PRESS -RIGHT

With VIO10 card

- Installation manual

1 Press-Right Installation

This chapter describes the operations required to assemble and connect the *Press-Right* to the machine and to make it operational.

The *Press-Right* instrument has been designed to work stand-alone or combined with a PLC (see important information in section 1.4.1).

For operation, the *Press-Right* instrument must be connected to a PLC via various input and output signals. In addition to this, the instrument must be connected to a force transducer (typically a load cell) and to a position transducer (incremental encoder, potentiometer or transducer with analog output).

The load cell and encoder or potentiometer are powered by the instrument itself. The instrument also contains the amplifiers needed to condition the signals coming from these transducers.

The *Press-Right* is supplied with ModbusTCP as standard and can be requested with PROFINET or EthernetIP interface.

1.1 Important notes for installation

If you use an incremental encoder, even if you use the fieldbus, the TDC signal must always be connected to the relevant digital input (X3.3). Furthermore, the use of the GO and BOOSTER digital outputs for cylinder command, instead of the relative fieldbus signals, reduces stop delays to a minimum, considerably improving the pressing quality.

This manual refers only to the instrument with VIO10 internal card.

This instrument is not (and could not be) a safety device: the movement of the press must be entrusted to external elements. The instrument simply synchronizes the movement of the press for its own operation.

It is very important that the unshielded end of the load cell cable be as short as possible.

When electric motors are present, these must be equipped with an anti-interference filter and must be controlled by means of semiconductor devices.

Press-Right instrument must be powered at 24VDC. It is possible to have an optional internal power supply that allows direct connection to the mains voltage.

Always connect the instrument case to the earth conductor.

1.2 Instrument operation

Attention: Press-Right instrument is not (and could not be) a safety device: the movement must be entrusted to elements external to it. The instrument synchronizes the movement for its own operation. Usually, the GO and BOOSTER outputs are connected in series to the

cylinder safety chain. In short, if the instrument activates the outputs, the cylinder must not move if the machine is not in safety.

Operation occurs as follows: when the START input of the instrument is activated by an external command, the *Press-Right*, if ready and with all ENABLE inputs active, activates the downward output of cylinder GO. With the presence of the GO signal, the cylinder must advance until the instrument removes the same signal.

With GO output active, the instrument activates the BOOSTER output when it reaches contact on the piece.

According to the stop parameters reached (position, force, etc.) the *Press-Right* removes the GO signal.

After removing the GO signal, the instrument continues to control the curve until either the force and height begin to decrease and the cylinder retracts. This is provided with the signal of good or bad piece.

If the piece is good, the OK output is activated. Conversely, if the piece is rejected, the KO output is activated.

The correct zeroing of the encoder takes place using its zero signal and the TDC back cylinder signal.

1.3 Internal cards

The *Press-Right* is made up of two electronic components:

PR2MB2 front panel   this component mounts the display, the keyboard, the memory and the CPU.

VIO10 Input and output   the digital input and output, the transducers and the communication port are connected to this card.

All cards are made by us.

1.4 Electrical wiring

The following information is needed to carry out the electrical wiring of the instrument.

1.4.1 Information for connecting to an external controller (PLC)

The PLC connected to the *Press-Right* must be PNP positive logic. The inputs and outputs of the instrument are isolated and protected and consequently **there is no need for interfacing relays**. The essential signals for operation are START, GO, OK and KO.

Remember that in all cases it is always necessary to connect the TDC input of the instrument. The TDC signal can be taken directly from a limit switch activated with the press in rest position. When the press signal in the rest position is also needed by the PLC, the signal to be supplied to the instrument can be taken in parallel with the one connected to the PLC.

1.4.2 Wiring with VIO10 card

When closing the instrument, make sure that the display cables are not crushed between the frame and the case.

When closing the instrument, check that the USB and LAN connectors fit well in the relevant holes to avoid crushing them.

This information refers only to the VIO10 card. Check that the card in question is exactly this version.

Terminal number 1 of the terminal blocks is always at the bottom

Each terminal of each terminal block is numbered. The seventh terminal of the X18 terminal block will be called X18.7. The numbering of the terminal blocks is also shown on the board itself.
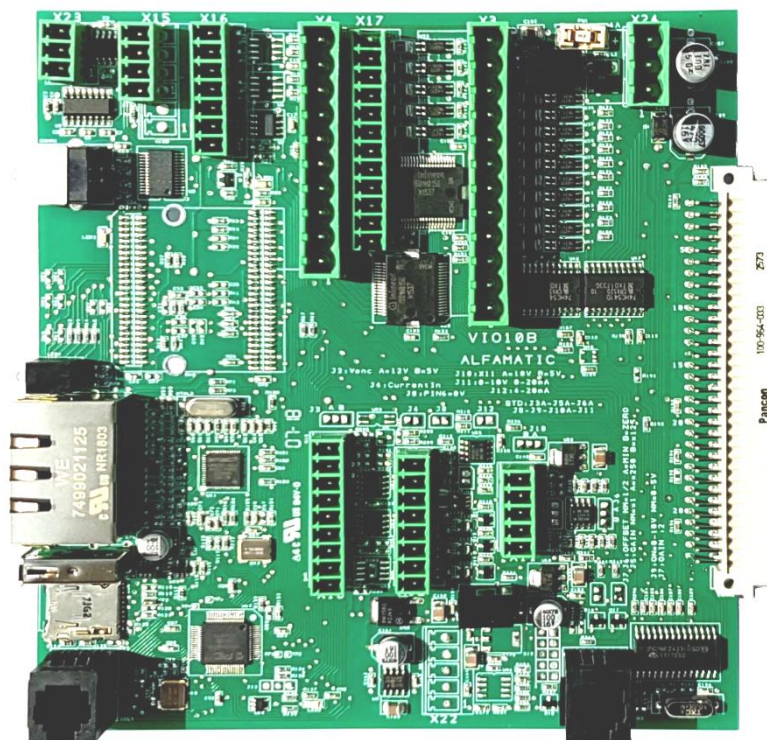

Figure1

Main power terminal block (X24)

Press-Right electronics and transducers are powered at 24VDC via the three-pole terminal block X24.

Name	Terminal	Function
0VDC	x24.1	Negative power supply
PE	X24.2	Earth connection
+24VDC	X24.3	Positive feeding

If the internal power supply is present, the switch behind the instrument must interrupt the phase and the neutral before reaching the power supply itself. The power supply output is connected to terminal block X24.

Input terminal block (X3 and X17)

The inputs are isolated and compatible with clean contact signals or with PNP 24VDC transistor output. Terminal block X17 is optional.

Name	Terminal	Default
Input 0	X3.1	START
Input 8	X3.2	
Input 1	X3.3	TDC (1)
Input 9	X3.4	
Input 2	X3.5	
Input 3	X3.6	
Input 4	X3.7	
Input 5	X3.8	
Input 6	X3.9	
Input 7	X3.10	
0VDC	X3.11	Power mass
+24VDC	X3.12	Power positive

(1) The TDC input (cylinder back) must always be input 1.

Name	Terminal	Default
Input 10	X17.7	
Input 11	x17.8	
Input 12	x17.9	
Input 13	x17.10	
Input 14	X17.11	
0VDC	X17.12	.

The function of each input is configurable. Each input can have one of the following functions:

Name	Preferred	Function
START	0	Request to start a new cycle. If it is removed, the acquisition is interrupted.
TDC (1)	1	"Top dead centre" signal, used as a reset for a new cycle and in AND with the zero notch of the encoder for the zero of the absolute positions
BIT JOB SELECTOR		These inputs are used to select a job with their binary combination.
BIT PHASE SELECTOR		These inputs are used to select the work phase with their binary combination.
RED BASKET 1	2	Sensor for normal waste container
RED BASKET 2	3	Sensor for the special waste container
SELF-CHECK BASKET		Sensor for the sample container used in self-test
RESET	2	Re-enables the tool after a discard
AIR PRESENCE		Pneumatic supply presence sensor
ENABLE #		See chapter 2.3
TEST SIGNAL #	#1=4	See chapter 2.3
PICK-TO-LIGHT SENSOR		Sensor for pick-to-light box
MAINTENANCE	5	Turn off all controls
TABLE IN POSITION		Manual slide signal in working position
IMPULSIVE STARTS	Left=6 Right=7	Request to start a new cycle
NO ALARM		No emergency commands
SAFETY		Machine in safety (guards closed)

(1) The TDC input must always be input 1.

Output terminal block (X4 and X17)

Outputs are 24VDC PNP. For inductive loads, such as valves and relay coils, a diode must be fitted in parallel to eliminate overvoltage. Tterminal block X17 and the output 8 on X4.4 are optional.

Name	Terminal	Default
Output 0	X4.1	GOOD
0V	X4.2	Power ground
Output 1	X4.3	REJECTED 1
Output 8	X4.4	
Output 2	X4.5	GO
Output 3	X4.6	
Output 4	X4.7	CONTACT/BOOSTER
Output 5	X4.8	
Output 6	X4.9	
Output 7	X4.10	

Name	Terminal	Default
Output 9	X17.1	
Output 10	X17.2	
Output 11	X17.3	
Output 12	X17.4	
Output 13	x17.5	
Output 14	X17.6	

The function of each output is configurable.

Each output can have one of the following functions:

Name	Default	Function
GOOD	0	Good piece signal. It is activated when the cylinder has returned to its rest position. It should not be used to interrupt pressing.
REJECTED	1	Normal rejected signal. It is activated when the cylinder has returned to its rest position. It should not be used to interrupt pressing.
REJECTED 2	7	Special rejected signal. It is activated when the cylinder has returned to its rest position. It should not be used to interrupt pressing.
GREEN LAMP GOOD	0	Good piece indicator.
RED LAMP REJECTED 1	1	Normal rejected indicator.
RED LAMP REJECTED 2		Special rejected indicator.
AUTO-CHECK REJECTED		Sample reject piece signal used in self-test
GO	2	Pressing consent. Activated after the start if the instrument is ready and deactivated when the stop value is reached.
CLOSE THE DOOR		Guard closing command
OPEN THE DOOR		Guard opening command
BUZZERS	3	Acoustic signal command.
TRIGGER TEST		Activation signal for TEST SIGNAL 1 See 2.3
CONTACT/BOOSTER	4	Workpiece contact signal and start of the power phase. Note: This signal is activated only if the TDC signal is missing
JOB BIT		Binary combination of active job number
PHASE BIT		Binary combination of active phase number
PICK-TO-LIGHT LAMP		Light for pick-to-light box
OPEN GREEN BOX		Good pieces basket opening command
BLOCK OF THE TABLE		Manual slide lock control
PULL LEVER		Cylinder return aid cylinder control (for heavy tools)

Transducer terminal block (X12)

An incremental encoder, a potentiometer or a transducer with analog output can be connected to terminal block X12.

The power supply for the transducers can also be taken from this terminal block. A supply voltage of 12VDC (J3A*) or 5VDC (J3B) is foreseen for the encoder. A 10VDC precision voltage supply is provided for the potentiometer.

Name	Terminal	Description
Phase Z	X12.1	Zero signal
Phase B	X12.2	PHASE B signal
Phase A	X12.3	PHASE A signal
+FR	X12.4	12V power supply with J3A or 5V with J3B
0VDC	X12.5	Mass
AIN-	X12.6	Analog input negative (with J8 inserted it is at Ground for shielded cable shield)
+10VDC	X12.7	Analog transducer power supply
AIN+	X12.8	Positive analog input

Electrical characteristics of terminal X12.4 with J3A*

Output voltage	12V ±10%
Continuous output current	200mA
Protections	Current, Temperature

Electrical characteristics of terminal X12.4 with J3B

Output voltage	5V ±10%
Continuous output current	200mA
Protections	Current, Temperature

Electrical characteristics of terminal X12.7

Output voltage	10V
Continuous output current	10mA
Protections	Current, Temperature

Input circuit terminals X12.1, X12.2 and X12.3
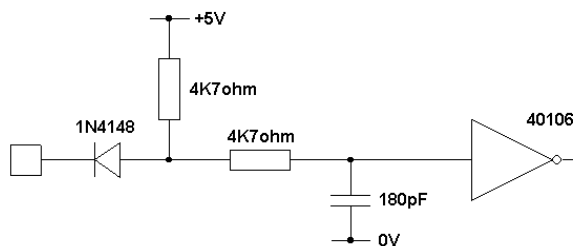
X12 analog input type selection

	J4	J9	J11	J12
0-10V input *	OPEN	IN	IN	OPEN
0-5V input	OPEN	OPEN	IN	OPEN
0-20mA input	IN	IN	IN	OPEN
4-20mA input	IN	IN	OPEN	IN

* default

Load cell terminal block (X11)

Input for resistive bridge load cell with sensitivity of 2mV/V or differential analog input 0-10V or 0-5V. The transducer power supply is also present on this terminal block.

Name	Terminal	Description	Gefran TU	AEP TC4
IN+	X11.1	Positive input	Yellow	Yellow
IN-	X11.2	Negative input	Red	White
0V	X11.3	Shield	Fits	Fits
0V	X11.4	Power ground	Green	Black
+VDC	X11.5	J10A=10V J10B=5V	White	Red

Electrical characteristics of terminal X11.5 voltage 10V

Output voltage	10V ±10%
Continuous output current	60mA
Protections	Current, Temperature

Electrical characteristics of terminal X11.5 voltage 5V

Output voltage	5V ±10%
Continuous output current	100mA
Protections	Current, Temperature

X11 analog input type selection

	J5	J6	J7	J10
Load cell 2mV/V 10V compression only *	TO	TO	OPEN	TO
Load cell 2mV/V 10V compression and traction	b	OPEN	OPEN	TO
Load cell 2mV/V 5V compression and traction	TO	OPEN	OPEN	b
0-10V input	OPEN	b	IN	TO
0-5V input	OPEN	b	OPEN	b

default

Optional encoder terminal block 422 (X18).

This terminal block is used to connect an encoder with 422 signals. This terminal block is optional.

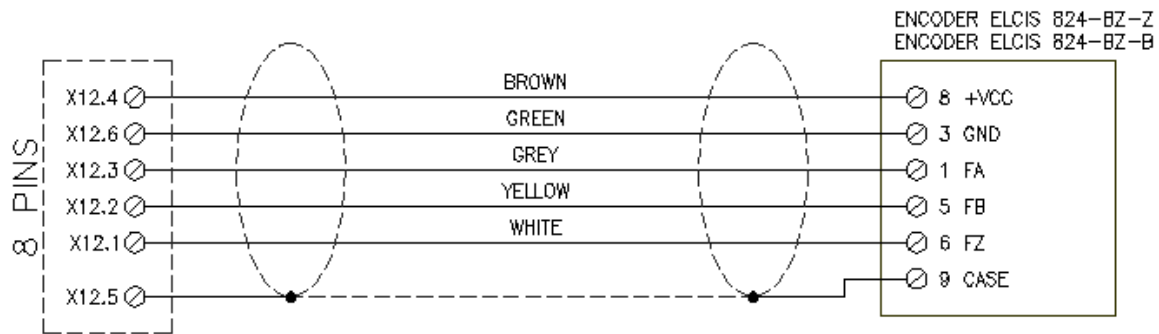| Name	Terminal	Description
0V	X18.1	Signal reference voltage
ENC_C-	X18.2	Zero mark signal -
ENC_C+	X18.3	Zero mark signal +
ENC_A-	X18.4	Phase A signal -
ENC_A+	X18.5	Phase A+ signal
ENC_B+	X18.6	Phase B+ signal
ENC_B-	x18.7	Phase B signal -
+VDC	X18.8	Power supply: 12V with J3A or 5V with J3B
0VDC	X18.9	Shield

Encoder Alfamatic EMAG1

Type: incremental quadrature encoder

Resolution: 0,01 mm

Index pulse: every 5 mm

Colour	Function	
White	0 V	X12.6
Brown	+ VDC	X12.4
Green	Signal A	X12.3
Yellow	Signal B	X12.2
Black	Signal Z	X12.1
Violet	Signal A inverted	
Orange	Signal B inverted	
Gray	Signal Z inverted	
Screen	PE	X12.5

Other transducer connection
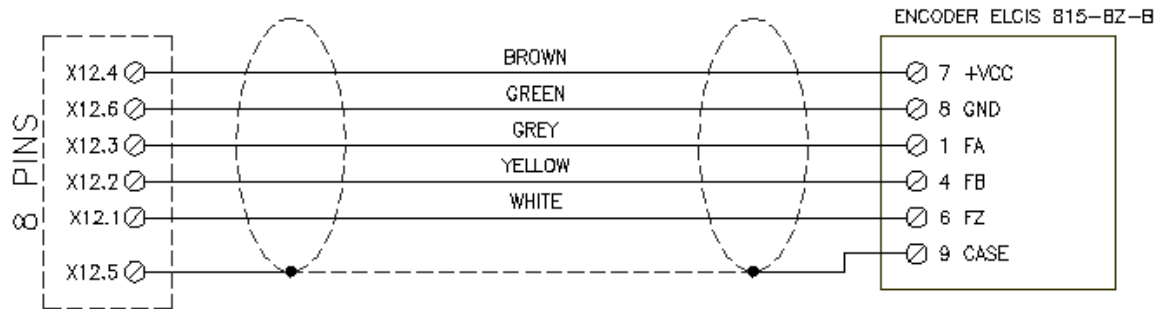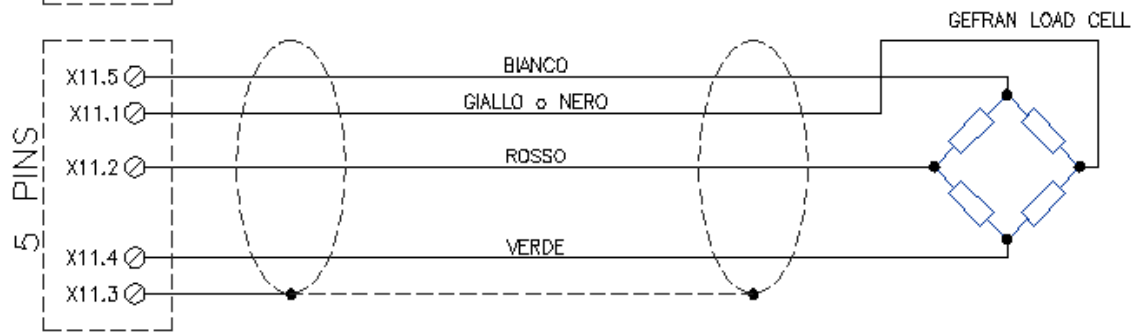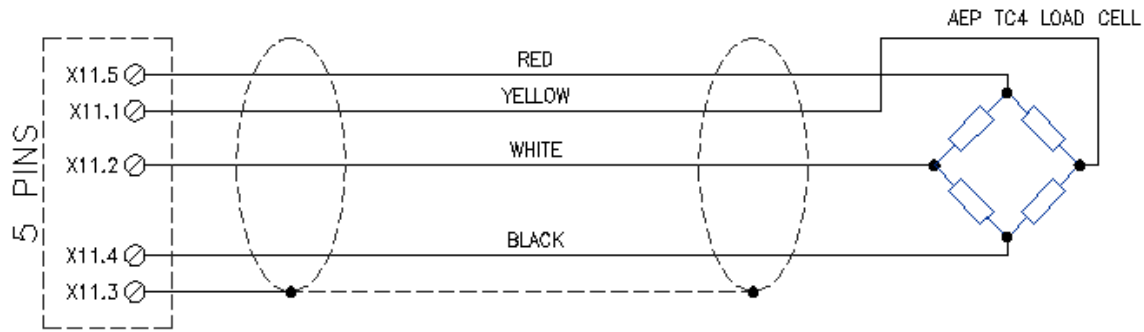
Optional internal serial port terminal block (X23).

The RS485 serial port can only be used for connection RFID radio device. This terminal block is optional.

Name	Terminal	Description
0V	X23.1	Serial reference GND
A+485	X23.2	RS485 interface signal
B-485	X23.3	RS485 interface signal

Optional analog output terminal block (X16).

There are two analog outputs on terminal block X16. Analog output 1 can be used to drive a proportional valve for regulating the cylinder operating pressure. This terminal block is optional.

Name	Terminal	Description
CLK+	X16.1	Do not connect
CLK-	X16.2	Do not connect
DIR+	X16.3	Do not connect
DIR-	X16.4	Do not connect
ANA2	X16.5	Analog output 2
ANA1	x16.6	Analog output 1
0V	x16.7	Signal reference voltage

2 Special functions

This chapter describes the special functions of the inputs and outputs.

2.1 Configure automatic job selection

The *Press Right* supports automatic job selection by combining inputs or via a bar-code scanner.

The selection via inputs can be useful for the automatic recognition of the piece or of the mounted tool.

To enable the automatic selection of jobs, select the menu **TOOLS > SETUP > JOBS SELECTION**.

2.1.1 Selection via inputs

With selection by inputs, the instrument changes its job when the state of the inputs changes. The instrument ignores the job change command when the START signal is active.

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

2.2 Connecting an external reset

When a reject is detected, the tool blocks preventing the execution of other pieces. To unlock the instrument it is necessary to reset the deviation. To reset the deviation, press the RESET key or activate a RESET input. It is to avoid locking the instrument with reject by disabling the keyboard reset from the general options menu in the instrument configuration.

2.3 Additional controls

Up to six additional controls can be connected to the instrument.

Three of these are used as consent to start the press, the other three are used to determine the good or bad outcome of the job or as other consents to start.

The first three are called ENABLE, the second three are called TEST SIGNAL. It is possible to assign a name to each additional control from the instrument configuration menu.

It is possible to establish in each job whether to exclude the additional checks.

The TEST SIGNAL 1 control can also be associated with an output signal useful for activating the control itself.

To use the additional controls you need to configure the instrument by indicating which inputs the signals are connected to.

After configuring the inputs, it is possible to assign an identification name to each of the six signals.

The enabling signals are checked when the START signal is activated: if an enabling signal is missing, the instrument displays the message absence of enabling signal.

The test signals condition the good or rejected outcome: if a test signal is missing, the piece is rejected.

The moment in which the presence or absence of each test input is checked is individually configurable.

The time when the test signals are checked can be chosen in the job options. Note that only the input tests 1 all possibilities.

at the start   the signal is checked when the starting input is activated

upon arrest   the signal is monitored when the stop is commanded

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in the end   the signal is checked when the cylinder has moved back

continuous   the signal is controlled from start to stop

enabling   the signal is used as a start enable signal

3 Instructions for assembling the Press-Right

Always disconnect the instrument from the power supply before opening it.

Open the instrument by unscrewing the four screws placed in the corners of the panel.

Pull out the internal card.

Remove the terminal block assemblies.

To fix the instrument it is possible to drill the container on the sides or above or below in a central position (first remove all the boards).

Fit the cable glands and plugs.

Thread the wires through the cable glands and start wiring.

It is very important that the unshielded end of the load cell cable be as short as possible

After wiring, insert the cards

Finally, insert the groups of terminal blocks paying attention to the correct insertion direction.

Pay attention to the cables that must not be crushed on the bottom of the instrument.

Once the wiring is completed, it is possible to power the instrument and follow the next steps:

- Configure the tool.
- Check the operation of the inputs and outputs, using the commands in the **DIAGNOSIS**
- Calibrate transducers.

4 Transducer assembly

Encoder and load cell for Alfamatic cylinders.