Instruction Manual

1T-CT-400 Series
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 VGA and YPbPr 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.

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.

1.2 Features

The 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 or Component Video content via Cat.5/5E or 6 Cable
- Resolutions to 1920x1200, 1080p @ 60Hz
- Range up to 300 meters (1000')
- Gain and equalization adjustments at each receiver
- Some models with built-in Skew Correction adjustment
- Some models with Analog Stereo and S/PDIF Digital Audio
- One receiver model featuring built-in UTP Repeater

1.2 Transmitter Features and Compatibility Chart

Transmitter Model	Signal Type	Stereo Audio	Maximum Distance	Cat.5 Out	Compatible Receivers
1T-CT-441	RGBHV	None	300M (1000')	1	442, 444
1T-CT-443	RGBHV	Yes (1)	300M (1000')	1	442, 444, 452, 456
1T-CT-453	YPbPr	Yes (1)	300M (1000')	1	464
1T-CT-467	RGBHV	Yes	300M (1000')	8	442, 444, 452, 456
C2-1250/1250 (2)	RGBHV/YPbPr	No	300M (1000')	1	442, 444, 464
Notes: (1) These models have both Analog Stereo and S/PDIF Digital Inputs. (2) Models C2-1200 and C2-1250 are covered in a separate manual.					

1.3 Receiver Features and Compatibility Chart

Receiver Model	Signal Type	Stereo Audio	Maximum Distance	Built-in Skew Comp	Compatible Transmitters
1T-CT-442	RGBHV	None	150M (500')	No	441, 443, 467, C2-1200/1250
1T-CT-444	RGBHV	None	300M (1000')	Yes	441, 443, 467, C2-1200/1250
1T-CT-452	RGBHV	Yes (1)	150M (500')	No	443, 467
1T-CT-456 (2)	RGBHV	Yes (1)	300M (1000')	Yes	443, 467
1T-CT-464	YPbPr	Yes (1)	300M (1000')	No	453, C2-1200/1250
Notes: (1) These models have both Analog Stereo and S/PDIF Digital Audio Outputs. (2) This model has a built-in UTP Repeater to drive another Receiver at up to 1000'.					

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	2 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	
All models except 1T-CT-467	External Power Supply +5 VDC@2A, Locking DC
1T-CT-467	Internal Power Supply 100-240VAC@ 50-60Hz
Accessories Included	
1x Power Adapter	US, UK or Euro (except 1T-CT-467)
1x User Manual	CAT.5 Extender Series

2.2 Transmitters

Video Inputs	
1T-CT-441, 443, 467	1x RGBHV via HD-15
1T-CT-453	1x YPbPr via 3x RCA
Video Outputs	
1T-CT-441, 443, 467	1x RGBHV via HD-15
Audio Inputs	
1T-CT-441	None
1T-CT-467	1x Analog Stereo via 3.5mm
1T-CT-443, 453	1x Analog Stereo via 3.5mm, 1x S/PDIF via Toslink
Audio Outputs	
1T-CT-441	None
1T-CT-443, 453, 467	1x Analog Stereo via 3.5mm Mini Stereo
UTP Outputs	
1T-CT-441, 443, 453	1x via RJ-45 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
Audio Performance	
Input Sampling Rates	32, 44.1, 48, 96KHz
Maximum Range	
All Models	Up to 300M (1000'), depending upon Receiver selected
Mechanical (H-W-D)	
1T-CT-441, 443, 453	88x141x32mm (1.26"x5.5"x3.5")
1T-CT-467	44x213x134mm (1.75x8.4x5.3")
Weight	
1T-CT-441, 443, 453	240g (0.53 lbs)
1T-CT-467	860g (1.9 lbs)
Model Numbers	
1T-CT-441	Transmitter for RGBHV
1T-CT-443	Transmitter for RGBHV and Stereo
1T-CT-453	Transmitter for YPbPr and Stereo
1T-CT-467	Transmitter for RGBHV with 8x UTP Outputs
Optional Accessories	
RM-370T Rackmount	3 units – 1T-CT-441, 443, 453
RM-360S Rackmount	1 unit – 1T-T-467
Notes	
(1) TV One Model C2-1200 and C2-1250 Video Switcher/Scalers have built in UTP transmitters capable of sending RGBHV or YPbPr format signals up to 1000'. Check the Spec Sheets for those products for full details. These units are compatible with UTP Receiver models 1T-CT-442, 444, 464.	

2.2 Receivers

UTP Inputs	
All Receiver Models	1x via RJ-45 Connector
UTP Outputs	
1T-CT-456	1x via RJ-45 Connector for Cat.5 Repeater function
Video Outputs	
1T-CT-442, 444, 452, 456	1x RGBHV via HD-15
1T-CT-464	1x YPbPr via 3x RCA
Audio Outputs	
1T-CT-442, 444	None
1T-CT-452, 456, 464	1x SPDIF via Toslink and 1x Analog via 3.5mm Mini St.
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
Audio Performance	
Output Sampling Rate	32KHz
Maximum Range	
1T-CT-442, 452	150M (500') for RGBHV Output
1T-CT-444, 456	300M (1000') for RGBHV Output
1T-CT-464	300M (1000') for YPbPr Output
Signal Adjustments	
All Receiver Models	Equalization and Gain
1T-CT-444, 456	R-G-B Skew Compensation in 32 steps per color
Mechanical (H-W-D)	
All models	89x141x32mm (1.26"x5.5"x3.5")
Weight	
All Models	240g (0.53 lbs)
Model Numbers	
1T-CT-442	Receiver for RGBHV to150M
1T-CT-444	Receiver for RGBHV to 300M
1T-CT-452	Receiver for RGBHV to 150M with Stereo
1T-CT-456	Receiver for RGBHV to 300M with Stereo, UTP Repeater
1T-CT-464	Receiver for YPbPr to 300M with Stereo
Optional Accessories	
RM-370T Rackmount	3 units – 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 (except 1T-CT-467)
- 1x AC Power Cord (1T-CT-467 only)
- 1x Operations Manual

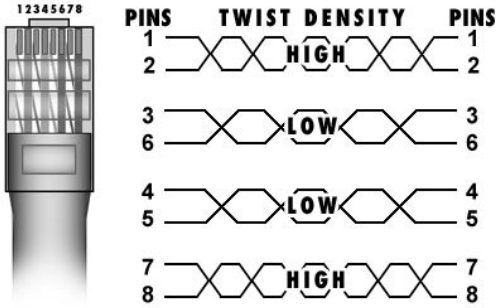
Note: Please retain the original packing material should the need ever arise to return the unit. If you find any items are missing, contact your reseller or TV One immediately. Have the Model and Serial Number and Invoice available for reference when you call.

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.*

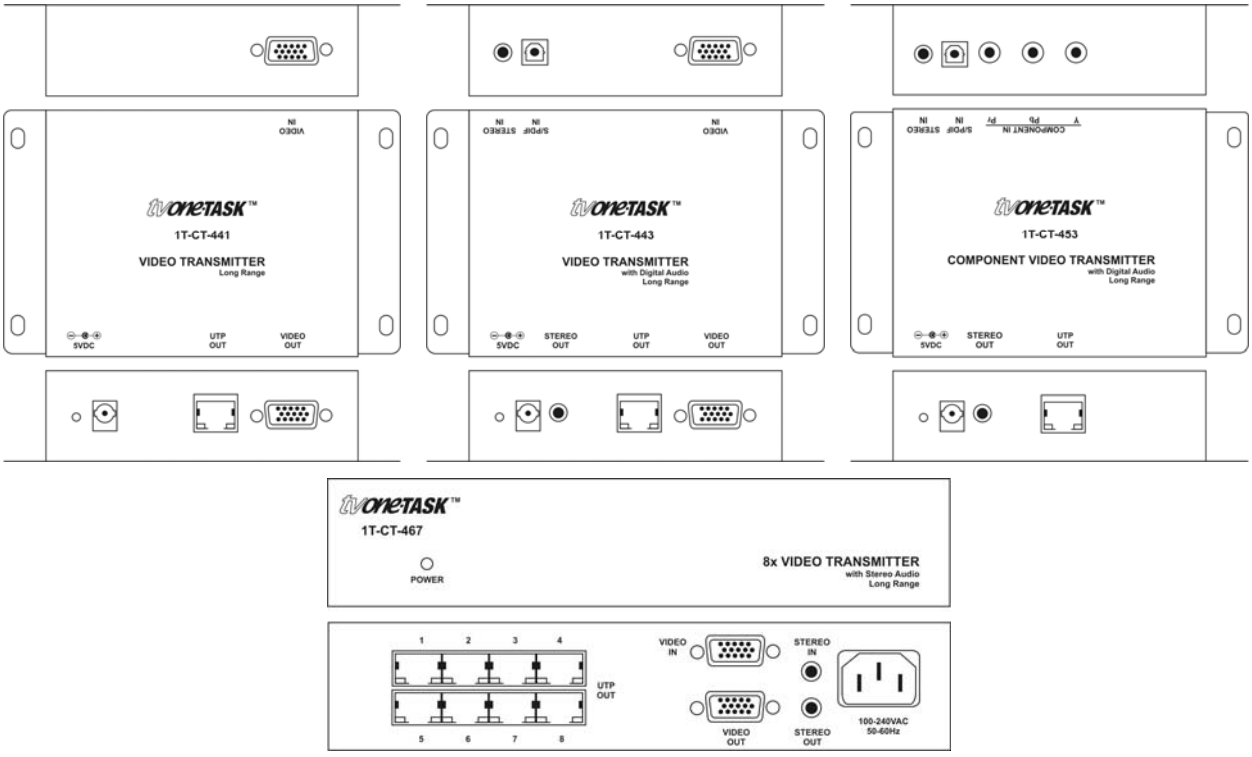
4.1 Cat.5/5E/6 Cable Notes

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 (assign to pin pairs 1-2 & 7- 8), and B and D with low pitch twist (assign to pin pairs 3-6 & 4-5).

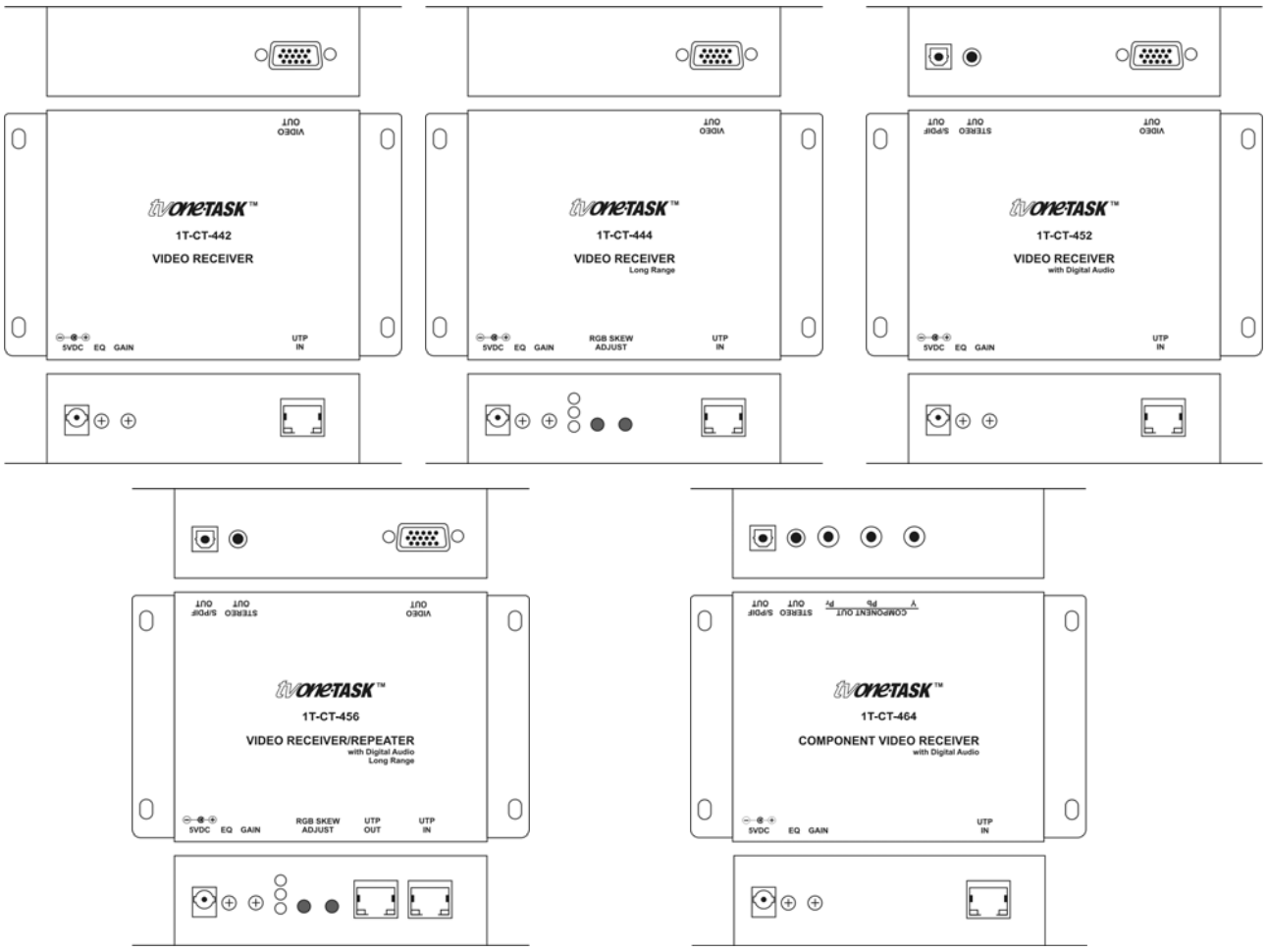
4.2 1T-CT-400 Series Transmitters



1. Connect the source device's video output to the VIDEO IN connector of the Transmitter, using the appropriate cable. All models except the 1T-CT-453 have a VIDEO OUT connector that can provide a loop-thru signal to a local monitor.
2. All Transmitter models, except the 1T-CT-441, have audio capability. Connect either the source device's analog stereo or S/PDIF audio output to the either the STEREO IN connector or the S/PDIF IN connector of the Transmitter (1T-CT-467 does not have S/PDIF in). Do not connect both as this will result in interference between the two. The system is designed to support either audio format, but not both at the same time. The audio output of the Transmitter can provide an analog stereo signal for local monitor. If a S/PDIF input is used, this will be converted to analog stereo for this purpose.
3. Connect a Cat.5/5E or Cat.6 cable to the UTP OUT connector of the Transmitter. Model 1T-CT-467 has 8 UTP Outputs. All Transmitter models support up to 300 meters (1,000') of CAT.5/5E or CAT.6 premium grade network cables as described in 4.1 above. Model 1T-CT-467 has 8 UTP Outputs. The Receiver model determines the maximum distance of either 150 meters (500') or 300 meters (1,000') of the cable as cam be determined by checking section 4.3 below.

Note – In addition to these three Transmitter models mentioned about, TV One Models C2-1200 and C2-1250 Video Switcher/Scalers have built-in UTP transmitters capable of sending either RGBHV or YPbPr format signals (without audio) up to 1000 feet. Consult the manual for those units when they are being used.

4.2 1T-CT-400 Series Receivers



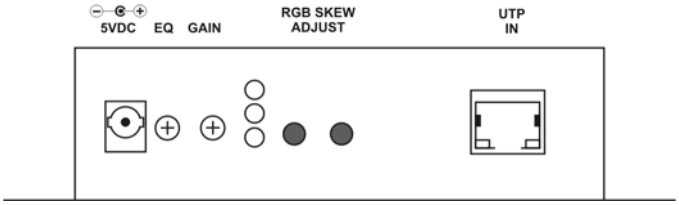
1. At the remote location, connect the other end of the Cat.5/5E or Cat.6 cable to the UTP IN connector of the Receiver.
2. Connect the VIDEO OUT connector of the Receiver to the video input of the remote display or other device, using the appropriate cable.
3. If the Transmitter and Receiver models chosen have audio capability, connect the Receiver's STEREO OUT and/or S/PDIF OUT connectors to remote display or other audio device. Both audio outputs may be used simultaneously, regardless of the audio signal format chosen at the transmitter.
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.

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-444 and 1T-CT-456 have Skew Compensation adjustments.

5.1 Equalization and Gain Adjustments

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

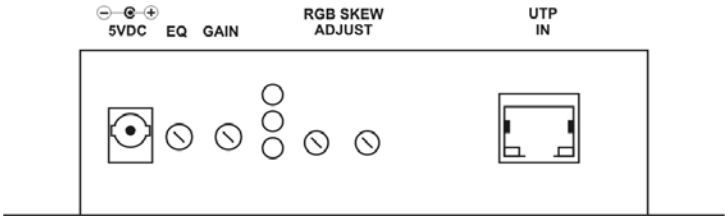


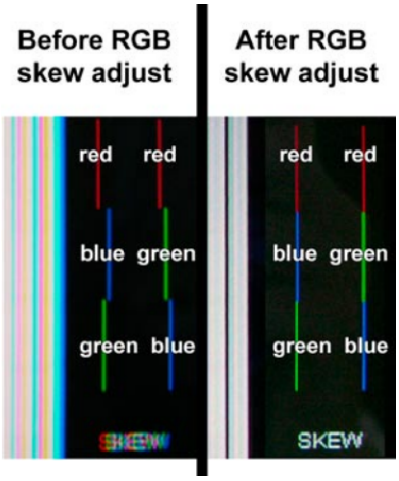
On long cable runs, the high frequency detail can be lost resulting in a “soft” looking picture. This will first show up in text where the characters will lose their sharp edges. Adjust the EQ can sharpen the image. While viewing an image on a display connected to the Receiver, insert a small screwdriver 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.

Then 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. Models 1T-CT-444 and 1T-CT-456 have built in Skew Compensation adjustments 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 ***http://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

LIMITED WARRANTY – With the exceptions noted in the next paragraph, TV One warrants the original purchaser that the equipment it manufactures or sells will be free from defects in materials and workmanship for a period of two years from the date of purchase. Should this 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.

Items integrated into TV One products that are made by other manufacturers, notably computer hard drives and liquid crystal display panels, are limited to the term of the warranty offered by the respective manufacturers. Such specific warranties are available upon request to TV One.

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-400 Series Extender products have been tested for compliance with appropriate FCC and CE rules and regulations. The Power Adaptor/Supply has been tested for compliance with appropriate UL, CUL, CE, PSE, GS Rules, Regulations and/or Guidelines. This Product and Power Adapter is RoHS Compliant.