Art. Nr. 14269

PROTECHNA

Qualitätssicherung für Textilien

User Manual

ProCamInspect

ProCAM Visualization

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Content

1 Introduction

Welcome to ProCamInspect, the visualization software for the ProCAM camera system from the home of Protechna.
With ProCamInspect you have the access to all input parameters of the ProCAM system. You can store the settings of Articles and respectively Machine information and when needed, store this information in the ProCAM control unit.
For a quick overview of the quality of the fabric, as well as the recognition of eventual defects in the textile machine, there is now a means available of viewing an image of the most recently produced fabric.
To detect eventual fault functions, the Camera system has been implemented with a diagnostic screen, where a quick overview concerning the functioning of the system operates.
Detected faults (Thread breaks, weft insertion failures, holes…) are controlled and can be recalled as a history to be called up at a later time.
All functions of the ProCamInspect Software are user friendly controlled, that means different user's have differing access rights and can only carry out the functions which they are allowed.

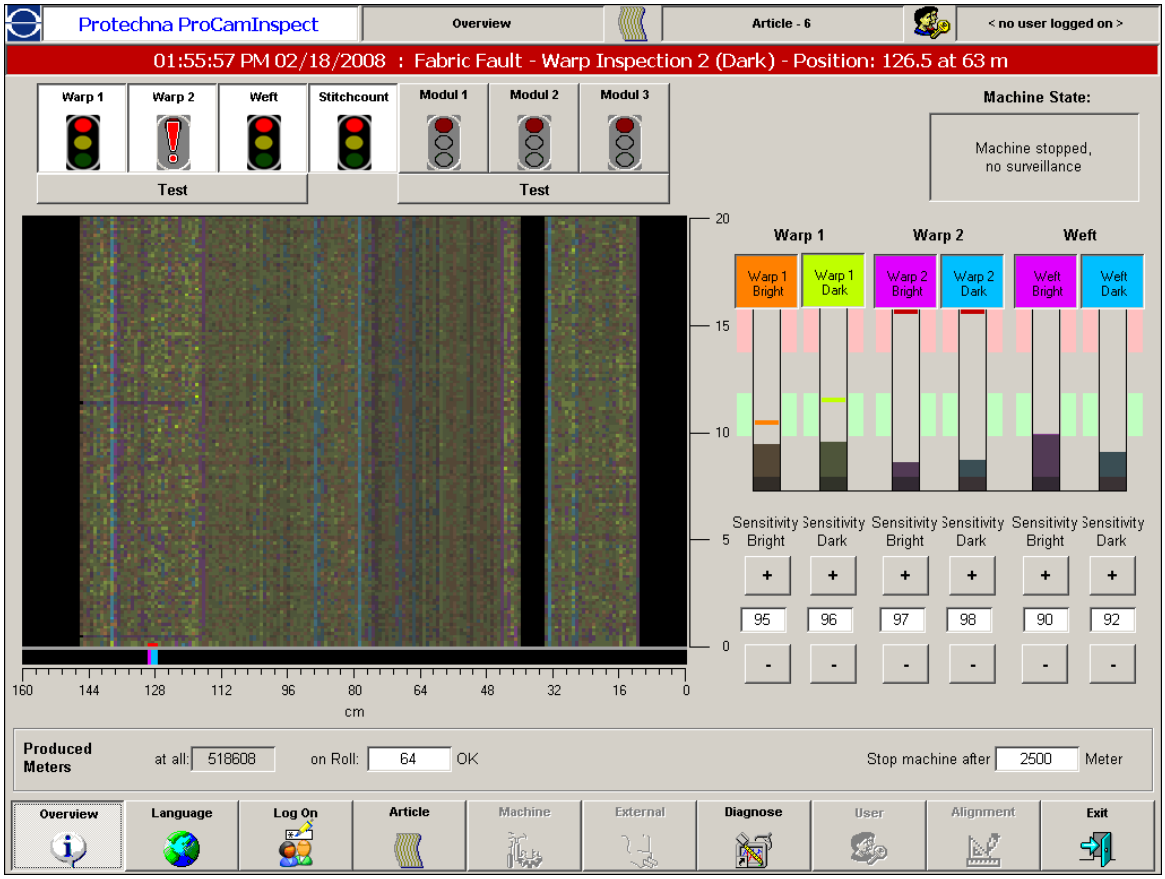
ProCamInspect serves only the visualisation of the ProCAM Camera system. The Camera system itself works independently to the ProCamInspect Software. This means that in the case of the ProCamInspect Software being switched off, the Camera system is still fully function useable. Input of the surveillance parameters must then be carried out using the Hand Terminal at the Control unit 5300!

1.1 ProCamInspect Operation

ProCamInspect uses the so called Touch Screen-PC's. That means that the complete programme usage is exclusively carried out by touch operation on the screen with a finger or a similar pressing implement.
There are two different Input elements. One of these is the switching area. This is simply activated by touching. On the other side, there are input fields where there is the possibility to input information either numerically or alphabetically. These fields are operated by pressing the respective field area. This results in operation of a screen keyboard, which works in exactly the same manner as any standard office keyboard P.C. Inputs are carried out by pressing the Enter Key, whereupon the screen keyboard is automatically linked and the respective inputs are carried out in the input field. Fields in which Inputs are active can be seen in such a way that they are shown against a white background.

2 The Screen "Overview"

After starting the ProCamInspect software, the following display is shown:



The view sets together 6 separate function areas which in part are also present in other screen views. The following areas can bee seen:

- The Title Line
- The Report Line
- The Status Line
- The Surveillance Visualisation
- The Piece Line
- The Menu Line

These individual areas are described in the following sections later on.

ProCamInspect works in a user status level manner. Therefore the following described functions are accordingly only available when the named user meets the necessary user rights. Further information regarding user access rights and groups are to be found under 9.1 *User Groups* from page 30.

2.1 The Title Line

The title line is usable in all screen views and shows there status information about the ProCamInspect Software. To change a name on the actual displayed screen, the relevant prerequested article as well as the user is shown.
After starting the ProCamInspect software at the beginning or after cancelling the actual user name, the screen "Overview" is always shown.

2.2 The Report Line

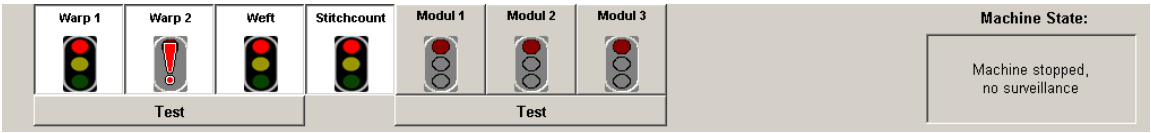
In the report line, reports, warnings and faults are displayed, which either has been caused by functioning faults in the system, undue setting parameters or by faults in the ware. They are all available to be seen on the screen.
The different report categories are split into various background colours so that a fast classification of the report type is possible. Completed reports can be activated either by restarting the textile machine or by scrolling the report line and they will be then no longer displayed.

Categories	Background	Cause
Reports		Uncritical faults in the ProCAM control unit.
Warnings		Critical faults in the ProCAM control unit.
Faults		Detected faults in the ware.

An entry in the Report Line as a rule is always shown at an actual time of occurrence with the report number and a short text description! This information generally is sufficient to detect an eventual problem and then to rectify it.

Should the control unit 5300 report a fault caused by incorrect setting parameters, then first of all the respective fault in the report line must be activated before the setting parameter can be altered. Otherwise the new settings will not be transferred from the control unit.

2.3 The Status Line



In the Status Line you will see information about all of the Systems connected surveillance equipment as well as the actual status of the textile machine. Additionally one can activate or reactivate

individual surveillance activities and also switch the test mode to its active position. The following surveillances are available for the ProCAM control unit:

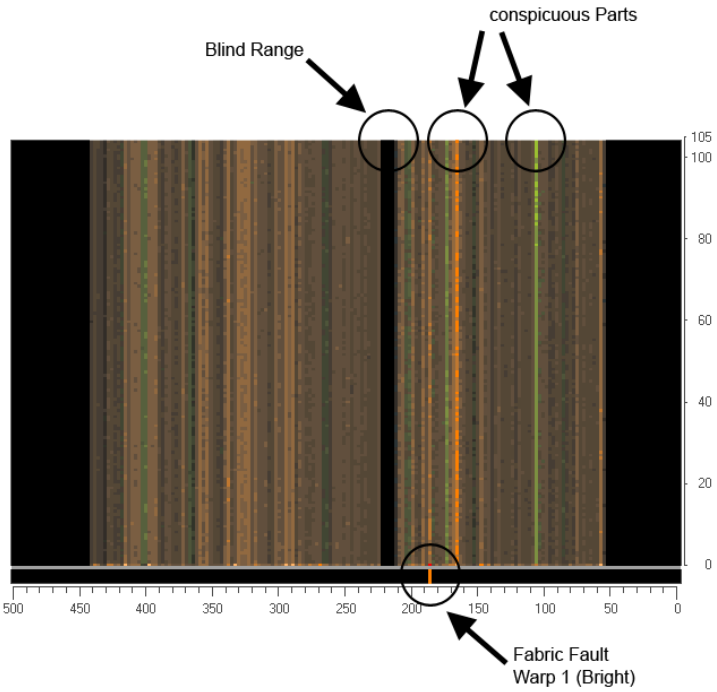
Surveillance	Remarks
Warp 1 + Warp 2	The standard thread break detection of the ProCAM system.
Weft	The standard weft insertion failure detection of the ProCAM system
Piece Length	Optional piece length surveillance. Only possible with an installed revolution counter
Module 1-3	Optional. Allows 3 further expansion modules to be fitted. These can be light barriers or Filstop modules.

For every surveillance you will however also have a signal lamp symbol in the status line. The symbol is however only active when the accompanying surveillance is installed. By activating the lamp symbols one can control the respective surveillance, that is to say activating or deactivating. The Test mode is switched using the switching bar underneath the lamp symbols! In the following table you will see a short overview of the different display states of the lamp symbols and their meanings.

Signal Lamp State	Meaning
	The respective surveillance is not installed and therefore is not useable in the system
	The respective surveillance is installed and therefore useable in the system.
	The surveillance is switched to active. The colour of the lamp informs you of the actual status of the surveillance: • Red → Surveillance stopped. • Yellow → Surveillance started, start delay running. • Yellow/Green → Surveillance is in its learning phase. • Green → Surveillance is running.
	The surveillance has detected a fault and stopped the textile machine! Further information can be found in the Report Line!
	The control unit 5300 has encountered a system failure and has switched off the surveillance! Further information can be found in the Report Line!
	The surveillance is active and running, but only in its Test Mode. Faults will be displayed, but will not result in the machine being stopped.

To the right side of the Lamp symbols you will find yet another display field in which the actual status of the textile machines itself will be given.

2.4 The Surveillance Visualization



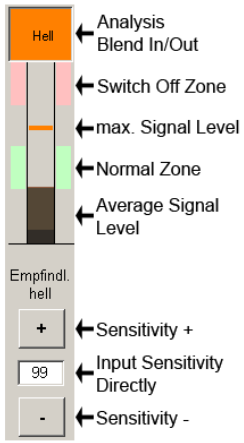
The surveillance-visualisation is comprised of two parts. One of them is a schematic portrayal of the most recently produced fabric. The other part is the levels of the display signals such as setting possibilities for the sensitivity of the thread break/ weft insertion surveillance. The schematic of the fabric shown does not represent a 1:1 view of it, instead, an interpretation of the section via the ProCAM system. Generally speaking, one can say that each dark area in this schematic is thereby inconspicuous in these areas. Lighter sections however indicate irregularities. Such lighter coloured areas are shown as a more conspicuous position in the cloth. In the case of a really lengthy fault in the Textile Machine then as a rule near the fault, a light coloured line will be shown running through the picture. If the fault size increases, this will also cause the brightness of the line to increase. As a rule you can easily recognise faults as needle variation or other problems. Very often this is possible before one is aware of the actual fault in the fabric. If a fault leads to the machine being stopped, then the position of the fault is shown as a red dot on the picture. Generally the colouring of the picture is stained on the strongest signal of the individual surveillance.

The ProCAM camera system detects fabric faults on the basis of brightness deviation in the produced ware. These can be shown as a dark area (for example as a shaded area) or a lighter areas (for example a faulty thread). Therefore there are two methods of analysis for both surveillances (warp 1 + warp 2/weft). One of these in the area of lighter variations and the other in darker areas, and also for the respective two separate sensitivity levels.

The colour shade of the individual picture elements always points towards which of the 6 analyses has produced the strongest signal at that position. In this way the analysis of the following basic colour shades is arranged.

Warp 1 (Light)	Warp 1 (Dark)	Warp 2 (Light)	Warp 2 (Dark)	Weft (Light)	Weft (Dark)

On the right side of the surveillance visualisation you will see signal displays for the six separate analysis methods. These show accordingly, the resultant highest signal level which has been emitted during the actual accumulative cycle and the average level over the whole fabric width. Should the signal level reach the red marked switch-off area, the stopping level will be reached and the machine stopped. (Provided that the test mode has not been activated).



Beneath the signal displays are situated the requisite switching elements with which the required sensitivity levels for the respective analysis settings are made. A higher sensitivity automatically indicates a higher signal level. As a rule of thumb, one should adjust the sensitivity so that the signal level for perfect fabric ware and correct machine settings should be indicated in the green Normal range. Thus the level is established that real faults have caused the machine to be stopped and at the same time prevent false stops occurring.
Depending on application it might be necessary to select a different sensitivity. Additionally by using the switch board "Analysis Fade-in/Fade-out" mode, one can decide if the current analysis method with its portrayal of the produced ware is to be shown or not.
If an Analysis method is faded out, then the actual signal will not be taken into account for calculation of the actual colour value on the picture screen.
This can be useful when for example only the valuation of the Warp 2 surveillance is needed to be shown. In this case one must fade out both analyses of the Warp 1 surveillances (light and dark) as well as both analyses of the weft surveillance.
As standard, all six methods are faded in. Faded out analyses inform you then that the switch board (Analysis Blend In/Out is shown against a black background.

2.5 The Piece Line

The information in this section is only for your interest in case the piece length surveillance which is incorporated in the ProCAM system is used.

In order to use the piece length surveillance, an impulse giver must be installed which will count the revolution speed of the machines main shaft. In order to obtain correct data, you must also input the correct stitch length for the produced article. See section 5 *The Screen "Article"* from page 10.

The following report, respectively the input elements are available:

Anzeige-/ Eingabeelement	Bedeutung
at all	Running metre counter, records the total number of metres the machine has produced.
on Roll “OK”	Actual length of the produced piece. Can be set by manually.

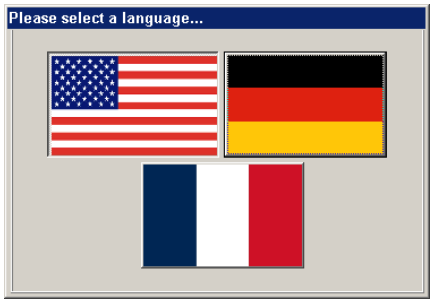
Stop Machine After	In this input field the actual required length of piece is inserted. If the metre length is reached, then the machine will be stopped so long as the piece length surveillance is active.

2.6 The Menu Line

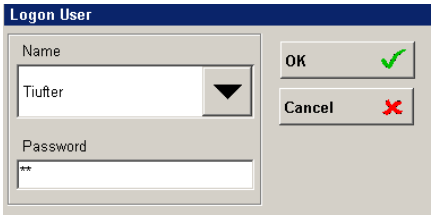
The Menu Line is likewise usable in all screen views. With your assistance you can move between the individual picture screens which ProCamInspect has provided for you. Here you can either open complete screen views or only a selection window to be shown in the foreground.
For possible selection options please use the diagrams. The descriptions of the separate views are described in the following chapter.

3 The Dialogue "Language"

Using this menu position you can very easily change the user language of the ProCamInspect software.
Following a simple touch on the button "Language" will lead to the opening of the pictured dialogue on the right. Here, with one touch, by using the respective Country flag, select a new language.
The change over then takes place automatically. At present English, French and German are portrayed.



4 The Dialogue "Log On-/ Log Off"

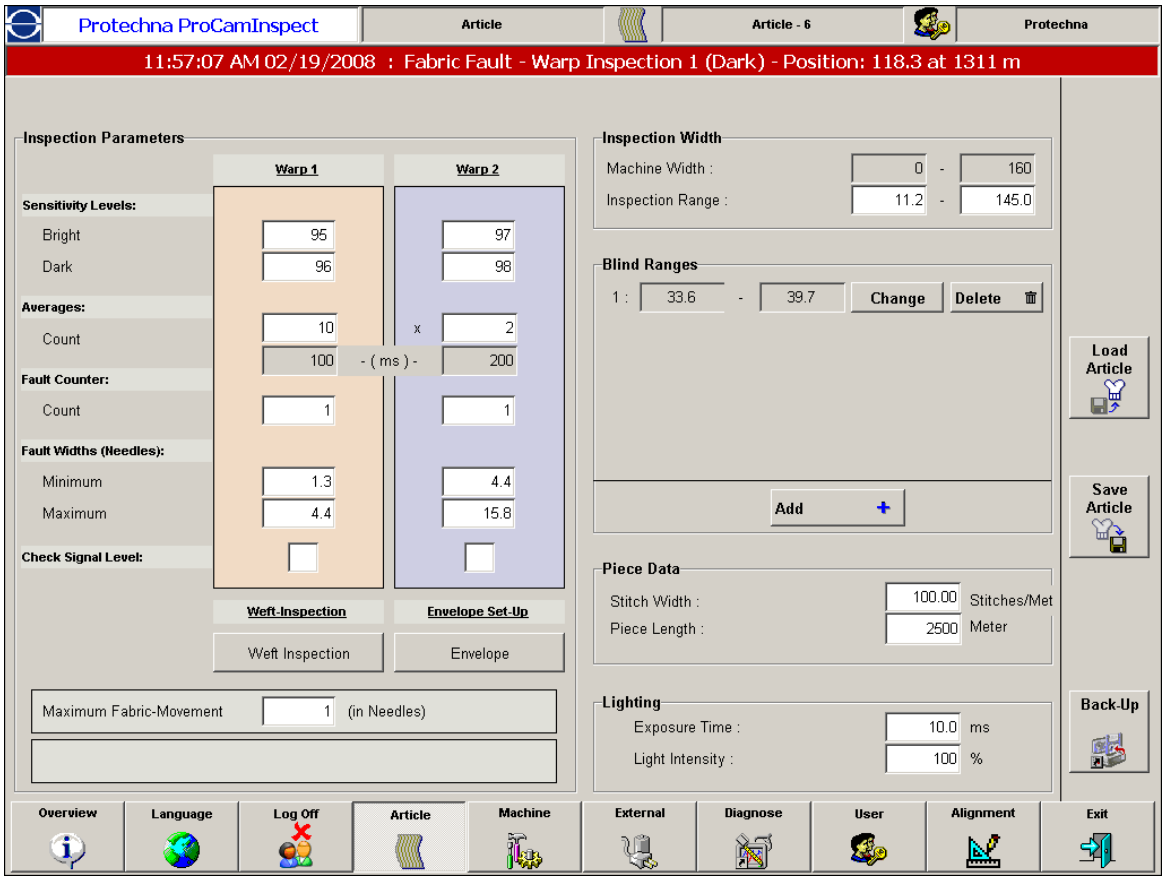


By using the button "Log On-/ Log Off", one can call up a user name and the respective password in the system i.e. when one is selected you can Log Off again in order that no interruption can affect access to the system. When you wish to Log On, open the dialogue seen on the right. One can now easily access the respective user name password and confirm it with "OK".
The user name can either be loaded directly into Input field or selected from a list of all other users. To do this simply call up the "User List" and press it to select the chosen name from the opened list.
If you wish to Log Off from the system, simply press once, the button "Log Off".
You can learn more about the preinstalled users and their user rights in chapter 9 *The Dialogue "User"* from page 30.

In the event that you should forget to log off after using, an automatic logging off will be carried out by the ProCamInspect software. The time span before automatic logging off is dependant on the actual user. More about this under 9.1 *User Groups* from page 30.

5 The Screen "Article"

On the screen "Article" you will find all settings for the ProCAM system which are specifically



"Article" measured. The values can be simply altered and stored against the respective article number. Then data-sets can be used again later and configured in the parameter of the camera system under their respective articles.

5.1 Parameters of the Screen "Article"

- Sensitivity level

Value	Meaning
Warp 1 - Light	Sensitivity of the warp 1 surveillance in direction "Light".
Warp 1 - Dark	Sensitivity of the warp 1 surveillance in direction "Dark".
Warp 2 - Light	Sensitivity of the warp 2 in direction "Light".
Warp 2 - Dark	Sensitivity of the warp 2 in the direction "Dark".

These four setting parameters are identical to those on the screen "Overview" (see 2.4. *The Surveillance Visualization* from page 5). It is however unimportant at which position the value is altered.

- Averages

Value	Meaning
Averages - Warp 1 Surveillance	For each calculation cycle of the ProCAM system a definite number of measured values are collected. This number can be established here. A high incidence of averages is above all necessary when brief interruptions of the messaging occurs and can cause the machine to be stopped.
Averages - Warp 2 Surveillance (Multiplier)	A average system is also carried out for the warp 2 surveillance. Though one cannot directly input the number of messages, instead you can however it is possible to carry out a multiple messaging factor for the thread break surveillance.

Please be aware that in the case of an increasing number of averages that the length of the fault in the fabric also increases. In order to carry out a calculation, you must first collect the respective number of measured values in order to carry out an averaging. The ProCAM system works for example in a synchronised manner whereby each stitch has a measurement carried out. That means for example if 150 averages are input then the fault would be about 150 stitches in length. Only then would the machine be stopped.

- Fault counter

Value	Meaning
Number - Warp 1 Inspection	The value of the fault counter which is referenced for the warp 1 inspection.
Number - Warp 2 Inspection	The value of the fault counter which is referenced for the warp 2 inspection.

The fault counter (separate for warp 1 and warp 2 inspection) defines how often the ProCAM system must have detected an fault in succession before the machine is stopped. If the fault count is 1, the machine is stopped immediately when the first fault is detected, or correspondingly later if the count is higher.
As a rule, the fault counter is used if wrong stoppages occur occasionally, i.e., the machine stops and there is actually no real fabric fault. To avoid this, the fault counter can be set higher which makes detection safer because the same fault must be detected at the same spot several times in succession.

In any case, a fault count larger than 1 causes extended fault lengths in the finished fabric because the same fault must be detected several times and therefore the calculation must run several times.

- Fault Width (in Needles)

Value	Meaning
Minimum Fault Width - Warp 1 Inspection	Minimum error width at which as fabric defect is identified as thread break.
Maximum Fault Width - Warp 1 Inspection	Maximum error width at which as fabric defect is identified as thread break.
Minimum Fault Width - Warp 2 Inspection	Minimum error width at which as fabric defect is identified as thread break.
Maximum Fault Width - Warp 2 Inspection	Maximum error width at which as fabric defect is identified as thread break.

Here you can define the fault width to which the warp 1 or the warp 2 inspection shall react.
The lower limit is important, which for thread inspection normally is just above 1 because if a thread breaks at least one thread is missing.
Typically, these 4 values are preset by a Protechna engineer during the installation of the system and should not be changed unless more serious problems are encountered (if possible with prior consultation of Protechna).

To enable the ProCAM system to work properly with the fault width settings, it is necessary to enter the gauge of the fabric carefully (see 6. *The Screen "Machine"* from page 19).
Be especially careful if the gauge changes during an article change.

- Check Signal Level

If you enable the checking of the signal level function, the system automatically monitors the mean signal level of all cameras and outputs an error message if the level of one camera drops to below 20 per cent. As a rule, this indicates that the system configuration is wrong or a problem has arisen at the camera or the illumination.

It is possible that an error message is displayed even if you cannot find any irregularities of the signal level in the overview screen (see 2.4. *The Surveillance Visualization* from page 5). The reason is that the signal monitoring function scans each camera separately whereas only the mean of all cameras is displayed in the overview screen.

Do not mistake the signal level for the camera level which is displayed in the diagnostic screen (see 8.1. *The Camera level* from page 26).
The monitoring signal level is the signal level after the camera signal has been processed by the ProCAM system.

- additional settings

Value	Meaning
Maximum fabric shift	Maximum horizontal movement of the finished fabric within the camera view line
Target speed	Speed which defines whether the machine is running or not. Must be entered if the option "Use clock as machine-runs signal" is used (see 6.1 "Parameters of the screen

- Piece Data

Value	Meaning
Stitch Width	Stitch length of the article produced. On the basis of the stitch length and registered revolutions of the main machine shaft it is possible to calculate the piece length in metres.
Piece Length	Required piece length for the piece actually produced. The machine Will be stopped when it reaches this length.

These values are only of use when you require the piece length stopping to be used. You will have no idea of the fault detection!

- Lightning

Value	Meaning
Exposure Time	Time span in milliseconds that the fabric wares must be illuminated in order to carry out a measured value.
Light Intensity	The light strength is regulated by the intensity of the infra-red light source. 100% means full light power and 0% indicates the power is switched off.

With these two parameters, one can use the measuring system on differently coloured wares. Dark coloured wares generally reflect the light worse. Therefore you should in this case operate with a high light strength and perhaps with a longer illumination period. For light coloured articles the opposite is the case.
In order to check if the cameras have sufficient light, you can see on the screen a diagnostic display element which will show the signal level of separate cameras.
Also see 8.1. *The Camera level* from page 26. It is therefore worthwhile to establish both parameters in conjunction with the diagnosis picture screen.

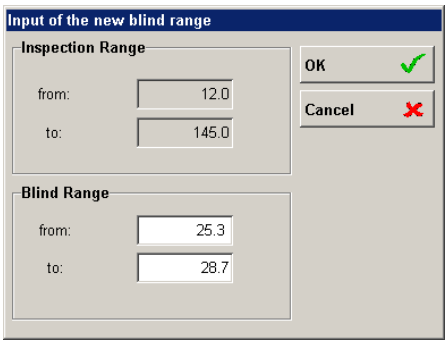
The lighting period cannot be changed at will. When the ProCAM system operates in synchronisation with the machine, the maximum lighting time period is thereby dependent on revolution speed of the machine. The higher the revolutions, the lower the maximal lighting period.
In the case a lighting period that has been set too high, the system will indicate Alarm 451 and this can be seen in the message line. In this case, the lighting time period must be reduced.

- Inspection Width

Value	Meaning
Machine Width	This field is here for information only! It indicates the maximum machine width!
Inspection Range	The surveillance width determines the area of the ware which the ProCAM system should control. It must not exceed the machine width!

In order to really set the maximum possible surveillance width, it is useful and helpful to be able to see on the screen "Overview", a schematic of the ware produced (see 2.4. *The Surveillance Visualization* from page 5). In this way one can use the effect that as soon as the camera passes beyond the fabric selvedge, then the respective position of the selvedge fabric fault will be very noticeable There will also be light coloured stripes shown on the portrayal at the cloth edges. In so long as this is the case, then the surveillance width must be shortened. When the light coloured stripes are no longer visible, then you have reached the optimum width setting. To accomplish this it is recommended that the machine is run in its Test Mode status.

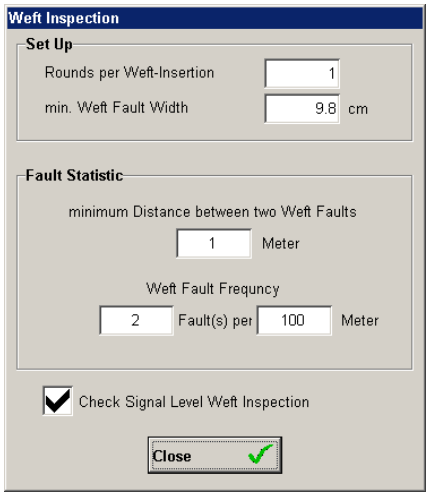
- Blind Ranges



If there are separating gaps in the produced ware or other areas that are not controlled, then you must make sure that these positions are faded out and excluded from the surveillance.
In this case use the switch panel "additional". It will open the dialogue shown on the left. At this stage input the position of the inspection range (from - t) and establish this with the confirmation "OK". The blind range must lie within the surveillance range. There are a maximum of 6 blind ranges possible.
Blind Ranges no longer required are removed with the help of the button "Delete" to the left near the fade-out. For the exact positioning of the blind range area the same procedure is used as that with the positioning of the surveillance areas.

5.1.1 Dialogue “Weft Inspection”

In this dialogue you can configure the weft insertion surveillance to the needs of the specific article.
Additionally to the common settings there is a fault statistic that can be used to configure the ProCAM in a way to only stop the machine if there is a cumulation of weft insertion failures.



- Set Up

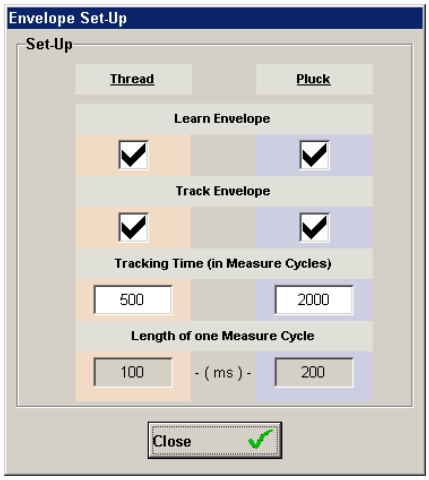
Value	Meaning
Rounds per Weft-Insertion	Defines how many rounds the main shaft of the machine is doing before the next weft insertion takes place.
min. Weft Fault Width	Marks out the minimum width of a weft insertion failure. Failures smaller than that are not causing the machine to be stop.
Check Signal Level	Similar to the warp inspection you can switch on the continuously checking of the signal level of the weft insertion surveillance. A signal level smaller than 20 percent is causing a warning message.

- Fault Statistic

Value	Meaning
Minimum distance between two weft insertion failures	Defines the minimum distance between two weft insertion failures. If the distance between two consecutive failures is smaller than this value, the machine is going to be stopped. If not, the machine will be stopped only if the second criteria (Weft Fault Frequency) is being fulfilled. If this value is set to 0, the fault statistic will be deactivated.
Weft Fault Frequency	Defines the maximum count of weft insertion failures that are allowed within a portion of the fabric. In the example above there is a count of two failures allowed within 100 m of fabric. By reaching the limit the machine will be stop on the next occurrence of a failure.

5.1.2 Dialogue “Envelope”

The so called envelope is an integrated function which allows the ProCAM system to teach vertical structures which can be seen in or through the finished fabric. The sensitivity setting of the fabric monitoring function (see 2.4. *The Surveillance Visualization* from page 5) is not applied to the whole monitored width but separately to each section of the finished fabric as taught.
This makes it possible, as a rule, to operate the system at substantially higher sensitivities which improves detection and reduces stoppages.
The teach-in occurs every time this function is enabled and every time the control unit 5300 is switched on. The envelope can be activated/configured separately for warp 1 or warp 2 monitoring.



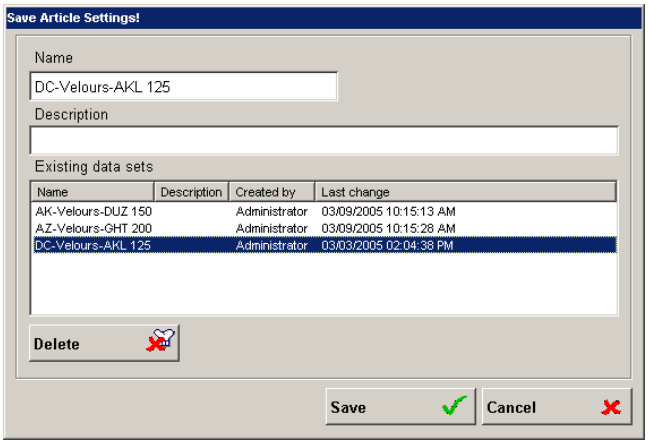
Value	Meaning
Learn envelope	Enables the envelope function.
Track envelope	If this option is enabled, the envelope adapts automatically to changing characteristics of the finished fabric and other ambient parameters (contamination, ambient light, etc.).
Tracking time (in measuring cycles)	Period of time which is covered by the automatic adaptation of the envelope. This period should not be too short because otherwise fabric errors might be taught which would then not cause stopping of the machine. It is recommended to set an interval of at least 3 minutes.
Length of one measuring cycle	This value will only be displayed and indicates the length of one measuring cycle. This makes it easier to estimate the tracking time which is entered in measuring cycles.

As described above, the envelope is taught only once when the function is enabled and when the control unit 5300 is switched on.
If another type of finished fabric is monitored, it is recommended to enable the learn function manually to enable the envelope to adjust to the new conditions. This can be done by pressing and holding the "Start/Stop" button at the control unit 5300 for 5-6 seconds until the Learn indicator lamp starts blinking. The envelope will then be taught again at the next start of the machine.

5.2 Loading and storing of Articles

For the input and storing of Article data, then both the buttons "Article input" and "Article Store are used.

- Save Article



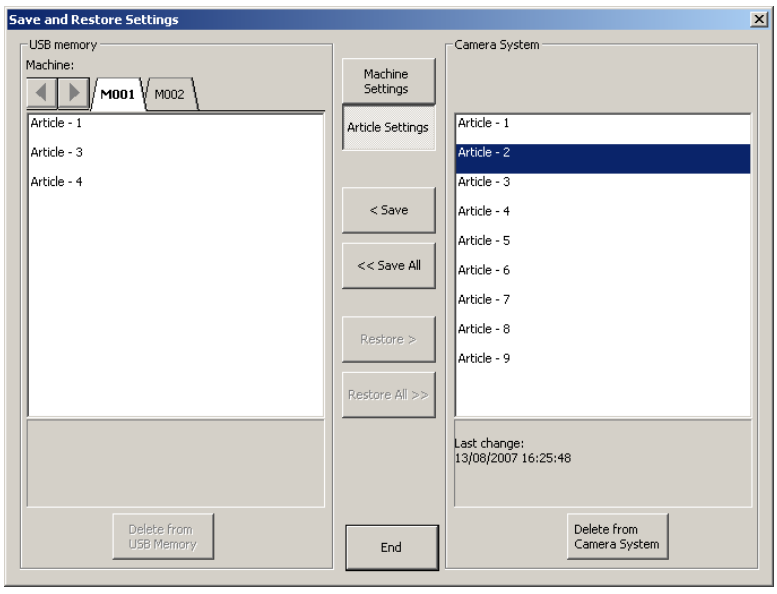
In order to use a Data set, simply operate the button "Article Store". It will open the dialogue shown on the left.
In order to record an existing Article (and also to change it), simply choose the article from the list shown and press "Save". You will then be asked if the article shown should be overwritten.
In order to record a new article, simply input a new article name and then operate the button "Save".
Optionally you can also make a comment in the description field. In order to cancel an existing article, simply select the article from the list and operate the button "Cancel".

- Load Article

In order to load an article, operate the button "Article Input". It will open a dialogue which will look similar to that for the button "Article Input". At this point you simply choose the required article from the list and press the "Save" button. The respective article data are then at this point loaded and immediately transmitted into the ProCAM System,

5.3 Article data backup

Pressing the button "Back-up" saves article data in a USB memory stick or copies data back into the panel PC.
This is important if there should be a problem with the PC and the PC must be replaced. If no article data back-up is available in such a case, the data may be lost and must be created again.

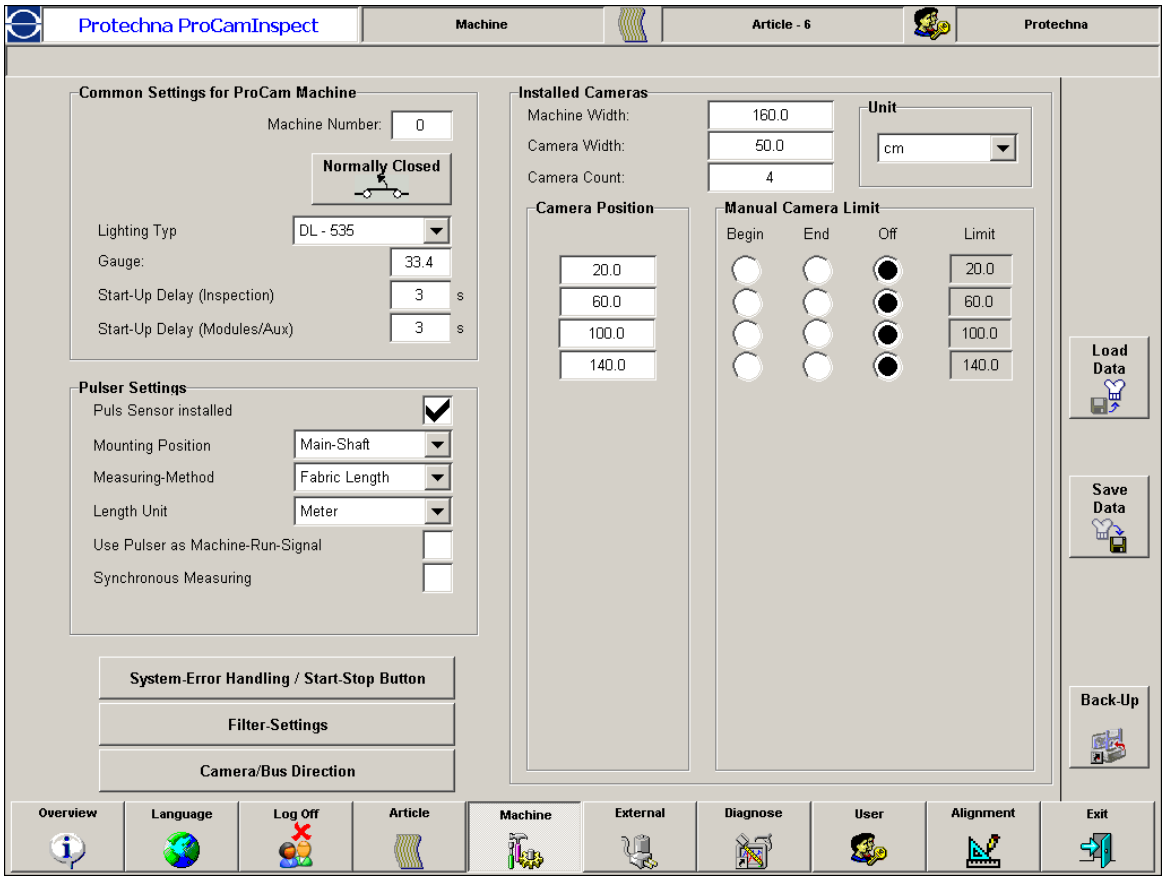


For a data back-up, at first connect a USB memory stick to the panel PC (one stick is enough for all equipped machines).
Then press the "Back-up" button, which opens the dialogue on the right.
The article data already stored in the stick is shown in the left part of the window, data in the PC is displayed on the right.
Data on the stick is organized by machine. A tab is displayed for every machine (whose data is stored in the stick), which allows the user to select the machine he needs. It is also possible to copy article data of another machine to any panel PC and use the data there.

To copy data, simply highlight the article from the list and press "Save", or press "Save all" if you want to copy all articles. This also works from the USB stick into the panel PC, in which case you have to press "Load" and "Load all".

6 The Screen "Machine"

The Screen "Machine" contains all the basic settings for the ProCAM Camera system.



These are set up during the course of the installation by the Protechna engineer and must only be adjusted if a slight adjustment is needed. Similarly, as with Article Data, it is also possible to input these basic settings as Data Sets. This is very important if the control unit 5300 needs to be exchanged due to a defect. In this case the Data Sets with its basic settings can be reloaded and the new control unit can be reconfigured immediately.

6.1 Parameters of the Screen "Machine"

- General settings of the textile machine

Value	Meaning
Machine number	Number of the machine
Relay mode	Confirms if the relay for the stopping of the machine should operate as an "Open" or "Closed relay system.
Lighting Type	There are various types of lighting which can be connected to the ProCAM System. The type which you have installed must be indicated here.
Gauge	The gauge at which the machine works

Start delay inspection	When the textile machine makes a new start, the control module waits for the time set before the fabric monitoring (warp/weft) is started. Normally, the time entered here should be that which the machine needs to obtain full speed.
Start delay module/Aux	When the textile machine makes a new start, the control module waits for the time set before the optional extra module and external switching inputs are enabled.

The gauge must always be entered exactly because together with the error width of the article (see 5.1 *Parameters of the Screen "Article"* from page 10) it contributes directly to the detection of errors.

- Pulser settings

Value	Meaning
Puls Sensor installed	Depends whether the ProCAM System is equipped with an Impulse giver for the machine revolution speed. Without an impulse giver it is not possible get synchronised running and also no piece length surveillance.
Mounting Position	Defines where the clock is installed - at the main shaft or the shaft take-off.
Pulser Mode	If the clock is installed at the main shaft, the user can define if it should work as stitch counter or measure the fabric length (with reference to the defined fabric take-off; see 5.1 *Parameters of the Screen "Article"* from page 10).
Unit of length	The unit of length in which the fabric is measured. Available units: metres, yards or feet.
Use clock as machine-runs signal	Defines if the clock is used as machine-runs signal.
Synchronized measurement	Switches the machine to synchronous mode. One measurement is made with every revolution of the main shaft.
Phase	When the system operates in a synchronised running manner, it will indicate a value as to which number of degrees; (referring to the revolutions of the machines main shaft) the measuring of the Camera system will be started. To deactivate the synchronised operation, please input at this stage the number 999.

Sometimes it may be difficult to obtain a correct machine-runs signal. In such a case the clock can be used by enabling the function "Use clock as machine-runs signal". In this mode, reference to the "Target speed" (see 5.1 *Parameters of the Screen "Article"* from page 10) is made to decide if the machine is running (speed > target speed) or not (speed < target speed).

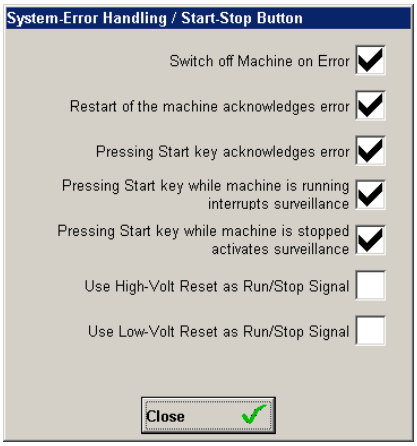
When the Camera System operates in synchronised operation, a measurement is carried out for every revolution of the main shaft. The parameter “phase” defines when the measuring starts.
The synchronised operation is always then necessary when the cameras are mounted in such manner that they are not aimed at the fabric, but instead are looking at the needle bar for a set time during the main shafts revolutions. Then the synchronised operation must be activated, as a measurement can only take place when the cameras have an uninterrupted view of the fabric.

- installed Cameras

Value	Meaning
Machine Width	The maximum width of your textile machine.
Camera Width	The fabric width which an individual camera can cover.
Camera Count	Number of installed cameras.
Unit of measure	The unit in which position data is entered.
Camera Position	The viewing area of the cameras can be manually limited on the left or right edge view. This is useful when for example an anchor pile projects into the cameras field of view.
Manual Camera Limit	The viewing area of the cameras can be manually limited on the left or right edge view. This is useful when for example an anchor pile projects into the cameras field of view.

6.1.1 Dialogue "Error / Start-Stop Button”

Here the settings for error handling, the treatment of the start/ stop button and the treatment of the reset inputs can be found.



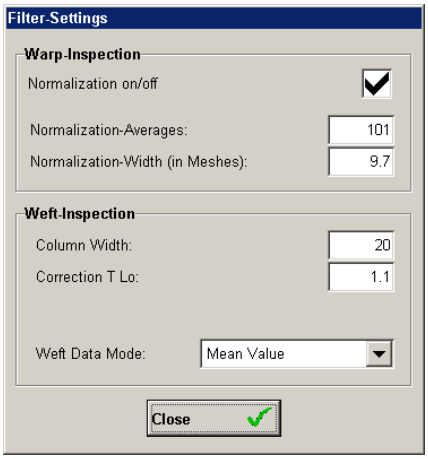
Value	Meaning
Switch off Machine on Error	If this option is active then the machine will be stopped as soon as the control unit 5300 detects a system fault but with no fabric fault.

Restart f the machine acknowledges error	Eventual detected System faults will be automatically confirmed when the machine is restarted. If this option is not active, then this can only be confirmed via the Report f Line (see 2.2 *The Report Line* from page 3)
Pressing Start key acknowledges error	When activated, with the help of this start key, which is to found on the front of the control unit 5300, one can confirm a System fault. It is however recommended to deactivate this option in connection with the use of the ProCamInspect software!
Pressing Start key while machine is running interrupts the surveillance	With this option it is possible to interrupt the fabric surveillance (warp/weft) whilst the machine is running, by use of the above mentioned Start key. It is however recommended to deactivate this option in connection with the use of the ProCamInspect software!
Pressing Start key while machine is stopped activates surveillance	With this option one can activate the fabric surveillance (warp/weft) even when the machine is stopped, like wise by using the Start key This option is carried out during the installation phase and can then be deactivated later on.
Use high-voltage reset as interrupt signal	If this option is enabled, the surveillance of the ProCAM system is interrupted as long as a signal is available at the high-voltage reset.
Use low-voltage reset as interrupt signal	If this option is enabled, the surveillance of the ProCAM system is interrupted as long as a signal is available at the low-voltage reset.

If the mounting position of the camera makes it possible that the monitored area is crossed by people, this can cause problems because the machine may be stopped due to wrong signal.
To prevent this, motion detectors can be installed and connected to one of the two reset ports. If a person crosses the monitored field, a signal is generated and the surveillance is interrupted for this time. "Use high-voltage reset as interrupt signal" or "Use low -voltage reset as interrupt signal" should be enabled.

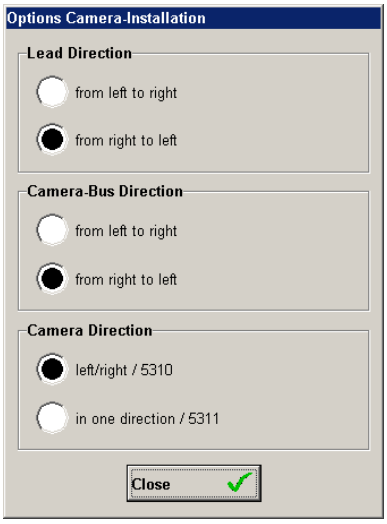
6.1.2 Dialogue "Filter Settings"

This dialogue contains specific settings for the normalization and the configuration of the weft insertion surveillance. These values are input by a Protechna technician during the system installation and should not be changed.
Normalization occurs before every start of the fabric surveillance. It compensates application related irregularities such as lighting differences or extreme interference. Therefore, the standardization function should always be enabled.



Value	Meaning
Normalization on/off	This option enables the normalization (teach-in) phase.
Normalization - Averages	Number of averages used for the normalization calculation.
Normalization - Width (in Needles)	Lower limit of the normalization filter. This value should be 3 - 4 times the minimum error width of warp 2 surveillance.
Column Width	Column Width of the weft insertion surveillance in pixels. The typical value is around 32.
Correction T Lo	Correction factor for the filter used for the weft insertion surveillance. The typical value is 1.1.
Weft Data Mode	Weft data mode used for the weft insertion surveillance.

6.1.3 Dialogue "Camera - Bus Direction"



The following information relates to the set-up and orientation of the camera system. It is important that all data is obtained from the same vantage point (in front of the machine or behind the machine).

- Lead direction

Defines the side of the first lead and thus defines the direction in which lead is counted.

- Camera bus direction

Defines the position of the first camera and therefore the direction in which the camera counts.

- Camera direction

Defines the camera model. The older version has a "right" and a "left" camera. The newer version only knows one direction.

6.2 Loading and storing of machine settings

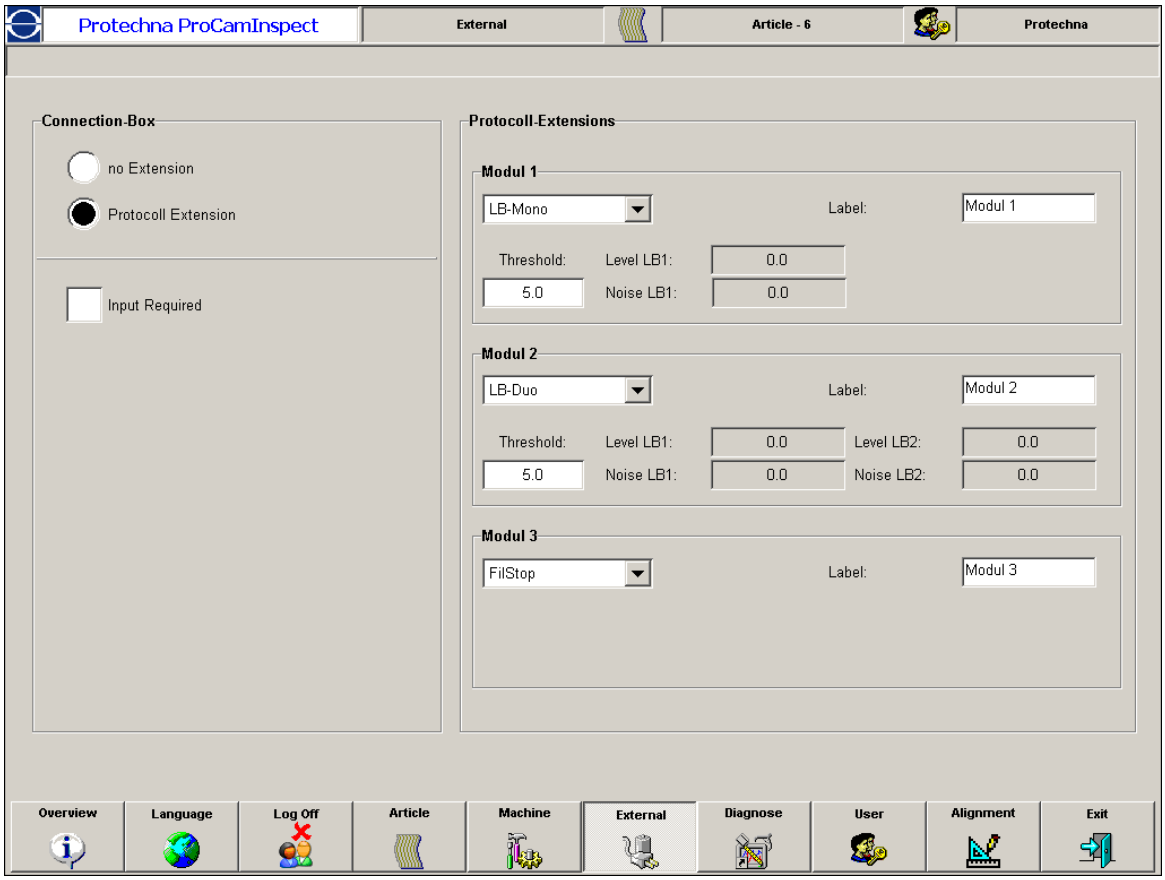
The storing and loading of Data sets is carried out in the same scheme as that with the Article Data (see 5.2 *Loading and storing of Articles* from page 16). There are shown again the two buttons "Data Load" and "Data Store" and the dialogue is pictured in the same manner.

6.3 Machine data back-up

The procedure of backing-up machine data records is the same as that of article data (see 5.3 *Article data backup* from page 17).
You have to connect a USB stick, press "Back-up" and then follow the same dialogue as for article data.

7 The Screen "External"

In addition to the internal surveillances, the ProCam control box can be extended by up to three



other extension modules each of which provides a monitoring function.
Either light barrier modules (with one channel (type mono); with two channels (type duo)) can be connected, or so called FilStop modules can be integrated, which monitor edge threads.
These modules can be enabled here and the light barrier modules configured.

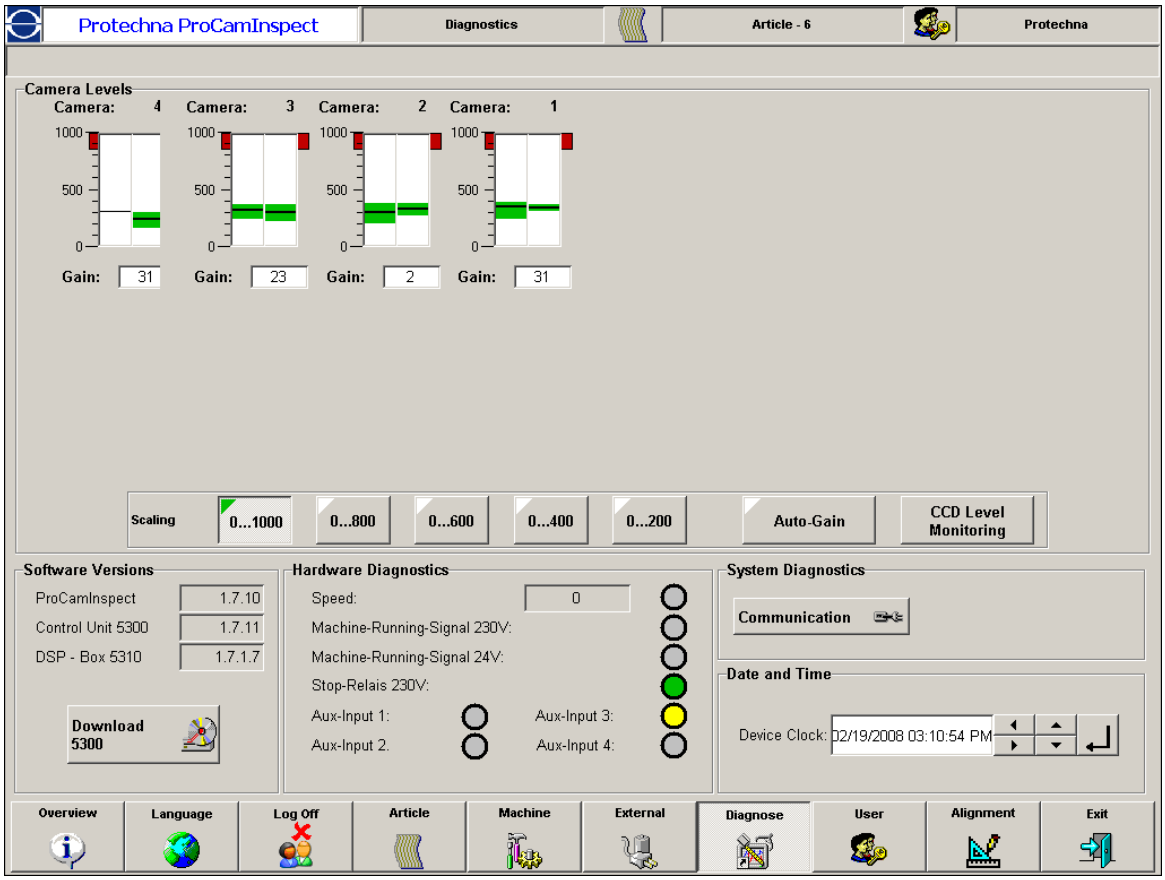
Value	Meaning
Module type	The installed module can be selected with the selection box or the respective mounting slot can be disabled (no module installed)
Threshold	In case of light barrier modules, the value "threshold" defines the level at which the light barrier trips.
Levels LS1…2	Displays the present signal level of the relevant light barrier channel (level LS1 in mono; level LS1+LS2 for duo)
Noise LS1…2	Displays the present noise level of the relevant light barrier channel (noise LS1 in mono; noise LS1+LS2 for duo)
Label	Label of the module.

Beside this, it is possible to equip the whole system with a so called protocol extension. This enables you to acknowledge and to correct machine stops as well as to input piece changes.
This stop data can be collected and stored within a database by using a special software and is then used to open evaluations for your past production.

In case the protocol extension is installed one can activate a lock that prevents the textile machine from starting up again without an acknowledgment of the current machine stop.

8 The Screen "Diagnosis"

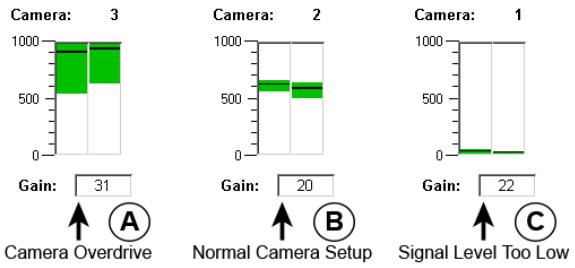
The diagnosis screen displays your System information (software versions, time, as well as other



diagnostic possibilities available for the ProCAM System. One of these is the brightness level of the individual cameras, also the switching condition of various external inputs in the control unit. Another is the communication statistics about the position of the serial communications between ProCamInspect and the control unit 5300.

8.1 The Camera level

In the section Camera level an information symbol is displayed for every connected camera. Here you will find displayed the input levels for the two camera halves. They should be in the range of 0 … 1000. The green coloured area is actual bandwidth between the smallest signal and the highest signal for the respective camera halves. The black area within the green band refers to the average signal value. In the above drawing are three possibilities detailed to show how a camera can be arranged.



A : This camera is overloaded, that means the camera is giving out too much light. If all cameras show this tendency, a shortening of the lighting period or a reduction of the lighting strength

(see 5.1 *Parameters of the Screen "Article"* from page 10) is called for. Such a case can happen for example when one changes from a very dark article to a very light article. If only one camera shows such problem, it could have been caused by a wrongly adjusted lens aperture.

B : This camera shows an orderly signal level and needs no attention.

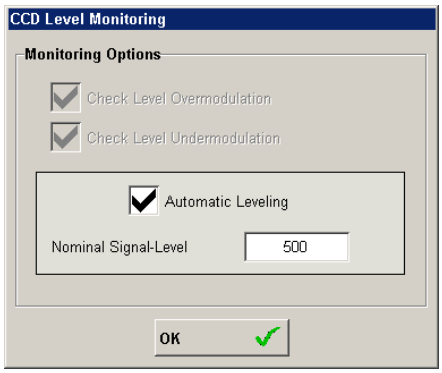
C : This camera is underpowered and tells you that it is not giving out enough light. If all cameras show this tendency, it could be caused by other reasons. Firstly it could be that the lighting strength is too low or it could be that the lighting time period has been set too short. If neither of these is the case, it could be have been caused by a lighting defect (this easily seen when not all but several adjacent cameras display this condition). If only one camera is affected, then once again it could be that the aperture is wrongly set or the camera itself is defective.

Wrong camera levels (too much/too few light) should be levelled out by adjusting the lighting strength. Only in case this is not enough, you should additionally adjust the exposure time too.
This is necessary to ensure as short as possible exposure times. Longer exposure times are mostly leading to a more worse signal quality.

As an overall view, the system must be tuned so that generally all camera levels are approximately set up to a similar standard. Should this not be the case, then the camera adjustment and the lighting should be checked. If these settings are in order, one can carry out an equalisation operation between the individual cameras using the "Gain" parameter. A higher "Gain-Factor results in a higher Signal level and vice-versa. By pressing the “Auto-Gain” button the system is performing an automatic levelling of the gain set up for all cameras.
Using the four buttons on the right near the camera symbols, one can alter the scaling of the level indicator. This is useful when the total level alone is not too high. Then by altering the scaling, a better fine adjustment of the camera level is achieved.

8.1.1 Dialogue "CCD Level Monitoring"

This dialogue controls the automatic monitoring of the camera CCD level and also enables the automatic mode which maintains the levels of all connected camera at a preset value.
This ensures that even if the finished fabric is different, the same signal level is always available and no changes have to be made to the exposure and illuminance settings (see 5.1 *Parameters of the Screen "Article"* from page 10).
Besides, other factors affecting the level of any of the cameras will be compensated automatically. As a rule, this adds

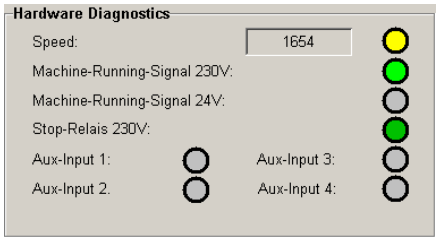


substantially more stability to the monitoring process by the ProCAM system and also reduces the frequency of necessary operator interventions.

Value	Meaning
Check level overmodulation	If this option is enabled, the camera level of each camera is monitored for overmodulation and a warning / alarm issued, if necessary. A camera over-modulates if the maximum level of a half camera is over 850.
Check level undermodulation	If this option is enabled, the camera level of each camera is monitored for undermodulation and a warning / alarm issued, if necessary. A camera undermodulates if the maximum level of a half camera is below 15.
Automatic levelling	This option enables automatic levelling. All camera levels are maintained constant at a preset value. If automatic levelling is enabled, the two level monitoring functions are enabled automatically and cannot be disabled.
Nominal signal level	If automatic levelling is enabled, all camera levels are automatically maintained at this value.

8.2 Hardware- Diagnosis

In this field all the switching states of the external inputs in the control unit 5300 are displayed.
They are the standard input for the impulse giver, the machine Running Signal, the stopping relay and the optional 4 external switching inputs.
The status of the respective inputs is shown by a coloured LED display. Here you can easily manage to filter out small installation faults like machine connections and impulse giver defects.



8.3 Other Diagnosis-/Information possibilities

Next to these two diagnosis methods is given further information possibilities relating to the system condition.

- Software versions

Here you can have a look at the individual software versions of the various system components. You should always do this before you call the Protechna-Service.
With this information we can then more easily comprehend what is not in order, in the case of a fault, with your ProCAM installation.

- Download 5300

This button switches the control unit 5300 into a special working mode, that enables you to download a new software into the control unit. After pressing the button the ProCamInspect software is being closed automatically. Then you can proceed with the download by using the 5300 download utility.

- System Diagnosis

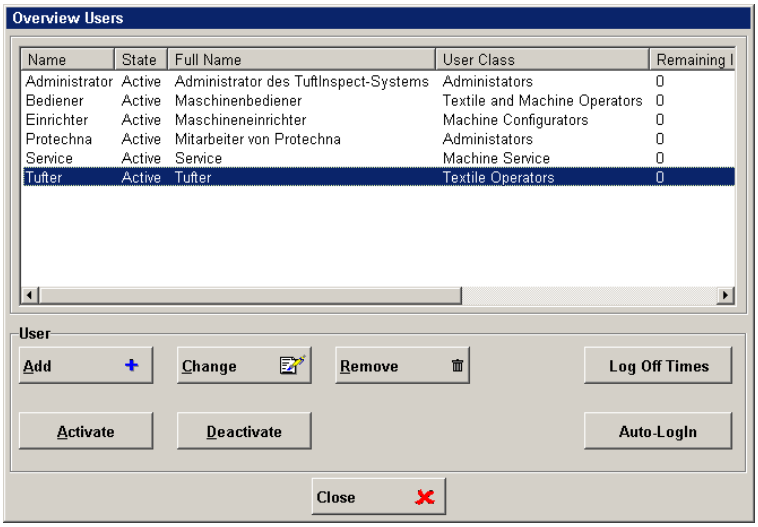
The button "Communication" opens a dialogue in which more information regarding communication between the ProCamInspect Software and the control unit can be displayed.

- Date/Time

In this part you can find an overview about the current state of the device clock and the current state of the pc clock. It is possible to adjust the device clock manually, or to transfer the current state of the pc clock into the control device.

9 The Dialogue "User"

Here you will find the user administration for the ProCamInspect software. You will see a list of all present users including their actual user status and user groups to which they respectively belong.
You can insert new users, change existing users respectively to activate or deactivate and also to completely remove a user from the system.
As standard there are 2 users preinstalled. Currently a user per user group and a user for Protechna service purposes. In the following table there are shown the 2 standard users including the pre-selected passwords. In operation it is recommended to change these passwords.



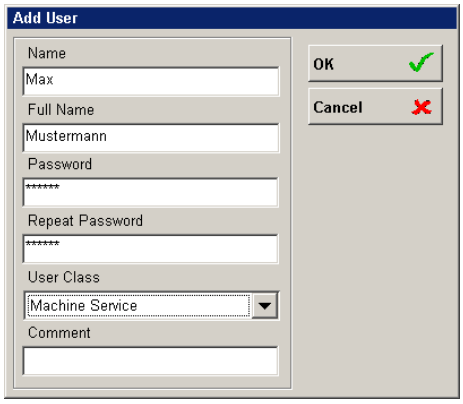
User	Password	User Group
Service	se	Service Personal
Administrator	admin	Administrator

9.1 User Groups

ProCamInspect works in a User Level manner. That means there are 2 User Groups in which their respective status rights are laid out. In the system the users concerned are then arranged in a user group where they will have also have respective rights for that user group. In the following table, all 2 user groups are laid out. You will see an overview as to which group can do what and at what time a user will be automatically cut off.

User Group	Cut Of Time (min)	Detailed Rights
Service Personal	30	• Complete access to the screen “Article” • Complete access to the screen "Machine" • Complete access to the screen "Diagnosis" • Complete access to the screen " History"
Administrator	10	• Complete operation of the ProCamInspect Software • Complete Access to the User Administration

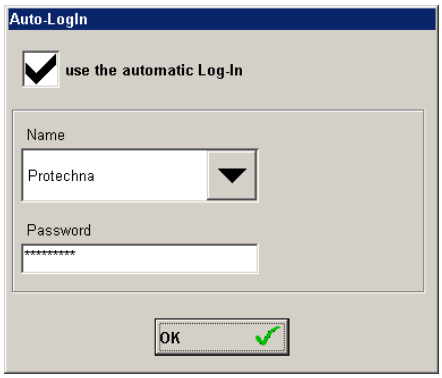
9.2 Dealing with Users



In order to add a new user, press on the bar "Add User". It opens the dialogue shown on the left. At this point enter the respective data. Important, is the name, a password and the section to which of the user groups the new user should belong to. Confirm the details with "OK". Now the new user will be shown in the list of present users and will have the status "Newly appointed". In order that the user can now proceed you must activate the User table again. To do this simply select the user name in the list and press the "Activate" bar. The user is now actively connected and is installed for use in the programme.
In order to alter an existing user, you should select the user name form the users list and press the button "Change". In the open dialogue you can change the password and respective user class. Always confirm again with "OK" and finally switch the user to active.
If you wish to completely remove a user from the system, select the user in the list and press the button "Remove". In order to temporarily deactivate a user do the same, though select the button "Deactivated".

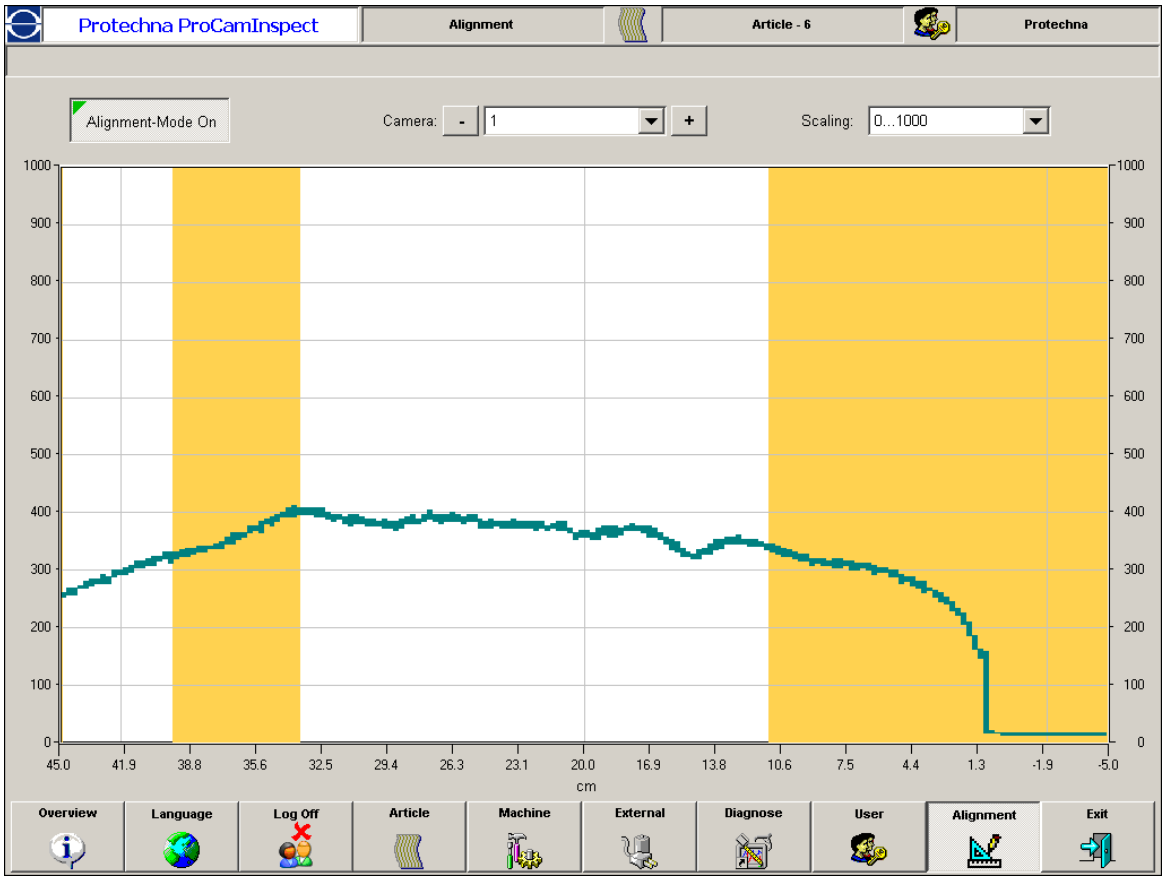
9.3 Dialog “Auto-LogIn”

The automatic log-in function is enabled in this dialogue window. When the ProCamInspect software boots, the respective user is logged in automatically with the specified password.



10 The Screen "Adjustment"

The direct signals which are recorded by the different cameras can be viewed in the "Signal" dia-



logue. This is a simple means of making sure that the camera positions are correct and whether there is any disturbing object in the camera view line which might obstruct the camera monitoring action.

Wrong camera positions can be corrected by means of the adjustment dialogue and a number of adjusting mechanisms at the machine. The signal display is updated constantly so that changes of the camera position are detected in the adjustment dialogue and corrective action can be taken.

The camera which you want to view can be selected in the top part of the window. The scale of the display can also be changed, which may be helpful if the signal level is low.

The main screen displays the camera signal (green line), the yellow fields contain hidden sectors and sector limits at the fringes of the camera.

A Error Codes and Troubleshooting

A.1 Error Codes

When the control unit detects an error in one of the subsystems of the ProCAM defect detection system, a corresponding error number will be displayed on the matrix display, the terminal 8024 and on a connected PC.

Error messages are divided up into errors and warnings. In case of a warning the matrix display shows “W“ and the error code. The lamp “Störung” or “Störung extern” shows yellow. The terminal 8024 and the connected PC will show the message marked as “warning”. Warnings do not prevent the system from detecting defects. If ProCAM should report a warning, this still means that something is wrong, and that the system or one of the subsystems does not work properly. One should always try to find the reason of any error message!

Errors prevent ProCAM from operating. In case of an error the matrix display shows “E“ and the error code. The lamp “Störung” or “Störung extern” shows red. The terminal 8024 and the connected PC will show the message marked as “error”. In the machine menu you can choose if the machine should be stopped in case of an error. In any case the inspection process of the camera but also of the modules and external inputs is stopped.

Errors as well as warnings can be of the type “internal” or “external”. “Internal” means that the reason for the error is somewhere inside of the control unit. “External” means, that the source of the error is a cable or a device that is connected to the control unit, like a DSP-box or a lighting module. The two lamps “Störung” (for internal errors and warnings) and “Störung extern” (for external errors and warnings) on the front panel of the control display the error type.

Error Codes	Description
101 **102** **103** **104**	**Software error**: Hardware watchdog (101) or software watchdog (102) period has expired; CPU load is too high (103) or inconsistent system state (104) (internal warning) The control unit was restarted automatically (reboot). If the error still recurs, please update the control unit firmware or replace the control unit.
200	**All configuration data of the PROCAM system are lost** (internal error). 1. This error may occur once when updating the control unit firmware. Therefore the settings should be stored before starting the download. 2. The battery may be discharged. You will have to check all settings in all menus before you can restart the inspection. Alternative you can load stored parameter files. If this error recurs more than once after changing the battery, replace the control unit.
201 **202** **203** **204** **206**	**I²C bus or device error** (internal warning or error) Internal functions of the control unit does not work properly. If this message occurs as warning, some display functions are affected but the inspection process is still working. If this message occurs as error, please replace the control unit.
205	**The device clock is defect** (internal warning). The inspection process is not affected, but you can not time the machine stops. The internal error buffer will contain wrong time stamps. Therefore the control unit should be replaced at next opportunity.

Table: A.1 - Error Code Description

300	**DSP-box(es) not recognized within the PROCAM system** (external error) 1. Please check the setting for the number of connected cameras. 2. Check the camera bus cable from the control unit up to the last DSP-box. 3. Check the power indicator LED of the termination connector at the last DSP-box. If it remains dark permanently (even when the error is acknowledged and the machine is restarting), replace control unit. 4. If the error persists, the control unit or one of the DSP-Boxes is defect and must be replaced. Replace the DSP-boxes successively or read out the error buffer (see chapter "The PC Interface") to find out the defect box.
3x0	**The firmware of the DSP-box is outdated** (external error), "x" stands for the number of the DSP-box which is meant (1..8). This error occurs only after replacing system components or a firmware update of the control unit. The PROCAM system cannot be used until a newer firmware version is loaded.
3x1	**CCD signal of camera CAM1 is low** (external warning, switched to external error after some minutes), "x" stands for the number of the DSP-box. 1. Check CCD signal level of all cameras first. In case only one camera is affected the most common reason is that the camera is extremely misadjusted. But first check the cable between the camera and the DSP-box 2. Check the lighting system if more than one cameras show low CCD level. 3. If the low CCD signal is caused by a very low relection rate (frontlighting) or the fabric is very densely (backlighting) and the inspection is still working, this self-test can be switched off.
3x2	**CCD signal of camera CAM2 is low** (external warning, switched to external error after some minutes), "x" stands for the number of the DSP-box. see error number 3x1
3x3	**CCD signal of camera CAM1 is overdriven** (external warning, switched to external error after some minutes), "x" stands for the number of the DSP-box Use an exposure time and a light intensity that does not overexpose the image sensor.
3x4	**CCD signal of camera CAM2 is overdriven** (external warning, switched to external error after some minutes), "x" stands for the number of the DSP-box see error number 3x4
3x5	**Warp inspection signal of camera CAM1 is low** (external warning, switched to external error after some minutes), "x" stands for the number of the DSP-box The warp inspection signal must not be below 20% of the fault threshold for each camera. 1. Raise the sensitivity for the warp inspection and/or check the defect detection at this camera. 2. If the warp inspection is still working, but the error message persists, switch off this self-test. 3. If there are false stops now, try to find out the reason for these stops (see chapter "Troubleshooting")
3x6	**Warp inspection signal of camera CAM2 is low** (external warning, switched to external error after some minutes), "x" stands for the number of the DSP-box see error number 3x5
3x7	**Weft inspection signal of camera CAM1 is low** (external warning, switched to external error after some minutes), "x" stands for the number of the DSP-box see error number 3x5, read weft inspection instead of warp inspection
3x8	**Weft inspection signal of camera CAM2 is low** (external warning, switched to external error after some minutes), "x" stands for the number of the DSP-box see error number 3x5, read weft inspection instead of warp inspection

Table: A.1 - Error Code Description

3x9	**DSP-box returns software error** (external error), “x” stands for the number of the DSP-box If the error persists, the box is defect and must be replaced.
400 **401** **402** **403** **404** **405** **407** **408** **409** **410** **411** **412** **413**	**Communication errors on camera bus** (external warning or error) Temporary failures will be handled as warnings. Even though these errors are not critical for inspection process, you should check the camera bus cable. There may be a loose contact or electromagnetic interferences from other machine parts. If the communication between control unit and DSP boxes is broken down, the inspection process cannot be continued and an error message is generated. 1. Check the camera bus cables. 2. Replace the DSP-boxes successively 3. If the problem persists, replace the control unit. For error codes 407 to 413 a more likely reason is a software error. Please check for new software versions on the Service-CD. Especially take care that you update the entire system including PC, control unit and DSP-boxes.
440	**Measurement time-out during normalization operation** (external error). 1. In case the camera exposure is synchronized with the machine rotation, check the RPM sensor. The PROCAM system should display the correct machine RPM 2. This error could point out a problem with the camera bus cable, see error code 400..405. 3. If the problem persists, replace the DSP-boxes successively and the control unit.
441	Hardware error in self-test of the camera’s “Detect” line. **The control unit does not receive the fault detect signal from the DSP boxes**. (external error) 1. This error points out a problem with the camera bus cable, especially if also error numbers occurred in the range 400..413. 2. If there are no other errors and the problem persists, replace the DSP-boxes successively. 3. If the problem persists, replace the control unit.
442	Hardware error in self-test of the camera’s “Detect” line. **The control unit receives a fault detect signal without any sender**. (external error) see error code 441
443	**Measurement time-out during inspection operation** (external error). see error code 440.
451	**The exposure time is too long** (internal error). This error message will occur only in **synchronous mode**. An exposure period must not exceed the time of a half machine rotation in that case.
452	A RPM Sensor is declared as installed but there are **no pulses from the RPM sensor** (external error). Please check mounting and wiring of the RPM sensor.
453	**The exposure time is too short for weft inspection** (internal error). The time of a machine rotation must not exceed about 40 to 60 exposure periods (depending on weft filter settings).
454	**The exposure time is too long for weft inspection** (internal error). An exposure period must not exceed the time of a machine rotation.
455	A Sensor measuring the position of a **sliding needle bar** is declared as installed. **The measure values received from this sensor are invalid** (external error). Please check mounting and wiring of this sensor.

Table: A.1 - Error Code Description

460	**Missing overlap between two cameras** (external error) 1. Check the installation of the cameras. The control areas of the cameras have to overlap. It is not allowed to have gaps in the system control area, even if you want to mark these gaps later as blind ranges. 2. Check if you typed in the correct values for the camera positions and the width of the camera control range.
461	**Not enough overlap between two cameras** (external error) see error code 460.
463	**More than one blind range per camera** (external warning) It is not allowed to set more than one blind range in the effective control area of one camera. The system is running but only the first (position with lower numbers) blind range has been set.
464	**The system control range has been set larger than the area from the first to the last camera control range** (external error) 1. Check if you typed in the correct values for system control range. 2. Check if you typed in the correct values for the camera positions and the width of the camera control range.
604	**Hardware error in self-test of the module's "Detect" line** (internal error). 1. Switch off the control unit and switch it on again after waiting a few seconds. Check if this restart removes the error. 2. Otherwise, one of the modules and/or the control unit is defect. Replace the control unit.
6x0	**Light barrier or filstop module not recognized within the system** (internal error or warning), "x" stands for the number of the module which is meant (1..3). 1. If you did remove a module from the control unit, you have to sign off the module. 2. Switch off the control unit and switch it on again after waiting a few seconds. Check if this restart removes the error. 3. Otherwise, the module is defect and has to be replaced. You can continue working with the other inspections by deactivating the module. In that case no error message will be generated but a warning with the same error code.
6x1	**Communication error in light barrier or filstop module** (internal error or warning), "x" stands for the number of the module which is meant (1..3). see error number 6x0
6x2	**Light barrier or filstop module reports measurement error or status error** (internal error), "x" stands for the number of the module which is meant (1..3). 1. Switch off the control unit and switch it on again after waiting a few seconds. Check if this restart removes the error. 2. Otherwise, the module is defect and has to be replaced. You can continue working with the other inspections by deactivating the module.
6x3	**Wrong configuration of light barrier or filstop modules** (internal error or warning), "x" stands for the number of the module which is meant (1..3). 1. Check if you typed in the correct type of module. 2. Otherwise, the module is defect and has to be replaced. You can continue working with the other inspections by deactivating the module. In that case no error message will be generated but a warning with the same error code.

Table: A.1 - Error Code Description

6x5	**Low receiver level at light barrier module** (external error), “x” stands for the number of the module which is meant (1..3). The receiver level is too low for proper work. 1. Check if the light barrier is blocked. 2. Check the mounting and wiring of the light barrier. 3. Replace the sender and/or receiver part of the light barrier.
700	**Battery voltage is low** (internal warning). Please replace the backup battery inside the control unit.

Table: A.1 - Error Code Description

A.2 Troubleshooting

The following table lists the most frequent problems and their solutions. If you should run into problems that are not listed here, please contact the author!

Problem	Solution
PROCAM displays error code on the matrix display and/or on the terminal 8024 and/or one of the error lamps on the front panel light up.	1. Look up the error code (see *table A.1 on page 33*), possibly read out the error buffer (connect your PC to the SERVICE port, start Hyperterminal and type in “be”) and act accordingly. By reading the error buffer, one can view the error numbers together with a lot of additional information. The error buffer should be read out when in doubt about the actual reason for the error.
PROCAM continually reports incorrect defects at the same position, seemingly without cause.	1. Check lighting and cameras for dirt, misalignment and defects. 2. Check line of sight of the cameras for obstructions and remove them. 3. Check for objects behind the fabric, especially if the fabric is see-through. 4. Check the control range and the blind ranges of PROCAM (possibly use “Justage” screen) and change them if necessary. 5. Check CCD signal level. The mean CCD signal levels of the cameras should be about equal. If this is not the case (i.e. more than about 30% deviation), the camera may be misaligned and has to be aligned again. 6. Change Camera
PROCAM continually reports incorrect warp defects at random positions, seemingly without cause.	1. Reduce the sensitivity. The average warp inspection signal should be between 40 and 70% of the defect threshold. Check the defect detection afterwards! 2. If the signal is oscillating raise the warp averages. Disadvantage: increased defect length. 3. If single signal peaks cause false stops, raise the defect counter. The defect length will be increased heavily. 4. Raise the min. defect width. The system could not detect very small defects after that. 5. Check the mounting of the lighting (position and stability).
PROCAM continually reports incorrect weft defects at random positions, seemingly without cause.	1. Reduce the sensitivity. The weft inspection signal should be between 40 and 70% of the defect threshold. Check the defect detection afterwards! 2. If single signal peaks cause false stops, raise the min. defect width. The system could not detect very short defects after that. 3. If the signal is oscillating raise the column width or the filter correction factor. 4. Check the mounting of the lighting (position and stability).
PROCAM shuts down the textile machine right after the start delay.	1. Increase the start delay, so that PROCAM sees only good fabric when the start delay is over. 2. Check the sensitivity. 3. Check the relay mode settings.
PROCAM reports a defect but does not shut down the textile machine.	1. Check for test mode. Test mode must be OFF: 2. Check the STOP fuse in the rear panel of the control unit. 3. Check the relay mode setting. 4. Check the relay contacts with an ohmmeter. 5. Check wiring between control unit and textile machine. 6. Check textile machine.

Table: A.2 - Frequently problems

The textile machine does not run, even when the control unit is off.	1. Check the relay mode setting. 2. Check STOP fuse in the rear panel of the control unit. 3. Check the relay contacts with an ohmmeter. 4. Check wiring between control unit and textile machine. 5. Check textile machine.
The textile machine shuts down when the control unit is switched off.	1. Check wiring between the control unit and the textile machine. 2. Check the textile machine 3. Replace the control unit.
Control unit is switched on, but mains indicator lamp (“Netz”) remains dark.	1. Check mains fuse in the rear panel of the control unit. 2. Check mains cable. 3. Replace control unit.
Control unit is switched on, but the power indicator LED of the termination connector at the last DSP-box remains dark:	1. Check if the number of cameras is correctly set (must be greater than 0). 2. Check the camera bus cable. 3. Replace the control unit.
Control unit is switched on, textile machine is running, but red 6 watt indicator lamp remains dark.	1. Check lamp cable and bulb. 2. Change bulb. 3. Replace whole indicator lamp unit. 4. Replace control unit.
Matrix display remains dark or displays diagonal lines only.	1. Switch off the control unit. Switch it on after about 5 sec. The matrix display should show “PROCAM” or “INACTIVE” now. 2. Check matrix display cable. 3. Replace matrix display unit. 4. Replace control unit.
PROCAM does not show the correct textile machine speed (RPM sensor is activated)	1. Check encoder. The green control LED of the encoder has to light permanently (power supply). The yellow LED has to light up exactly once per rotation. 2. If in doubt, check with oscilloscope. 3. Check encoder cable, replace cable. 4. Replace encoder.
PROCAM incorrectly reports defects at the margins of the fabric.	1. Check control range and blind ranges. Possibly reduce the controlled range. 2. Check for obstructions in the vicinity of the margins.
The lighting does not seem to work.	1. It is no fault that the lighting remains switched off while the camera inspection is deactivated (matrix display shows “INACTIVE”). 2. Check correct setting of the lighting intensity. 3. Check connectors and cables of the lighting modules and the lighting distribution box BLV 537. 4. Start textile machine, check the lamps at the front of the lighting distribution box BLV 537 (two lamps “U”/”I” for each lighting unit): Are all the “U” lamps dark, check the power supply of the lighting distribution box. If not all of the “U” lamps are lighting, replace the ligthing distribution box. 5. If all the “I” LED’s are dark, check cable between distribution box and control unit. Otherwise a lighting unit could be defect and to be replaced. 6. Check lighting fuse inside of the control unit (SI11, 6.3 AT) or replace control unit.

Table: A.2 - Frequently problems

The CCD levels seen suspect to me. (or: Error number 3x1 or 3x2 occurred.)	1. The average CCD levels of all cameras should show nearly equal values. If one camera's signal is too low, then this camera is probably misaligned. 2. If more than one camera shows not enough signal, lighting modules are probably misaligned 3. If more than one or all cameras are affected ,a lighting module ore the lighting distribution box could be damaged. 4. In case of a backlighting, the fabric transparency could much vary. The light intensity should be adapted to the fabric type (good values for the average CCD level are between 300..500).

Table: A.2 - Frequently problems

PROTECHNA ProCam/TuftCam - Camera System for Finished Fabric Control

E.C.- Conformity Declaration

We hereby declare:

Protechna Herbst GmbH & Co KG
Otto-Hahn Strasse 26
85521 Ottobrunn
Germany

That the product to the following description insofar as its original design and construction and also the model now despatched by us, corresponds to the relevant safety and health requirements laid down by the E.C. Directives.

Any alteration of the product carried out without permission nullifies this declaration.

Description of the product:	**Finished Fabric Control**
Type:	**ProCam/TuftCam**
Model - No.	**5310**

Relevant E.C. Directives:

E.C. - Directive relating to Electro-Magnetic Tolerance (89/336/EEC) followed by 93/31/EEC

E.C. - Low Voltage Directive (73/23/EEC)

Applied co-ordinating standards, in particular:

DIN EN 50 081 Part 2	Electromagnetic Tolerance (EMV) technical base standard interference emission
DIN EN 50 082 Part 2	Electromagnetic Tolerance (EMV) technical base standard inteference strength
DIN EN 60 204	Electrical equipment on industrial machines
DIN EN 61 010	Safety regulations for measuring, controlling, regulating and laboratory equipment

Applied national standards and technical specifications, in particular:

DIN VDE 0100

Signature of manufacturer:

Dr. Rainer Bongratz

Details of signatee: Development Manager

Date: 10.06.2003