



**Posco 500**  
**Sequencing, Control Monitoring and Positioning Unit**

6159326560	POSCO500 Desk
6159326570	POSCO500 Wall
6159326580	POSCO500 Desk+I/O Card
6159326590	POSCO500 Wall+I/O Card



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Document History				
Date	Revision	Work Done	by	Remarks
25.01.2006	1.0	Modification	al	supplement for firmware version V.3.1X
18.04.2006	1.1	Extension	al	Start-End sequence supplemented, Appendix - Parameter list
29.09.2006	1.2	Extension	al	Supplement for firmware Version V.3.60 , inverted lettering in displays restored
13.10.2006	1.3	Check	TE/al	Amendment review and release
21.12.2006	1.4	Check	al	English translation of diagrams, range of cycle select output now 8 bits, some new parameters added (Logic step, led display)
02.01.2007	1.4	Check	TE	font general, description Posco-principal

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## Posco 500

# 1. Terms

### Fastening

The process from the screwdriver start to the shut-off controlled by the screwdriver or Fastening electronics

### Job

List of fastening operations with or without predefined positions that are associated with a workpiece

### Cycle

Number of the Fastening program on the Fastening control unit to be used for a specific Fastening operation

### LED Backlight

The display backlight can be red, green, blue, or white.



Desoutter

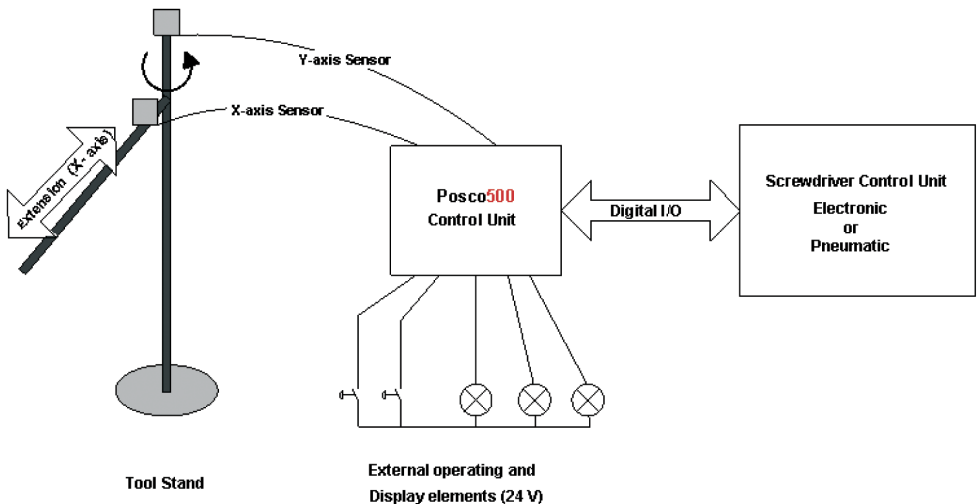


## 2. System Description

The Posco 500 is an electronic control unit for controlling and monitoring the process sequence and completeness of fastening operations on a workpiece. If the control unit works in conjunction with a tool stand, it is equipped with an angle and distance sensor and it is thus able to detect the position of the screw currently being handled.

The description below applies to this control unit, which is referred to as Posco 500 in the following. In addition to the distance and angle sensor interfaces, the Posco 500 provides further 24 volt digital input and output signals (that can be freely programmed with the Profi-Programming). These signals are used to enable and control workstations and the deployed tools are integrated into the process. Pneumatic screwdrivers can also be enabled and monitored with the "FAS" option in addition to the electrical tools.

Complete equipment: Posco with a connection to the screwdriver, external operating and display elements (24 V) and a tool stand with position control.



The Posco 500 thus assumes two different roles, depending on whether it controls an air or electric screwdriver.

With air screwdrivers, the Posco 500 undertakes the monitoring functions (optionally) known from the FAS system. In this case, the Posco 500 not only evaluates the OK/NOK for each individual Fastening, but also the total. This classification is based on the signal sequence at two digital inputs (dual sensor system) or one digital input (single sensor system). The air screwdriver functions are available as an option FAS/air for Posco 500 for software versions V.3.00 and higher. The FAS can be used with and without the tool stand - with and without position control.

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With electric screwdrivers, the Posco 500 primarily monitors the sequence of screws and their completeness including actuating the Fastening program, with and without position control. The OK/ NOK classification of the individuals fastenings is undertaken by the screwdriver control unit (e.g., CVC1 or ESP-7), which transmits these results via digital I/O signals to the Posco 500.

By utilizing digital 24V signals, the system can be easily linked to existing screwdriver control units. Due to its intuitive menu structure, it can be quickly and smoothly operated after a short learning period.

In teach mode, the unit is programmed with the desired position and process sequences. With the Posco 500, the complete sequence definition for a workpiece is called a job. The system only supports random process sequences by using tool stands without a positioning-device.

	Software V.2.xx	Software V.3.xx
Number of Possible Jobs	32	63
Number of Positions	320	600

The Posco 500 can store up to 63 jobs for software version V.3.00 and higher with a total of 600 sequence element memories for positions, logic positions and text messages available for these jobs. These sequence elements can be freely allocated to the 63 supported jobs. Thus it is possible to create, e.g. 60 jobs with 10 positions each or 20 jobs with 30 positions each, etc.

Apart from the Fastening positions, the Posco 500 can also assume additional functions. Additional input queries can be defined for specific positions in the basic design and external starting signals and output signals can be processed for clamping.

With the additionally available option of Profi-Programming, logic positions can be combined with input enquiries, process times and output signals with any position steps. Furthermore, freely programmable text messages can be built into the sequence.

These tools allow the implementation of complex Fastening processes and they normally make it unnecessary to use additional control unit hardware such as Memory-Programmable Controls (MPC).

In order to be able to realize as many applications as possible with the Posco 500, the assignment of the input/output resources is freely programmable.

The standard unit features 10 digital inputs and 6 digital outputs, which can be doubled with an optional module to a total of 20 digital inputs and 12 digital outputs.

In the Setup area, the user can assign these inputs/outputs to the various functions.

For example, up to 5 outputs can be assigned for selecting a screwdriver control unit cycle, whereas users who do not require cycle selection will not waste an output, since they simply forgo specifying a cycle selection output.

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## JOB STRUCTURE

In each case, the Fastening sequence processing in the Posco follows a defined scheme, with the user being able to utilize various options.

As a rule, the user has to specify the number and positions of a job; this is done in teach mode, which is automatically called up after a new job has been created.

After specifying the number and positions of the Fastening operations, the user can link various functions to the individual positions of a job. Thus, the enabling of a screwdriver for a specific position can be linked to additional queries of digital inputs, which facilitates, e.g., the polling of a sensor at position 3 if an additional part should be inserted there.

The system deploys absolute distance and angle sensors. In regards to their coordinates, these sensors are not calibrated to any specific external reference. With respect to this, every tool stand has its own coordinate system which usually does not correspond to that of another tool stand.

Therefore, the position data for a Fastening job solely apply to the system for which they were taught. Thus, when transferring job data between two systems or restoring saved job data, the position data for the jobs must usually be newly taught.

## PROPERTIES

In the following, the extension axis (linear sensor) is called the X-axis and the rotational axis (angle sensor) is called the Y-axis.

The position resolution of the Posco 500 is finer than 1 mm.

### X-axis Resolution (Linear Sensor)

The geometry of the D53 tool stand allows for a maximum extension of 600 mm and a minimum extension of 340 mm. The effective extension length is thus 260 mm.

This length is typically represented by 900 digits, which results in an X-axis resolution of 0.3 mm.

### Y-axis Resolution (Angle Sensor)

With the Y-axis, a digital angle sensor with a 13 bit resolution is deployed.

The D53 frame has a maximum tool radius of approx. 600 mm.

At 600mm max. Extension, the resulting circumference is  $2 * \pi * 600 \text{ mm} = 3768 \text{ mm}$ , which amounts to approx. 10.5 mm per degree.

At the given 13 bit resolution (corresponding to 0.044 degrees/digit) and maximum extension, the resulting resolution is thus  $10.5 \text{ mm} * 0.044 = 0.46 \text{ mm}$ .

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## USER INTERFACE

The unit is operated via the integrated graphical display and a tactile keyboard with short-stroke keys.

The display has a resolution of 128 x 64 pixels and supports different font and text sizes as well as graphics, therefore providing all requirements for the implementation of a simple user interface.

The user interaction is divided into three segments:

### Unit Parameterization

A parameter menu is available for setting specific system properties (e.g., type of connected tool, etc.); the unit is operated and navigated via the arrow, OK, VAL and ESC keys.

### Teach Mode

To specify a position sequence in teach mode, a position will be approached and acknowledged by pressing a key. In this operating mode, the current position number is displayed.

### Fastening Mode

In this operating mode, the job number and the number of the Fastening positions are displayed. The number display of the processed Fastening position has a dark background.

Moreover, OK/NOK and "In Position" are signalled in colour on the display. These signals are also available as digital outputs.



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## HOUSING DESIGN

The control unit is mounted in a plastic desk-type housing.

All connections are located on the back of the system. By deploying a 180 degrees rotatable front plate, the unit can be converted into a wall housing with the connections then located at the bottom of the desk. An appropriate wall mounting kit is available as an optional accessory.



## Dimensions:



Weight: 0.75 kg

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### 3. Operation

In normal operation mode, the system should control the processing of a workpiece processing the positions and monitoring the order of these positions.

The following section shows the process for a typical Fastening application. Please remember that other processes are possible depending upon the unit configuration.

#### OPERATIONAL STEP: JOB PROCESSING

After activation, the display shows the last selected job or, in the case of job selection via external signals, the job currently selected via the relevant inputs.

J01: JOB-01

1

2

3

4

5

6

7

8

Cycle: 1

START

MENU

Depending on the connected peripheral devices and the configuration, the system is started via the **Start** key (F1) or the external start signal.

J01: JOB-01

1

2

3

4

5

6

7

8

Cycle: 1

START

MENU

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After start-up, the unit detects the position and sets the screwdriver control outputs according to the cycle number specified for the current position.

J01: JOB-01

1

2

3

4

5

6

7

8

Cycle: 1

RESET

The LED backlight remains white or flashes green and white until the position is reached depending upon the results of the previous Fastening operation position.  
As soon as the position is reached, the LED backlight changes to blue and the output enabling the screwdriver is activated.

J01: JOB-01

1

2

3

4

5

6

7

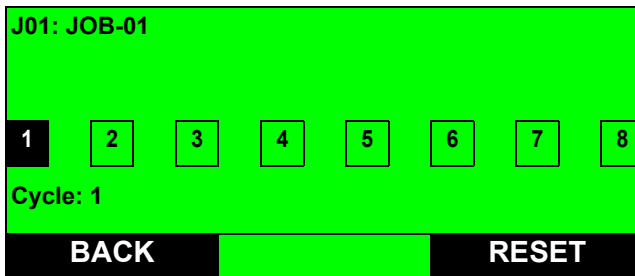
8

Cycle: 1

RESET

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If the screwdriver transmits an OK signal, the first position is flagged as processed (the corresponding box turns black) and the LED backlight changes to flashing green and white.



As soon as the next position is reached, the backlight reverts to blue.

The completed Fastening operation is flagged by an inversion of the box symbol.

As soon as at least one position has been completed, an additional **BACK** button is displayed, which enables the repetition of a Fastening operation even in the event of an OK result. This function can be activated via the "Allow back" setup parameter.

#### Note:

There is only a Reverse button on a unit with the Profi-Programming option where a Back function is available. The Back function is only available when the prior element of the process sequence is also a position element or a text message. The Back function is not available with a prior logic step. Processing can be cancelled with the Reset button or any external reset input assigned:

The following happens when processing is cancelled with the Reset button:

- The Really Cancel the Job? query appears if yes (OK button)
- Set All NOK output
- LED backlight changes to red
- Displays **START** again.

If the screwdriver transmits a NOK signal, the backlight changes to red and the tool is disabled. The further process now depends on the unit configuration. The "Acknowledge NOK" and "NOK" Max Counter" parameters play a role here.

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a. NOK acknowledgement not required:  
If NOK does not require an acknowledgement, the operator can immediately repeat the Fastening operation for this screw; however, the tool must first have left the position of the current screw before the same screw is released again for processing.

J01: JOB-01

NOK=> Repeat

1

2

3

4

5

6

7

8

Cycle: 1

RESET

If the "NOK Max Counter" parameter is set to a value unequal to 0, the operator can only start the number of repeated attempts deposited there. If this number is exceeded, a signal is issued and the cycle has to be reset.

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b. with NOK acknowledge:

**J01: JOB-01**

**NOK=> Acknowledge**

1

2

3

4

5

6

7

8

**Cycle: 1**

**RESET**

In this case, the worker has to press the NOK key on the device or, if accordingly configured, activate the external "Acknowledge NOK" input (e.g., with a key switch). The position is released for repeated processing after this acknowledgement has been signalled.

If NOK acknowledge is activated, the "NOK Max Counter" parameter is not evaluated.

In both cases, processing can be cancelled with the Reset button.

From software version V.3.40, the NOK Max Counter is in effect irrespective of the parameter Acknowledge NOK.

## MENU FUNCTIONS

Provided a job is not being processed, the "menu" key can be used to call up the job menu, from which additional submenus can be accessed. Pressing the **Menu** key displays the following selection menu in the bottom line:

New Job

J01: JOB-01

J02: Mirror Holder

J03: Module 5

J04: Module 18

**SELECT**
**EDIT**
**RESET**

- Jobs can be selected with the **Arrow Up / Down** keys.
- The **OK** or **SELECT** keys activate the job.
- The **New Job** option lets you select a new job.

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- **EDIT** lets you edit the job selected from the list for, e.g., re-teaching positions or entering additional position queries, etc.
- The **SETUP** key calls up the Setup menu
- **ESC** can be used to exit this routine without making a selection.

## New Job Menu Function

When the New Job function is called up, a password query appears. This password query can be activated or deactivated in the Setup-System Parameters area.

After creating a new job, the position teaching mask is immediately called up.

<b>J05: JOB-05</b>		<b>TEACH</b>
<div>1</div>		
<b>Cycle: 1</b>		
<b>POSITION</b>	<b>CYCLE</b>	

The **Position** key lets you adopt the position for this step.

If **Tool** or **Cycle** is available, **Cycle 1** or **Tool 1** are always suggested for the first position. This information can subsequently be changed for the position.

If the "Tool Number" and "Output Cycle Selection" setup parameters are accordingly set, the **Cycle** and **Tool** keys are also displayed.

**Cycle** lets you enter the cycle number that should be transmitted to the screwdriver control unit for this position.

**Tool** lets you specify the tool number that should apply to this position (later on during the Fastening operation, the corresponding tool is then enabled for this position).

The "Right Arrow" key takes you to the next position. **Cycle** and **Tool** are imported from the previous position.

**VAL** concludes the teach procedure.

A job taught in this Function can be processed by the **Edit Job** function, for instance linking additional I/O signals with individual positions or, in the case of the Profi-Programming option, additional logic positions and text messages can be inserted into the process sequence.

The "Left Arrow" key enables already taught positions to be deleted or corrected.

When using a bit tray, the bit currently removed will automatically be taken as the tool pre-selection for the taught position.

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## Edit Job Menu Function

The **EDIT** function lets you process an already existing job. The following functions can be executed with a job in this area:

J05: Mirror Holder			EDIT
1	2	3	
Cycle: 1			
POSITION		SEQUENCE	MORE

**TEACH** lets the positions be taught again. Only the same number of positions that were available before the job can be taught again.

**SEQUENCE** lets you set the position queries and position-specific output signals. Furthermore, the cycle values can be subsequently changed for the specific positions.

From firmware **Version V.3.60** and with the special functions activated, pressing the Sequence key first opens a further selection menu, in which you can select whether you would like to edit the Job sequence or the NOK-Exit sequence.

**MORE** opens another menu with the possibility of changing the job name or completely deleting a job.

## Additional Functions in Edit Job

### Edit Job Name

You can enter the job name with as many as 19 characters.

You can enter upper-case letters, lower-case letters, numbers and special characters.

The character areas can be switched over with the F1 key if the input window is active. The F2 key lets you enter a character and the F3 key deletes the character the Cursor is on.

### Copy Job

This function lets you copy a job. If the selected target job is not empty, there is a query whether you really want to delete this job. If the query is confirmed with the OK button, the target job is overwritten with the copy.

### Move Job

With this function, a job corresponding to the operation of the copy is moved with the exception of the fact that the original job is deleted.

### Delete Job

With delete job, a job is irrevocably deleted with all of its sequence elements. There is a safety query. If it is confirmed with the OK button, the job is deleted.



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## Sequence Submenu

In the sequence submenu, additional input enquiries can be defined for specific positions and additional positions can also be inserted.

If the Profi-Programming option is enabled, the logic position and text message elements are additionally available in this menu and they can be included in any process.

The sequence display always includes the Start query and Start outputs parameters.

After teaching a new job, the menu sequence continues to include one position input for each of the positions taught.

You can switch back the display between the expanded and compressed mode with the middle F2 function key (MORE/OVERVIEW). In the compressed mode, a line is issued per position or sequence element. In the expanded mode, all of the parameters of a sequence element are shown and that is parameter cycle and parameter query with one position.

When working with 2 tools or with a bit tray, the corresponding parameters will also be displayed.

This is what the sequence menu looks like with 3 positions in the compressed mode.

Start Qualifier	---
P1 Cycle	1
P2 Cycle	1
P3 Cycle	1
<b>INSERT      MORE      DELETE</b>	

This is what the sequence menu looks like with it 3 positions in the expanded mode.

Start Qualifier	---
Start outputs	---
P1 Cycle	1
P1 Qualifier	---
P2 Cycle	1
<b>INSERT      OVERVIEW      DELETE</b>	

You can include another element in the sequence with the Insert button. Additional positions can be inserted in the basic design and additional logic positions and text messages can be included if the Profi-Programming option is activated.

The selected sequence element (position, logic position or text) is always inserted after the element that is highlighted by the bar cursor.

Note: If additional options are installed (e.g. Profi-Programming) further parameters may appear for the relevant sequence elements.

### ***Start qualifier***

This lets you assign one or several input signals that have to be available at the start signal so that the start signal can be activated (Start Qualifier).

### ***Start outputs***

This lets you define output signal actuating after clamping.

## **Sequence Element Position**

A position element contains the parameters Cycle, Query and if applicable Tool (Tool number > 1) and tool pre-selection (when using a bit tray).

### ***Position - Cycle:***

Position cycle is the number of the Fastening program that is called up through the cycle selection outputs on the external screwdriver control unit. In the case of the FAS option, cycle gives the number of the FAS parameter set (1-4) that applies to this position.

### ***Position - Tool:***

If the system parameter Tool number is set to 2, Tool appears for every position of the parameter. This determines which of the available tools will be used at this position.

### ***Position - Qualifier:***

This parameter allows setting the conditions of any input signals that are supposed to apply as the additional condition for tool release in this position. That means that the presence of a Fastening component can be queried at a specific position.

### ***Position - Tool pre-selection:***

If using a bit tray, the parameter Tool pre-selection is given for every position.

### ***Position - LED display:***

If using a LED display module, the parameter LED display allows for input of the number of the LED, which should signal for this position.

## **Sequence Element Logic Step**

(only with Profi-Programming Option)

Process control can be implemented with one or more logic positions.

A logic position always includes the following parameters

### ***Logic step - Condition***

This determines whether the logic step will be carried out either always, only with an OK result or only with an NOK result. This parameter is only displayed when using a logic step element in the end sequence. Logic steps in the Start or Job sequence are always carried out. The functions Start or end sequence are available when the Profi-Programming option has been enabled.

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## ***Logic step - Inputs***

This parameter allows setting the conditions of any input signals. The logic position waits until the combination of inputs set here is available.

## ***Logic step - Input combination***

This parameter defines whether the inputs signals for this logic are "AND" or "OR" combined.

if "AND" is chosen, all input signals given, must be valid at the same time, to allow the logic step to proceed.

if "OR" is chosen, at least one of the given input signals must be in the defined state, to allow the logic step to proceed.

## ***Logic step - NOK rating***

The possible selection for this parameter is Yes or NO.

If "NO" is selected, this logic step can not cause a NOK, and the logic step will proceed as soon as the inputs signals will be valid.

If "YES" is selected, the input signals defined with Inputs and Input combination must become valid within a given time. This time is defined with the parameter time. If this time will elapse before the signals have the valid state, a NOK for the job will be generated.

## ***Logic step - Time***

The meaning of this parameter depends on the setting of the parameter NOK rating.

With "NOK rating" set to "No", the time entered here (resolution 100 ms) is started after the valid input combination of inputs set. After processing the time, the output conditions are set that are defined in the next parameter.

With "NOK rating" set to "Yes", the time entered here (resolution 100ms), defines the maximum time it may take for the inputs signals to become valid. If the inputs signals will not become valid within the time given, this logic step will generate a NOK result.

## ***Logic step - Outputs***

The output conditions defined in this parameter are issued to the outputs after the end of the process time. Outputs whose condition is set with P issue a pulse of a defined length. The pulse length can be set with the pulse length outputs parameter in the System Parameters menu.

It is always possible to only use specific parameters of a logic position and leave the other parameters unused. If you only need a short delay, the inputs and outputs are just left unassigned.

Of course, logic positions can be strung together to represent more complex functions.

## **Sequence Element Text Message**

(only with Profi-Programming Option)

The sequence element text message lets the operator issue signals in the process. There are two different output formats available, either as an information line as per the system signals such as the signal NOK repeat or as a signal window that presents the signal in larger letters to fill the entire screen. Then as many as 3 lines are available.

The text message has 3 other parameters along with the actual text that equip this sequence element with useful features:

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### ***Text message - Format***

The formats line, line + ACK or window can be selected.

#### **Line:**

This is issued in a line and the text stays until a system signal or another text message overwrites the text. An empty text message is defined for deleting.

#### **Line + ACK:**

This is issued in a line and sequence processing is interrupted until the operator confirms the signal with the OK button. When it is confirmed, the text disappears.

#### **Window:**

This is issued in a window that fills the screen and sequence processing is interrupted until the operator confirms the signal with the OK button. When it is confirmed, the signal window is closed again.

### ***Text message - Text Sound***

Here an acoustic signal can be defined with an adjustable length ranging from 0.1 to 99.9 seconds that is issued together with the signal.

### ***Text message - External acknowledge***

This parameter lets you define a digital input for the text formats with confirmation function that have to be used for the confirmation function instead of the OK button.

### **Sequence element signal check**

(only with Profi-Programming option)

From firmware version V.3.60, one of the two position signal interfaces can be used for the checking of an measurement value with the system parameter "Signal check" by means of the selection possibilities None, 0-10V or SSI.

If 0-10V or SSI is selected, the other remaining value will automatically be used for positioning if the position control is active. (=> 1 axis system)

If the parameter "Signal check" is set to "0-10V" or "SSI", the new sequence element "Signal check" will be available in the sequence editor.

This sequence element has the following parameters:

#### ***Signal check - Trigger [--, E1...E20]***

The signal check will be carried out as soon as the specified input conditions exist.

#### ***Signal check - Timeout [0...25.5 seconds]***

In case of a timeout, the check will always be carried out after the timeout, the timeout also applies in case of an allocated trigger input, in which case the timeout generates an NOK signal.

0 = Off

#### ***Signal check - Lower limit [0...1023]***

The signal check is passed if the analog input signal at the selected input (0.10V or SSI) has a value  $\geq$  the lower limit.



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## ***Signal check - Upper limit [0...1023]***

The signal check is passed if the analog input signal at the selected input (0.10V or SSI) has a value  $\leq$  the upper limit.

If both conditions are fulfilled for the duration of the specified check time, the signal check is OK and the step is left with an OK result.

If one of the two conditions is not fulfilled within the check time, the signal check is NOK and the step will be left with an NOK result.

## ***Signal check - Check time [0...25.5 seconds]***

This parameter defines the time for which the analog input value at the selected input (0.10V or SSI) must have a value between the lower and upper limit in order for the measurement to be evaluated as OK.

## **Processing of the sequence element signal check**

When the processing of the job sequence comes to this sequence element, the analog value is read in via the configured signal input.

If trigger input conditions have been defined, these must first be present (level evaluation, no flank triggering) in order to actuate the check.

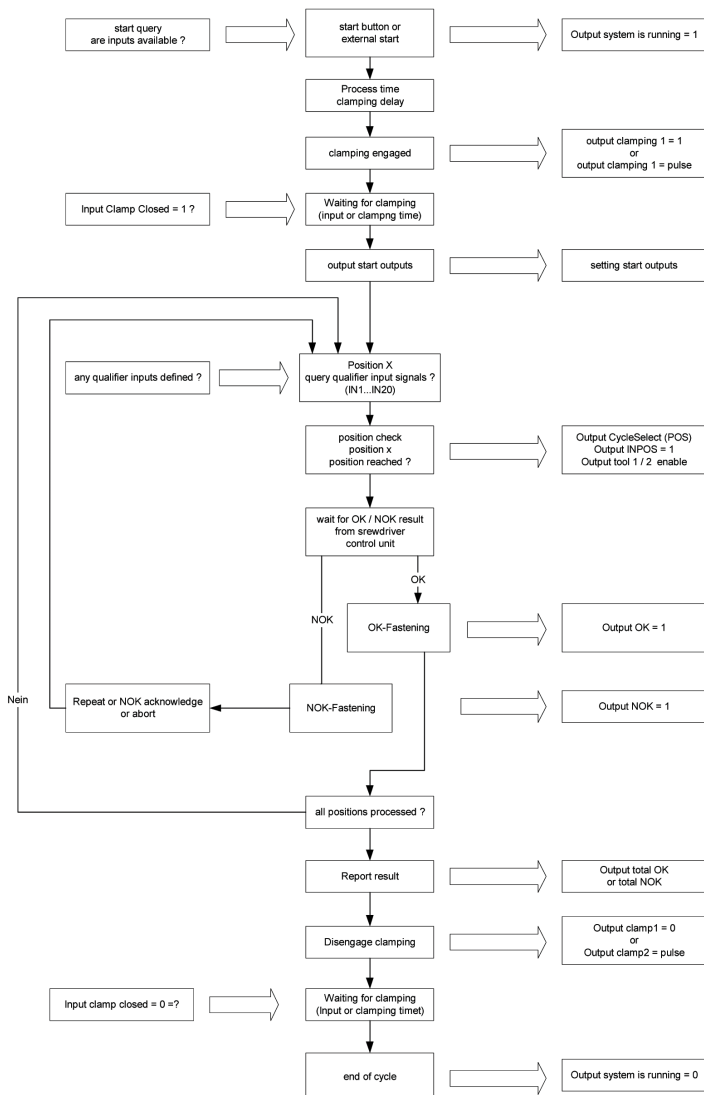
The analog check of the measurement value is shown in the display after the measurement has been started, and until the step is left with OK or NOK.

If the measurement value is not within the specified range (value  $\geq$  lower limit and value  $\leq$  upper limit), the sequence step will be left with an NOK.

The sequence element signal check can only be used in the start sequence or the job sequence, but not in the end sequence or the NOK-Exit sequence.

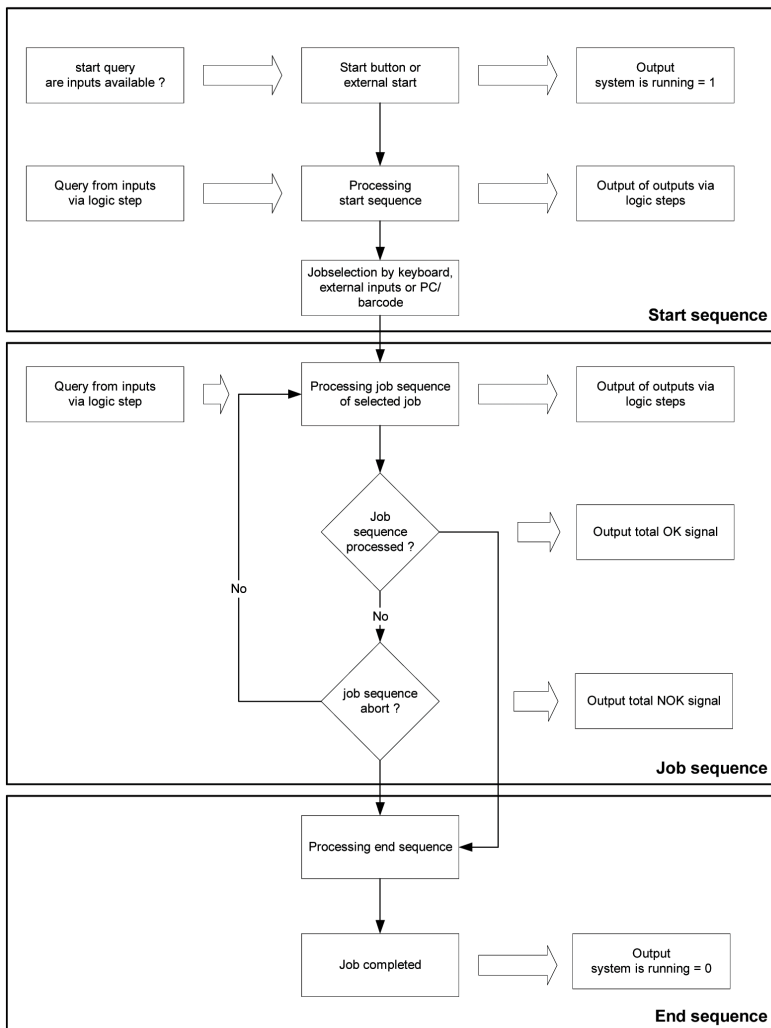
This sequence element is only visible with the Profi-Programming option active and with the system parameter Special functions = YES.

## Parameter evaluation in the job process (standard unit)



## Option Start and end sequence

The Profi-Programming option offers the facility of programming your own start or end sequence. The start sequence then replaces the clamping procedure programmed in the basic unit, and thereby enables complex clamping procedures to be carried out prior to the actual job selection. The connection between the start, job and end sequence is shown in the following diagram.



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The job selection is then carried out only at the end of the start sequence in accordance with the set method (System parameter Job selection).

After selecting the job, this is carried out in accordance with its programmed job sequence.

After complete processing of the job sequence, the end sequence is then called up again.

The end sequence is also carried out by the reset function when cancelling a job.

The Profi-Programming option activates the parameters Start/end sequence and Enter start sequence and Enter end sequence in the Process parameters setup menu.

If the options PC-coupling and Job selection PC/Barcode are activated, the Start/end sequence will be activated automatically, since these must always be carried out with the Start/end sequence.

When programming the Start and end sequence, the same sequence elements are available as for the Job sequence, although no positions can be defined for the Start and end sequence; this is only possible in the Job sequence.

At the end of the Start sequence, the Job selection is generally carried out in accordance with the set Job selection.

The entry of the start and end sequence is carried out in the Process setup menu.

#### ***Job selection - Keyboard:***

This selects the job which was pre-set at the time of starting via the keyboard.

Since in this case the job is already defined on starting, the job is shown in square brackets from the beginning of the start sequence.

<b>Start Sequence [J01]</b>		
Wait for Start signal		
<b>START</b>		<b>MENU</b>

#### ***Job selection - External inputs:***

In this case, the job is defined by external inputs. The conditions of the inputs are evaluated at the end of the start sequence, thereby selecting the job.

#### ***Job selection - PC/Barcode:***

In this case, the job is selected by communication with the PC or barcode scanner. The communication takes place at the end of the start sequence.

The job selection by barcode can also be used without the Start/end sequence.

## **NOK-EXIT SEQUENCE**

From firmware version 3.60, it is also possible to define in a job sequence a separate section for the NOK case. This so-called NOK-Exit sequence can be specifically defined for each job.



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The NOK-Exit sequence is carried out, if a job is ended by an NOK result (NOK of one position or NOK by sequence element logic step or signal check).

The NOK-Exit sequence is not carried out, if a job is cancelled by Reset (keyboard or external input). Logic steps can also be inserted into the NOK-Exit sequence as well as text messages.

The NOK-Exit sequence can be used for example to actuate the hardware for the marking of an NOK part.

The NOK-Exit sequence is carried out before the end sequence, if the end sequence is active, or otherwise before the Clamp-open routine.

## **SETUP Menu Function**

**SETUP** lets you enter system parameters:.

System parameter
Input configuration
Output configuration
Sequence
Position
<b>SETUP</b>

**Arrow Up/Down** lets you select the parameter group.

**OK** calls up the desired parameter menu.

**ESC** exits the selection menu.

## **Example of System Parameters**

Station Number	12
Tool Number	1
Position control	Yes
Special functions	Off
Job Selection	Keyboard
<b>SETUP</b>	

**Arrow Up/Down** lets you select the desired parameter.

**OK** opens the selected parameter

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**Arrow Up/Down** lets you change the opened parameter

**ESC** exits the parameter without changes

**OK** incorporates the changed parameter into the list.

**VAL** stores all changed values for the displayed parameter list in the EEPROM.

**ESC** cancels all changed values for the displayed parameter list.

The lowest inverted status line shows what parameter zone you are presently in.

The following section contains a description of the available parameters and their meanings.

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## 4. Setup Menu

The system parameters and a number of special functions can be accessed from the Setup menu. To facilitate navigation, the Setup menu is divided into the following subgroups:

- 1 System Parameters
- 2 Input Configuration
- 3 Output Configuration
- 4 Sequence
- 5 Position
- 6 FAS Parameter (only with the air tool / FAS Option)
- 7 Service

### SYSTEM PARAMETERS

Parameter Name	Description	Condition
Station number	Number of this Fastening station set by the user	
Tool type	Electric/Pneumatic Software versions V.2.40 and higher also support air tools.	Option FAS
Tool count	Specifies the number of tools mounted on the tool stand 1 or 2	
Position control	Selection between just counting (operating without a tool stand) (choice = No) and position check (operating with a tool stand) (choice = yes)	
Special functions	Off/On, controls the display of certain parameters for advanced programming.	
Signal check	Off / 0-10V /SSI This parameter enables one of the two inputs for the position sensors to be defined as the test input for an analog measurement signal. The corresponding input is however then no longer available for position control. See also Chapter 3, Section Sequence element signal check	
Use bit tray	No / Yes, activates the routines for control of the bit tray	
Use LED module	No / Yes, activates the routines for control of an optional LED module for display of the current screwing position	
Timed Outputs	This defines the length of the pulse for output signals in logic positions defined as a pulse.	Profi-Prog Option
FAS Adjust	This lets you adapt the signal check to the corresponding air tool. Also refer to FAS Functions Section	FAS Option
Number of FAS sensors	This lets you decide whether you want to work with 1-Sensor or 2-Sensor FAS. Also refer to FAS Functions Section	FAS Option

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Parameter Name	Description	Condition
Job selection	Selection between external inputs and the keyboard. With external inputs, the job is selected via the configured job select inputs.	
Beeper	The selection between none, with OK and with NOK lets you determine whether and at what result the built-in beeper should give an acoustic signal.	
RS-232 parameter	Calls up a submenu for entering the RS-232 parameters	
Display parameter	Calls up a submenu for entering display parameters	
<b>Password</b>	Never / Once / Always You can set this parameter that is used like the password query for the Setup Menu and Job Edit functions. <b>(NOK - Reset - VAL - INFO - ESC - MENU - OK)</b>	

#### Submenu: RS-232 parameter

Parameter Name	Description
C1: Baudrate	This sets the transmission speed for the serial interface
C1: Character delay	This lets you enter a waiting period when transmitting after each character (in ms)
C1: Line delay	This lets you enter a waiting period when transmitting after each line (in ms)
C2: Baudrate	This defines the transmission speed for the second serial interface (only valid for the Barcode option, with the PC-coupling option, the 2nd interface has a fixed setting of 3800 Baud)
C2: Data bits	7/8 data bits, enables the setting of the data byte length for the barcode reader interface
C2: Parity	None/even/odd, enables the definition of the parity method for the barcode reader interface

#### Submenu: Display Setup

Parameter Name	Description
Display contrast	This lets you adapt the display contrast to the surroundings
Screen saver [min]	Off, 1-15 minutes, This activates a switch-off for the LED backlight after a set time if there is no keyboard input or job processing.

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Parameter Name	Description
Red adjust	<p>The three correction parameters let you set the proportions of colour for the RGB backlight for white. If all three are set to off, all colours are switched on at maximum power.</p> <p>Stages 1-5 let you adapt the power to specific colours. 1 is the darkest level and 5 is the brightest.</p>
Green adjust	Refer to red correction
Blue adjust	Refer to red correction

## INPUT CONFIGURATION

Parameter Name	Description	Condition
OK Tool 1	OK message from Tool 1 control unit	tool type = electrical
NOK Tool 1	NOK message from Tool 1 control unit.	tool type = electrical
OK Tool 2	OK message from Tool 2 control unit.	tool number =2 tool type = electrical
NOK Tool 2	NOK message from Tool 2 control unit.	tool count =2 tool type = electrical
Signal clutch 1	Clutch sensor input with the air tool (Tool 1)	Option FAS tool type = air tool
Signal lever 1	Lever sensor input with the air tool (Tool 1)	Option FAS tool type = air tool FAS sensors = 2
Signal Clutch 2	Clutch sensor input with the air tool (Tool 2)	tool count =2 Option FAS tool type = air tool
Signal Lever 2	Lever sensor input with the air tool (Tool 2)	tool count =2 Option FAS tool type = air tool FAS sensors = 2
Clamp closed	Initiator for clamping engaged confirmation	
External Start	<p>External start input; if assigned, the corresponding keys are deactivated on the keyboard.</p> <p>The evaluation method of the External Start signal can be configured in the PROCESS menu.</p>	

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Parameter Name	Description	Condition
External Reset	External reset input; if assigned, the corresponding keys are deactivated on the keyboard. A high level signal at this input results in cancellation of a currently processed job.	
External Back	External input for the Repeat/Back function. If an external signal has been assigned, the corresponding button has been deactivated on the keyboard. A low-high transition on this input goes back one position in the job list.	
External NOK Acknowledge	External input for the NOK Acknowledge function. If this is assigned, the corresponding button has been deactivated on the keyboard	NOK acknowledge = yes
Loosening / rework	Calling up the Loosen mode (repair mode). When the Parameter Rework cycle is activated, this mode stays active to the next reset (keyboard or external reset depending upon the configuration). The input is only classified if no job is active.	
Force ext. Job selection	If a n input is assigned, this input will switch the job selection method used. If the assigned input is inactive, the job will be selected with the method given in the system parameter "job selection". If the assigned input will be active, the job selection will be done by external inputs, independent of the setting of system parameter job selection.	
Force PC Job selection	If the assigned input will be active, the job selection will be done by an host pc, independent of the setting of system parameter job selection.	Option pc-interface
Job select Bit 1	Bit 1 of a Job Select value (0-5 bits possible)	
Job select Bit 2	Bit 2 of a Job Select value (0-5 bits possible)	
Job select Bit 4	Bit 3 of a Job Select value (0-5 bits possible)	
Job select Bit 8	Bit 4 of a Job Select value (0-5 bits possible)	
Job select Bit 16	Bit 5 of a Job Select value (0-5 bits possible)	
Job select Bit 32	Bit 6 of a Job Select value (0-5 bits possible)	

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## OUTPUT CONFIGURATION

Parameter Name	Description	Condition
Output ready	Is set to 1 if the control unit can process a start signal.	
Output in job	Is set to 1 when a job is being processed.	
Out clamp 1	If an Output clamp 2 signal is not assigned, this output actuates a spring valve. If the clamping 2 output is assigned, clamping 1 is the pulse output for engage clamping.	
Out clamp 2	If this output is assigned, both the clamping 1 and clamping 2 outputs are used for actuating a pulse valve. In this case, clamping 1 is the Engage Clamping signal and clamping 2 is the Disengage Clamping signal. The pulse duration can be configured via the "Clamping Pulse Duration" item in the Process menu.	
Out Tool 1 enable	Enables the control unit for tool no. 1 as soon as the position is reached and, if applicable, defined additional query conditions are met.	
Out Tool 2 enable	Enables the control unit for tool no. 2 as soon as the position is reached and, if applicable, defined additional query conditions are met.	Tool Number = 2
Out in position	Switches to active as soon as a specified position has been reached.	
Out OK	OK signal for individual Fastening	
Out NOK	NOK signal for individual Fastening	
Out Complete OK	All OK signals for job, all positions successfully processed.	
Out Complete NOK	All NOK signals for job, job cancelled.	
Out cycle bit-1	Bit 1 of a Cycle select value (0-8 bits possible)	tool type = electrical
Out cycle bit-2	Bit 2 of a Cycle select value (0-8 bits possible)	tool type = electrical
Out cycle bit-3	Bit 3 of a Cycle select value (0-8 bits possible)	tool type = electrical
Out cycle bit-4	Bit 4 of a Cycle select value (0-8 bits possible)	tool type = electrical
Out cycle bit-8	Bit 4 of a Cycle select value (0-8 bits possible)	tool type = electrical
Parameter Name	Description	Condition
Out cycle bit-16	Bit 5 of a Cycle select value (0-8 bits possible)	tool type = electrical

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Parameter Name	Description	Condition
Out cycle bit-32	Bit 6 of a Cycle select value (0-8 bits possible)	tool type = electrical
Out cycle bit-64	Bit 7 of a Cycle select value (0-8 bits possible)	tool type = electrical
Out cycle bit-128	Bit 8 of a Cycle select value (0-7 bits possible)	tool type = electrical

## SEQUENCE

Parameter Name	Description	Condition
Start-/End sequence	Defines whether the system works with Start/end sequence or with standard clamping	Option Profi-Programming
Edit Start sequence	Sub-menu for definition of the start sequence, enables the implementation of complex clamping processes or other workpiece equipment	Option Profi-Programming Start/end sequence = Yes
Edit End sequence	Sub-menu for definition of the end sequence, enables the implementation of complex clamping processes or different workpiece handling depending on OK or NOK result	Option Profi-Programming Start/end sequence = Yes
Label	Enables Start/ changes Job, defines whether a new label must be read in for each start (enables Start) or not (changes Job)	Option Barcode
Start signal	Selection between <b>edge:</b> it is necessary to change from low to high condition for start <b>level:</b> it is necessary to change from low to high condition for start <b>continous:</b> Start requires a rising edge and the start signal has to be available over the entire operation (otherwise operation will be aborted)	
Debounce start	The meaning for start evaluation of flank/duration time in 0.1 seconds (that has to be the low signal to ensure that flank is accepted) The meaning for start evaluation of condition: forced interruption between the end of the last operation and the start of the new operation when the start signal is always high	



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Parameter Name	Description	Condition
start pause	Minimum duration of an interruption before a new job can be started by the input.	Start signal = continous
Backstep enable	Off/On:	
NOK acknowledge	Off/On:	
NOK limit count	Off, 1-99:	
NOK limit acknowledge	Off/On:	
Clamp delay	clamping is only activated 0-9.9 seconds after start	
Clamp time open	0-99.9 seconds	
Clamp time close	0-99.9 seconds	
Clamp pulse time	0-99.9 seconds	
Position timeout	Off, 1..99 seconds. if this parameter is not set to OFF, it will maximum time which may be spent in a position step.	
Missing pos.qualifier	This determines the system behaviour when a position query drops for more than 500 ms after being available once. <b>"Waiting"</b> The system waits until the signal comes again <b>"Cancel"</b> The system interrupts this cycle with NOK	
Rework cycles	<b>"Only loosen, 1...x"</b> This parameter sets whether only a loosen program or several Fastening programs can be selected in "Reworking" special operation. The value set equals the highest cycle number that can be selected via the keyboard in this operating mode. A 5 means those cycles 1-5 are available in reworking mode.	

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Parameter Name	Description	Condition
Loose cycle	1-31 (depending upon the number of the configured cycle selection outputs) This parameter sets what cycle number is selected for loosening in the reworking mode. This number may be in the range of the enabled reworking cycles (refer to the prior parameters) or outside of this range (Reworking Special Operation)	

## POSITION

Parameter Name	Description	Condition
Position field	0-9.9 mm: Specifies the size of the rectangular search field surrounding the target position.	
Position hysteresis	0-9.9 If a position was found, it is only considered lost if the position window * position hysteresis was exited. This parameter should always be set to a value larger than or equal to 1.0.	

## FAS PARAMETERS

This item on the menu does not exist without the air tool / FAS enable option.

Parameter Name	Description	Condition
FAS cycle 1 T0	Input of the FAS T0 time A Fastening operation is not evaluated with a run-down-time that is less than T0 (false start suppression) only when it is less than this time 2 times in a row, it reports NOK.	Option FAS
FAS cycle 1 T1	The Fastening operation time has to at least be as long as the T1 value to get OK.	
FAS cycle 1 T2	The Fastening operation time may only be as long as the T2 value to get OK.	
FAS cycle 1 T3	The T3 value determines how long the operator has to keep the lever pressed after the coupling is switched off to get an OK result.	Option FAS FAS sensors = 2
FAS cycle 2 T0	corresponding to the FAS cycle 1 T0	
FAS cycle 2 T1	corresponding to the FAS cycle 1 T1	

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Parameter Name	Description	Condition
FAS cycle 2 T2	corresponding to the FAS cycle 1 T2	
FAS cycle 2 T3	corresponding to the FAS cycle 1 T3	
FAS cycle 3 T0	corresponding to the FAS cycle 1 T0	
FAS cycle 3 T1	corresponding to the FAS cycle 1 T1	
FAS cycle 3 T2	corresponding to the FAS cycle 1 T2	
FAS cycle 3 T3	corresponding to the FAS cycle 1 T3	
FAS cycle 4 T0	corresponding to the FAS cycle 1 T0	
FAS cycle 4 T1	corresponding to the FAS cycle 1 T1	
FAS cycle 4 T2	corresponding to the FAS cycle 1 T2	
FAS cycle 4 T3	corresponding to the FAS cycle 1 T3	

The two FAS parameters of FAS Adjust and Number FAS Sensors are in the System parameter menu branch.

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### FAS Adjustment:

FAS Adjust lets you adjust the FAS function to the corresponding tool.

This should always be repeated when changing the air tool, sensors or air supply.

Please do the following:

FAS Adjust should first be set to 0 and NOK Fastening operations carried out without switching off the coupling.

For example, Start can be actuated by pressing and releasing the lever again before the T1 time is reached (minimum run-down-time). Increase the T1 value to a sufficiently high value to do this simply.

A number value is shown in square brackets with the appropriate NOK signal.

<b>J01: JOB-01</b>		
<b>Clutch too early — [65]</b>		
<b>NOK=&gt; Repeat</b>		
<b>Cycle: 1</b>		
		<b>RESET</b>

This number value should be on the same scale with several attempts.

You can accept this value in the parameter FAS Adjust. That means that the parameter FAS Adjust should be adjusted with the value 65 in the display example shown.

Afterwards, the T1 time should be reset to the desired value.

### SERVICE

Function	Description
User language	Enables the selection of the language for the operating dialog between English and German Only these two languages are supported at the moment, although others are possible.
System information	This gives the software version number, series number and version number of the I/O modules and the enabled options
Print out	This calls up the submenu with the printing functions
Test functions	This calls up the submenu with the test functions
Reset parameters + jobs	This resets all setup parameters to the factory settings and deletes all jobs

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Function	Description
Reset jobs only	This deletes all jobs, but the parameters are preserved
System Reset	This restarts the Posco-500 system (corresponding to the power-on cycle)
Licence keys	This calls up the input mask for enabling optional functions. Enabling codes can be ordered from CP-Desoutter giving the unit serial number
Firmware update	This prepares the unit for a firmware update as per RS-232 interface. <b>Important:</b> <b>This function deletes firmware in Posco-500.</b> <b>The Posco-500 cannot be operated anymore without the matching update file.</b>

#### Submenu: Print-Out

Function	Description
Print parameters	This gives a plain text list of all setup parameters on the RS-232 interface
Print jobs	This gives a plain text list of all jobs on the RS-232 interface
Print all	This gives all parameters and then all jobs on the RS-232 interface

#### Submenu: Test Functions

Function	Description
Test inputs	A function for testing the digital inputs and sensor inputs for distance and angle sensors
Test outputs	A function for testing the digital outputs
Test Posco	This calls up other test functions for the display and keyboard, etc.
Test I/O-Port 1	This lets you make the hardware test of the input/output module no.1 . A test plug is required for this test that you can purchase from CP-Desoutter as an accessory part.
Test I/O-Port 2	This lets you make the hardware test of the optional input/output module no.2. A test plug is required for this test that you can purchase from CP-Desoutter as an accessory part.

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### Submenu: Licence codes

Certain optional functions can be activated by entering a licence code.

This is done in this submenu.

After entering a valid licence code, the corresponding option is displayed in the menu of available options.

Any available option can be temporarily deactivated by putting the bar cursor on the appropriate option with the arrow up/arrow down keys and pressing the middle F2 function key (ON-OFF).

A [--] flag appears before a deactivated option.

Repeating the process reactivates the option.

An option is completely removed with delete and the enabling code has to be re-entered.

### Firmware Update

The unit can be equipped with new firmware via the RS-232 interface.

#### Important Note:

**The power may not be switched off during this process under any circumstances because the unit may become useless.**

Only trained personnel may update the firmware.

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## 5. Process Interface

The following digital I/O interfaces are provided for the purposes of linking the Posco 500 to the screwdriver control unit, signalling results and connecting additional control elements and initiators/actuators:

- 1 angle transmitter interface (SSI interface)
- 1 linear sensor interface (analog input 0-10 V)
- 10 digital inputs, opto-decoupled, 24 volt
- 6 digital outputs, opto-decoupled, 24 volt, positive switching, short-circuit proof, 0.7 A
- 1 RS-232 interface, galvanically separated, 9,600 Baud to 115 KBAud

### CONNECTIONS

RS-232:9-pin Sub-D Socket

Digital I/O:25-pin Sub-D Socket

Angle Sensor:7-pin Flange Socket (Binder, Series 680)

Linear Sensor:5-pin Flange Socket (Binder, Series 680)

Power Supply:2-pin Coax Socket

### CONNECTION FOR DISTANCE SENSORS (5-pin flange socket)

Pin	Signal	Cable Colour	Remarks
1	24 V supply	Brown	Sensor supply
2	GND 24V supply	Blue	GND 24 V supply
3	Analog Input	Green	
4	Analog GND	Grey	GND analog output
5	Not connected		

Place cable shield on flashplug housing.

### ANGLE TRANSMITTER CONNECTION (7-pin flange socket)

Pin	Signal	Cable Colour	Remarks
1	24 V Supply	Red	
2	Clock +	Brown	
3	Clock -	White	
4	Data -	Yellow	
5	Data +	Green	
6	Not connected		
7	24V GND	Blue	

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### CONNECTION RS-232 (9-pin sub-d socket)

Pin	Signal	Remarks
1	Not connected	
2	TxD	Data output 1
3	RxD	Data input 1
4	Not connected	
5	GND	Potential-free GND of RS-232 interface
6	Not connected	
7	HSI	Handshake input or Data output 2
8	HSO	Handshake output (constantly -12V) or Data output 2
9	Not connected	

### INPUT/OUTPUT CONNECTION (25-pin sub-d socket)

Pin	Signal	Remarks
1	GND 24 V	
2	OUT1	Output, positive switching 24V, max.0.7 A, short-circuit proof
3	OUT2	Output, positive switching 24V, max.0.7 A, short-circuit proof
4	OUT3	Output, positive switching 24V, max.0.7 A, short-circuit proof
5	IN2	Digital input 16-32 Volt
6	IN4	Digital input 16-32 Volt
7	GND 24V	
8	IN6	Digital input 16-32 Volt
9	IN9	Digital input 16-32 Volt
10	OUT4	Output, positive switching 24V, max.0.7 A, short-circuit proof
11	OUT5	Output, positive switching 24V, max.0.7 A, short-circuit proof
12	OUT6	Output, positive switching 24V, max.0.7 A, short-circuit proof
13	GND 24V	
14	+24 V	
15	GND 24V	
16	GND 24V	



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Pin	Signal	Remarks
17	IN1	Digital input 16-32 volt
18	IN3	Digital input 16-32 volt
19	IN5	Digital input 16-32 volt
20	IN7	Digital input 16-32 volt
21	IN8	Digital input 16-32 volt
22	IN10	Digital input 16-32 volt
23	GND 24V	
24	GND 24V	
25	Not connected	

In the Posco 500 control units, all I/O signals can be freely assigned in regards to their meaning. The optional second OK module is assigned identically. Input IN1 corresponds to the IN11 input with the second module, IN2 corresponds to IN12, OUT1 corresponds to OUT7 and OUT6 corresponds to OUT12, etc.

## POWER SUPPLY

The Posco 500 is supplied by an external 24-volt power supply unit.

A fitting power supply unit can be ordered as an accessory.

Alternatively, the unit can be supplied with 24 VDC from an external power signal via the I/O plug.

The power consumption is approximately 300 mA (24 volt) for the Posco 500 when sensors of the tool stand are connected.

## GROUND CONNECTION

There is a 6.3 mm flashplug on the unit connection side for the ground connection.

This connection has to be linked to the protective ground of the system installation for operating the Posco-500.

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## 6. Potential Options

The basic Posco 500 design is prepared for expanding via several options. The user has several hardware options available that can be retrofitted by installing additional modules.

In addition, there is the possibility of upgrading system functions with optional functions. The optional functions are activated by an enabling code for the specific unit.

### HARDWARE OPTIONS

Second I/O module with another 10 digital inputs and 6 digital outputs

- a. Second RS-232 interface (via adapter cable)
- b. MMC card slot

### OPTIONAL FUNCTIONS

- a. Option O0:Air-Tool / FAS Support
- b. Option O1:Profi-Programming
- c. Option O2:PC-coupling
- d. Option O3:Barcode
- e. Option O4:PC software

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## 7. Appendix: Parameter list

No.	System parameters	Range	Default value	Customer value
1	Station number	0 - 255	0	
2	Tool type	Electrical Pneumatic	Electrical	
3	Tool count	1..2	1	
4	Position control	No / Yes	No	
5	Signal Check	None/0..10V/ SSI	None	
6	Special functions	Off / On	Off	
7	Use bit tray	No / Yes	No	
8	Use LED module	No / Yes	No	
9	Timed outputs	0.0...9.9 sec.	0.1	
10	FAS adjustment	0-200 ms	0	
11	Number of FAS sensors	1...2	2	
12	Job selection	Keyboard ext. inputs PC/Barcode	Keyboard	
13	Beeper	Off / OK / NOK	NOK	
14	<b>Interface Setup</b>			
14.1	C1: Baud rate	4800-115200	19200	
14.2	C1: Character delay	0-20 ms	0	
14.3	C1: Character delay	0-99 ms	0	
14.4	C2: Baud rate	4800-115200	19200	
14.5	C2: Data bits	7/8	8	
14.6	C2: Parity	None/odd/even	None	
15	<b>Display Setup</b>			
15.1	Display contrast	30-63	40	
15.2	Screensaver [min]	Off, 1..15 min	Off	
15.3	Red adjust	Off, 1...5	Off	
15.4	Green adjust	Off, 1...5	Off	

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No.	System parameters	Range	Default value	Customer value
15.5	Blue adjust	Off, 1...5	Off	
16	Use password	Never Once Always	Never	
<b>Input configuration</b>				
1	Tool1 OK or Tool 1 clutch	---, E1...E20 <sup>(1)</sup>	E1	
2	Tool1 NOK or Tool 1 lever	---, E1...E20 <sup>(1)</sup>	E2	
3	Tool2 OK or Tool 2 clutch	---, E1...E20 <sup>(1)</sup>	---	
4	Tool2 NOK or Tool 2 lever	---, E1...E20 <sup>(1)</sup>	---	
5	Clamp closed	---, E1...E20 <sup>(1)</sup>	---	
6	External start	---, E1...E20 <sup>(1)</sup>	---	
7	External reset	---, E1...E20 <sup>(1)</sup>	---	
8	External back	---, E1...E20 <sup>(1)</sup>	---	
9	Acknowledge external NOK	---, E1...E20 <sup>(1)</sup>	---	
10	Loosening / rework	---, E1...E20 <sup>(1)</sup>	---	
11	Force ext. job selection	---, E1...E20 <sup>(1)</sup>	---	
12	Force PC job selection	---, E1...E20 <sup>(1)</sup>	---	
13	Job select Bit 1	---, E1...E20 <sup>(1)</sup>	---	
14	Job select Bit 2	---, E1...E20 <sup>(1)</sup>	---	
15	Job select Bit 4	---, E1...E20 <sup>(1)</sup>	---	
16	Job select Bit 8	---, E1...E20 <sup>(1)</sup>	---	
17	Job select Bit 16	---, E1...E20 <sup>(1)</sup>	---	
18	Job select Bit 32	---, E1...E20 <sup>(1)</sup>	---	
	<sup>(1)</sup> Input assignment up to E20 with available additional module, without additional module, the largest available input is input E10.			
<b>Output configuration</b>				
1	Output ready	---, A1...A12 <sup>(2)</sup>	---	
2	Output in job	---, A1...A12 <sup>(2)</sup>	---	
3	Output clamp 1	---, A1...A12 <sup>(2)</sup>	---	

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No.	System parameters	Range	Default value	Customer value
4	Output clamp 2	---, A1...A12 <sup>(2)</sup>	---	
5	Out tool 1 enable	---, A1...A12 <sup>(2)</sup>	A1	
6	Out tool 2 enable	---, A1...A12 <sup>(2)</sup>	---	
7	Out in position	---, A1...A12 <sup>(2)</sup>	---	
8	Out OK	---, A1...A12 <sup>(2)</sup>	---	
9	Out NOK	---, A1...A12 <sup>(2)</sup>	---	
10	Out complete OK	---, A1...A12 <sup>(2)</sup>	---	
11	Out complete NOK	---, A1...A12 <sup>(2)</sup>	---	
12	Out cycle bit 1	---, A1...A12 <sup>(2)</sup>	A3	
13	Out cycle bit 2	---, A1...A12 <sup>(2)</sup>	A4	
14	Out cycle bit 4	---, A1...A12 <sup>(2)</sup>	---	
15	Out cycle bit 8	---, A1...A12 <sup>(2)</sup>	---	
16	Out cycle bit 16	---, A1...A12 <sup>(2)</sup>	---	
17	Out cycle bit 32	---, A1...A12 <sup>(2)</sup>	---	
18	Out cycle bit 64	---, A1...A12 <sup>(2)</sup>	---	
19	Out cycle bit 128	---, A1...A12 <sup>(2)</sup>	---	
<sup>(2)</sup> Output assignment up to A12 with available additional module, without additional module, the largest available output is output A6.				
<b>Sequence parameters</b>				
1	Start-/end sequence	No / Yes	No	
2	Edit start sequence	Sub-menu		
3	Edit end sequence	Sub-menu		
4	Label	enables Start / changes Job	enables Start	
5	Start signal	Flank Duration Condition	Flank	
6	Debounce start	Off, 0.1...9.9 sec.	Off	

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No.	System parameters	Range	Default value	Customer value
7	Start pause	Off, 0.1...9.9 sec.	Off	
8	Backstep enable	Off / On	Off	
9	NOK Acknowledge	Off / On	Off	
10	NOK limit count	Off, 1...99	Off	
11	NOK limit acknowledge	Off / On	Off	
12	Clamp delay	0.0...25.5 sec.	0	
13	Clamp time open	0.0...99.9 sec.	0	
14	Clamp time close	0.0...99.9 sec.	0	
15	Clamp pulse time	0.0...99.9 sec.	0	
16	Position timeout	Off, 1...99 sec.	Off	
17	Missing pos. qualifier	Wait Cancel	Wait	
18	Rework cycles	Untighten only1...Max. cycles	Untighten only	
19	Loose cycle	1...Max. cycles	1	
<b>Position parameters</b>				
1	Position field	0.5...9.9 mm	2.0	
2	Position hysteresis	1.0...9.9	2.0	
<b>FAS parameters</b>				
1	FAS cycle 1 T0	0.0...0.40 sec.	0.1 sec.	
2	FAS cycle 1 T1	0.0...99.9 sec.	0.5 sec.	
3	FAS cycle 1 T2	0.0...99.9 sec.	2.0 sec.	
4	FAS cycle 1 T3	0.0...2.55 sec.	0.25 sec.	
5	FAS cycle 2 T0	0.0...0.40 sec.	0.1 sec.	
6	FAS cycle 2 T1	0.0...99.9 sec.	0.5 sec.	
7	FAS cycle 2 T2	0.0...99.9 sec.	2.0 sec.	
8	FAS cycle 2 T3	0.0...2.55 sec.	0.25 sec.	
9	FAS cycle 3 T0	0.0...0.40 sec.	0.1 sec.	

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No.	System parameters	Range	Default value	Customer value
11	FAS cycle 3 T2	0.0...99.9 sec.	2.0 sec.	
12	FAS cycle 3 T3	0.0...2.55 sec.	0.25 sec.	
13	FAS cycle 4 T0	0.0...0.40 sec.	0.1 sec.	
14	FAS cycle 4 T1	0.0...99.9 sec.	0.5 sec.	
15	FAS cycle 4 T2	0.0...99.9 sec.	2.0 sec.	
16	FAS cycle 4 T3	0.0...2.55 sec.	0.25 sec.	
<b>Service</b>				
1	User language	English, German *French*	Deutsch	
	in preparation*			

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## 8. Appendix: Barcode function

The barcode function extends the Posco-500 by the facility of collecting a barcode scanner to the second serial interface and carrying out the job selection by means of the read-in barcode.

### POSCO CABLING

A Y-branching cable is required for connection of the barcode scanner to the Posco, so that the two serial interfaces, which are connected together at the rear 9-pin Sub-D socket, can be used independently of each other.

Cable	Posco (male)	Serial 1 (female)	Serial 2 (female)
	2 (Txd0)	2	
	3 (Rxd0)	3	
	5 (GND)	5	5
	8 (Txd1)		2
	7 (Rxd1)		3

### SCANNER INTERFACE PARAMETERS

In order to be able to connect different scanners, additional parameters are shown in the system parameters for the setting of the second serial interface.

Baud rate	4800, 9600, 19200, 38400, 57600, 115200 Baud
Number of data bits	7/8
Parity	none, even, odd



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## SCANNER INTERFACE PROTOCOL

In order for the barcode function to be able to be adapted to the data format of different scanners, additional parameters are provided, which are used to define the data transmission procedure.

The connected barcode scanner sends the read-in label automatically to the Posco-500.

The actual label characters can be prefixed or suffixed by additional STX or ETX character sequences.

The STX character sequence can be from 0 to 4 characters in length, the individual characters being entered with their ASCII code.

The ETX character sequence can be from 0 to 4 characters in length, the individual characters being entered with their ASCII code.

With many scanners, the STX sequence is empty and the ETX sequence consists of a CR-LF (Carriage Return, Line Feed) sequence. The CR for example has the ASCII code 13 and the LF the ASCII code 10.

A control length can also be defined for the label.

This can be set to values between 1 and 32 or to variable.

In case of a variable control length, an ETX sequence must be defined, so that the end of the label data can be detected.

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## BARCODE DEFINITION PARAMETERS

The system must be told which labels initiate a particular job.

The entry of these numbers is carried out in the Parameter menu under the menu item Barcode entry.

When calling up this menu item, the following display appears:

Label data format		
New code definition		
C1: ##1234*	JO1	
C2: ##6754*	JO2	
SELECTION	SORT	DELETE

The first menu item "Label data format" is used to open a further entry menu, which enables the definition of the control length and the STX or ETX sequence.

If you select "New code definition", an entry menu is opened for the entry of the label parameters for a new label.

This is followed by listing of all already existing barcode definitions and the corresponding job selection. The display of the already existing codes takes place with the following characters

# is a wildcard for any individual character

\* is a wildcard for one or more individual characters, and can only be used at the beginning or end

The permissible characters in the comparison string are: A - Z, a - z, 0 - 9.

This menu also includes a code deletion function and switching of the sorting (sorting by codes or sorting by assigned jobs)

### Entering label data

The system can process labels containing up to 54 characters. From this total of 54 possible characters of a label, the user can define a contiguous range with a maximum length of 10 characters as relevant characters; these characters will then be saved as the comparison value for this label.

The start position of this comparison string can be defined by the user either in relation to the start or the end of the label data.

Start position:	1..53
counting from	Head / Tail
Code (10 characters)	1234567890
Job number	1..63

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## Parameter examples

(control length = variable)

Start position 1, counting from head

Code	123
Job number	10

With these parameters, all labels starting with the characters 123 would select Job 10.

Display in overview menu: Cx: 123\*

Start position 4, counting from head

Code	78
Job number	3

With these parameters, all labels with a 7 as the 4th character and an 8 as the 5th character would select Job 3.

Display in overview menu: Cx: ###78\*

Depending on whether the system is equipped with Start/end sequence processing, or uses this, the label must either be read in before the start (without Start sequence use), or it is read in at the end of the start sequence, and then selects the assigned job.

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By means of a parameter in the Process menu, it can be defined whether a new label must be read in for every start, or whether the previous job selection will continue to be used when starting without a new label.

Sequence parameter: Label	allows start / changes Job / starts job
---------------------------	---

A read-in label will be shown in the display of the Posco 500 if it cannot be processed.

The software is designed so that it can administer a total of 200 labels.

All label data can also be printed out by means of the parameter print function.