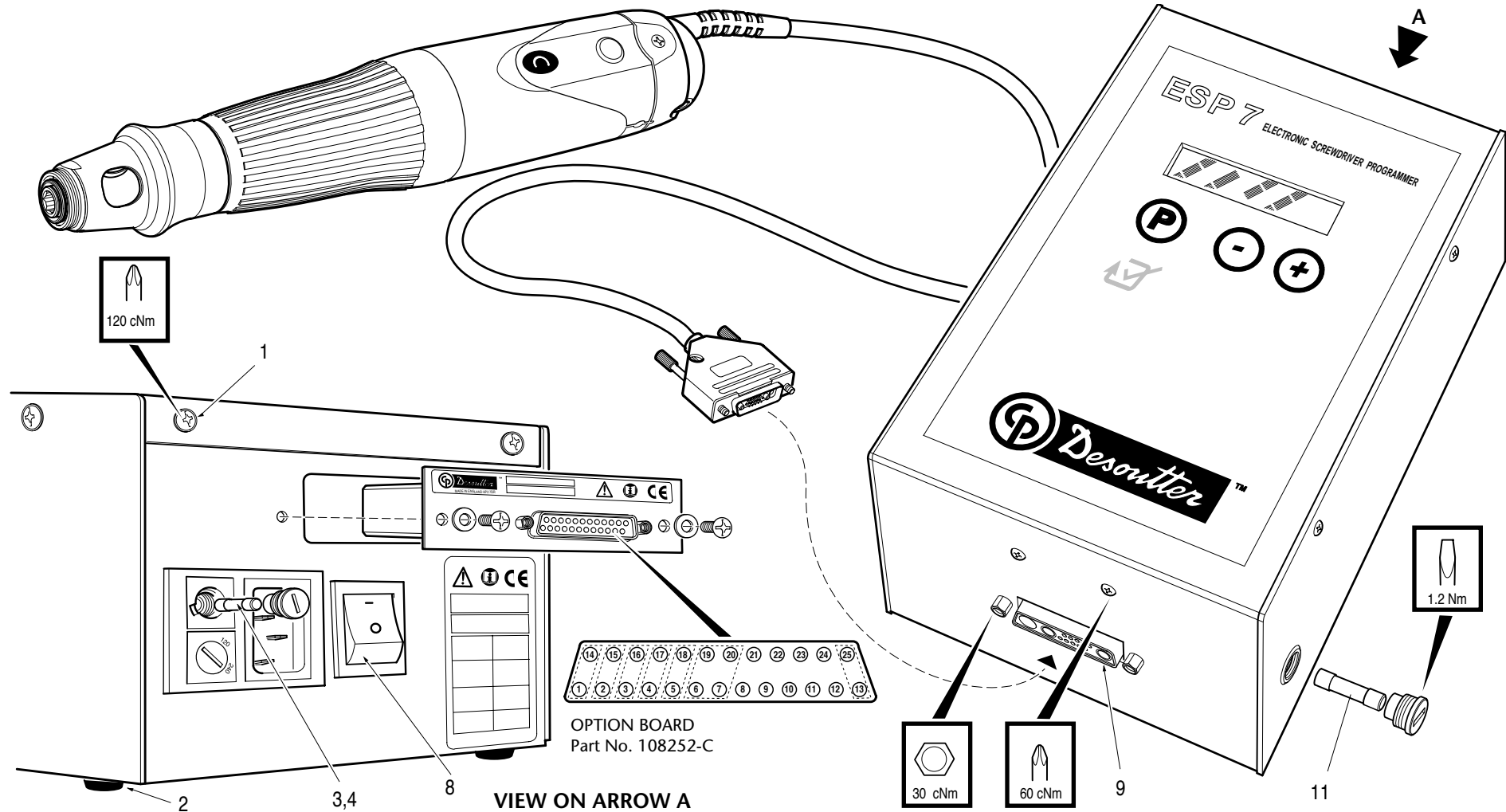


# ESP 7 -Option 3 and 4



Desoutter Limited Eaton Road Hemel Hempstead Hertfordshire HP2 7DR England



VIEW ON ARROW A

**GB** SERVICING AND OPERATING INSTRUCTIONS  
**D** WARTUNGSANLEITUNG BEDIENUNGSANLEITUNG

**F** MANUEL D'ENTRETIEN MANUEL D'UTILISATION  
**E** INSTRUCCIONES DE SERVICIO INSTRUCCIONES DE OPERACIÓN

**P** INSTRUÇÕES DE MANUTENÇÃO INSTRUÇÕES DE FUNCIONAMENTO  
**I** ISTRUZIONI PER LA MANUTENZIONE ISTRUZIONI OPERATIVE

**NL** ONDERHOUDSINSTRUCTIES BEDIENINGSinSTRUCTIES  
**GR** Οδηγίες Συντήρησης Οδηγίες Λειτουργίας

**DK** SERVICEVEJLEDNING BETJENINGSVEJLEDNING  
**N** SERVICEINSTRUKSJONER DRIFTSINSTRUKSJONER

**S** SERVICEINSTRUKTIONER BRUKSANVISNING  
**FIN** HUOLTO-OHJEET KÄYTTÖOHJEET

# ESP 7 - Option 3 and 4 Programming Description



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## STATEMENT OF USE:

This control board (Part No. 108252) is to be used in conjunction with Desoutter unit ESP 7 (111362). No other use permitted. For professional use only.

This instruction to be used in conjunction with ESP 7, Option 1 instructions.

Note: When fitting or removing a new option board:

1. Anti Static precautions must be taken.
2. Ensure the ESP 7 is powered Off before connecting or disconnecting an Option Board. (Wait at least 10 seconds after switching power off).
3. The Factory Default values must be re-loaded and parameters changed as required afterwards.

## FUNCTION - PARAMETER CHANGE MODE:

Note that a tool does not have to be connected to carry out parameter changes.

### Parameter - VALUES:

To set-up specific parameter values, depressing the mode key (P) for 3 seconds enters the parameter change mode where the following is displayed:

PARAMETER MODE

If the password feature has been enabled in the "Set-Up-Routine" described in Option 1 (i.e. Password "Yes"), the following is displayed when the mode key is released:

PASSWORD 0

If a password has been enabled enter it using up key (increased +) or down key (decreased -). To validate the number depress and release the mode key (P). If the wrong password is used the unit will return to the pre-set operational mode with no parameter changes.

Note: If no password has been selected this operation will be bypassed and the first parameter will be presented to the operator.

When the mode key is next depressed and released the first parameter is presented to the user. The user can step through a list of parameters by pressing the mode key. There is always one

parameter presented at one time. This parameter can be changed by the up key (increased +) or down key (decreased -). By pressing the mode key (P) a changed value is stored temporarily and the next parameter is presented. If the mode key (P) is pressed for greater than 3 seconds, all parameter changes are saved, the parameter change mode is closed and the unit resumes normal operation. The following is displayed after the 3 second period, and disappears when the key is released.

PARAMETER STORED

The set-up and the parameter mode will both be exited automatically, if there is no user input for more than 60 seconds. In this case NO changes will be stored, and the programme will operate to the original set values.

### Parameter: TOOL/MODE:

Set parameters as "Basic version".

### Parameter: EXTERNAL FORWARD:

The parameter can be configured as OFF, AND or ONLY and is used in conjunction with the I/O porting.

OFF: means inactive, so only the tool start (Lever/Trigger and/or push) will be active.

AND: means that the tools start (Lever/Trigger and/or push) and the external signal must be supplied to start the operation.

ONLY: means that the fastening or reverse operation will be triggered only by the corresponding external signal.

Note: If TOOL has been programmed as PUSH, the ONLY function, although displayed, will be stored as AND. This is intentional.

### Parameter: EXTERNAL REVERSE:

The parameter can be configured as OFF, AND or ONLY and is used in conjunction with the I/O porting.

OFF: means inactive, so only the tool Reverse (button and push) will be active.

AND: means that the tools Reverse (button and push) and the external signal must be supplied to start the operation.

ONLY: means that the reverse operation will be triggered only by the corresponding external signal.

Note: If TOOL has been programmed as PUSH, the ONLY function, although displayed, will be stored as AND. This is intentional.

### Parameter: EXTERNAL STOP:

This programme can be selected as NO or YES and is used in conjunction with the I/O porting.

NO: means inactive.

YES: means an external signal is required to stop the fastening (i.e. The tool is being used to position a fastener/component to a specific position, rather than to a torque). If the clutch cut-off operation occurs before the external signal, the tightening will be rated as NOK (cycle not completed).

### Parameter: SELECT GROUP:

This parameter can be set to EXT, 1, 2, 3 or 4 and is used in conjunction with the I/O porting.

With 1, 2, 3 or 4 selected, the parameter group to be used or edited, will be selected by the number programmed via the Display.

With EXT selected, the parameter group to be used or edited, will be selected using the External I/O PROG SEL 1 and PROG SEL 2 lines.

Changes on the PROG-SEL inputs will be disregarded during an already started tightening.

### Parameter: SLOW TIME, SLOW SPEED:

If the Slow Time is selected with a value greater than 0, the parameter "Slow Speed" will appear and a value can be selected. The tool will start with the programmed Slow Speed and will then switch automatically to the programmed FAST or FINAL speed after the SlowTime has elapsed. If the Slow start is set to 0, the parameter Slow Speed will be skipped. The Slow Time/Speed parameters apply only to the fastening operation.

Note: The Slow Phase does not function when using the HT-Current feature, even though the Slow Time and Slow Speeds can be programmed.

### Parameter: FAST TIME, FAST SPEED:

If the Fast Time is selected with a value greater than 0, the parameter Fast Speed will appear and a value can be selected. The tool will run at the programmed Fast Speed and will then switch automatically to the programmed FINAL speed after the Fast Time has elapsed.

Note: To ensure correct tightening of fastener, the change from Fast Speed to Final Speed must occur before the total rundown time of the fastener.

The Fast Time/Speed parameters apply only to the fastening operation.

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## Parameter: FINAL TIME, FINAL SPEED:

The Final Time and Final Speed selection will apply after the slow and fast time (if programmed). The tool operates at this speed until either the shut-off operation (clutch or current controlled) occurs or the set time, if programmed, has elapsed. In non FAS mode, an "E5" message will be displayed in the right hand digits should a "Final Timeout" occur before the operation has completed. In FAS mode an "ERR - 5" message will be displayed in the second display should a "Final Time" timeout occur before the operation has completed.

## Parameter: SPEED REVERSE:

This is the speed used for reverse operation.

## Parameter: PRE-REVERSE: (All Tools)

A reverse operation followed by a tightening operation can be selected. This will mean that the tool will first run in reverse for the programmed "Pre-Reverse" time, and will then automatically run in the forward direction until clutch or current shut-off has occurred. To activate pre-reverse, program the "Pre-Reverse" time and "Speed Reverse" for reverse speed, the following parameters may then be selected as required slow time/speed, fast time/speed and final time/speed. The cycle will be terminated on completion with a valid clutch or current shut-off signal and an OK (Cycle Complete) signal. The tool will also stop, if the start condition (button or external start) is released before the clutch or current shut off has occurred. This will result in a NOK (cycle not complete) condition.

## Parameter: AUTO-REVERSE (SLE Manual (Lever), Trigger, Current Control and Angle Head Tools Only).

An auto-reverse time period can be selected. This will mean, that after clutch or current shut-off has occurred the tool will automatically reverse and run for the defined time and then stop. The auto reverse operation will only be executed, if the fastening cycle had been executed with a valid clutch or current shut off signal. The cycle will be terminated on completion of the complete programmed Auto Reverse time, with an OK (cycle complete) signal. The tool will also stop, if the tool start or external start conditions are disabled (i.e. Button, push start or external start signals) before the clutch or current shut-off has occurred or before the complete auto-reverse time has elapsed. This will result in a NOK (cycle not completed) condition.

## Parameter: CURRENT: Option 4 Only (SLE Push and Lever Current Controlled Tools Only)

### ESP 7 Current Control Mode

CURRENT MODE is selected when the parameter CURRENT is programmed with values between 30% and 100%.

When operating in Current Mode it is important to note the following:

1. All programmable Current and Final Speed values between 30% and 100% are internally translated to values that prevent the tools maximum rated torques being exceeded on a hard joint causing damage to the tool. The resulting translated Current and Speeds are displayed as shown in the following examples.
2. Note that the above reductions reduce the tool speed in Current Mode and that **both Current and Speed affect the final torque.**
3. The reduced values mean that on anything other than a hard joint, the maximum achievable torque will be less than that achievable on a hard joint.
4. The maximum rated torques for SLE **Current Controlled** tools are:

Tool - Torque Relationship			
Tool	Soft Joint (Nm)	Semi Soft Joint (Nm)	Hard Joint (Nm)
1500	1.6	2.0	2.6
1000	2.1	2.5	3.0
750	2.8	3.0	3.6
550	3.8	4.1	4.5

5. Displayed values: These will be the internally translated values shown below where **S** indicates Speed and **C** indicates Current.

### Example showing Final Speed and Current:

First Display: (Original Programmed Current)

Programmed Final  
Phase Current

**G1 PUSH \* 50% - -**

\*S Indicates programmed Final Speed in Non Current Mode,  
C Indicates Programmed Current in Current Mode.

## Second Display: (Final Phase Speed and Current Values)

Internal Final    Internal  
Speed            Current

**G1 FINAL S - 40 C - 40**

Second display shows values after any necessary translation.

Display shown in order when using the + Key.  
Order reversed if using the - Key.

Summary of display contents in parameter mode:  
(Number in left column is Program Group number)

TOOL	PUSH	MANU/PUSH
MODE	PUSH	PUSH/COMBI
EXT . FORWARD	OFF	OFF/AND/ONLY
EXT . REVERSE	OFF	OFF/AND/ONLY
EXT . STOP	OFF	OFF/ON
SELECT GROUP	EXT	EXT/1/2/3/4
1 : SLOW TIME	0 . 7	OFF, 0.1 . . . 9.9 sec
1 : SLOW SPEED	40 %	30% . . . 100%
1 : FAST TIME	0 . 7	OFF, 0.1 . . . 9.9 sec
1 : FAST SPEED	80 %	30% . . . 100%
1 : FINAL TIME	5 . 0	OFF, 0.1 . . . 9.9 sec
1 : FINAL SPEED	30 %	30% . . . 100%
1 : REVERSE	60 %	30% . . . 100%
1 : PRE REVERSE	OFF	OFF, 0.0 . . . 9.9 sec
1 : AUTO REVERSE	OFF	OFF, 0.0 . . . 9.9 sec
1 : CURRENT	OFF	OFF, 30% . . . 100%

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## I/O Signals:

The option modules add the following digital input/output capabilities to the system.

IN: EXTERNAL FORWARD IN: EXTERNAL REVERSE

IN: EXTERNAL STOP.

IN: PROG-SEL 1 IN: PROG-SEL 2

OUT: CYCLE COMPLETE (OK), same operation as LED on front panel.

OUT: NOT COMPLETED (NOK).

## Functionality of Inputs:

EXTERNAL FORWARD and EXTERNAL REVERSE are for external operation of the tool.

EXTERNAL STOP NO/YES. When "External Stop" is programmed YES, this input will cause the tool to stop.

PROG - SEL 1 and PROG - SEL 2 are used to select program groups 1, 2, 3 or 4 when "SELECT GROUP" is programmed to EXT.

## Functionality of Outputs:

The outputs are switched inactive with every trigger operation, which sets the tool into forward motion.

The OK (Cycle Complete) or NOK (Not Completed) will be rated by the following:-

A tightening finished by a valid clutch or current shut off operation will be rated as OK.

In the case of active auto reverse, the OK rating will only be given, if the initial tightening was OK and the tool reversed for the complete programmed reverse time. Failure to complete the initial tightening, or not allowing the full reverse time to be completed, will result in a NOK condition.

**WARNING:** A valid clutch or current shut off operation requires that the tool is held firmly against the fastener throughout the operation and for the tightening to be completed within the Final Time period. (If programmed).

For further information, refer to "Explanation of status of Green OK LED" in ESP 7 Programming Description - Option 1. All other operations will show a NOK display.

## Signals on the I/O connector:

Signal	I/O	Pin/common connections	Description	Signal Type	Signal Duration
EXTERNAL FORWARD	Input	21	Signal to run tool forward, can be used exclusive or together with the tool button.	L	24V signal Must be enabled when Ext Forward = And or Only
EXTERNAL REVERSE	Input	22	Signal to run tool in reverse, can be used exclusive or together with the tool button.	L	24V signal Must be enabled when Ext Reverse = And or Only
EXTERNAL STOP	Input	12	Allows immediate stop of tool (depth sensor, park position)	P	24V signal. See Note below.
CYCLE COMPLETED (OK)	Output	2/15	Signals that the fastening is complete - i.e. clutch has fired or current shutoff has activated	L	24V signal Signal remains enabled until start of next tightening cycle (not reverse) or ESP is powered off
NOT COMPLETED (NOK)	Output	1/14	Signals that the tool has stopped, but fastening was not successful.	L	24V signal Signal remains enabled until start of next tightening cycle (not reverse) or ESP is powered off
PROG SEL 1	Input	23	Grp1:0V, Grp2:0V, Grp3:+24V, Grp4:+24V	L	24V signal level required to select required Programs 1 thru 4 via Ext I/O
PROG SEL 2	Input	24	Grp1:0V, Grp2:+24V, Grp3:0V, Grp4:+24V	L	24V signal level required to select required Programs 1 thru 4 via EXT I/O
+24V		5/18	24V from external power supply	L	Required for all External I/O operations
0V		6/7/13/19 20/25	0V return to external power supply	L	Required for all External I/O operations

**Note:** An external 24V power supply is required to enable the external Input and Output signals.

Maximum output current per output is 500mA.

Current per input is 9mA.

**L** Signal level required for time period indicated.

**P** Can be a pulse with a minimum time duration of 200ms, however if longer, the External Stop must be disabled before the start of the next cycle.

Note that signals Reset Last, Reset All and NOK Receipt are rising edge triggered. While they can be low or high at the start of the next cycle, to be used at the end of it, they must be first disabled and then enabled.

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# ESP 7 - Option 3 and 4 Programming Description <sup>GB</sup>



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## Pins of Ext I/O Pin D 25 Pin D type connector as viewed from rear of ESP 7 Controller

Pin 4/17: Output signal (L See Note). **n Screws OK** Signals that a complete Group of screws has been completed successfully, or Reset All signal has been enabled. Signal remains enabled until start of first cycle of the next Group, End of Programming or ESP is powered off.  
**Note that this signal is also Enabled when Reset All is used.**

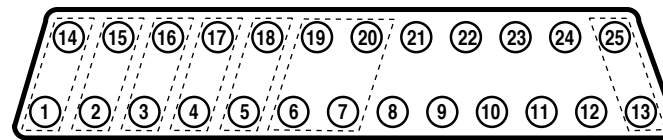
Pin 3/16: Output signal (L See Note) **n Screws NOK** Signals that a complete Group of screws has been completed, but not successfully. Signal available until Reset Last; Reset All; End of Programming or ESP is powered off.

Pin 2/15: Output signal (L See Note). **Cycle Completed (OK)** Signals that the fastening is complete- i.e. clutch has fired or current shutoff has occurred. Signal remains enabled until start of next tightening cycle (Not Reverse) or ESP is powered off.

Pin 1/14: Output signal (L See Note). **Not Completed (NOK)** Signals that the tool has stopped, but fastening was not successful. Signal remains enabled until start of next tightening cycle (Not Reverse) or ESP is powered off.

Pins 5 and 18: +24V from external power supply. Required for all External I/O operations.

Pin 8: Input Signal (L See Note). External **Group Start** for FAS operation. If Group Start programmed Ext, this signal must be enabled for all operations. Note that it can be enabled / disabled by external control before each Group start (i.e. Use as an external " Master Enable " signal).



Pin 21: Input Signal (L See Note). **External Forward** Signal to run tool forward, can be used exclusive or together with the tool button signal. Must be enabled when Ext Forward = And or Only.

Pin 22: Input Signal (L See Note). **External Reverse** Signal to run tool in reverse, can be used exclusive or together with the tool button signal. Must be enabled when Ext Reverse = And or Only.

Pins 6/7/13/19/20/25: Common 0V return to external power supply. Required for all External I/O operations.

Pin 12: Input Signal (P See Note). **External Stop**. Allows immediate stop of tool (depth sensor, park position). See Note below.

Pin 11: Input Signal (P See Note). **Reset Last**.  
1. Resets last screw within current Cycle.  
2. Used with **Reset All** in Sequence Mode to return to first Valid Group

Pin 9: Input Signal (P See Note). **NOK Receipt** Resets NOK of last result.

NOTE, An external 24V power supply is required to enable the External Input and Output signals. Maximum output current per output is 500mA. Current per Input is 9mA.  
L: +24V Signal level required for time period indicated.  
P: +24V Can be a Pulse with a minimum time duration of 200ms, however if longer, External Stop must be disabled before the start of the next cycle.  
Note that signals **Reset Last**, **Reset All** and **NOK Receipt** are rising edge triggered. While they can be low or high at the start of the next cycle, to be used at the end of it, they must be first disabled and then enabled.