DPC Touch V2

OPERATION MANUAL

(Differences VS DPC Version 1 highlighted in YELLOW)

IMPORTANT

The controller delivered with this manual may be modified for specific needs.

In this case, please give us the controller serial number written on our shipping note or the approximate controller delivery date when you will place an order for a new similar controller or for spare parts.

In this way, you will be sure to get the required controller and/or spare parts.

WARNING

This information has to be kept in a location known to all users.

Each operator has to read carefully this instructions manual before installing, using, and mending the product.

Be sure that the operator has understood usage recommendations and the meaning of signs put on the product.

Most accidents could be avoided respecting this Instructions Manual. As a matter of fact, they were created according to European laws and norms applied to the product.

In each case, please respect and follow national safety norms. Do not take off nor damage the stickers or notifications put on the product and above all the details imposed by the law.

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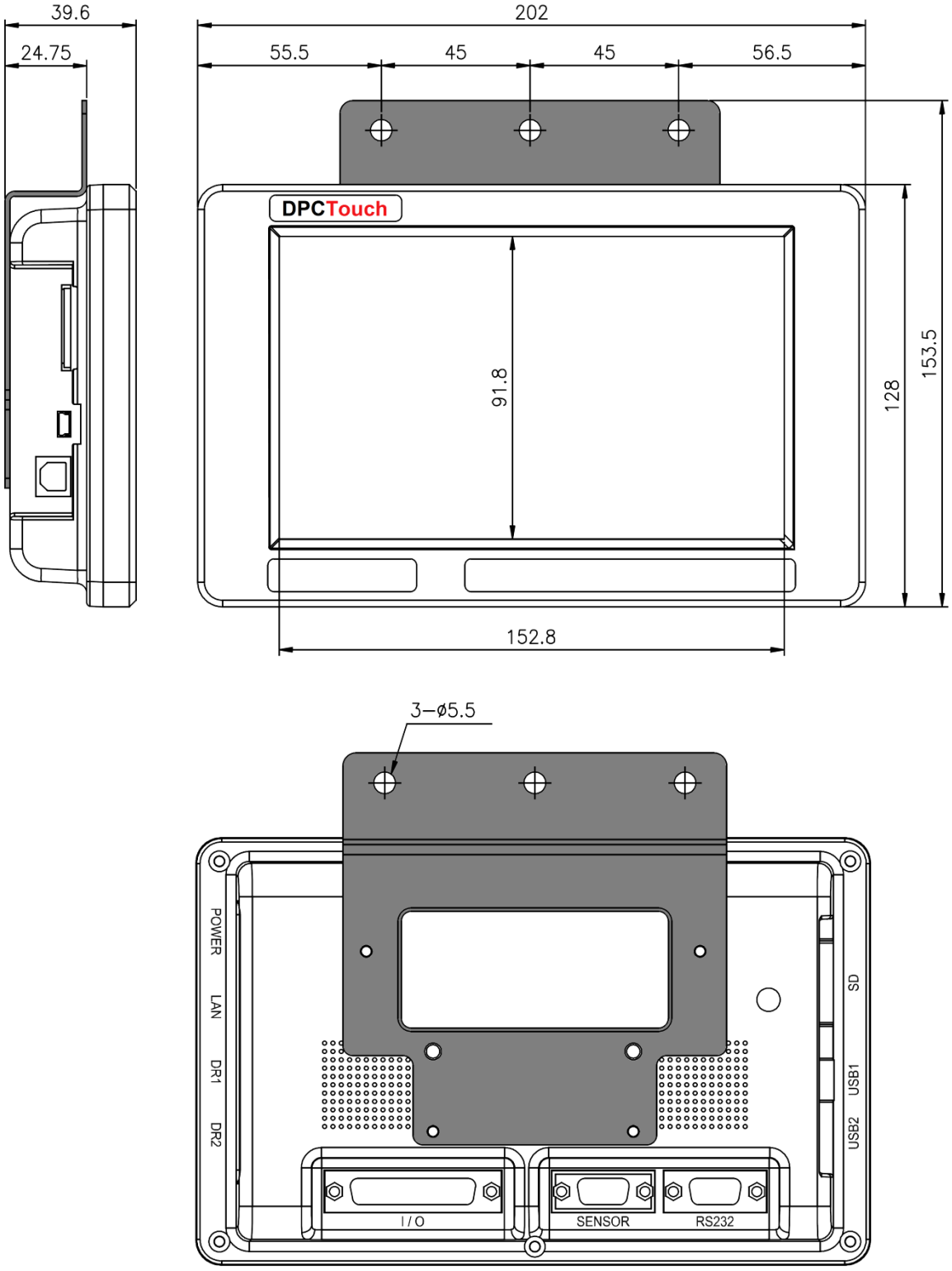
2. SPECIFICATIONS

No	Spécifications
1. Input power	DC24V, 1A AC 100-240V / DC 24V adaptor is provided
2. Dimensions	202(W) x 128(H) x 38(D) mm
3. Weight	0.55 kg
4. Screen	7” LCD Touch screen, 800 x 480 px
5. Graphical interface	Visualization of assembly process with graphical instructions
6. Inputs and Outputs 24V	12 inputs and 12 outputs with assignable functions Logical I/O’s for workstation automation
7. Analog encoders	4 channels, 0...5V
8. Memory card	Removable SD card, 8Gb
9. Total jobs memory	255 jobs with open structure
10. Total positions memory	255 jobs x 80 steps x 50 positions per fastening step max 999 positions in one job (counter limit)
11. Programming	Automatic and manual programming of a Fastening step
12. Positioning accuracy	0.09° for angular encoders <0.5 mm for linear encoders
13. Positioning tolerance	Adjustable for each position and for each axis. Smart tolerance detection feature.
14. Compatible tools	All tool with signals – electric or pneumatic. Min required signals: «Fastening OK», «Tool Lock»
15. Communication	RS232 for bar code scanner and firmware upgrade Ethernet

3. HARDWARE

3.1 Dimensions and mounting interface



Mounting plate with 4 x M3 screws is delivered with the controller as a standard accessory.

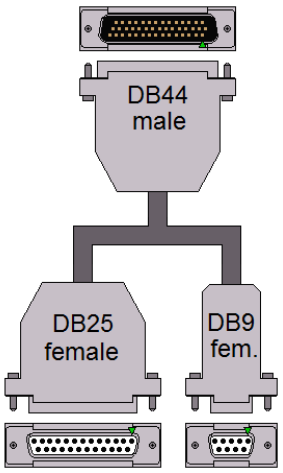
Weight of the controller: 0.55 kg

3.2 Interface ports

NOTE: ports shown in grey are disabled

I/O port adaptor

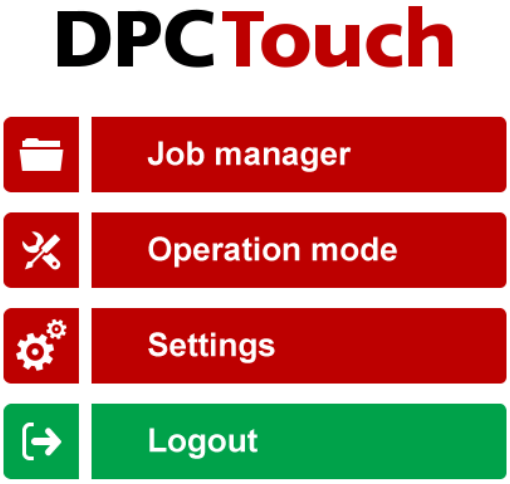
This adaptor is used to split I/O signals for tool interface and other automation equipment (see Electric wiring chapter for the wiring scheme).



4. GETTING STARTED

1. Connect power supply to the controller to turn it on. Normal booting time is about 2 sec. If the controller is not booted, the last booting step indicates the problem (e.g. *"Init SD Card…"* - missing or damaged SD card).
2. Controller is started automatically in operating mode. If default job is defined it will start automatically.
3. Tap on the HOME button in order to access to the main menu screen. While not logged in, JOB MANAGER and SETTINGS are not fully accessible.
4. To log into the system tap on the LOGIN button. **Default factory password is "0".**
   NOTE: if the password is "0", there is no need to enter it, just press OK button directly.

5. MAIN MENU



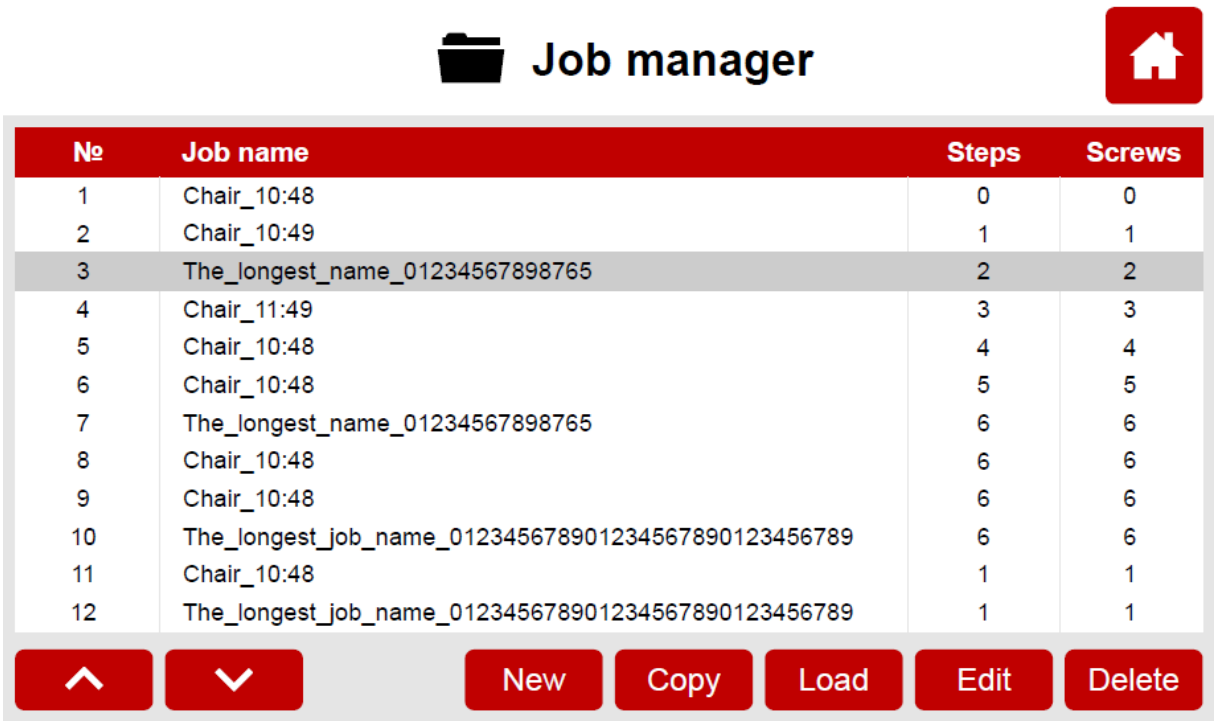
The main screen provides access to the main menu with four buttons:

- **Job manager**
  Provides access to the list of saved jobs and allows creation/modification of jobs. This menu is partially locked while user is logged out.
- **Operation mode**
  Provides access to the operating screen (normal work mode).
- **Settings**
  Provides access to the controller settings. This button is locked while the user is logged out.
- **Login/Logout**
  Allows logging into the system by entering the password to access and modify *Job manager* and *Settings*.

6. JOB MANAGER

Job manager interface provides access to the list of saved jobs. It also allows to *Edit* or to *Delete* saved jobs as well as to create new ones by pressing *New* button or by *Copying* an existing job. *Load* button is used to load selected job into operating mode.

NOTE: a job can't be loaded or renamed if it doesn't contain any steps.



Each job has its sequential number (№). In order to change job number tap one more time on the selected job and then change its position in the list by using *Up* and *Down* buttons.

For information purposes number of steps and screws in a job is displayed in corresponding line in the list.

Home button provides access to the main menu screen.

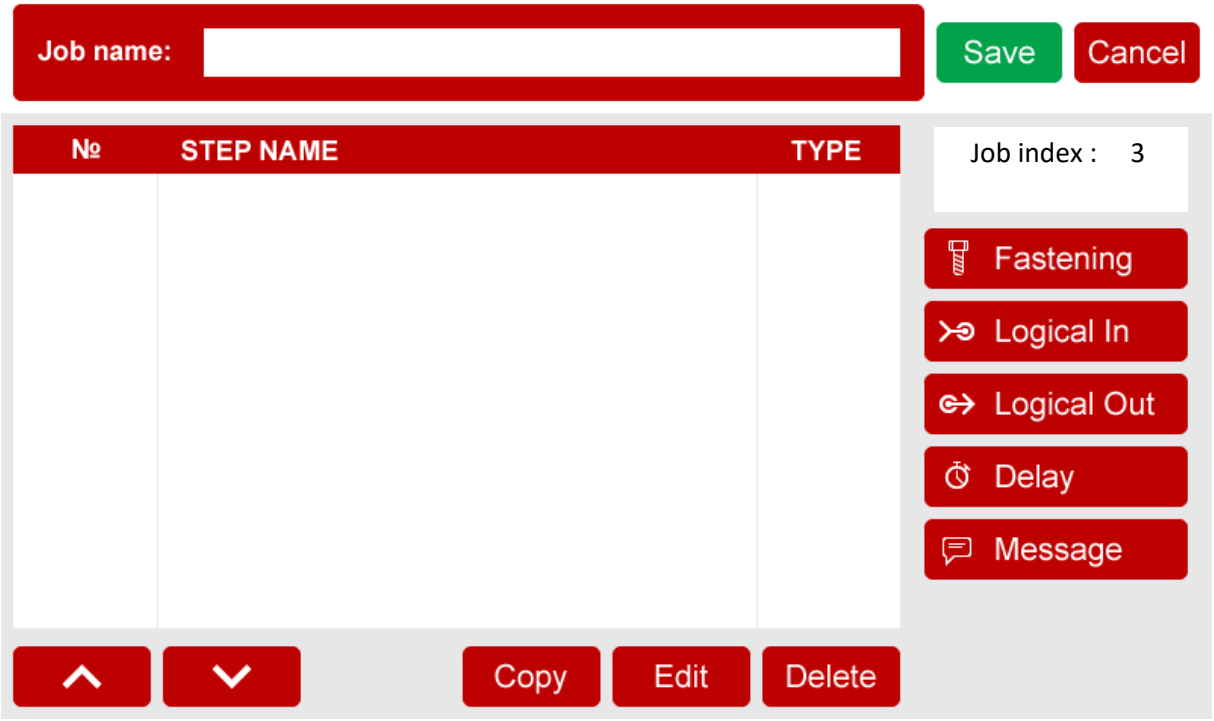
Maximum number of jobs is 255.

NOTE: while not logged in, the only active buttons are *Load* and *Home*, other buttons are locked.

7. NEW JOB CREATION

While in Job Manager screen, press NEW button. New job will be created and placed in the end of the list. New job creation screen will be displayed automatically.

A job is represented by a sequence of steps. These steps can be organized in any order which corresponds to the desired production sequence. There are 5 types of steps and each one of them can be used multiple times if necessary.



- **Fastening**: this step contains fastening positions including information associated with these positions (positioning tolerance, tightening program, tightening time, etc.)
- **Logical In**: this step is used to verify an input signal in order to pass to the next step (e.g. signals from proximity sensors, buttons, etc.).
- **Logical Out**: this step is used to send an output signal(s) to manage automation equipment on work station (e.g. activation of pneumatic valves, lights, etc.).
- **Delay**: this step allows to maintain the current state of I/O's for specified time (e.g. a delay required between receiving an input signal and sending an output signal, bar code, confirmation).
- **Message**: this step is used to display a graphical or text message on the operating screen during working cycle.

A job may contain up to 80 steps. The maximum number of positions in a single fastening step is 50.

In order to change sequence of steps in a job, tap one more time on the selected step and then change its position in the list by using *Up* and *Down* buttons.

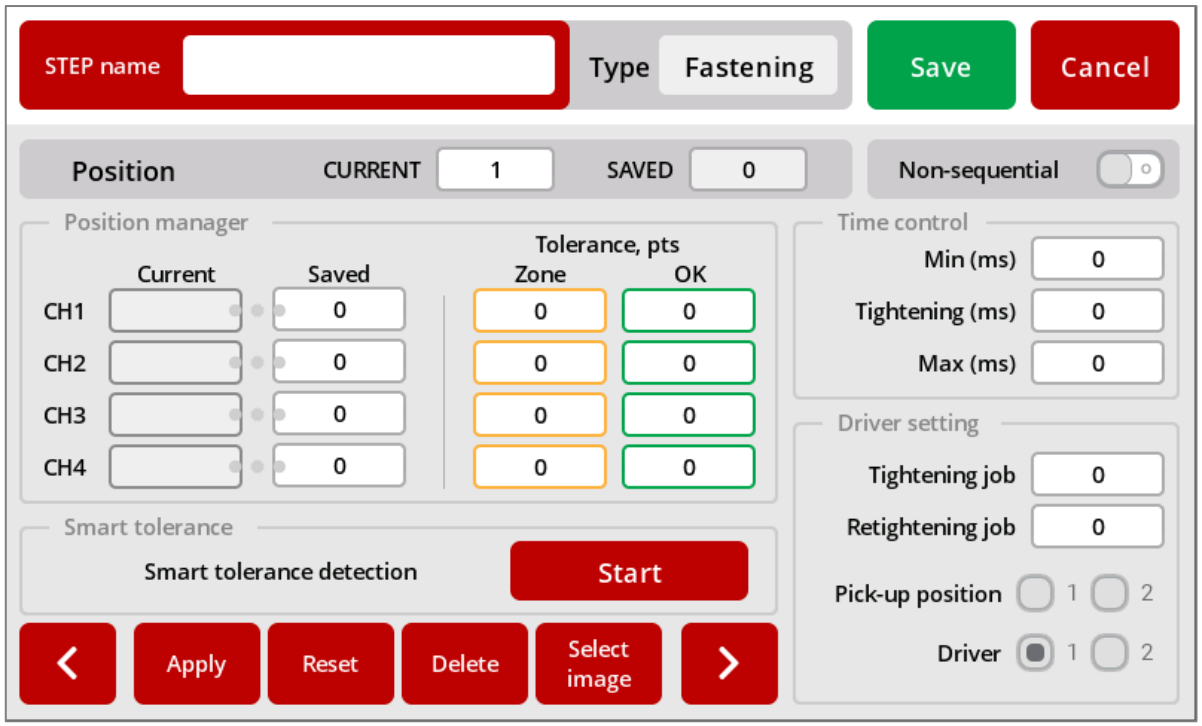
Created steps can be modified by using EDIT button or deleted by using DELETE button. COPY button creates a copy of the selected step and inserts it in the end of the list.

Press SAVE button to save the job or CANCEL button to quit programming without saving changes.

7.1 Fastening step creation

NOTE: it is useful to define encoder's reference point before creating a fastening step. See encoder's settings for more information.

While in Job creation screen, tap on FASTENING step button. The Fastening step creation screen will appear.



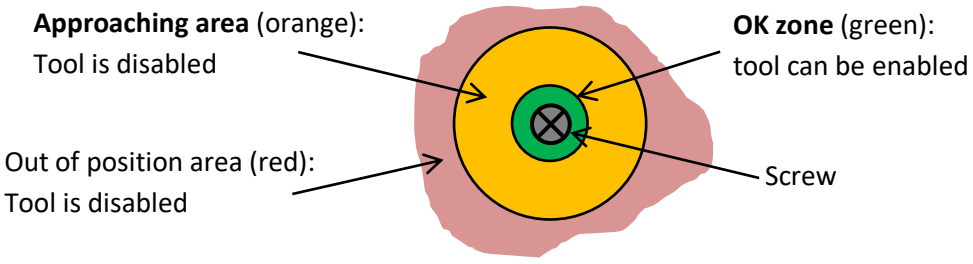
Position Current field displays the number of position being programmed.

Position Saved field displays the total number of saved position in the fastening step being programmed.

Position Manager Current channels fields display current values from analog encoders. Only active channels are shown.

Position Manager Saved channels fields display saved values from analog encoders. Current values are saved when Apply button is pressed or when Fastening OK signal is received.

Tolerance fields display tolerance values for analogue encoders to be applied for each encoder for the current position. Tolerance values can be automatically detected by using Smart Tolerance detection feature (please refer to corresponding chapter for more details).



NOTE: real shapes of tolerance areas are not circular; they depend on the geometry of the positioning arm being used. To avoid overlapping of tolerance areas of different screws, keep tolerance values as low as possible.

Time control fields display measured Tightening time and calculated Min and Max limits. Min and Max values are calculated according to percentages defined in operating settings.

Tightening job is a preset number to be selected for the current tightening position via 24V outputs (direct or binary logic) if supported by the tool.

Retightening job is similar to the Tightening job but it is used only for rework operation and it is automatically selected after NG tightening (if retightening is enabled in operating settings).

Pick up positions 1 and 2 can be selected to allow to start the tool in a specific position or area (outside position OK zone) in order to pick up a screw. Fastening OK signals and Motor run signals are not effective on pick-up position.

Driver 1 and 2 selection is only applied to Mountz tools (NF, BF, LF and HF) connected through RJ45 port. This selection allows enabling and disabling tools for each individual position.

Reset button is used to reset current position data to default values.

Delete button is used to delete the current position, with a confirmation «Are you sure?».

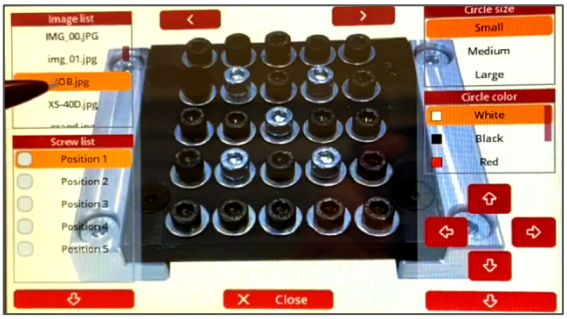
Select Image button is used to add images in fastening steps, and add the different screw directly on it. The position will appears according to the fastening sequence, and change color according to encoders.

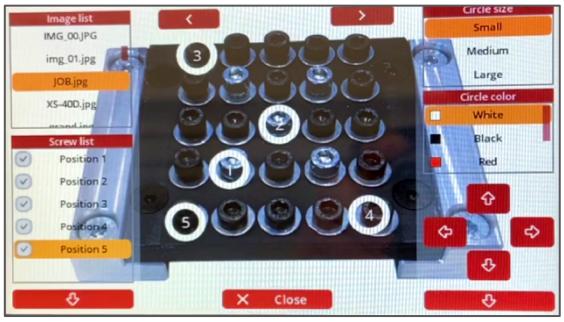
- **Image list** : select the .JPG file 800x400 on the SD card (/Images).

- **Screw list** : select the position to place it directly on the picture, it can adjusted precisly with arrow Up and Down, Left and Right.

- **Circle size** : allow to increase the size of the circle

- **Circle color** : allow to change the color of the circle to increase it's visibility





NOTE: there is no need to use APPLY button after modification of any of the above values. APPLY button is only used to save current values from encoders for the current position.

A Fastening step can be programmed manually or automatically.

6.1.1 Manual programming of fastening step:

0. *Optional: Use Smart tolerance detection feature (refer to Smart tolerance detection below)*
1. Position the arm on the first screw.
   Encoders monitoring fields are displaying the current position of the arm.
2. Press APPLY button to save current position of the arm. Saved values from encoders will be displayed in corresponding fields. If not satisfied with the result press APPLY button again to rewrite saved values from encoders.
3. Default tolerance values for the approaching Area and for the OK zone are applied. To change default values refer to encoders' settings. Tolerance values can be adjusted manually for each individual position or by using Smart tolerance detection feature.
4. If necessary, define Tightening and Retightening programs to be used for the current position, feeding point (see Pick Up positions in encoders' settings) and the screwdriver to be used for this tightening position (used only for Mountz (NF,BF, LF and HF tools).
5. If necessary, enter Min and Max tightening time limits in corresponding fields. Tightening time control is not used if limits are equal to 0.
6. Press NEXT button to pass to the next position.
7. Repeat 1-6 for each position.
8. Activate Non-sequential mode if there is no need to keep strict tightening sequence.
   NOTE: in non-sequential mode, retightening can't be managed.
9. Press SAVE button to save the step or CANCEL button to quit programming without saving changes.

6.1.2 Automatic programming of fastening step:

For automatic programming, make sure that the tool is connected to the controller and signals are correctly assigned. In order to register tightening time, Motor run and Fastening OK signals have to be connected.

0. *Optional: Use Smart tolerance detection feature (refer to Smart tolerance detection below)*
1. Position the arm on the first screw.
   Monitoring fields are displaying the current position of the arm.
2. Default tolerance values for the approaching Area and for the OK zone will be applied. To change default values refer to encoders settings. Tolerance values can be adjusted manually for each individual position or by using Smart tolerance detection feature.
3. If necessary, define Tightening and Retightening programs to be used for the current position, feeding point (see Pick Up position in encoders' settings) and the tool being used.
4. Perform a tightening operation as it has to be performed during production.
5. Tightening time will be registered automatically. Min and Max tightening time limits are calculated automatically by using default values in operating settings. Tightening time control is not used if limits are equal to 0.
6. Repeat 1-5 for each position.
7. Activate Non-sequential mode if there is no need to keep strict tightening sequence.
   NOTE: in non-sequential mode, retightening can't be managed.
8. Press SAVE button to save the step or CANCEL button to quit programming without saving changes.

6.1.3 Smart tolerance detection feature:

This feature allows automatic detection of OK zone tolerance for each position. Motor Run signal has to be connected in order to use this feature.

1. Press START button to begin smart tolerance detection.
2. Start the tool and move it around the screw to define OK zone (the zone where operator is allowed to run the tool).
3. Stop the tool and press STOP button on the screen.
   Or perform a tightening operation as it has to be performed during production.
   In this case tightening time will be saved automatically together with detected tolerance values and current position coordinates. Next position teaching will start automatically.
4. Continue with Manual or Automatic programming.

7.2 Logical Input step creation

While in Job modification screen, tap on LOGICAL IN button. The Logical In step creation screen will appear. Select an available input from the list of Inputs. If an Input was assigned for a specific function in Input settings it is not available to be used as a logical signal.

Select the type of the signal. There are four types of input signals:

- **Active High**: for this type of signal it is necessary to detect a transition from 0 to 1.
- **Active Low**: for this type of signal it is necessary to detect a transition from 1 to 0.
- **Status High**: for this type of signal it is enough to detect if the signal is equal to 1.
- **Status Low**: for this type of signal it is enough to detect if the signal is equal to 0.

Logical input step is completed if the corresponding input signal matches the condition of the selected signal type.

If two or more signals are selected, then AND condition will be applied for selected signals to complete the step.

Press SAVE button to save the step or CANCEL button to quit programming without saving changes.

7.3 Logical Output step creation

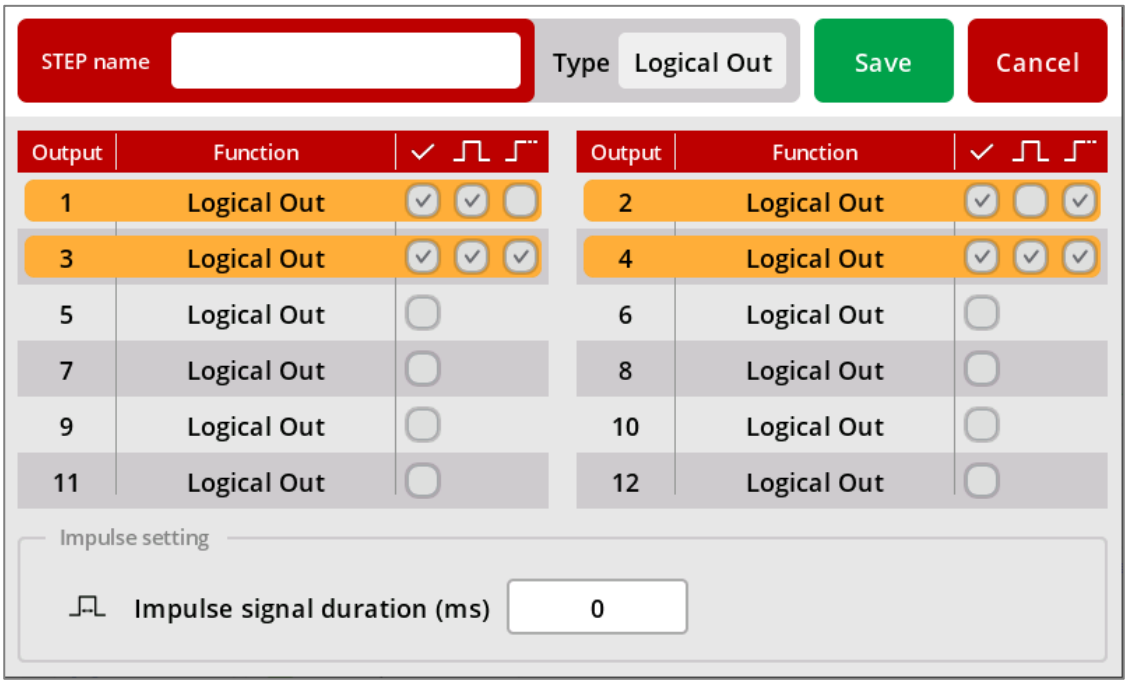
While in Job modification screen, tap on LOGICAL OUT button. The Logical Out step creation screen will appear.

Select an available output and its type from the list of Outputs. If an Output was assigned for a specific function in Output settings it is not available to be used as a logical signal.

There are three types of output signals:

- **Continuous ON**: the signal is continuous until it is deactivated in the next Logical Out step. To deactivate the signal, create a new Logical Out step and deselect the corresponding signal.
- **Impulse**: the signal is an impulse with defined duration. Duration of the signal is defined in ms.
- **Flashing** (select both above) : the signal will be blinking until it is deactivated in the next Logical Out step. Duration between two flashing signal is defined in ms in the impluse duration field.

Multiple output signals can be used in the same Logical Out step.



Press SAVE button to save the step or CANCEL button to quit programming without saving changes.

7.4 Delay step creation

While in Job modification screen, tap on DELAY button. The Delay step creation screen will appear.

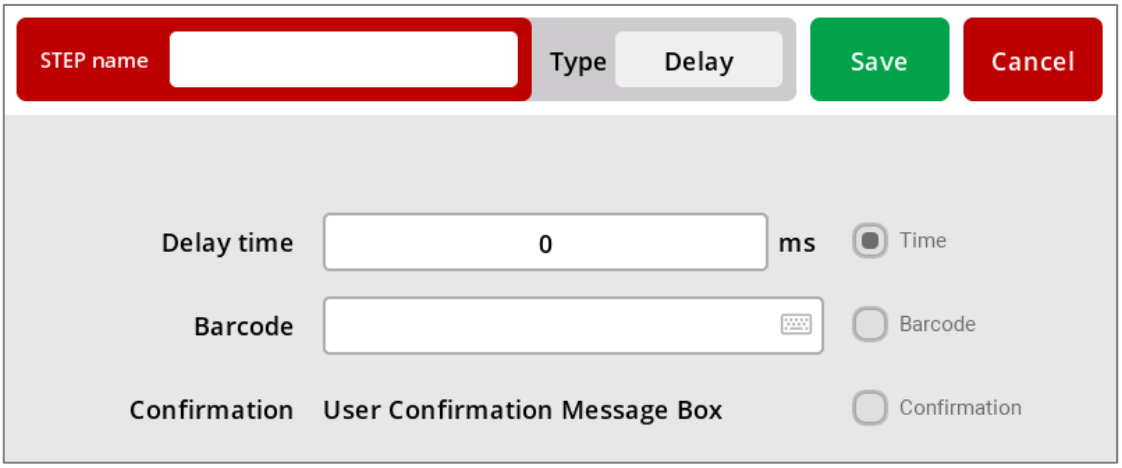
There are three types of delay step :

- **Delay time** : The controller will stay on hold for the defined time. Delay step can be used to manage timing between Logical In and Logical Out steps or between messages.

- **Barcode** : Enter the barcode to enter (until 32 alphanumerical characters) and filter it according to the number of digit. Example : Barcode «ABCDE», start will be «1» and end is «5». If filter are «0» and «0», all barcode are accepted. Barcode can be typed manually with the keyboard, or with a barecode reader.

- **Confirmation** : User will see a confirmation message Box «Are you Sure?».

Press SAVE button to save the step or CANCEL button to quit programming without saving changes.



7.5 Message step creation

While in Job modification screen, tap on MESSAGE button. The message step creation screen will appear.

Enter the text to be displayed on the operation screen and activate the corresponding switch.

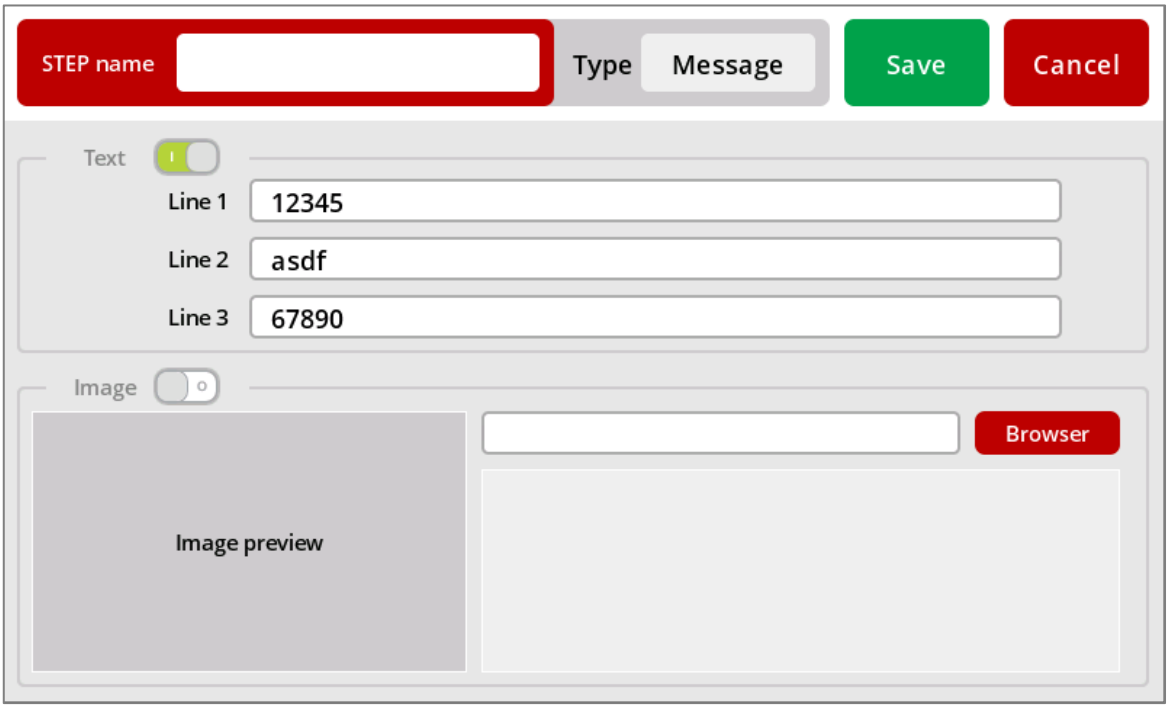
Select an image to be displayed from the list of available images and activate the corresponding switch.

To hide the displayed message it is necessary to create a new Message step without text and/or image.

Images are stored on SD card in the following directory: **SD:\images**

For the best result, use pictures with the following format: **800 x 480 px, .JPG**

Press SAVE button to save the step or CANCEL button to quit programming without saving changes.



7.6 Job example

A simple job may contain only a Fastening step, which will assure screws counting and tool position control functions.

Example below illustrates a job for management of an automated station with multiple sensors and actuators.

This job uses 5 logical inputs, 4 logical outputs, 7 messages (text and/or image) and 2 fastening steps.

No	Step type	Step functions
1	Message	Text or Image message appears on the screen to indicate what workpiece has to be assembled. Image stays on the screen until replaced by next message or until screen is touched.
2	Logical In	Three input signals (active high) are expected from proximity switch to detect presence of the workpiece on the table and from two buttons which operator has to press simultaneously in order to keep his hands off the clamping device.
3	Message	Text or Image message is shown on the screen to worn the operator about closing clamping device.
4	Delay	A short delay is used before activation of the clamping device.
5	Logical Out	Two output signals (continuous) are sent to activate the clamping device to lock the workpiece on the table and to turn on assembly status light.
6	Message	Text or Image message is shown on the screen to indicate parts to be picked
7	Logical Out	One output signal (continuous) is sent to turn on pick to light indicator 1
8	Logical In	One input signal (active high) is expected for picking verification by sensor 1
9	Logical Out	Pick to light indicator 1 is turned off once picking is performed
10	Message	Text or Image message is shown on the screen to indicate first fastening operations to be performed.
11	Fastening	First fastening operations are performed, screws are counted and tool position is assured.
12	Message	Text or Image message is shown on the screen to indicate parts to be picked
13	Logical Out	One output signal (continuous) is sent to turn on pick to light indicator 2
14	Logical In	One input signal (active high) is expected for picking verification by sensor 2
15	Logical Out	Pick to light indicator 2 is turned off once picking is performed
16	Message	Another message is shown on the screen to indicate second fastening operations to be performed.
17	Fastening	Second fastening operations are performed, screws are counted and tool position is assured.
18	Logical Out	Two output signals are disabled to open the clamping device and to turn off assembly status light.
19	Message	Job completion message
20	Delay	Delay before the job is restarted

8. SETTINGS

8.1 Operating

Screen 1 of 5: Management of interface

Parameter	Description	Range	Default value
Tool selection	Select one of the following option: - **NF, BF, LF, HF**: Mountz low voltage tools (XS-40D, XS-38D, XT-30D, XS-35D, XT-35D) - **DC tools**: all electric digital control tools equipped with 24V I/O signals	-	DC tools
Screws counting up/down	This parameter manages counting display. Turn it ON to count up (1,2,3,…) or OFF to count down (...,3,2,1)	ON/OFF	ON
Screws counting for step/job	This parameter manages counting display. Turn it ON to display counting separately for each step or OFF to display counting for the whole job.	ON/OFF	ON
Torque selection by binary outputs	Selection of tightening presets for each position is done via Torque selection outputs. These outputs can function in binary logic or in direct logic (one output per preset).	ON/OFF	ON
Job selection by binary inputs	Selection of Jobs of DPC Touch can be done via Job selection inputs. These inputs can function in binary logic or in direct logic (one input per job).	ON/OFF	ON
Default job number	Default job is a job which is automatically started after booting of DPC Touch. If default job number is set to 0, DPC Touch will not boot any jobs. NOTE: job selection via inputs has higher priority	0 - 255	0

Screen 2 of 5: Management of buttons in operating mode

Skip button access without password	Enables access to Skip button without entering password. If turned OFF the password will be asked when Skip button is pressed.	ON/OFF	ON
Back button access without password	Enables access to Back button without entering password. If turned OFF the password will be asked when Back button is pressed.	ON/OFF	ON
Reset button access without password	Enables access to Reset button without entering password. If turned OFF the password will be asked when Reset button is pressed.	ON/OFF	ON
Job selection access without password	Enables access to Jobs selection without entering password. If turned OFF the password will be asked when Job selection button is pressed.	ON/OFF	ON
Display job reset button	Job reset button can be displayed or hidden by using this parameter. NOTE: if turned OFF and automatic reset is used, then the current step will be reset instead of the current job.	ON/OFF	ON

Screen 3 of 5: Management of fastening time

Min fastening time limit, %	Lower limit of fastening time control in percentage of actual fastening time detected during programming. NOTE: changes will be applied only to new jobs, existing jobs won't be affected.	0 - 100	25
Max fastening time limit, %	Upper limit of fastening time control in percentage of actual fastening time detected during programming. NOTE: changes will be applied only to new jobs, existing jobs won't be affected.	0 - 100	25
Start trigger release time limit, ms	Fastening time threshold after which trigger release will be considered as NG tightening. Error message "Trigger released before Torque Up" will appear.	0 - 9999	0
Temporary position loss time, ms	If fastening is started (Motor Run signal is received), then it is allowed to exit position OK zone (green) into approaching area (orange) for the specified time without locking the tool. If this time limit is passed the tool will be instantly locked. If position NOK zone (red) is entered the tool will be instantly locked. NOTE: this parameter is used to avoid interruptions of fastening process when position is lost for short time due to vibrations.	0 - 3000	50
Judging time, ms	Judging time is used if Fastening OK signal is delayed after the fall of Motor run signal.	0 - 500	100

Screen 4 of 5: Management of NG tightenings

Number of retightenings on a position	Maximum number of attempts to rework a NG fastening. If the maximum number of attempts is reached the current position can be skipped or Job/Step can be reset according to parameters selected. NOTE: this parameter is not effective in non-sequential assembly mode.	0 - 10	1
Skip NG tightening	Allows to skip automatically a NG tightening if rework is not allowed or if rework wasn't successful.	ON/OFF	OFF
Fastening NG signal if position skipped	If turned ON, Fastening NG signal will be provided when a position is skipped automatically, by Skip button on the operating screen or by external input. If turned OFF, Fastening OK signal will be provided.	ON/OFF	ON
Auto reset delay, ms	Alarm can be reset automatically after the specified delay. If delay is equal to 0 than reset has to be done manually or by external input.	0 - 9999	3000

Screen 5 of 5: Management of operating options

Automatically restart the job when finished	If turned ON, the job will restart automatically when finished	ON/OFF	ON
Store logs during operation	If turned ON, all the events will be stored on the SD card (/Logs) , One folder per year, One sub folder per month, One .csv file per day	ON/OFF	ON
Skip by step	Skip the complete step instead of position	ON/OFF	OFF

8.2 Encoders

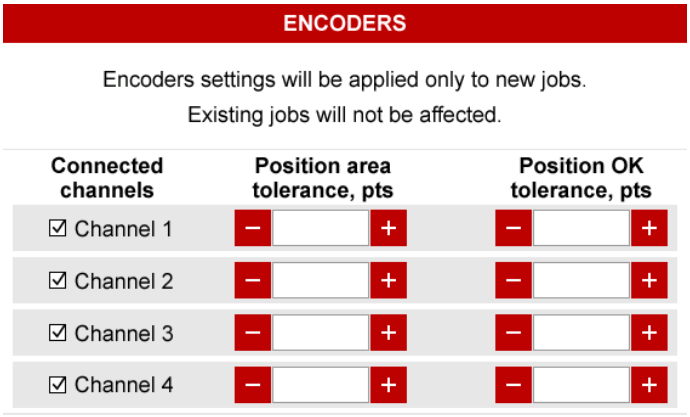
Screen 1 of 3: Encoder's activation and tolerance settings

Activate or deactivate corresponding encoders by selecting check boxes accordingly.

Enter default tolerance values for the approaching Area and for OK zone where tool is enabled. Default tolerance values are applied automatically during Fastening step creation. It is possible to modify tolerances manually for each individual position during creation of a fastening step.

If default tolerances are changed they will be applied only to new jobs, existing jobs will not be affected.

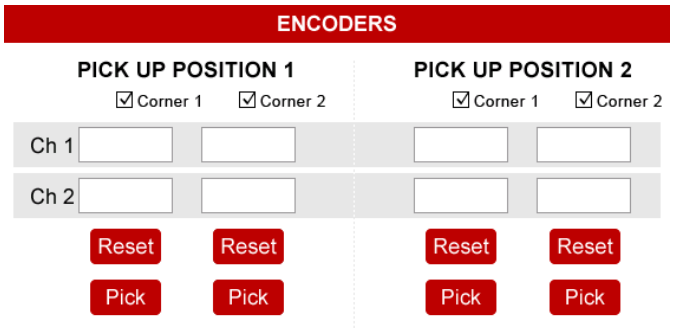
See more information about approaching Area and OK zone tolerances in Fastening step creation chapter.



Screen 2 of 3: Pick up position 1 and 2

It is possible to define two screw feeding positions or areas. The tool can be enabled on the corresponding feeding position for easier screw picking.

Pick up position can be defined as a single point (Corner 1) or as an area between Corner 1 and Corner 2 (see below).



NOTE: the real shape of pick-up area is not rectangular and depends on the geometry of the arm.

To register location of a corresponding corner, position the arm and press *Pick* button. Encoders turn light blue and output is activated when rest position is reached.

Screen 3 of 3: Zero position and Rest Position

Setting zero point of encoders : Encoders' reference point can be defined by using this function. Definition of the reference point is useful when encoders have to be replaces after failure or when repeatability of position of the workpiece can't be assured.

The reference point can be defined by using *Pick* button or reset by using *Reset* button. The reference point can also be defined by using external input signal in Operating mode.

Setting rest position of encoders : Designed to make sure the tool is not interfering when the product is moving along the production line. The rest position can be defined by using *Pick* button or reset by using *Reset* button. The rest position can also be defined by using external input signal in Operating mode.

Encoders turn dark blue and output is activated when rest position is reached.

8.3 Inputs

Activate necessary inputs by selecting corresponding check boxes. Select required input function from the list.

Non-assigned inputs can be used for Logical In steps.

Impulse signals duration must be between 100 and 500 ms.

Each input function can be assigned only once.

Input name	Function description	Signal type
Job select 1-8	Inputs to select jobs on DPC Touch in binary or in direct logic (see the table below). Logic is selected in operating settings.	Continuous
Skip	Signal is used to skip the current step or position.	Impulse
Back	Signal is used to get back to previous position. It's not possible to get back to previous step.	Impulse
Reset	DPC Touch alarm reset. If maximum number of retightenings is reached it's not possible to reset the alarm. Step or Job has to be reset.	Impulse
Reset Step	Signal is used to reset current fastening step.	Impulse
Reset Job	Signal is used to reset current job.	Impulse
Next Job	Signal is used to select next job in the job manager list.	Impulse
Previous Job	Signal is used to select previous job in the job manager list.	Impulse
Workpiece Detect	Signal is used to continuously monitor the presence of the workpiece during assemble. If assembly is not finished and the workpiece is removed, then "I/O error" is provided.	Continuous
Tool Alarm	Fastening NG (alarm) signal from the tool to indicate that fastening operation wasn't successful.	Continuous or Impulse
Tool disable	Signal is used to continuously monitor the disabled tool out of picking and green zone.	Continuous
Set Origin	Signal is used to set zero of encoders in operating mode.	Impulse
Driver Reverse	Signal from tool to indicate that the tool is in reverse rotation mode. DPC Touch will lock the tool if the signal is received on the first tightening. After NG tightening DPC Touch will not lock the tool if this signal is received to allow rework operation.	Continuous
Driver Run	Signal from tool to indicate that the tool is running. Signal is used to control fastening time and to assure functioning of Smart tolerance teaching feature and Temporary position loss feature.	Continuous
Driver torque Up	Signal from tool after successful fastening operation. Once the signal is received, current position is declared as finished.	Impulse
Emergency	*External signal to lock DPC Touch until emergency button is released*	Continuous

The table below shows the relation between Job select signals and Job number in binary logic.

Job number	Job select 1	Job select 2	Job select 3	…	Job select 8
0	0	0	0	0	0
1	1	0	0	0	0
2	0	1	0	0	0
3	1	1	0	0	0
4	0	0	1	0	0
…					
255	1	1	1	1	1

NOTE: See Output's settings for direct logic example.

8.4 Outputs

Activate desired outputs by selecting corresponding check boxes. Select required output type from the list.

Non-assigned outputs can be used for Logical Out steps.

Duration of impulse signals is 100 ms.

Each output function can be assigned to multiple outputs.

Output name	Function description	Signal type
Fastening OK	Signal is provided after successful fastening operation.	Impulse
Fastening NG	Signal is provided after a fastening operation completed with errors.	Impulse
Rest position	Signal is provided when the tool is on the rest position	Continuous
Step OK	Signal is provided after successful completion of a step.	Impulse
Step NG	Signal is provided after if a step was interrupted or completed with missing screws.	Impulse
Tool Enable	Signal is provided to enable the tool (when position is OK)	Continuous
Tool Disable	Signal is provided to lock the tool (when position is NOK or during alarm mode)	Continuous
Driver Run	Signal is provided when the tool is running (Driver Run input has to be connected)	Continuous
Driver torque-Up	Signal is provided when Fastening OK signal is received from the tool (Driver torque up input has to be connected)	Impulse
Driver reset	Signal is provided when reset was made (manually, automatically or via I/O)	Impulse
Torque Select 1-8	Signals to select fastening presets on the tool in binary or direct logic (see the table below). Logic is selected in operating settings.	Continuous
Job OK	Signal is provided after successful completion of a job.	Impulse
Job NG	Signal is provided after if a job was interrupted or completed with missing screws.	Impulse
System Ready	Signal is provided when the controller is in operating mode and ready for selection of jobs. Once a job is started the signal drops down.	Continuous
Alarm	Signal is provided when the controller is in Alarm mode	Continuous

The table below shows the relation between Torque select signals and Preset number in direct logic.

Pset number	Torque select 1	Torque select 2	Torque select 3	…	Torque select 8
0	1	0	0	0	0
1	0	1	0	0	0
2	0	0	1	0	0
…					
8	0	0	0	0	1

NOTE: See Input's settings for binary logic example.

8.5 Network

Screen 1 and 3 of 3: RS232 and Barcode

Only RS232 communication is enabled in for Barcode scanner interface.

To use serial communication, it has to be enabled by ON/OFF switch in Network settings.

By default, only COM 1 port is enabled. COM2 port can be enabled on a special request.

Barcode scanner usage:

To use a bar code scanner, it is necessary to set COM 1 in “Barcode” mode and select corresponding Baudrate. Most of serial bar code scanners operate at 9600 baudrate by default.

ATTENTION: bar code scanner has to be set to use termination (postfix) characters. These characters can be either CR (carriage return), LF (line feed) or CRLF.

Bar codes can be entered on Screen 3/3. Bar code value can be entered manually or by pressing Read button and scanning a bar code. Max length of a bar code is limited by 32 alphanumerical characters.

For each bar code it is necessary to enter a job number to be loaded when a bar code is scanned in operating mode. Bar code can only be scanned when controller is in Ready mode (System Ready output is active: see outputs chapter for details).

If only one part of a bar code should be used for job selection, then this part can be defined by Start and End characters number. The content of rest of the bar code will be ignored.

«Reset all» button can be pressed to erase all registered bar codes from the memory.

Attention: crossed serial cable has to be used for the bar code scanner interface. It is recommended to connect only 3 pins (pin 2 – RX, pin 3 – TX and pin 5 – GND). Pins 2 and 3 should be crossed.

Screen 2 of 3: Ethernet

To use Ethernet communication, it has to be enabled by ON/OFF switch in Network settings.

Implementation of Modbus TCP/IP (Ethernet) :

Accessible information(Live):

All the parameters in the setting menu

Job #, step #, screw #, etc…

Encoders position

Tool info (F/R, lock, motor run, torque up…)

Reset Job / Step

Skip / Back

Init (code 77

Accessible information (Per event):

Event # + timestamp

Event type

Job #, step #, screw #, etc…

Encoders position when fastening was performed

Barcodes

Actions:

Job selection

8.6 Other

Real time monitoring of encoders and I/O's (screen 1 of 4)

This interface helps to verify if encoders function correctly. It also helps to check status of input signals and to force output signals to test wiring.

Touch screen calibration (screen 2 of 4)

Press on *Start* button to enter into touch screen calibration mode. Press and hold indicated positions for few seconds in order to calibrate the screen.

Sounds (screen 2 of 4)

Adjust the volume by using the slide bar.
Select desired sounds for Position Ok, Alarm and Cycle complete signals. Activate sounds to be used.

Date and time (screen 3 of 4)

Adjust current date and time. The controller is equipped with internal battery to keep this data.

Language (screen 3 of 4)

Select language of the graphical interface. Available languages :

English, French, German, Spanish, Portuguese, Italian, Russian, Czech, Polish

Password (screen 4 of 4)

Enter the new password and press Set.

Default factory password is "0".

Controller reset to factory settings (screen 4 of 4)

Enter "77" to reset the controller to factory settings. Saved jobs will not be deleted.

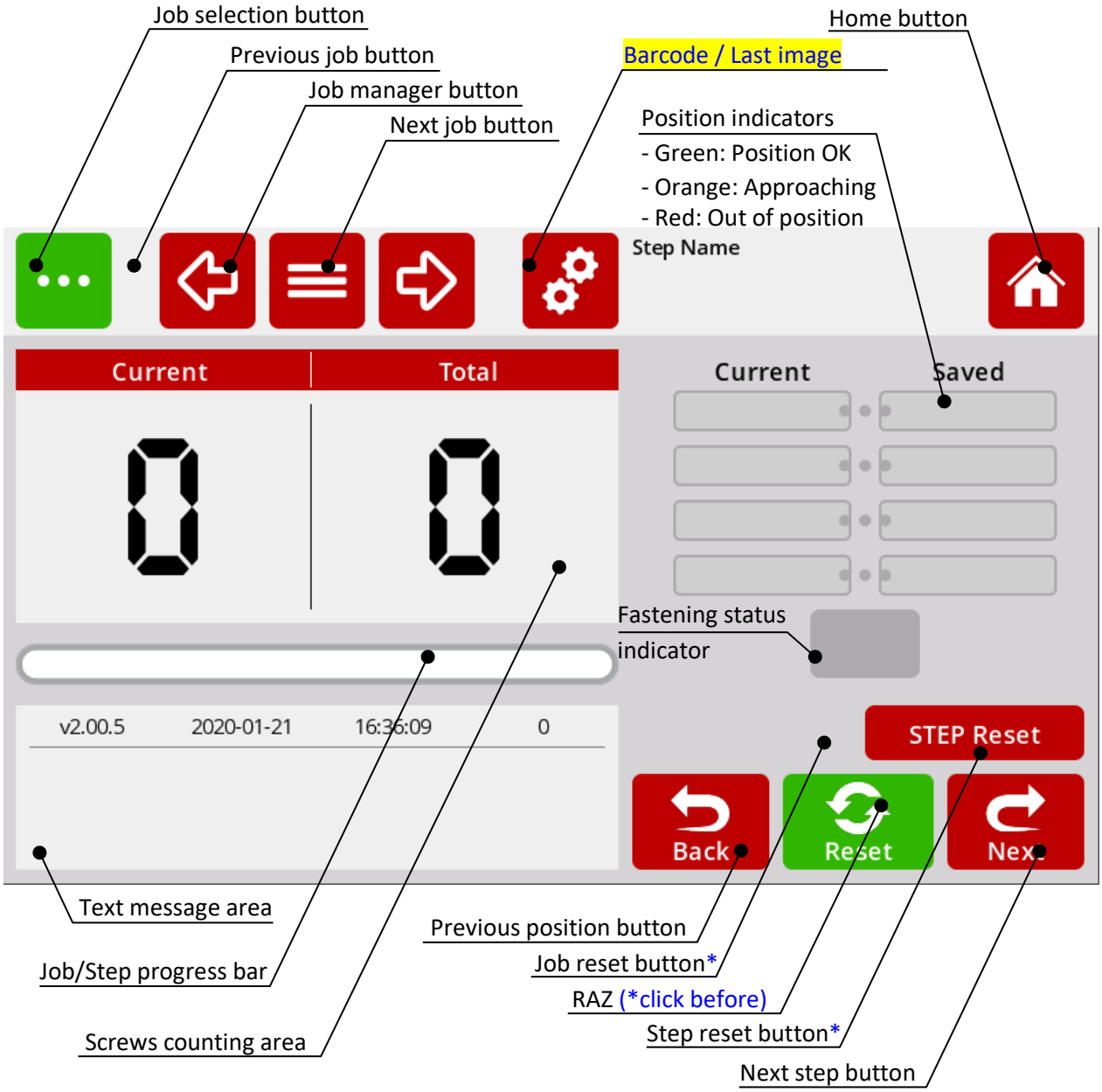
Firmware version (screen 4 of 4)

Current firmware version of the controller. Upgrade the firmware regularly to keep the controller up to date. Refer to the firmware upgrade manual for the upgrade procedure.

9. OPERATING MODE

Controller is started automatically in Operating mode after booting. Default job is loaded automatically (see operating settings). Operating mode is accessible through the main menu and though Job Manager by pressing Load button.

In Operating screen functions are managed in Operating settings.



In operating mode the following error messages can occur:

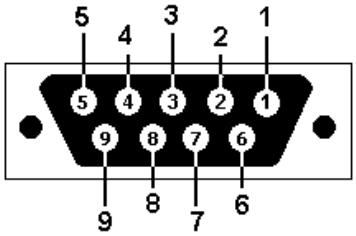
- **Fastening time is too long/short:** fastening time is out of min/max limits (see programming)
- **Trigger released before torque up:** tool was stopped before reaching torque (see settings)
- **Fastening NG (tool alarm):** fastening NG (alarm) input signal is received from the tool
- **System error:** operating system error (reboot the controller)
- **I/O error:** error of management of inputs and outputs (check logical and assigned I/O's)
- **Emergency : Job complete NG:** job was interrupted or completed with missing screws

10. ELECTRICAL WIRING

10.1 Encoder's port wiring scheme

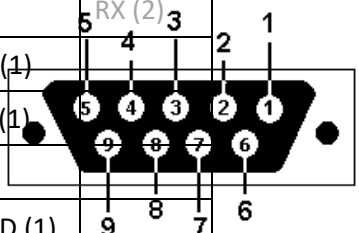
Pin	Function
1	5V power supply
2	Channel (1)
3	Channel (2)
4	GND
5	
6	Channel (3)
7	24V
8	
9	Channel (4)

Only for serial numbers SC*********	
1	5V power supply
2	24V
3	
4	GND
5	
6	Channel (1)
7	Channel (2)
8	Channel (3)
9	Channel (4)



10.2 RS232 port wiring scheme

Pin	Function	
	Port 1	Port 2
1		RX (2)
2	RX (1)	
3	TX (1)	
4		
5	GND (1)	
6		TX (2)
7		
8		
9		GND (2)

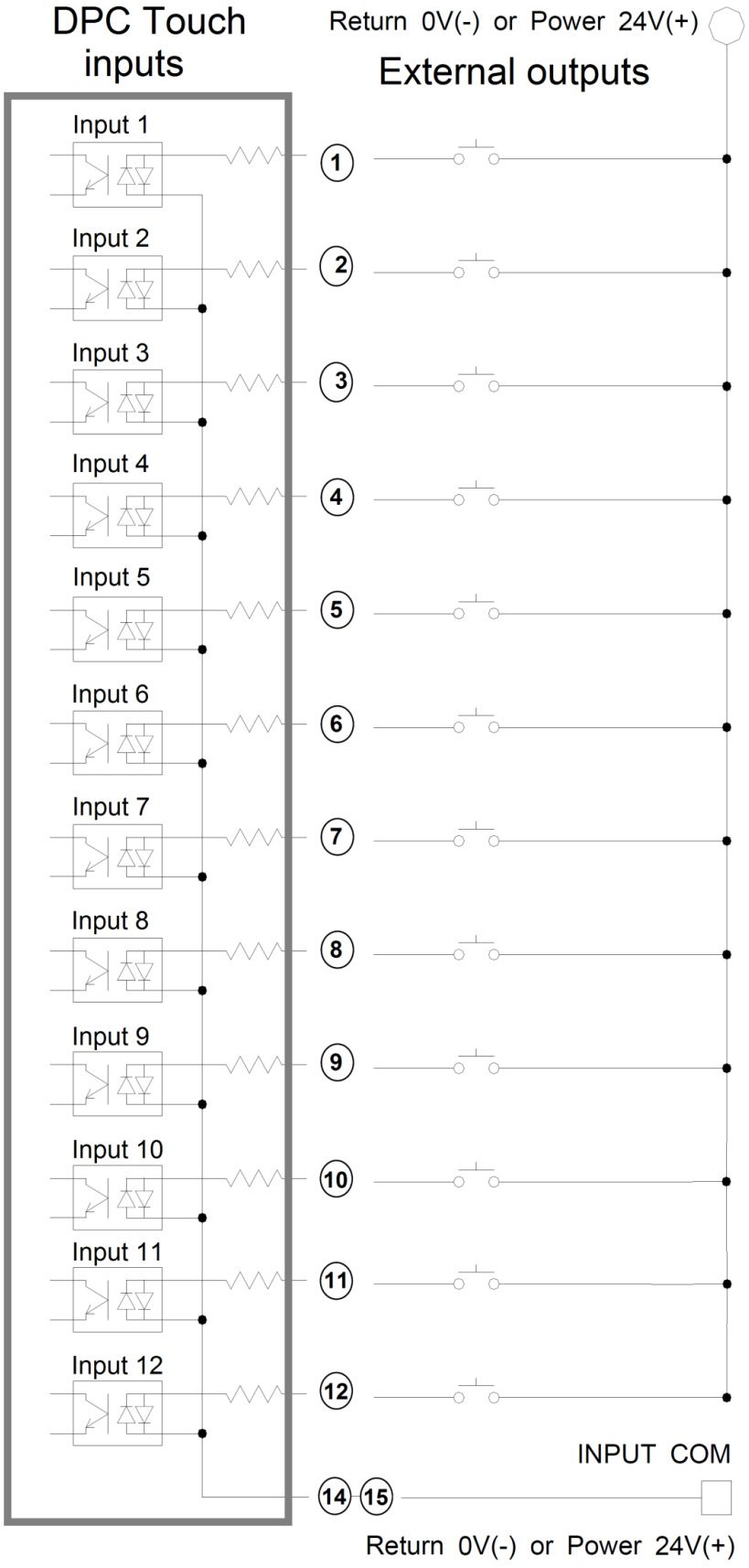


Note: Port 2 is disabled by default. It can be enabled on special request.

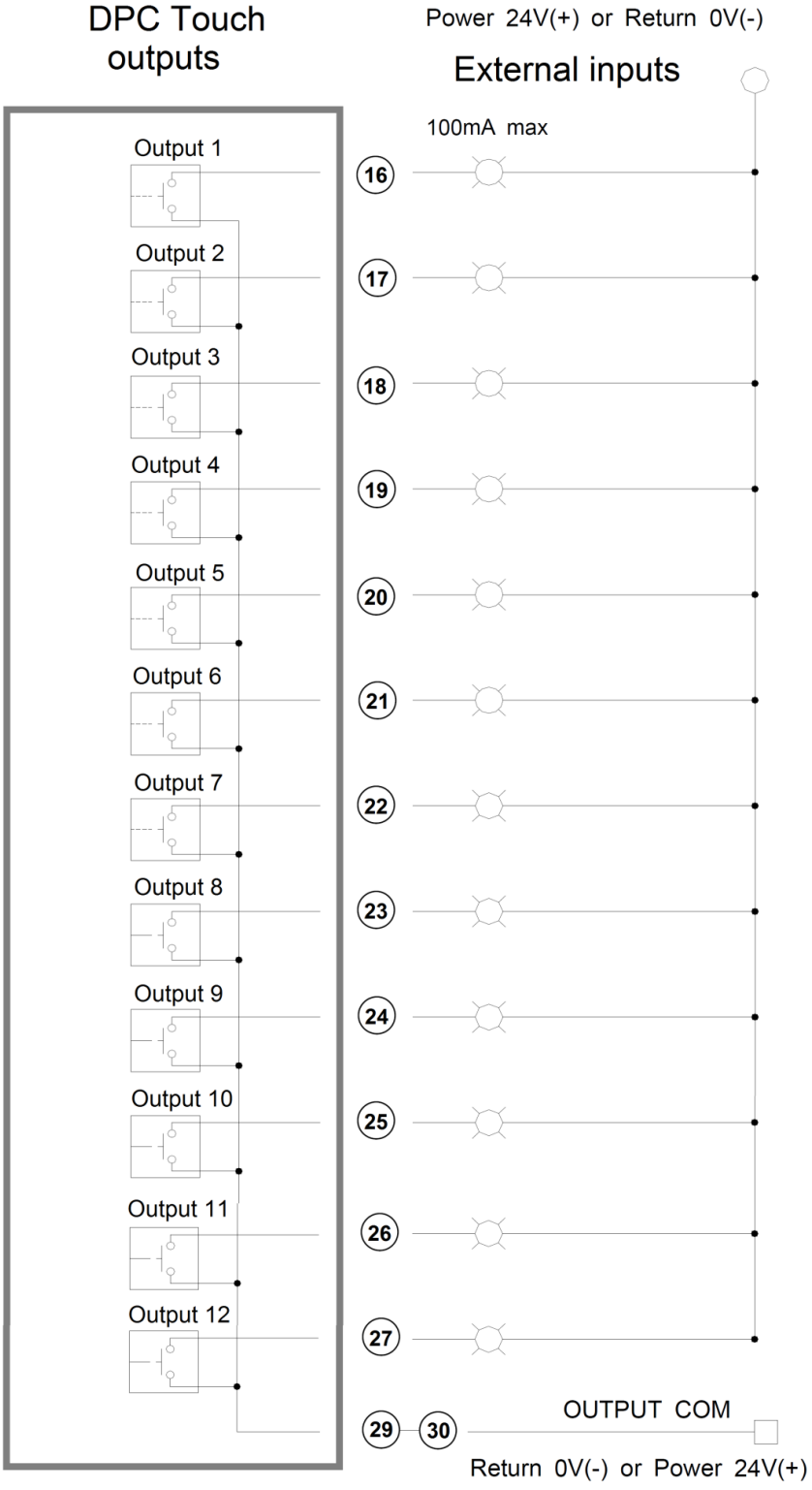
NOTE:

- for the firmware upgrade mode pins 7 and 8 have to be short connected (refer to the firmware upgrade manual). - use crossed cable for barcode scanner connection.

10.3 Inputs wiring scheme



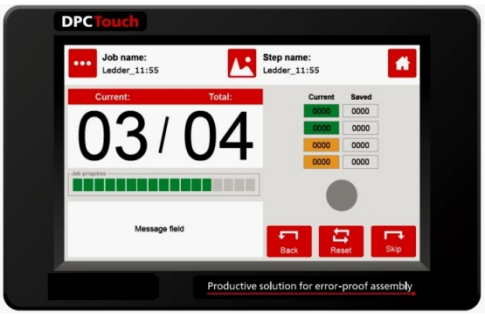
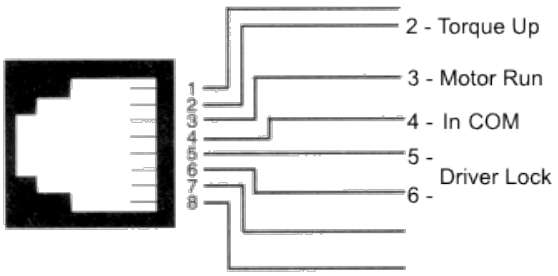
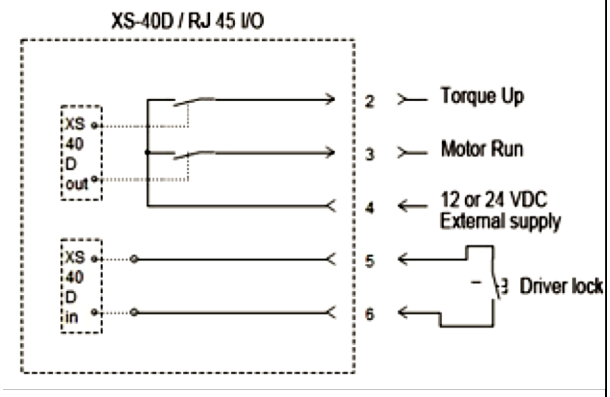
10.4 Outputs wiring scheme



NOTE: All outputs are optically isolated. Max current capacity is 100mA per output. Total of 500mA.

10.5 Connection Mountz low voltage tools BF, NF, LF and HF

Two tools can be simultaneously connected to corresponding ports DR1 and DR2

DPCTouch	Mountz STC40
	
RJ45 I/O port 1 and 2	**RJ45 I/O port**
	

Signal	RJ45 pin №	RJ45 pin №	Signal
Torque Up input	2	2	Torque Up output
Motor Run input	3	3	Motor Run output
Driver Lock output	5, 6	5, 6	Driver Lock input
24V	4	4	24V

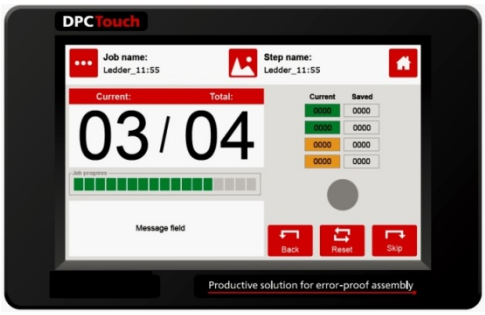
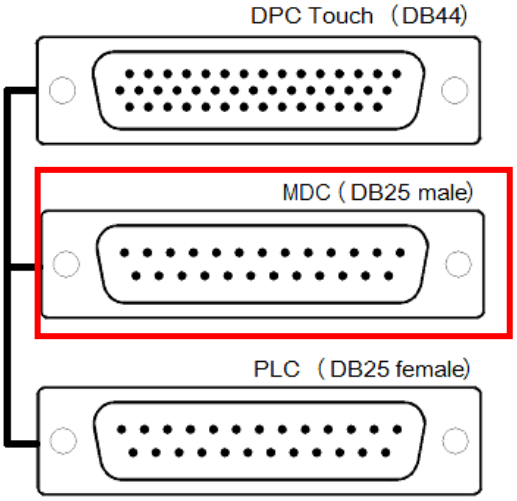
*Controllers XT-30D, XS-38D, XS-40D, XS-35D, XT-35D

NOTE: Select GX/GY/DO/GA tool interface in DPC Touch operating settings.
The tool is locked by short connecting contacts 5 and 6.

1. Orange (Not used)
2. White+Orange stripe
3. Blue
4. White+Blue stripe
5. Green
6. White+Green stripe
7. Brown
8. White+Brown stripe (Not used)

ATTENTION! Use only straight RJ45-RJ45 cable (not crossed).

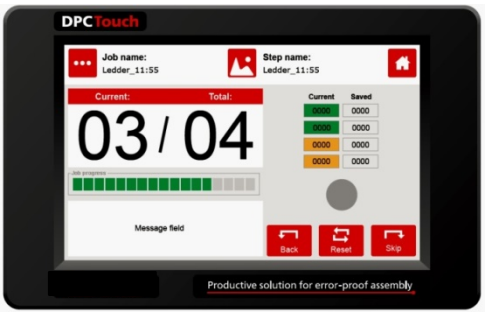
10.6 Connection to Mountz current control MDC series

DPCTouch	Mountz MDC series
	
I/O cable (DB44 male to DB25 male and DB25 female) Ref: 6-1252006 	**DB25 I/O port** (potential free) 

Input/Output	Assigned signal	DB44pin №	DB25pin №	Input/Output	Signal
Output 1	Torque Select 1	16	1	Input 1	Preset select 1
Output 2	Torque Select 2	17	2	Input 2	Preset select 2
Output 3	Torque Select 3	18	3	Input 3	Preset select 3
Output 4	Torque Select 4	19	4	Input 4	Preset select 3
Output 5	Tool Disable	20	5	Input 5	Driver Lock
Input 1	D_Motor_Run	1	10	Output 1	Motor Run
Input 2	Tool Alarm	2	11	Output 2	Alarm
Input 3	D_Fastening_OK	3	12	Output 3	Fastening OK
IN_COM		14, 15	22		0V DC
OUT_COM		29, 30	21		24V DC

NOTE:
All 8 inputs and 8 outputs of MDC controller are wired to DPC Touch controller. These signals can be used for advanced functions (management of Reset, Reverse, etc). I/O's numbers are matching.
Assign signals on DPC Touch and MDC as above.
Select DC tool interface in DPC Touch operating settings.
Activate Torque selection by binary in DPC Touch operating settings.

10.7 Connection of Atlas PF4000

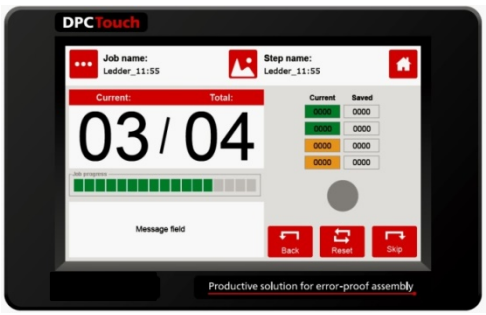
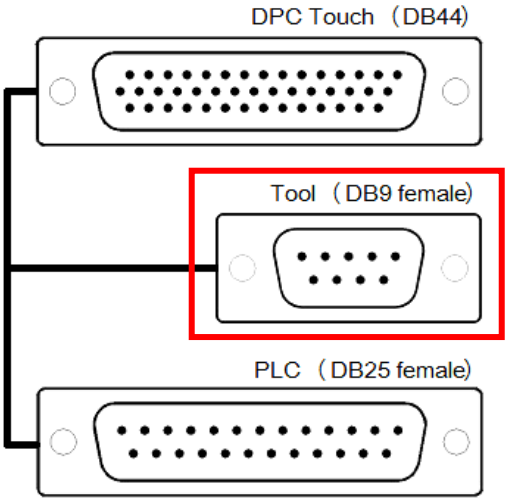
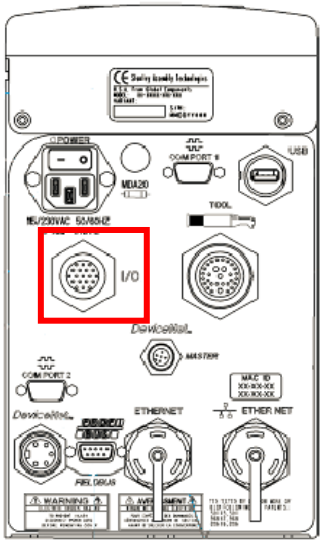
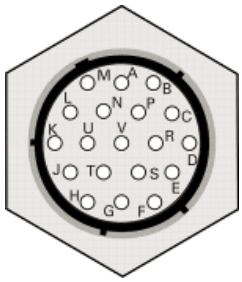
DPCTouch	Atlas PF4000
	
I/O adaptor (DB44M to DB9F + DB25F)	**I/O connectors** (12 + 10 contacts)

I/O number	Signals assignment example	ONE OF DB9 pin	ONE OF DB25 pin	Signals assignment example	Contacts			I/O
Input 8	D_Fastening_OK	5	13	Tightening OK	1	NO	RE1	OUTPUT RELAYS
					2	C		
					3	NC		
Input 9	Job select 1	6	14	Select Job 0	4	NO	RE2	
					5	C		
					6	NC		
Input 10	Job select 2	7	15	Select Job 1	7	NO	RE3	
					8	C		
					9	NC		
Input 11	Job select 3	-	16	Select Job 2	10	NO	RE4	
					11	C		
					12	NC		
Output 1(5)	Torque Select 1	1	(7)	Pset select 0	13	+	DI 1	DIGITAL INPUTS
					14	-		
Output 2(6)	Torque Select 2	2	(8)	Pset select 1	15	+	DI 2	
					16	-		
Output 3(7)	Torque Select 3	3	(9)	Pset select 2	17	+	DI 3	
					18	-		
Output 4	Tool Enable	4	25	Tool Enable	19	+	DI 4	
					20	-		
OUT_COM (24V)		9	23,24	Power supply	21	24V		
IN_COM (GND)		8	21,22	Ground	22	GND		

NOTE: Select DC Tool interface in DPC Touch operating settings

- Either DB25 or DB9 connectors can be used depending on desired number of I/O's
- If DB9 connector is used, then max 3 jobs can be selected on DPC Touch in binary logic by using 2 contacts.
- In order to use independent power supply to DPC Touch, do not connect 24V contact.

10.8 Connection of Stanley Alpha and Kappa tools

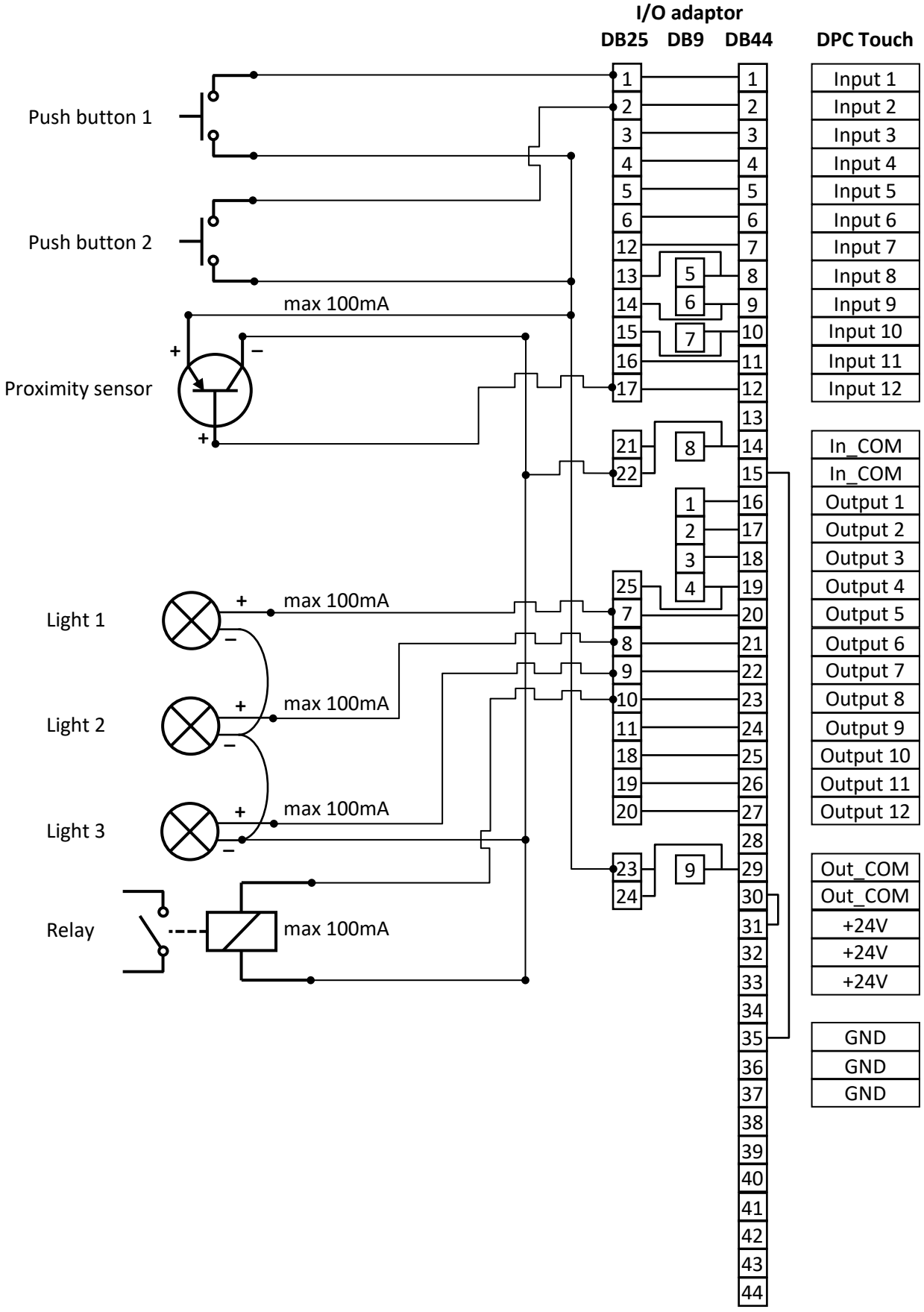
DPCTouch	Stanley Alpha/Kappa
	
I/O adaptor (DB44 male to DB9 female and DB25 female) 	**I/O port**  

Input/Output	Assigned signal	DB9 pin №	Stanley pin №	Signal
Output 1	Torque Select 1	1	P	Select Job (bit)
Output 2	Torque Select 2	2	R	Select Job (bit)
Output 3	Torque Select 3	3	S	Select Job (bit)
Output 4	Tool Disable	4	M	Disable Tool
Input 8	D_Motor_Run	5	C	Tool Running / Trigger
Input 9	Tool Alarm	6	K	Cycle NOK
Input 10	D_Fastening_OK	7	J	Cycle OK
IN_COM		8	V	0V DC
OUT_COM		9	B	24V DC

NOTE: Select DC tool interface in DPC Touch operating settings.
In order to use 24V supply from Stanley controller, short connect pins A and B. In this case DPC Touch will be powered by Stanley controller. Don't connect DPC Touch to external power in this case.

To decouple DPC Touch power supply and I/O external power supply, cut the bridges (15)-(35) and (30)-(31) in the DB44 connector of the I/O adaptor in order to disconnect 24V power supply.

10.9 Automation equipment wiring example



10.10 I/O port adaptor (DB44 → DB25 + DB9) wiring scheme

	DPC Touch	DB44 (male)		DB25 (female)	DB9 (female)	**Example** of assigned signals
INPUTS	**Input 1**	1	←	1		Job select 1
	Input 2	2	←	2		Job select 2
	Input 3	3	←	3		Job select 3
	Input 4	4	←	4		Job select 4
	Input 5	5	←	5		Reset
	Input 6	6	←	6		Reset Step
	Input 7	7	←	12		Reset Job
	Input 8	8	←	13	5	*D_Motor_Run*
	Input 9	9	←	14	6	*Tool Alarm*
	Input 10	10	←	15	7	*D_Fastening_OK*
	Input 11	11	←	16		Logical In
	Input 12	12	←	17		Logical In
		13				
	IN_COM	14		21, 22	8	Out Com (0V)
		15				
OUTPUTS	**Output 1**	16	→		1	*Torque Select 1*
	Output 2	17	→		2	*Torque Select 2*
	Output 3	18	→		3	*Torque Select 3*
	Output 4	19	→	25	4	*Tool Disable*
	Output 5	20	→	7		Tool Enable
	Output 6	21	→	8		D_Run
	Output 7	22	→	9		D_Torque
	Output 8	23	→	10		Alarm
	Output 9	24	→	11		Job OK
	Output 10	25	→	18		Logical Out
	Output 11	26	→	19		Logical Out
	Output 12	27	→	20		Logical Out
		28				
	OUT_COM	29		23, 24	9	In Com (24V)
		30				
	+24V	31	→			
		32	→			
		33	→			
		34				
	0V	35	→			
		36	→			
		37	→			
		38				
		39				
		40				
		41				
		42				
		43				

ATTENTION!

By default, the controller provides 24V output on the pins 31-33 and 35-37. This power supply can only be used to power I/O signals (max 100mA per output, max 500mA for all outputs). The controller can

11. Troubleshooting

Problem	Solution
Controller is not booted (black booting screen)	Check the boot log on the screen. Last booting step indicates the problem. Example: “SD card Init” – SD card is not found. Check if SD card is inserted and not damaged.
Operating screen is not displayed after booting	SD card content can’t be found. Check if “system” and “user” folders are placed in the root directory of the SD card and not placed in other folders. Check if names of folders are correct. Rewrite the “system” folder content if necessary.
Controller is not responding after calibration	Calibration is not performed correctly. Turn off the controller and delete the following file from the SD card: **SD:\system\setting\Setting_posi.dat**
Password is lost or forgotten	Turn off the controller and delete the following file from the SD card: **SD:\system\setting\Setting_posi.dat**
Controller is unresponsive	Turn off and on the controller.
Input signal is not received	Input signals should be between 20 and 30V in order to be detected by controller. Check if signal is detected in Other settings, real time monitoring
Output signal is not sent	Max current capacity of outputs is 100 mA per output and total of 500mA for all outputs. To check wiring, force output signal in Other settings, real time monitoring. Outputs are optically isolated.
Image message is overlapped with operating screen	Press on the screen where Image button is situated (top middle) in order to initialize the screen. Use recommended pictures format 16 bit bitmap. To convert images into 16 bit format use image converter utility.
Image message is not displayed on the screen	Check image size and format. Images have to be in .bmp format of the following size: 800x480 px. Recommended bit depth is 16 bit. To convert images into 16 bit format use image converter utility.
Job is locked in a loop with no end	Turn off and on the controller. If the job is assigned as default, delete the job from the SD card. Make sure that a job contains at least one Fastening or one Logical input step. Otherwise the job will be stuck in automatic loop.
Error: “Fastening time is too short/long”	Check fastening time control limits in operating settings (screen 3 of 4). Check saved min and max fastening time in corresponding fastening step. Reprogram or modify manually if needed. To disable tightening time control set min and max fastening time to 0 in fastening step programming. NOTE: control limits in operating settings are only applied to newly created jobs.
Error: “Trigger released before torque up”	Check min threshold for trigger release control in operating settings (screen 3 of 4). If start trigger is released after the min threshold, the error is displayed. To disable trigger release control, set the threshold to 0 or to 9999.

Mountz Calibration & Repair Services
Mountz Inc. features an experienced calibration and repair staff. Our trained technicians can calibrate and repair most any tool. Mountz provides rapid service with quality that you can trust as we offer two state-of-the-art calibration lab and repair facilities that can calibrate up to 20,000 lbf.ft.

Since 1965, Mountz's in-depth knowledge of torque is reflected in our tool's craftsmanship and our ability to provide solutions to both common and uncommon torque applications. We perform calibrations in accordance with ANSI/NCSL-Z540. Mountz is dedicated solely to the manufacturing, marketing and servicing of high quality torque tools.

Tool Service & Repair Capability
- Torque Wrench Calibration: Click Wrench, Dial Torque Wrench, Beam Wrench, Cam-Over & Break-Over Wrench
- Torque Screwdrivers: Dial, Micrometer, Preset & Adjustable
- Torque Analyzers/Sensors: All brands
- Electric Screwdrivers: All brands
- Air Tools: All brands, Impact Wrenches, Drills, Pulse Tools, Grinders, Percussive Tools, Air Screwdrivers, Nutrunners, DC Controlled Nutrunners
- Torque Multipliers: All brands

Mountz Torque Testers and Calibration Equipment

Torque tools go out of calibration with use. Calibrating a torque tool is a fine-tuning process of bringing the tool back within its tolerance. Torque testers can also be used for quick tools tests on the line or in the lab to determine whether torque tools are holding a given setting.

A regular torque tool calibration and re-calibration guarantees the operator repeatable accuracy and adherence to international standards. Torque testing also ensures torque equipment is operating to peak performance and can highlight potential tooling problems before they arise perhaps due to tool wear or broken components.

Controlling torque is essential for companies to ensure their product's quality, safety and reliability isn't compromised. The failure of a three-cent fastener that isn't properly tightened can lead to catastrophic or latent failures. Fasteners that are insufficiently torqued can vibrate loose and excessive torque can strip threaded fasteners. Using a quality torque tool has become increasingly important for many companies to ensure that proper torque is being applied and maintains gauge requirements associated with the ISO 9001 Quality Standard. Look for the Mountz hexagon logo - it's a stamp for quality tools, service and knowledge in the field of torque control.

Mountz Service Locations

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