

Screwdriver System **Microdrive MD** User's manual



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1 Security information

CAUTION:

- 1.1 Before use please read all the information given in this manual carefully. The unit may only be used for its foreseen purpose as set out in these operating instructions. Improper use can cause damage of the instrument and falsification of the system operation
- 1.2 High voltage on the power supply unit can cause death or serious injury
- 1.3 Disconnect the mains plug from the net before dismantling driver, controller or power supply.
- 1.4 Before connecting the equipment to the mains for the first time check to ensure that the mains input voltage of the equipment corresponds to the local supply voltage.
- 1.5 Do not manipulate the equipment. Use only the original mains adapter.
- 1.6 Defective components should be repaired or replaced immediately by Microtec Systems GmbH
- 1.7 Do only use permitted accessory equipment of Microtec Systems GmbH.
- 1.8 Use the tools only in temperature range of 5°C (41°F) to 40°C (104°F).
- 1.9 Do not use the tools in explosive environment.
- 1.10 Cleaning of the components and the connecting cables should not be done with solvent containing cleanser.

2 General

2.1 Receipt

The system has to be checked immediately after receipt. Damages caused by transportation must be reported to the manufacturer at least 1 week after receipt or any possible guarantee will be void.

2.2 Transport

To avoid braking the connecting cables each connection should be removed before transport. For sending you should have an eye on sufficient insulation of the shipping packet. The components should be protected against mutual damage.

2.3 Storage

The components should be stored at a dry place, and should be protected from dust and aggressive media. High variation of temperature should be avoided. Storage temperature: -25°C (-13°F) to +60°C (140°F)

2.4 Installation

At first a safe place should be chosen for the installation of system. After that, the driver must be connected to the controller with the driver cable. Then the controller must be connected to the power supply and the power supply to the mains wall socket. After pressing the esc-key at the front side of the controller, the system will initialise. All basic hardware functions are checked and displayed during initialisation. Also the driver serial number is displayed. After initialisation passed correctly, the system is ready for use.

3 Extend of delivery

The system requires at least the following components:

3.1 **Microdrive** controller unit:

3.2 **screwdriver**

3.3 **drive cable**

3.4 **power supply**

3.5 **user's manual**

4 System Description

The **Microdrive** screw fastening systems are servo driven microprocessor-controlled precision tools, based on cutting edge technology. Each driver contains a servo motor, planetary gear, incremental encoder, signal conditioning electronics and data memory. The highly integrated control unit **Microdrive** was designed for servo control, torque controlmanagement via serial, and user dialog control for parameter setting.

The standard screw fastening procedure passes the following steps:

- start of the procedure
- driver runs on forward mode at low search speed
- when exceeding the shift point torque, the driver accelerates to the operating speed
- when reaching the tightening torque, the torque can be maintained during a programmable torque hold time
- the driver stops.

The most significant advantages of these assembly tools are:

Simultaneous screw tightening and torque control

- Freely programmable screw fastening parameters
- Maintenance of the torque after fastening for an adjustable time
- Precise tightening torque, torque monitoring and process data documentation
- No clutch for torque setting, therefore no mechanical adjustments
- Facility for customer-specific assembly programs

These features make the screwdriver particularly suitable for highly demanding assembly work and guarantee exactly controlled tightening torque even under difficult conditions.

Figure 1 shows the front side of the controller **Microdrive**:



Controller front side with LCD, status-LED and buttons and the following functions:

Button \uparrow to increase a parameter value

Button \downarrow to decrease a parameter value

Button \rightarrow to go to the next menu

Button **esc** to go back to the status screen and for receipt of error messages

The LCD displays the driver state and the parameter values while setting. It gives detailed information during the screw fastening procedure, e. g. search mode and fastening operation are displayed beneath torque and angle measurement data. After a process is finished, the results are displayed. (Measurement data, if OK, or error messages).

During programming, the display shows parameter values. The status LED shines green at ready, yellow while busy, red at error state.

At the back side there are the connectors for

1 Power supply

4-Pin connector for the power supply. Use only with Microtec power supply.

2 RS232-C-Interface

3-Pin, data-transfer-rate 9600, 8 data bits, 1 stop bit, no parity

PIN	DESCRIPTION
1	TXD
2	GND
3	RXD

3 Vacuum Suction Pump (optional)

5-pin connector for the external vacuum pump. Use only with Microtec vacuum pump

4 I/O-Interface for Device Holder Switch (optional)

PIN	DESCRIPTION
1	+24 V
2	GND
5	OK

5 Parameter Explanation and Programming

The operation of **Microdrive** systems requires an appropriate setting of parameters for the screw fastening procedure. The menu can be entered by pressing the →-key. All parameters can be varied by using the ↑- and ↓-keys. The →-key can be used to get to the next menu item, the esc-key will bring you back to the driver state display.

The following parameters available are for specific programming:

Torque	The tightening Torque is the pre-set torque value to finish the screw fastening procedure
Speed	The parameter Speed corresponds to the tightening torque during the screw fastening procedure
Shift Point	The Shift Point is the threshold torque to change from the slow search mode speed to the higher operating speed
Search Speed	The Search Speed parameter determines the revolution during the search sequence of a screw fastening procedure.
Torque hold time	The Torque hold time parameter determines the driver to keep up the torque at the end of a screw fastening procedure for the specified amount of milliseconds
Delay time	The parameter Delay time allows an automated restart of the driver after expiration of the configured time. If this value is set to zero, the function is disabled
Max. Cycle Time	The parameter Max. Cycle Time limits the time for one screw fastening procedure. If exceeded, an error will be displayed.
Language	The parameter Language can switch the display driver to German, French or Spanish language
Engineering Unit	The parameter Engineering Unit is to select Ncm, kgcm, ozin or lbin.
Cycles	The Cycle Counter can be reset by pressing the ↓-button for more than 5 seconds.

6 General Maintenance

There are certain general maintenance procedures you should perform to keep your **Microdrive** system clean and operating at its efficiency. The **Microdrive** system is a sophisticated instrument containing many sensitive components.

Preventive Maintenance:

- The system should never be exposed to harsh environment as those containing rapid temperature changes or excessive dust.
- Never expose the system to excessive vibration or high humidity.
- Prevent overheating by use only in the permitted temperature range. Do not cover driver or controller or power supply.
- Cleaning of the driver and controller should be done regularly, but not with aggressive cleanser.
- Check wear of the bit regularly.
- Replace worn cables immediately.
- Calibration of the transducer system should be done once a year. Recommended to be done by Microtec Systems GmbH or any authorised service station of Microtec Systems GmbH

Limited Liability / Guarantee

We guarantee for this instrument for a period of 12 month from the date of purchase. Any repair work carried out under the guarantee conditions is free of charge. Our responsibility is limited to the repair or, if we consider it necessary, to its free replacement. The following are not covered by our guarantee: damage due to incorrect handling, failure to observe the instruction manual, or attempts by any non-qualified party to repair the instrument; any consequences what ever which may be connected either directly or indirectly with the instrument supplied or its use. Do not open the driver housing, the controller housing and the housing of the power supply. Breaking the seals invalidates warranty.

Regulation

By properly use the instrument confirms with any valid rule of the CE-regulations.

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