PITAG⬦RA

TrueScan
User's Manual

Security document analyzer instrument

Introduction

TrueScan constitutes today's response to the ever growing need for high security and prompt verification of documents, banknotes and security printing in general.

This simple, but sophisticated instrument, allows the user to safely and quickly verify the authenticity of the document, passport, visa, permit, banknote, check or other, by a few clicks from the mouse, achieving almost the same results as with a complex forensic analysis station.

TrueScan conceals, under its unsuspected mouse appearance, a number of features that enable the user to perform an in depth verification of authenticity and possible adulteration of any document by analyzing the presence of most of today's anti-counterfeiting technologies.

The philosophy behind TrueScan is the possibility to include as many critical tests as possible into a simple yet powerful portable package, containing most of the light spectrum analysis as well as invisible light spectrum, together with the possibility to perform a surface integrity analysis, including holograms, special OVI® inks, relief, cancellation attempts, microsurgery, watermarking, threads, fibers, and others.

TRUESCAN CHARACTERISTICS

TrueScan resembles a simple three button mouse connected to its triple adapter cable and to the necessary display which can be an LCD video display, or surveillance monitor, a computer VGA Monitor by means of an optional adapter, or directly to PC with another optional Video to USB adapter, or frame Grabber board. We will describe these options in detail on the options section of this manual.

TrueScan provides a spectrum analysis of the object document by generating seven visible colors of light plus two frequencies of infra red light, and two frequencies of ultra-violet or UV light. The surface integrity and relief analysis is achieved by shooting IR light from different angles which allow the detection of minor imperfections due to mechanical interventions or microsurgery, as well as the presence of a magnetic or fluorescent thread, or even fibers embedded within the paper, confirming the presence of Intaglio printing, micro-letters, nano-letters within a hologram, and other anti-counterfeiting features explained latter in this manual. The magnification produced by the miniature camera lens allows the user to quickly verify a document and establish areas of interest or doubt.

Careful attention will be devoted to the analysis of the security features contained in the US Dollar, the Euro and the Swiss Franc. Another chapter will be spent on adulteration attempts and the detection of ink residues from corrections, micro surgery on numbers or data fields, and simulation of metallic threads and watermarks.

Our difficult times require that we provide rapid, effective and inexpensive solutions to the frontlines of banks, border posts, document check points, and anyone having to verify the authenticity of printed material, being that of banknotes or security printed documents in general.

TrueScan Installation

TrueScan is simple to install since it has a single triple adapter cable between the mouse, a power adapter and the Video output connector that can go to either an LCD video display, surveillance monitor, television, projector (beamer),…or a computer VGA Monitor by means of an optional adapter, or directly to PC with another optional Video to USB adapter, or Frame Grabber board.

S T A N D A R D   I N S T A L L A T I O N   I N S T R U C T I O N S

1. Place the TrueScan mouse on the table and connect the power adapter to the wall outlet.

2. Connect the PS2 type mouse connector to the socket in triple adapter cable.

3. Connect the Video cable to the Cinch Video output connector in the triple adapter cable, if necessary use the adapter provided.

4. Connect the other end of the video cable with the RCA male connector to the VCR or video input 1 on your monitor or display.

5. Connect the DC power adapter connector to triple adapter cable.

6. Upon power up, the mouse will run a self test sequence turning different lights on and remains off in standby mode until a button is pressed. Click any mouse button to start TrueScan analysis. The unit is now ready to analyze a document.

Attention: never attempt to connect the mouse as a regular mouse to the PS2 port on a PC since this could cause damage to both. TrueScan only looks and feels like a regular mouse but it is not a PS2 mouse. Instead it is "the wolf dressed as sheep". On the same token, never connect a standard PS2 PC mouse to TrueScan's triple adapter cable.
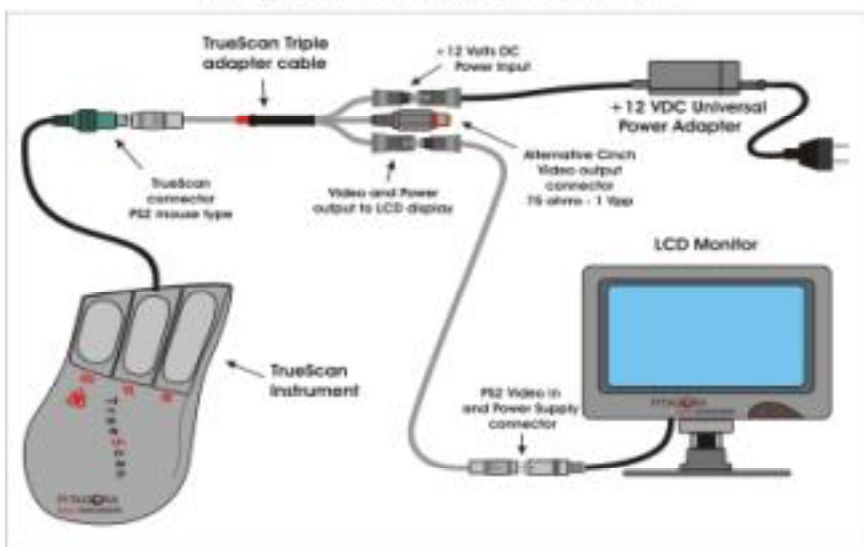

Figure 1.

TrueScan Operation

Once TrueScan has been connected to the monitor, Video display, PC VGA monitor or PC frame grabber, and power is applied to the unit, it performs the self test and remains in standby mode, (camera off), waiting for any button to be pressed. We can then turn the TrueScan spectrum analyzer on, by pressing any of the three analysis buttons and the light source will be indicated by the external light indicators.

LEFT BUTTON UV OPERATION

The left button, with the UV indication for Ultra Violet light, turns the camera and the UV light sources on (375 nm), under the camera, so as to analyze the document visually for UV fluorescence from the so called "invisible" printed inks, paper embedded UV fibers, threads or bands, which can be seen through the color monitor.

Pressing the left button again, the unit turns the camera off and the four external UV light (385nm) on. The instrument can then be lifted and used as a manual torch or flashlight to hit the desired document area under study.

In order to exit the UV mode, just press any other button. Please refer to the following page for the complete UV cycle diagram.
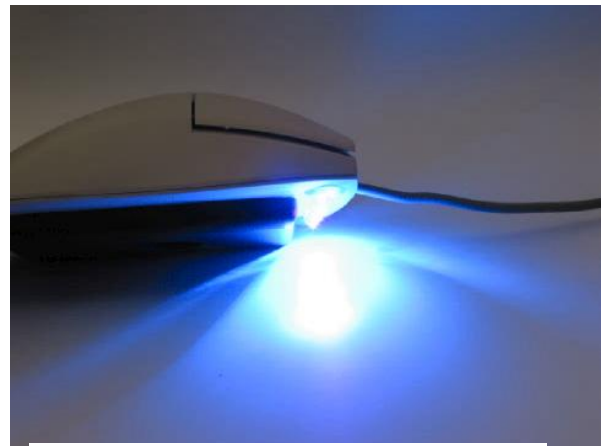
Figure 2. TrueScan UV lights

WARNING!!! Do not turn mouse upside down when UV light is on. Avoid looking at UV lights directly since prolonged exposure can be harmful to your eyes.
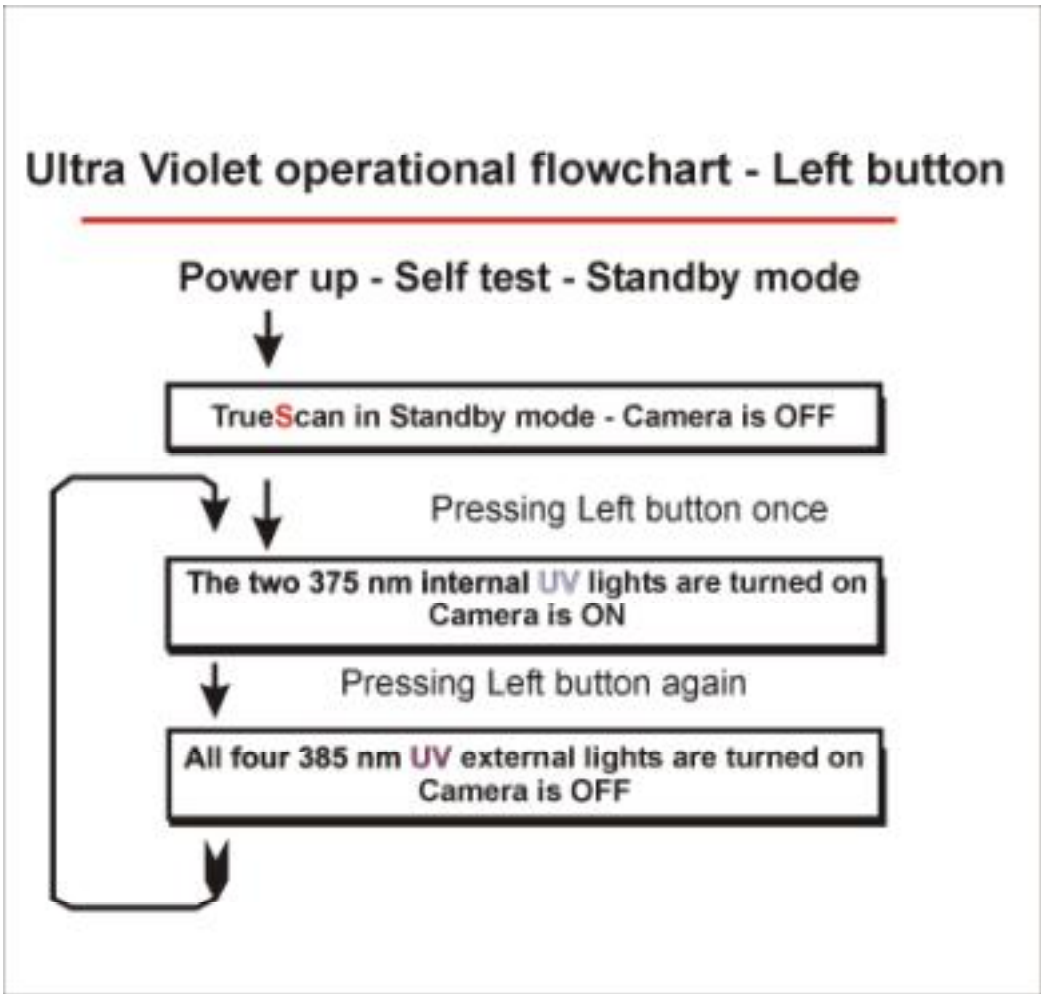
Ultra Violet operational flowchart - Left button

Power up - Self test - Standby mode

↓

TrueScan in Standby mode - Camera is OFF

Pressing Left button once

The two 375 nm internal UV lights are turned on
Camera is ON

Pressing Left button again

All four 385 nm UV external lights are turned on
Camera is OFF

Figure 4 e 5 – 200.- Swiss Francs banknote UV printed section.

Figure 6 e 7 – MicroSoft® authenticity certificate with UV print and fibers.

Figure 8 – Date of birth under UV light.

CENTER BUTTON

The center button with the VL indication for Visible Light spectrum, also turns the camera on and shows the first color from the seven available colors and frequencies. These colors are, white, red, yellow, green, cyan, blue and magenta, after which the camera stays on without any lighting, for transparency analysis.

Pressing the button repeatedly, changes the color to the next until the cycle repeats itself. The video image is in colors and this quick "voyage" through the visible spectrum, allows the user to eliminate colored backgrounds and inks to better distinguish specific features in a document or to enhance a specific color.

As previously mentioned, the final step in the VL cycle, turns all light sources off leaving the camera on, so as to verify transparency effects. This configuration requires a small light table (optional), where the document is placed. Using TrueScan the watermark can be immediately verified, as well as "see through" or perfect register from Simultan® printing both between different colors on the same side as well as between one side and the other . In addition, demetalized hologram areas as well as bands or threads can be easily verified for their particular details such as micro text or additional designs such as in the Euro or US dollars threads.

Figure 9 – TrueScan on magenta light.
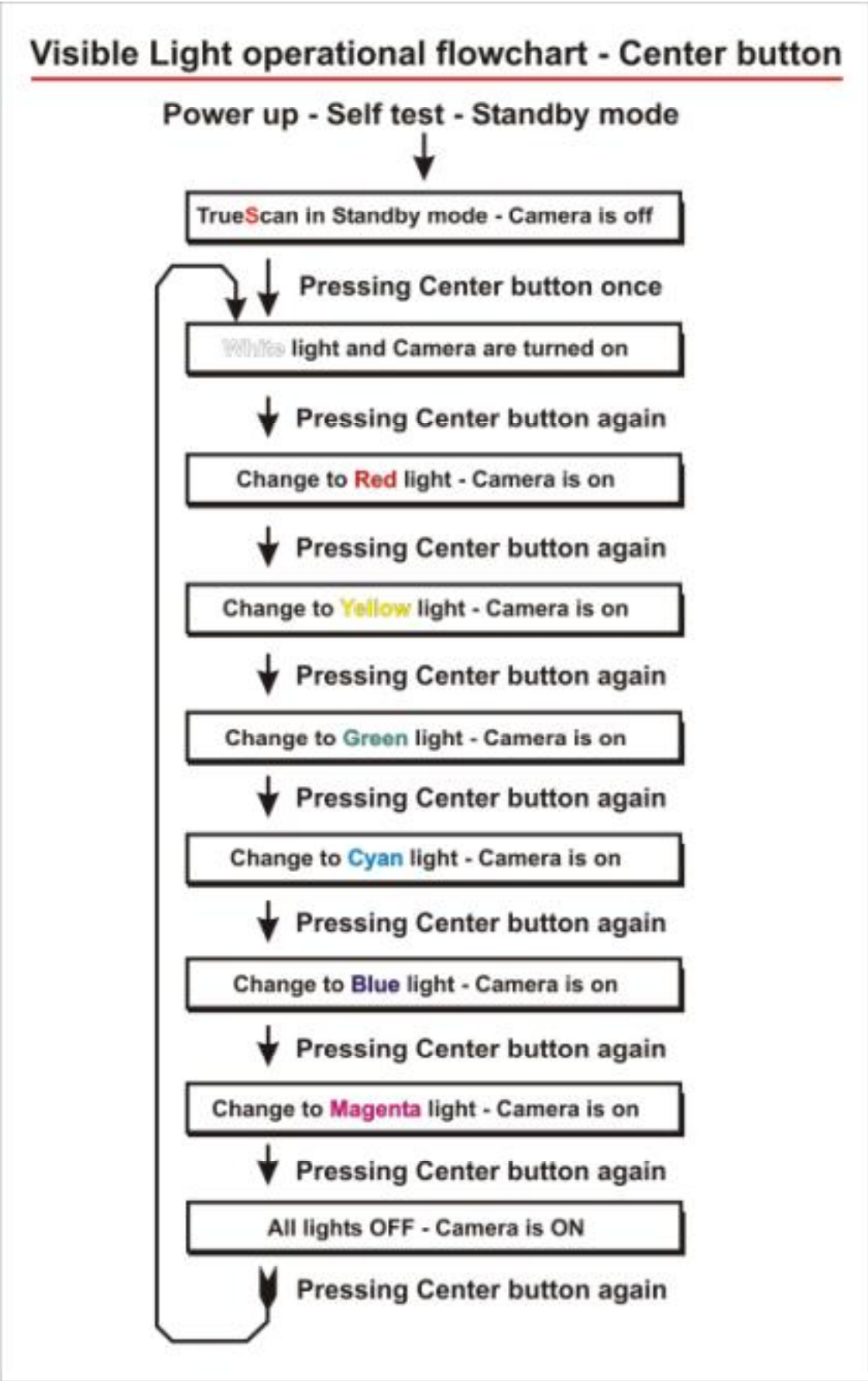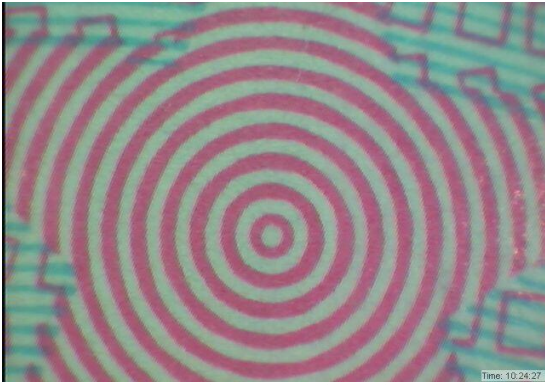

Figure 10. TrueScan on cyan, bottom

Visible Light operational flowchart - Center button

Power up - Self test - Standby mode

↓

TrueScan in Standby mode - Camera is off

↓ Pressing Center button once

White light and Camera are turned on

↓ Pressing Center button again

Change to Red light - Camera is on

↓ Pressing Center button again

Change to Yellow light - Camera is on

↓ Pressing Center button again

Change to Green light - Camera is on

↓ Pressing Center button again

Change to Cyan light - Camera is on

↓ Pressing Center button again

Change to Blue light - Camera is on

↓ Pressing Center button again

Change to Magenta light - Camera is on

↓ Pressing Center button again

All lights OFF - Camera is ON

↓ Pressing Center button again

Figure 11.

Figure 12- Euro, disigns under white light.

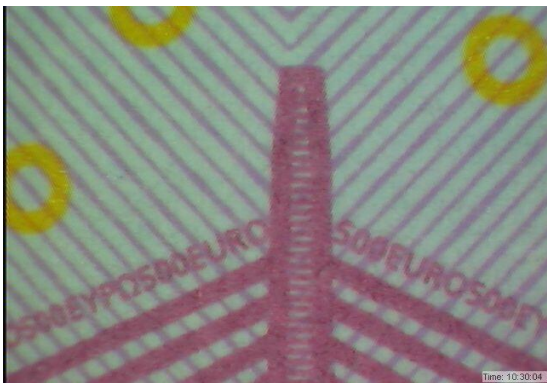*Figure 13 –* Euro, designs under white light.

Figure 14- Euro, designs with microletters.
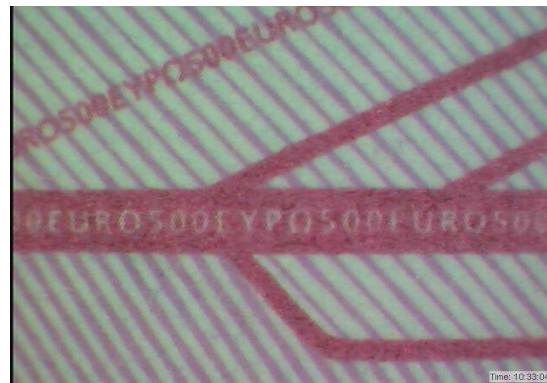

Figure 15 – Euro, designs with microletters.

Figure 16- Euro, hologram with nano letters.

Figure 17 – Euro, holograms with 3D designs.

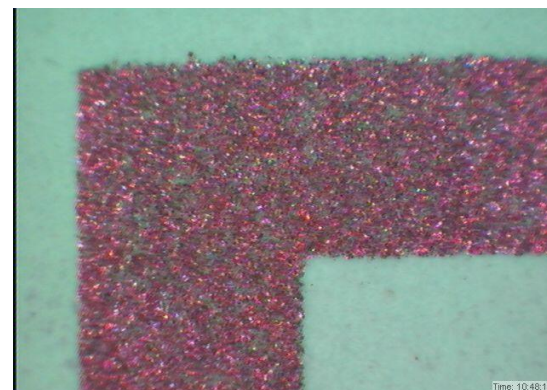*Figure 18-* Euro, microletters under white light.

Figure 19 – Euro, OVI® print in VL mode.

RIGHT BUTTON

The right button with the IR indication for Infra Red light, turns the camera on and shows all four external pink lights pulsating slowly, indicating all four top IR lights of 780 nanometers are on, pressing the button again changes to pulsating red, indicating all tangential IR lights (880 nm.) are on. Pressing again will lit only one of these four tangential lights at a time circling the object from all four directions until it returns to the original pulsating pink light.
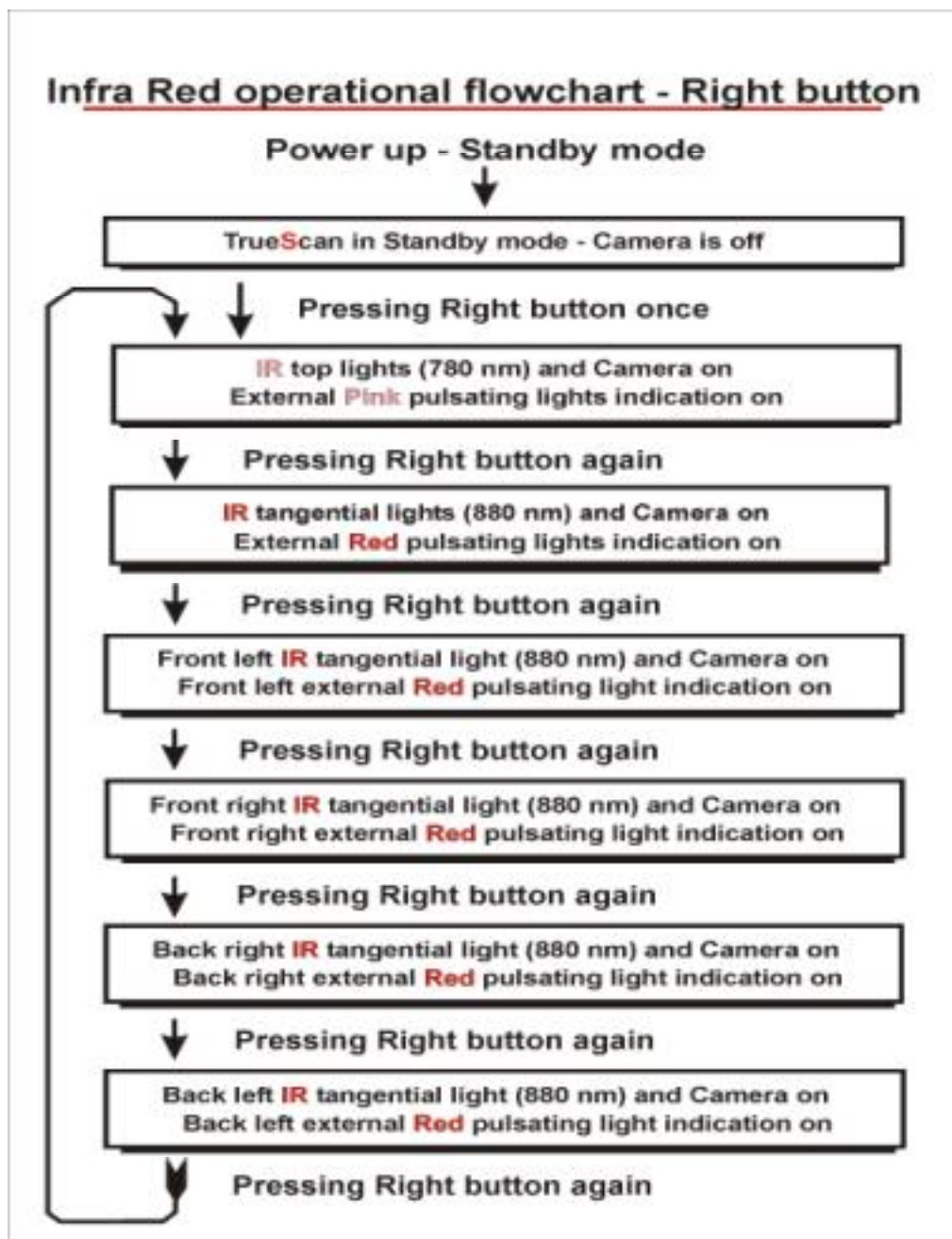

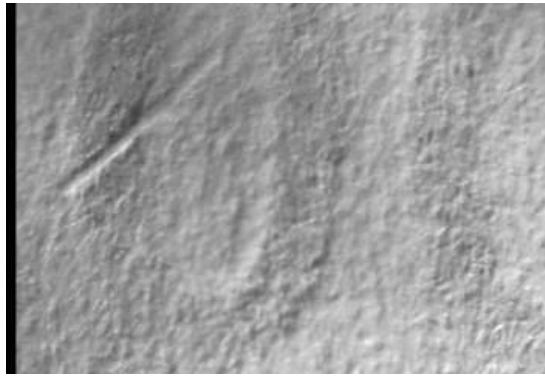*Figure 20.*

Figure 21 - Euro, intaglio relief in IR mode.
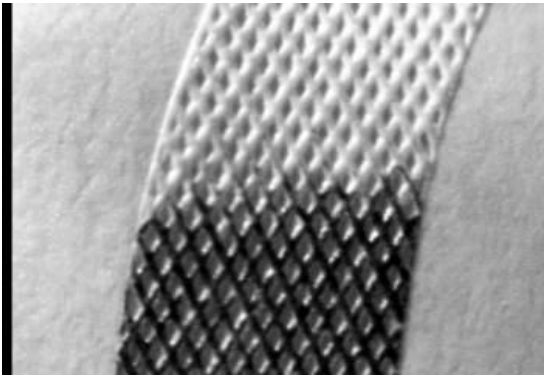

Figure 22 – Euro, watermark and UV fiber.

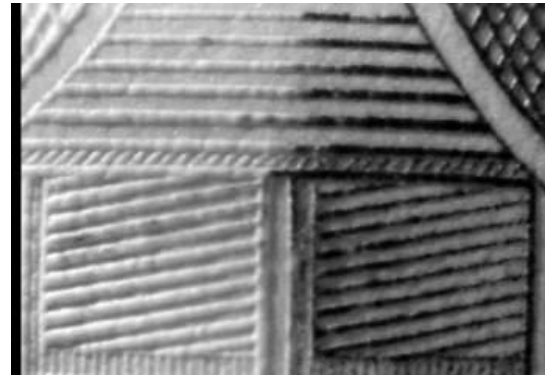*Figure 23*- Euro, 2 colors intaglio under IR.

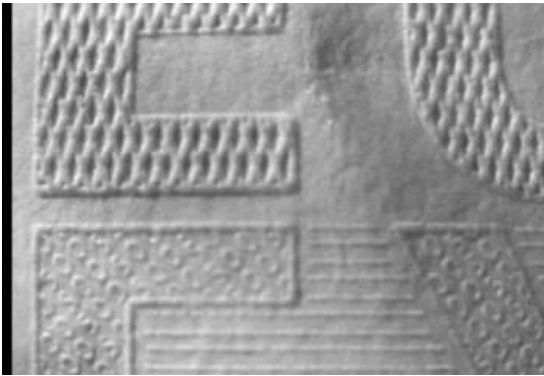*Figure 24* – Euro, 2 colors intaglio under IR.
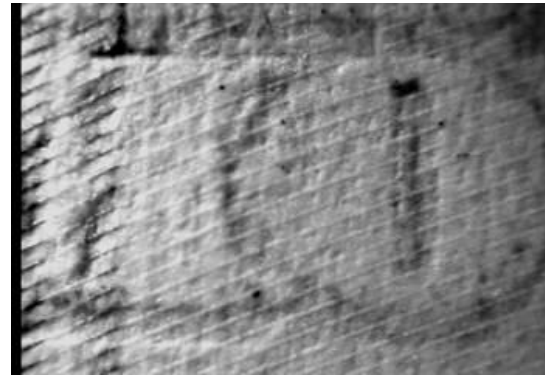

Figure 25 - Euro, microletters under IR.
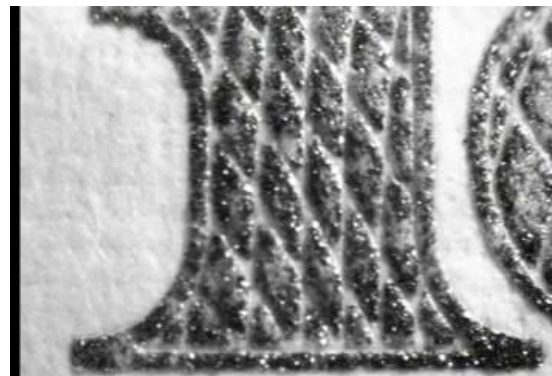

Figure 26 – USD intaglio relief on the back.

Figure 27 – USD 100.- OVI® intaglio print.

Figure 28 – USD 100.- microletters in intaglio.

G E N E R A L   O P E R A T I O N A L   N O T E S

TrueScan can access any mode at any time from any position within a given mode, therefore if the user is in the third step within the IR mode, and he or she wants to change to the Visible Light mode, they can just click the center mouse button.

Each menu is equipped with step position memory, to remember and return to the last light in use in that menu. Therefore if you go from the UV menu into IR, you enter the last step used in that menu. This improves considerably the document analysis through comparison under different lights. Specifically, we can verify the actual presence of UV fibers after verifying their fluorescence we can move into IR and check their relief within the paper surface; (no relief means counterfeited or printed fibers).

It is important to note that the unit will turn itself off after six minutes without a button being pressed. If the user wants to turn the unit off, all that needs to be done is to press any of the three buttons for more than two seconds. To turn the unit back on press any of the three buttons again.

Careful attention has been given both to the number of steps and to the practical aspects, so as to obtain the best possible analysis within the least available time, yet providing an in depth study of the document without compromising the effectiveness of the verifications performed.

Disclaimer

Pitagora SA does not assume any responsibility for eventual losses of data, tardiness on the delivery to a customer or other direct or indirect expenses caused by an eventual malfunctioning of the proprietary products or any other product mentioned within this manual.

Pitagora S.A. does not assume any responsibility whatsoever regarding physical or moral damages caused directly or indirectly by any of the products or operations described within this manual, be that due to defective malfunctioning equipment or due to improper use.

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Options

TrueScan offers maximum flexibility regarding its hardware configuration, either as a single standalone unit with its optional LCD monitor, or in a more complex environment, connected to the PC by means of a Video USB adapter, or a Video VGA converter. TrueScan can also be connected to the PC by means of a Video frame grabber board where video input from TrueScan can be either saved as video files or snap shots can be taken and stored in JPG or BMP formats, to create personal reference libraries. The unit also works in conjunction with a light table in order to improve the image on demetalization elements, threads and watermarks.

STANDARD TRUESCAN STANDALONE SYSTEM

As previously explained on this manual, under TrueScan Installation, we offer an optional 7" LCD monitor, complete with power adapter and remote control which can also be used on board a vehicle.

Figure 29 – TrueScan with optional 7" LCD Monitor.

Optional 7" LCD Monitor This optional monitor is a solid state flat monitor which can be used as either a color or Black and white unit in either NTSC or PAL system in standard size or wide size display modes. It also comes with a car plug to run from a vehicle's battery and a power adapter to be used as a desktop unit. The monitor can be operated with its remote control for mode, brightness, contrast or other settings.

Figure 30 – Optional 7" LCD Monitor.

TRUESCAN PC CONNECTION

Optional Video to UBS Adapter

This option allows the user to directly connect TrueScan to a portable or desktop PC by means of the USB port. The unit also comes with the necessary driver and image capture software which allows the user to record a video inspection session, or to record snap shots from particulars during the inspection of a document. The user can create its own library or catalog of images, to be edited or printed accordingly. It is not our purpose to explain in detail the use of this option since the unit has its own installation and instructions manual, please refer to that information or contact our support department for additional information.

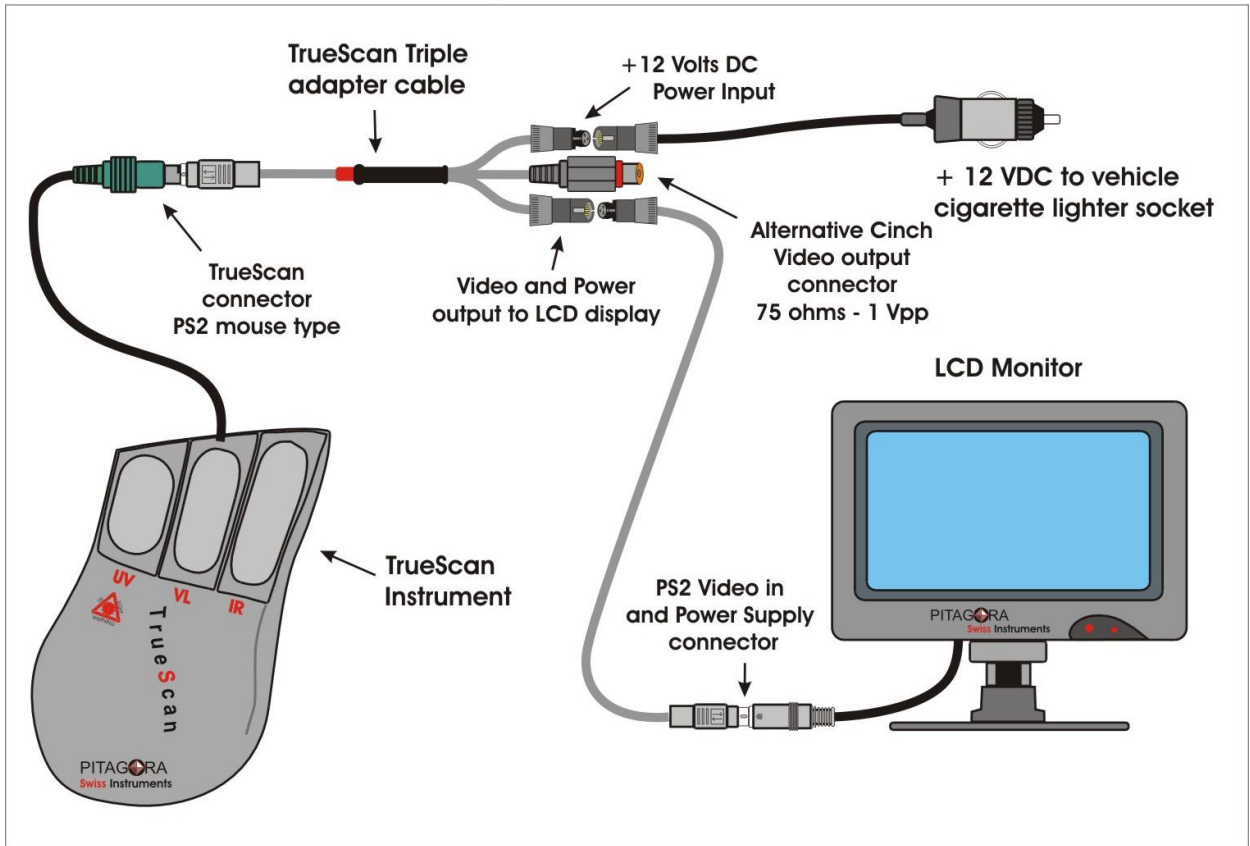*Figure 31* – Optional Video to USB adapter.

Optional Light table

The optional light table is particularly useful when inspecting watermarks or demetallized holograms or even threads, always in transparency mode. Although most light tables will work, many can present soft interference lines traveling vertically due to the difference in frequencies between the light table and the camera, however, this does not represent a major problem. The unit can operate with batteries or with its power adapter.
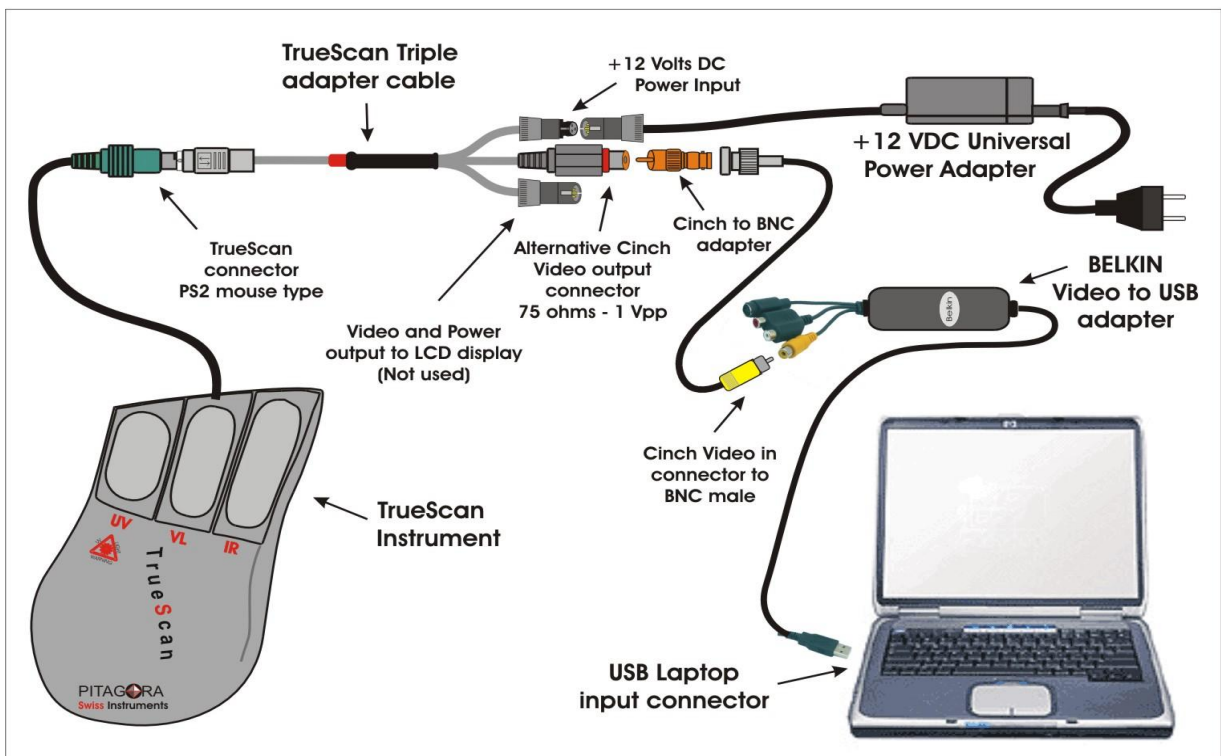

Figure 34 – Optional Light table.

Connection diagram for vehicle operation getting power from the cigarette lighter socket.

Connection diagram using Belkin Video to USB adapter for PC connection, software must be loaded from CD ROM.

Technical Specification

Enlargement:	20 times on 7" monitor (final size depends on output monitor size).
Video output:	Composite video signal NTSC color; resolution 510x492 pixels; 380 TV lines.
Light sources:	White; red 615 nm.; yellow 575 nm.; green 528 nm.; cyan 510 nm.; blue 470 nm. Magenta 410 nm.; UV1 375 nm.; UV2 385 nm.; IR1 780 nm.; IR2 880 nm.
Standby time:	2 minutes for UV and 4 minutes for the other lights (after which the unit turns itself off; any key will turn it on again).
Manual turn off:	Pressing any key for more than two seconds turns the unit off; (any key will turn it on again).
Key type:	High resistance micro switch keys (40 grams key pressure).
External power supply:	Universal switching supply; Input voltage 100-240 AC, 50/60Hz; Output voltage adjusted at 9 Volts DC./ 900 mA.
Power requirements:	9 Volts DC, 300 mA, maximum consumption 3 Watts. Also available on 12 Volts DC for vehicle installation and usage.
Operating temperature:	–23°C a +50°C (-10°F a +122°F)
Storage temperature:	–30°C a +70°C (-22°F a +158°F)
Humidity:	0% to 90% (from 0°C to 35°C or from 32°F to 95°F).
	0% to 70% (from 35°C to 50°C or from 95°F to 122°F)
External dimensions :	Length 130 mm.; width 70 mm.; height 50 mm.
Weight:	110 grams.