



# Needle path detector SK3

## User's manual

**WARNING! Prototype versions bear no indication of SW version.**

This manual applies to program versions 1.2 and higher

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## FOREWORD

### ***Letter from the engineering team:***

The design of this new needle path detectors was prompted by the intention of BIANCO S.p.A. to be present on the market as a benchmark in terms of performance, capability and service, by enhancing the technological content, and hence the added value of the machines supplied.

This policy and the trust accorded to our engineering team has kindled the enthusiasm and dedication we already feel for our job, which now appears more attractive and interesting than ever. For this reason, we are grateful to the company management and express our hope to be able to repay their trust with products in keeping with their expectations and, first and foremost, with customer requirements.

### **Hw ad hoc:**

In the design of the SK3 detector, we started out by considering the objectives to be reached, without setting for ourselves any time or cost limitations.

Only after defining the characteristics of each individual part, a market survey got underway to assess actual feasibility.

Since we were unwilling to accept any compromise, the design of the optical and mechanical parts proved rather complex, and after a number of experiments, it became focused on the present-day solution, where each individual part is made to measure according to stringent construction principles.

The electronic components are mostly derived from the automotive and military markets and are certified to operate in particularly adverse environmental conditions. For the computation parts, it was decided to combine a microcontroller and a digital signal processor (DSP), both of them very powerful, so as to be able to reserve the DSP to mathematical computations also and use the microcontroller and its peripherals for control and service tasks. The visual sensor is a new generation device, more performing than traditional CCD's; from the few top-performing visual sensors available on the market, we selected one already adopted by medical centres, with superior capabilities in terms of sensitivity and signal/noise ratio.

### **Sw that "sees and sees to it":**

The software monitors the system's operation and working conditions on a continuous basis, warns the operator of any anomaly and at the same, if necessary, takes action to by-pass the problem.

### **Upgrade your machine:**

The computation algorithms implemented at present should already be able to create an appreciable gap compared to competing products. At all events, new algorithms will be implemented in the forthcoming SW versions. To download the upgrades is easy (all you need is a portable PC), and they can be received by electronic mail or regular mail. Soon a downloading feature will be activated in the official web site of Bianco ([www.bianco-spa.com](http://www.bianco-spa.com)). Thank you for choosing Bianco, we hope the performance levels offered by the product will meet your expectations in every respect.

The design team of the R&D division

## SET-UPS AND CONFIGURATIONS

### POSSIBLE CONFIGURATIONS:

- Depending on type of installation, the SK3 needle path detector is available in two different configurations.
- Each configuration can be supplemented by a “completion kit”, selected from a choice of versions available, that makes it possible to adapt the detector to different assembly layouts.
- Regardless of the configuration selected and the kit applied, it is possible to add a number of optional devices.

The foregoing is summarised in the table below:

		<b>1 Configuration from panel</b>	<b>2 Stand alone configuration</b>
	<b>Completion kit</b>		
<b>1</b>	TGL80 upgrade kit - basket	HH1001004003	HH1001004003
<b>2</b>	TGL80 upgrade kit - air slit	(Note 1)	(Note 1)
<b>3</b>	TGL90 upgrade kit - basket	HH1001004003	HH1001004003
<b>4</b>	TGL90 upgrade kit -air slit	(Note 1)	(Note 1)
<b>5</b>	Line SK1 assembly kit	HH1001004003	HH1001004003
	<b>Options</b>		
<b>1</b>	Giant Display	(Note 1)	
<b>2</b>	Vdtx	(Note 2)	
<b>3</b>	OP16	(Note 1)	

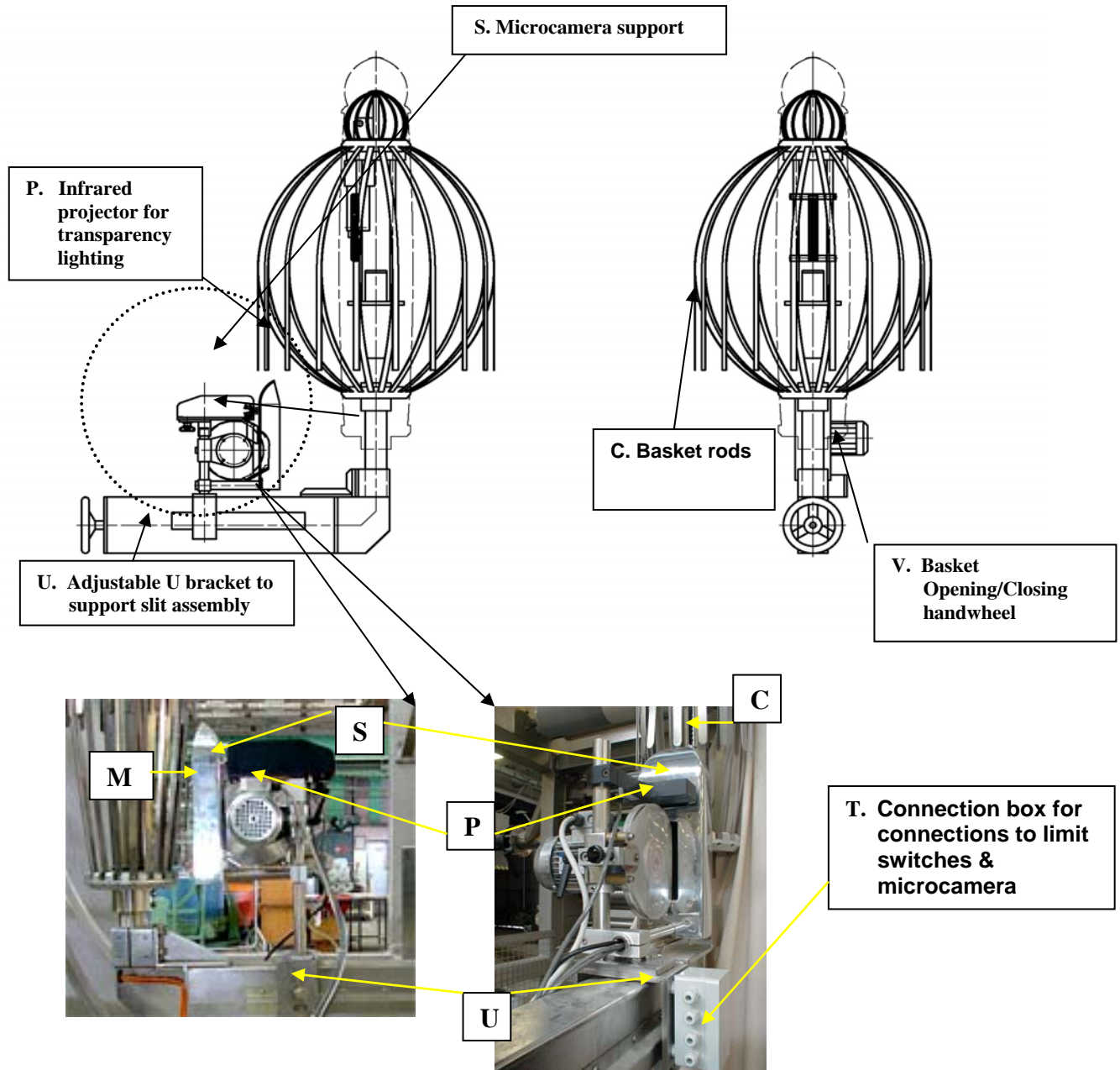
Note 1) Not yet available

Note 2) Only for installation and technical service operations

Parts making up the SK3 needle path detectors:

	<b>Bianco ordering code</b>	<b>Description</b>
<b>1</b>		<b>Configuration from panel</b>
<b>1.1</b>	HH1001004002	Infrared projector for transparency lighting
<b>1.2</b>	HH1001004001	Microcamera with IR projector for reflex lighting
<b>1.3</b>	EE5900010156	Control electronics with board and transformer
<b>2</b>		<b>Stand alone configuration</b>
<b>2.1</b>	HH1001004002	Infrared projector for transparency lighting
<b>2.2</b>	HH1001004001	Microcamera with IR projector for reflex lighting
<b>2.3</b>	EE5900010157	Control electronics with box without transformer
<b>3</b>	<b>HH1001004003</b>	<b>Completion kit</b>
<b>3.1</b>	L2700010031	Projector support
<b>3.2</b>	L2700010007	Cutter support
<b>3.3</b>	A1800C91402	Cam spacer
<b>3.4</b>	A1800C91403	Limit switch rod with cam
<b>3.5</b>	FF4115-2DN	IP67 limit switch with washer
<b>3.6</b>	A1800012596	Bracket for microcamera support
<b>3.7</b>	A1800012505	Blade guard

**Schematic view of photodetector fitted to basket:**



**INSTALLATION:**

Completion kits are necessary when you wish to install an SK3 needle patch detector. Depending on type of installation, it is necessary to choose the most appropriate completion kit.

The mounting procedures for the SK3 described below use the various kits available.

**Upgrading a photodetector:**

We provide below the instructions to de-install an earlier version photodetector and then replace it with an SK3.

Three cases are envisaged:

- Upgrading a TGL80 equipped with basket.
- Upgrading a TGL90 equipped with basket.
- Upgrading a TGLSK3 prototype Rev.

Materials needed:

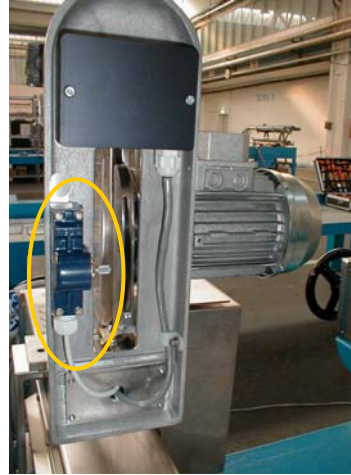
- Small sized screwdriver for the terminals.
- 2.5, 4 and 6 mm sized Allen wrenches
- 8 mm long socket wrench
- 8 and 13 mm wrenches

De-installation procedure:

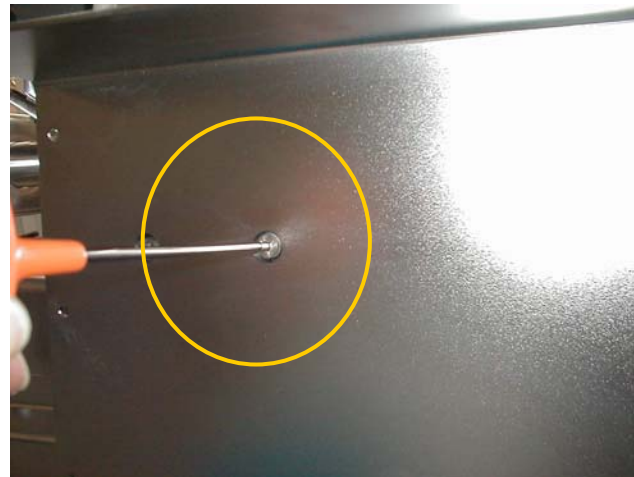
1. Disconnect all the cables from the box installed aboard the basket. N.B. all wires are shown in the wiring diagram of the machine, nevertheless we recommend marking the cables, terminal strips and number of terminal for each connection, in order to avoid problems and facilitate the upgrading process.
2. Disconnect the limit switch and remove it by mechanical means.
3. Remove the box fitted to the basket (it is fastened by 4 nuts).
4. Remove the box supporting plate (it is fastened by two bolts).
5. Remove the projector (fastened by a bolt).
6. Remove the photodetector (fastened by two bolts).
7. Remove the mechanical parts supporting the photodetector (fastened by a socket head screw).
8. Pull out the motor after realising it by means of an ad hoc lever.
9. Remove the bracket supporting the motor and the projector (fastened by 4 bolts).
10. Remove the U bracket connecting the motor support to the basket truck (fastened by 4 bolts, 2 per part).

Now we can proceed with the mounting of the completion kit needed for the installation of the SK3 detector.

Images illustrating the de-installation procedure:

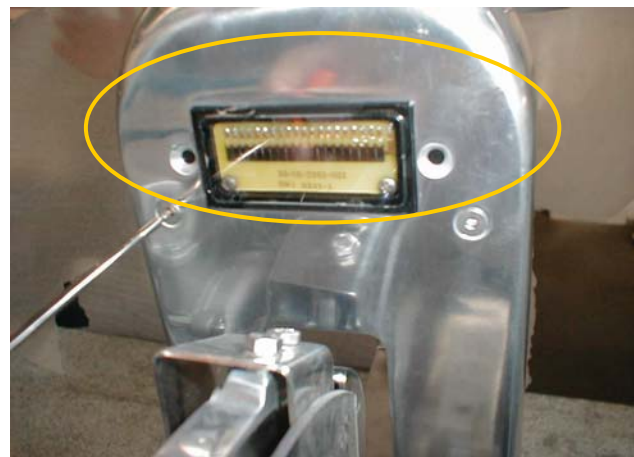
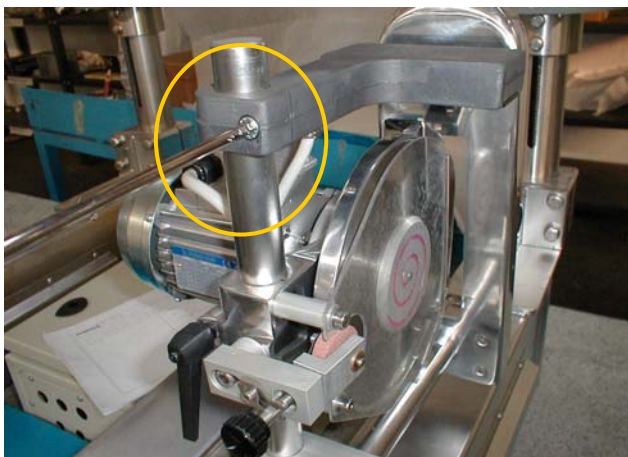


1) Disconnect the cables from the box fitted to the basket 2) Disconnect the limit switch and remove it



3) Remove the electronics box

4) Remove the box supporting plate

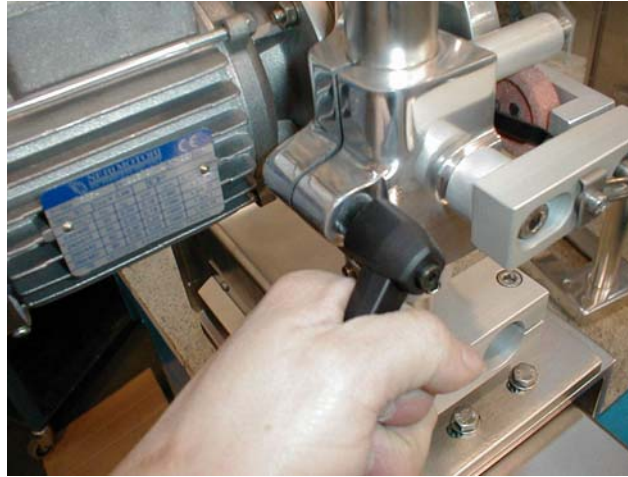


5) Remove the projector

6) Remove the photodetector



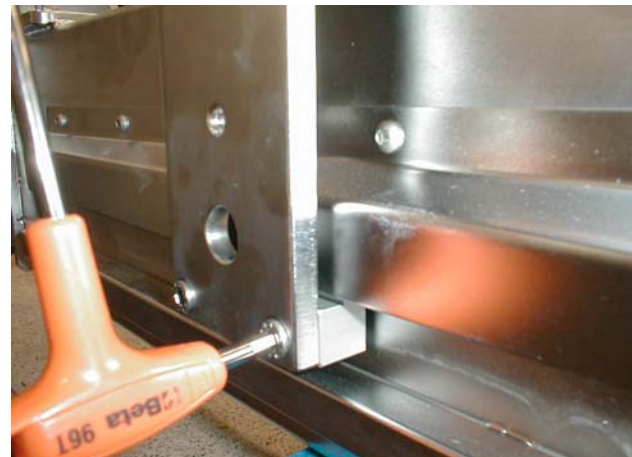
7) Remove bracket+photodetector support



8) Remove motor assembly



9) Remove bracket supporting motor/projector



10) Remove U bracket



**Fitting the completion kit EE5900010226:**

The completion kit in question must be used in all cases of installation on a basket, i.e.: for upgrade purposes after de-installing the previous photodetector version, or when fitting the photodetector onto a new line.

**Materials needed:**

- 2.5, 4 and 6 mm sized Allen wrenches
- 8 mm long socket wrench
- 8 and 13 mm wrenches

**Installation procedure:**

1. Fit the new U bracket supplied with the KIT and screw it in place after pushing it towards the handwheel as far as permitted by the adjustment slots.
2. Fit back the motor & projector supporting bracket previously taken down. It must be screwed in place keeping the base flush with the left hand shoulder of the U bracket.
3. Insert the new photodetector mechanical support. Warning: the new mechanical support is normally supplied with the limit switch and the SK3 photodetector already mounted inside it: handle it with care so as not to expose it to shocks.
4. Replace the blade guard present on the previously taken down motor assembly with the new version supplied with the KIT.
5. Fit back the motor assembly. WARNING: the photodetector mechanical support must be pushed all the way towards the basket to make room for the passage of the motor assembly.
6. Secure the photodetector mechanical support at a distance of 205 mm from the support that links it to the projector motor supporting bracket. Make sure that the support is vertical relative to the mechanical parts of the basket.
7. Adjust the connecting support of the photodetector mechanical parts, with the motor supporting bracket, so that between the connecting support and the base of the latter there is a gap of ca 10mm.
8. Fasten the motor assembly so that its supporting ring remains at a distance of 60 mm from the base of the projector motor supporting bracket.
9. Adjust the entire assembly installed on the U bracket, by moving the U bracket within the relative ad hoc slots; this adjustment must be performed so that the back of the photodetector will remain at a distance of a few mm (3/5) from the lower support of the basket rods.
10. Rotate the basket in all directions and make sure that in any opening condition the bottom end of the rods remains at all times ca 10 mm above the upper end of the photodetector mechanical support; if it does not, adjust the height of the photodetector and its mechanical parts accordingly, by changing the distance specified at step 8.
11. For an upgrade with SK3 box version, fit back the box supporting bracket.

The mechanical parts now are ready for the installation of the SK3 upgrade kit

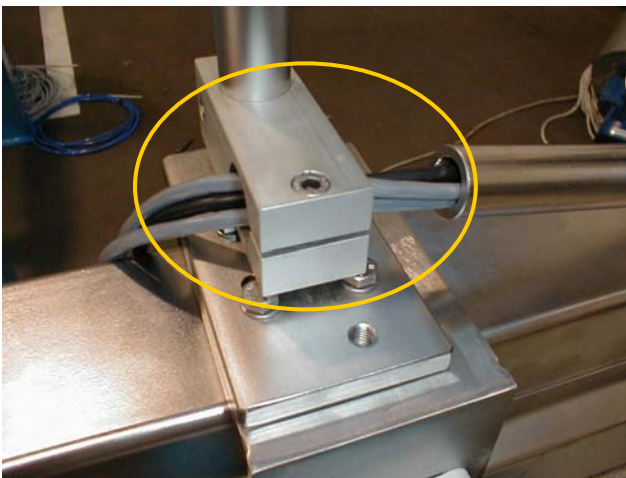
Images illustrating the completion kit installation procedure:



1) Install the U bracket towards the handwheel



2) Fit back the projector/motor supporting bracket



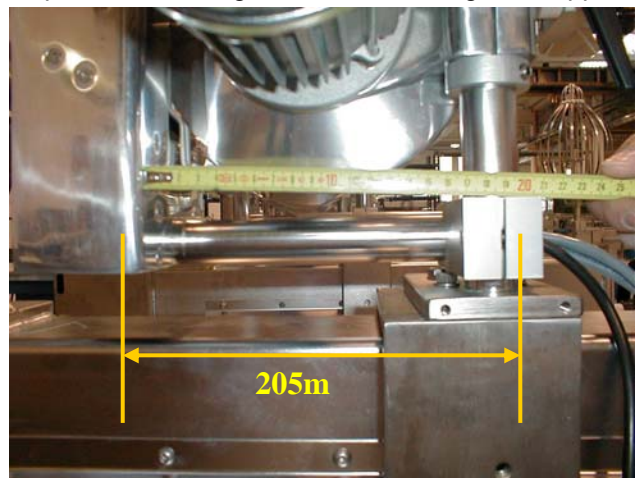
3) Insert the new photodetector mechanical parts



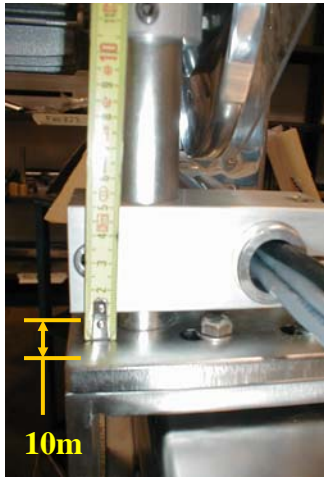
4) Replace the blade guard with the new guard supplied



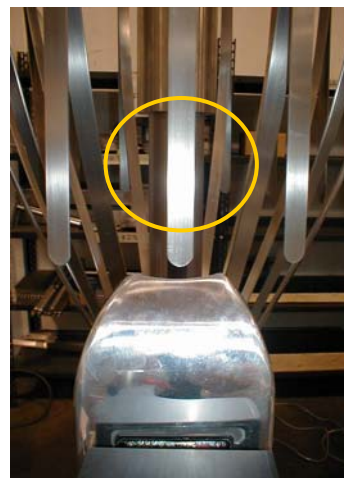
5) Fit back the engine assembly



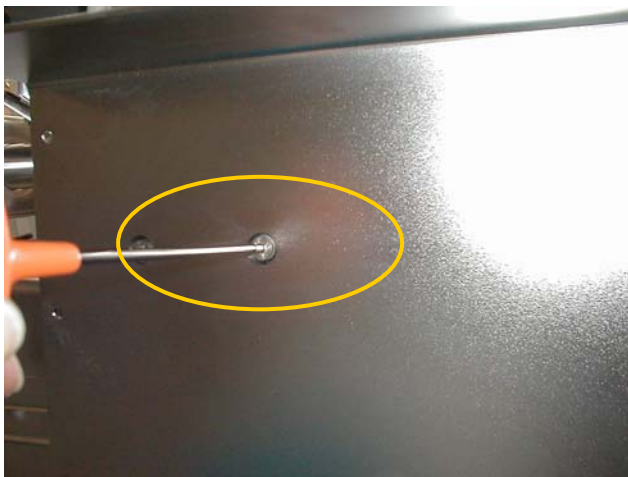
6) Fasten the photodetector mechanical parts at a distance of 205mm



7) Adjust the photodetector support at a distance of 10mm from the base 8) and the motor assembly at a distance of 60 mm from the support



9) Adjust the photodetector at a distance of a few mm from the basket and 10) Make sure that the rods do not touch it



11) If necessary, fit back the box support

**Installing an SK3 kit:**

The following procedure must be performed in parallel with the installation of a completion kit and must be used in the case of an initial installation onto a line or an upgrade installation.

Materials needed:

- Small sized screwdriver for the terminals.
- 2.5, 4 and 6 mm sized Allen wrenches
- 8 mm long socket wrench
- 8 and 13 mm wrenches

Procedure:

1. Insert wire of the SK3 photodetector + the limit switch wire in the tube connecting the photodetector mechanical parts with the rest of the machine.
2. Insert the limit switch wire into the connection box fastened to the bracket using the PG located in the portion facing the basket opening handwheel. In the PG located on the opposite side, insert the limit switch connecting wire from the panel.
3. Insert the projector into its ad hoc support and arrange it so that the lenses of the photodetector and the projector will face one another, at the same level and parallel to one another. The distance between them should be approx 20mm. If this cannot be achieved, you can work on the adjustments of the U bracket and the mechanical parts of the photodetector.
4. Make sure that the blade and blade guard do not touch in the mechanical parts and the limit switch rod can move freely.
5. For versions with the control assembly in a box, fasten the box to the relative support.
6. Fit the wires of the projector and the photodetector (3 wires in all), connecting them to the box aboard the basket of the panel. In the case of panel installation, the limit switch connection box can be replaced with a bigger one having four PG's on the input and as many on the output, and use it to make a connection between the wires from the panel to the project and receiver wires, so as to simplify the harnessing scheme.

For correct photodetector operation, it is now necessary to proceed with the calibration and alignment of the projector with the microcamera.

Images illustrating the installation procedure of an SK3 kit:



- 1) Insert the photodetector+limit switch wires into the ad hoc tube
- 2) Connect the limit switch to the wire from the electric panel by means of the ad hoc box



- 3) Mount the projector, which must be at a distance of 20mm approx from the photodetector
- 4) Make sure that the blade and blade guard do not touch at any point and the limit switch rod can move freely.



5) If necessary, the box be replaced



Image at end of installation

**Calibration and alignment of the projector with the microcamera:**

This process is indispensable for correct system operation, it must be performed in the event of first installation and must be checked and, if necessary, repeated in the event of malfunctioning (e.g. after a shock to the projector or the microcamera support).

The projector is aligned with the receiver by adjusting the position of the projector and, if necessary, the position of the photodetector mechanical parts.



The supporting mechanical parts should always be vertical, i.e. parallel to the basket.

The calibration process can be performed in three ways, that can be used regardless of the equipment available.

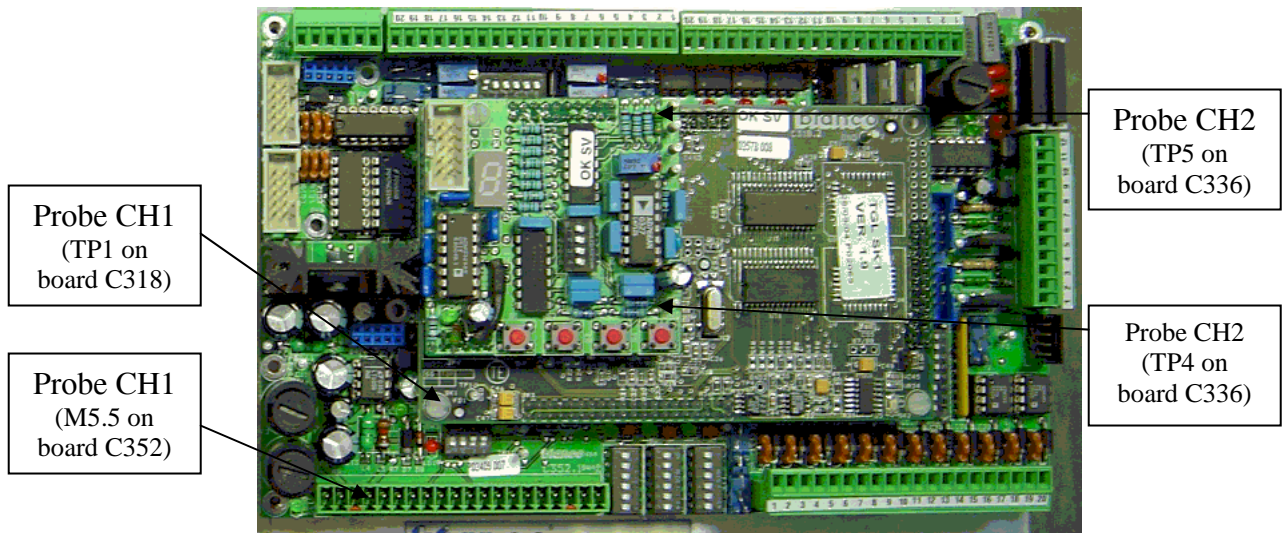
1. Calibration by means of an oscilloscope
2. Calibration by means of VDTEX programme
3. Calibration by means of a tester.

**Calibration by means of an oscilloscope:**

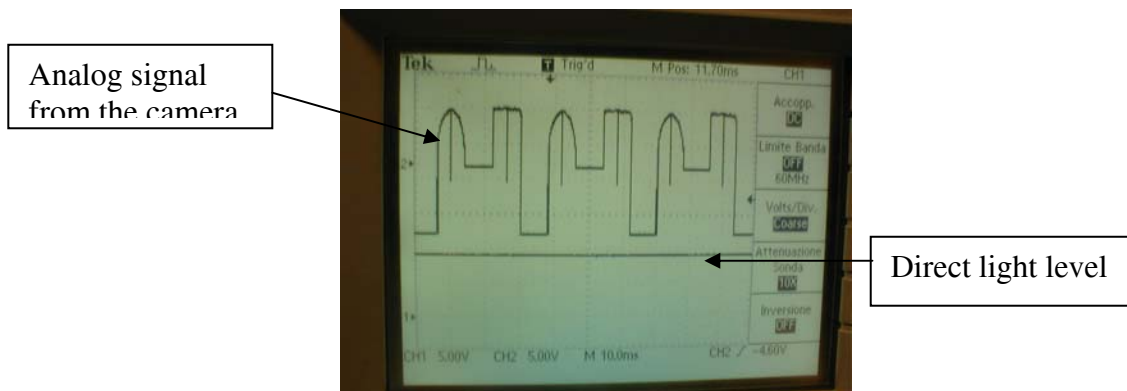
This is the method offering the best results. In view of the nature of the signals, we recommend using a digital oscilloscope. However, an analog unit can also be used.

**RE: Calibrating the TGL SK3 by means of an oscilloscope.**

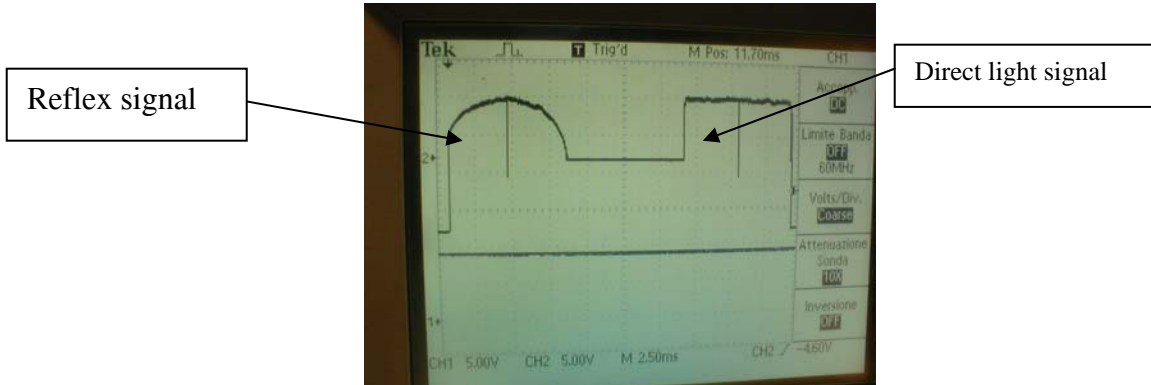
- 1) Turn off the machine
- 2) Set switch SW2-1 on “ON”
- 3) Connect probe no. 1 (CH1) to board C352 terminal M5-5, connect 0V (potential) of probe no.1 to TP1 on board C318. **On the first channel you can see the level of the direct light signal, maintain this signal at the highest possible level, ca +10vdc.**
- 4) Connect probe no.2 (CH2) on board C336 to test point TP5, connect 0V (potential) of probe no.2 to TP4 on board C336. **On the second channel you can see the analog signal of the camera sensor**, adjust the trigger or the oscilloscope for CH2.



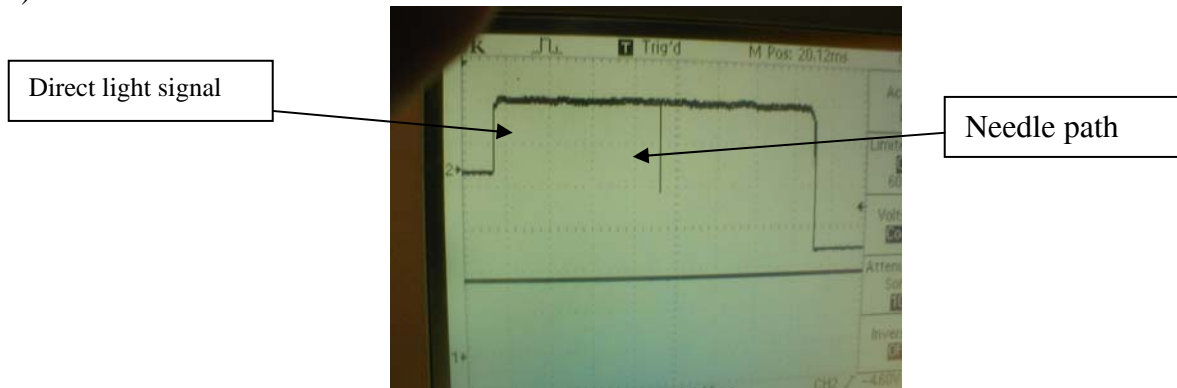
- 5) Power the machine, make sure that the reflex / transparency (working mode) selector is set on transparency and the red 7-segment display is on “0.” (On board C336), you can see this image.



6) zoom ...



7) zoom in further ...

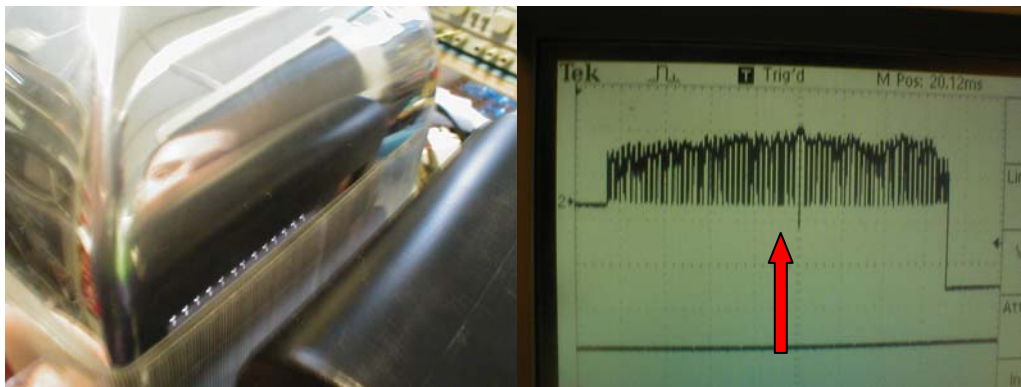


Adjust the camera up/down, left/right to obtain...

- A) The analog signal from the camera will be similar to the previous image.
- B) The direct light signal level will be ca +10Vdc.

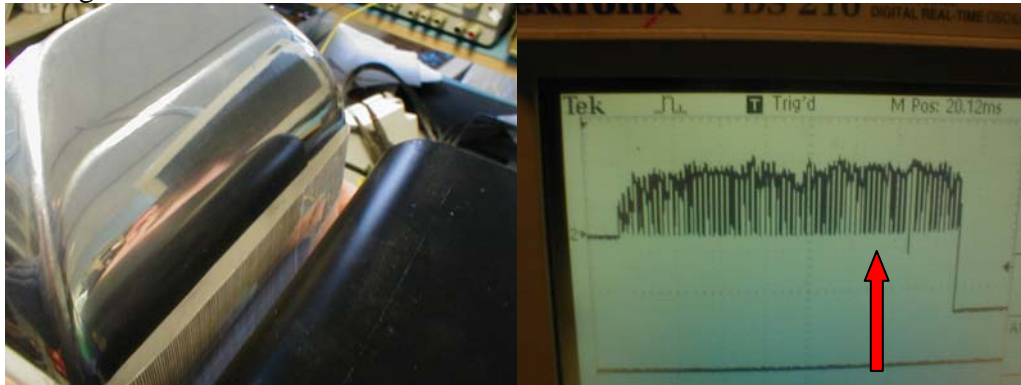
8) Having adjusted the mechanical position of the camera without any fabric interposed between the camera and the projector, interpose fabric (or a finger, or a screwdriver)...

In the next image, the fabric is represented as parallel lines, the needle path is represented as a line of varying amplitude. ...  
 ... now in the centre ...

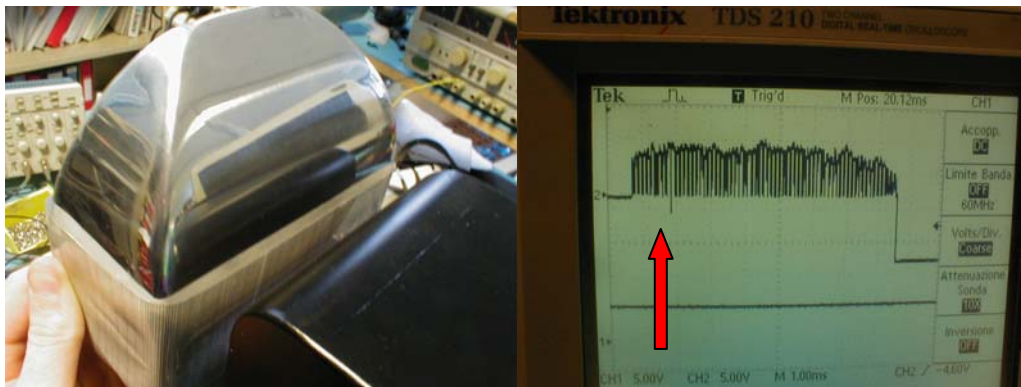




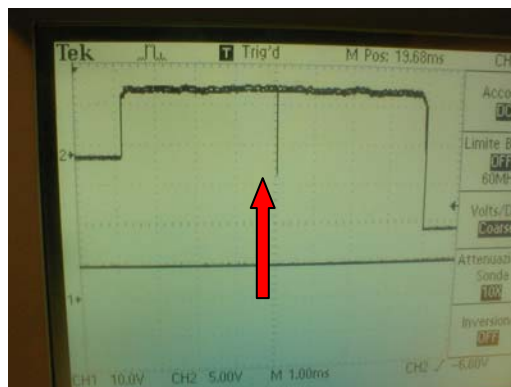
... now on the right ...



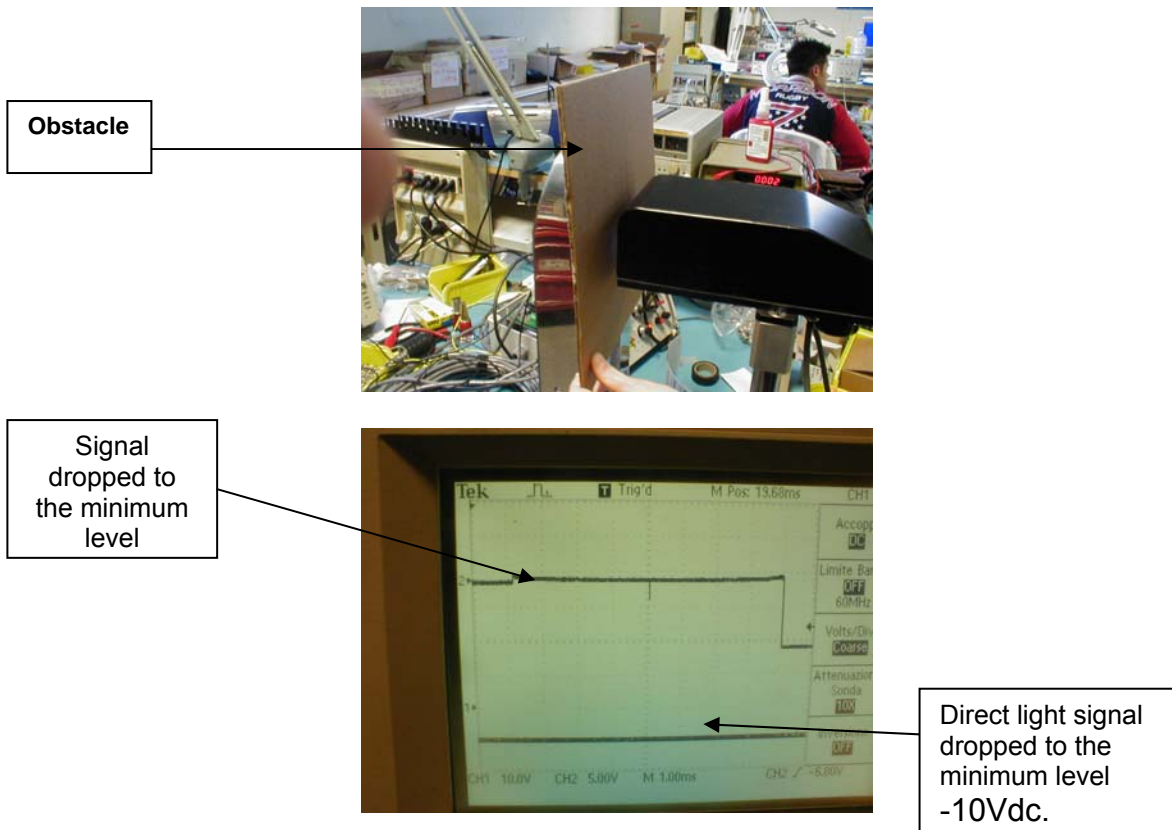
... now on the left ...



9) Check the level of the direct line signal (without any obstacles between the camera and the direct light projector); in the next image you can see the signal reaching the highest level, ca +10Vdc.



- 9) If you obscure the signal by interposing an obstacle between the camera and the projector you will see the signal drop to ca -10Vdc.



### Calibration by means of VDTEX SW:

This is perhaps the easiest method as it requires no specific equipment other than a portable PC where to run the VDTEX program.

Material necessary:

- PC with VDTEX96 program installed
- 4 mm Allen wrench

Minimum requirements for PC used for upgrade:

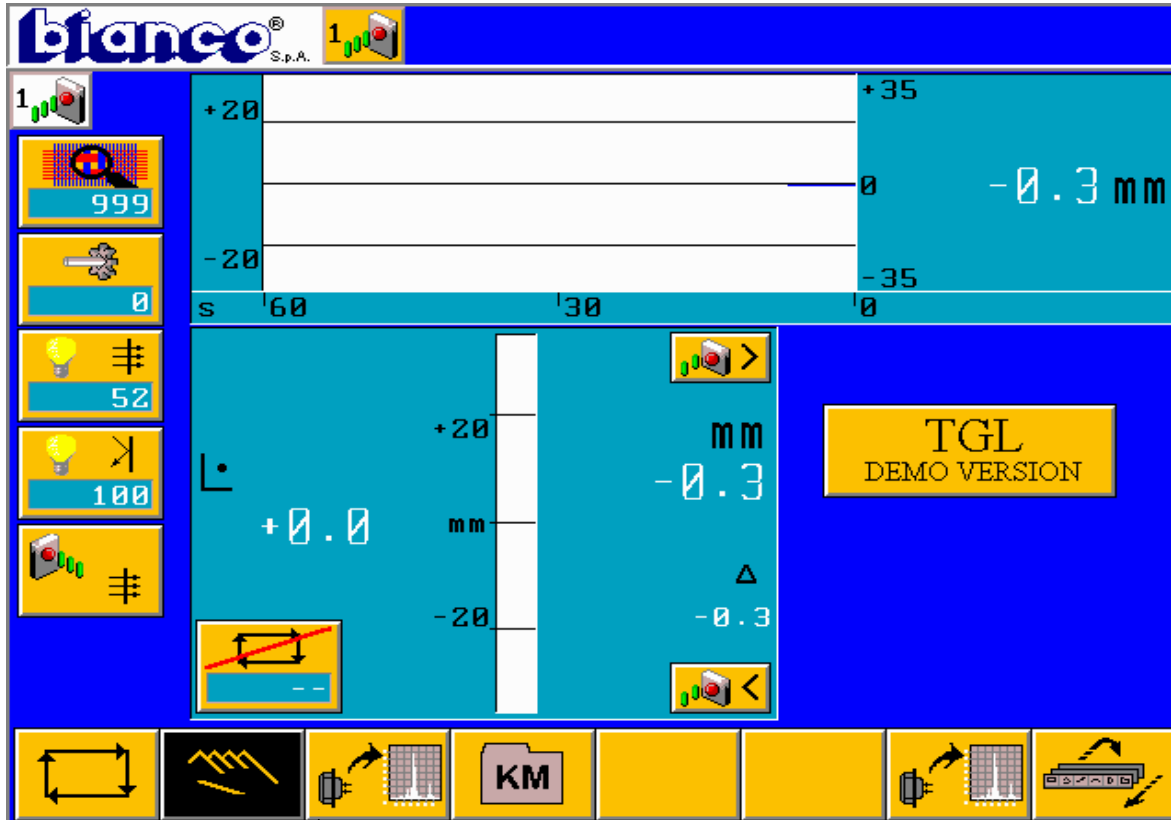
- Any PC DOS 6.22 or compatible operating system.
- The PC should be equipped with a standard receptacle type 9 pin RS232 serial connector (DB9S).

The VDTEX96 SW version installed on the PC should be 3.0m or higher.

Procedure:

- On C352 board: open, if closed, selector S7 (two-way selector, leave both ways free). If S7 was closed previously, memorise point of connection to be able to reset it later.
- On C336 board: insert 10-way connector of flat cable into JP3 housing, insert receptacle type connector of upgrade cable into serial communication port of PC.
- On the PC: run the VDTEX96 program. If the PC has been configured correctly, the screen will display the following page.
- On the PC: press key F3 to view the calibration page.
- Make sure that the lenses of projector and receiver are perfectly clean. WARNING, do not use abrasive substances or cloths, as this is no ordinary glass but optical glass and the photodetector might mistake an incisions or score for a needle path.
- If necessary, adjust the photodetector mechanic support so that it is perfectly vertical and so that the viewer lens is parallel to the plane of the projector.
- Rotate the projector so that it is parallel to the photodetector, then adjust it for height so that the transparency light reference is as low as possible.
- Adjust the projector finely and, if necessary, the photodetector so that the transparency signal is as symmetrical and as similar as possible to the photo, with the uppermost part in the centre. During this process, make sure the transparency light reference does not move too far up.
- If possible, during the adjustment process, make sure that the transparency centre position is as close as possible to zero; if this occurs during system operation in the absence of fabric and with the machine in automatic mode, the basket will be kept stationary regardless of alarm threshold sensitivity setting.
- Check the quality of the signal by means of the expanded screen of the transparency chart, which can be viewed by pressing key F7 in the main page.
- On C336 C352: reset the original position of S7.

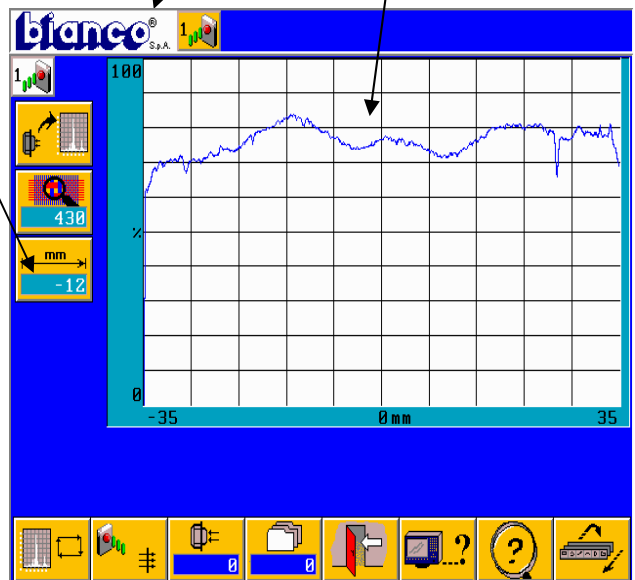
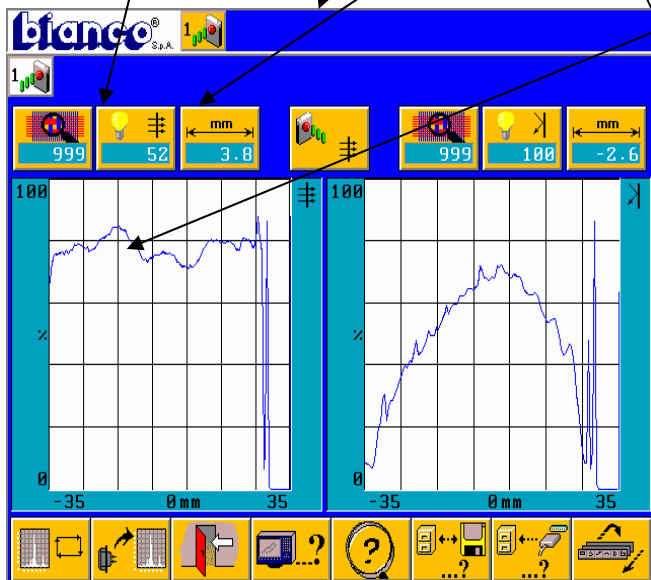
Images of VDTEX screens described in previous procedure:



Trasparenze light reference

Trasparenze centre position

Trasparenze signal: The signal should appear as flat as possible, the part which is highest on average should be around the centre.



**Calibration by means of tester:**

This is perhaps the simplest method, but the correctness of the calibration of the calibration process completed will not be determined with the same level of confidence.

Material needed:

- One or two testers, we recommend using digital testers.
- 4mm Allen wrench.

Procedure:

- Set the tester(s) as DC voltmeter(s) and 20 volt full scale.
- Cut out the power to the boards, then set SW2-1 onto ON, WARNING: make a note of the previous position of SW2-1.
- Connect the first tester: positive to M5-5 and negative to M5-2 (vertical calibration)
- Connect the second tester: positive at M5-6 and negative at M5-2 (horizontal calibration). If you have a single tester, connect it as described in the previous section; having completed the vertical calibration process, move the positive to M5-6 to perform the horizontal calibration.
- If necessary, set the mechanical support of the photodetector so that it is perfectly vertical and so that the lens of the viewer is parallel to the plane of the projector.
- Make sure that the lenses of projector and receiver are perfectly clean. WARNING, do not use abrasive substances or cloths, as this is no ordinary glass but optical glass and the photodetector might mistake an incisions or score for a needle path.
- Turn on the system.
- Rotate the projector so that it is parallel to the photodetector, then adjust it for height so that the signal present on the first tester is as high as possible.
- Adjust the projector finely and adjust the photodetector if necessary so that the signal on the second tester is as close as possible to zero, which indicates maximum symmetry of the signal. During this operation, make sure the value indicated by the first tester does not decrease too much.
- Restore SW2-1 to its original position.

## UPGRADING THE SOFTWARE

It might be necessary to upgrade the photodetector control software (SW).

As a rule, the upgrade changes the treatment of the images acquired by the microcamera, and it mainly affects the reading capacity of some types of needle path or peculiarities. A fabric that is not read with the SW version originally supplied may become legible at a later stage, as the SW upgrades become able to deal with the case in question.

For this reason, if a fabric seems illegible it is important to send a sample to the following address:

**BIANCO S.p.A.**  
- R&D division- TGL -  
**Viale industria, 4**  
**12051 ALBA(CN)**

***Specify the BIANCO part number of the machine on which the photodetector is installed or at least the SW version installed on the latter*** (the SW version is read on a label glued to board C318).

The samples must also be accompanied by the following data: name of the supplier company and ID code of the product, and, if possible, telephone number and name of contact to obtain information over the telephone on this issue.

***The minimum size to perform the customary tests is a width of 300mm with the needle path in the centre x 500mm length. Greater widths and lengths will be appreciated.***

Having received the new SW version, via e-mail or by any other means, “download” it into the memory of the programmable components that govern the photodetector. This operation required great care no to damage the electronic parts and it can be performed according to the instructions given below.

Material needed:

1. Small screwdriver for cross-slotted screws
2. A number of jumpers to short-circuit the jumpers of the boards.
3. Personal computer (preferably a portable)
4. Upgrade cable (is supplied together with the manual of the machine on which the photodetector is installed, it is a flat cable ending on one side with a 9-way receptacle type connector).
5. SW upgrade file.

Minimum requirements for the PC used for the upgrade:

- Any PC with a WINDOWS 95,98,2000 or NT operating system.
- The PC must be equipped with a standard receptacle type 9-pin RS232 serial connector (DB9S).
- You must have installed the appropriate programming SW on the PC. The SW is necessary to read the upgrade file and download it into the non volatile memory of the C318 board microcontroller. If the programming SW is not available, it can be supplied together with the upgrade file.

Installing the programming SW in the PC:

- 1) Insert the floppy disk called “FLASH communications & download driver” in the PC and run the “install” program contained in it.

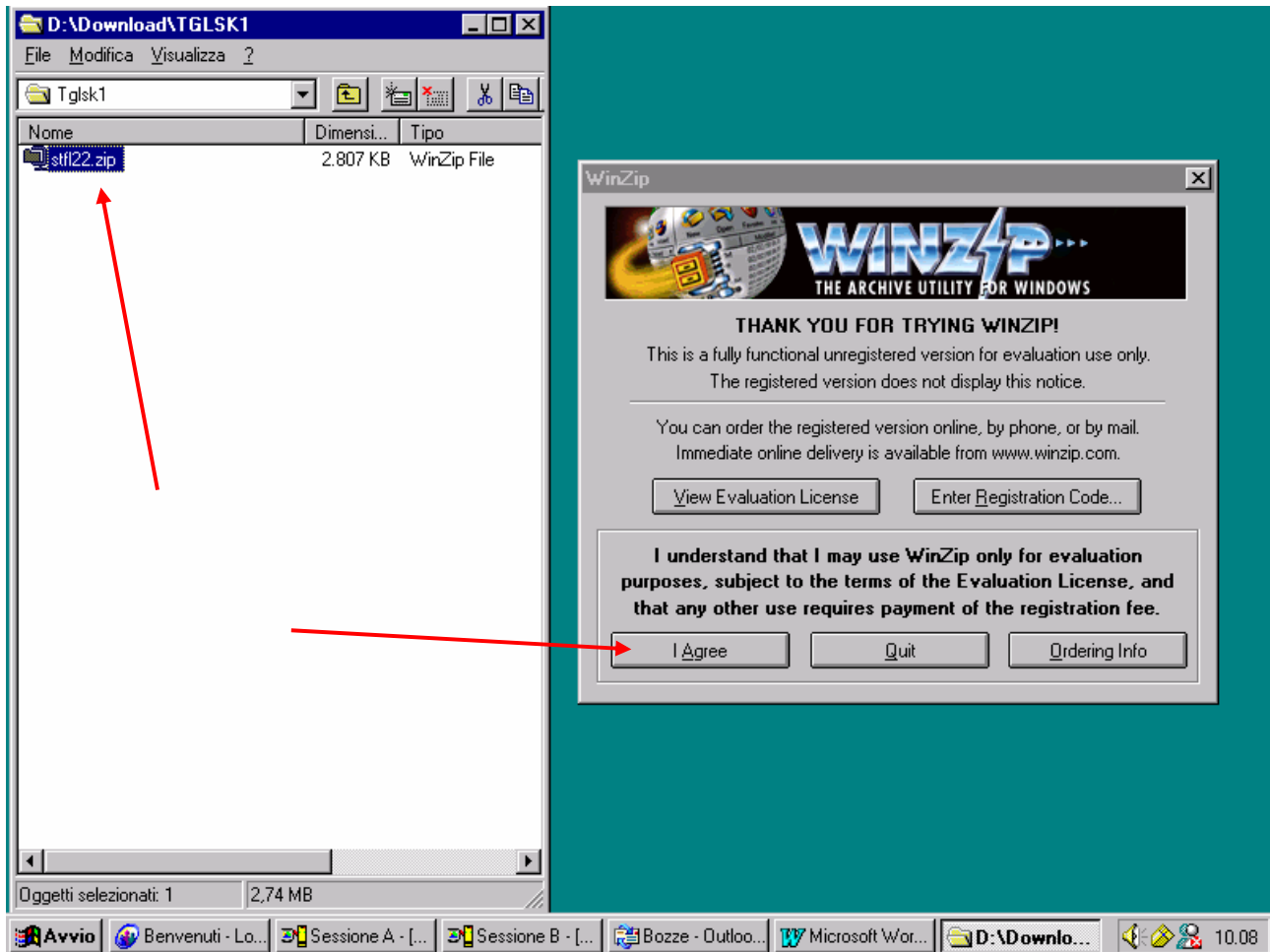
- 2) Follow the instructions that appear on the screen, until the end of the installation procedure
- 3) After the installation, an icon called “flash” appears on the desktop: use it to run the program.

Procedure to perform the upgrade:

- On the C354 board: disable basket rotation by opening jumper B3 and make sure that yellow LED LD1 turns on.
- On the C354 board: close jumper B1 and make sure that green LED's LD2 and LD3 go out, now boards C351, C318 and C336 are off.
- On the C318\C352\C336 boards: make sure they are really off (all LED's off). Remove board C336 after loosening the screw that fastens it to C318.
- On the C318 board: close jumpers B4 and B5.
- On the C352 board: open, if it is closed, selector S7 (two-way selector, leave both ways free). If S7 was closed, memorise point of connection to be able to reset it later.
- On the C318 board: fit back board C336 onto C318. **WARNING:** when inserting connectors JP4 and JP5: no pin must remain outside the connectors, **NOT TO DAMAGE BOARD C318.**
- On the C336 board: insert 10-way connector of flat cable into JP3 housing, insert receptacle type connector of upgrade cable into serial communication port of the PC.

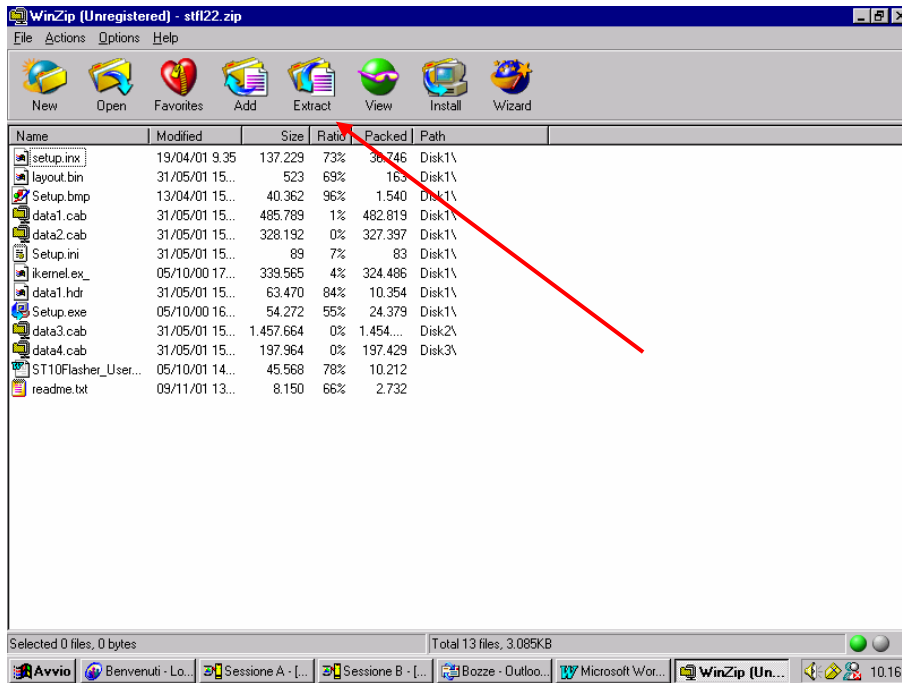
### Download software program installation procedure

1. Execute file stfl22.zip
2. The following Winzip screen appears, click "I Agree"

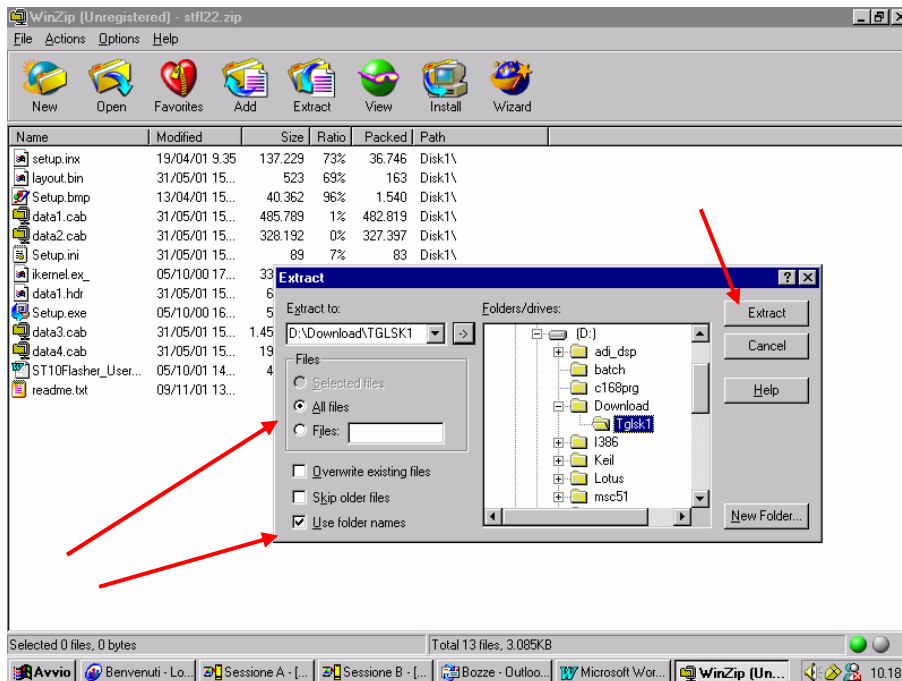




3. Then the following window appears:

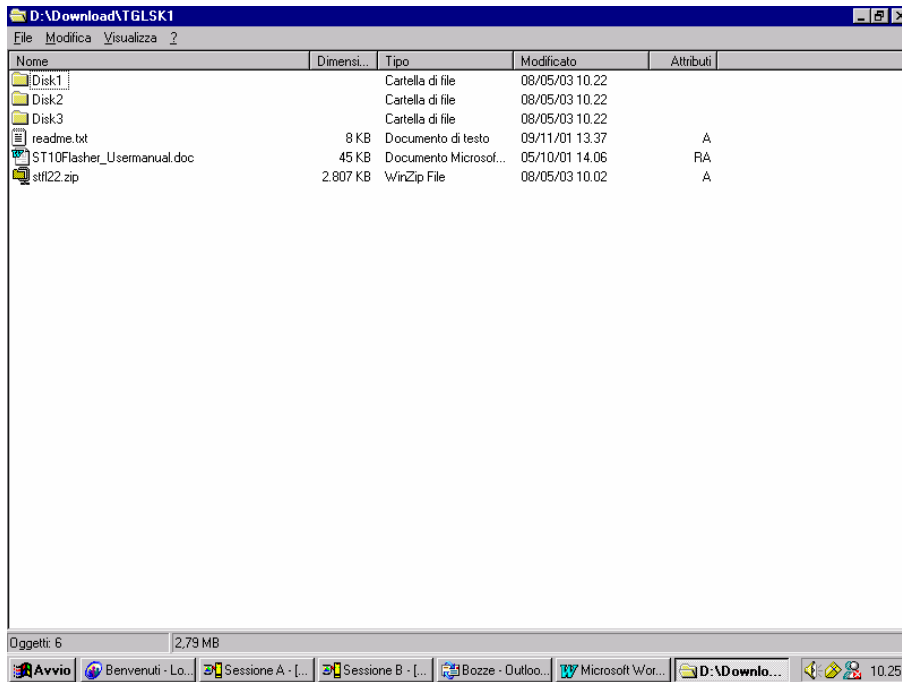


4. Click the “EXTRACT” button to view the following window:

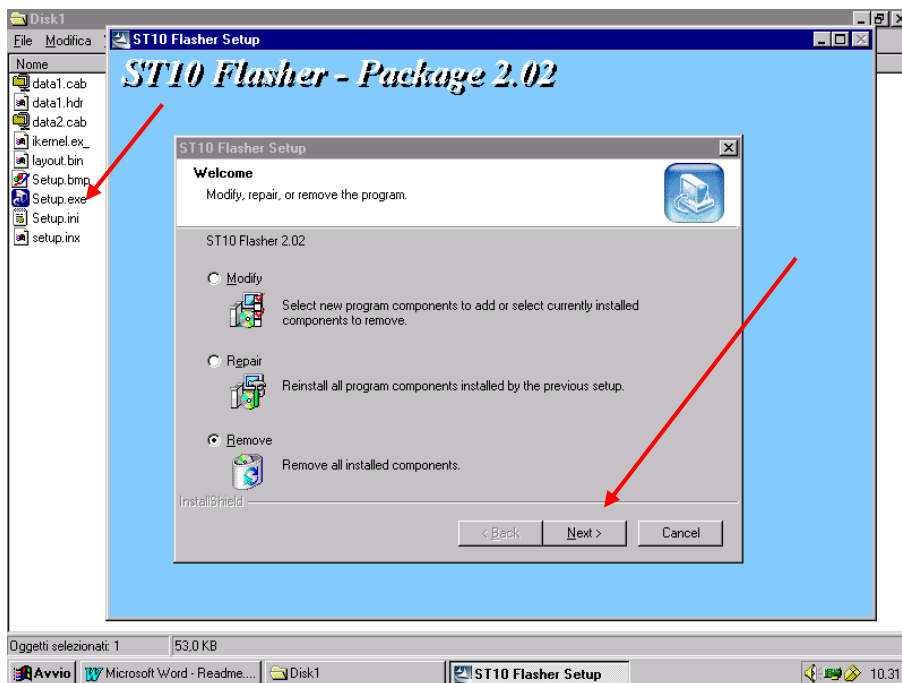


5. Tick “All files” and “Use folder names”, click EXTRACT

6. The files and directories (see image) are stored in the chosen directory:

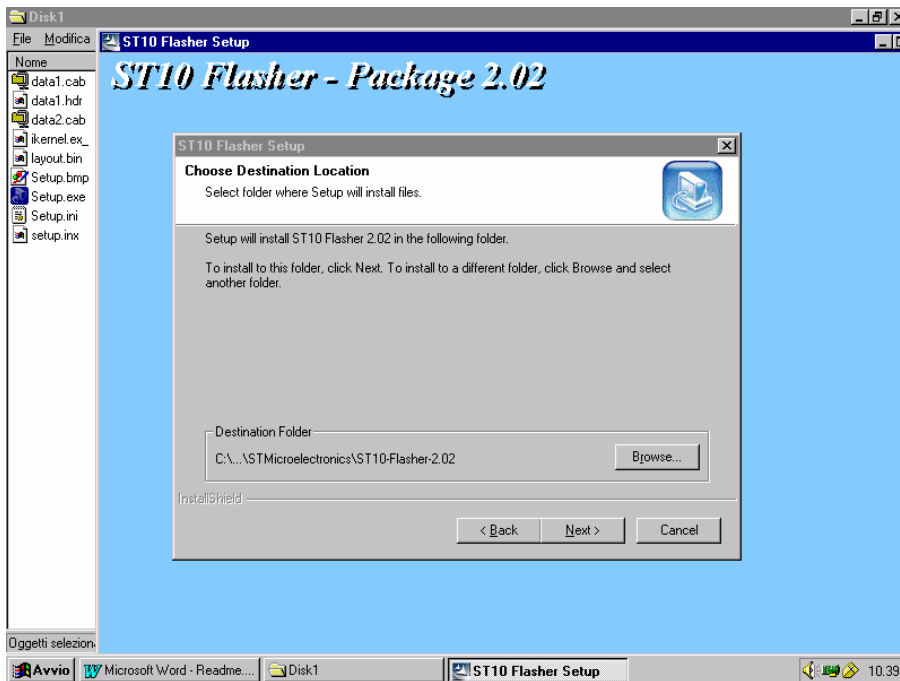


7. Select "Disk1" and launch "Setup.exe".
8. The following image appears, click "Next"

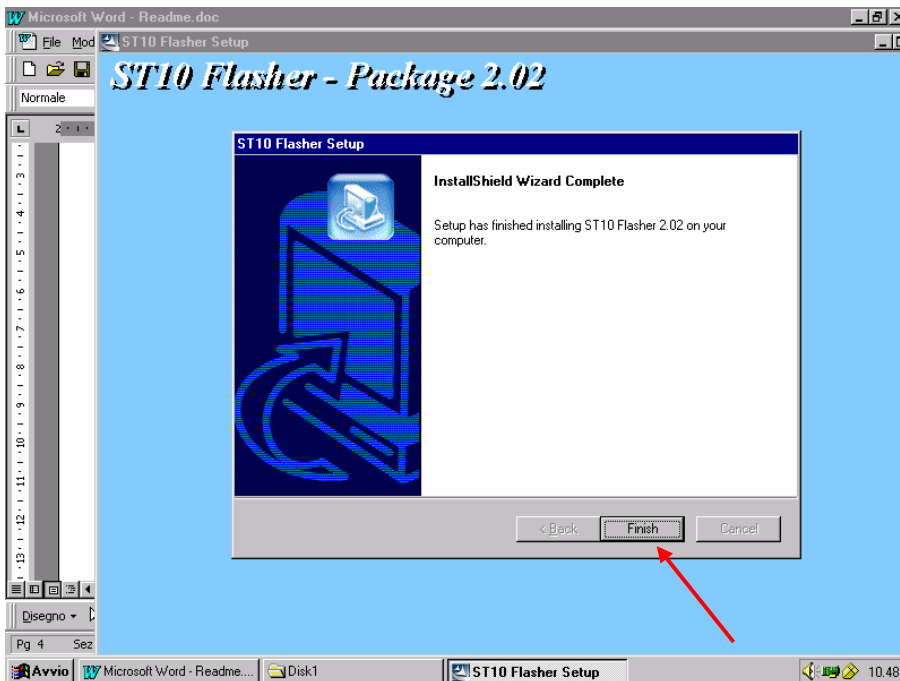


9. Answer Yes to the question and click the "Finish" button that appears.

10. Launch “Setup.exe”, the following screen appears. This screen will probably appear the first time you launch the program, if so, follow the instructions displayed.



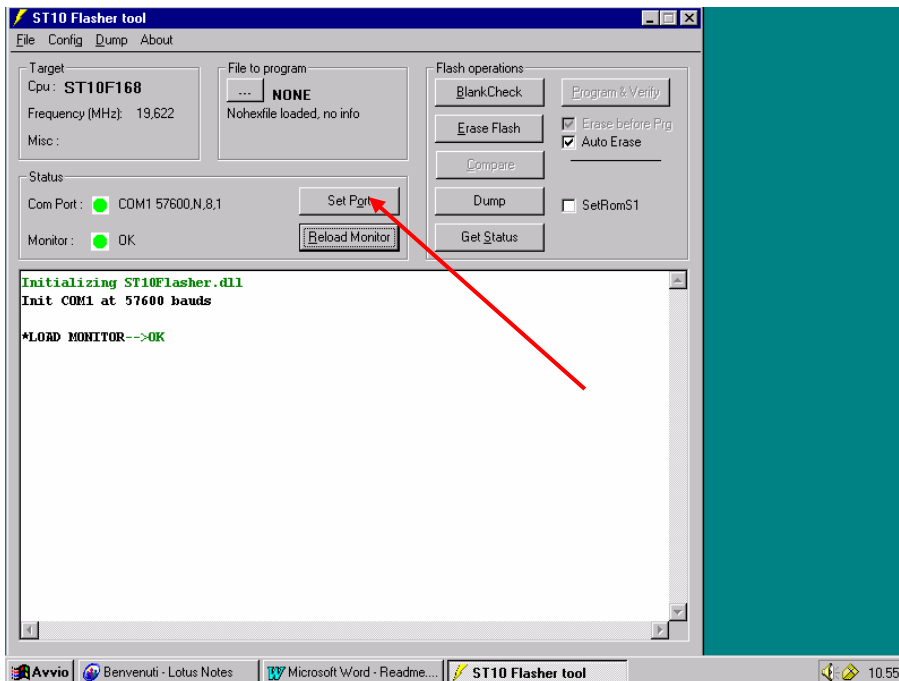
11. Click “Next”. At the end of the installation process, the following window appears:



12. Click “Finish”. Now **Flash.22** has been installed on your PC.

**SW upgrade procedure:**

1. Turn off the control panel.
2. Connect the serial cable between your PC and connector J5 on board C376-C .
3. Close jumper B4 and B5 on board C318.
4. Power the control panel: now it is ready and configured to download the new software version.
5. Launch “ST10 Flasher 2.02” from the “Start -> programs” menu of your PC.
6. If the electronic board of the SK3 has been properly connected to the serial port of your PC with the upgrade cable, you will see the following screen:



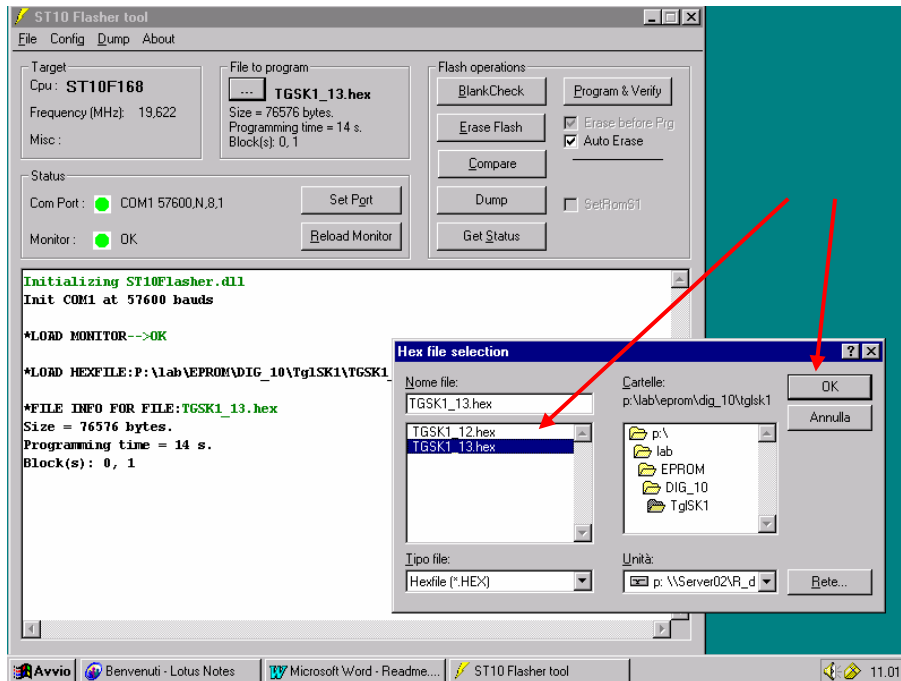
NOTE1: You can change the parameters of the serial communication line using the “Set Port” utility, restart the PC to confirm your changes.

NOTE2: If the communication between your PC and the board is not activated at the first attempt, try again through the following procedure:

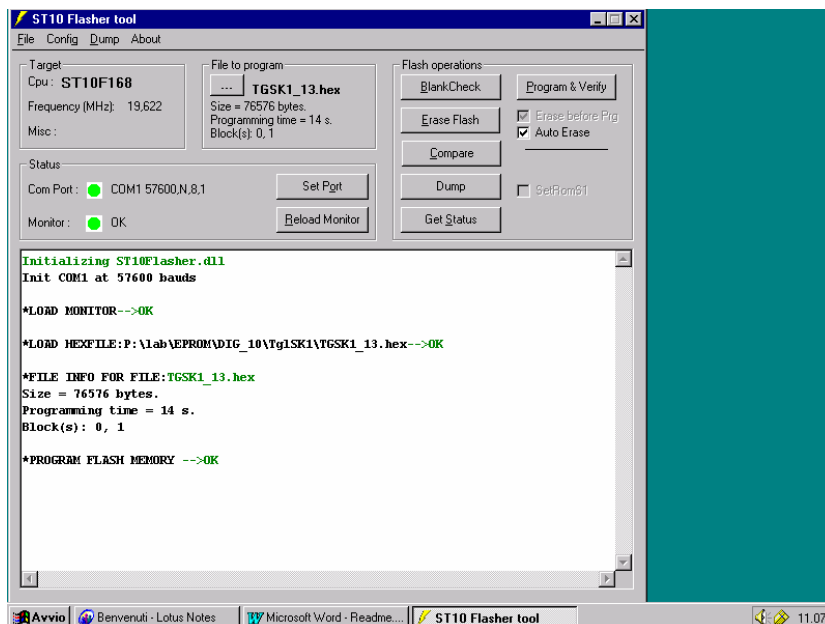
- 1) Quit “ST10 Flasher Tool”
- 2) Reset board C318, close jumper B1 for 1 sec.
- 3) Launch “ST10 Flasher Tool” again

Repeat these steps until the communication is activated.

7. Click “File to program”, select the SW file that you want to download and press “OK”



8. Click “Program and Verify”, “\*PROGRAM FLASH MEMORY” is displayed. When “\*PROGRAM FLASH MEMORY -->OK” appears, the new SW has been downloaded correctly.



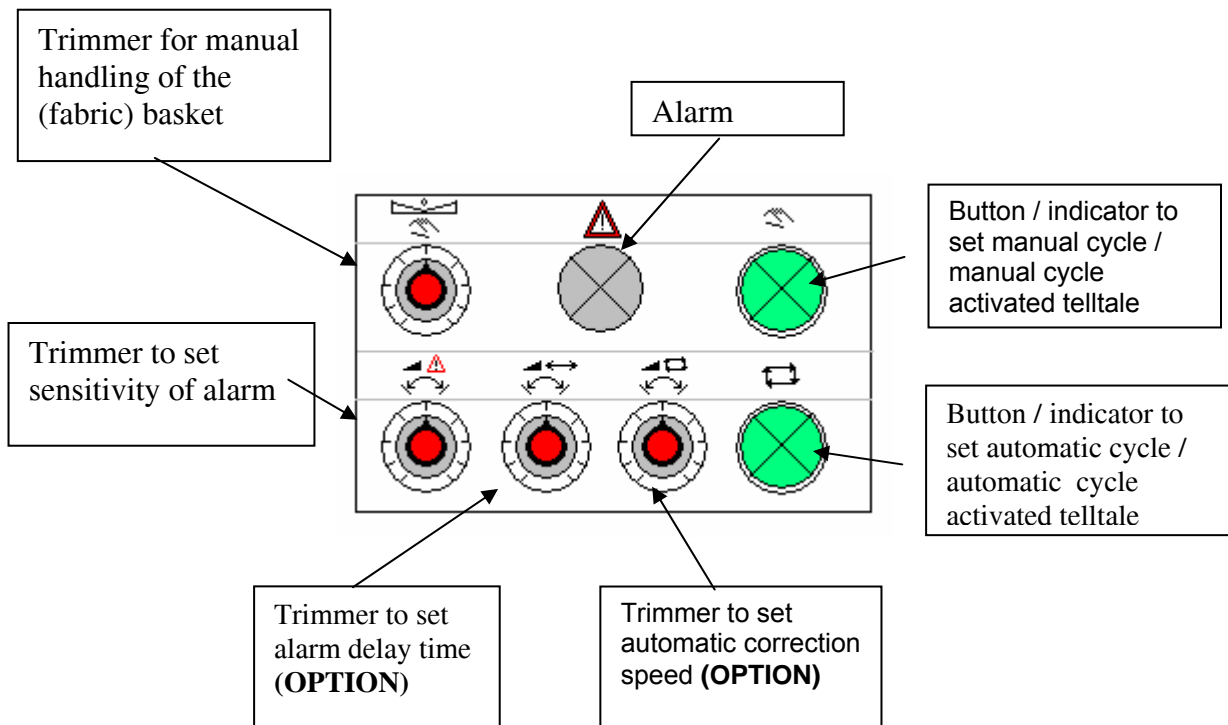
9. Now you can remove jumper B4 and B5 on board C318.
10. Power the control panel.
11. Try to use the equipment.

### INDICATORS AND CONTROLS:

The user is provided with a certain number of indicators and controls for the use and control of the SK3 photodetector.

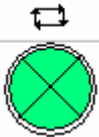
Some of these devices are optional and are mounted only for some special applications.

The figure below illustrates a console equipped with all conceivable controls and indicators. Keep in mind that the symbols and colours of the various elements are purely indicative, and so is their arrangement, since as a rule these devices are located on the control button strips of the line that includes the SK3.

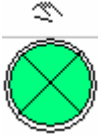
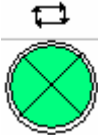





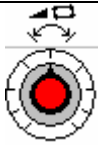
#### Operating mode indicators:

	<p><b>Alarm indicator:</b>                  Gives out fixed light if any alarm condition has been detected in the system. The alarm conditions controlled are:</p> <ol style="list-style-type: none"> <li>1) Temperature too high</li> <li>2) Power supply voltage out of limits</li> <li>3) One or more LED's in lighting devices not working</li> <li>4) Fabric legibility below alarm sensitivity threshold set by means of relative trimmer.</li> </ol>
	<p><b>Manual mode telltale:</b></p> <ul style="list-style-type: none"> <li>• Gives out fixed light when system is in manual mode.</li> <li>• Flashes at ½ sec. intervals if (external) enable signal is not present, regardless of operating mode selected.</li> </ul>

	<p><b>Automatic mode telltale:</b></p> <ul style="list-style-type: none"> <li>• Gives out fixed light when system is in automatic mode, whether or not enable signal is present.</li> <li>• Flashes at ½ sec. intervals if fabric legibility is close to or lower than threshold set by means of alarm sensitivity trimmer.</li> </ul>
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Controls:

	<p><b>Manual button:</b></p> <ul style="list-style-type: none"> <li>• If pressed during automatic operation it sets the manual cycle and stops the basket, regardless of whether or not the enable signal for system operation is present.</li> <li>• If pressed during manual operation it stops the basket, independently of the position of the basket manual handling trimmer.</li> </ul>
	<p><b>Automatic button:</b></p> <ul style="list-style-type: none"> <li>• If pressed during manual operation it sets the automatic cycle, regardless of whether or not the start enable signal is present.</li> <li>• If pressed during automatic operation it activates manual operations temporarily (which continues as long as this button is kept pressed).</li> </ul>
	<p><b>Basket manual movement button</b></p> <ul style="list-style-type: none"> <li>• In manual mode, use this button to turn the basket to the right or to the left, at a speed proportional to the angle of rotation to the right or left relative to the centre.</li> <li>• In automatic operation or in the absence of the start enable signal, turning this control has no effect.</li> <li>• NOTICE that immediately after the pressing of the manual button, the basket remains stationary, regardless of the position of this trimmer. Only when it has been moved slightly, this begins to have an effect: this avoids sudden and potentially hazardous movements.</li> </ul>
	<p><b>Alarm threshold adjustment trimmer:</b></p> <ul style="list-style-type: none"> <li>• Sets an alarm threshold for fabric legibility. If legibility drops below the threshold for a time period which can be set by means of the alarm delay adjustment trimmer, the alarm indicator/warning light will be turned on and, in the event of automatic operation, the alarm relay present on the control board will open. The opening of the alarm relay stops the movement of the line.</li> </ul>
	<p><b>Alarm delay adjustment trimmer:</b></p> <ul style="list-style-type: none"> <li>• This is used to set the time period that must elapse before the alarm indicator/ warning light is turned on and the alarm relay opens (if applicable). The count down begins each time fabric legibility drops below the alarm threshold set by means of the alarm threshold adjustment trimmer. This means that in order to generate an alarm it is necessary that the alarm threshold be passed for the time period specified.</li> <li>• It is possible to set a time lasting from 0 to over 6 seconds.</li> <li>• This trimmer is OPTIONAL. If it is not fitted (see electronic control units section below), the alarm delay is set on 3 seconds by default.</li> </ul>
<p><b>Correction speed adjustment trimmer:</b></p> <ul style="list-style-type: none"> <li>• This is used to set the maximum correction speed. The speed of rotation of the basket for the correction will range from 0 to the set value, depending on the error detected.</li> <li>• The speed that can be obtained with the trimmer rotated to obtain the</li> </ul>	



maximum value depends on the setting of a number of switches located on the control board (see electronic control units section).

- This trimmer is OPTIONAL. If it is not fitted (see electronic control units section), the maximum speed will correspond to the value set by means of the afore-mentioned switches.

## USING THE EQUIPMENT:

We describe below the optimal utilisation method for the SK3 needle path detector.

- 1) When the machine is powered and started, the operating mode is manual.
- 2) The operator performs the drawing-in process and places the fabric in front of the microcamera.
- 3) With the aid of the manual movement trimmer, the operator puts the needle path (or other peculiarity to be monitored) in front of the sensor, in line with the cutting disk.
- 4) Always working in manual mode, the operator turns the alarm sensitivity trimmer until the alarm light is turned on, then rotates in the other direction until said light goes out.
- 5) The line is started by keeping the needle path centred with the aid of the manual movement trimmer, then, if desired, the alarm threshold is adjusted to keep the relative indicator/warning light off.
- 6) The automatic cycle is started.
- 7) The operator makes sure that the machine maintains the needle path in the centre, if the automated device fails to perform its task it is possible to work on the basket by means of the manual movement trimmer by keeping the automatic button pressed.
- 8) At this point it is necessary to adjust the alarm threshold trimmer by turning it very slowly until the automatic model indicator/light starts blinking and then turning it immediately in the opposite direction until the light remains fixed. The optimal set point for the alarm threshold is in between the point where the light is fixed and the point where the light flashes, i.e., the condition in which the light is normally off and blinks every now and then.
- 9) With the alarm threshold set in this manner, if the needle path moves out of the field of vision, the line will stop after a fixed time interval of 3 seconds, or after a time period set with the (optional) alarm delay adjustment trimmer.
- 10) If the tubular fabric has seams or peculiarities undermining operation in automatic mode, it is always possible to intervene by keeping the automatic button pressed for the time it takes to complete the correction manually.
- 11) In the presence of holes or seams, we recommend reducing the line speed as the holes/seams pass in front of the sensor, in order to facilitate the reading of the needle path of the new piece and prevent the fabric from getting stuck behind the microcamera mechanical support.
- 12) In the latter case, or if the disk is unable to cut the fabric, the line will be stopped by ad hoc limit switches.
- 13) If the correction is too fast (a problems that occurs rarely), by means of the (optional) correction speed adjustment trimmer it is possible to reduce the speed to a desired value, or even stop the basket altogether.



- 14) In the event of the line being stopped by a reason other than an alarm condition, for instance when it is stopped by the operator, the automatic mode is maintained, and will be effective again as soon as the line is restarted.

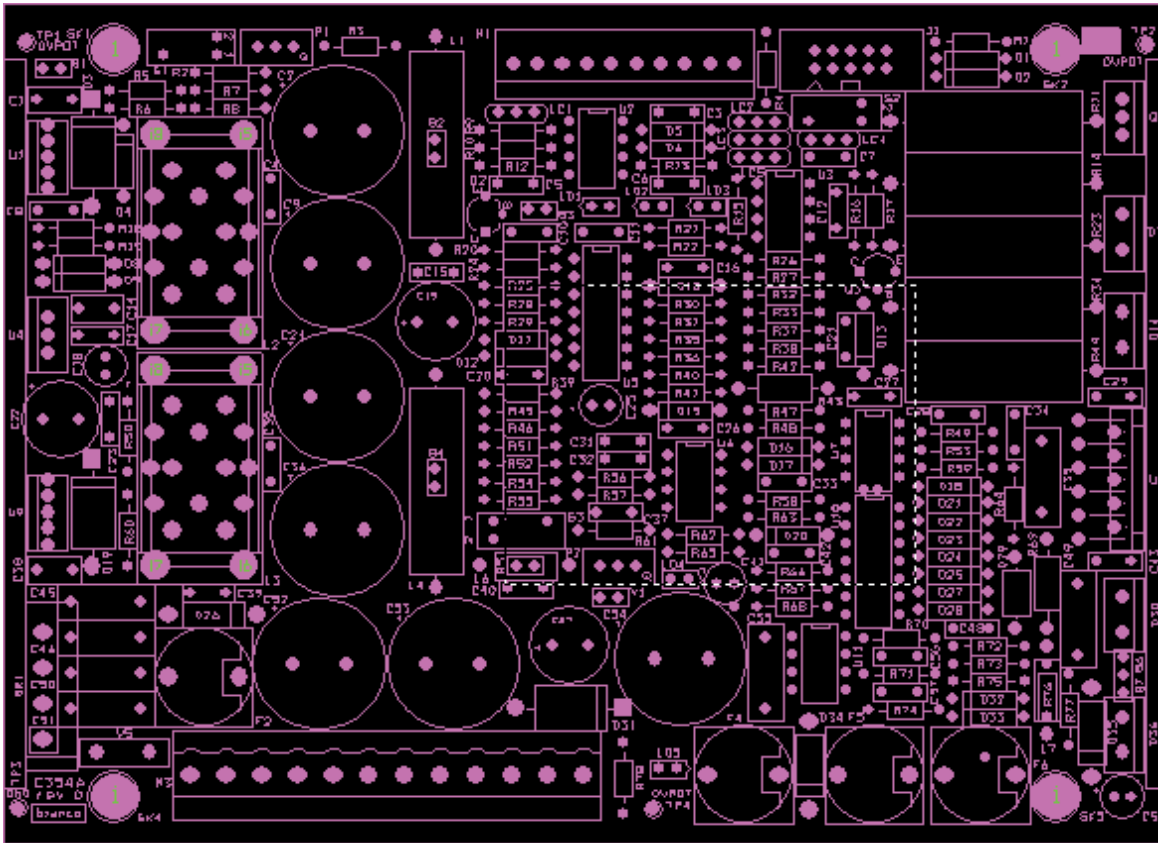
If the needle path is illegible, it is necessary to correct the fabric manually, by means of the basket manual movement trimmer. In this case, the manual operating cycle has to be used.

- 1) If the fabric displays a constant spiral pattern, just keep the manual movement trimmer set on the appropriate value to obtain a constant rotation of the basket in the desired direction.
- 2) To stop the basket regardless of the position of the manual adjustment trimmer, just press the manual cycle button.
- 3) To restore the movement of the basket, just move slightly the manual movement trimmer from its position.

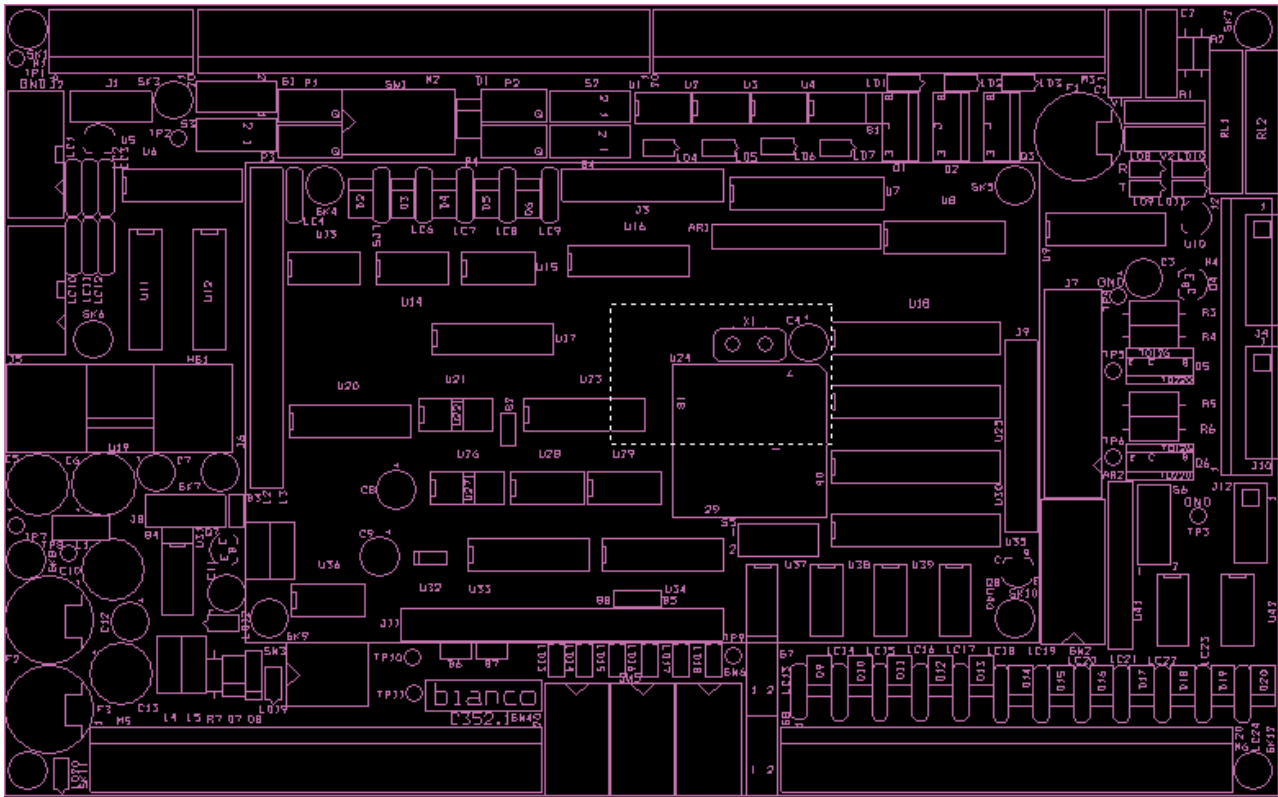
### ELECTRONIC CONTROL UNITS

The electronic control units can be located in a stainless steel box on board the machine, near the sensor, or be housed in an electric panel of the line.

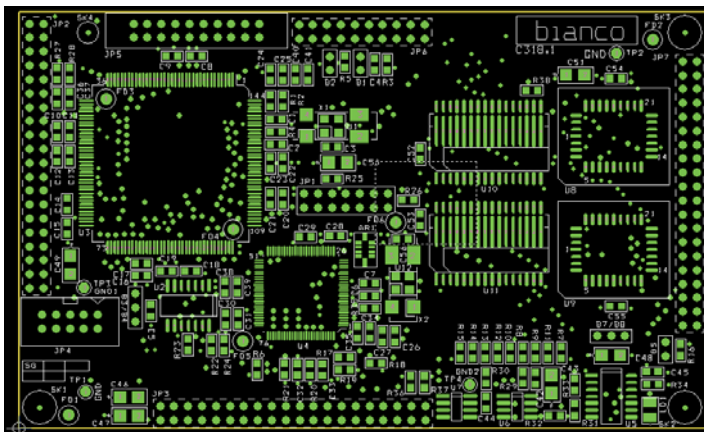
At all events, electronic control units basically consist of two boards, referred to as C352 and C354. Tow other boards are an integral part of board C352 and are connected to it: board C318 which represents the intelligent part, i.e. the board housing the programmable digital IC's, and board C336 which is used for SW upgrade and system calibration.



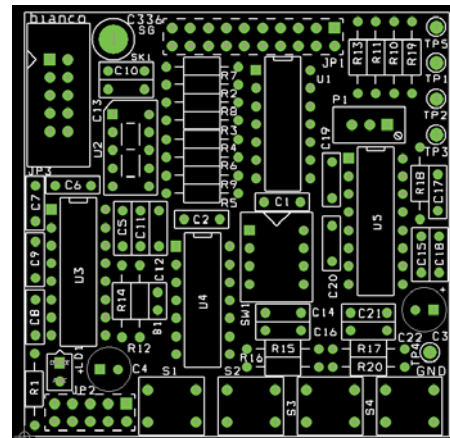
Board C354



Board C352 (board C318 is mounted on C352 and board C336 is mounted on C318)



Board C336 (mounted on C318)



Board C318 (mounted on C352)

We provide below a description of the main LED's, fuses, switches, test points and terminal strips present on these boards, in order to be able to identify the causes of possible problems and to remedy them.


### Protective fuses

<b>Fuses on board C352</b>	
F1 = 1.0 A Rapid	Common protection for static relays RL1 and RL2
F2 = 150 mA	General input protection –12VDC (NOT FITTED, –12 is produced by the board)
F3 = 1.0 A Rapid	General power supply protection +12VDC

<b>Fuses on board C354</b>	
F1 = 2.0 A Delayed	Protection for power supply of 110/220/380 VAC
F3 = 2.0 A Delayed	Protection for power supply of 110/220 VAC filtered
F2 = 5.0 A Delayed	Protection for power supply of 24VAC output from toroidal transformer
F4 = 3.15 A	Protection for projector power supply variable DC output
F5 = 3.15 A	Protection for C352 power supply variable DC output
F6 = 3.15 A	Protection for motor power output

### Indicator LED's

<b>LED's on board C352</b>	
LD1 led 3mm red	Monitors status of alarm light collector open output (ON if output is 0V/light off)
LD2 led 3mm red	Monitors status of manual light collector open output (ON if output is 0V/light off)
LD3 led 3mm red	Monitors status of automatic light collector open output (ON if output is 0V/light off)
LD4 led 3mm red	Monitors status of manual button optoisolated input (ON if input closed =button pressed)
LD5 led 3mm red	Monitors status of automatic button optoisolated input (ON if input closed =button pressed)
LD6 led 3mm red	Monitors status of optoisolated input no. 3 (NOT USED)
LD7 led 3mm red	Monitors status of optoisolated input no. 4 (NOT USED)
LD8 led 3mm green	Luminosity proportional to reference given to reflex projector (OFF if ref =0)

LD9 led 3mm green	Luminosity proportional to reference given to transparency projector (OFF if ref =0)
LD10 led 3mm red	Monitors status of alarm output static relay (ON if relay is closed = ALARM)
LD11 led 3mm red	Monitors status of knife start enable signal static relay (ON if relay is closed = ENABLED)
LD12 led 3mm green	ON if -12 VDC is present
LD13 led 3mm green LD14 led 3mm red	Asynchronous serial rec. line A (OFF if line is at 0V) Serial line A to VDTEX Asynchronous serial tr. line A(OFF if line is at 0V) for debugging and installation
LD15 led 3mm green LD16 led 3mm red	Asynchronous serial rec. line B (OFF if line is at 0V) Serial line B NOT USED Asynchronous serial tr. B (OFF if line is at 0V)
LD17 led 3mm green LD18 led 3mm red	Asynchronous serial rec. line C (OFF if line is at 0V) Serial line C NOT USED Asynchronous serial tr. C (OFF if line is at 0V)
LD19 led 3mm red	Board error code indications: off = no error, flashing = error Flashing frequency reveals error code to be communicated to technical service. Read error code as follows: 1. Wait for LED to stay off for 2 sec; this marks the beginning of the error code 2. Count the number of flashes in ½ s., this number represents the first digit of the error code. 3. At the end of the first digit, the LED stays on for 2 seconds. 4. The second digit is again given by flashing frequency, then the LED stays lit for 2 sec. again, and so on until the last digit; after that the LED stays off for 2 sec. On E.g.  → code = 24 (decimal) Notes: for the first digit it goes out twice, for the second digit is goes out 4 times.
LD20 led 3mm green	On is +5 VDC is present (hence +12 VDC)

**LED's on board C318**

LD1 led 3mm green	Indicator LED (replicates display point of C336)
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**LED's on board C336**

U2 display 7 ind+point	Error code: = no error
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1.÷F. = system errors, contact the technical service
6 = prototype SW version

**LED's on board C354**

LD1 led 3mm yellow	Monitors motor start external enable status (OFF is motor is enabled)
LD2 led 3mm green	ON if board C352 is powered
LD3 led 3mm green	ON if reflex and transparency projectors powered
LD4 led 3mm green	ON if + 5 VDC power supply is present
LD5 led 3mm green	ON if +32 VDC power supply is present

**Setting switches and jumpers**
**Switches on board C352**

B1 jumper N.O. Default = OPEN	Open = makes it possible to power the AUTOMATIC, MANUAL and ALARM lights at the desired direct voltage, present between terminals M3-8 (positive) and M3-4 (negative). <b>Closed</b> = power the lamps with +12V generated internally by the board. In this case, do not connect other power supplies <b>between terminals M3-8 and M3-4 AS THIS MIGHT DAMAGE THE BOARD.</b>
B2 weld-on jumper	Jumpers set in phase of construction non modifiable = closed by welding
B3 weld-on jumper	Jumpers set in phase of construction non modifiable = closed by welding
B4 weld-on jumper	Jumpers set in phase of construction non modifiable = closed by welding
B6 weld-on jumper	Jumpers set in phase of construction non modifiable = open
B7 weld-on jumper	Jumpers set in phase of construction non modifiable = closed by welding
B5/8 jumper 2 pos N.O	Factory setting = B8 closed by welding
S1 2-pos selector Default = pos 2	Selects source of analog input no.2: pos2 = from trimmer P1 pos1 = from input M5-9 Normally, this input is used to adjust max basket rotation speed
S2 2-pos 1selector Default = pos 1	Selects range of desired analog output on M5-5: pos2 = 0/10 V pos1 = -10/+10 V
S3 2-pos selector Default = pos 1	Selects source of analog input no.3: pos2 = from trimmer P3 pos1 = from input M5-12 Normally, this input is used to adjust alarm sensitivity
S4 2-pos selector Default = pos 1	Selects range of desired analog output on M5-6: pos2 = 0/10 V pos1 = -10/+10 V
S5 2-pos selector Default = pos 2	Selects use of rec. serial line C: pos1 = data reception pos2 = CTS signal

S6 2-pos selector Default = pos 1	Selects serial electric protocol C: pos1 = RS422 pos2= RS485		
S7 2-pos selector Default = open	Selects serial electric protocol A: pos1 = RS422 pos2= RS485		
S8 2-pos selector Default = pos 1	Selects serial electric protocol B: pos1 = RS422 pos2= RS485		
<b>SW1 set of 6 switches</b>			
SW1-1 Default = ON	Selects direction of CLK signal: ON = output signal from board OFF = input signal to board		
SW1-2 Default = OFF	Selects direction of SYN signal: ON = output signal from board OFF = input signal to board		
SW1-3 Default = OFF	Selects direction of RES signal: ON = output signal from board OFF = input signal to board		
SW1-4 Default = OFF	Selects type of CLK signal: ON = single ended OFF = differential		
SW1-5 Default = OFF	Selects type of SYN signal: ON = single ended OFF = differential		
SW1-6 Default = OFF	Selects type of RES signal: ON = single ended OFF = differential		
<b>SW2 set of 8 switches</b>			
<b>SW2-1</b>			
Digital to Analog utilisation mode converter - Default = ON			
<b>OFF</b>			
DAC Hi Res=signal sampled DAC1=signal processed DAC2=needle path position			
ON			
DAC Hi Res=signal sampled DAC1=vertical calibration DAC2=horizontal calibration			
<b>SW2-2</b>			
Analog to Digital utilisation mode converter – Default = ON			
<b>ON</b>			
Ch1=not used Ch2(P1)= basket rotation max speed Ch3(P3)=alarm threshold			
OFF			
Ch1=basket rotation max speed Ch2(P1)=alarm delay Ch3(P3)=alarm threshold			
<b>SW2-3</b>			
Needle path position determination method – Default = ON			
<b>OFF</b>			
Mode no.1			
ON			
Mode no.2			
<b>SW2-4 5 6</b>			
Basket motor PID control gain – Default = ON ON ON			
OFF	OFF	OFF	1/32 of possible maximum
OFF	OFF	ON	2/32 of possible maximum
OFF	ON	OFF	3/32 of possible maximum
OFF	ON	ON	4/32 of possible maximum
ON	OFF	OFF	5/32 of possible maximum
ON	OFF	ON	6/32 of possible maximum
ON	ON	OFF	7/32 of possible maximum
<b>ON</b>	<b>ON</b>	<b>ON</b>	8/32 of possible maximum

<b>SW2-7</b>		Board operating mode – Default = OFF OFF	
<b>8</b>			
<b>OFF</b>	<b>OFF</b>	Normal mode	
OFF	ON	HW test, digital part	
ON	OFF	Calibration of the lenses	
ON	ON	HW test, analog part	
<b>SW3 set of 4 switches</b>		Selects analog input voltage range from photodetector – Default OFF OFF ON ON	
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>OFF</b>	<b>OFF</b>	<b>ON</b>	<b>ON</b>
Range –10/+10 V			
OF	ON	ON	OF
F			F
Range 0/+5 V			
ON	OF	ON	ON
	F		
Range 0/+10 V			
Other combinations		Not of interest	
<b>SW4 set of 6 switches</b>		Closed = Activation of pulls +5V channel+ serial differential lines - Default: all OFF	
<b>SW5 set of 6 switches</b>		Closed = Activation of termination resistors, serial differential lines - Default: all OFF	
<b>SW6 set of 6 switches</b>		Closed = Activation of pulls GND channel - serial differential lines - Default: all OFF	
SWx-1/6 (x=4,5 o 6)		1=RxA	2=TxA 3=RxB 4=TxB 5=RxC 6=TxC

<b>Switches on board C318</b>	
B1 jumper N.O. Default = OPEN	If short-circuits causes HW reset of board
B2 weld-on jumper	Jumpers set in phase of construction non modifiable = open
B3/4 jumper 2 pos N.O. Default = B3 CLOSE	See SOFTWARE UPGRADE paragraph
B5 jumper N.O. Default = OPEN	See SOFTWARE UPGRADE paragraph
B6/7 jumper 2 pos N.O. To be welded	Jumpers set in phase of construction non modifiable = both open
<b>Switches on board C336</b>	
S1/S4 buttons N.O.	NOT USED



**Switches on board C354**

B1 weld-on jumper Default = OPEN	Closed = disables / Open = enables power outputs of board C352 and projectors
B2 weld-on jumper	Factory setting = open
B3 jumper N.O. Default = CLOSE	if closed it enable motor operation
B4 weld-on jumper	Jumpers set in phase of construction non modifiable = open
B5 weld-on jumper	Jumpers set in phase of construction non modifiable = open
B6/7 jumper 2 pos N.O. Default = B6 CLOSE	0V connection to B6 motor protections closed = 0Vmot, B7 closed = ground
S1 2-pos selector Default = pos 2	Selects projector power output type: pos1=output variable with P1 pos2=12VDC output
S2 2-pos selector Default = pos 1	Selects motor rotation: pos1=CW pos2=CCW
S3 2-pos selector Default = pos 2	Selects C352 power supply output type: pos1=output variable with P2 pos2=12VDC output

**Test points**
**Test points on board C352**

TP1,3,4	GND (ground for interior board circuitry)
TP2	+5V
TP5	Reflex projector analog reference
TP6	Transparency projector analog reference
TP7	-12V
TP8	+12V
TP9	Photodetector analog input
TP10	Aux. sensor analog input (NOT USED)
TP11	GND1 (projectors power supply ground)

**Test points on board C318**

TP1,2	GND
-------	-----

**Test points on board C336**

TP1,2,3	NOT USED
TP4	GND
TP5	Output of analog signal for calibration of photodetector mechanical parts

**Test points on board C354**

TP1,2	0V power
TP3	GND
TP4	0V motor

**Terminal strips**
**Terminal strips on board C352**

<b>M1 3.5mm 6-way</b>	Field bus (CAN Bus)
M1-1	+5 V external power supply of optoisolators (in the case of optoisolated CAN)
M1-2/3	0 V external power supply of optoisolators
M1-4	CAN+ (CAN BUS differential line positive)
M1-5	CAN- (CAN BUS differential line negative)
M1-6	GROUND (for connection to screen of shielded cable, if used)
<b>M2 3.5mm 20-way</b>	Digital inputs and inputs/outputs from/to microcamera
M2-1	GROUND
M2-2	0 V for digital inputs
M2-3/4	RES -/+ (signal to photodetector)
M2-5	GROUND
M2-6	0 V for digital inputs
M2-7/8	SYN -/+ (signal from photodetector)
M2-9	GROUND
M2-10	0 V for digital inputs
M2-11/12	CLK -/+ (signal to photodetector)
M2-13	0 V for digital inputs
M2-14	Digital input, not used
M2-15	AUTOMATIC button input
M2-16	MANUAL button input
M2-17	+12 V for digital inputs (Common for buttons)
M2-18	GROUND
M2-19	PWM of motor 2 (Debugging signal)
M2-20	PWM of motor 1 (Debugging signal)
<b>M3 3.5mm 20-way</b>	Digital outputs
M3-1	Common for static relays
M3-2	N.O. contact for alarm static relay
M3-3	N.O. contact for knife enable static relay
M3-4	GROUND
M3-5	Alarm light output
M3-6	MAN light output
M3-7	AUTO light output

M3-8	Common for lamps
M3-9	Negative for optoisolated output no.4 (NOT USED)
M3-10	Positive for optoisolated output no.4 (NOT USED)
M3-11	Negative for optoisolated output no.3 (NOT USED)
M3-12	Positive for optoisolated output no.3 (NOT USED)
M3-13	+12 V for digital inputs
M3-14	GROUND
M3-15	0 V for digital inputs
M3-16	Negative for optoisolated output no.2 (NOT USED)
M3-17	Positive for optoisolated output no.2 (NOT USED)
M3-18	Negative for optoisolated output no.1 (NOT USED)
M3-19	Positive for optoisolated output no.1 (NOT USED)
M3-20	+12 V for digital inputs
<b>M4 3.5mm 12-way</b>	Reflex and transparency projectors power supply
M4-1	+12 V
M4-2	Transparency projector first branch
M4-3	Transparency projector second branch
M4-4	Transparency projector third branch
M4-5	Transparency projector fourth branch
M4-6	0 V
M4-7	+12 V
M4-8	Reflex projector first branch
M4-9	Reflex projector second branch
M4-10	Reflex projector third branch
M4-11	Reflex projector fourth branch
M4-12	0 V
<b>M5 3.5mm 20-way</b>	Analog inputs from microcamera and button strip trimmers and analog outputs
M5-1	+12 VDC board power supply
M5-2	0 VDC board power supply
M5-3	-12 VDC board power supply (NOT USED)
M5-4	GROUND (for screen connection)
M5-5	DAC1 output
M5-6	DAC2 output
M5-7	+12 V
M5-8	Analog input no.1 (NOT USED)
M5-9	Analog input no.2 (NOT USED)
M5-10	0 V
M5-11	+12 V
M5-12	Analog input no.3 (alarm sensitivity trimmer central)
M5-13	Analog input no.4 (basket manual movement trimmer central)

M5-14	0 V
M5-15	GROUND (for screen connection)
M5-16/17	Microcamera analog signal differential input +/- line
M5-18	GROUND (for screen connection)
M5-19/20	Auxiliary sensor analog signal differential input +/- line (NOT USED)
<b>M6 3.5mm 20-way</b>	Digital inputs and serial lines
M6-1	Analog input no.1 (NOT USED)
M6-2	Analog input no.2 (NOT USED)
M6-3	Analog input no.3 (Basket movement enable)
M6-4	+12 V
M6-5/6	TXA+/TXA-
M6-7/8	RXA+/RXA-
M6-9	0 V
M6-10	GROUND
M6-11/12	TXB+/TXB-
M6-13/14	RXB+/RXB-
M6-15	0 V
M6-16/17	TXC+/TXC-
M6-18/19	RXC+/RXC-
M6-20	GROUND

**Terminal strips on board C354**

<b>M1 3.5mm 10-way</b>	
M1-1	+5 V
M1-2	Motor secondary enable
M1-3	0 V
M1-4	GROUND
M1-5	Motor analog reference
M1-6	0 V
M1-7	Replicates motor secondary enable
M1-8	0 V
M1-9	Motor voltage feedback
M1-10	GROUND
<b>M2 5mm 10-way</b>	This terminal strip is on part B of the board (filters before transformer input)
M2-1/2	Toroidal transformer power supply PHASE/NEUTRAL VAC
M2-3	Toroidal transformer power supply GROUND
M2-4/5	Transformer power supply output, filtered
M2-6	Filtered power supply output NEUTRAL (or PHASE)
M2-7	Filtered 115VAC PHASE (or NEUTRAL)

M2-8	Filtered 230VAC PHASE (or NEUTRAL)
M2-9	GROUND
M2-10	Filtered 400VAC PHASE (or NEUTRAL)
<b>M3 5mm 12-way</b>	
M3-1/2	24 VAC at output from toroidal transformer
M3-3	GROUND
M3-4/5	+Vdc/0V power supply for C352 (Vdc=12V)
M3-6/7	+Vdc/0V power supply for reflex and transparence projectors (Vdc normally 15V)
M3-8/9	Terminal +/- motor 1 power
M3-10	GROUND
M3-11/12	Terminal +/- motor 2 power

## DIAGNOSTICS

### Fault finding table

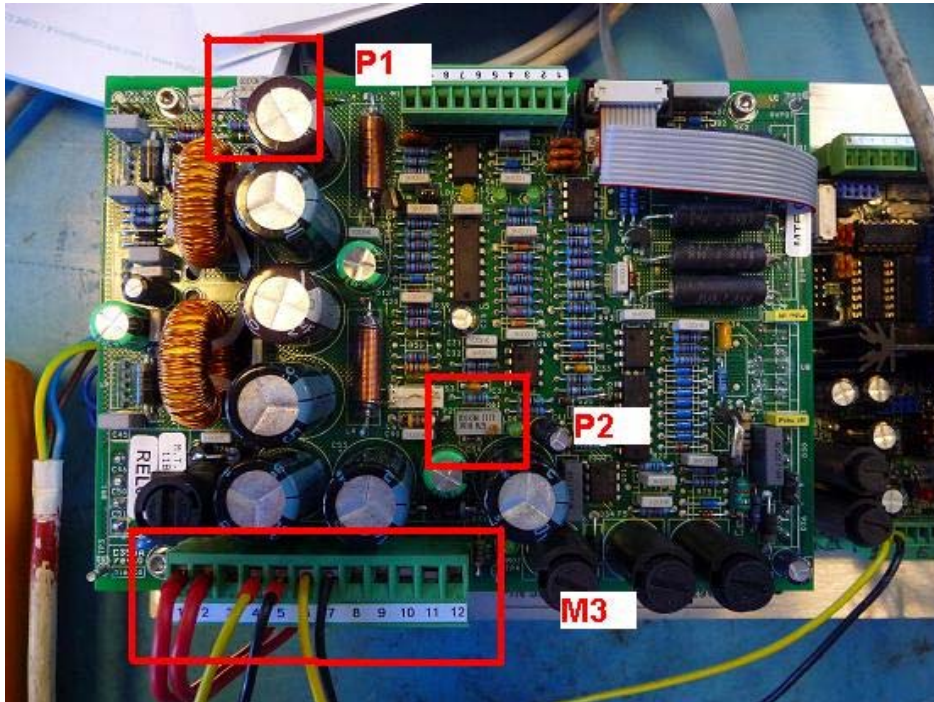
<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
After the SW update, the TGL SK3 seems to work but the basket will not move.	Jumper B1 left closed on C354 board	Open B1
The TGL SK3 no longer detects needle paths which previously were legible.	<ol style="list-style-type: none"> <li>1. Mechanical parts out of alignment due to shocks</li> <li>2. Projector failure</li> </ol>	<p>Follow procedure to realign the microcamera with the projector.</p> <p>Check error codes on 7 segment display of C336 and by means of LED LD19 of C352.</p>

**TECHNICAL DATA**

	U.o.m	Min	Typ	Max.	Notes.
	.				
<b>Electrical characteristics</b>					
Voltage	V	21.5	24	26.5	Box version
	AC	100	115	130	x 110
	50/60	200	230	260	Panel version
	Hz	360	400	440	x 220 x 380
Power input	VA	120	40	150	
Operating temperature	°C	-20	-----	+60	
Storage temperature		-40		+85	
Humidity - operating storage	%	20		80	Non condensing relative humidity
		10		90	
<b>Field of vision</b>					
Width x height	mm	-----	70x3	-----	
Reading resolution	µm	-----	68	-----	

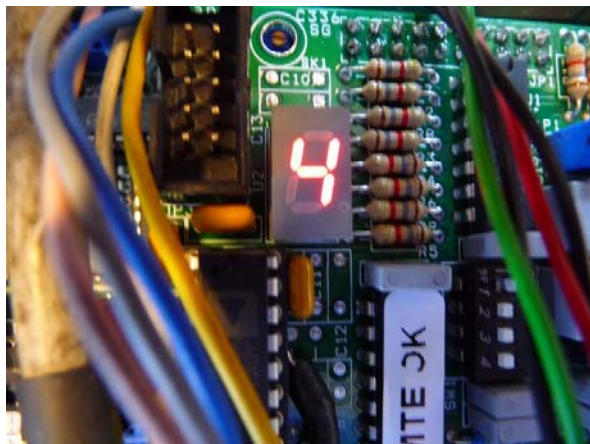
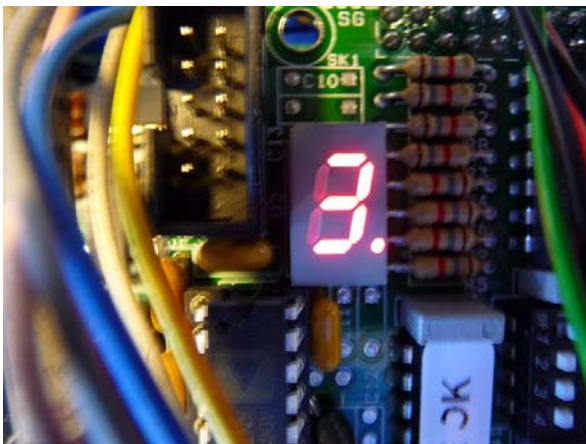
# **Annex I**

## PROCEDURE TO CONTROL FUNCTION OF SK3



- 1) Check following voltage on board C354:
  - 24Vac between clamp M3.1, M3.2 must measure: 24Vac +/- 10%
  - +12.3Vdc between M3.4(+) e M3.5(0V) if not correct (exactly ) 12.3Vdc than adjust Trimmer P2
  - +15.3Vdc tra M3.6(+) e M3.7(0V) if not correct (exactly ) 15.3Vdc than adjust Trimmer P1

---
- 2) Please check and inform our service department software version installed on SK3 control group. To check the software version it should be turned off and on again the unit, the first 2 numbers that appear on the red display of the board C336 identify the version of software: example "3." + "4" = version 3.4





- 3) Report the serial number of the machine and / or serial number of the device and if possible the year of installation. Report and other information that would help in solving the problem, such as the fact that we are working on a sensor or installed as an upgrade on an existing line.

Check the display indication on board C336 after the unit has been turned on for at least 5 minutes. If the number includes the decimal point, such as "0." or "1." this doesn't mean an error but normal operating mode, but if the number is shown without the decimal point, example "2", "3" so there is an error that prevents the machine to operate in automatic mode.

**Errors meaning on 7 segments display:**

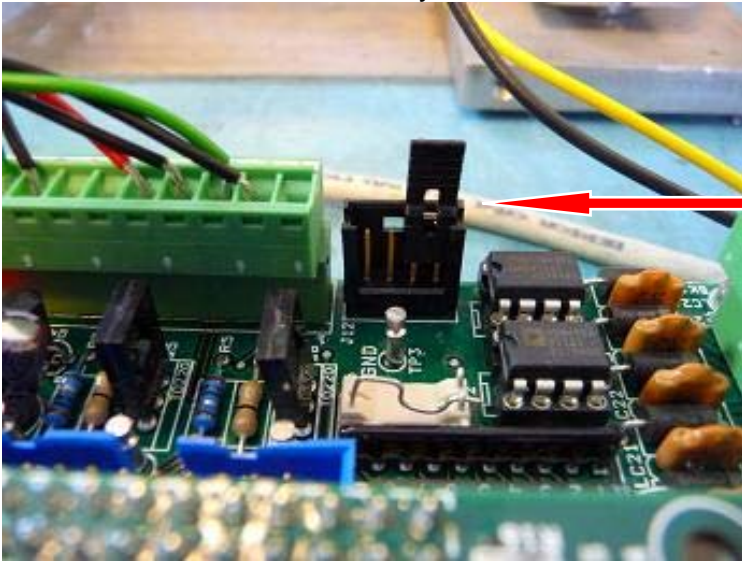
- 1) These error are displayed immediately after turn on the unit and affect the complete functioning of the sensor.

Error displayed	Meaning
0 o 1	Problem on RAM of board C352/C318 or C319

- 2) These error are displayed after about 5 minutes sensor turning on. Errors are considered displayed number without decimal point. If decimal point is on (Example 0. , 1. , 2.) they are no errors but working mode (transparency, reflex, whales).

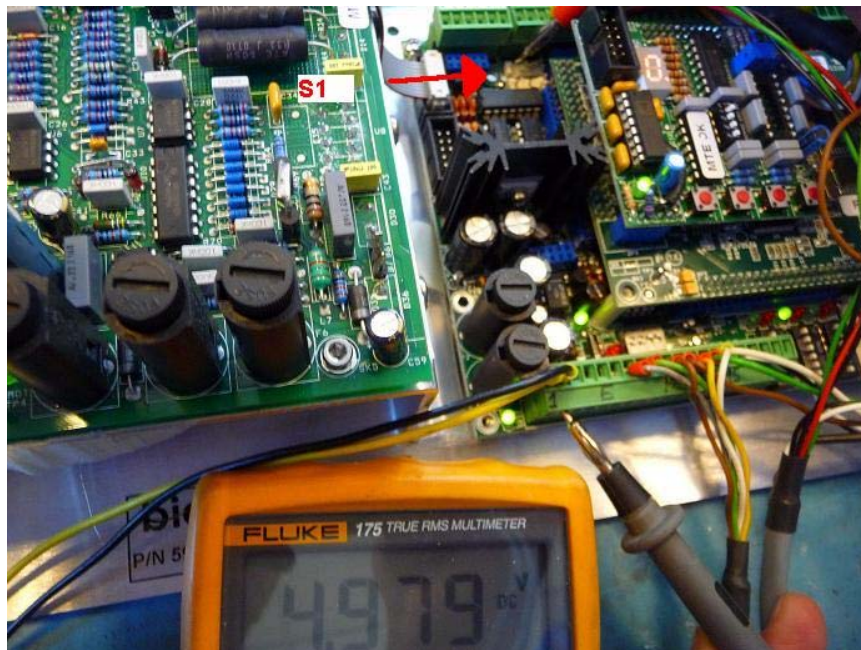
Error displayed	Wrong voltage	High temperature	Reflex Problem	Projector Problem
1				*
2			*	
3			*	*
4		*		
5		*		*
6		*	*	
7		*	*	*
8	*			
9	*			*
A	*		*	
B	*		*	*
C	*	*		
D	*	*		*
E	*	*	*	
F	*	*	*	*

If there is an error, but want to continue to work in AUTO mode while waiting for a spare, you can bypass the problem by inserting a jumper (jumper) between the metal pins 3-4 of J12 connector. This trick only works with a version of SW > = to 2.3.



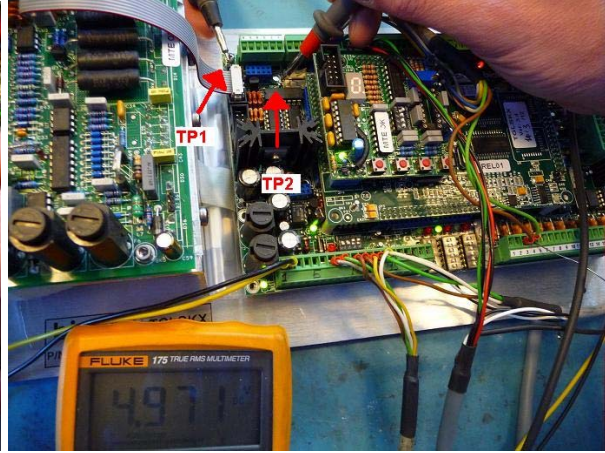
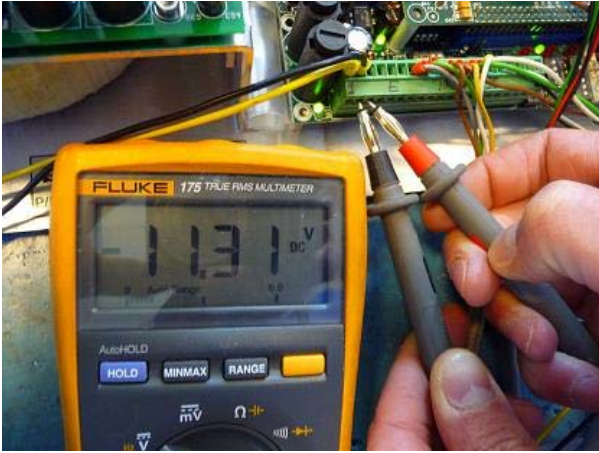
4) Check the wiring between the card C352 and the card C354, between the card C352/C354 and the sensor SK3. Also check any wiring interconnection with the rest of the line: the enables, commands, buttons, lamps. (follow the wiring diagram of the machine)

5) Check that the trimmer P1 is at maximum of his run, otherwise repeatedly rotate clockwise until you measure approximately 5.0 Vdc on pin 2 metal of the switch positions S1 (closed in position 2). (refer to 0V for the measurement of the board M5.2)



6) Check the voltage of the auxiliary board C352:

- Verify that there is a negative voltage between -9.5 and -12.0 Vdc between M5.3 (-) and M5.2 (0V)
- Verify that there is a positive voltage of 5.0Vdc between TP2 (+) and TP1 (0V)



7) Check the correct AUTO e MAN lamps functioning.

**If the lights are powered directly through the card C352, bridge B1 must be closed .If they are powered from external, B1 should remain open otherwise can damaged the operation of the card, up to total failure.**

**Always follow the diagram of the machine.**

### SETTINGS CARD C352

SETTAGGI SCHEDA C352

		ON	OFF			ON	OFF
SW1/1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW4/1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW1/2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW4/2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW1/3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW4/3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW1/4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW4/4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW1/5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW4/5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW1/6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW4/6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW2/1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SW5/1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW2/2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SW5/2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW2/3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SW5/3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW2/4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW5/4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW2/5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW5/5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW2/6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW6/6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW2/7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
SW2/8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
SW3/1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW6/1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW3/2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW6/2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW3/3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW6/3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW3/4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SW6/4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SW6/5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
SW6/6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
B1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	B5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		1	2				
S1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
S2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
S3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
S4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
S5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
S6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
S7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
S8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
		OPEN					

### SETTINGS CARD C354

SETTAGGI SCHEDA C354

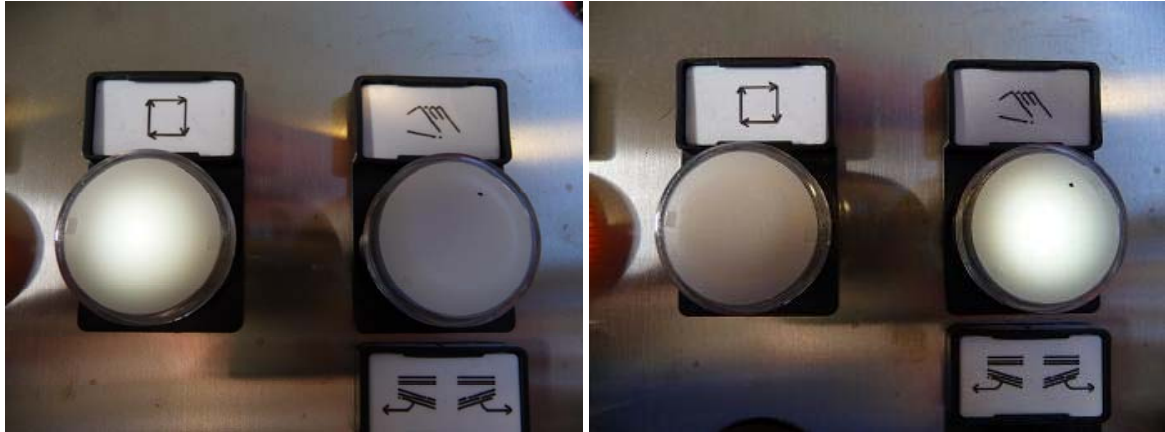
		ON	OFF			1	2
B1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
B5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
B6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
B7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				

x = Ponticelli Settati in fase di produzione non configurabili dall' utente

**x = JUMPER WELDED NOT CUSTOMIZE**

**NOTA**  
ATTENZIONE IL PONTICELLO B1 SULLA SCHEDA C352 DEVE ESSERE A OFF

**WARNING: THE JUMPER B1 ON THE C352 BOARD MUST BE OFF**




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8) Verify that the alarm system is working. Turning the potentiometer, the voltage between M5-12 (+) and M5-2 (-) changes from 0V to 12V.

9) Check the enable signal of M6.3, if absent, the user must flash lamp and the machine should not move the basket or in the MAN and AUTO neither.

10) Ensure that, as the enable signal of M6.3 C352 is present, pressing MAN lights the lamp is located under the button and rotating the drum rotates the potentiometer MAN. With the basket and free tissue incorsato not carry the MAN potentiometer fully anticlockwise and check on between M3.8 and M3.9 C354 is a voltage between 24 and 32Vdc, turn the potentiometer fully clockwise and check that the M3.8 and M3.9 voltage appears roughly the same but of opposite sign.

11) Holding the basket not incorsato-free tissue or obstacles between the receiver and projector alarm SK3 move the potentiometer fully clockwise, make sure that there is an enable signal of M6.3, press the AUTO button and check that the lamp alarm is turned off. Then gradually move the potentiometer counterclockwise and check that the alarm light comes on.

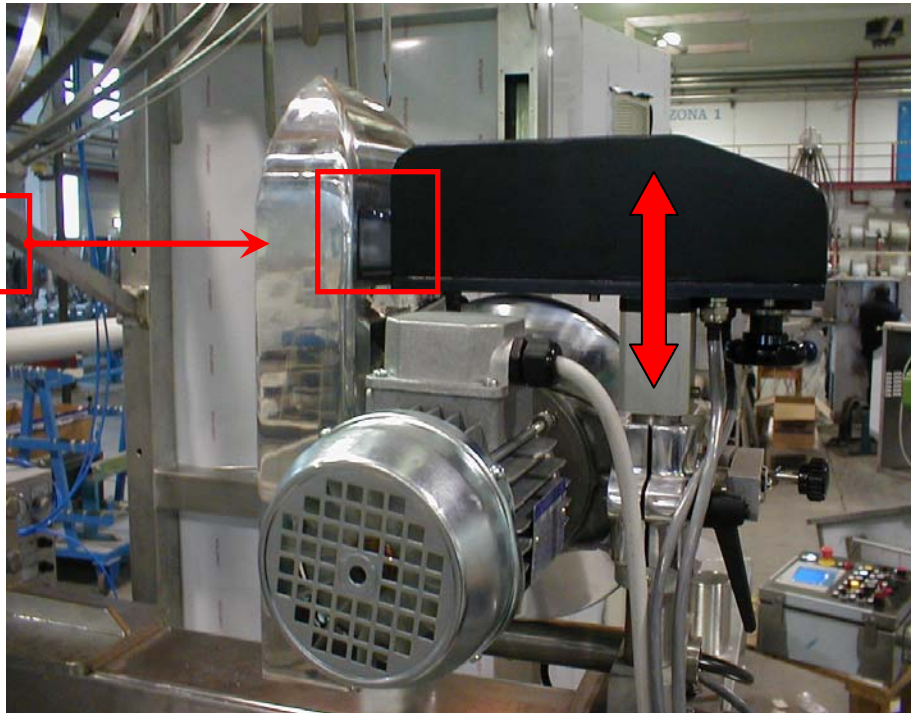
12) Make sure that when the enable signal is present on board the C352 M6.3 red LED LD1 of the relay enable "knife" is turned on, and this is off about 5 seconds after removing the enable.

13) Ensure that the LD11 red LED stays on until the machine is not in alarm (alarm light off) and it goes off for about 0.5 seconds, then turn on again when the car goes into alarm. This LED turns off for a moment in time when the alarm light comes on.

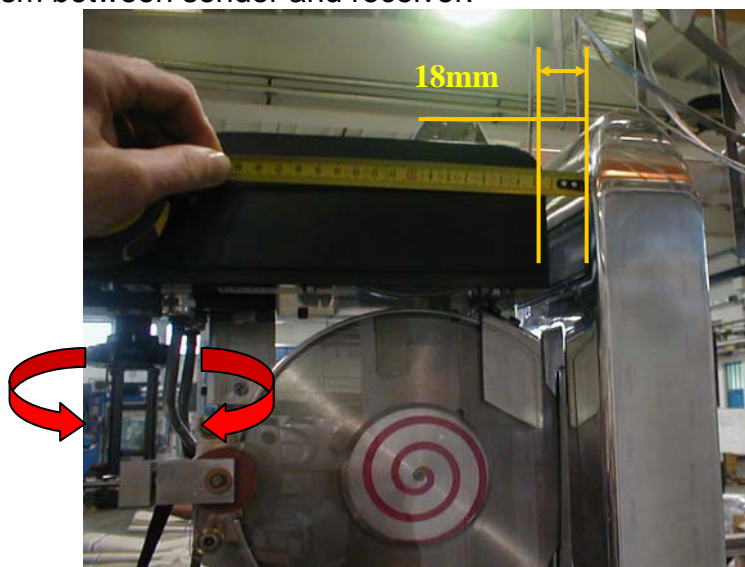
14) Now perform the calibration of the positioning of the sensor and transmitter SK3 in order to ensure the reading of the deviation of the needle in the AUTO mode.

- Check that approximately the glass front of the projector and receiver are aligned vertically.

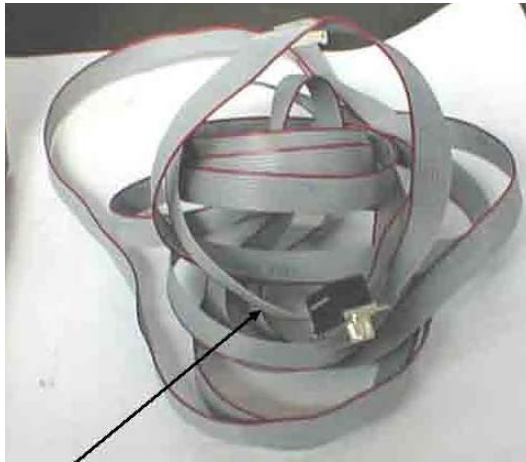
GLASS OPTICAL ALIGNMENT



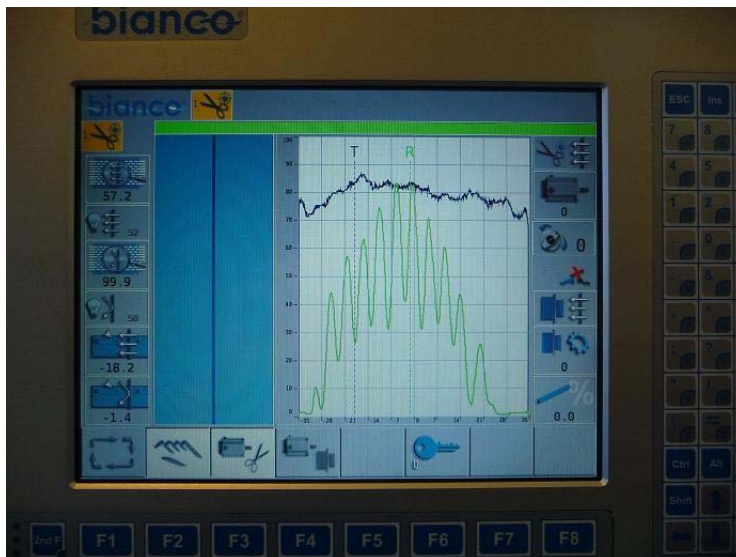
- Verify that the distance between the glass by the front edge and the mechanics of the receiver is about 18mm, check the distance on both edges to ensure the parallelism between sender and receiver.



- A perfect calibration procedure by connecting the control board to a laptop where it was installed a calibration program. Ask to Bianco SpA service department to obtain the software and the installer procedure.
- You need to have special connection cable between C336 e il PC supplied with the bianco's unit.(flat cable with 10 terminals). If the PC doesn't have a serial port RS232 available you must have a coverter adapter **RS232-USB (not supplied but easy to find in a computer's shop).**

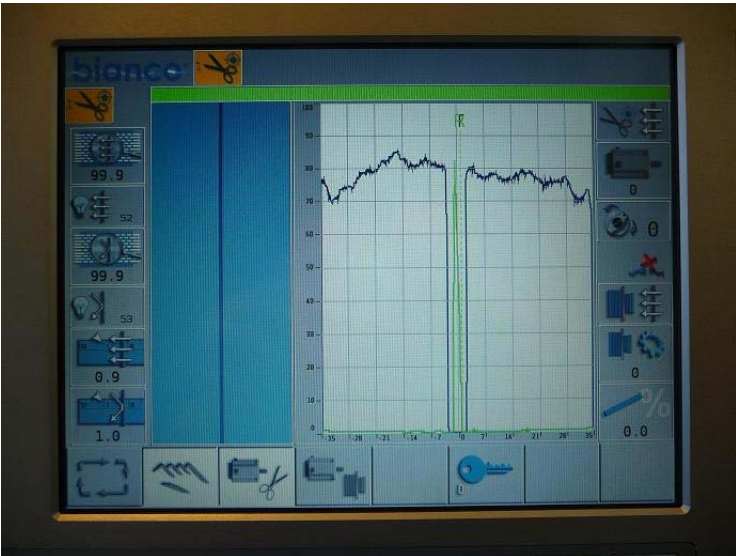


- To calibrate the sensor SK3, you must move the camera vertically to get the blue line (transparency) as flat as possible, or with the two ends slightly lower, as seen in photos.



**BEST SIGNAL OBTAINED  
AFTER CALIBRATION**

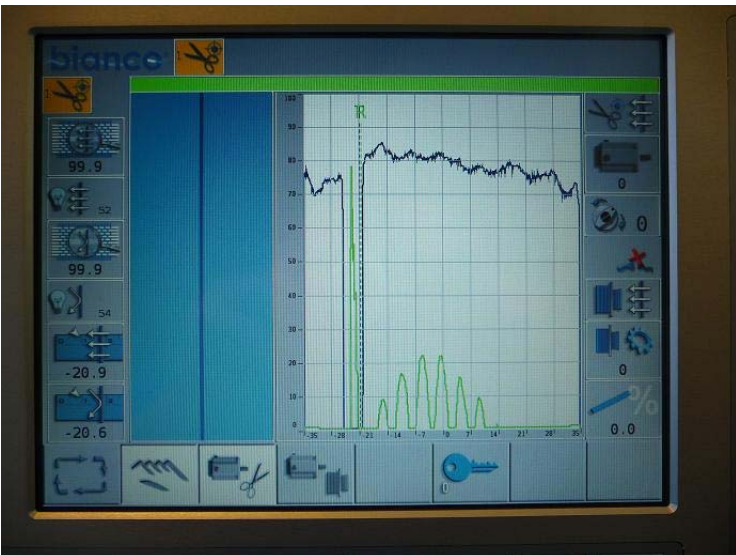
**INSERT A SCREWDRIVER BETWEEN THE CAMERA AND THE PROJECTOR AND CHECK THAT THE LINES T (TRANSPARENCY) AND R (REFLEX) FOLLOW THE FAKE SLITTING LINE.**



CENTRE SLITTING LINE



RIGHT SLITTING LINE

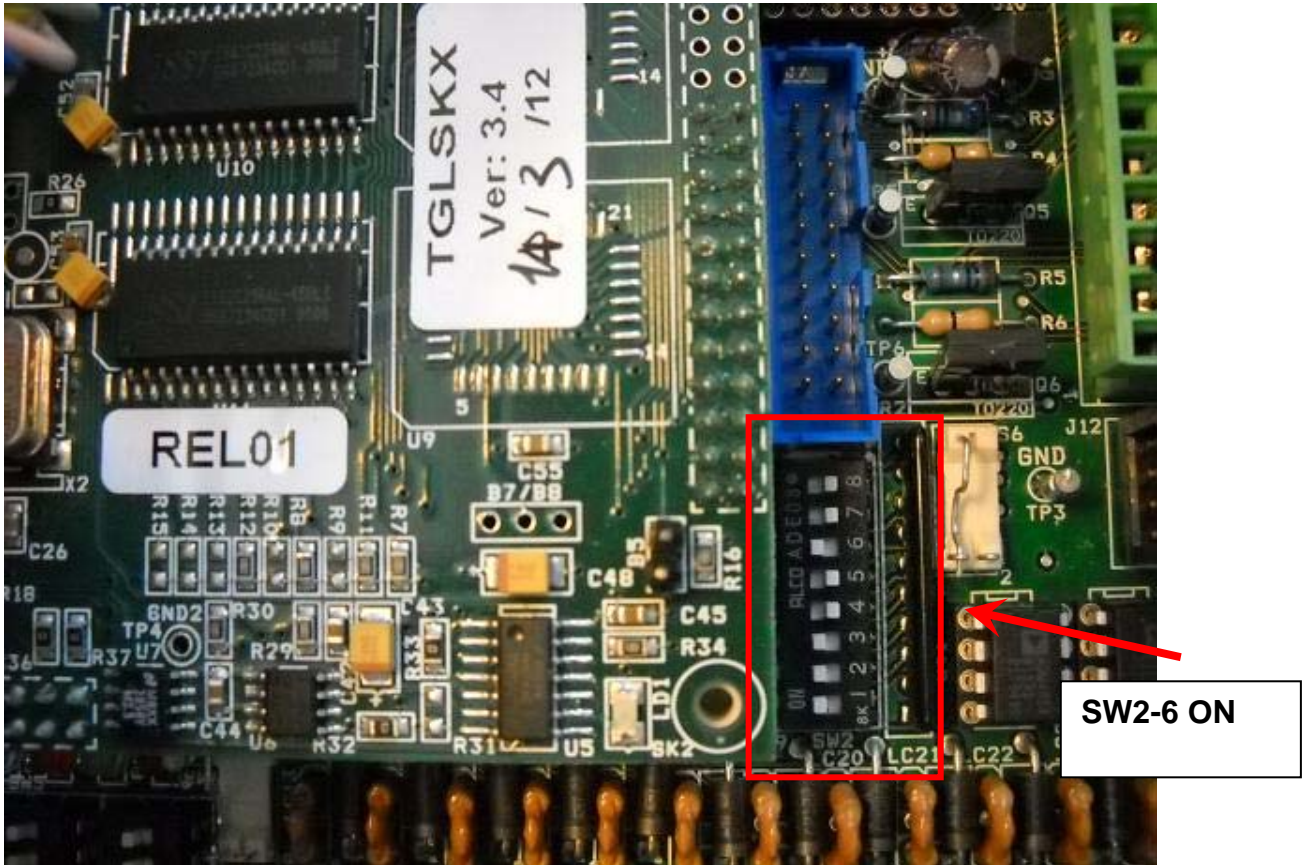


LEFT SLITTING LINE

Once you reach the optimal position, firmly tighten the screws loosened to move the camera. And WE recommended, (with a permanent marker), to make marks on the supporting arm at the setting position so if the camera is removed for any maintenance, you can reassemble without repeating the steps of calibration.



15) Insert a fabric with slitting line to start the machine, select the reading mode in TRANSPARENCY ("0." On the display card's C336), adjust the alarm threshold, enter the AUTO mode and see that the basket rotates to bring the deviation of the missing needle in the center. If the answer of the basket is too fast, decrease the gain by adjusting the trimmer P1 of the board C352, if the response is too slow, set to ON SW2.6 board C352 in order to duplicate the gain adjustment and act again of P1 to refine the the gain setting.



16) Test correct functioning with different type of fabric in AUTO MODE and at different working speed ..

**End.**