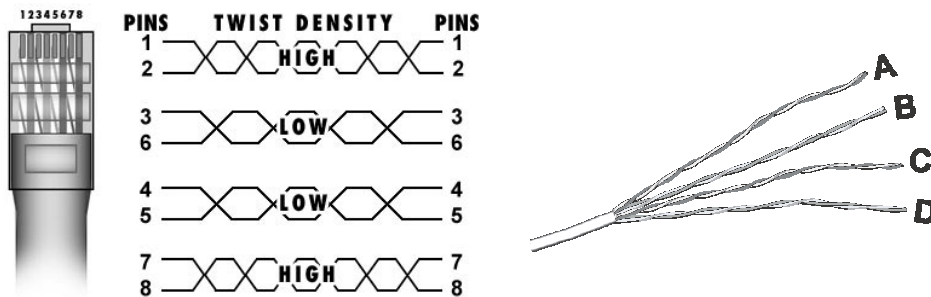
Note: Please retain the original packing material should the need ever arise to return the unit. If you find any items are missing, contact your reseller or TV One immediately. Have the Model and Serial Number and Invoice available for reference when you call.

4.0 CONNECTING THE HARDWARE

Please study the panel drawings below and become familiar with the signal input, outputs, power requirements/inputs plus any controls present. *Note: Each product has somewhat different capabilities and therefore different cable connections are present. Locate the drawing for the item(s) you have purchased and become familiar with the connectors used in that product. The resolution capability of the remotely located display devices must be capable of displaying the output of the source device. Before connecting the CAT.5 extender system, verify that the display device on the receiving end can support the output resolution and signal format by connecting it directly to the source device.*

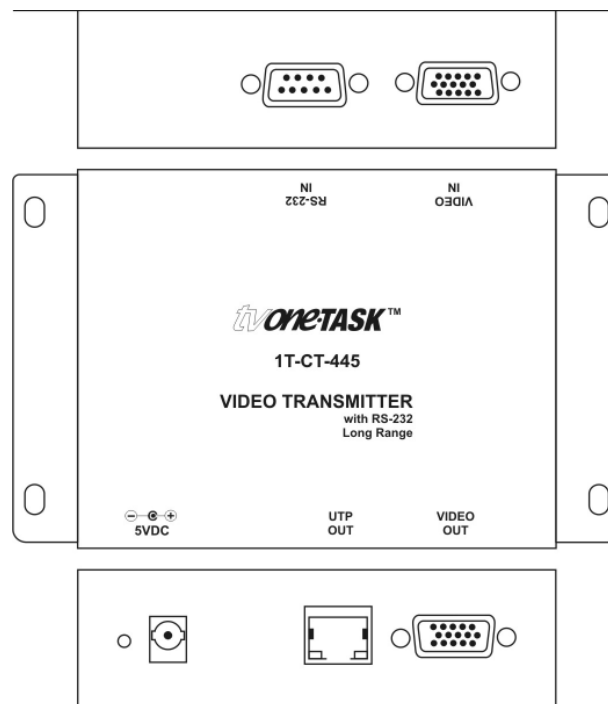
4.1 Cat.5/5E/6 Cable Notes

Pins and pairing. Make sure the CAT5/5E/6 cable pin assignments are standard. The correct pairing is straight through pin-to-pin, with pairing as follows.



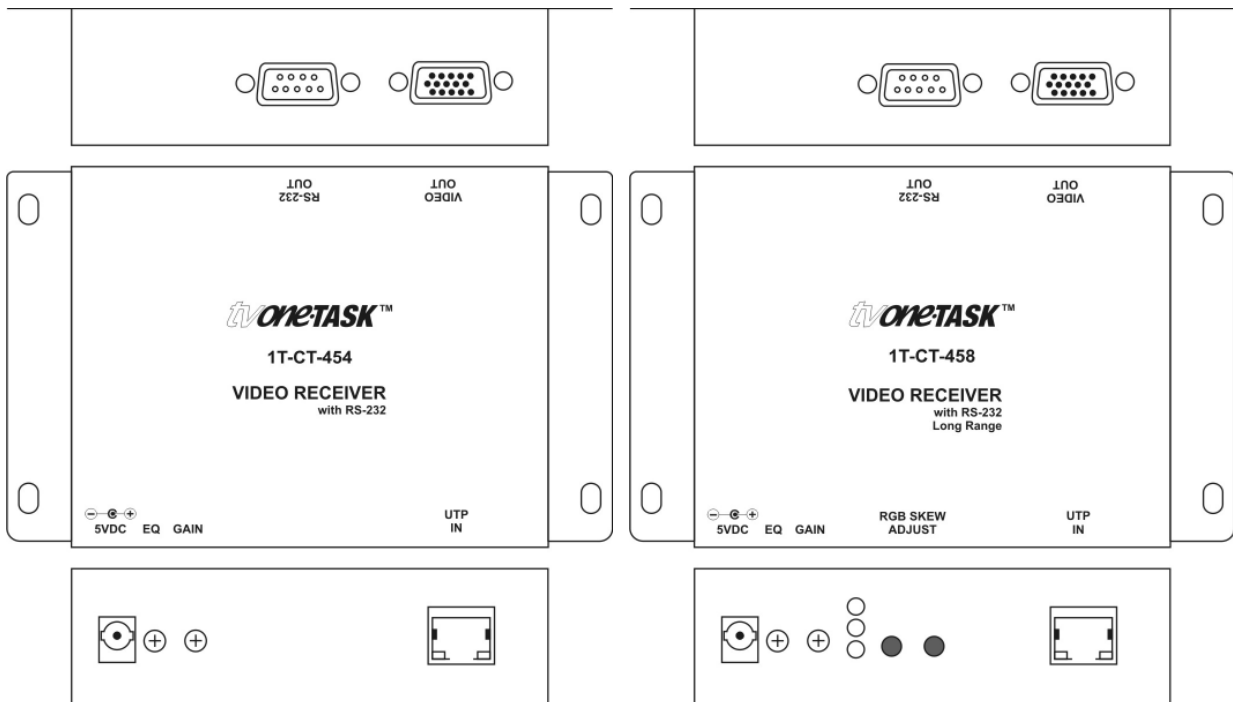
Twist density. UTP cable pairs have different twist densities (twist pitches). There are two pairs with high density twist and two pairs with low density. Colors vary by manufacturer. Twist densities can be seen by stripping off about 10 cm (4') of insulation and visually inspecting. Pairs 1-2 and 7-8 should be assigned to high density twists. Failure to assign correct twist densities can result in image jitter. The ABCD picture shows typical UTP cable, with pairs A and C showing a high pitch twist (assign to pin pairs 1-2 & 7-8), and B and D with low pitch twist (assign to pin pairs 3-6 & 4-5).

4.2 1T-CT-445 Transmitter



1. Connect the source device's video output to the VIDEO IN connector of the Transmitter, using the appropriate cable. The 1T-CT-445 has a VIDEO OUT connector that can provide a loop-thru signal to a local monitor.
2. The 1T-CT-445 Transmitter has RS-232 control capabilities. Connect an RS-232 cable to the RS-232 Input at this time if you are using this functionality.
3. Connect a Cat.5/5E or Cat.6 cable to the UTP OUT connector of the Transmitter. The 1T-CT-445 Transmitter supports transmission distances of up to 300 meters (1,000') of CAT.5/5E or CAT.6 premium grade network cables as described in 4.1 above. Receiver model determines the maximum transmission distance of either 150 meters (500') or 300 meters (1,000'.) See section 2.2 above for details.

4.3 1T-CT-454 and 1T-CT-458 Receivers



1. Connect the Cat.5/5E or Cat.6 cable to the UTP IN connector of the Receiver.
2. For either a 1T-CT-454 or 1T-CT-458 Receiver, connect the RS-232 cable at this time if you are using the RS-232 functionality.
3. Connect the VIDEO OUT connector of the Receiver to the video input of the remote display or other device, using the appropriate cable.
4. Connect the supplied AC adapters first to the respective Transmitter and Receiver and then to the AC sockets.
5. Lastly, turn on the source device and remote display. The source signal should now appear on the remotely located display. If not, consult the Troubleshooting section of this manual.

4.4 Special Instructions: 1T-CT-445 Transmitter & 1T-CT-454, 458 Receivers

The following instructions apply to systems using DDC2B/EDID capable monitors. You must follow the sequence listed below in order for the EDID automatic monitor resolution detection to work properly.

Note: If your monitor is not EDID capable, you can follow the instructions listed in sections 4.2 and 4.3 above instead of those listed below.

1. Make certain that power to all devices you will be connecting is turned off.
2. Connect VGA cable from the computer and the RS-232 cable to the 1T-CT-445 Transmitter.
3. Connect the Car 5/5E or Cat.6 cable to the 1T-CT-445 Transmitter.
4. Connect the 1T-CT-454 or 1T-CT-458 Receiver to the EDID Capable Monitor.
5. Connect the RS-232 Cable to the Receiver.
6. Connect the Cat.5/5E or Cat.6 cable to the Receiver.
7. Apply power to the monitor.
8. Connect the AC adaptor to the Receiver and then to the AC power socket.
9. Connect the AC adaptor to the 1T-CT-445 Transmitter and then to the AC power socket.
10. Apply power to the computer.

4.5 RS-232 Pin Assignments

Note: Rx = Receiver, Tx = Transmitter

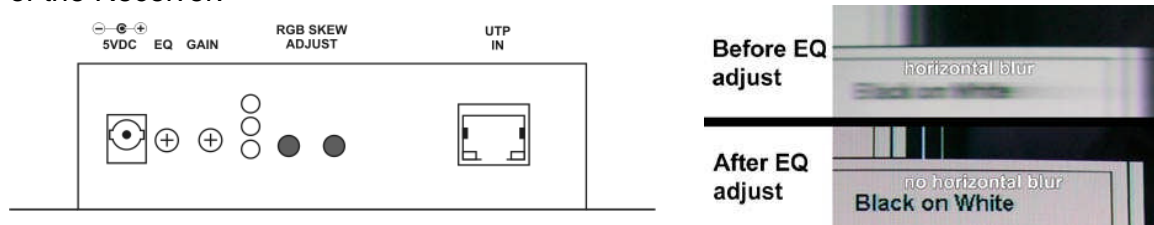
Unit	GND	TxD	RxD	RTS	CTS	DTR	DSR	NC	NC
Rx	5	3	2	7	8	4	6	1	9
Tx	5	2	3	8	7	6	4	1	9

5.0 OPERATING THE UNITS

Once the connections have been made and power applied, there is little in the way of operational adjustments required. All Receivers have Equalization and Gain adjustments. Additionally, the 1T-CT-458 has a Skew Compensation adjustment.

5.1 Equalization and Gain Adjustments

On all Receiver models, locate the EQ (Equalization) and GAIN adjustments on the side of the Receiver.



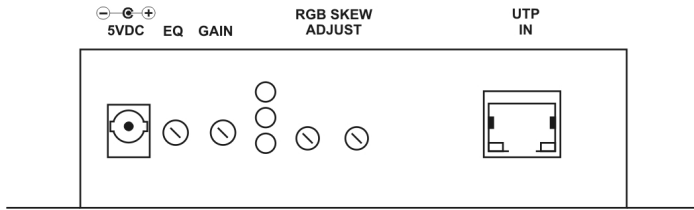
On long cable runs, the high frequency detail can be lost resulting in a “soft” looking picture. This will first show up in text where the characters will lose their sharp edges.

Adjust the EQ can sharpen the image. While viewing an image on a display connected to the Receiver, insert a small screwdriver into the EQ adjustment on the side panel of the Receiver. Rotate gently until the best EQ setting, as determined by image clarity, is achieved. Next, insert the screwdriver into the GAIN adjustment, and rotate gently until the best Gain setting, as determined by the brightness of the image is achieved. You may notice an increase in video noise (sometimes called “snow”) in the picture at higher gain settings so a compromise will have to be found if the cable run is at or near the maximum length. EQ and GAIN settings are retained by the Receiver.

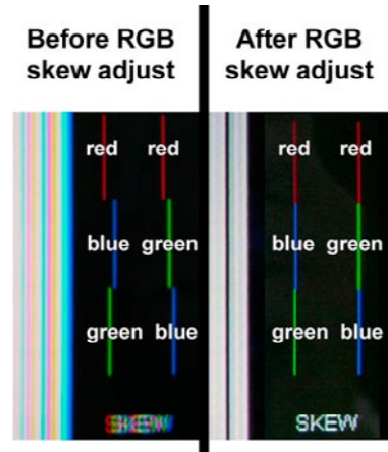
5.2 RGB Skew Compensation Adjustment

RGB images transmitted over long Cat.5/5E or Cat.6 cable paths can sometimes arrive at the destination with the individual RGB pictures no longer in registration. Model 1T-CT-458 has a built in Skew Compensation adjustment to correct this. This adjustment should be made after the EQ and Gain adjustments described above. A good test pattern for RGB Skew adjustment is pictured below and is available for download at the TV One Technical Support website: tvone.crmdesk.com.

After saving the test pattern on the source PC, display and view it while making adjustments on the remote display.



Locate the RGB Skew Adjust buttons on the side of the Receiver. While watching the remote display, press and HOLD either RGB skew adjust button. After three seconds, the RGB adjust indicator LED starts blinking; Receiver is now in RGB Skew Adjust Mode. The color of the blinking LED indicates the color being adjusted. Colors cycle if you hold the button down steadily.



If you want to nudge the blue image to the left, make sure the blue LED is blinking, then hold the nudge button in and wait until the blue LED is blinking. Then tap the Nudge Left button repeatedly. Each tap will result in a tiny incremental move to the left. There are 32 increments in this adjustment. To shift the blue image to the right, make sure the blue LED is still blinking and tap the Nudge Right button repeatedly. To adjust the Red and Green images, repeat the process, making sure the color you want to adjust is blinking. Adjust the Skew controls until the Red, Blue and Green images are vertically aligned and the white vertical lines show no prismatic halos. When complete, release the adjustment buttons and in 30 seconds the LED will stop blinking and the Receiver reverts to normal operation and the Skew adjustment settings are retained in memory.

6.0 TROUBLESHOOTING

Other than faulty cables or attempting to use the product over too great of distances, there are seldom problems with these Video Extender products.

If there is no image present at the remote location, connect the display device directly to the source to make certain that the problem is not in the display. If an image is present under those circumstances, make certain the transmitter and receiver(s) are receiving power. Next make certain your Cat.5/5E/6 cable is defect free and the RJ-45 connectors are securely attached to the cable at both ends.

After trying the above suggestions should the problem still persist, contact your dealer for additional suggestions before contacting TV One. Should the dealer's technical personnel be unable to assist you, contact TV One via our support website:

<http://tvone.crmdesk.com>. Create a technical support request on the site and our support team will respond within a short period of time.

7.0 LIMITED WARRANTY

TV One warrants the original purchaser that the equipment it manufactures or sells will be free from defects in materials and workmanship for a fixed term from the date of purchase. The warranty term for specific product lines is defined below.

1. TV One branded products based on TV One's CORIO technology are warranted for a period of five years from the date of purchase. This includes products with the model number prefix of C2, 1T-C2, CX, A2 or S2.
2. TV One-task branded products, other than those based on TV One's CORIO technology mentioned above, are warranted for a period of three years from the date of purchase. This includes products with the model number prefix of 1T, with the exception of 1T-C2.
3. LCD Monitors are warranted for a period of three years from the date of purchase, with the exception of the LCD panels integrated into the monitors that are supplied by third parties. LCD panels are limited to the term and conditions of the warranty offered by the respective LCD panel manufacturer. Such specific LCD panel warranties are available upon request to TV One.

Should a product, in TV One's opinion, prove defective within this warranty period, TV One, at its option, will repair or replace this product without charge. Any defective parts replaced become the property of TV One. This warranty does not apply to those products which have been damaged due to accident, unauthorized alterations, improper repair, modifications, inadequate maintenance and care, or use in any manner for which the product was not originally intended.

If repairs are necessary under this warranty policy, the original purchaser must obtain a Return Authorization Number from TV One and return the product to a location designated by TV One, freight prepaid. After repairs are complete, the product will be returned, freight prepaid.

LIMITATIONS - All products sold are "as is" and the above Limited Warranty is in lieu of all other warranties for this product, expressed or implied, and is strictly limited to two years from the date of purchase. TV One assumes no liability to distributors, resellers or end-users or any third parties for any loss of use, revenue or profit.

TV One makes no other representation of warranty as to fitness for the purpose or merchantability or otherwise in respect of any of the products sold. The liability of TV One with respect to any defective products will be limited to the repair or replacement of such products. In no event shall TV One be responsible or liable for any damage arising from the use of such defective products whether such damages be direct, indirect, consequential or otherwise, and whether such damages are incurred by the reseller, end-user or any third party.

8.0 REGULATORY COMPLIANCE

The 1T-CT-445/454/458 have been tested for compliance with appropriate FCC and CE rules and regulations. The Power Adaptor/Supplies have been tested for compliance with appropriate UL, CUL, CE, PSE, GS Rules, Regulations and/or Guidelines. These Products and Power Adapters are RoHS Compliant.

9.0 CONTACT INFORMATION

Should you have questions or require assistance with this product in areas not covered by this manual, please contact TV One at the appropriate location.

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