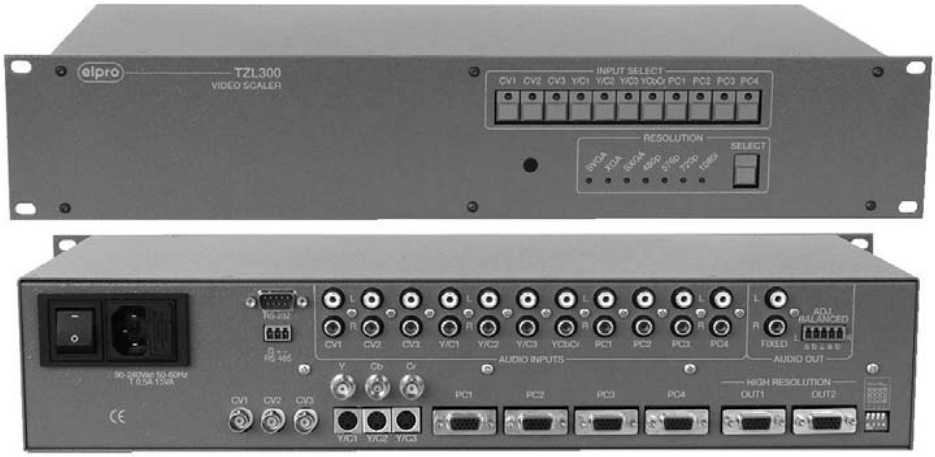
TZL300

MAXI SWITCHER/HIGH RESOLUTION SCALER



- **11 Inputs with associated audio**
- **Variable time "THROUGH BLANK" switching**
- **Twin high resolution output**
- **Buffer on high resolution outputs**
- **Selectable output format**
- **VCA on audio balanced output**
- **Maintenance of presets**
- **IR remote control provided with the unit**
- **Can be controlled via RS232 and RS485**

TZL300-M 20/10/2005 INCLUDE FIRMWARE RELEASE 1.4

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INSTALLATION AND USE THE TZL300

INDEX:

Please read this handbook carefully when installing the TZL300 unit.

The manufacturer does not assume any responsibility for damages caused by use, even correct, of its products.

The data and characteristics of the product may vary without prior notice.

1.0 OVERVIEW

Thank you for purchasing this product. Check the contents of the packaging carefully. It contains:

- The TZL300 unit

- This handbook and certificate of conformity

- The mains cable

- The IR remote control

The TZL300 is a unit that transforms a video signal into a high resolution signal. The output format is selectable, from SVGA to SXGA. The Y, Cb, Cr format progressive from 480 to 1080i is also available. The vertical output frequency is fixed at 60Hz.
The high resolution output is double and a buffer that upgrades the signal can be activated on this.

The TZL300 can be used when, for video-projection or display on TFT or plasma monitor, the quality of the image is to be improved. The wide selection of input signals, each with associated audio, makes the TZL300 very useful in presentation environments when several video and computer sources, must be displayed on a single device.

The TZL300 performs switching without glich or jumps and with passing through blank. The switching time can be selected by the user in order to adapt more effectively to the characteristics of the destination. This solution makes it possible to avoid the annoying effects that characterize LCD devices at the time of switching of a signal on their input.

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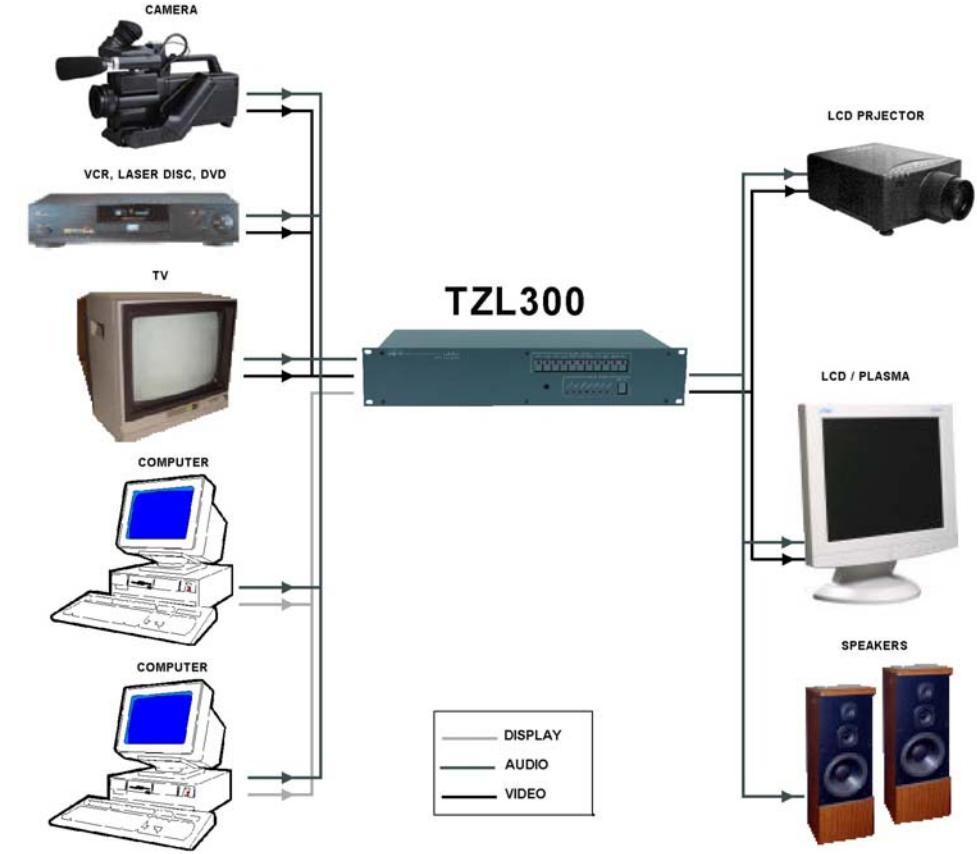
The audio output, which presents the associated audio of the input selected, is both unbalanced and balanced. The audio outputs permits 8-step level variation using the IR remote control or serial link.

For details of IR remote control functioning, refer to chap. 6.0

For the data exchange protocol via RS232 and RS485, refer to chap. 7.0 and 8.0



2.0 POWER SUPPLY

The TZL300 unit must be powered with an AC voltage of 90÷240 50/60Hz using the cable provided. The outlet of the cable must be inserted in the related panel plug to the left on the back of the unit.The panel plug is equipped with a fuse-holder for 5X20 fuses. If the fuse blows, replace it with one of **equal rating** as specified on the back of the unit.

WARNING

All operations must be carried out by qualified personnel only who must be informed of the risks of electric shock.

In some countries, the plug of the cable must be adapted to local standards. The wires will be identified according to the following coding:

- Brown PHASE (Identified with the letter L, may be red)
- Blue NEUTRAL (Identified with the letter N, may be black)
- Yellow/Green GROUND (Identified with the letter E, may be green)

WARNING

A ground connection is compulsory

3.0 PRESETS

A 4-pin dip-switch is accessible on the back of the unit in order to:

a) Energize a Booster on the HIGH RESOLUTION outputs (BOOST)

To activate the booster on the HIGH RESOLUTION outputs, set the BOOST dip-switch to the **ON** position. The BOOST dip-switch is factory-set in the OFF position.

b) Assign an address to the unit for control via RS485 (COD0, COD1, COD2)

This function is useful in the case in which several units are connected on a party line with the RS485 standard and these are to be controlled with a single host computer.Usually the RS485 standard is used so as to obtain longer sections of cable than those permitted by the RS232 standard and the connection is of the point-to-point type. In this case, the address must be OFF, OFF, OFF as per factory setting.

Other firmware settings of unit functioning can be made directly from the keypad (See ch. 5.3)

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4.0 INSTALLATION

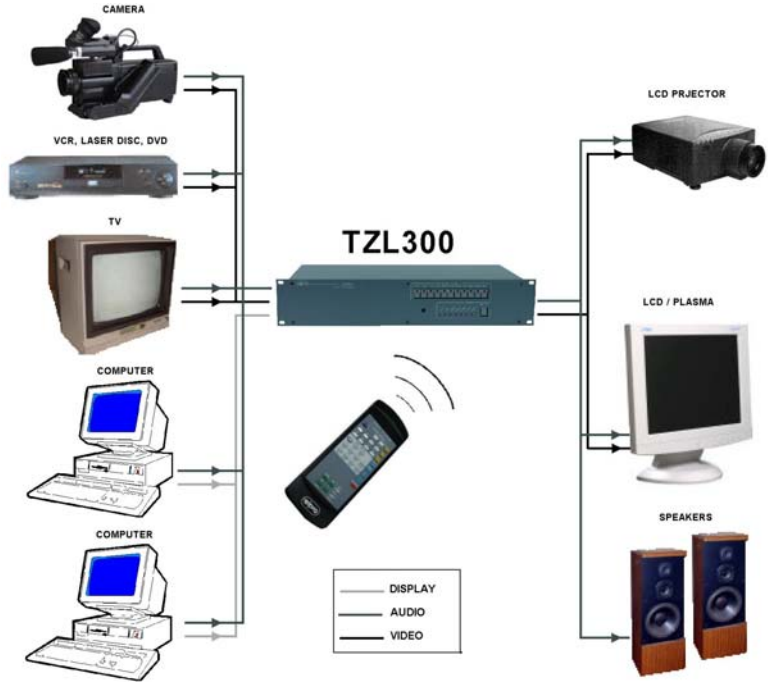
4.1 Video Signals

Connect the **composite Video** source to the 3 BNC called **CV1**, **CV2** and **CV3**.
The inputs are already terminated at 75 Ω; the inputs not used can be left free.
Connect the **Y/C** source to the 3 mini-Din connectors called **Y/C1**, **Y/C2** and **Y/C3**.
The inputs are already terminated at 75 Ω; the inputs not used can be left free.
Connect the **Y**, **Cb**, **Cr** source to the 3 BNC called **Y**, **Cb**, **Cr**.

4.2 Graphic Signals

Connect the graphic sources (Notebook or computer) to the HDD15p.f. connectors called **PC1**, **PC2, PC3** and **PC4**.
Connect the destinations (Video-projector and/or plasma or TFT monitors) to the two HIGH RESOLUTION outputs, OUT1 and OUT2

WARNING
The 2 HIGH RESOLUTION outputs have the same signal.
If destination is a PLASMA MONITOR could be advisable to set "ON" the 3D and NOISE REDUCTION functions "on" TZL300 (OSD)



4.3 Audio Signals

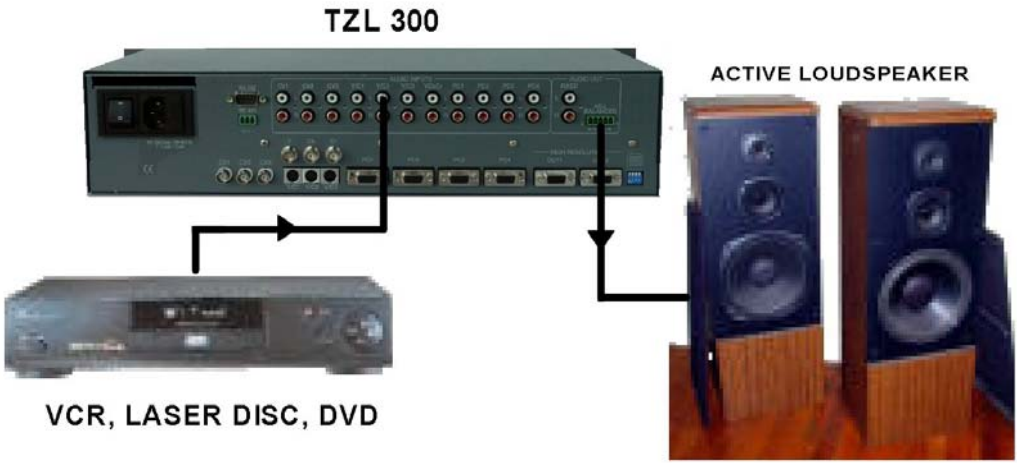
Connect the audio of all the sources to the RCA stereo AUDIO INPUTS sockets.

The TZL300 has two audio outputs: one balanced and one unbalanced.

Connect the unbalanced audio output to its destination (usually a VHS recorder).

Connect the balanced audio output to a set of active speakers or to a stereo amplifier.

WARNING
If the speakers or the amplifier have the input unbalanced,
use outputs "a" and GND leaving output "b" free.
In this case, half of the output level is lost.



The balanced and unbalanced outputs level can be modified using the IR remote control or via RS232/RS485.

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5.0 LOCAL CONTROL

5.1 Input selection

The input to be converted to high resolution is selected pressing one of the eleven INPUT SELECT keys.

The led ON indicates which input is selected at that moment.

5.2 Resolution of the output signal

The resolution of the output signal can be set pressing the RESOLUTION / SELECT button repeatedly.
The active resolution is displayed by the led ON and remains saved even after subsequent power-on.

WARNING
Selecting PC1 ÷ PC4 the format in output remains that of the PC input signal.

5.3 Presets from keypad

a) Switching time through blank

The TZL300 features an important preset for modification of the switching time through blank of the high resolution output signal.

This time is set according to the characteristics of the display device that is connected to the outputs of the TZL300. This important feature makes it possible to avoid the annoying effects that characterize LCD devices at the time of switching of a signal at their input.
As each LCD device has its own response time, for optimal switching, the user can adjust duration of the blank from 0.5 to 2 seconds.

Four times can be set: 0.3sec.; 0.5sec.; 1sec. and 2sec. according to the table below.

SELECT+PC1	0.3 sec.
SELECT+PC2	0.5 sec.
SELECT+PC3	1 sec.
SELECT+PC4	2 sec.

To select the switching time required, press the two buttons at the same time; a flash of the built-in led of the PC1÷PC4 button indicates that the command has been saved.

The default unit has the switching time set to 0.5 second.

b) Preset of the input at power-on

To enable a particular input at power-on of the unit, hold down the button of that input for 3 seconds. A flash of the built-in led indicates that the command has been saved. From now on, the TZL300 will enable that input at each power-on.

The factory setting enables the PC1 input.

a) IR reception

IR reception can be disabled maintaining pressed the RESOLUTION / SELECT button during the power-on. IR reception can be re-enabled repeating the routine as above the default unit enables IR reception

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6.0 FUNCTIONS WITH IR REMOTE CONTROL

The unit is equipped with a receiver for an IR remote control supplied with the unit.

WARNING
The remote control is of the self-teaching type. After inserting the batteries and each time these are changed, press the "Set" key for a few moments followed by the button with violet border

The following functions, divided into eight active groups, are performed using the 24 keys of the IR remote control:

1st Group – 1 key: Self-teaching:

Set + key CV1 Self-teaching of the remote control each time the batteries are changed.

2nd Group - 2 keys: Save and recall

Save Saves all the current presets.

Recall Recalls the presets saved previously with SAVE.

3rd Group - 1 key: Default

DEFAULT Restores all the standard conditions of the unit.

4th Group - 11 keys: **INPUT SELECT**

Press the key of the input to be converted to high resolution. The input selected is identified by switching on of the built-in led of the button located on the console.

5th Group - 4 keys: On Screen Display

Use the 4 keys **+**, **-**, **PICT** and **MODE** to use OSD.

6th Group - 1 key: Resolution

RESOLUTION Sets the format of the high resolution output signal. The format set can be viewed by checking the leds on the console of the TZL300 unit.

7th Group - 2 keys: **VOLUME OUT**

Operate on the **–** and **+** buttons to adjust the volume of the audio outputs. The level of the output signal cannot be monitored on the TZL300

8th Group - 2 keys: MICrophone ***THIS FUNCTION IS NOT AVAILABLE***
9th Group - 10 keys: AUX DRY CONTACTS ***THIS FUNCTION IS NOT AVAILABLE***

10th Group - 2 keys: **MUTE ON-OFF**

Press MUTE ON to reset the level of both audio outputs

Press MUTE OFF to restore the level of both audio outputs

7.0 COMPUTER CONTROL via RS232

On its site www.elprovideolabs.com, Elpro has made available software running under Windows suitable for controlling the TZL300 via RS232 or RS485.

If the user intends to develop personalized software, the protocols to be implemented both RS232 and RS485 are available on the same site.

All functions of the TZL300 can be controlled through transmission/reception by a computer of strings of hexadecimal and ASCII characters.

The procedure for data exchange via RS232 is as follows:

Transmission standard:

8 data bits, no parity, 1 stop bit and speed of 9600 baud.

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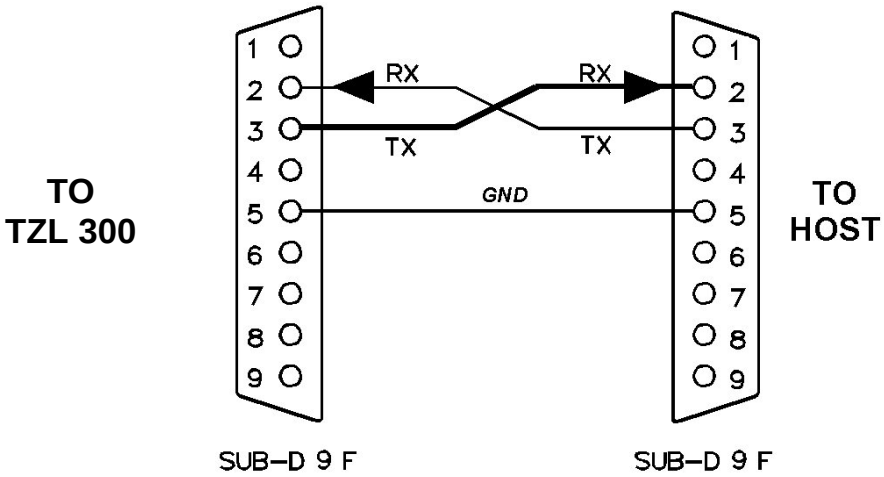
7.1 Physical connection

Physical connection must be afforded using a cable according to the diagram below:



7.2 Video and audio input selection command

The host must send the following sequence:

BXX followed by **CR** where: B is the Hex character 42
XX is the video and audio input (from 01 to 11)
from 01 to 03 indicates the inputs 1..3 CV
from 04 to 06 indicates the inputs 1..3 Y/C
07 indicates the input YCbCr
from 08 to 11 indicates the inputs 1..4 PC

Example: to select the Y/C input number 2 the following characters must be sent on line: 42 30 35 0D

The TZL300 scaler replies:

ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.3 Setting the volume level

The host must send the following sequence:

IX followed by **CR** where I (l as in love) is the hex character 6C
X indicates the level volume (from 0 to 7)

0 = -20 dB	4 = -4.5 dB
1 = -13 dB	5 = -3 dB
2 = -9 dB	6 = -1.5 dB
3 = -6 dB	7= 0 dB

Example:
to set the level to -6 dB the following characters must be sent on line: 6C 33 0D
The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.4 Increment/Decrement audio Volume

The host must be sent the following sequence:

LX folllowed by CR, where: L is the character Hex 4C
X indicates the type of operation:
1 = Increment of one step the volume level
0 = Decrement of one step the volume level

Example:
To increment the volume level, the host will send the following sequence: 4C 31 0D

The scaler will respond sending the new setted volume level:

LY followed by CR where: L is the character Hex 4C
Y indicates the updated volume level that can be:
From 0 to 3 or
From 0 to 7 depending of the type of hardware mounted onto the scaler.

If transmission errors are detected the scaler responds with NAK (Hex 15)

Warning: If the MUTE Audio is in active state, this command restores the current volume level.

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7.5 Setting mute audio

The host must send the following sequence:

mX followed by **CR** where m is the hex character 6D
X indicates the status of the mute (0 or 1)
0 indicates mute audio de-activated
1 indicates mute audio activated

Example: to activate the mute audio the following characters must be sent on line: 6D 31 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.6 Set output resolution

The host must send the following sequence:

fX followed by **CR** where f is the hex character 66
X indicates the resolution of the output (from 1 to 7)

1 format SVGA
2 format XGA
3 format SXGA
4 format 480p
5 format 576p
6 format 720p
7 format 1080i

Example:

to set the output format SXGA the following characters must be sent on line: 66 33 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.7 Set switching through blank time

The host must send the following sequence:

WX	followed by **CR**	where W is the hex character 57 X indicates the switching time (from 0 to 3) 0 = 0.3 seconds 1 = 0.5 seconds 2 = 1 second 3 = 2 seconds

Example: to set the switching time to 0.5 seconds the following characters must be sent on line: 57 31 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.8 Save settings

The current status of the TZL300 (i.e. the input selected, the resolution of the output, the image adjustment parameters (brightness, contrast, color, tint, sharpness), the status of the filters (3D filter and Noise Reduction filter), the output format (16:9 or 4:3) is saved in the non-volatile memory. The mute condition are not saved.

The host must send the following sequence:

S	followed by **CR**	where S is the hex character 53 The current settings are saved in the non-volatile memory and setat the next power-on.

Example: to save the settings made the following characters must be sent on line: 53 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.9 Recall settings

The host must send the following sequence:

R	followed by CR	where R is the hex character 52 the setting saved previously is restored.

Example: to recall the settings saved the following characters must be sent on line: 52 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

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7.10 Restore default settings

The command restores the factory settings of the parameters described above for the "Save settings" command.

The host must send the following sequence:

Z	followed by **CR**	where Z is the hex character 5A The factory settings are restored

Example: to restore the factory settings the following characters must be sent on line: 5A 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.11 Setting of RS485 parameters

The functioning parameters of the RS485 serial bus can be defined; with a single command, it is possible to set Tx/Rx speed and the reply time of the TZL300.
The effect of this command is immediate and once it has been invoked the RS485 serial line will operate according to the parameters set.

The host must send the following sequence:

CXY	followed by CR	where C is the hex character 43

X indicates the Tx/Rx speed (1 or 2)

1 = 2400 bit/sec
2 = 9600 bit/sec

Y indicates the reply time of the TZL300 (from 1 to 7)

1 = 16 msec
2 = 32 msec
3 = 48 msec
4 = 64 msec
5 = 80 msec
6 = 96 msec
7 = 112 msec

Example: to set a speed of 2400 bit/sec and a reply time of 64 msec. the following characters must be sent on line: 43 31 34 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.12 Machine status request

The host must send the following sequence:

D	followed by **CR**	where D is the hex character 44

The TZL300 scaler replies:

D	hex character 44	
AA	number of input selected	from 01 to 11
B	resolution of the output	from 1 to 7
CC	setting of *brightness*	from 00 to 48
DD	setting of *contrast*	from 00 to 48
EE	setting of *color*	from 00 to 48
FF	setting of *sharpness*	from 00 to 48
GG	setting of *tint*	from 00 to 48
H	3D filter	0 or 1
I	NR filter	0 or 1
J	format 16:9/4:3	0 or 1
L	mute audio status	0 or 1
M	volume level	from 0 to 7
N	seamless switching time	from 0 to 3
P	enabling IR receiver	0 or 1
Q	address on RS485 bus	from 0 to 7
R	Tx/Rx speed	1 or 2
S	reply time	from 1 to 7
CR	hex character 0D	

The meaning of the parameters sent by the TZL300 is the same as that of the related commands.

7.13 Firmware identifier request

The host must send the following sequence:

i	followed by **CR**	where i is the hex character 69

The TZL300 scaler replies:

i	hex character 69
R	TZL300 identifier (hex character 52)
X	identifier of the firmware version (from 0 to 9)
CR	hex character 0D

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7.14 Setting of the image adjustment parameters

This category of commands includes all possible image adjustments on the *High Resolution OUT1 and OUT2* outputs, i.e. the same adjustments as permitted by the menus on OSD. This group of commands always has the **Y** character (hex 59) as first byte and is followed by a character that identifies the specific command.

7.14 1 Setting of brightness

The host must send the following sequence:

YBXX followed by **CR** where YB are the pair of hex characters 59 42
XX indicates the brightness value to be set (from 00 to 48)

Example: to set brightness to 28 the following characters must be sent on line: 59 42 32 38 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected.

7.14.2 Setting of contrast

The host must send the following sequence:

YCXX followed by **CR** where YC are the pair of hex characters 59 43
XX indicates the contrast value to be set (from 00 to 48)

Example: to set contrast to 28 the following characters must be sent on line: 59 43 32 38 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.14.3 Setting of color

The host must send the following sequence:

YSXX followed by **CR** where YS are the pair of hex characters 59 53
XX indicates the color value to be set (from 00 to 48)

Example: to set the color to 28 the following characters must be sent on line: 59 53 32 38 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.14.4 Setting sharpness

The host must send the following sequence:

YHXX followed by **CR** where YH are the pair of hex characters 59 48
XX indicates the value of sharpness to be set
(from 00 to 48)

Example: to set the value of sharpness to 28 the following characters must be sent on line: 59 48 32 38 0D

The TZL400 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.14.5 Setting tint

The host must send the following sequence:

YTXX followed by **CR** where YT are the pair of hex characters 59 54
XX indicates the value of tint to be set
(from 00 to 48)

Example: to set the value of tint to 28 the following characters must be sent on line: 59 54 32 38 0D

The TZL400 scaler replies:

ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.14.6 Setting of the 3D filter

The host must send the following sequence:

YDX followed by **CR** where YD are the pair of hex characters 59 44
X indicates the status of the 3D filter (0 or 1)
0 = filter OFF
1 = filter ON

Example: to activate the filter 3D the following characters must be sent on line: 59 54 31 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

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7.14.7 Setting of noise reduction filter

The host must send the following sequence:

YNX followed by **CR** where YN are the pair of hex characters 59 4E
X indicates the status of the filter Noise Reduction (0 or 1)
0 = filter OFF
1 = filter ON

Example: to activate the NR filter the following characters must be sent on line: 59 4E 31 0D

The TZL300 scaler replies:
ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detected

7.14.8 Setting of aspect

The host must send the following sequence:

YAX followed by **CR** where YA are the pair of hex characters 59 41
X indicates the format (0 or 1)
0 = 16:9
1 = 4:3

Example: to set the format 16:9 the following characters must be sent on line: 59 41 30 0D

The TZL300 scaler replies:

ACK (Hex 06) if the command has been performed correctly
NACK (Hex 15) if transmission errors have been detecte

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8.0 COMPUTER CONTROL via RS485

On its site www.elprovideolabs.com, Elpro has made available software running under Windows suitable for controlling the TZL300 via RS232 or RS485.

If the user intends to develop personalized software, the protocols to be implemented both RS232 and RS485 are available on the same site.

All the functions of the TZL300 scaler can be controlled through transmission and reception of strings of hexadecimal and ASCII characters by a computer.

The transmission protocol is of the master/slave multi-point type where the TZL300 are the slaves while the host that controls these is the master. Up to 8 TZL300 identified by addresses from 0 to 7 that can be selected using the CODE0. CODE1, CODE2 dip-switches can be connected on the 485 Bus.

The characteristics of the serial connection are:

8 data bits, no parity, 1 stop bit and speed of 2400 or 9600 baud,
transmission speed and reply time can be set with the suitable command from RS232.

By default, the speed on RS485 is 9600 baud

The reply time of the TZL300 is period of time that must pass between the end of reception of the command and the start of transmission of the reply. This time allows the host to release the RS485 bus and to prepare for reception without any conflicts.

The following parameters are set by default:

- speed = 9600 bit/sec
- reply time = 32 ms

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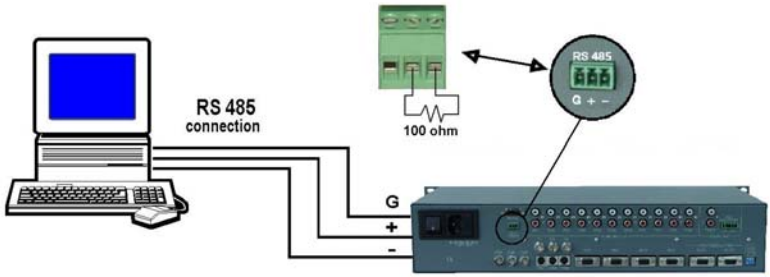
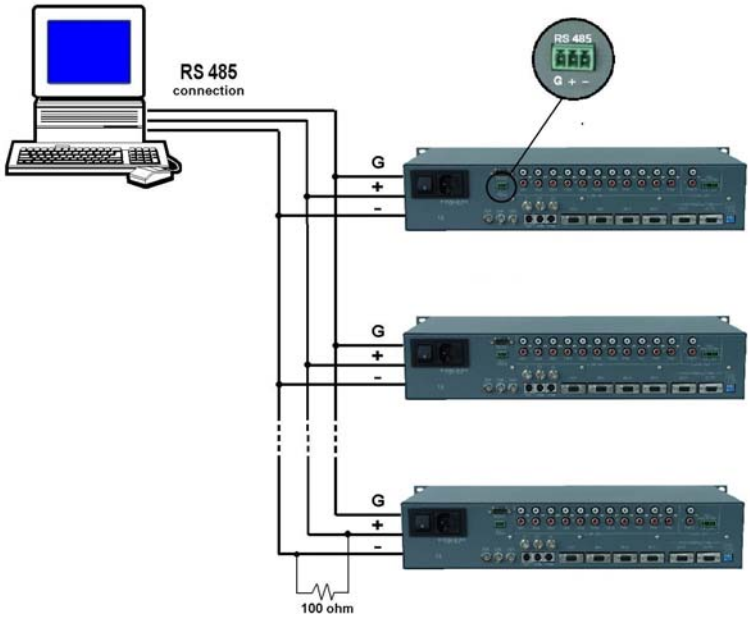
connection must be afforded using a cable according to the diagram below:



WARNING
If several units are connected on a party line
the 100 ohm termination must be on the last unit



On the back of the unit, there is a 4-pin dip-switch; 3 of these called COD0, COD1, COD2 are used to determine the address of the unit in the case in which more than one is connected on the RS485 party line.

If there is only one unit, use the default address OFF,OFF,OFF.

The protocol used requires that the messages exchanged between host and TZL300 be between the following control characters:

- command from host to TZL300:

STX ADDR command **ETX**

- reply of the TZL300 verso host:

STX ADDR reply **ETX**

The character **STX** corresponds to 02 hex,
the character **ETX** corresponds to 03 hex,
the field **ADDR** is the address of the TZL300: from 30 hex to 37 hex (or from 0 to 7 in ASCII)

The contents of the **command** and **reply** fields are the same as the commands indicated previously for the RS232 protocol except for the **CR** (hex 0D) character that is omitted in this case.

8.1 Commands managed

The commands that can be sent via RS485 include all those possible with RS232 except for the "Setting of RS485 parameters" command:

- Selection of video and audio input
- Setting of volume level on balanced audio output
- Setting of audio mute
- Sets resolution output
- Sets switching through blank time
- Save settings
- Recall settings
- Restore default settings
- Machine status request
- Firmware identifier request
- Setting of image adjustment parameters

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For a description of these commands, refer to the related paragraph of Chapter 7.0 COMPUTER CONTROL VIA RS232.

Example: in this case, the input selection command will have the following format:

STX ADDR BXX ETX where: B is the Hex character 42
XX is the input (from 01 to 11)

The TZL300 scaler replies:

STX ADDR ACK ETX where: ACK is the Hex character 06
if the command has been performed correctly

STX ADDR NACK ETX where NAK is the Hex character 15
if transmission errors have been detected or incorrect parameters.

Therefore, the input Y/C1 selection command for the TZL300 with address 2 will be as follows:

STX 2 B 04 **ETX** (in Hex code: 02 32 42 30 34 03)

the scaler will reply with:

STX 2 ACK **ETX** (in Hex code: 02 32 06 03)

or with:

STX 2 NACK **ETX** (in Hex code: 02 32 15 03)

9.0 TECHNICAL DATA

VIDEO:

Inputs:	:N°4 Graphic (active bypass) with HDD15p.f.
	:N°3 CVBS (Pal, Secam, NTSC)
	:N°3 Y/C
	:N°1 Y, Cb, Cr
Output	:Twin, High resolution, bufferable with HDD15p.f.
Output Format	:Selectable SVGA, XGA, SXGA and HDTV 480p, 576p, 720p, 1080i
Synch. level	:TTL
Vertical synch.	:60Hz
Switching	:Through blank, with switching time user adj.
Remote command	:RS232, RS485 and IR

AUDIO:

Inputs	:N°11 with RCA outlet
Input coupling	:AC, unbalanced
Input impedance	:56KΩ
Input level	:+9 dBm Max.
Frequency response	:-1 dB from 40Hz to 20KHz
Crosstalk	:60 dB at 5KHz
Distortion	:<0,03% at 0 dBm with 10KΩ load
Hum & noise	:-75 dBm unweighted
Outputs	:Unbalanced, 150Ω, with RCA outlet Balanced, 600Ω, with Phoenix screwtype
Output level	:Adjustable in 8 steps by IR control or RS232/485

Main input	:90÷240 Vac 50-60Hz
Power consumption	:15VA
Size (WxDxH)	:483x210x88

Operating temp.range	:0÷45°
Safety	:according to EN60065
EMC	:according to EN55103-1 and-2

CE Mark

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10.0 NOTES

This product is guaranteed for 2 years from the date of purchase.

If the fault in the product is due to improper use or operations carried out by third parties, the warranty is forfeited.

During the warranty period, Elpro will repair the faulty units free of charge.

The faulty units must be sent CARRIAGE FREE to the Elpro offices in Turin with a regular accompanying note.

The units repaired will be returned CARRIAGE FORWARD to the addressee.
Outside the warranty period, Elpro will repair the faulty units EX its Turin offices, charging the cost of the repair to the customer.

For any problems during installation of the TZL300,

call the Elpro hot-line 011 9348778
or E-mail: info@elprovideolabs.com

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