

## ***PRESS-RIGHT***

For electric cylinder

- User manual





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# 1 General informations

*Press-Right* is a control and measurement instrument which, when connected to a press, guarantees the quality control of the production processes.

Interfaced to a position transducer and a load cell, it continuously detects the position and the instantaneous force.

## 1.1 Introduction to control theory

During machining on sample pieces, the data relating to the position of the cylinder and the force exerted by it are recorded; the graph can be drawn: position-force which is characteristic of the work carried out.

If several machining operations are carried out on similar pieces, the respective position-force curves will also be similar. If, on the other hand, one of the workpieces differs from the sample, the relative curve will deviate from the sample curve. It is intuitive how curve control can ensure consistent machining quality.

## 1.2 Pressing cycle

Each pressing cycle can be divided into several moments:

1. Approach
2. Contact
3. Work
4. Pre-arrest
5. Wait
6. Return

### 1.2.1 Approach

During the approach, the cylinder advances up to the **END APPROACH POSITION**. The approach takes place with the **APPROACH SPEED**. During the approach the measured force must be less than the **COLLISION FORCE ALARM** value.

If rapid approach to the piece is not desired, the **END APPROACH POSITION** must be set to zero.

### 1.2.2 Contact

In machining operations where it is necessary to accurately measure the contact position with the workpiece or when the workpiece is fragile, it is possible to advance to contact slowly. To advance slowly it is sufficient to set the **CONTACT SPEED** other than zero.

If the **CONTACT SPEED** is not zero, once the approach is complete, the cylinder advances at the **CONTACT SPEED** until contact with the workpiece. Contact with the workpiece is detected when the measured force exceeds the **CONTACT DETECTION THRESHOLD**.

### 1.2.3 Work

The job can be done in two ways depending on whether or not pre-stop is used. The work without pre-stop is executed when **THE PRE-STOP POSITION** is equal to zero.

#### Work without pre-stop

During work without pre-stop, the cylinder advances at the **WORKING SPEED** until the stop value is reached. Once the stop value is reached, the cylinder is stopped.

#### Work with pre-stop

During work with pre-stop, the cylinder advances at the **WORKING SPEED** until it reaches the **PRE-STOP POSITION**. Once the **PRE-STOP POSITION** has been reached, the cylinder advances up to the stop value

by regulating the cylinder speed according to the distance from the stop value. The greater the distance from the stop value, the greater the movement speed. If the stop value is lower than the current value, the speed will be negative and the cylinder will move back to maintain the programmed stop value. The maximum speed during the pre-stop can be set with the **PRE-STOP SPEED** parameter.

### 1.2.4 Wait

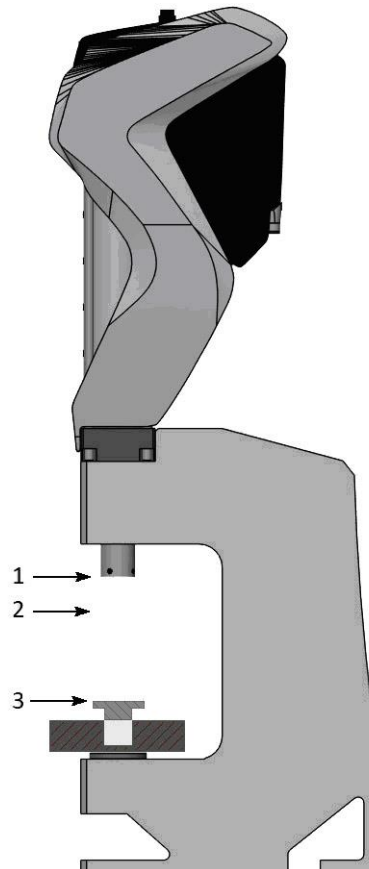
Once the stop value has been reached, a timer is started for the set time with **WAITING BEFORE RETURN**. Once the time has elapsed, the return of the cylinder is commanded. Except in special cases, the **WAITING BEFORE RETURN** time is normally set to zero.

### 1.2.5 Return

After the set wait, the cylinder returns to the **REST POSITION** at the **RETURN SPEED**.

## 1.3 Absolute and relative positions

The positions referred to the zero of the cylinder are called absolute positions. The positions referred to the contact position on the piece are called relative positions. The *Press-Right* can use both absolute and relative positions. The load cell is used to detect the *contact position*: when the force measured by the load cell exceeds a programmed value, the position values is set to zero. This force value is called **CONTACT DETECTION THRESHOLD**. The position in which the contact is detected (*contact position*) is recorded and can be controlled with two limits, minimum and maximum, to continue or not.



- 1) Absolute zero position
- 2) Rest position
- 3) Zero relative position

Figure 1

The accuracy of the *contact position* detected with the load cell depends on the speed of the cylinder and above all on the type of piece to be machined. In inserting operations, the two pieces have rounded corners, consequently the *contact position* also varies with the variation of the bevel and the force used to position one part into the other.

## 1.4 Control of the position-force curve

From a theoretical point of view there is an ideal curve which is obtained by machining perfect pieces (in practice there may be a sample curve obtained by machining carefully selected pieces). Any geometric tolerances or material differences lead to a deviation from this ideal curve.

In practice, the *Press-Right* controls the curve through a **tolerance range**, **check points** and **limits**.

The *tolerance range* positioned around the sample curve is such that if the curve obtained from the current machining does not pass within this range, the piece is rejected.

The *limits* control the position and the force values reached. The limits are as follows: minimum peak force, maximum peak force, minimum peak position and maximum peak position. If the position reached does not exceed the minimum peak position and/or exceeds the maximum peak position, the piece is rejected. In the same way, if the force reached does not exceed the minimum peak force and/or exceeds the maximum peak force, the piece is rejected.

The *check points* are used to control the curve in discrete points, for example it is possible to check that in a pre-established position the measured force is between a minimum and a maximum, or that at a pre-established force the measured position is between a minimum and a maximum. If the values measured in a check point are not correct, the piece is rejected.

## 1.5 Rejected piece

It is possible to define how the machine should behave in the event of rejected. The behavior can be set differently for each single type of rejected. For example, it is possible to set that, only when the curve comes out of the upper edge of the tolerance range, the press must stop immediately or it must block with a request for a password.

## 1.6 Traction cycle

The traction cycle is the same as the pressing cycle but with the movements reversed. In the traction cycle, the positions refer to a virtual zero position that can be positioned at will in a point of the cylinder stroke. For example, if the virtual zero position is set to 100 mm, further from the fully retracted cylinder position (mechanical zero) when programming a traction of 5 mm the cylinder will start from the mechanical position 100 mm and come back by 5 mm to the mechanical position of 95 mm. Once the traction is over, it will go back to the mechanical position of 100 mm.



## **2 Installation *Press-Right***

To install the instrument on the machine, consult the specific manual.

### 3 How to start

This chapter will walk you through the basics of programming and using the *Press-Right* instrument. To better illustrate the operations, it is advisable to carry out the tests in practice.

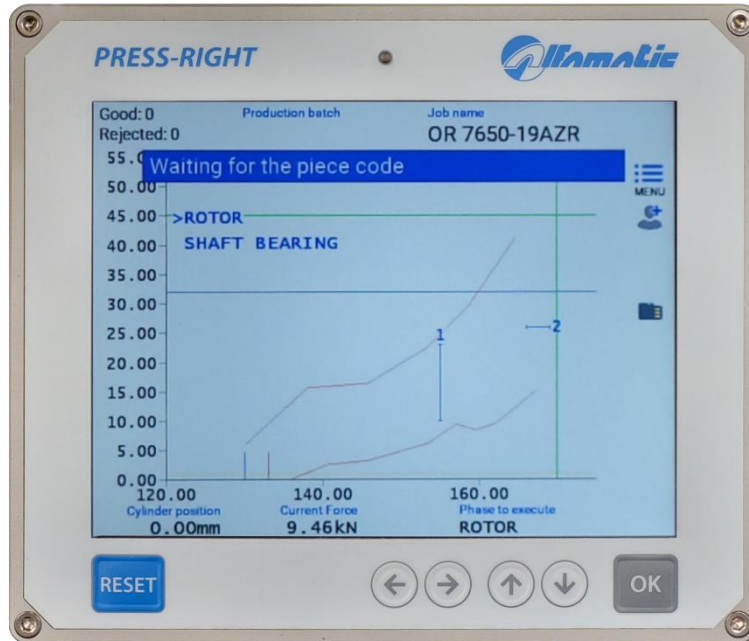


Figure2

To turn on the instrument there is a button on the back. When it is pressed, after a few seconds, the display lights up and the graph appears:

#### 3.1 *Press-Right* user interface

If you touch the menu button, the items that make up the main menu are displayed. To select an item in the menu it is possible to move with the arrow keys and press the OK button or it is possible to directly touch the item itself.

The reset button cancels the operations and allows you to return to the main screen.

#### 3.2 First approach

To become familiar with the press it is possible to perform a series of manual movements.

To do this, proceed as follows:

- Touch the menu button
- Touch the **TOOLS** item
- Touch the **MANUAL MOVING** item
- Touch the **ENABLE MANUAL MOVEMENT** item

The cylinder can be moved with the arrow keys

By pressing an arrow key once, the cylinder advances by one hundredth of a millimeter.

By keeping an arrow key pressed, the cylinder moves very slowly for one second, after this time, the speed increases.

#### 3.3 Create a job

The set of cylinder motion and curve control parameters will be called **job**.

To create a job:

- Touch the menu button
- Touch the **JOBS LIST** item
- Touch the **CREATE A NEW JOB** item
- Enter the name that identifies the job (example TEST 1) and press the enter key.

**Note: in the rest of this manual, when it is indicated, for example, “JOBS LIST > CREATE A NEW JOB” command, we mean to press the menu button, then press the **JOBS LIST** item and finally press the **CREATE A NEW JOB** item.**

### 3.4 Set the movement

Once the job has been created, it is necessary to define how the cylinder must move.

The motion profile parameters are found in **EDIT JOB > MOVEMENT MANAGEMENT**.

Before proceeding, check that there is at least 50mm of free cylinder stroke.

Enter the following values:

Final position = 50 mm

End approach position = 40 mm

By pressing the start command of the machine, if the cylinder is further forward than the rest position, the cylinder will return to the rest position, on the contrary, if it is already in the rest position or further back, the complete programmed cycle will be carried out. Therefore, it will advance up to the position of 40 mm at the approaching speed, from the position of 40 mm to the position 50 mm will advance with work speed. Once the final position of has been reached (50 mm) the return to the rest position will be started with a return speed.

### 3.5 Set the view

The central part of the display is occupied by the position-force graph. It is possible to modify the full-scale values using the commands in the **EDIT JOB > GRAPH SETUP**.

### 3.6 The main menu

**Note:** Some menu items are not visible if not needed.

The main menu is the first displayed by pressing the menu key.

**JOBS LIST** allows the choice of the job to be used, the creation of a new job or the elimination of the job in use.

The **PHASE EDIT** is visible when the job is divided into several phases. It allows the modification of all the parameters of the displayed phase.

The **EDIT JOB** allows you to modify all the parameters of the job in use. See chapter **Errore. L'origine riferimento non è stata trovata.** When the job is divided into several phases, the modification of the parameters of the single phase will be possible from the *PHASE EDIT* menu while the options common to all phases will be present in the *JOB PROPERTIES* menu.

The **SHOW MEASURED VALUES** displays the values measured during the last cycle.

The **TOOLS** allows the modification of the instrument configuration and the possibility of moving the cylinder manually.

The item **RESET COUNTERS** is used to reset the counters of processed pieces. When the batch number is managed, this menu will be replaced by the **NEW PRODUCTION BATCH** menu which allows the batch number to be entered. This number will be stored together with the curve.

The **PART NUMBER** item allows the insertion of the identification number of the piece being processed. This identifier will be stored together with the curve.

The **USER** item allows the operator's identification to be entered. This identifier will be stored together with the curve.

The **PHASE TO EXECUTE** item allows you to select the next phase to be executed by modifying the normal execution sequence. When a phase runs out of sequence, immediate stops on reject are disabled. This command is available only if the phase sequence is adjusted by the instrument.

## 4 Jobs

The *Press-Right* memorizes all the settings (parameters, tolerance range, limits and counters) relating to the various jobs in an internal memory. Each group of settings is called *Job*. Each job has its own name.

**JOBS LIST** item is present in the main menu. Through this menu it is possible to choose a job among those present, create a new one, or delete the job in use.

### 4.1 Create a new job

To create a new *job*, use the **JOBS LIST > CREATE A NEW JOB** and give it a name. As a name you can use the drawing number, the customer's name or whatever you prefer to be able to easily identify it.

When creating a new job, you are asked if you want to make a copy of the job currently in use. If you choose to copy the current job, the parameters of the current job will be duplicated and will remain unchanged. In the other case the new one will be empty.

After having created the job, you can set the parameters, options and tolerance range.

### 4.2 Change the job name

To change the name of a job, you must first select it. Once you have selected the job to which you want to change the name, you can use the command **EDIT JOB > PROPERTIES AND OPTIONS > NAME OF THE JOB**.

### 4.3 Selecting a job

To select the job to use, choose the **JOB LIST > CHANGE JOB** command. When you select this command, a list of the existing jobs is displayed. Next to the name of each job, the date and time of the last modification are shown.

If the list is very long, look for the name by touching the magnifying glass icon.

To prevent manual selection of a job, the selection of jobs can be locked with a password. To activate the password, activate the **Job selection** option in the **TOOLS > PASSWORD > FUNCTIONS WITH PASSWORD**.

### 4.4 Moving a Job in the Job List

To move a job in the job list, select the **JOB LIST > MOVE JOB** command. After selecting the command, the job list will be displayed. Choose the job to move and specify its new position.

### 4.5 Selection of a job by barcode

If a barcode scanner is connected, it is possible to select the job automatically by simply reading the barcode. To activate this function, activate the **Jobs with identification codes** option in the **TOOLS > SETUP > JOB SELECTION**.

After activating the **Jobs with identification codes** option, the relative identification codes must be assigned to the jobs. To assign the codes to the job see chapter 4.9.

### 4.6 Job selection by inputs

With selection by inputs, the instrument changes the job when the state of the digital inputs changes.

The job number is derived from the binary combination of the inputs.

To activate job selection, you must define the inputs you want to use for selection as **JOB SELECTOR** inputs.

You must also activate the option **Selectable jobs with numerical index** found in the **TOOLS > SETUP > OPERATION SELECTION** menu. After activating the option, you have to assign the jobs their identification number via the **EDIT JOB > PROPERTIES AND OPTIONS > CODES OF THE JOB** menu.

## 4.7 Selecting a job via tool recognition

It is possible to connect sensors and RFID antenna to the instrument to automatically recognize the tool used. It is possible to recognize up to three parts, for example the punch, the placement, and a simple mechanical selector. These signals can be used to automatically select the job to be used or to enable machine operation. To activate the recognition of the tools, the relative options must be configured in the **TOOLS > SETUP > ELECTRICAL CONNECTIONS > TOOLS**.

After having configured the recognition of the tools, it is necessary to activate the automatic selection in **TOOLS > SETUP > JOB SELECTION**. Finally, the relative tool code must be assigned to the jobs in **EDIT JOB > PROPERTIES AND OPTIONS > ACCESSORIES**.

## 4.8 Selection of a job via fieldbus

It is possible to select the job to be used via the fieldbus in three different ways: via the job name, via the identification code or via an index number.

### 4.8.1 Selection from fieldbus by name

To select a job, first write the code of the desired job in the string buffer at the address 45, then write command 3 in the **CONTROL\_WORD\_OUTPLC**.

### 4.8.2 Selection from fieldbus via the identification code

To activate this function, activate the **Jobs with identification codes** option in the **TOOLS > SETUP > JOB SELECTION**.

After activating the **Jobs with identification codes** option, the relative identification codes must be assigned to the jobs. To assign the codes to the job see chapter 4.9.

To select a job, first write the code of the desired job in the string buffer at the address 45, then write command 2 in the **CONTROL\_WORD\_OUTPLC**.

### 4.8.3 Selection from fieldbus by index number

To activate this function, activate the **Jobs selectable by index** option in the **TOOLS > SETUP > JOB SELECTION**.

After activating the **Jobs selectable by index** option, the relative index number must be assigned to the jobs in **EDIT JOB > PROPERTIES AND OPTIONS** menu.

To select a job, write the index number of the desired job in register 90.

## 4.9 Modify job identification codes

To assign the codes to the job, first select the job and then go to the **EDIT JOB > PROPERTIES AND OPTIONS** menu. Depending on the configuration, it will be possible to enter the identification codes and the identification number of the equipment. Up to seven codes can be assigned to each individual job.

*Notes:*

When the code entry window is displayed, you can use the barcode reader to automatically enter the job identification code.

If an @ is inserted in the code, this character will be ignored in comparison with the read code.

## 4.10 Copy a job

To copy a job, first select the job you want to copy using the command **JOB LIST > SELECT JOB**. Once the job is selected, you can create a copy by using the command **JOB LIST > COPY JOB**. After choosing this command, you will be prompted to enter the name of the copied job.

## 4.11 Delete a job

To definitively eliminate a job from the instrument's memory, select the **JOBS LIST > DELETE JOB** command.

## 4.12 Edit a job

The **EDIT JOB** menu allows the modification of all the parameters that make up the job. If the job has several phases, in this menu it will be possible to modify the parameters common to all the phases while the modification of the parameters of each single phase will be possible from the **MODIFY PHASE** menu.

**Note:** In general, in jobs, **the parameters set equal to zero will be ignored by the instrument.**

## 4.13 Job counters

Each job has a piece counter. To access the counter options, select the menu **EDIT JOB > SCHEDULING**. In this menu it is possible to reset the piece counter or choose a maximum number of pieces to block the instrument.

## 4.14 The graph

The submenu **GRAPH SETUP** allows you to modify the values of the graph axes to enlarge and show the interesting part of the position-force curve.

### Auto range

This function adapts the scale of the graph to display the curve of the last machining performed.

### Graph origin

It is the **origin** value of the horizontal axis of the dimensions, this parameter allows you to hide all the run of no interest, such as the approach run. If relative dimensions are used, the origin should normally be set equal to zero.

### End scale position

The full scale of the positions indicates the maximum stroke which is displayed in the graph.

### End scale force

The full scale of the forces indicates the maximum force that is displayed in the graph.

### 4.14.1 How to set up the graph

After executing a piece, it is possible to view the measured values. From these it is possible to obtain the values of the graph axes.

As the origin of the graph, enter a value slightly lower than the measured starting height. As end scale of the positions, enter a value higher than the measured position reached.

As end scale of the forces, choose the value higher than the measured reached force.

For convenience, the values measured in the last pressing are shown in the value entry box.



## 4.15 Phase management

It is possible to manage multiple processing phases for a single job. The phases can be considered as "under construction" which contribute to the completion of a more complex process (for example the insertion of a bearing and a gear on the same shaft).

The phase management functions are normally hidden. To make them visible, select the **Job phase management** option in the **TOOLS > SETUP > VISIBLE OPTIONS** menu.

To use more phases, it is necessary to enable the execution of phases in the menu **EDIT JOB > ENABLE PHASES**. Once you have enabled the phases, you can change their name.

When a job has several phases, the main menu will contain the **PHASE EDIT** item where it is possible to set all the parameters of the displayed phase and the **JOB PROPERTIES** item where it is possible to set the options common to all phases. In this manual we will continue to indicate the location of many commands in the **EDIT JOB** menu but if we are using phases, the same commands will be in the **PHASE EDIT** menu.





The list of phases is always visible in the upper part of the graph, with the keys   it is possible to change the phase displayed and modify its parameters with the **PHASE EDIT** menu. The phase that will be performed is always indicated at the bottom right of the main page. Changing the phase displayed with the arrow keys does not change the phase that will be performed. To change the phase to be executed it is possible to touch the phase name at the bottom right or use the **PHASE TO EXECUTE** command.

The phases will be performed automatically in sequence. If you want to carry out a phase individually out of sequence, select the **Do not perform the phases in sequence** option in the **TOOLS > SETUP > JOBS SELECTION** menu. In this case it is not possible to change the phase that will be performed from the menu.

It is also possible to have a single phase repeat several times by activating the **Phase repeat options** in the **TOOLS > SETUP > VISIBLE OPTIONS** menu.

### 4.15.1 Phase copy

To copy a phase, you can use the **COPY PHASE** and **PASTE PHASE** commands in the **PHASE EDIT** menu. The *copy phase* command stores the current job number and the current phase number. The *paste phase* command overwrites the current phase with the job phase stored with the *copy phase* command.

It is possible to copy a phase over another one, even from a different job. To copy a phase, display the phase to be copied by selecting the job that contains it and navigating with the keys   , select the **COPY PHASE** command under **EDIT PHASE**. Then, display the destination phase by selecting the job that contains it and navigating with the keys   , and select the **PASTE PHASE** command under **EDIT PHASE**.



## 5 Parameters

After creating a new job, the first thing to do is to set the job options in the **EDIT JOB > PROPERTY AND OPTIONS** menu.

Once this is done, it is possible to set the operating parameters.

Note: In the jobs **the parameters set equal to zero will be ignored by the instrument**.

### 5.1 Movement management

The movement profile parameters are the following and can be found in the **EDIT JOB > MOVEMENT MANAGEMENT** menu.

#### Final position

Position to reach

#### Stop force

Force that commands the cylinder to stop before the final position.

#### End approach position

Position to be reached in rapid advance for approaching the piece. This position must be lower than the contact position with the piece. If a force is measured during the approach, the system goes into collision alarm.

#### Rest position

Return position at the end of the pressing cycle. In fact, the cylinder does not necessarily have to return to the zero position (this item is only visible if you activate the relative option in the **TOOLS > SETUP > VISIBLE OPTIONS**).

#### Waiting before return

In some cases, it may be useful to stop in the end pressing position for a few seconds.

#### Work speed

Speed of the pressing section.

#### Approach speed

Speed of the rapid feed section for approaching the piece.

#### Contact speed

Speed used at the end of approach until contact with the piece. If zero it is not used.

#### Return speed

Return speed after pressing to rest position.

#### Pre-stop position

Pre-stop initial position. If zero it is not used.

#### Pre-stop speed

Speed with which the cylinder carries out the last working section starting from the **pre-stop position**. If zero it is not used. During the pre-stop the cylinder adjusts the speed with the measured force value.

### 5.2 Control limits

The control limits, together with the range, determine the outcome of the job.

It is possible to set the limits of the reached force, the limits of the reached position, the limits of the contact position and the check points.

**Note:** Control limits, set equal to zero, are not used.

### **Contact position limits**

They control the contact dimension of the working. For a part to be classified as good, the measured contact dimension must be above the minimum contact dimension limit and below the maximum contact dimension limit.

### **Peak Position limits**

They control the maximum position reached during machining. For a piece to be classified as good, the measured position reached must be higher than the minimum position reached limit and lower than the maximum position reached limit. If the minimum reached position limit is not set and the tolerance band is present, the position of the band is used as the minimum limit.

### **Peak Force limits**

They control the force reached during machining. For a piece to be classified as good, the maximum force achieved must be above the minimum force limit and below the maximum force limit.

### **Contact detection threshold**

The initiation force is the force threshold used to measure the contact height.

## **5.2.1 How to choose the limits**

Contact dimension limits let you control the dimensions of components even before the job begins. They can be used to check the dimensions of the pieces to be assembled or to check that there are all the details necessary for the machining.

The choice of the limits of the position values and of the force reached depend on the type of machining. In general, you can follow this guide:

### **Limits with machining with mechanical stop**

When there is a mechanical stop, the press will always reach either the **stop force**. The maximum peak force limit can be used to ensure that the maximum force that the workpiece can withstand is never exceeded.

In this type of work, to control the effective force required, the tolerance range or the checkpoints are necessarily used.

The peak position limits are used to verify that the dimensions of the assembly, once machining is completed, are within tolerance.

### **Limits with machining without mechanical stop**

The peak force limits can be used to control the maximum force that has been applied to the workpiece.

The peak position limits are used to verify that the dimensions of the assembly, once machining is completed, are within tolerance.

### **Limits for bending and breaking tests**

In bending tests, the force limits are used simply to verify the force that has been applied while the position limits are used to verify the measured deflection.

In breaking tests, force limits are used to verify the force that was required to break the piece.

## **5.3 Checkpoints**

Checkpoints are additional tools for curve control. Up to five checkpoints can be defined. Each checkpoint can be used to:

**Check force**

Measure and control the force at a pre-set position. This check point is also useful for having a discrete value at the end of pressing to be displayed or sent via fieldbus.

**Check position**

Measure and control the position at a pre-set force. This check point is useful for checking deformation at a pre-set load. It is also useful to have a discrete value at the end of pressing to be displayed or sent via fieldbus.

**Digital force filter**

This check point is useful to clean the curve from unwanted vibrations.

**Minimum maximum measurement**

This check point is useful for having the minimum and maximum force value in a section of the stroke to be displayed or sent via fieldbus.

**Slope control**

This check point measures the force at the check position and at a certain distance verifies that the force variation is between a minimum and a maximum.

**Localized stop**

This check point commands the cylinder to stop when a pre-set force is reached. The force control takes place only in a pre-established section of the stroke. The stop can take place as soon as the force is exceeded or after a pre-set stroke.

## 5.4 Modifying All Positions

Sometimes it may be necessary to change the positions of all job parameters. This happens, for example, if the length of the tool or the height of the fixture is changed. To modify all position values of the current phase's parameters, you can select the **TOOLS > CHANGE POSITIONS** command. After selecting the command, you can specify by how many millimeters to shift the parameters. The value entered will be added to the position values of all parameters.

## 6 Job options

The following job options can be modified with the **EDIT JOB > PROPERTIES AND OPTIONS > OPTIONS**. If the job is divided into several phases, the options relating to a single phase are found in the **PHASE EDIT > PROPERTIES AND OPTIONS** menu, while the options relating to the whole job are found in **JOB PROPERTIES**.

### Use relative positions

By activating this option, the relative positions are used instead of the absolute ones (chapter 1.3).

### Request batch ID

By activating this option, before running a batch, you are asked to enter a batch identifier. To use this option, you need to activate the **Lot id management** option in the **TOOLS > SETUP > VISIBLE OPTIONS** menu.

### Ask for the piece code

By activating this option, before executing each piece, you are asked to enter a numerical code that identifies the piece itself. The piece code can also be set via a barcode scanner. To use this option, it is necessary to activate the **Part number management** option in **TOOLS > SETUP > VISIBLE OPTIONS** menu. Contact Alfamatic to find out which barcode readers are compatible with the instrument.

### Save curves of pieces good

Save the curves of the good pieces on the internal flash memory.

### Save curves of pieces rejected

Saves the curves of the rejected pieces on the internal flash memory.

### Do not use rejected basket

Disables basket control for rejected pieces.

### Request a confirmation with rejected

By activating this option, when a phase is recognized as reject, a message is shown which allows you to confirm the reject, repeat the reject phase or move on to the next phase. To use this option, you need to activate the **Request a confirmation with rejected phase** option in the **TOOLS > SETUP > VISIBLE OPTIONS** menu.

### Ask for the operator code

By activating this option, you are asked to enter the operator ID. This identifier will be stored together with the curve. To use this option, you need to activate the **Operator ID management** option in the **TOOLS > SETUP > VISIBLE OPTIONS** menu.

## 6.1 Counters

Through the **EDIT JOB > SCHEDULING** command it is possible to configure the counters and the data saving and maintenance options.

There is a counter for good pieces and two counters for normal and special pieces. There is also a counter that counts the number of cycles performed with a single tool. Finally, it is possible to enable the saving of the curves in the internal memory of the instrument. To transfer the curves, it is necessary to connect the instrument via the LAN port and use the Alfamatic AutoCopy program.

### Reset the number of good pieces

Resets the counter of the number of good pieces made.

### Reset the number of rejected pieces

Resets the counter of the number of rejected pieces.

### **Save curves**

Activates the saving of the curves in the internal memory of the instrument.

### **Save a good curve every**

If you only want to save some curves, with this parameter you can set every how many pieces you want the curve to be saved.

### **Number of good pieces to be produced**

Number of pieces to produce. When the good parts counter reaches this value, a warning appears on the instrument screen.

### **Maximum number of rejected pieces**

Maximum number of rejected pieces, once this number is exceeded, a warning appears on the instrument screen.

### **Tool life**

Number of pieces that can be made with the same tool, once this number is exceeded, a warning appears on the tool screen.

If a tool is shared among several jobs, it is possible to activate the Shared tools table option in **TOOLS > SETUP > ELECTRICAL CONNECTION > TOOLS > "THIRD TOOL"**. With this option active, a table of twelve tools is created which can be shared between several jobs. The table is visible in the **TOOLS > MAINTENANCE** menu. To indicate in the job which tool in the table must be used, access the **EDIT JOB > PROPERTIES AND OPTIONS > ACCESSORIES** menu.

## **6.2 Additional sensors**

Allows configuration of additional control signals when they are present.

## **6.3 Force transducers**

Allows the choice of force transducers to be used when there are multiple force transducers.

## **6.4 Accessories**

In this menu it is possible to:

Exclude the check of the enable signals if present.

Choose which equipment to use to carry out the work.

Which component must be requested before carrying out the work when a pick-to-light system is connected.

## **6.5 Repetition**

With this command it is possible to enter the number of repetitions of the single operation.

## **6.6 Verification**

With this command it is possible to configure the self-verification of the job.

## **6.7 Codes of the job**

In this menu it is possible to indicate the job name, the selection index and which part of the barcode identifies the job code.

## 7 The tolerance range

The tolerance range is used to control the curve and consequently to control the quality of the piece.

The tolerance range consists of two lines called the upper border and the lower border.

For the piece to be classified as good the points representing the curve cannot be above the upper edge, and cannot be below the lower edge.

The figure shows a curve relative to a good piece, as it is included between the two edges of the tolerance range.

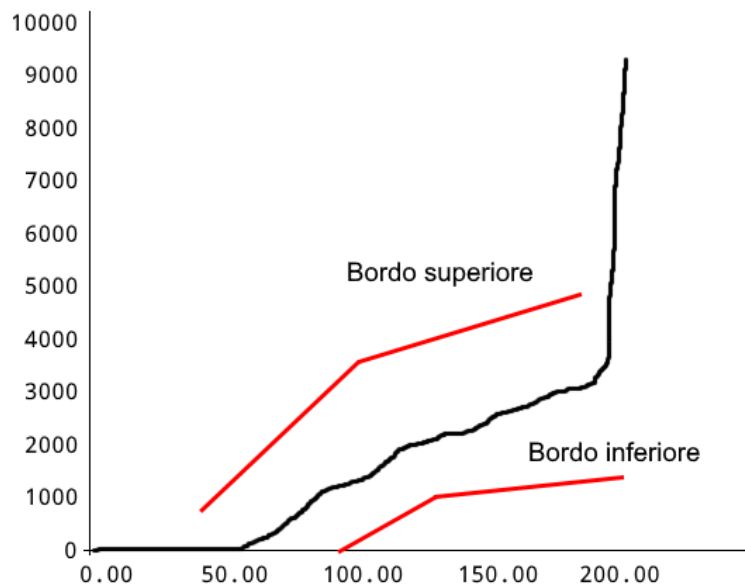


Figure3


Each border is composed of a sequence of points joined by segments.

### 7.1 Create the tolerance range

To create a new tolerance range, use the **EDIT JOB > TOLERANCE RANGE** menu. If the tolerance range does not exist, confirmation is requested for the creation of a new one. Choosing YES, a simple tolerance range formed by two points for each edge appears in the graph.

### 7.2 Modify the tolerance range

To modify the tolerance range, use the **EDIT JOB > TOLERANCE RANGE** menu. When moving the points, be careful not to switch the top edge with the bottom edge.

The modification of the tolerance range must be performed by moving the points that determine the two edges. When the tolerance range is modified, only one point of one of the two edges is highlighted, this point is the active one, i.e. it is the one that can be moved using the keys . It is possible to change the active point with the "select previous point" and "select next point" commands. To activate the points of the other border, press the command "select other edge". The force and position of the active point are displayed below the graph.

You can add a point by dividing the segment following the active point in two parts. To do this, press the "add new point" command.

It is possible to delete the active point with the "delete point" command.

When using the arrow keys, it is possible to change the speed by pressing the "change size of step" command.

## 7.3 Remove the tolerance range

To eliminate the tolerance range use the **EDIT JOB > TOLERANCE RANGE > DELETE** menu.

## 8 Rejected pieces

When a rejected piece is detected, the instrument stops preventing the execution of new pieces. In the standard configuration, to re-enable the instrument it is necessary to press the RESET key.

Furthermore, if the reject basket is present, the piece must pass through the sensor; the RESET key allows you to open the safety door if present.

If the job has multiple phases, the *Press-Right* can request confirmation for the rejected.

If the tolerance band is not reached by the curve and if the minimum quota limit is not present, the piece is signaled as reject due to the minimum quota not being reached.

### 8.1 The causes of rejected

A piece can be good or rejected. The reject can be caused by one or more different causes. The following list shows all possible reject causes.

#### **Maximum force exceeded**

The peak force has exceeded the peak maximum force limit. Note: The peak force may not coincide with the force of the last point of the curve.

#### **Minimum force not reached**

The peak force has not reached the peak minimum force limit. Note: The peak force may not coincide with the force of the last point of the curve.

#### **Below lower edge (low force)**

The curve has passed under the lower edge of the tolerance range.

#### **Above upper edge (high force)**

The curve has passed over the upper edge of the tolerance range.

#### **Aborted by the keyboard**

The execution of the job was interrupted by the operator who pressed the RESET key.

#### **Execution interrupted**

The start command was removed during the execution of the job. It is usually caused by the intervention of emergencies or for release of start buttons.

#### **Time expired**

The execution of the job took too long. You can increase the maximum time by reducing the acquisition frequency using the *Press-Right Setup* program.

#### **Additional test value high**

The value of the supplementary transducer is higher than the maximum supplementary limit.

#### **Additional test value low**

The value of the supplementary transducer is lower than the minimum supplementary limit.

#### **Additional test wrong**

The extra check caused the discard.

#### **Maximum position exceeded**

The peak position has exceeded the maximum peak position limit. Note: the peak position may not coincide with the position of the last point of the curve.

#### **Minimum position not reached**

The peak position has not reached the minimum peak position limit or has not reached the tolerance range. Note: the peak position may not coincide with the position of the last point of the curve.



**Maximum contact position exceeded**

The contact position measured is higher than the maximum contact position limit.

**Contact before minimum limit**

The contact position measured is lower than the minimum contact position limit.

**Check point high**

The value measured at the checkpoint is higher than the maximum value.

**Check point low**

The measured value at the checkpoint is below the minimum value.

## 8.2 Rejected management

For each cause of reject it is possible to indicate to the instrument how to classify the piece and how to behave. For the configuration, choose the desired reject cause in the list that appears with the **EDIT JOB > PROPERTIES AND OPTIONS > REJECTED MANAGEMEN**. Once the reason for the rejection has been selected, the following options can be configured:

**PROCEDURE WITH REJECTED**

For each cause of reject it is possible to immediately stop the press as soon as the cause of reject is detected, block the press in operation and request the insertion of the unlock password.

**CLASS: NORMAL / SPECIAL**

For each cause of reject it can be classified as normal or special. This allows you to classify the rejected to separate them. For example, it is possible to separate recoverable rejected from unrecoverable rejected. When there is a special reject the *Press-Right* activates the second reject signal and counts the piece separately. In this way it is possible to know, for example, how many pieces are rejects due to operator error.

The first item in the list of reject causes is **ALL**, by selecting this item, the choices that will be made will be applied to all the causes in the list.

## 9 Measured values

The Press-Right stores the displacement-force curve and measures some quantities that can be controlled thanks to the limits. The last curve can be analyzed with the analysis cursor. The quantities measured can be displayed at the end of each process.



### 9.1 The measured value page

In the main menu is present the **SHOW MEASURED VALUES** command. This command shows the measured values of the last process carried out. This page can be displayed at the end of each cycle by changing the option in the menu **TOOLS > DISPLAY OPTIONS**. To close the page just touch the screen.

### 9.2 Analysis cursor

It is possible to know the force in a given position using the cursor. The cursor appears as a vertical line in the graph. When the cursor is displayed, the force of the curve at the position indicated by the cursor and its current position are shown below the graph.

To display the cursor, touch the horizontal ruler of the graph.

The cursor can be moved to the right or left with the keys  .

# 10 The tools menu

The *Press-Right* configuration is performed via the **TOOLS** menu. The detailed description of the single configuration options can be found in the following chapters.

This menu contains the following submenus:

## DISPLAY OPTIONS

Allows you to setup the main page.

## MAINTENANCE

Allows the setting of a scheduled check of the machine.

## MANUAL MOVUNG

Allows manual movement of the cylinder.

## DIAGNOSIS

In this submenu it is possible to calibrate the transducers and check the operation of the inputs and outputs.

Note: To view the real-time status of the inputs and outputs, it is possible to activate the **Display the status of the command signals** option in the **TOOLS > DISPLAY OPTIONS** menu.

## PASSWORD

It allows the configuration of users and passwords and allows the selection of the instrument functions that must be locked with the password.

## SETUP

It allows the hardware configuration of the instrument.

## LANGUAGE

Allows you to change the instrument language.

## 10.1 Display options

The display options modify the behavior of the main page.

### Do not show measured values

At the end of the acquisition, normally, a page is shown which contains the measured values and the outcome of the processing. By activating this option, the window will not appear automatically, but you will have to manually select the **SHOW MEASURED VALUES** command in the main menu.

### Do not remove old curves

By activating this option, all curves will be superimposed on each other creating a strip representing the dispersion of forces. This option doesn't work with phases.

### Light up the working area

This option is available if a Press-Right output is configured to control the work area light.

### Displays the status of the command signals

By activating this option, the status of the inputs and outputs is displayed above the graph.

## 10.2 Manual moving

Allows manual movement of the press.

## **ENABLE MANUAL MOVEMENT**

With this command you can use the arrow buttons to move the cylinder. In the manual movement, the first section takes place very slowly, then the speed increases. If the cylinder is under stress the speed will be limited.

## **GO TO POSITION**

With this command it is possible to move the cylinder to a known position.

## **FORWARD UNTIL TOUCHING THE PIECE**

With this command, the cylinder descends until it touches the piece. The forward speed and the support force is set in the cylinder configuration menu.

## **GO TO REST POSITION**

With this command it moves to the rest position of the current job.

## **SET THE END APPROACH POSITION**

This command sets the approach end position of the current work equal to the current position of the cylinder. Selecting this command, it is possible to modify the value.

## **SET THE FINAL POSITION**

This command sets the final position of the current job equal to the current position of the cylinder. Selecting this command, it is possible to modify the value.

## **SET THE REST POSITION**

This command sets the rest position of the current work equal to the current position of the cylinder. Selecting this command, it is possible to modify the value.

# 11 Instrument configuration

In general, when the *Press-Right* is supplied already connected to the machine, it is not necessary to configure it.

Thanks to the many configuration options, the *Press-Right* can adapt to your needs.

To configure the *Press-Right*, access the **TOOLS > SETUP** menu.

This menu contains the following items:

## GENERAL OPTIONS

It allows you to configure the *Press-Right* based on the type of press connected and to activate some functions.

## ELECTRICAL CONNECTIONS

It allows to set the function of each input and each output, to configure the connected transducers and to configure the recognition of the tools.

## CYLINDER SETUP

Allows configuration of the cylinder. Some parameters are protected by a particular password which must be requested from Alfamatic.

## JOBS SELECTION

Configure the selection of jobs and phases. See chapter 4.

## NETWORK AND CLOCK

Allows definition of the machine name, network settings and system clock.

## VISIBLE OPTIONS

Allows you to indicate which options should be visible.

## 11.1 General options

Some general options depend on the type of press to which the instrument is connected, other options activate particular functions.

### Disable button for reset rejected

If there is an input configured as RESET, by activating this option it will no longer be possible to reset the instrument after a rejected piece without activating the relative reset input.

If there is NOT an input configured as RESET, by activating this option it will no longer be necessary to reset the instrument after a scrap piece.

### Wait for supervisor system connection

By activating this option, the *Press-Right* is blocked and enabled by the supervision system connected via fieldbus.

### Wait for computer connection

By activating this option, the *Press-Right* does not allow the machining of the pieces if it is not connected to the WinScope program.

### Count the piece when it senses a force

By activating this option, the *Press-Right* will not increase the piece counter if it has not measured an initial position.

### Don't come back at the end

At the end of pressing the press will not return to the rest position. The return to the rest position will be possible by external command.

**Use encoder input**

This option must be activated if encoder feedback is present.

**Ask whether to continue with the rejected phase**

By activating this option in the event of a reject phase, the operator can repeat the execution of the same phase.

**Different load cell for each phase**

If several load cells are connected to the instrument, activating this option will use a different cell for each phase. This option allows you to connect up to four identical presses working in sequence one after the other to a single *Press-Right*.

## 11.2 Job selection

These options modify the method used by the instrument to automatically select jobs and phases. The options are accessible from the **TOOLS > SETUP** menu. More information regarding automatic selection is in chapter 4.3.

## 12 Diagnosis

The diagnostic function (**TOOLS > DIAGNOSIS**) allows: displaying the version of internal processors, display transducers values and calibration, displaying the status of the inputs, displaying and forcing the outputs.

Given the complexity of these latter operations, their use is recommended only to qualified personnel.

Activated inputs and outputs are highlighted with a black rectangle.

For each transducer, the raw output value from the converter and the real value of the measured quantity are shown.

To force the outputs, move the cursor with the keys   desired output and press the OK key. You must know the password in order to force an output.

**Note:** In diagnosis the instrument does not work. To check the status of the inputs and outputs while the instrument is running, press the point key in the main display (outside the menus).

### 12.1 Firmware version

The Press-Right has several microprocessors inside. To find out the version of the software contained in the microprocessors, it is possible to view the diagnosis window **TOOLS > DIAGNOSIS**.

## 13 Special configurations

The Press-Right tool is very versatile. Thanks to Alfamatic years of experience in pressing, the instrument is set up to solve the most varied customer needs. In order not to unnecessarily complicate the use of the instrument, these functions are hidden and must be made visible manually in the instrument configuration.

This chapter describes some of the possible functions. If you have a particular need, contact Alfamatic to find out if your need is already foreseen.

### 13.1 Additional force transducer

A small force transducer can be connected to the instrument for greater precision in operations that require low forces. The Alfamatic HPT high precision transducer has been designed to resist the maximum force that can be exerted by the cylinder.

In order to connect an additional force transducer, the instrument must have inputs for two load cells.

The connection of the smallest load cell must be made to terminal block X22.

#### 13.1.1 Additional force transducer configuration

To configure the second load cell, use the **TOOLS > SETUP > ELECTRICAL CONNECTIONS > TRANSDUCERS** menu.

#### 13.1.2 Use of additional force transducer

You can select the transducer to be used in automatic or manual. To use automatic transducer selection, both calibrations of the internal transducer and the reduced force transducer must have the same unit of measurement and the same number of decimal places. Only under these conditions can the Automatic force transducer selection option be activated in the transducer configuration menu.

Manual selection is done by activating or not activating the option **Use transducer for reduced force** in the **PROPERTIES AND OPTIONS** menu.

### 13.2 Self-test

The self-test function is used to periodically check the functioning of the machine by executing specially prepared sample pieces.

To use this function, it is necessary to make the relative options visible from the **TOOLS > SETUP > VISIBLE OPTIONS > SELF-TEST** menu.

The execution of the sample pieces can be performed: every time the instrument is switched on, every time the job is changed, every time the job is modified, every number of pieces.

Depending on your needs, it is possible to create deliberately rejected sample pieces or calibrated pieces which must be marked as good.

For self-testing, you can also use a specially created special job. The name of this job must be exactly the same as the name set in the self-test setup menu.

The self-test configuration is possible from the **TOOLS > SETUP > SELF-TEST** menu.

To reserve the self-test procedure to qualified personnel, this function can be blocked with a password by activating the relative option from the **TOOLS > SETUP > PASSWORD > FUNCTIONS WITH PASSWORD** menu.

For each single job it is possible to exclude the self-test function.

#### 13.2.1 Self-test operation

A message appears on the screen when the self-test procedure must be performed. Tapping the message initiates the self-test.



During the self-test, the self-test bar appears at the top of the main page. The self-test bar indicates how many test cycles remain to be performed and, if additional test inputs are in use, the status of the test signals. To cancel the self-test, tap the X in the top left of the self-test bar.

## 13.3 Management of supplementary controls

In addition to curve control, up to three additional sensors can be connected to determine if the part is good or rejected. In practice, the outcome of the machining can be conditioned by the logic status of three inputs. This logical state can be checked at various times during the working.

For additional control number 1, the *Press-Right* can also activate an output before carrying out the control and, after a pre-set time, read the state of the input.

To use the additional controls, first of all, assign the TEST function to the input to which the sensor is connected.

The **TOOLS > SETUP > ELECTRICAL CONNECTIONS** menu allows you to configure the inputs and assign a descriptive name in **SIGNAL OPTIONS** submenu.

In the **EDIT JOB > PROPERTY AND OPTIONS > ADDITIONAL SENSORS** menu it is possible to establish when and how to carry out the additional checks.

### 13.3.1 Additional control options

The additional control options are as follows:

#### No supplementary control

The additional check is not performed.

#### Check at the start

The supplementary check is performed when the instrument receives the **START** command.

#### Check at the stop

The additional check is carried out when the tool wants to command the stop and the piece is good.

#### During pressing

Additional control is performed during pressing.

#### Use as enable

The signal is checked at the start of work to enable or disable the cycle.

## 13.4 Tools recognition

The *Press-Right* can be programmed to recognize the equipment (tools) mounted on the press.

Thanks to the recognition of the tools, it is possible to prevent the operation of the press if the equipment is not the one foreseen by the job, or it is possible to have the correct job selected according to the mounted equipment or again it is possible to have the work phase automatically selected according to of the tool in use.

For equipment recognition, up to three RFID transceivers can be connected to the instrument or the binary combination of some inputs can be used.

### 13.4.1 Recognition configuration

To set how the tools are identified, access the **TOOLS > SETUP > ELECTRICAL CONNECTIONS > TOOLS** menu.

### 13.4.2 RFID tablet writing

To write the identification number of the tool, access the **TOOLS > SETUP > ELECTRICAL CONNECTIONS > TOOLS** menu.

### **13.4.3 Select tool to use**

To indicate the tool that must be used for the operation, access the **EDIT JOB > PROPERTIES AND OPTIONS > TOOLS** menu.

### **13.4.4 Automatic selection of work with tool**

To automatically select the job according to the tool mounted on the press, activate the relative option in the **TOOLS > SETUP > JOB SELECTION** menu.

## 14 Data storage

The *Press-Right* is able to memorize the production data in the internal memory. In practice, for each piece produced, a file is created which contains the following information:

- The recorded force-displacement curve.
- The job settings used when recording the curve.
- The serial number of the part.
- The order number.
- The operator ID.
- The date and time.

The file created is stored in a flash memory inside the *Press-Right* instrument. The AutoCopy software for Windows is available which autonomously moves the curves from the instrument's memory to a folder on the computer. The WinScope software for Windows allows the visualization of the curves contained in the moved files.

The instrument can be configured so that the serial number is requested for each piece.

Through the instrument menus it is possible to enter the job number and the operator ID.

For quick entry of the various identifiers, it is possible to use a barcode scanner connected to the USB 2 port of the instrument. Contact Alfamatic to find out which barcode readers are compatible with the instrument.

Note: There are limitations on the length of these fields as indicated in the technical characteristics.

# 15 Password

The *Press-Right* can store a list of users with their identification codes.

The identification code is a four-digit number.

The last three digits are never displayed and act as the password.

Permissions can be defined for each user, i.e. which functions they can access.

There is an administrator password that allows access to all functions and user management.

To add, modify or delete a user it is necessary to know the password of a user who can manage the user list.

## USER LIST

In the user list you can add or edit a user. When adding a user, it is necessary to indicate the descriptive name, the password (four digits) and the permissions that the new user will have. The first digit of the password must be different for each user.

## ADMIN PASSWORD

The admin user cannot be deleted and has full permissions. To change the password, you need to know the old password or, if it has been lost, you need to contact Alfamatic to send him the code that appears in the old password entry window. The default administrator password is 9724.

## LOGOUT

When a user's password is entered, an icon is displayed on the main page indicating the name of the user who has accessed. This avoids the constant entry of passwords. To cancel access, you can use the **TOOLS > PASSWORD > LOGOUT** command or press the RESET key.

## REMOVE USER

Allows you to delete a user.

## FUNCTIONS WITH PASSWORDS

This menu defines which instrument functions are accessible only by entering the password. The user who enters his password will be able to access only if he has the relative permissions enabled.

# 16 Calibration

The calibration operation must be performed by trained and qualified personnel.

To calibrate the transducers connected to the Press-Right you need to access the **TOOLS > DIAGNOSIS** menu.

For each transducer, the raw output value from the converter and the real value of the measured quantity are shown. The transformation from the converter value to the actual value is achieved via the gain:

Actual value = drive value x gain.

To calibrate a transducer, you must first modify the offset to bring the raw value to zero and then calculate the gain to obtain the real value.

Calibration requires the password of a user with maintenance permissions.

## 16.1 Force transducer calibration

The **offset** is the value that is subtracted from the output value of the analog-digital converter.

The **gain** is the multiplication factor that adjusts the displayed value. If the gain is greater than 3, it is better to change the unit of measure and the number of decimal digits.

Force transducer gain is best calculated using a calibrated reference load cell, alternatively a theoretical gain can be entered.

### 16.1.1 Calibration through calibrated load cell

To calculate the gain and the offset you can follow the procedure:

- Choose the unit of measure and the number of decimals to display
- Do not exert any force on the load cell.
- Enter the raw value thus displayed as an offset.
- Place the calibrated load cell under the cylinder.
- Move the cylinder manually and change the value in according whit calibrated cell.

### 16.1.2 Calibration using theoretical values

If you do not have a calibrated load cell, you can follow the procedure:

- Choose the unit of measure and the number of decimals to display
- Do not exert any force on the load cell.
- Enter the raw value thus displayed as the offset.
- Now enter the theoretically calculated gain with the formula:

$$\text{Gain} = 0.03 * \text{Load cell full scale [kN]}$$

# 17 Connection to computer

The *Press-Right* can be connected to a computer. It is possible to connect the instrument to the computer via USB port or LAN (Ethernet) port.

*WinScope* program is supplied together with the instrument, through which the potential of the instrument is extended.

All the software can be downloaded from the website [www.alfamatic.com](http://www.alfamatic.com).

## 17.1 Connection via USB port

If you are using the USB connection, you will need to use a standard USB Type A/B cable to plug into the *Press-Right*'s USB 1 port.

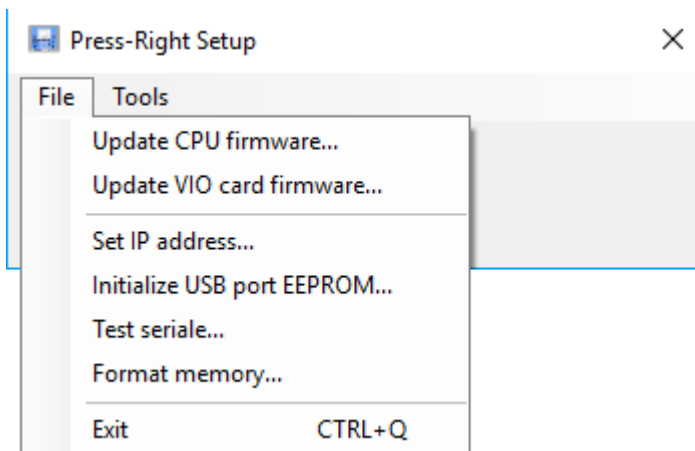
When you first connect the *Press-Right* to your computer, the operating system will look for drivers to properly handle the device. For this reason, the first time you connect, your computer must have access to the Internet. After installing the drivers, the instrument will automatically appear in the *WinScope* Connection menu.

## 17.2 Connection via LAN port (ethernet)

In order to use the Ethernet port, the instrument must first be assigned a static IP address. To do this, you need access the **TOOLS > SETUP > NETWORK AND CLOCK SETUP** menu. After having assigned an IP address to the instrument, it is necessary to add it to the list of usable ports in *WinScope* through the related **File > Preferences** menu.

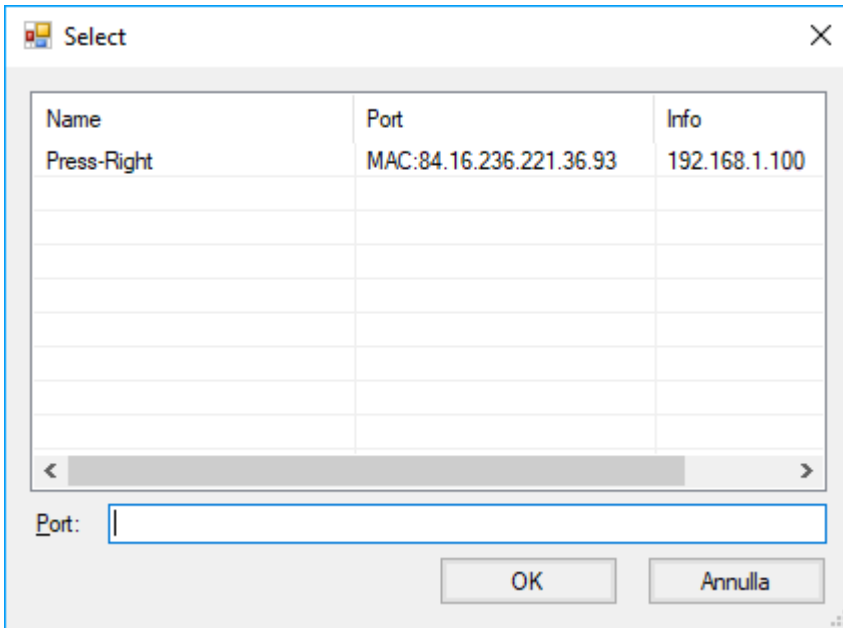
You can also set the IP address via *Press-Right* setup.

Install and run the *Press-Right Setup* program; Select the **Set IP address** command in the **File** menu.



At this point the Alfamatic instruments present in the subnet are searched for by sending broadcast packets.

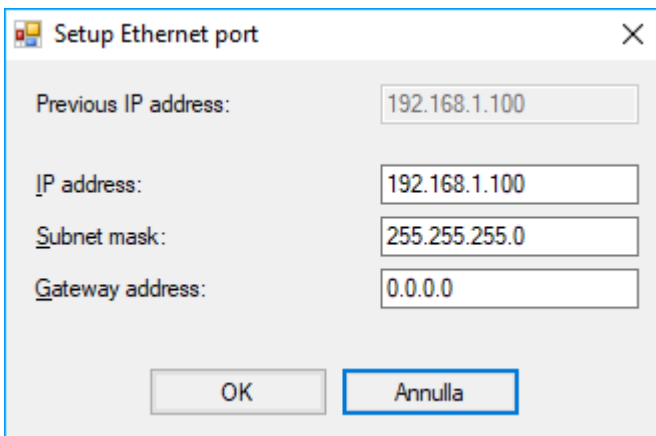
Choose the instrument you want to assign the IP address to from the list that appears.



If the list is empty, check the Firewall status of your computer, if any. The Firewall can be disabled from the Windows Control Panel.

If you can't tell which instrument to configure, just turn it off, redisplay the list, and see who's missing.

Once the instrument has been chosen, the following window appears with which it is possible to assign an IP address:



# 18 Field bus

*Press-Right* instrument can communicate via **Modbus TCP** (standard), **PROFINET** (optional), or **EtherNet/IP** (optional) fieldbuses.

## 18.1 Organization

The instrument has a list of registers that can be read or written via fieldbus communication.

Each register has an address. From the fieldbus it is possible to access the registers by indicating the address of the same.

PROFINET and EtherNet/IP buses, there is also direct access to 11 read registers and 11 write registers. You can decide which registers should be accessible directly. To do this you need the *Press-Right setup* program. Access to a greater number of registers requires accessing through the address of the same.

## 18.2 Status and Control

The register at address 1 STATUS\_WORD\_INPLC contains the instrument status bits.

The register at address 24 CONTROL\_WORD\_OUTPLC allows the instrument to be commanded.

When a command is written (non-zero) the CMD\_BUSY bit of the status register is raised to indicate that the command has been received by the instrument.

If the command is valid, the RUN bit of the status register is raised.

If the command is invalid, the ERROR bit of the status register is raised.

At the end of the execution of the command, the RUN bit is reset and the COMPLETED bit is activated.

The CMD\_BUSY bit is cleared if zero was written as a command and execution is terminated.

The COMPLETED and ERROR bits are cleared when a new (non-zero) command is written.

## 18.3 Modbus/TCP

The instrument acts as a server and opens TCP port 502 for reception.

If a client with bank addressing is used, the value 40001 must be added to the address shown in the table. For example, to access register 90, address 40091 must be used. With Siemens PLCs, the MB\_MODE parameter must be 0 to for reading and 1 for writing. The registers must be read individually.

*Note:*

When reading the registers, a 10 ms delay must be added between one reading and the next.

The registers must be read individually.

## 18.4 PROFINET and EtherNet/IP

Via these fieldbuses, you have access to 16 input variables and 16 output variables.

Through the first four input (CTRL\_INPLC, SUBINDEX\_INPLC, INDEX\_INPLC, PV\_INPLC) and output (CTRL\_OUTPLC, SUBINDEX\_OUTPLC, INDEX\_OUTPLC, PV\_OUTPLC) variables it is possible to have read and write access (if allowed) via address/data to all the instrument parameters.

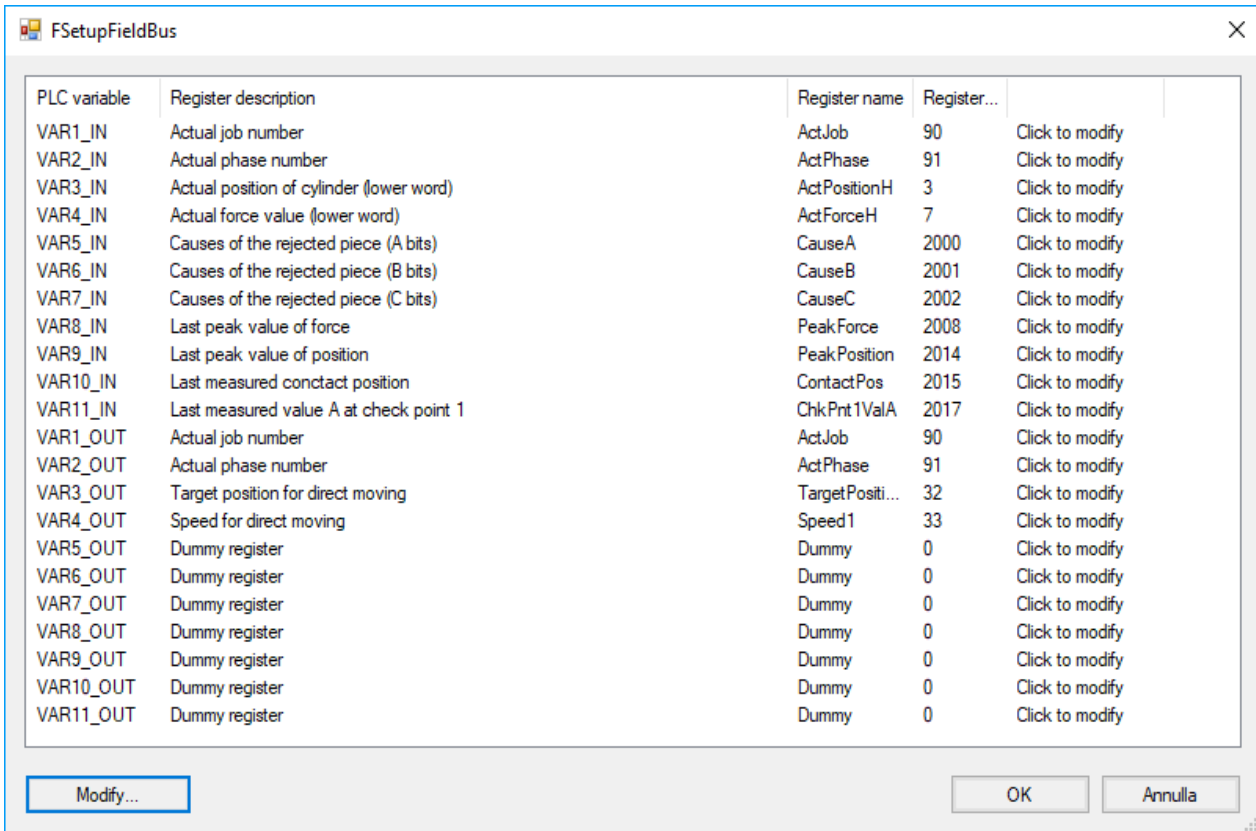
The STATUS\_WORD\_INPLC input word contains the instrument status bits (register 1).

The CONTROL\_WORD\_OUTPLC output word contains the commands to be supplied to the instrument (register 24).

The content of 11 input words (VAR1\_INPLC ... VAR11\_INPLC) and 11 output words (VAR1\_OUTPLC ... VAR11\_OUTPLC) can be configured by the user using the *Press-Right Setup* software.



The default content of these words is as follows:



PLC variable	Register description	Register name	Register...	
VAR1_IN	Actual job number	ActJob	90	Click to modify
VAR2_IN	Actual phase number	ActPhase	91	Click to modify
VAR3_IN	Actual position of cylinder (lower word)	ActPositionH	3	Click to modify
VAR4_IN	Actual force value (lower word)	ActForceH	7	Click to modify
VAR5_IN	Causes of the rejected piece (A bits)	CauseA	2000	Click to modify
VAR6_IN	Causes of the rejected piece (B bits)	CauseB	2001	Click to modify
VAR7_IN	Causes of the rejected piece (C bits)	CauseC	2002	Click to modify
VAR8_IN	Last peak value of force	PeakForce	2008	Click to modify
VAR9_IN	Last peak value of position	PeakPosition	2014	Click to modify
VAR10_IN	Last measured contact position	ContactPos	2015	Click to modify
VAR11_IN	Last measured value A at check point 1	ChkPnt1ValA	2017	Click to modify
VAR1_OUT	Actual job number	ActJob	90	Click to modify
VAR2_OUT	Actual phase number	ActPhase	91	Click to modify
VAR3_OUT	Target position for direct moving	TargetPositi...	32	Click to modify
VAR4_OUT	Speed for direct moving	Speed1	33	Click to modify
VAR5_OUT	Dummy register	Dummy	0	Click to modify
VAR6_OUT	Dummy register	Dummy	0	Click to modify
VAR7_OUT	Dummy register	Dummy	0	Click to modify
VAR8_OUT	Dummy register	Dummy	0	Click to modify
VAR9_OUT	Dummy register	Dummy	0	Click to modify
VAR10_OUT	Dummy register	Dummy	0	Click to modify
VAR11_OUT	Dummy register	Dummy	0	Click to modify

### 18.4.1 Access via address/data

Values denoted by 0x are values expressed in hexadecimal. For example, 0x20 corresponds to the decimal value 32.

#### 18.4.1.1 Initialization

Load the value 0x00 into CTRL\_OUTPLC

Wait for CTRL\_INPLC to contain 0x00

#### 18.4.1.2 Reading a 16-bit register

Load the register address into INDEX\_OUTPLC

Load the value 64 (0x40) into CTRL\_OUTPLC

Wait for CTRL\_INPLC to contain 16 (0x10)

Read the value from PV\_INPPLC

Load the value 0x00 into CTRL\_OUTPLC

Wait for CTRL\_INPLC to contain 0x00

#### 18.4.1.3 Reading a 32-bit register

Load the register address into INDEX\_OUTPLC

Load the value 16 (0x10) into CTRL\_OUTPLC

Wait for CTRL\_INPLC to contain 32 (0x20)

Read the value from PV\_INPPLC

Load the value 0x00 into CTRL\_OUTPLC

Wait for CTRL\_INPLC to contain 0x00

#### **18.4.1.4 Writing a 16-bit register**

Load the register address into INDEX\_OUTPLC

Load the value to write into PV\_OUTPLC

Load the value 32 (0x20) into CTRL\_OUTPLC

Wait for CTRL\_INPLC to contain 16 (0x10)

In case of error CTRL\_INPLC will contain 112 (0x70)

Load the value 0x00 into CTRL\_OUTPLC

Wait for CTRL\_INPLC to contain 0x00

#### **18.4.1.5 Writing a 32-bit register**

Load the register address into INDEX\_OUTPLC

Load the value to write into PV\_OUTPLC

Load the value 48 (0x30) into CTRL\_OUTPLC

Wait for CTRL\_INPLC to contain 32 (0x20)

In case of error CTRL\_INPLC will contain 112 (0x70)

Load the value 0x00 into CTRL\_OUTPLC

Wait for CTRL\_INPLC to contain 0x00

### **18.4.2 PROFINET interface**

To install the GSD file in the library, select tools > device description file management.

In the library, it can be found under Additional field devices > PROFINET IO > General > Alfamatic > PressRight.

The device name and address are set by TIA:

Open the TIA, under "Online access" select "Update accessible nodes". It should appear immediately below as CompactCom 40 PIR.

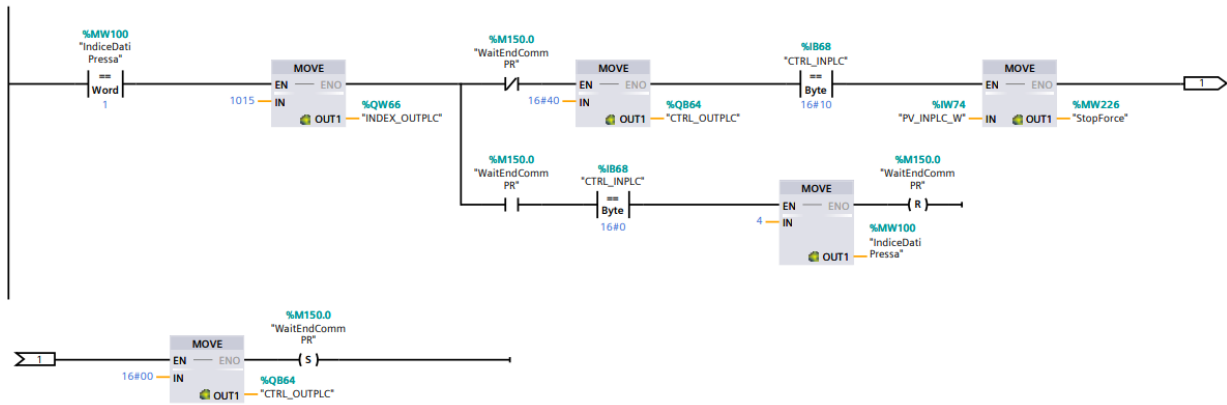
Open the device and in the "Functions" branch you will find set IP and set Name.

A new module is found automatically if it has the same IP address and the same name.

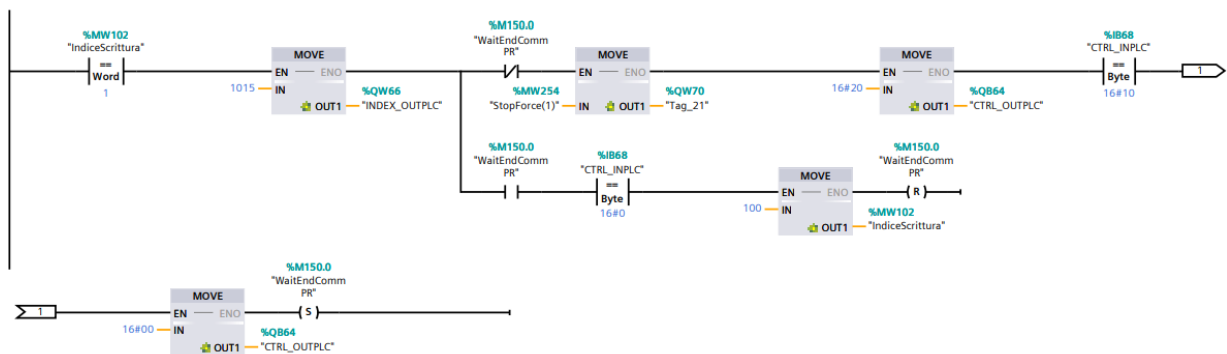
Example of register mapping accessible from the field bus:

Module	Rack	Slot	I address	Q address	Type
▼ PressRight01	0	0			DAP
▶ Interface	0	0 X1			PressRight01
CTRL_INPLC_1	0	1	68		CTRL_INPLC
SUBINDEX_INPLC_1	0	2	69		SUBINDEX_INPLC
INDEX_INPLC_1	0	3	70...71		INDEX_INPLC
PV_INPLC_1	0	4	72...75		PV_INPLC
STATUS_FLAG_INPLC_1	0	5	76...77		STATUS_FLAG_INPLC
VAR1_INPLC_1	0	6	78...79		VAR1_INPLC
VAR2_INPLC_1	0	7	80...81		VAR2_INPLC
VAR3_INPLC_1	0	8	82...83		VAR3_INPLC
VAR4_INPLC_1	0	9	84...85		VAR4_INPLC
VAR5_INPLC_1	0	10	86...87		VAR5_INPLC
VAR6_INPLC_1	0	11	88...89		VAR6_INPLC
VAR7_INPLC_1	0	12	90...91		VAR7_INPLC
VAR8_INPLC_1	0	13	92...93		VAR8_INPLC
VAR9_INPLC_1	0	14	94...95		VAR9_INPLC
VAR10_INPLC_1	0	15	96...97		VAR10_INPLC
VAR11_INPLC_1	0	16	98...99		VAR11_INPLC
CTRL_OUTPLC_1	0	17		64	CTRL_OUTPLC
SUBINDEX_OUTPLC_1	0	18		65	SUBINDEX_OUTPLC
INDEX_OUTPLC_1	0	19		66...67	INDEX_OUTPLC
PV_OUTPLC_1	0	20		68...71	PV_OUTPLC
CONTROL_WORD_OUTPLC_1	0	21		72...73	CONTROL_WORD_...
VAR1_OUTPLC_1	0	22		74...75	VAR1_OUTPLC
VAR2_OUTPLC_1	0	23		76...77	VAR2_OUTPLC
VAR3_OUTPLC_1	0	24		78...79	VAR3_OUTPLC
VAR4_OUTPLC_1	0	25		80...81	VAR4_OUTPLC
VAR5_OUTPLC_1	0	26		82...83	VAR5_OUTPLC
VAR6_OUTPLC_1	0	27		84...85	VAR6_OUTPLC
VAR7_OUTPLC_1	0	28		86...87	VAR7_OUTPLC
VAR8_OUTPLC_1	0	29		88...89	VAR8_OUTPLC
VAR9_OUTPLC_1	0	30		90...91	VAR9_OUTPLC
VAR10_OUTPLC_1	0	31		92...93	VAR10_OUTPLC
VAR11_OUTPLC_1	0	32		94...95	VAR11_OUTPLC

Example of 16-bit register reading:



Example of 16-bit register writing:





# 19 Registry organization

## 19.1 Execution of commands

By writing commands in the CONTROL\_WORD\_OUTPLC the press is commanded.

When a command is written, the “command busy” bit of STATUS\_WORD\_INPLC goes high; at this point it is possible to reset the command in the CONTROL\_WORD\_OUTPLC.

Regardless of whether the command involves motion or not, bit 11 of STATUS\_WORD\_INPLC will remain high as long as the command is present.

## 19.2 Status register behavior

The behavior of the status bits under the most common conditions follows:

In this chapter the Busy bit is not indicated because it always behaves in the same way: High when a command is received, low when the zero command is received and there are no other commands in execution.

The Result OK and KO bits are activated at the end of the phase and must be reset with command 16 or 17.

If the operator stops the cylinder by pressing the reset button or if a malfunction occurs, the Fault bit is activated instead of the Completed bit and the Ready bit is not activated.

The fault is restored with command 1.

### **Stopped at resting altitude ready to go:**

Ready + Rest position + (Zero Position)

### **Phase start with command 10:**

*As soon as the movement begins:*

Running + Execute

*At the end of the movement:*

Ready + Completed + (Rest position and/or Zero Position if with automatic return)

### **Return to rest position or to zero with command 11 or 12:**

*As soon as the movement begins:*

Running + Execute

*At the end of the movement:*

Ready + Completed + Rest position and/or Zero Position

### **Advance to tap with command 13:**

*As soon as the movement begins:*

Ready + Completed bits go low

Running + Execute bits go high

*On contact:*

Running + Execute bits go low

Ready + Completed bits go high

### **Starting simple movement 21:**

*As soon as the movement begins:*

Running + Execute

*At the end of the movement:*

Ready + Completed

## 19.2.1 Note

**Rest Position** behaves differently depending on whether an input is configured as "Start return" or not. With a "Start return" input, the Rest Position bit is active if it is at the rest position. Without a "Start return" input, the Rest Position bit is active if it is at the rest position or further behind it.

## 19.3 Strings

Strings are made up of single 8-bit ASCII characters.

For this reason, it is recommended to avoid accented letters.

Since each register has 16 bits, two characters fit into a single register.

The high byte of the register contains the first character of the pair.

The low byte of the register contains the second character of the pair.

## 19.4 Register table

Some commands use, for their function, the text contained in the register at address 45. For example, to use commands 2 (select job by text code), 3 (select job by name) and 4 (set the part number) , you need to load the text at address 45 before executing the command.

Each job has a name, in addition to this it can have alphanumeric identification codes (barcodes) and an index. The current job name is listed at address 1000.

The job index allows selection by a simple numerical value. For selection by index, the index must be written in register 90.

### 19.4.1 Status register STATUS\_WORD\_INPLC

The status register is accessible from ModbusTCP at address 1.

Position	First name	Function
0 Bit 0	Ready	Conditions to have bit 0 active (Ready): You must be outside the instrument menus. There must be a job. There should be no video messages. With the <b>TOOLS &gt; CONFIGURE &gt; GENERAL OPTIONS &gt; REQUEST SUPERVISION SYSTEM OPTION</b> , Start must be enabled with command 16. With the <b>TOOLS &gt; CONFIGURE &gt; GENERAL OPTIONS &gt; REQUEST CONNECTION WITH COMPUTER OPTION</b> , the computer must be connected (absence of exclamation mark on the display)
1 Bits 1	Zero Position	The cylinder is in the physical zero position.
2 Bits 2	Rest Position	Cylinder is at rest position or further back.
3 Bits 3	Fault	The cylinder is in fault condition. To remove the fault it is necessary to use command 1.
4 Bits 4	Running	Obsolete - The cylinder is moving.
5 Bits 5	Working	The cylinder is moving or there is a command in the CONTROL_WORD_OUTPLC register address 24
6 Bits 6	Enabled	<b>INSTRUMENTS &gt; CONFIGURE &gt; GENERAL OPTIONS &gt; REQUEST SUPERVISION SYSTEM</b> option on the instrument , the instrument must be enabled after each cycle via command 16. It is also possible to deactivate the instrument with command 17. This status bit indicates whether the instrument is it enabled or not.

7 Bits 7	New Part Number	New part number
8 Bit 0		Not used
9 Bits 1	Result OK	The outcome of the cycle performed is good because the measured values fall within the control parameters set in the job. <i>Note:</i> This bit can be reset by command 16 or command 17.
10 Bits 2	Result KO	The outcome of the cycle performed is rejected because the measured values do not fall within the control parameters set in the job. <i>Note:</i> This bit can be reset by command 16 or command 17.
11 Bits 3	Command BUSY	Indicates the presence of a command received on the fieldbus.
12 Bits 4	JOG mode	The manual movement of the cylinder has been enabled.
13 Bits 5	Command ERROR	Not used
14 Bits 6	Command COMPLETED	Not used
15 Bits 7	Command EXECUTE	Not used

Note: Siemens PLCs have the high and low byte positions reversed.

## 19.4.2 CONTROL\_WORD\_OUTPLC commands

The command register is accessible via Modbus at address 24.

### Command 0 – No command

No command executed.

### Command 1 – Fault reset

Resets the fault condition. The fault condition is signaled by bit 3 of the status.

### Command 2 – Select job by code

Selects the job with the code specified in the text buffer. The text buffer is located at address 45.

*Note:* Before using command 2, load the desired code at address 45.

### Command 3 – Select job by name

Selects the job with the name specified in the text buffer. The text buffer is located at address 45.

*Note:* Before using command 3, load the job name at address 45.

### Command 4 – Set part number

Sets the part number specified in the text buffer. The text buffer is located at address 45.

*Note:* Before using command 4, load the part number at address 45.

### Command 6 – Ask part number

When a job requires the part number to be entered before processing, a warning message appears on the instrument's display. By sending the part number with a scanner connected to the instrument's USB 2 port or using command 4, the message is removed, and the instrument is ready to execute the job. This command cancels the part number entry and reactivates the part number request message.

### Command 9 – Re-reading field bus

Forces re-reading of the registers from the field bus. Use this command after a phase change if you wish to write operating parameters from the field bus.

**Command 10 - Start**

Starts the cycle (start phase). If the general option that disables automatic return is not active, at the end of the forward motion, the cylinder will return to the rest position. See also command 34.

*Note:* Start is accepted only if bit 0 of the Status (ready) is active.

**Command 11 – Start to zero**

Commands the return to the physical zero position of the cylinder.

**Command 12 – Start return**

Commands the return to the rest position set in the job parameters.

**Command 13 – Start to touch**

Commands the start of slow forward motion until contact with the piece.

**Command 14 – Disable driver**

Disable the driver. The driver switches from RUN state to RDY state.

**Command 16 – Enable start**

By activating the option **TOOLS > CONFIGURE > GENERAL OPTIONS > REQUEST SUPERVISION SYSTEM**, the instrument must be enabled after each cycle via this command. After giving command 16, bit 6 of the status (Start enabled) becomes active.

**Command 17 – Disable start**

Disables the instrument so that a start phase command is not accepted. To enable the instrument, use command 16.

**Command 18 – Reset counters**

Resets the workpiece counters (registers at addresses 97 and 99).

*Note:* The instrument's general counter (address 95) cannot be reset.

**Command 20 – Stop**

Stops the cycle (stop phase) and returns the cylinder to the rest position.

**Command 21 – Start simple movement**

Starts the simple movement of the cylinder.

*Note:* Before starting the cylinder, load the target position and speed in registers 32 and 33.

**Command 24 – Enable jog**

Activate the buttons for manual movement.

**Command 25 – Disable jog**

Deactivates buttons for manual movement.

**Command 26 – Stop job movement**

Stops the cylinder during manual movement.

**Command 27 – Start jog forward**

Starts manual forward movement.

**Command 28 – Start jog backward**

Starts manual backward movement.

**Command 29 – Set operator id**

Sets the operator ID specified in the text buffer. The text buffer is located at address 45.

*Note:* Before using command 29, load the operator code at address 45.

**Command 30 – Set order id**

Sets the order or job number specified in the text buffer. The text buffer is located at address 45.

*Note:* Before using command 30, load the order number at address 45.



### Command 32 – Reset rejected

If a reset input is present or the option **INSTRUMENTS > CONFIGURE > GENERAL OPTIONS > DISABLE RESET REJECTS FROM KEYBOARD** is not active, the instrument must be reset in case of a reject. This command allows resetting the reject via the field bus.

### Command 34 –Start without return (from version 3.95)

Starts the cycle (start phase). Unlike command 10, this command starts the press, and at the end of the forward motion, the cylinder will return to the rest position.

Note: Start is accepted only if bit 0 of the Status (ready) is active.

### Command 35 – Shift Parameters (from version 3.95)

Command 35 shifts the phase parameters based on the height difference between the workpiece and the reference piece.

Note: Before using Command 35, load the height difference at address 1075.

## 19.4.3 Protocol information

This register contains information about the format of registers.

The bits in the register have the following meaning:

Bit	Nome	Funzione
0,1,2,3,4,5	Type	Always = 1
6	Byte Order	0 first version with bytes in "little endian" format 1 second version compatible with popular PLCs (available from version 3.66)
7	Instrument	0 version with motor control 1 version without motor control

## 19.4.4 Table of registers:

Name	Description	Type	Addr	Access
Dummy			0	
Status and Flags	See chapter 19.4.1 - STATUS_WORD_INPLC	UINT16	1	Read only
PositionAct	Current position of the cylinder	INT32	2	Read only
SupplAct	Current value of additional transducer	INT32	4	Read only
ForceAct	Current force	INT32	6	Read only
Control Word	See chapter 19.4.2 - CONTROL_WORD_OUTPLC	UINT16	24	Write
InfoFB	Field bus information	UINT16	25	Read only
Position1	Target position for basic movement	UINT16	32	Write/read
Speed1	Speed for basic movement	UINT16	33	Write/read
StatusInputs	Status of digital inputs (from version 3.23)	UINT16	40	Read only
StatusOutputs	Status and control of digital outputs (from version 3.23)	UINT16	41	Write/read
ToolA	Tool A ID	UINT16	42	Read only
ToolB	Tool B ID	UINT16	43	Read only
ToolC	Tool C ID	UINT16	44	Read only
StringBuffer	Textbuffer	STRING 28L	45	Write/read
OrderNum	Order number	STRING 24L	62	Read only
JobIndex	Job number The first job is number 1 The selection is immediate	UINT16	90	Write/read
PhaseAct	Phase number The first phase is number 1	UINT16	91	Write/read
PhaseValue	Phase values	UINT16	ninety two	Write/read
MainCounter	Main counter	UINT32	95	Read only
JobNumOK	Number of good pieces (to reset use control word = 18)	UINT32	97	Read only
JobNumNOK	Number of rejected pieces (to reset use control word = 18)	UINT32	99	Read only

MaxNumOK	Maximum number of good pieces	UINT32	101	Write/read
PartNumber	Queues	STRING 28L	103	Read only
decimalsY	Number of decimals digit of force values	UINT16	207	Read only
UnitY	Unit of measurement of the Y axis	UINT16	208	
decimalsX	Number of decimals digit of position values	UINT16	209	Read only
UnitX	Unit of measurement of the X axis	UINT16	210	
DecimalsP	Number of decimal digits of probe values	UINT16	211	Read only
UnitP	Unit of measurement of the probe	UINT16	212	
InstrumentName	Name of the instrument	STRING 24L	213	Read only
JobName	Name of current job	STRING 14L	1000	Read only
StopPosition	Stop position	UINT16	1014	Write/read
StopForce	Stop force	UINT16	1015	Write/read
EndApproachPos	End position for fast approach	UINT16	1016	Write/read
RestPosition	rest position	UINT16	1017	Write/read
ApproachSpeed	Speed for fast approaches	UINT16	1018	Write/read
TouchSpeed	Speed for contact after approach	UINT16	1019	Write/read
WorkSpeed	Main working speed	UINT16	1020	Write/read
ReturnSpeed	Return speed	UINT16	1021	Write/read
PreStopPos	Pre-stop start position	UINT16	1022	Write/read
PreStopSpeed	Pre-stop speed	UINT16	1023	Write/read
StopDelay	Delay before return <i>(from version 1.86)</i>	UINT16	1024	Write/read
ContactForce	Force for contact senses <i>(from version 1.94)</i>	UINT16	1025	Write/read
PhaseOptionsA	BIT0: RELATIVE POSITIONS	UINT16	1026	Read only
PeakPosMin	Minimum value of reached position	UINT16	1027	Write/read
PeakPosMax	Maximum value of reached position	UINT16	1028	Write/read
PeakForceMin	Minimum value of reached force	UINT16	1029	Write/read
PeakForceMax	Maximum value of reached force	UINT16	1030	Write/read
InitPosMin	Minimum value of contact position	UINT16	1031	Write/read
InitPosMax	Maximum value of contact position	UINT16	1032	Write/read
CP1par1	First value of checkpoint 1	UINT16	1033	Write/read
CP1par2	Second value of check point 1	UINT16	1034	Write/read
CP1par3	Third value of check point 1	UINT16	1035	Write/read
CP1par4	Fourth value of check point 1	UINT16	1036	Write/read
CP1par5	Fifth value of check point 1	UINT16	1037	Write/read
CP2par1	First value of check point 2	UINT16	1038	Write/read
CP2par2	Second value of check point 2	UINT16	1039	Write/read
CP2par3	Third value of check point 2	UINT16	1040	Write/read
CP2par4	Fourth value of check point 2	UINT16	1041	Write/read
CP2par5	Fifth value of check point 2	UINT16	1042	Write/read
CP3par1	First value of checkpoints 3	UINT16	1043	Write/read
CP3par2	Second value of check point 3	UINT16	1044	Write/read
CP3par3	Third value of check point 3	UINT16	1045	Write/read
CP3par4	Fourth value of check point 3	UINT16	1046	Write/read
CP3par5	Fifth value of check point 3	UINT16	1047	Write/read
CP4par1	First value of check point 4	UINT16	1048	Write/read
CP4par2	Second value of check point 4	UINT16	1049	Write/read
CP4par3	Third value of check point 4	UINT16	1050	Write/read
CP4par4	Fourth value of check point 4	UINT16	1051	Write/read
CP4par5	Fifth value of check point 4	UINT16	1052	Write/read
CP5par1	First value of check point 5	UINT16	1053	Write/read
CP5par2	Second value of check point 5	UINT16	1054	Write/read
CP5par3	Third value of check point 5	UINT16	1055	Write/read
CP5par4	Fourth value of check point 5	UINT16	1056	Write/read
CP5par5	Fifth value of check point 5	UINT16	1057	Write/read
ProbeStop	Stop value of external probe	UINT16	1068	Write/read

ProbeMin	Minimum value of external probe	UINT16	1069	Write/read
Probe Max	Maximum value of external probe	UINT16	1070	Write/read
ShiftPhase	See chapter 19.7	INT16	1074	Write only
JobPhase	Name of current phase	STRING 14L	1100	Read only
JobCode1	Code of current job	STRING 24L	1114	Read only
JobCode2	Code of current job	STRING 24L	1128	Read only
JobCode3	Code of current job	STRING 24L	1142	Read only
JobCode4	Code of current job	STRING 24L	1156	Read only
JobCode5	Code of current job	STRING 24L	1170	Read only
JobCode6	Code of current job	STRING 24L	1184	Read only
JobCode7	Code of current job	STRING 24L	1198	Read only
OrderNumber	OrderID	STRING 24L	1212	Read only
OperatorNum	Operator ID	STRING 24L	1234	Read only
Issue A	BIT0: STOP FROM USER INTERFACE BIT1: STOP FROM ALARM CONDITION BIT2: TIME OUT BIT3: MAX PROBE BIT4: MIN PROBE BIT5: PROBE NOT OK BIT6: HIGH SPEED BIT7: LOW SPEED	UINT16	2000	Read only
Issue B	BIT0: MAX POSITION BIT1: MIN POSITION BIT2: MAX CONTACT BIT3: MIN CONTACT BIT4: MAX CHECK POINT BIT5: MIN CHECK POINT BIT6: TEST INPUT 2 BIT7: TEST INPUT 3	UINT16	2001	Read only
Issue C	BIT4: MAX FORCE BIT5: MIN FORCE BIT6: MAX BAND BIT7: MIN BAND	UINT16	2002	Read only
PeakForce	Force reached	UINT16	2008	Read only
PeakPosition	Position reached	UINT16	2014	Read only
ContactPos	Contact position	UINT16	2015	Read only
ProbeValue	Value measured by the micrometric probe	UINT16	2016	Read only
CP1ValueA	Value A at check point 1	UINT16	2017	Read only
CP1ValueB	Value B at check point 1	UINT16	2018	Read only
CP2ValueA	Value A at check point 2	UINT16	2019	Read only
CP2ValueB	Value B at checkpoint 2	UINT16	2020	Read only
CP3ValueA	Value A at check point 3	UINT16	2021	Read only
CP3ValueB	Value B at check point 3	UINT16	2022	Read only
CP4ValueA	Value A at check point 4	UINT16	2023	Read only
CP4ValueB	Value B at check point 4	UINT16	2024	Read only
CP5ValueA	Value A at check point 5	UINT16	2025	Read only
CP5ValueB	Value B at check point 5	UINT16	2026	Read only

\* To have the ready signal, the reject piece signal must be reset. To activate the auto reset you need to activate the option “Disable reset rejects from keyboard”.

## 19.5 Description of Check Point logs

Checkpoints are described by five different parameters: CPxPar1, CPxPar2, CPxPar3, CPxPar4, CPxPar5. The function of these parameters varies according to the type of check point.

Thanks to the checkpoints, for each piece worked, the instrument measures one or two values. These values are available in registers CPxValueA and CPxValueB.

The type of check point is indicated by the three least significant bits of parameter 5 (CPxPar5).

The types currently available are as follows:

CP\_FORCE = 011b

CP\_POSITION = 100b

CP\_PEAK = 001b

CP\_SPEED = 000b

### 19.5.1 Force check point logs

Register	Function	Value type
CPxPar1	Force measurement dimension	Quote
CPxPar2	Minimum force limit	Force
CPxPar3	Maximum force limit	Force
CPxValueA	Measured strength	Force

### 19.5.2 Position check point logs

Register	Function	Value type
CPxPar1	Height measurement force	Force
CPxPar2	Minimum position limit	Quote
CPxPar3	Maximum position limit	Quote
CPxValueA	Measured position	Quote

### 19.5.3 Peak check point logs

Register	Function	Value type
CPxPar1	Start position measurement minimum maximum values	Quote
CPxPar2	End of measurement position minimum maximum values	Quote
CPxValueA	Minimum measured value	Force
CPxValueB	Maximum measured value	Force

### 19.5.4 Log check point speed

Register	Function	Value type
CPxPar1	Speed measurement start position	Quote
CPxPar2	Speed measurement end value	Quote
CPxValueA	Speed	Speed

## 19.6 Description unit of measure

The following table contains the correspondence between the contents of the register with the unit of measure and the unit of measure to be used:

Index	First name	Unit of measure
0	decanewton	daN
1	kilonewton	kN
2	Newtons	No
6	Millimeters	mm
7	Micrometer	µm

## 19.7 Shift Register Description

The **ShiftPhase** register, accessible from the field bus, allows you to easily adjust the parameters of a work phase for pieces of different heights, while keeping the press controls unchanged. This is useful when you have pieces of varying heights that require the same processing. To use this function, it is essential to have a reference piece with a known height. The value to be written in the shift register will be the difference between the reference height and the height of the workpiece.

Note that the **ShiftPhase** register is a signed 16-bit register, so height differences relative to the reference piece can range between -320 mm and +320 mm.

When setting up the equipment, it is important to consider the heights of both the tallest and shortest pieces, ensuring that:

- 1 - The total stroke of the cylinder is sufficient for the shortest pieces.
- 2 - The available space is adequate for the tallest pieces.

After writing the shift value in the **ShiftPhase** register, Command 35 must be used to execute the shift.

### 19.7.1 Job Setup

Before setting the job parameters, you need to write the height difference between the reference piece and the pieces you are using for setting the parameters in the shift register. If the job is defined by testing on pieces with the reference height, the shift register should be set to zero. If you do not have a piece with the reference height and need to create the recipe on a piece with a different height, you must first write the height difference in the shift register. For example, if the reference piece is 50 mm high and you do not have pieces of this height, to create the recipe on a piece with a height of 80 mm, you need to write -30 mm in the shift register before proceeding.

### 19.7.2 Production Operation

When moving to the production of a piece with a different height, it is sufficient to write the height difference in the shift register. Suppose the new piece to be processed is 20 mm taller than the reference piece; you should write -20 mm in the register before starting the pressing operation. The value is negative because a taller piece requires a shorter cylinder stroke. Indeed, the position values of the job parameters must decrease as the height of the piece increases.

### 19.7.3 Practical Example

I choose a piece with a height of 50 mm as the reference piece. First, you need to write zero in the shift register. At this point, I start setting the job parameters by testing on pieces with a height of 50 mm. When in production, we will set the shift register according to the height of the workpiece. For example, if I need to work on a piece with a height of 55 mm, I will write -5 mm in the register; if I need to work on a piece with a height of 30 mm, I will write +20 mm in the shift register.

## 20 Technical data

The list of technical characteristics follows:

Subject	Characteristics
DC version power supply	24VDC Absorption 1A (excluding transducer absorption and input/output)
Sampling rate	700 samples/second
Dimensions	Width: 205mm Height: 175mm Depth: 240mm
Length of accepted codes	Up to 38 characters are accepted but only a part is stored. The memorized part must be defined by indicating the start and length of the useful part.
Part serial number length	Maximum 28 characters with the possibility of cutting longer codes
Job identification code length	Maximum 24 characters
Number of codes associated with individual jobs	Maximum 7
Operator code length	Maximum 24 characters
Maximum job number length	Maximum 24 characters

### 20.1 Instrument features

The *Press-Right* detects the position-force curve during work.

Manages and controls the speed profile of the cylinder.

Work on a continuous band of tolerance by controlling the entire position-force curve.

Check the elevation and peak force values.

Controls the stop of the press when a position or a force is reached.

Check the starting position measured in contact with the piece.

Check critical points of the position-force curve through *check-points*.

It manages up to eight consecutive phases with independent parameters.

All control parameters are stored in *250 independent and selectable jobs*.

Advanced management of users with passwords and personal authorizations.

It is possible to connect the *Press-Right* to the computer and, thanks to the *WinScope* program, save the curves, modify the settings, carry out statistical analyses, print the data.

Saving of the curves on internal flash memory accessible in FTP.

Job selection by barcode reading.

Registration of the serial number of the piece by reading the barcode.

It manages up to three antennas for the recognition of the equipment through RFID tags.

It manages up to three enabling signals.

Handles up to three additional pass/fail control signals.

Programmable periodic request for tool replacement due to wear.

Programmable periodic maintenance request.

Integrated management of a small pick-to-light system.



This image indicates that this appliance cannot be disposed of with unsorted domestic waste but must be disposed of separately. At the end of use, please send the appliance to Alfamatic to reduce the waste of materials and resources.

