Check Point 4

Version 1.05 and subsequent

Installation manual

Sep. 20, 2012

1 Introduction

This manual describes the operations necessary to connect CHECK POINT to the machine and to render it operational.
CHECK POINT is available in two versions: 24VDC or 100-240VAC 50-60Hz.
Before connecting the device please check the supply voltage.

Figure 1

1.1 Functions of the device

CHECK POINT has two function modes: *STANDBY* and *MEASURE*. When in standby mode, the device waits for the **start** command to begin measuring. When in measuring mode it controls the value detected until the **stop** command brings the device back to its standby mode. **Start** and **stop** events depend on the device's configuration.

1.1.1 STANDBY

When the device is in standby mode it is possible to access the menu to change function parameters.
The device enters measuring mode after activating the **start** command.

1.1.2 MEASURE

When the device is in measuring mode, the measured value is controlled.
The device terminates the measurement phase following a **stop** command.
Once the measurement has been terminated, the display will show a *good* or *rejected* outcome of the measurement.

1.1.3 START

If an input port is configured as *start input port* the passage to the measurement phase will occur when this input port is activated. On the other hand, if there is no *start input port*, passage to the measurement phase will occur when the measured value exceeds the programmable threshold value **V.START**.
Please note that, when at least one *output ports* with activation upon *start* is configured, therefore, when the device can reject a start and not activate the exit port, then the start command is not accepted in the following cases:
- If the last measurement was a reject and the device has not yet been **reset**.
- If *enabling inputs* have been configured and these input ports are not all active.

1.1.4 STOP

The measurements will be terminated when the measured value falls below the **V.START** programmable value minus the **V.HYSTERESIS** value. However, please note that if at least one *output port* has been configured with commutation *upon arrest*, then the measurement will terminate only if the **V.ARRESTO** arrest value has been reached before.

1.2 Input and output ports

CHECK POINT has eight configurable input ports and 4 output ports.

1.2.1 Input port configuration

In its current version it is possible to configure only two input ports in one of the following ways:

START

The activation of this input port commands the passage from the standby to the measurement mode. If no input port is configured as start, the passage from standby to measurement mode will occur when the detected value exceeds the **V.START** threshold value.

RESET

Activating this input port resets the device after a measurement which resulted in a reject.

1.2.2 Output port configuration

Each output port can be configured in one of the following ways:

GREEN LIGHT

Useful for connecting a green light indicating a good piece. It will be activated at the end of a measurement if the outcome is positive and until the subsequent start command.

RED LIGHT

Useful for connecting a red light indicating a rejected piece. It will be intermittently activated at the end of a measurement if the outcome negative, and it will be fixed when reset and will be deactivated at the subsequent start command.

BEEPER

It will be activated at the end of the measurement if the outcome is negative and will be deactivated when reset.

GREEN/STOP LIGHT

Useful for connecting a green light indicating a good piece and when the required force is achieved when the device is connected to manual presses. It will be activated when the minimum set force is achieved and will remain active with a positive outcome until the subsequent start command.

ENABLE/STOP VALVE

This signal is activated when the device is ready and deactivated upon arrest, or if the device is not ready. Useful for connecting a press enabling electro-valve.

PRESS VALVE

Activated when a start command is accepted and deactivated when the programmed arrest value is achieved. Useful for connecting a press function electro-valve.

SETPOINT 0..3

Generic output port activated when the value exceeds a programmable value and deactivated when it falls below the same programmable value minus the **V.HYSTERESIS** value. There are four programmable thresholds. The control of these output ports occurs always both during standby and measurement phases.

2 CHECK POINT hardware

Please read the following remarks:

Always check the power supply voltage required by the device before connecting it.

This manual refers ONLY to the version equipped with CP4 electronic cards. Check the markings on the card itself.

This device is not (and shouldn't be) a safety device: press operation must be assigned to other devices. This device can only synchronise the operation of the press for its own function.

It is very important that the final unsheathed part of the load cell cable is as short as possible.

When the machine has electric motors, these must be equipped with an anti-disturbance filter, and must be commanded by means of semi-conductor devices.

Always connect the device's container to the grounding cable.

2.1 Power supply

CHECK POINT operates at 24VDC, the version of the device operating at 100-240VAC contains a power supply (Figure 2) which supplies a voltage of 24VDC required to operate the device.
If present, the power supply must be supplied by grid voltage interrupted by the switch located on the rear panel of the device. The internal power supply allows for a direct connection with the power grid with voltages ranging between 100VAC and 240VAC, both at 50Hz and 60Hz and supplies a maximum current of 1A.

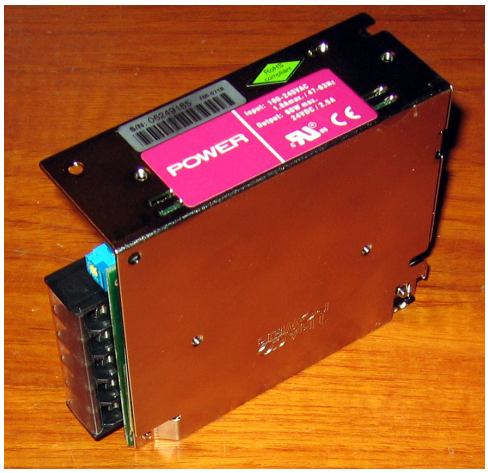

Figure 2

2.2 Transducers and signals

<u>Caution:</u> CHECK POINT is not (and shouldn't be) a safety device: press operation security <u>must</u> be assigned to <u>other devices</u>.

CHECK POINT has an input port for connecting a transducer, four output ports, eight digital input ports and one RS232 communication port.

There are three versions of the device, compatible with three different types of transducers, so it is necessary to order the correct version of the device. Furthermore, the device can be adapted to any special need.

Resistive bridge input. A typical signal used in load cells (force transducers). The load cell can be connected directly to the device without the use of a conditioning interface. In fact CHECK POINT is equipped with a power supply (10VDC) and an amplifier (2mV/V) for directly connecting the transducer.

Analog 0-10V input. This signal is used by many kinds of transducers. Power dial, LVDT, resistive magneto, pressure switch, etc. The power dial can be directly connected to the device. In fact CHECK POINT is equipped with a power supply (10VDC) and an amplifier for directly connecting the transducer.

Incremental encoder input. Quadrature two phase input port with a x4 multiplier. This signal is used by the encoder and by the optical line (position transducer). The encoder can be directly connected to the device. In fact CHECK POINT is equipped with a power supply (12VDC) for directly connecting the transducer.

The function of both **input and digital output ports** can be configured.

The serial communication port allows to read the measured values and to program operation parameters (see dedicated manual).

2.3 Wiring instructions

Input signals to CHECK POINT can be either with a *clean contact* or a 24VDC positive logic, meaning with a PNP transistor output port.

When active, CHECK POINT output ports supply a voltage of 24VDC. The maximum load for each output port is 15 watts, conditional to the fact that the power supply is enough.

In order to connect the device directly to a PLC, the PLC must have a 24VDC positive logic (PNP type input and output ports).

Wiring is based on various removable terminals which can be present or not according to the device's model. The terminal groups are numbered (X1, X2, X3, X24). Each single terminal is also numbered. For example, when indicating terminal X1.7, the reference is to the seventh terminal of terminal group X1. The numbering is shown in Figure 4.

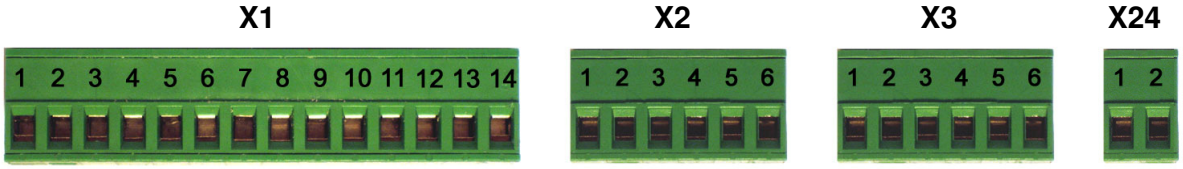

Figure 4

2.3.1 Power supply terminal (X24)

24VDC power supply.

Note: If the power supply is internal, the switch at the back of the device must interrupt the line's phase and neutral before reaching the power supply itself.

Name	Terminal	Description
0VDC	X24.1	Power supply negative
+24VDC	X24.2	Power supply positive

2.3.2 Input output port terminals (X1)

24VDC power supply.

Note: If the power supply is internal, the switch at the back of the device must interrupt the line's phase and neutral before reaching the power supply itself.

Input ports for clean contact signals or with PNP 24VDC transistor output port.

Output ports for operations at 24VDC. For inductive loads, such as valves and relays, it is necessary to install a diode or a filter in parallel to the coils to avoid over-voltages.

Name	Terminal	Description
Input port 0	X1.1	
Input port 1	X1.2	
Input port 2	X1.3	
Input port 3	X1.4	
Input port 4	X1.5	
Input port 5	X1.6	
Input port 6	X1.7	
Input port 7	X1.8	
Output port 0	X1.9	
Output port 1	X1.10	
Output port 2	X1.11	
Output port 3	X1.12	
0VSDC	X1.13	Sensor power supply
+24VSDC	X1.14	Sensor power supply

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Absorption of each single input port:          12 mA
Nominal current of each single output port:    1 A
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2.3.3 Encoder terminal (X2)

Name	Terminal	Description
0V	X2.1	Screened cable sheath
+12V	X2.2	Encoder power supply at 12VDC
0V	X2.3	Encoder grounding
Fase Z	X2.4	Zero signal
Fase A	X2.5	PHASE A signal
Fase B	X2.6	PHASE B signal

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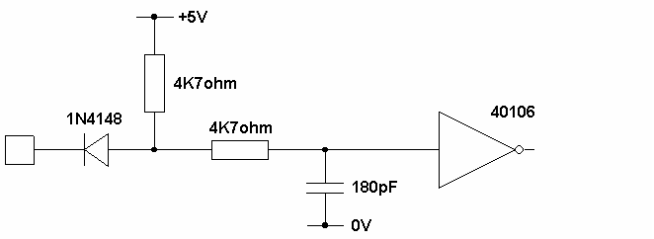
Encoder power supply:                          12V ±20%
Continuous power supply current:               200 mA
```

Encoder signal input (X2.4, X2.5 and X2.6 terminals):



2.3.4 Terminal for load cell or 0-10V input port analogical signals (X3)

Input port for the resistive bridge load cell with a sensitivity of 2mV/V or 0-10V input port.

Name	Terminal	Description
0VL	X3.1	Screened cable sheath
IN+	X3.2	Positive input
IN-	X3.3	Negative input
0V	X3.4	Load cell or power dial grounding
POT	X3.5	Power dial cursor
+10V	X3.6	Power supply positive

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Output voltage for the load cell version:          10V ±10%
Continuous output Current:                         60mA
Output voltage for the power dial version:         10V ±0.5%
Continuous output Current:                         10mA
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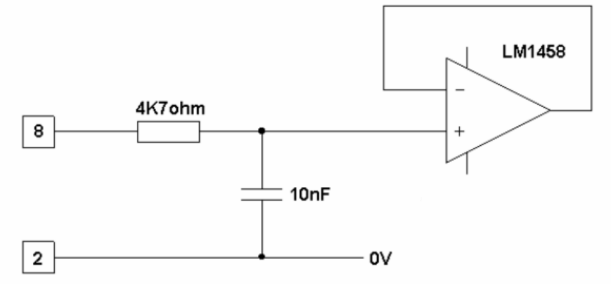
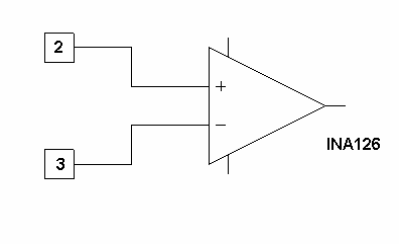
0-10V input port (X3.5 terminal):



Load cell input port (X3.2 and X3.3 terminals):



Note: it is very important that the final unsheathed part of the load cell cable is as short as possible:

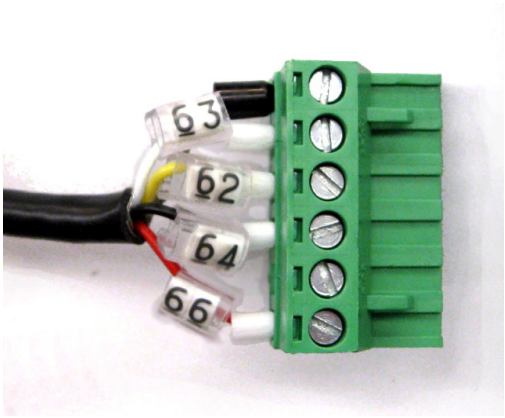
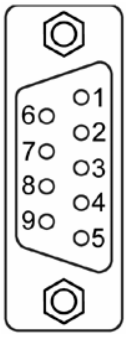


Figure 5

2.3.5 Serial port terminal (CONN1)

At the back of CHECK POINT there is a 9 pole male D-Sub connector for an RS232 serial connection. The connector's specifications are:



Pin 2: RX *Check Point* input line.
Pin 3: TX *Check Point* output line.
Pin 5: GND signal grounding

2.4 Assembly instructions

In order to secure the device to the machine it is possible to perforate the box. If it is secured via the lower part, it is necessary to take into account the card which must be assembled in the lower groove. Therefore, securing screws should not protrude on the inside by more than 7 mm.

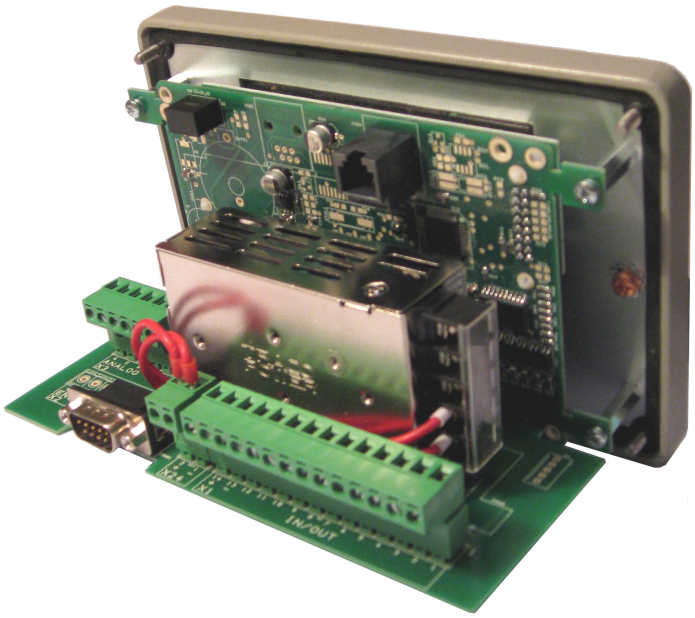


Figure 6

In order to open CHECK POINT unscrew the four screws located at the corners of the front panel.

Remove the terminal groups.

Extract the electronic cards from the front part (Figure 6).

Install the necessary wire tubes and plugs (Pg 9).

Thread the wires through the wire tubes and begin wiring as per the electrical schematic.

To know the number of the terminal groups, please refer to Figure 4.

After wiring, install the card.

Install terminal groups according to their insertion order.

2.5 Important remarks for the load cell

Normally, a tool or an adaptor is screwed to the load cell. In order to avoid it to become unscrewed there is an anti-rotation clamp. This clamp MUST NOT exert pressure between the central part of the cell and its edge.

In essence, there must be at least half a millimetre of space between the clamp and the cell's edge, as can be seen in the picture.

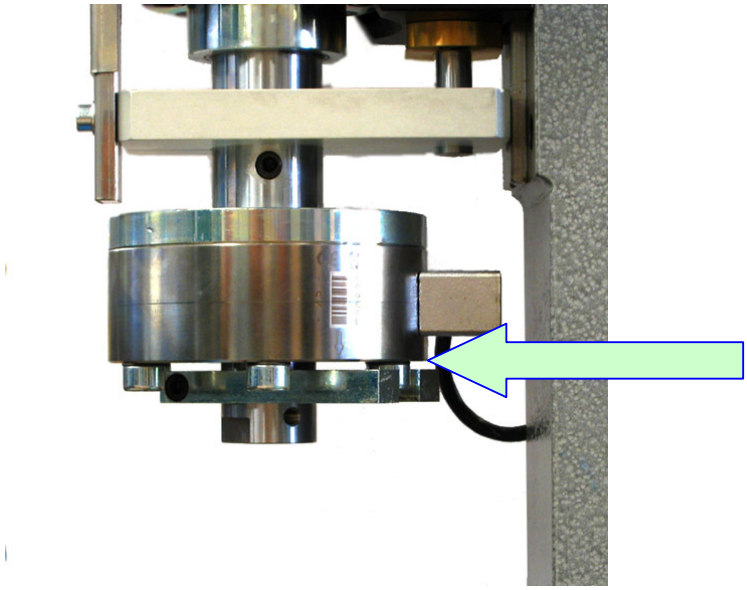


Figure 7

2.6 Encoder alignment

In order to correctly position the encoder, it is necessary, first of all, to zero the offset and then to follow these instructions:

2.6.1 For Tromboline type Alfamatic presses

Turn the device on and remove the cover which protects the encoder, the rack and the stop of the upper dead point by unscrewing the two screws. While pressing the stop, lower the cylinder with the press' lever; in this way, the device's display will show a changing value which, at a certain point will reach zero. This is the exact position of the encoder's zero point. Now, pull the encoder back in order to disconnect the rack's pinion, keep it in this position and return the cylinder back to the upper dead point. While keeping the encoder disconnected from the rack, lower the cylinder by about 1 millimetre. At this point it is possible to let go of the encoder. Lift the cylinder to the upper dead point and verify that the device shows a value ranging between –3 and –1 millimetres.

In order to verify the exact position, turn the device off and on again: at this point the value must be zero. Lower the cylinder with the lever and bring it back to the upper dead point: at this point the device must show a negative value of just a few millimetres.

2.6.2 For standard tipe Alfamatic presses

First of all press the press' emergency button, turn the device on and open the rack lock's upper cover, which is secured by two self-threading phillips screws. Inside it is possible to see the encoder's pinion. Unscrew the screws which secure the encoder and move it upwards; in this way, the device's display will show the value which, at a certain point will reach zero. This is the exact position of the encoder's zero point. Now move the encoder downwards by about 1 millimetre so that the display shows –1 millimetre. Pulling the encoder back it is possible to disconnect the pinion from the rack, so that the encoder can be repositioned in its original position without having the device change the value. In essence the encoder must be secured and the display must show a value ranging between –3 and –1 millimetres.

In order to verify the exact position, turn the device off and on again: at this point the value must be zero. Lower the cylinder with the lever and bring it back to the upper dead point: at this point the device must show a negative value of just a few millimetres.

3 Setup configuration program

The ***CheckPoint 4 setup*** program allows to configure the device, to set passwords and to update Check Point's internal software.

3.1 Firmware update

To update the device's firmware, it is necessary to start-up the bootloader and to use the ***CheckPoint 4 setup*** program. In order to start-up the bootloader, it is necessary to turn the device off, press together the **RESET** 

and  buttons and turn the device on while keeping these two buttons pressed.

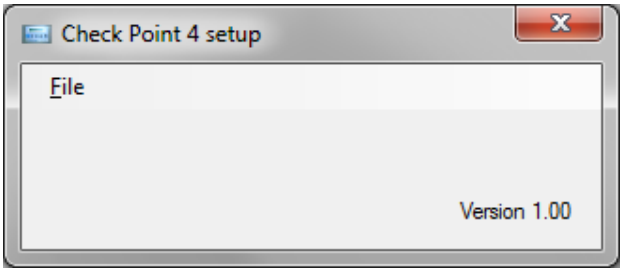


Figure 8

Start-up the ***CheckPoint 4 setup*** program.

Select the Update firmware command in the file menu.

Select the communication serial port.

Open the update file with an *.atm* extension.

Wait for the end of data transfer.

Note: in order to update the device it is necessary to acquire an update file which must be requested in Alfamatic.

3.2 Device setup

The device's configuration is saved in the profile. The profile can be saved, loaded, modified and sent to the device by means of the ***CheckPoint 4 setup*** program.

The following figure shows the device's initial configuration as it is set at the factory:

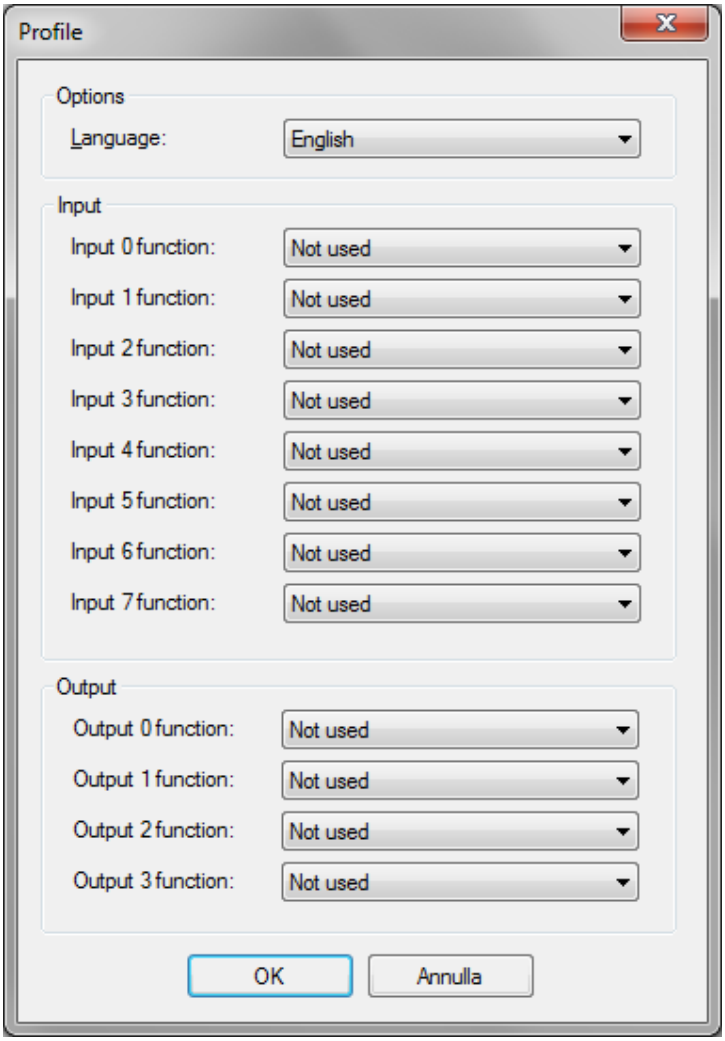


Figure 9