

## 4 Micro Sensor Torque Driver Systems

### 4.1 Handheld Micro Sensor Torque Drivers ng-TDH



- Total Torque Range: 0.01 – 5.0 Nm
- Ultimate Torque/Angle Measurement Precision:
  - Strain Gauge based Rotary Torque Sensor integrated at the Bit Chuck
  - 24 bits A/D Converter Resolution of the Torque Measurement at the Rotary Part
  - Brushless Digital Signal Transmission from the Rotary to the Stationary Part
  - 0.1 Degrees Resolution of the Angle Measurement directly at the Bit Chuck
- Brushless DC Motor Technology
- Adaptive Screw Tightening Strategies
- Massive Aluminum Housing
- All Controls integrated
- Industry-4.0-compliant
- Precise in measurement and highly productive

Adaptive screw tightening strategies to compensate for variations in headset torque when threading self-tapping screws.

The goal of a constant clamping force is thus achieved even with critical screw.

Inner Structure:



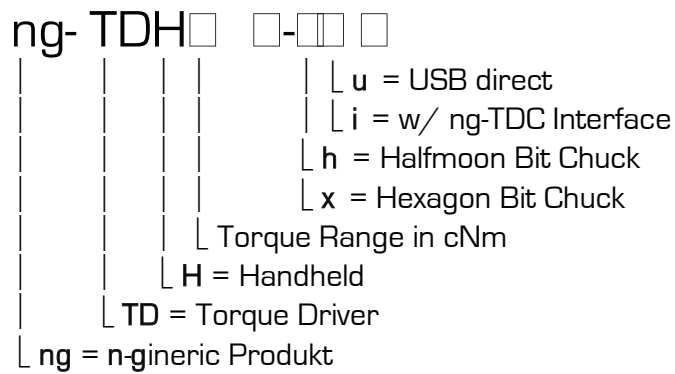
BL-DC Drive with Planetary Gearbox

Rotary Torque/Angle Sensor

Bit Chuck Unit



Torque Driver Nomenclature:



## ng-TDH10-hu Micro Sensor Torque Driver System

Article Number	01-01-00264-01
Torque Range	1 to 10 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.000 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDH10-hu Spindle	Torque Driver Handpiece	01-01-00255-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDH10-hi Micro Sensor Torque Driver System

Article Number	01-01-00265-01
Torque Range	1 to 10 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.000 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDH10-hi Spindle	Torque Driver Handpiece	01-01-00254-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDH20-hu Micro Sensor Torque Driver System

Article Number	01-01-00266-01
Torque Range	2 to 20 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.000 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDH20-hu Spindle	Torque Driver Handpiece	01-01-00256-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDH20-hi Micro Sensor Torque Driver System

Article Number	01-01-00267-01
Torque Range	2 to 20 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.000 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDH20-hi Spindle	Torque Driver Handpiece	01-01-00257-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDH50-hu Micro Sensor Torque Driver System

Article Number	01-01-00311-01
Torque Range	5 to 50 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDH50-hu Spindle	Torque Driver Handpiece	01-01-00310-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDH50-hi Micro Sensor Torque Driver System

Article Number	01-01-00350-01
Torque Range	5 to 50 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDH50-hi Spindle	Torque Driver Handpiece	01-01-00349-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDH100-hu Micro Sensor Torque Driver System

Article Number	01-01-00268-01
Torque Range	10 to 100 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDH100-hu Spindle	Torque Driver Handpiece	01-01-00258-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDH100-hi Micro Sensor Torque Driver System

Article Number	01-01-00269-01
Torque Range	10 to 100 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDH100-hi Spindle	Torque Driver Handpiece	01-01-00259-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD7	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDH200-xu Micro Sensor Torque Driver System

Article Number	01-01-00278-01
Torque Range	20 to 200 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 800 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDH200-xu Spindle	Torque Driver Handpiece	01-01-00283-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDH200-xi Micro Sensor Torque Driver System

Article Number	01-01-00281-01
Torque Range	20 to 200 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 800 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDH200-xi Spindle	Torque Driver Handpiece	01-01-00284-01
ng-TD-PS600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01

## ng-TDH400-xu Micro Sensor Torque Driver System

Article Number	01-01-00271-01
Torque Range	40 to 400 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 800 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDH400-xu Spindle	Torque Driver Handpiece	01-01-00260-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDH400-xi Micro Sensor Torque Driver System

Article Number	01-01-00270-01
Torque Range	40 to 400 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 800 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDH400-xi Spindle	Torque Driver Handpiece	01-01-00261-01
ng-TD-PS600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01



## ng-TDH500-xu Micro Sensor Torque Driver System

Article Number	01-01-00272-01
Torque Range	50 to 500 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 600 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDH500-xu Spindle	Torque Driver Handpiece	01-01-00262-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDH500-xi Micro Sensor Torque Driver System

Article Number	01-01-00273-01
Torque Range	50 to 500 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 600 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDH500-xi Spindle	Torque Driver Handpiece	01-01-00263-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## 4.2 Handheld Micro Sensor Measurement Drivers ng-TD HQ

The ng-TD HQ systems are optimized for high precision torque and angle measurement at low RPM. They can especially fulfill the high requirements of handheld or automated measurement and adjustment applications.

The scope of functions of the ng-TD HQ systems are identical to the ng-TD H systems, just the RPM Range starts very low.

### ng-TD HQ10-hu Micro Sensor Measurement Driver System

Article Number	01-01-00391-01
Torque Range	1 to 10 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TD HQ10-hu Spindle	Torque Driver Handpiece	01-01-00384-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A / USB Mini 1,8m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TD HQ10-hi Micro Sensor Measurement Driver System

Article Number	01-01-00390-01
Torque Range	1 to 10 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TD HQ10-hi Spindle	Torque Driver Handpiece	01-01-00383-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TD HQ20-hu Micro Sensor Measurement Driver System

Article Number	01-01-00290-01
Torque Range	2 to 20 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TD HQ20-hu Spindle	Torque Driver Handpiece	01-01-00382-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TD HQ20-hi Micro Sensor Measurement Driver System

Article Number	01-01-00389-01
Torque Range	2 to 20 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TD HQ20-hi Spindle	Torque Driver Handpiece	01-01-00381,01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TD HQ50-hu Micro Sensor Measurement Driver System

Article Number	01-01-00373-01
Torque Range	5 to 50 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TD HQ50-hu Spindle	Torque Driver Handpiece	01-01-00371-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TD HQ50-hi Micro Sensor Measurement Driver System

Article Number	01-01-00372-01
Torque Range	5 to 50 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TD HQ50-hi Spindle	Torque Driver Handpiece	01-01-00370-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A / USB Mini 1,8 m	01-90-00002-01

## ng-TD HQ100-hu Micro Sensor Measurement Driver System

Article Number	01-01-00282-01
Torque Range	10 to 100 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TD HQ100-hu Spindle	Torque Driver Handpiece	01-01-00302-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A / USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TD HQ100-hi Micro Sensor Measurement Driver System

Article Number	01-01-00388-01
Torque Range	10 to 100 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TD HQ100-hi Spindle	Torque Driver Handpiece	01-01-00380-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TD HQ200-xu Micro Sensor Measurement Driver System

Article Number	01-01-00294-01
Torque Range	20 to 200 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TD HQ200-xu Spindle	Torque Driver Handpiece	01-01-00379-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TD HQ200-xi Micro Sensor Measurement Driver System

Article Number	01-01-00387-01
Torque Range	20 to 200 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TD HQ200-xi Spindle	Torque Driver Handpiece	01-01-00378-01
ng-TD-PS600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01

## ng-TD HQ400-xu Micro Sensor Measurement Driver System

Article Number	01-01-00293-01
Torque Range	40 to 400 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TD HQ400-xu Spindle	Torque Driver Handpiece	01-01-00377-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDH400-xi Micro Sensor Measurement Driver System

Article Number	01-01-00386-01
Torque Range	40 to 400 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TD HQ400-xi Spindle	Torque Driver Handpiece	01-01-00376-01
ng-TD-PS600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01

## ng-TD HQ500-xu Micro Sensor Measurement Driver System

Article Number	01-01-00291-01
Torque Range	50 to 500 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TD HQ500-xu Spindle	Torque Driver Handpiece	01-01-00375-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01



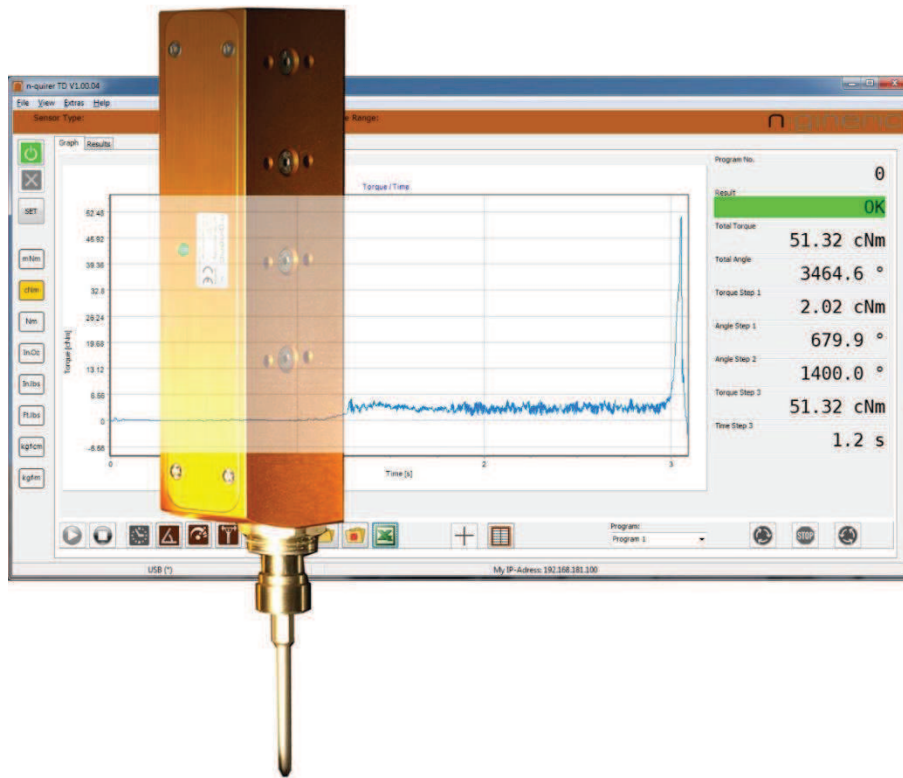
ng-TD HQ500-xi Micro Sensor Measurement Driver System

Article Number	01-01-00385-01
Torque Range	50 to 500 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

Scope of Supply

Type	Description	Article Number
ng-TD HQ500-xi Spindle	Torque Driver Handpiece	01-01-00374-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A / USB Mini 1,8 m	01-90-00002-01

## 4.3 Stationary Micro Sensor Torque Drivers ng-TDS

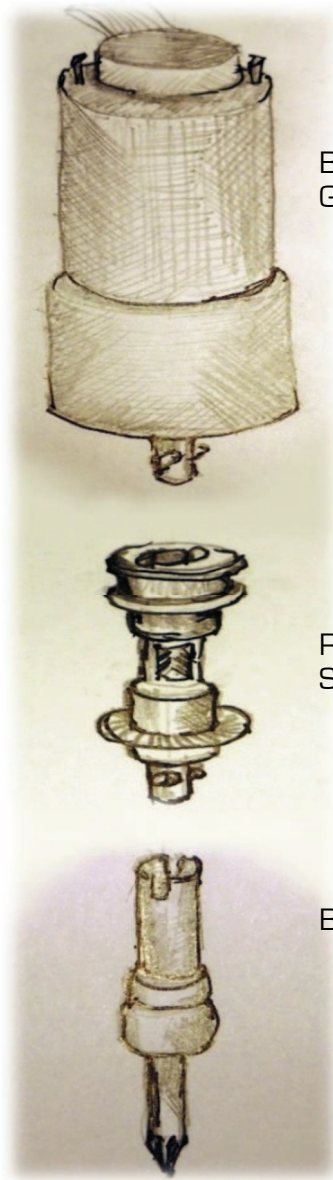


- Total Torque Range: 0.01 – 10.0 Nm
- Ultimate Torque/Angle Measurement Precision:
  - Strain Gage based Rotary Torque Sensor integrated at the Bit Chuck
  - 24 bits A/D Converter Resolution of the Torque Measurement at the Rotary Part
  - Brushless Digital Signal Transmission from the Rotary to the Stationary Part
  - 0.1 Degrees Resolution of the Angle Measurement directly at the Bit Chuck
- Brushless DC Motor Technology
- Adaptive Screw Tightening Strategies
- Massive Aluminum Housing
- All Controls integrated
- Industry-4.0-compliant
- Precise in measurement and highly productive

Adaptive screw tightening strategies to compensate for variations in headset torque when threading self-tapping screws.

The goal of a constant clamping force is thus achieved even with critical screw.

Inner Structure:



BL-DC Drive with Planetary Gearbox

Rotary Torque/Angle Sensor

Bit Chuck Unit



Torque Driver Nomenclature:

ng- TDS  -

- |  = n-gineric Produkt
- |  TD = Torque Driver
- |  S = Stationary
- |  Torque Range in cNm
- |  x = wHexagon Bit Chuck
- |  h = Halfmoon Bit Chuck
- |  i = w/ ng-TDC Interface
- |  u = USB direct

## ng-TDS10-hu Micro Sensor Torque Driver System

Article Number	01-01-00241-01
Torque Range	1 to 10 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.000 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDS10-hu Spindle	Torque Driver Spindle	01-01-00232-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDS10-hi Micro Sensor Torque Driver System

Article Number	01-01-00243-01
Torque Range	1 to 10 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.000 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDS10-hi Spindle	Torque Driver Spindle	01-01-00230-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDS20-hu Micro Sensor Torque Driver System

Article Number	01-01-00233-01
Torque Range	2 to 20 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.000 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDS20-hu Spindle	Torque Driver Spindle	01-01-00218-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDS20-hi Micro Sensor Torque Driver System

Article Number	01-01-00239-01
Torque Range	2 to 20 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.000 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDS20-hi Spindle	Torque Driver Spindle	01-01-00219-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDS50-hu Micro Sensor Torque Driver System

Article Number	01-01-00352-01
Torque Range	5 to 50 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDS50-hu Spindle	Torque Driver Spindle	01-01-00351-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDS50-hi Micro Sensor Torque Driver System

Article Number	01-01-00297-01
Torque Range	5 to 50 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDS50-hi Spindle	Torque Driver Spindle	01-01-00298-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDS100-hu Micro Sensor Torque Driver System

Article Number	01-01-00231-01
Torque Range	10 to 100 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDS100-hu Spindle	Torque Driver Spindle	01-01-00223-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDS100-hi Micro Sensor Torque Driver System

Article Number	01-01-00237-01
Torque Range	10 to 100 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 1.300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDS100-hi Spindle	Torque Driver Spindle	01-01-00217-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDS200-xu Micro Sensor Torque Driver System

Article Number	01-01-00279-01
Torque Range	20 to 200 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 800 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDS200-xu Spindle	Torque Driver Spindle	01-01-00285-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDS200-xi Micro Sensor Torque Driver System

Article Number	01-01-00280-01
Torque Range	20 to 200 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 800 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDS200-xi Spindle	Torque Driver Spindle	01-01-00286-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01



## ng-TDS400-xu Micro Sensor Torque Driver System

Article Number	01-01-00235-01
Torque Range	40 to 400 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 800 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDS400-xu Spindle	Torque Driver Spindle	01-01-00164-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDS400-xi Micro Sensor Torque Driver System

Article Number	01-01-00238-01
Torque Range	40 to 400 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 800 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDS400-xi Spindle	Torque Driver Spindle	01-01-00216-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDS500-xu Micro Sensor Torque Driver System

Article Number	01-01-00274-01
Torque Range	50 to 500 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 600 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDS500-xu Spindle	Torque Driver Spindle	01-01-00276-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDS500-xi Micro Sensor Torque Driver System

Article Number	01-01-00275-01
Torque Range	50 to 500 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	100 to 600 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDS500-xi Spindle	Torque Driver Spindle	01-01-00277-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

ng-TDS1000-xi Micro Sensor Torque Driver System

Article Number	01-01-00410-01
Torque Range	100 to 1000 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	50 - 400 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	253 x 64 x 42 mm
Weight	1.75 kg
Interface	Digital to ng-TDC

Scope of Supply

Type	Description	Article Number
ng-TDS1000-xi Spindle	Torque Driver Spindle	01-01-00409-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A / USB Mini 1,8 m	01-90-00002-01

## 4.4 Stationary Micro Sensor Measurement Drivers ng-TDSQ

The ng-TDSQ systems are optimized for high precision torque and angle measurement at low RPM. They can especially fulfill the high requirements of automated measurement and adjustment applications.

The scope of functions of the ng-TDSQ systems are identical to the ng-TDS systems, just the RPM Range starts very low.

### ng-TDSQ10-hu Micro Sensor Measurement Driver System

Article Number	01-01-00244-01
Torque Range	1 to 10 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDSQ10-hu Spindle	Torque Driver Spindle	01-01-00364-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDSQ10-hi Micro Sensor Measurement Driver System

Article Number	01-01-00245-01
Torque Range	1 to 10 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDSQ10-hi Spindle	Torque Driver Spindle	01-01-00363-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDSQ20-hu Micro Sensor Measurement Driver System

Article Number	01-01-00229-01
Torque Range	2 to 20 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDSQ20-hu Spindle	Torque Driver Spindle	01-01-00362-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDSQ20-hi Micro Sensor Measurement Driver System

Article Number	01-01-00246-01
Torque Range	2 to 20 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDSQ20-hi Spindle	Torque Driver Spindle	01-01-00361-01
ng-TD-PS-24-80	Power Supply Unit	01-91-00006-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDSQ50-hu Micro Sensor Measurement Driver System

Article Number	01-01-00365-01
Torque Range	5 to 50 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDSQ50-hu Spindle	Torque Driver Spindle	01-01-00353-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDSQ50-hi Micro Sensor Measurement Driver System

Article Number	01-01-00307-01
Torque Range	5 to 50 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDSQ50-hi Spindle	Torque Driver Spindle	01-01-00306-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDSQ100-hu Micro Sensor Measurement Driver System

Article Number	01-01-00227-01
Torque Range	10 to 100 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDSQ100-hu Spindle	Torque Driver Spindle	01-01-00360-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDSQ100-hi Micro Sensor Measurement Driver System

Article Number	01-01-00247-01
Torque Range	10 to 100 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	4 mm Halfmoon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDSQ100-hi Spindle	Torque Driver Spindle	01-01-00251-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## ng-TDSQ200-xu Micro Sensor Measurement Driver System

Article Number	01-01-00369-01
Torque Range	20 to 200 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDSQ200-xu Spindle	Torque Driver Spindle	01-01-00359-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01



## ng-TDSQ200-xi Micro Sensor Measurement Driver System

Article Number	01-01-00368-01
Torque Range	20 to 200 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDSQ200-xi Spindle	Torque Driver Spindle	01-01-00358-01
ng-TD-PS600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01

## ng-TDSQ400-xu Micro Sensor Measurement Driver System

Article Number	01-01-00228-01
Torque Range	40 to 400 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	¼" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDSQ400-xu Spindle	Torque Driver Spindle	01-01-00357-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

## ng-TDSQ400-xi Micro Sensor Measurement Driver System

Article Number	01-01-00248-01
Torque Range	40 to 400 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

### Scope of Supply

Type	Description	Article Number
ng-TDSQ400-xi Spindle	Torque Driver Spindle	01-01-00356-01
ng-TD-PS600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8m	01-90-00002-01

## ng-TDSQ500-xu Micro Sensor Measurement Driver System

Article Number	01-01-00367-01
Torque Range	50 to 500 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	USB

### Scope of Supply

Type	Description	Article Number
ng-TDSQ500-xu Spindle	Torque Driver Spindle	01-01-00355-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01
n-quirer TD	Torque Driver System Software	01-01-00215-01

ng-TDSQ500-xi Micro Sensor Measurement Driver System

Article Number	01-01-00366-01
Torque Range	50 to 500 cNm
Torque Measurement Accuracy	0.5% of the F.S.R.
Angle Measurement Resolution	0.1 Degrees
RPM Range	5 to 300 min <sup>-1</sup>
Bit Drive	1/4" Hexagon
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Digital to ng-TDC

Scope of Supply

Type	Description	Article Number
ng-TDSQ500-xi Spindle	Torque Driver Spindle	01-01-00354-01
ng-TD-PS-36-600	Power Supply Unit	01-91-00004-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00011-01
ng-TDC	Torque Driver Controller Interface	01-01-00220-01
n-quirer TD	Torque Driver System Software	01-01-00215-01
USB Cable	Cable USB-A /USB Mini 1,8 m	01-90-00002-01

## 5 Systems and Components for Automated Assembly

### 5.1 Blow-Feeding Module ng-BF400



The blow feeding module is designed for highly effective automated screw tightening applications. It is built from the following components:

- Fixture unit, prepared for mounting of the module at a robot (e. g. a SCARA or Cartesian Robot)
- Pneumatic precision slide für the driver stroke
- Mouthpiece Assembly with bracket set

The screws are blown from the screw feeder unit through a tube into the mouthpiece. They are stopped by the spring balanced brackets in alignment with the screw driver spindle. The tightening process begins, when the spindle moves downwards pushing the screw through the brackets towards the workpiece while rotating slowly.

The mouthpiece and the brackets sets are designed and manufactured in accordance with the geometric requirements of the parts and screws.

The module is prepared to carry the torque driver types

- ng-TDS50-xi
- ng-TDS100-xi
- ng-TDS200-xi
- ng-TDS400-xi
- ng-TDS500-xi

The total weight of the unit, including the torque driver spindle is approximately 2.0 kg.

The modules are based on a standard design. Most of the times, customization of application specific parts is necessary. It can be done on request after a profound technical clarification.

## 5.2 „Flying Handling“ Module ng-FLH400



The Pick-&-Place feeding module is designed for highly effective automated screw tightening applications. It is built from the following components:

- Fixture Plate, prepared for mounting of the module at (e. g.) a Cartesian robot
- Pneumatic precision slide für the driver stroke
- Screw handling assembly with vertical / horizontal movements via pneumatic precision slides

While the screw is being tightened, the next screw can be blow fed into a dome mounted in the screw handling. When the screw driver spindle has moved back into the upper position, the handling brings the screw to the vacuum nozzle, then it moves back into the loading position. This can happen while the robot moves to the next screw joint position. The process time is significantly shorter than with the normal Pick-&-Place.

The vacuum adapter assembly with the nozzle is attached to the torque driver spindle.

The module is prepared to carry the torque driver types

- ng-TDS50-xi
- ng-TDS100-xi
- ng-TDS200-xi
- ng-TDS400-xi
- ng-TDS500-xi

The total weight of the unit, including the torque driver spindle is approximately 3.4 kg.

The modules are based on a standard design. Most of the times, customization of application specific parts is necessary. It can be done on request after a profound technical clarification.

### 5.3 Micro-Screwfeeder ng-FEED



Intelligent Screwfeeder Module for high volume 24/7 production, prepared for Pick-&-Place by vacuum of micro screws (screw sizes from M1 to M2). All components are integrated in an aluminum housing.

- Vibratory feeder drive
- Feeder bowl
- Numerically controlled escapement
- Optical screw sensor
- Micro air compressor
- Control electronics
- Up-/Down-keys
- Digital-I/O-Interface
- USB-Interface
- Ethernet-Interface
- RS232-C-Interface

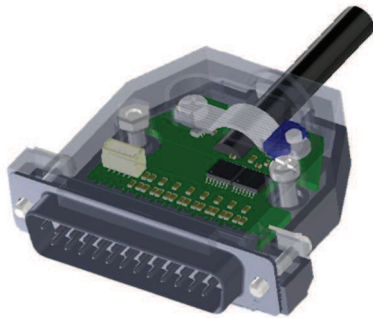
Power supply: 24 V 1 A

The feeder modules are based on a standard design. Most of the times, customization of application specific parts is necessary. It can be done on request after a profound technical clarification.

## 6 Accessories

### 6.1 Interface Extension ng-eTTx

For all intelligent torque and force sensor with *ng-Link* interface

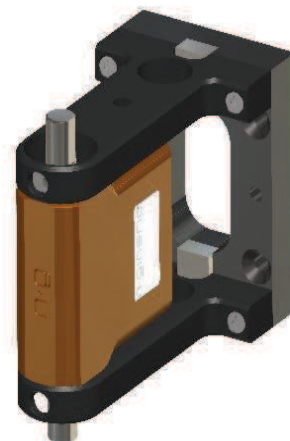


Article Number	01-01-00152-01
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- 8 isolated digital Inputs, NPN or PNP configurable, voltage range 12 – 36 V
- 8 isolated digital Outputs, NPN or PNP configurable, voltage range 12 – 36 V
- Supply voltage 24 V DC 1 A (sensor consumption included)
- Direct signaling of control window status
- Integrated in a SUB-D-25 Housing
- Connector compatible to the *ng-Link* interface
- Cable length 1.8 m

### 6.2 Sensor Mounting Assy

Prepared for ng-TTR-Series (ng-TTR01-ci to ng-TTR5000-qj)



Article Number	Type
01-01-00163-01	Diameter 19 mm
01-01-00226-01	Diameter 20 mm

## 6.3 Screw Joint Simulator Sets

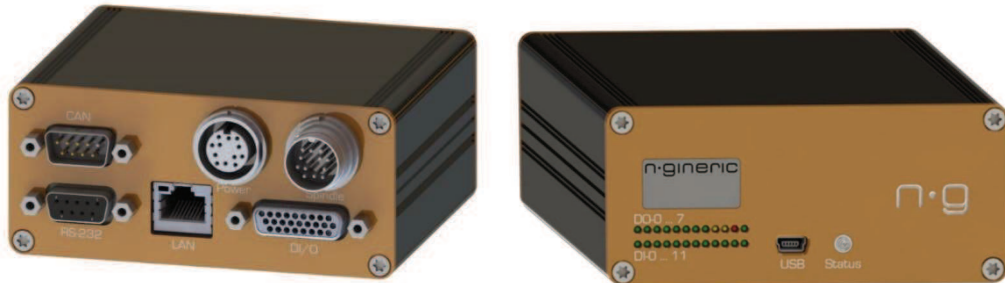


Article Number	Type	Drive	Thread Size
01-92-00019-01	Screw Test Joint Set 3 mm CYL M1	3 mm Shaft	M1
01-92-00020-01	Screw Test Joint Set 3 mm CYL M1.6	3 mm Shaft	M1.6
01-92-00002-01	Screw Test Joint Set 3 mm CYL M2	3 mm Shaft	M2
01-92-00014-01	Screw Test Joint Set 1/4" HEX M2	1/4" Hexagon	M2
01-92-00001-01	Screw Test Joint Set 1/4" HEX M3	1/4" Hexagon	M3
01-92-00003-01	Screw Test Joint Set 1/4" HEX M4	1/4" Hexagon	M4
01-92-00013-01	Screw Test Joint Set 1/4" HEX M5	1/4" Hexagon	M5
01-92-00004-01	Screw Test Joint Set 1/4" HEX M6	1/4" Hexagon	M6
01-92-00006-01	Screw Test Joint Set 1/4" HEX M8	1/4" Hexagon	M8
01-92-00027-01	Screw Test Joint Set 3/8" SQR M6	3/8" Square	M6
01-92-00028-01	Screw Test Joint Set 3/8" SQR M8	3/8" Square	M8
01-92-00029-01	Screw Test Joint Set 3/8" SQR M10	3/8" Square	M10
01-92-00030-01	Screw Test Joint Set 1/2" SQR M8	1/2" Square	M8
01-92-00012-01	Screw Test Joint Set 1/2" SQR M12	1/2" Square	M12
01-92-00031-01	Screw Test Joint Set 3/4" SQR M16	1/2" Square	M16
01-92-00032-01	Screw Test Joint Set 3/4" SQR M24	3/4" Square	M24
01-92-00033-01	Screw Test Joint Set 1" SQR M24	1" Square	M24



## 6.4 Torque Driver Controller Interface ng-TDC

The Digital Interface Extension for Torque Driver Spindles ng-TDH-i and ng-TDS-i can manage 32 screw tightening programs which can be addressed directly vial digital I/Os, Additional interfaces provide versatile connectivity to external controls.



<b>Article Number</b>	01-01-00220-01
<b>Interfaces</b>	12 photo isolated digital inputs, NPN/PNP configurable, 24 V DC 8 photo isolated digital outputs, NPN/PNP configurable, 24 V DC USB-Interface Ethernet-Interface (10/100 Mbit) RS-232-C CAN (in Preparation)
<b>Dimensions</b>	105 x 84 x 46 mm
<b>Weight</b>	0.3 kg

## 6.5 Linear-Arm ng-LA200

Linear Arms provide ergonomic support for the operator by a smooth movement and by the absorption of the reaction torque. They are highly recommended to be used for handheld screw tightening applications. Vertical alignment is mandatory to prevent from cross threading, and avoiding the rotation of the screw driver housing eliminates possible deviations of the angle measurement, as happens if the tool was just held manually.

The ng-LA200 is prepared for the Micro Sensor Torque Driver Spindles

- ng-TDH50-xi, -xu
- ng-TDH100-xi, -xu
- ng-TDH200-xi, -xu
- ng-TDH400-xi, -xu
- ng-TDH500-xi, -xu

Features:

- Horizontal Reach 200 mm
- Vertical Reach 300 mm
- Adjustable Spring Balancer for tool weight 1 to 2 kg
- Fixture Clamp



Article Number	01-01-00303-01
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## 6.6 Foot Switch ng-Tx-FSW



The footswitch ng-Tx-FSW can be used as an external operating element for the n-quirer TT and n-quirer TD Software. It is connected to the PC running the software via USB. The following functions are available:

n-quirer TT:

- External measurement triggering
- Quick graph export into Excel format (for multi-graph collection)

n-quirer TD:

- Start of the screw tightening process

Article Number	01-90-00034-01
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Conector: USB-A, cable length 2.5 meters

## 6.7 Cables

Type	Description	Article Number
ng-TD-Cable 2 m	Driver Cable 2 Meters	01-90-00014-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00011-01
Cable USB-A /USB Mini 1,8 m	USB-Cable 1,8 Meter	01-90-00002-01
Cable USB-A /USB Mini 5 m	USB-Cable 5 Meter	01-90-00006-01
Cable ng-eTTR / USB-A 1,8 m	ng-eTTR /USB-Cable 1,8 Meter	01-90-00008-01
Power Cord ng-PSC-EU	Power Cord Europe	01-90-00028-01
Power Cord ng-PSC-CH	Power Cord Switzerland	01-90-00029-01
Power Cord ng-PSC-US	Power Cord USA	01-90-00030-01
Power Cord ng-PSC-GB	Power Cord England	01-90-00031-01
Power Cord ng-PSC-CN	Power Cord China	01-90-00032-01
Sensor Cable single-sided	Sensor cable for analog interface, with single-sided connector, 1.5 meters	01-90-00021-01
Cable n-clude 1,8 m	<i>ng-Link-Cable</i> for sensor connection	01-90-00012-01
Cable USB-Mini-B / USB-Micro-B 1,0 m	USB-Cable Smartphone	01-90-00019-01
Cable ng-eTTR / USB-Micro1,8 m	ng-eTTR/USB-Cable Smartphone	01-90-00033-01

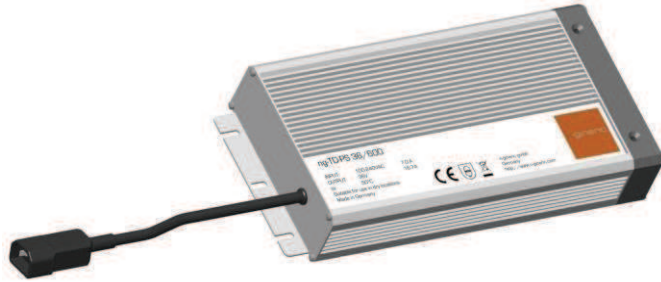


## 6.8 Power Supply Units

Type	Description	Article Number
ng-TD-PS-24-80	Power Supply Unit 24 V 80 VA	01-91-00006-01
ng-TD-PS-36-600	Power Supply Unit 36 V 600 VA	01-91-00004-01



ng-TD-PS-24-80



ng-TD-PS-36-600

## 6.9 Vacuum Adapter Assemblies



Vacuum Adapter Assemblies for Micro Sensor Torque Driver Spindles ng-TD are available in different sizes. They are selected according to the driver size, the screw geometry and possible constraints of the workpiece. Sometimes customizing can be necessary. The vacuum nozzle is not included.

Type	Article Number
ng-TD20-h44 Vacuum Adapter Assy D6	30-01-00032-01
ng-TD100-h44 Vacuum Adapter Assy D6	30-01-00035-01
ng-TD100-h64 Vacuum Adapter Assy D6	30-01-00034-01
ng-TD200-x Vacuum Adapter Assy D6	30-01-00033-01
ng-TD200-x Vacuum Adapter Assy D8	30-01-00029-01
ng-TD200-x Vacuum Adapter Assy D10	30-01-00030-01

## 6.10 Vacuum Nozzles

Vacuum nozzles are available in different standard sizes. They can be customized according to the screw geometry and possible constraints from the workpiece.



## 6.11 Bits

Bits for Micro Sensor Torque Driver Systems ng-TD are available from various manufacturers, with 4-mm- Halfmoon drive or 1/4" Hexagon drive. They are selected according to the screw tightening application requirements. They can be customized, if needed, especially for automated screw tightening systems.



Bit with 4-mm-Halfmoon Drive



Bit with 1/4" Hexagon-Drive

# 1 Applications



## Mobile Torque/ Angle Measurement

- Mobile Phone or Tablet with Android-OS serves as a simple „Measurement Instrument“
- Result window monitoring
- Graph data transmission via WiFi



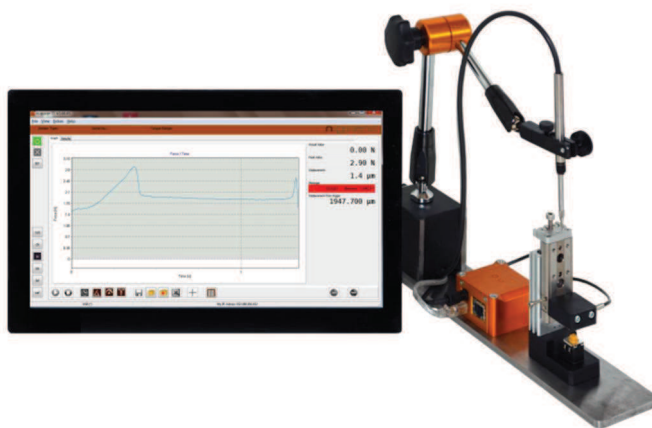
## Torque/ Angle Measurement for the Calibration of Screw Drivers

- Mobile measurement case with battery supply
- Windows Tablet-PC
- Screw driver tool identification with bar code reader
- Excel document template for SPC calculation
- Data storage via WiFi



Rotary Sensor for Torque/Angle  
Measurement with mounting  
flanges to be attached at a simple  
clutch Type screwdriver

- 100 percent control
- G/NG-Signalizing

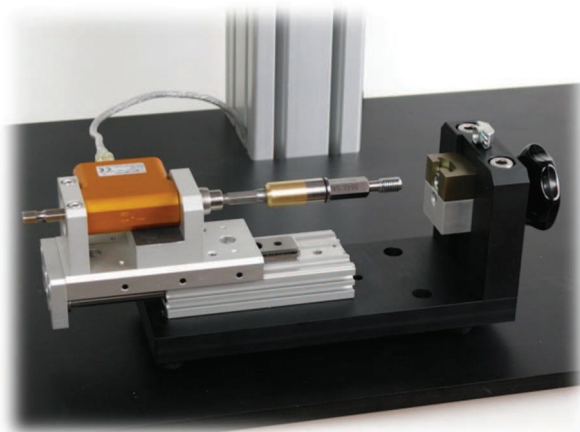


Force/Displacement  
measurement system for  
push button testing

Stationary sensor system for the measurement of the friction of ball bearings



Torque repeatability test of manual screwdrivers



Thread testing of cage nuts



Simultaneous Torque/ Angle and clamping force measurement of pulse and impact tools with screw joint simulators



Cyclic torque verification inside the automated assembly system



Accessory for torque/angle sensors which provides a WiFi hotspot for the transmission of measurement and high resolution graph data



## Automated Screw Tightening - Semi Automation or Full Automation

- Torque Driving Cell for Semi Automation or Inline Automation, Positioning with SCARA
- Screw Supply via Blow Feeding from Bowl Feeder System
- Industry-4.0-compliant by Connection to Manufacturing Execution Systems (MES)



## Automated Screw Tightening – Semi Automation

- Torque Driving Cell for Semi Automation, Positioning with Desktop-Robot
- Screw Supply via Pick & Place with Vacuum
- Industry-4.0-compliant by Connection to Manufacturing Execution Systems (MES)
- Operator-Feedback with Touch-Screen-Monitor
- Process Data Documentation



## Automated Screw Tightening – Semi Automation

- Miniaturized Torque Driving Cell for Semi Automation, Positioning with Desktop-Robot
- Screw size M1 to M2.5
- Screw Supply via Pick & Place with Vacuum
- Industry-4.0-compliant by Connection to Manufacturing Execution Systems (MES)
- Operator-Feedback with Touch-Screen-Monitor
- Process Data Documentation



## Automated Screw Tightening – Semi Automation

- Torque Driving Cell for Semi Automation, Positioning with Cartesian Robot
- Screw Supply via Pick & Place with Vacuum (3 feeders)
- Flexible workpiece tooling
- Numerical screw insertion depth control
- Screw tightening and removal functionality
- Industry-4.0-compliant by Connection to Manufacturing Execution Systems (MES)
- Operator-Feedback with Touch-Screen-Monitor
- Process Data Documentation

## 1.1 Sensor System Software n-quirer TT V3 basic

For tablet PCs, laptops, notebooks, PC running Windows, in combination with all intelligent Sensors from n-gineric, providing

- Graph recordings of
  - Torque vs. time
  - Torque vs. angle
  - Force vs. time
  - Force vs. displacement
- Automatic sensor identification
- Graph reading with up to 2,000 measurements per second
- Display resolution 5 digits plus decimal point
- Supports different physical units
- 2 control windows with internal or external triggering
- 2<sup>nd</sup> trigger value for angle control or displacement control
- Adjustable low pass filter (10 to 500 Hz)
- Supports the loading of a reference graph for comparison
- Direct export of the graph reading into Excel
- Direct export of measurements results listing into Excel with SPC document template
- Supported operating systems: Windows 7, Windows 8, Windows 10.
- Direct sensor connectivity via USB or Ethernet

Article Number	01-01-00012-02
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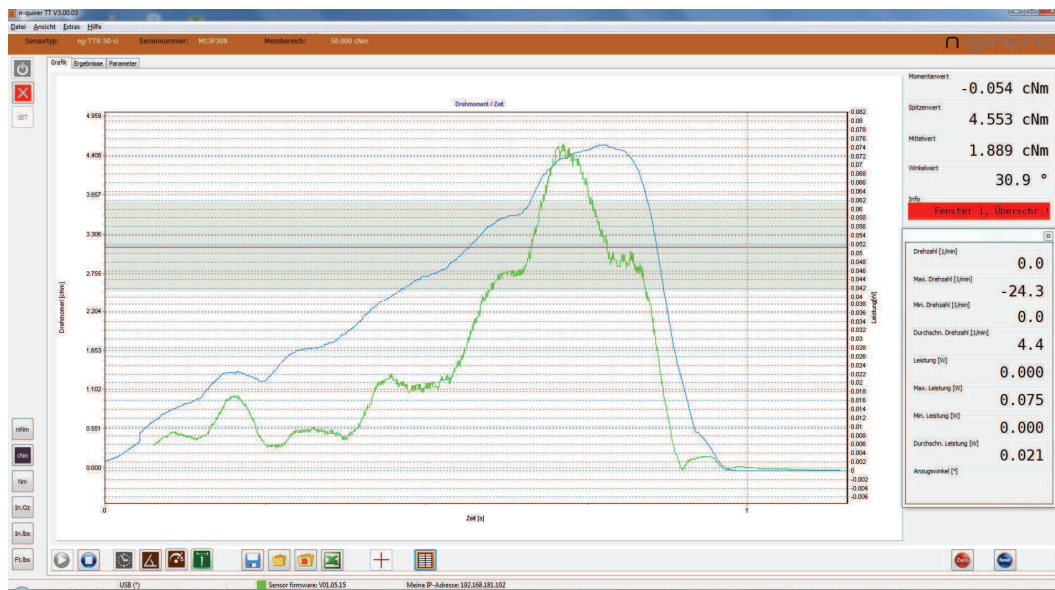
## 1.2 Sensor System Software n-quirer TT V3 advanced

For tablet PCs, laptops, notebooks, PC running Windows, in combination with all intelligent Sensors from n-gineric, providing

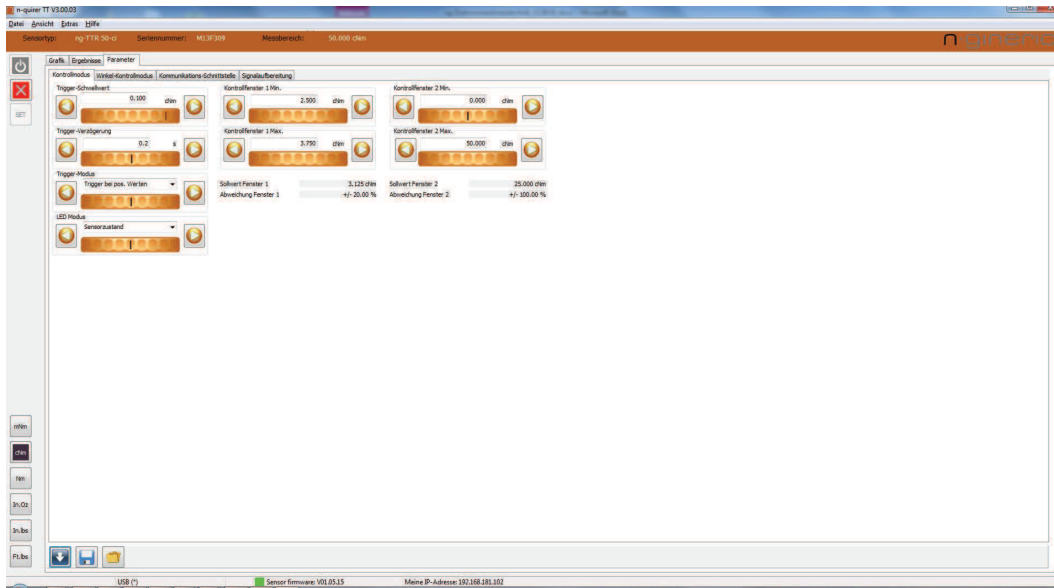
- Graph recordings of
  - Torque vs. time
  - Torque vs. angle
  - Force vs. time
  - Force vs. displacement
  - Speed vs. time
  - Speed vs. angle
  - Power vs. time
  - Power vs. Angle

- Automatic sensor identification
- Graph reading with up to 2,000 measurements per second
- Display resolution 5 digits plus decimal point
- Supports different physical units
- 2 control windows with internal or external triggering
- 2<sup>nd</sup> trigger value for angle control or displacement control
- Adjustable low pass filter (10 to 500 Hz)
- Supports the loading of a reference graph for comparison
- Direct export of the graph reading into Excel
- Direct export of measurements results listing into Excel with SPC document template
- Supported operating systems: Windows 7, Windows 8, Windows 10.
- Direct sensor connectivity via USB or Ethernet
- Cursor function with single values
- 2<sup>nd</sup> measurement display window (configurable)
- Bar code reader support for automatic loading of sensor configuration
- Supports a 2<sup>nd</sup> connected sensor with overlaid secondary graph ("n-clude-mode" e.g. for additional simultaneous measuring of clamping force in a screw joint)

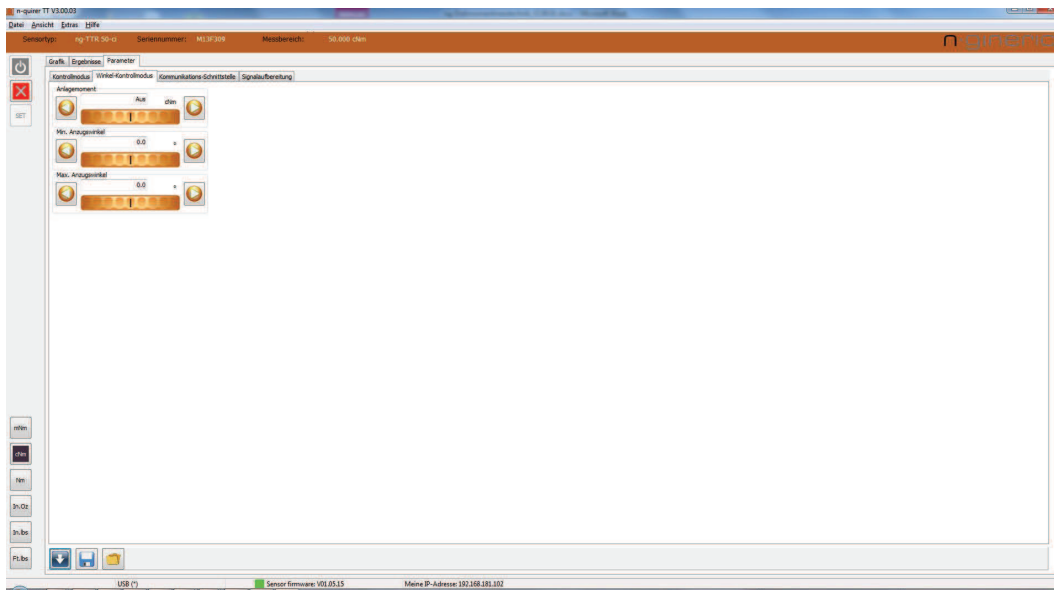
Article Number 01-01-00143-01



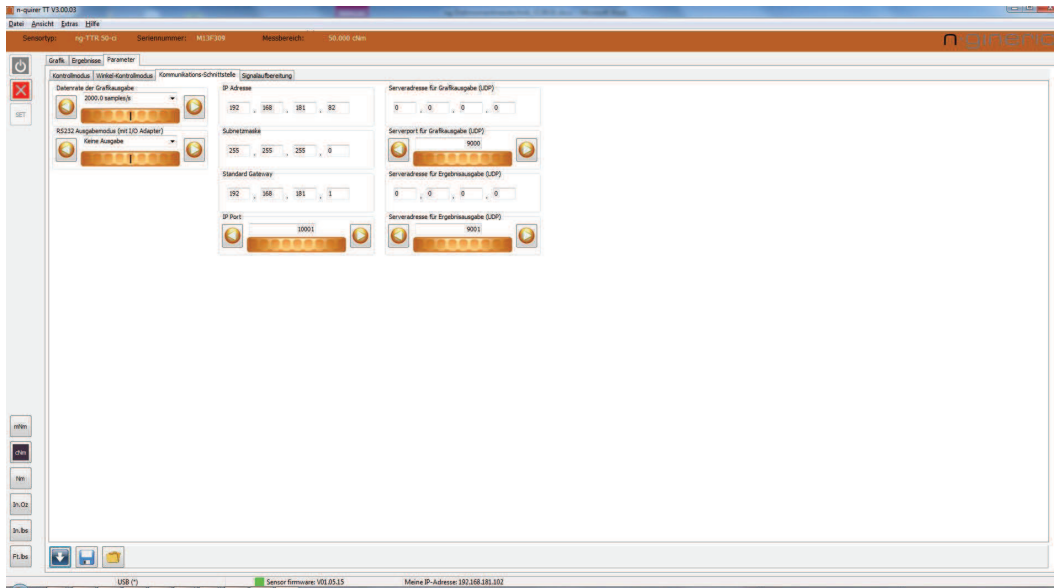
n-quirer TT V3 graph window



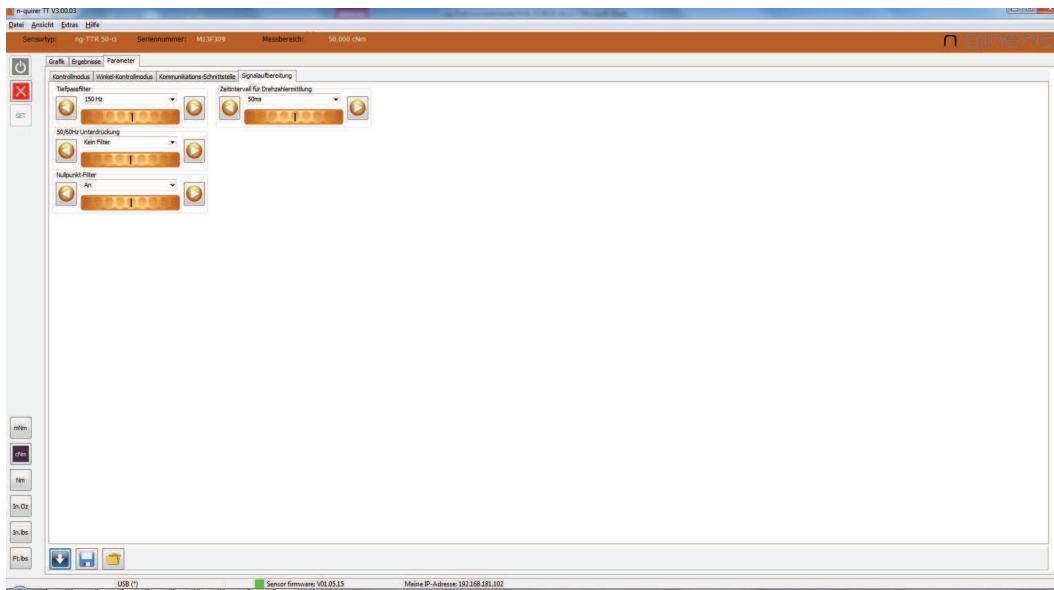
n-quirer TT V3 control mode tab sheet



n-quirer TT V3 angle control mode tab sheet



n-quirer TT V3 communication interface tab sheet

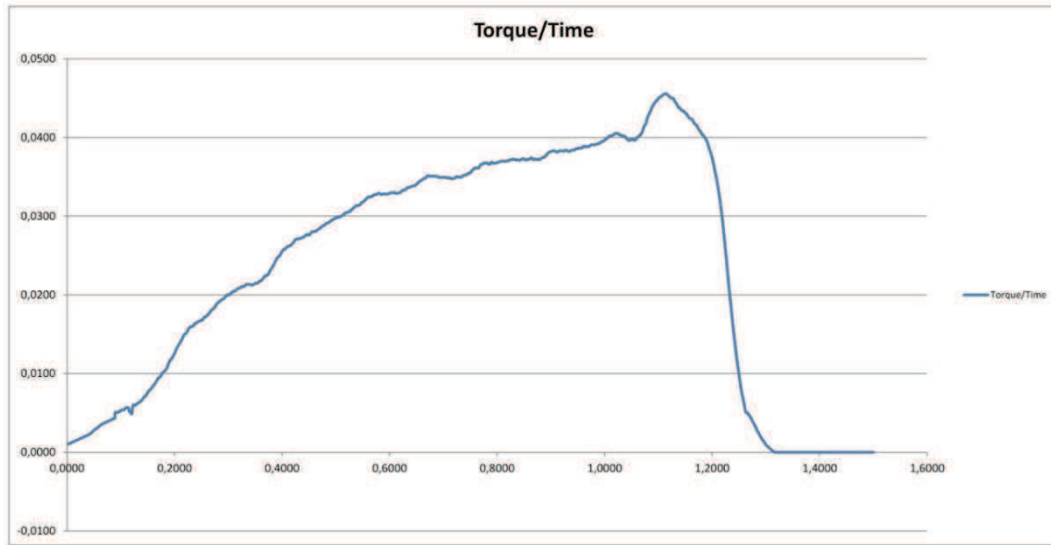


n-quirer TT V3 signal conditioning tab sheet



Graph

Date/Time:	26.05.13 17:43:20
Tool Serial Number:	M13F309
Y-Axis Unit:	cNm
X-Axis Unit:	s



n-quirer TT V3 graph exported to Excel

Grp.	Ergebnis	Erreichte	Max.	Min.	Hebel	Control	Modul	Wendepunkt	Ergebnis	Max. Drehzahl [U/min]	Min. Drehzahl [U/min]	Querdehn. Drehzahl	Max. Leistung [W]	Min. Leistung [W]	Querdehn. Leistung [W/kg]	
1	2013-05-26	17:34:34	3.593	-0.001	1.346	offen		12.52	*	0.00000	-6.0	0.0	3.7	0.960	0.000	0.038
2	2013-05-26	17:34:35	3.462	-0.000	1.418	offen		3.20	*	0.00000	-9.6	0.0	0.6	0.030	0.000	0.008
3	2013-05-26	17:34:36	3.742	-0.001	1.560	offen		3.60	*	0.00000	-10.0	0.0	0.6	0.035	0.000	0.020
4	2013-05-26	17:34:37	2.996	0.000	1.245	offen		-0.20	*	0.00000	-6.3	0.0	-5.4	0.011	0.000	0.003
5	2013-05-26	17:34:38	3.112	0.000	1.296	offen		3.06	*	0.00000	-11.6	0.0	0.0	0.030	0.000	0.004
6	2013-05-26	17:34:40	3.004	0.000	1.129	offen		0.30	*	0.00000	-7.3	0.0	0.0	0.011	0.000	0.003
7	2013-05-26	17:34:41	2.956	-0.001	1.268	offen		0.00	*	0.00000	-5.6	0.0	-6.1	0.008	0.000	0.003
8	2013-05-26	17:34:42	3.353	-0.001	1.604	offen		2.60	*	0.00000	-6.0	0.0	0.5	0.017	0.000	0.006
9	2013-05-26	17:34:44	3.378	0.000	1.606	offen		1.30	*	0.00000	-8.6	0.0	0.2	0.013	0.000	0.004
10	2013-05-26	17:34:45	3.323	-0.001	1.431	offen		0.00	*	0.00000	-8.0	0.0	-0.1	0.013	0.000	0.003

n-quirer TT V3 measurement results

n-gineric Statistical Report

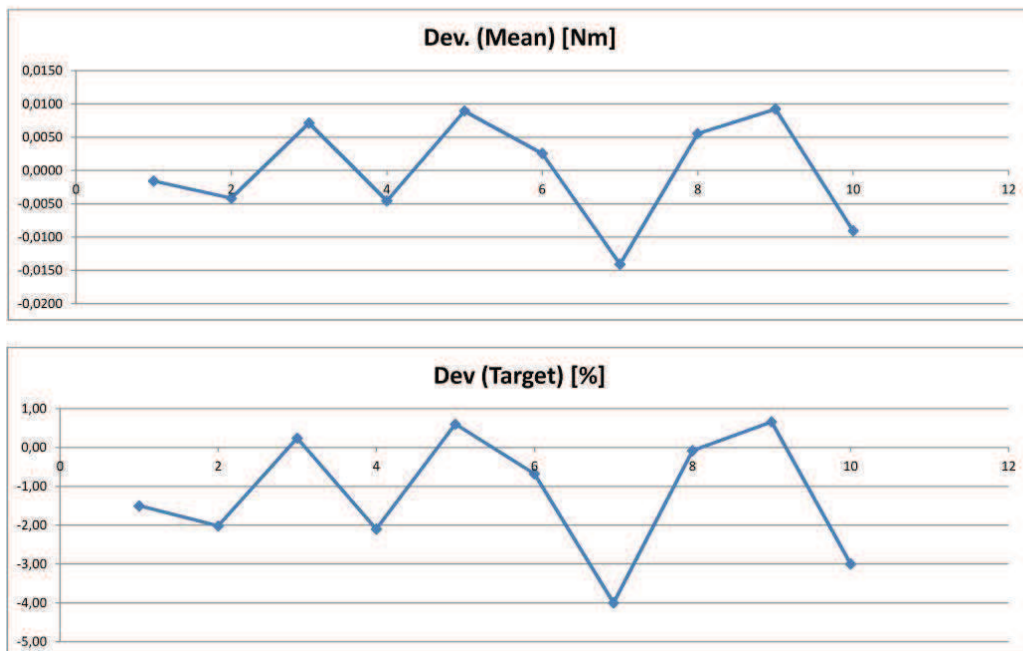
Date/Time:	28.08.12 18:01:49	Tool Serial Number:	M13F4E0
Target Value [Nm]:	0,5000	Tolerance (+/-) [%]:	12,00%

Count	Date	Time	Max	Unit	Dev (Target) [%]	Dev. (Mean) [Nm]	Sqr. Deviation
1	2012-08-28	18:00:47	0,4925	Nm	-1,50	-0,0016	0,0000
2	2012-08-28	18:00:52	0,4899	Nm	-2,02	-0,0042	0,0000
3	2012-08-28	18:00:55	0,5012	Nm	0,24	0,0071	0,0001
4	2012-08-28	18:00:58	0,4895	Nm	-2,10	-0,0048	0,0000
5	2012-08-28	18:01:00	0,503	Nm	0,60	0,0089	0,0001
6	2012-08-28	18:01:03	0,4966	Nm	-0,68	0,0025	0,0000
7	2012-08-28	18:01:06	0,48	Nm	-4,00	-0,0141	0,0002
8	2012-08-28	18:01:11	0,4996	Nm	-0,08	0,0055	0,0000
9	2012-08-28	18:01:22	0,5033	Nm	0,66	0,0092	0,0001
10	2012-08-28	18:01:25	0,485	Nm	-3,00	-0,0091	0,0001

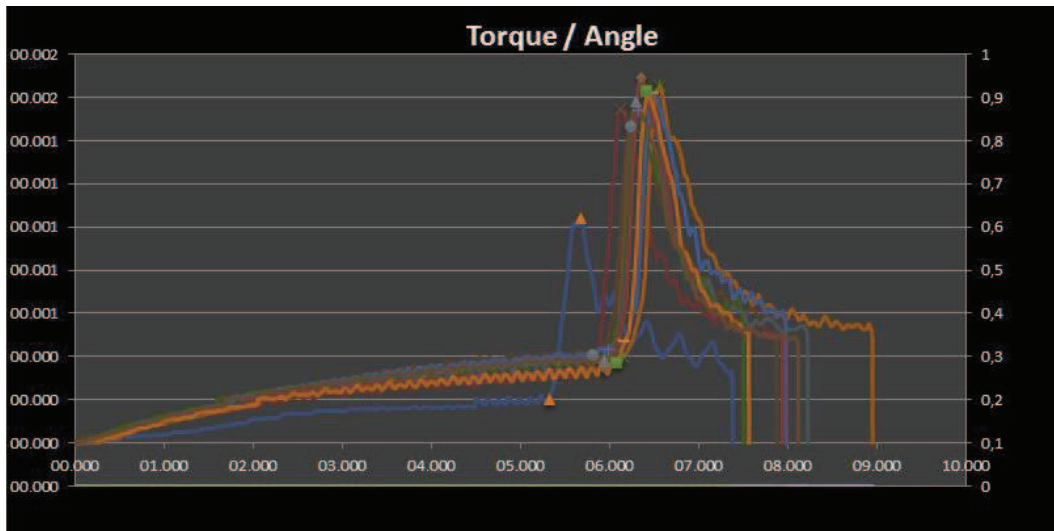
Lower Limit:	0,4400
Upper Limit:	0,5600
Process Mean:	0,4941
Standard Deviation:	0,0080
Cm	2,50
Cml	2,26
Cmu	2,75
Cmk	2,26

n-quirer TT V3 SPC report in Excel

n-gineric Statistical Report



Example of an Excel report with SPC functionality. Modifications of the template are possible according to your demands.



n-quirer TT V3 Torque/Angle Signature Analysis report in Excel

### 1.3 Sensor System Software ng-Display

Measurement Monitoring Application for Android devices, in combination with all intelligent Sensors from n-gineric, providing

- Automatic sensor identification
- Supports different physical units
- 2 control windows
- Direct sensor connectivity via USB

This application can be downloaded free of charge.

Article Number	01-01-00087-01
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Requirements: Android 3.2 or higher, USB Host or OTG

Cable USB-Mini-B auf USB-Micro-B 1 m

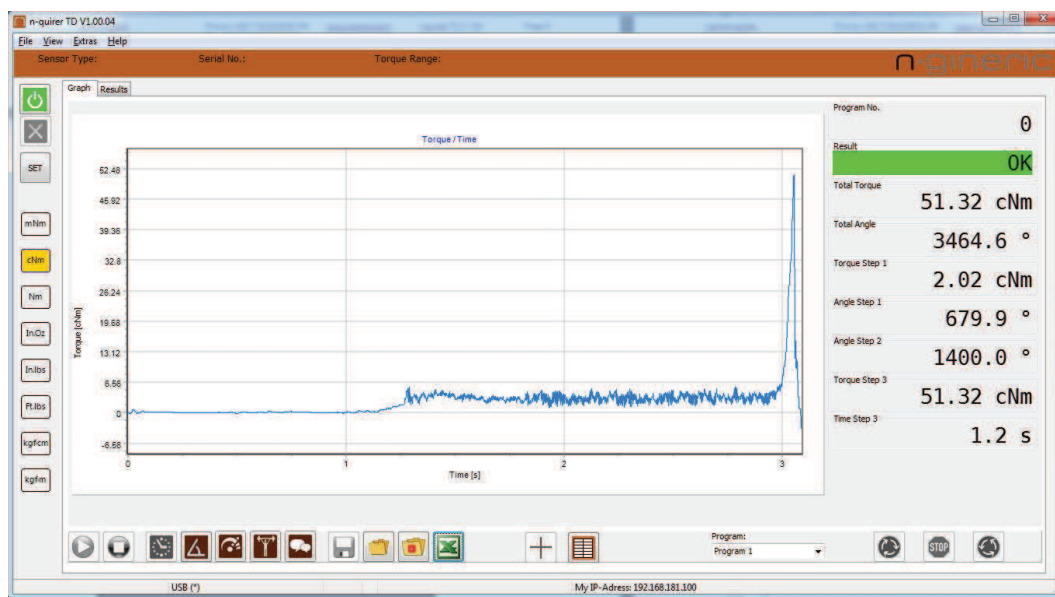
Article Number	01-90-00019-01
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## 1.4 Torque Driver System Software n-quirer TD

n-quirer TD is a software designed for ng-TDH and ng-TDS Torque Drivers. It provides parameter and program management, graphical visualization, and screw driving process data logging.

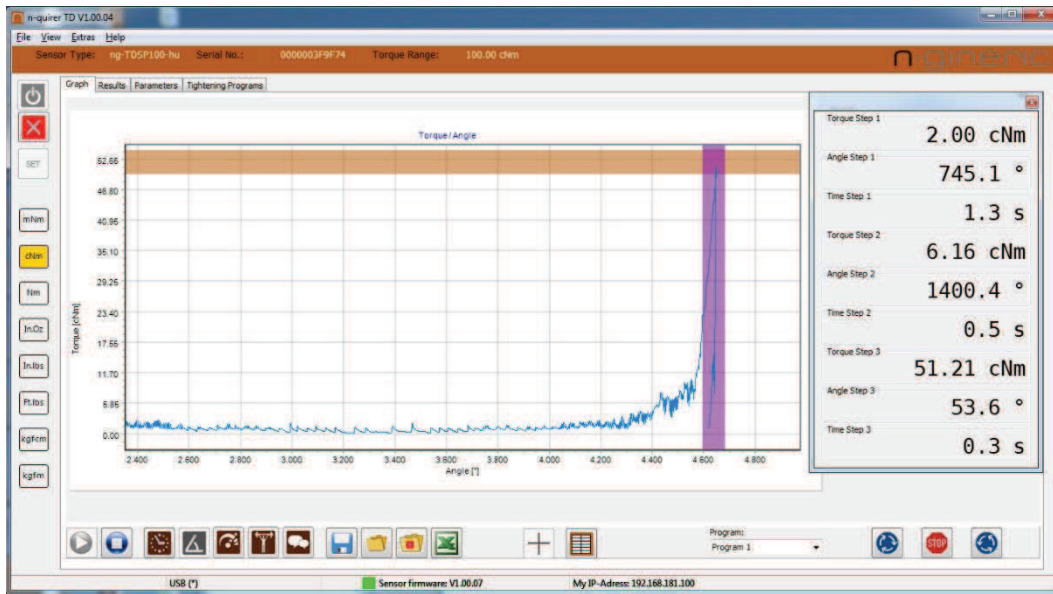
After connecting the Torque Driver, the system is being identified by showing the Type, serial number, and torque range in the header line. The Torque Driver firmware version is shown at the bottom line.

Article Number	01-01-00215-01
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### n-quirer TD V2 Graph

The graph reading of the screw tightening process is shown here. The display for numerical results of each screw tightening step can be configured in the setup.



n-quirer TD V2 Torque/Angle Graph

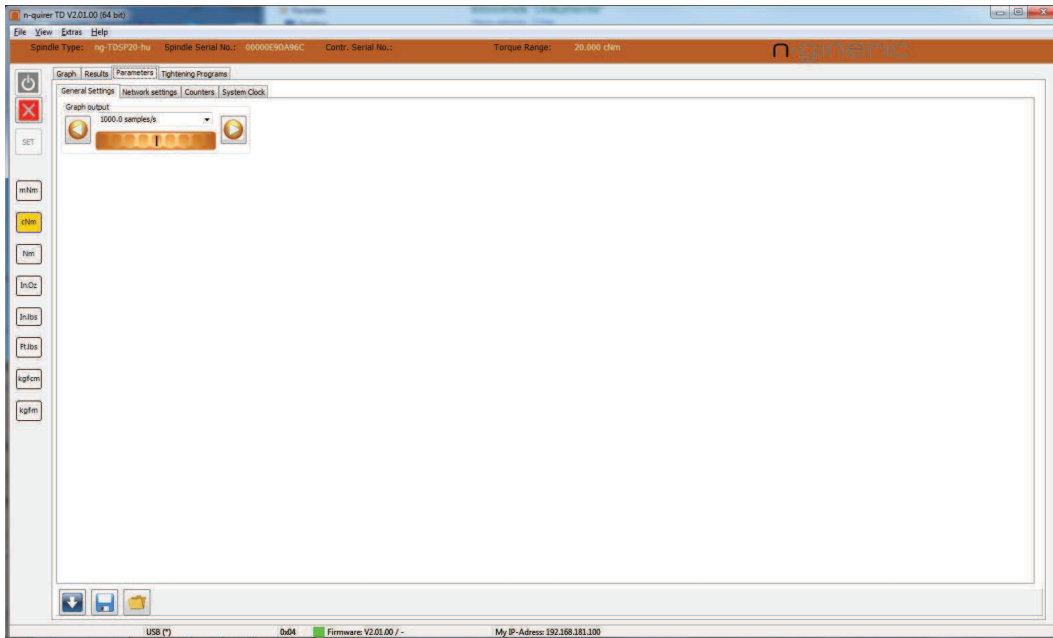
No.	Date	Time	Serial No.	Program No.	Result	Unit	Unit	Initial Torque	Initial Angle	Total Time	Torque Step 1	Angle Step 1	Torque Step 2	Angle Step 2	Torque Step 3	Angle Step 3	Torque Step 4	Angle Step 4	Torque Step 5	Angle Step 5			
1	2015-07-29	14:30:45	0000003F9F74	P1	1	3	cm	50.31	2521.4	1.9	2.03	412.9	0.7	7.47	1461.0	0.5	50.31	706.3	0.6	0.00	0.0	0.0	0.0
2	2015-07-29	14:30:45	0000003F9F74	P1	1	3	cm	50.49	2478.3	2.1	2.01	833.2	1.1	7.91	1400.3	0.5	50.49	463.2	0.4	0.00	0.0	0.0	0.0
3	2015-07-29	14:30:50	0000003F9F74	P1	1	3	cm	50.00	2443.3	2.2	2.01	785.9	1.2	15.82	1461.3	0.5	50.00	323.4	0.1	0.00	0.0	0.0	0.0
4	2015-07-29	14:30:58	0000003F9F74	P1	1	3	cm	50.55	2463.7	1.9	2.00	491.3	0.9	12.77	1400.0	0.5	50.55	360.3	0.1	0.00	0.0	0.0	0.0
5	2015-07-29	14:31:29	0000003F9F74	P1	1	3	cm	50.75	2487.0	1.1	2.01	628.2	1.1	26.90	1400.0	0.5	50.75	426.3	0.3	0.00	0.0	0.0	0.0

n-quirer TD V2 Screw Tightening Results

After each screw tightening the result will be appended to the listing. The listing of results can be exported into Excel.

n-gineric Screw Fastening Results																					
n-gineric Screw Fastening Results																					
Date/Time:		2015-07-27 18:00:05		Tool Ser. No:				0000003F9F74				Tool Type:				ng-TDSP100-hu					
Comment:		Test: 1001				Part Name:				Batch:											
No.	Date	Time	Measurement	Serial No	Program No	Result	Step	Unit	Torque	Angle	Time	Torque	Angle	Time	Torque	Angle	Time	Torque	Angle	Time	
10	1/2015-07-27	17:57:31	0000003F9F74	P1	1	3	chm	50.940	3456.0	3.2	2.010	808.3	1.5	10.971	1401.2	0.5	50.940	19.0	1.1		
11	2/2015-07-27	17:57:37	0000003F9F74	P1	1	3	chm	51.940	3267.9	2.8	2.010	594.2	1.1	7.680	1400.0	0.5	51.940	20.5	1.1		
12	3/2015-07-27	17:57:42	0000003F9F74	P1	1	3	chm	52.180	3559.7	3.0	2.000	592.2	1.0	6.180	1400.1	0.5	52.180	31.2	1.4		
13	4/2015-07-27	17:57:46	0000003F9F74	P1	1	3	chm	52.540	3636.6	3.2	2.000	626.0	1.1	8.590	1400.5	0.5	52.540	25.4	1.5		
14	5/2015-07-27	17:57:51	0000003F9F74	P1	1	3	chm	50.510	3621.6	3.1	2.010	593.5	1.1	8.850	1400.9	0.5	50.510	72.9	1.5		
15	6/2015-07-27	17:58:01	0000003F9F74	P1	1	3	chm	51.360	3225.4	2.7	2.010	540.9	1.0	6.530	1400.3	0.5	51.360	81.6	1.1		
16	7/2015-07-27	17:58:05	0000003F9F74	P1	1	3	chm	50.700	2726.9	2.3	2.010	621.1	1.1	5.910	1400.9	0.5	50.700	43.6	0.6		
17	8/2015-07-27	17:58:09	0000003F9F74	P1	1	3	chm	51.270	2768.2	2.3	2.000	558.0	1.0	6.710	1401.1	0.5	51.270	87.9	0.7		
18	9/2015-07-27	17:58:16	0000003F9F74	P1	1	3	chm	50.810	2772.6	2.2	2.000	497.4	0.9	11.750	1400.3	0.5	50.810	32.3	0.7		
19	10/2015-07-27	17:58:20	0000003F9F74	P1	1	3	chm	53.030	2321.4	1.8	2.000	457.2	0.8	9.450	1400.1	0.5	53.030	45.3	0.4		
20	11/2015-07-27	17:58:36	0000003F9F74	P1	1	3	chm	50.800	2376.0	1.9	2.000	484.8	0.9	13.000	1401.3	0.5	50.800	72.8	0.4		
21	12/2015-07-27	17:58:40	0000003F9F74	P1	1	3	chm	51.580	2426.6	1.8	2.050	395.3	0.7	6.260	1400.8	0.5	51.580	36.8	0.6		

The listing of the screw tightening results can be exported into Excel, e. g. for Statistical Process Control.



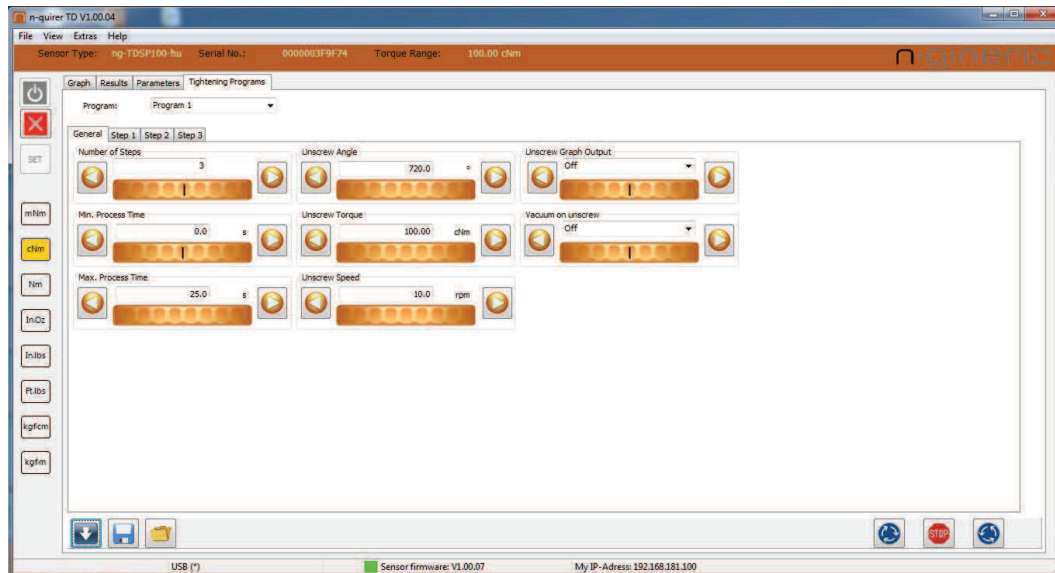
### n-quirer TD V2 Parameters

Here you can configure the general settings like the graph output data rate, the network settings, the counters and the system clock.

## n-quirer TD V2 Tightening Programs

## General Parameters

General parameters like the number of steps of the tightening process, the unscrew parameters, the vacuum function and the tightening cycle time window can be configured here.



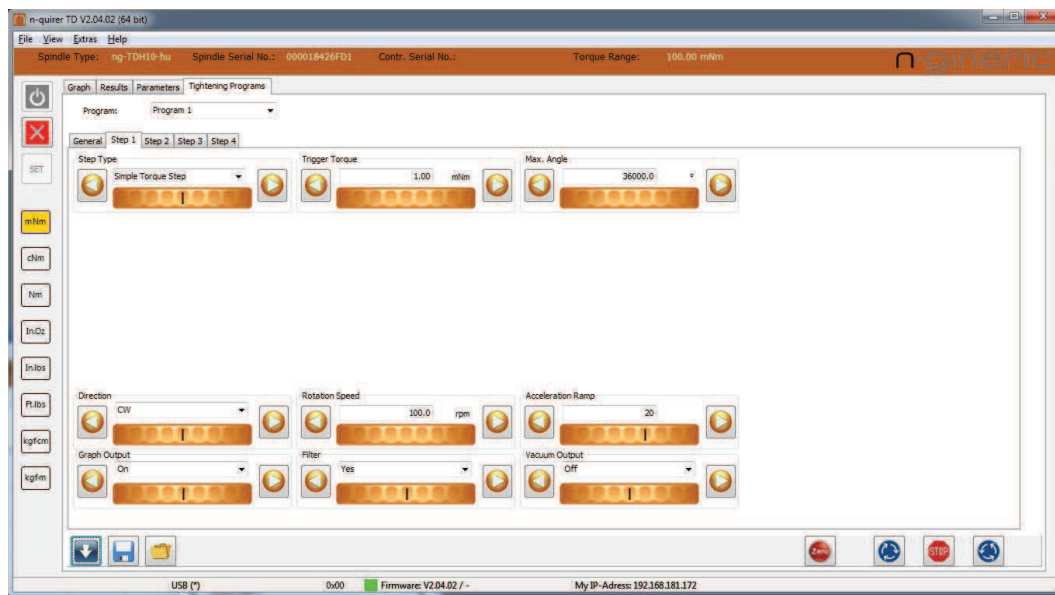
## Screw Tightening Step Types

The screw tightening process can be defined by a sequence of 1 to 8 different steps.

There are 7 step Types:

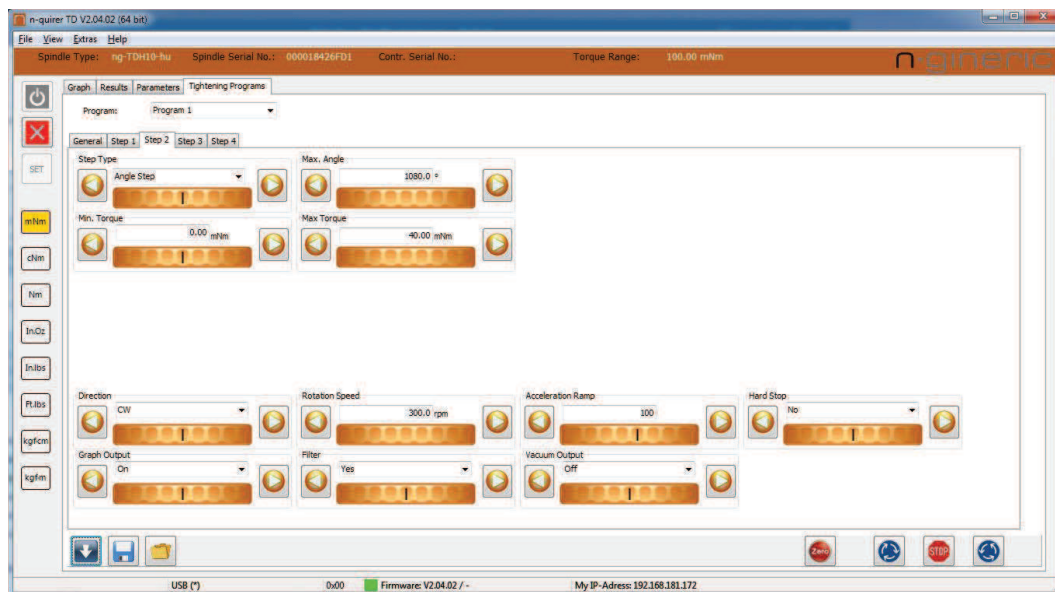
- Simple Torque Step
- Angle Step
- Average Angle Step
- Torque Step
- Snug Torque Step
- Delta Torque Step
- Time Step

## Simple Torque Step



The Simple Torque Step facilitates the screw engagement and avoids cross threading.

## Angle Step



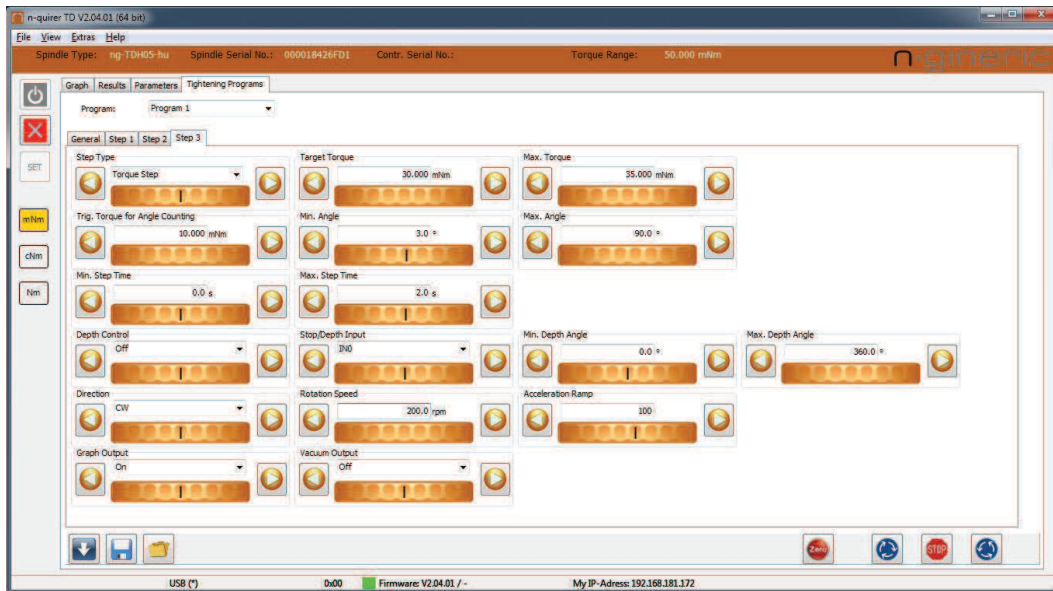
The Angle Step provides high productivity by quickly running the screw down. The Angle Step is limited by the angle programmed. It has to be adjusted accordingly that the final tightening can be done after the Angle Step has been finished.



## Average Angle Step

The Average Angle Step is mainly used for measurement applications. Here the arithmetic mean of the torque is being calculated while the angle step is running. The mean value has to reach the minimum torque, but must not exceed the maximum torque.

## Torque Step



The Torque Step provides a high level of process security by monitoring the torque window, the time window, the angle torque/angle gradient, and, as an option, the screw insertion depth.

## Snug Torque Step



The Snug Torque Step was designed to detect the torque just at the point when the screw is seated, that means when the screw head touches the surface of the part, just before additional torque will generate clamping force inside the screw joint. As soon as the screw is seated, the torque raises quickly, the torque vs. angle gradient changes, so it can be detected by appropriate parameter settings.

## Delta Torque Step



The Delta Torque Step allows to apply an amount of torque providing proportionate clamping force to the screw joint, with monitoring of the programmed windows. It is especially used after the Snug Point detection. The target torque is variably calculated, depending on the Snug Torque (if the previous step was a Snug Step), and the programmed limits. The torque delta can be varied by setting the target limits, because if the snug torque is high, it allows a higher amount of added torque, compared to a low snug torque.

## Time Step

The Time Step provides a programmable residence time, with an optional CW or CCW rotation.

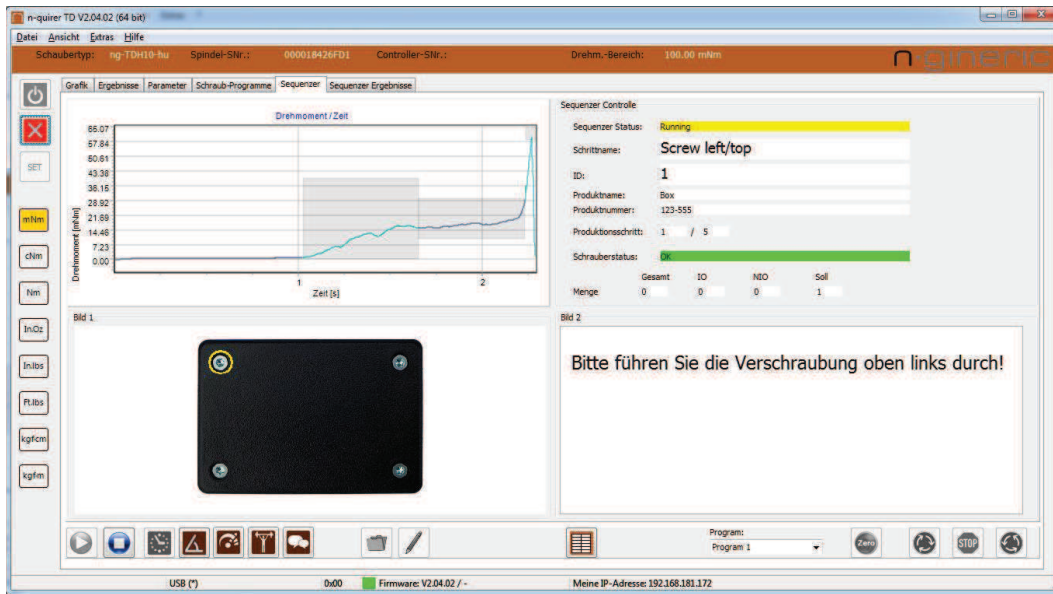
## 1.5 Torque Driver System Software n-quirer TD advanced

The scope of functions of the n-quirer TD advanced is the same as for the n-quirer TD, supplemented by a module that guides the operator through the assembly procedure.

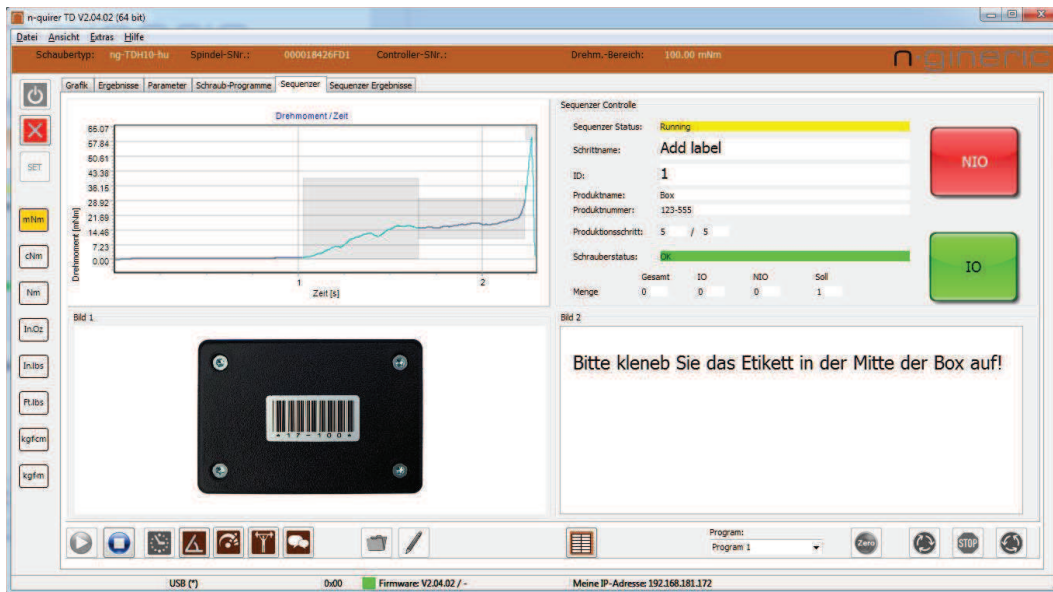


Each step in the assembly sequence is described with a written instruction and with pictures. Screw joint positions are visualized with circles. After a successful screw tightening, the sequence proceeds to the next step. Steps different from screw tightening can also be included. The result of the sequence is saved, as well as each sequence step. Workpieces can be identified via a bar code or DMC reader.

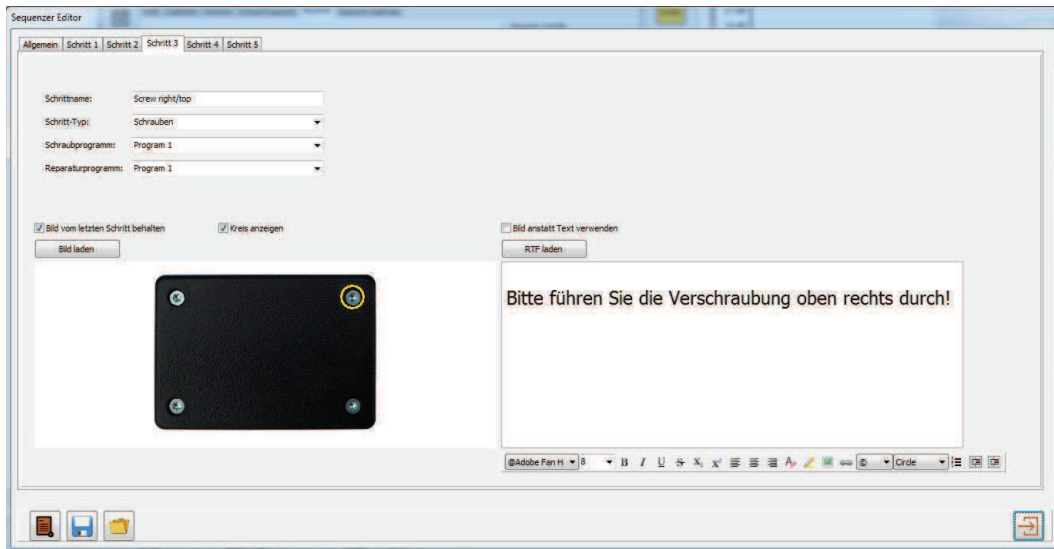
Article Number	01-01-00319-01
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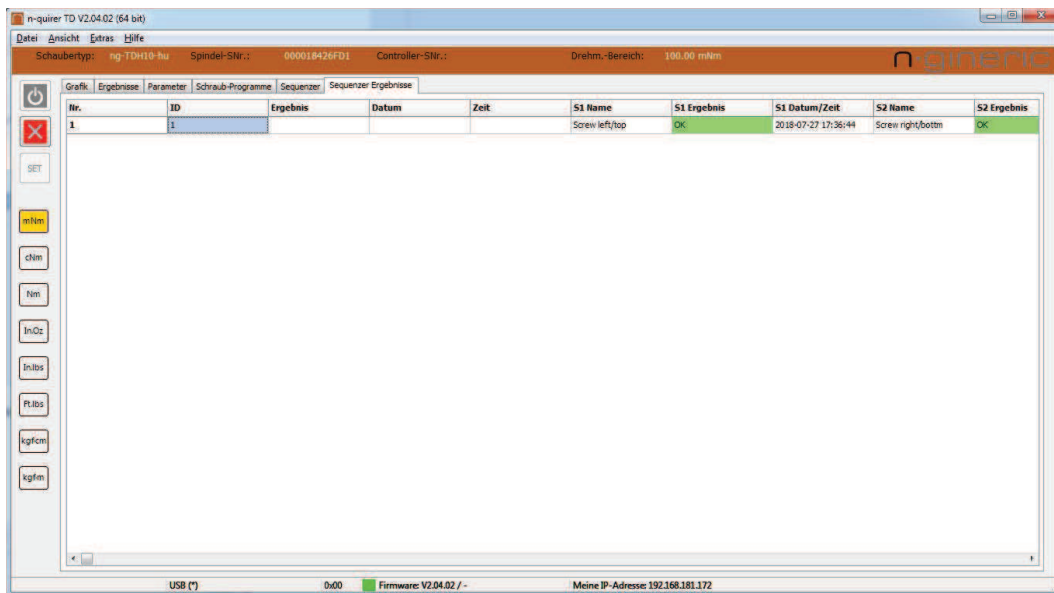
Example of instructions for a screw tightening step



Example of instructions for a general step



Sequencer - Editor



Sequencer- Results Listing