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Factory Automation Solutions

sunden

SUNDEN KOREA Co., LTD.

N • Gineric 엔기너릭 제품카다로그

"대한민국 대표 공장자동화 전문기업"

sunden
SUNDEN KOREA Co., LTD.

Factory Automation Solutions [썬덴코리아]

□ 기업개요

기관인증 · 이노비즈 · 우수기업 · 강소기업

업 종	매출액	기업형태	사원수	사업내용
기계·설비·자동차	100억원	중소기업	30명	국내외의 공장자동화

□ CEO 인사말

썬덴코리아(주)는 공장자동화의 개념이 아직은 낯설었던 1997년, 해외 무역 사업을 시작으로 국내 공장자동화 산업계에 출사표를 던졌습니다. **썬덴코리아**(주)는 유럽, 미국, 일본 등 산업선진국의 Janome, Sanyo Machine, Aimco, Santest, Pureron 등 유수의 글로벌 파트너를 통해 서보프레스 너트런너, 가스필터 및 다양한 계측기와 센서류를 국내 및 해외 자동차, 전기/전자, 반도체/디스플레이 산업의 치열한 현장에 소개하고 적용시켜 왔습니다. 최근 급변하는 시장환경 , 다양한 고객의 Needs에 부응하기 위해 자동차 부품 형상 및 표면 검사에 최적화 된 " 2D/3D 레이저 스캐너 및 컬러 센서" 를 글로벌 독일 기업 "QuellTech" ," Sensor Instruments" 사와 전략적 제휴를 체결하여 계측, 검사 솔루션에도 총력을 기울이고 있습니다. **썬덴코리아**(주)는 지난 20여년간의 다양한 현장 경험을 바탕으로 "고객사와의 상생"을 이 시장에서 살아남을 수 있는 유일한 궁극의 가치로써 믿고, 직원들이 행복한 기업 , 국가 사회 발전에 기여하는 기업으로 귀사와 동반 성장할 수 있는 "**대한민국 대표 공장자동화 전문기업**"이 되도록 배전의 노력을 경주하겠습니다.

- 고객 가치 창조
- 직원 가치 공유
- 국가 사회 발전 기여

◀ 경영 이념 ▶

- 공장자동화 마켓 리더
- 공장자동화 제어기기 전문 기업
- 신뢰할 수 있는 고객 파트너 기업

□ 인증/지정

ISO 9001 인증 — ISO9001 기관인증

INNOBIZ 중소기업기술혁신협회 중소기업 이노비즈 인증 — 중소기업 이노비즈 인증

우수기업 — 우수기업

강소기업 — 재무건전성 강소기업

□ 주요 고객사

자동차 부품 / 중공업 / 철강	반도체 / 디스플레이

DOOSAN, HANKOOK, SSANGYONG MOTOR, KUMHO TIRE, HYUNDAI, LG Innotek, HYUNDAI MOBIS, POSCO, Korea Powertrain Co., Ltd., HYUNDAI DYMOS, Mando, LG, DONGHEE, ILJIN, HWASHIN, DAEWON, KORAIL, HYUNDAI POWERTECH, DSME, SCHAEFFLER, FAG

OCI Materials, WONIK IPS, PSK, (주)유진테크, LIG INVENIA, TOPTEC, Parker, SAMSUNG 삼성디스플레이, SFA

□ 고객 가치 창조

썬덴코리아 [주]

GOOD!
제품 가격 납기

HIGH!
기술 서비스 R&D

BEST!
인적자원 / 해외 파트너

Win-Win
相生
항상 고객과 함께

고객 [customer]

COST!
비용절감 효과

QUALITY!
최고의 품질

PRODUCTIVITY!
최상의 생선성

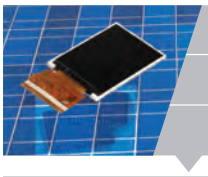
Win-Win 할 수 있는 전략적 파트너 기업

□ 사업분야

국내 시장

전기/전자
모바일

자동차
중공업
조 선
플랜트



반도체
디스플레이
태양 에너지

글로벌 시장

프레스 어셈블리 사업부

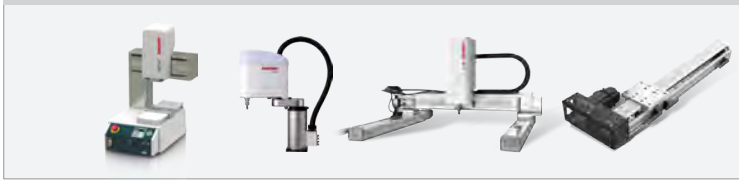
서보프레스 / 자동 너트런너 / 핸드 너트런너 / 무선 너트런너 / 토크 검사 시스템 / 툴 서포트 시스템

센서 / 계측기 사업부

2D-3D 레이저 스캐너 / 컬러센서 / 인디게이터 / 시그널컨버터 / 토크센서 로드셀 / 변위센서/써머스탯 (Thermostat)

로봇 사업부

데스크탑 로봇 / 스카라 로봇 / 직교 로봇 / 서보 액추에이터



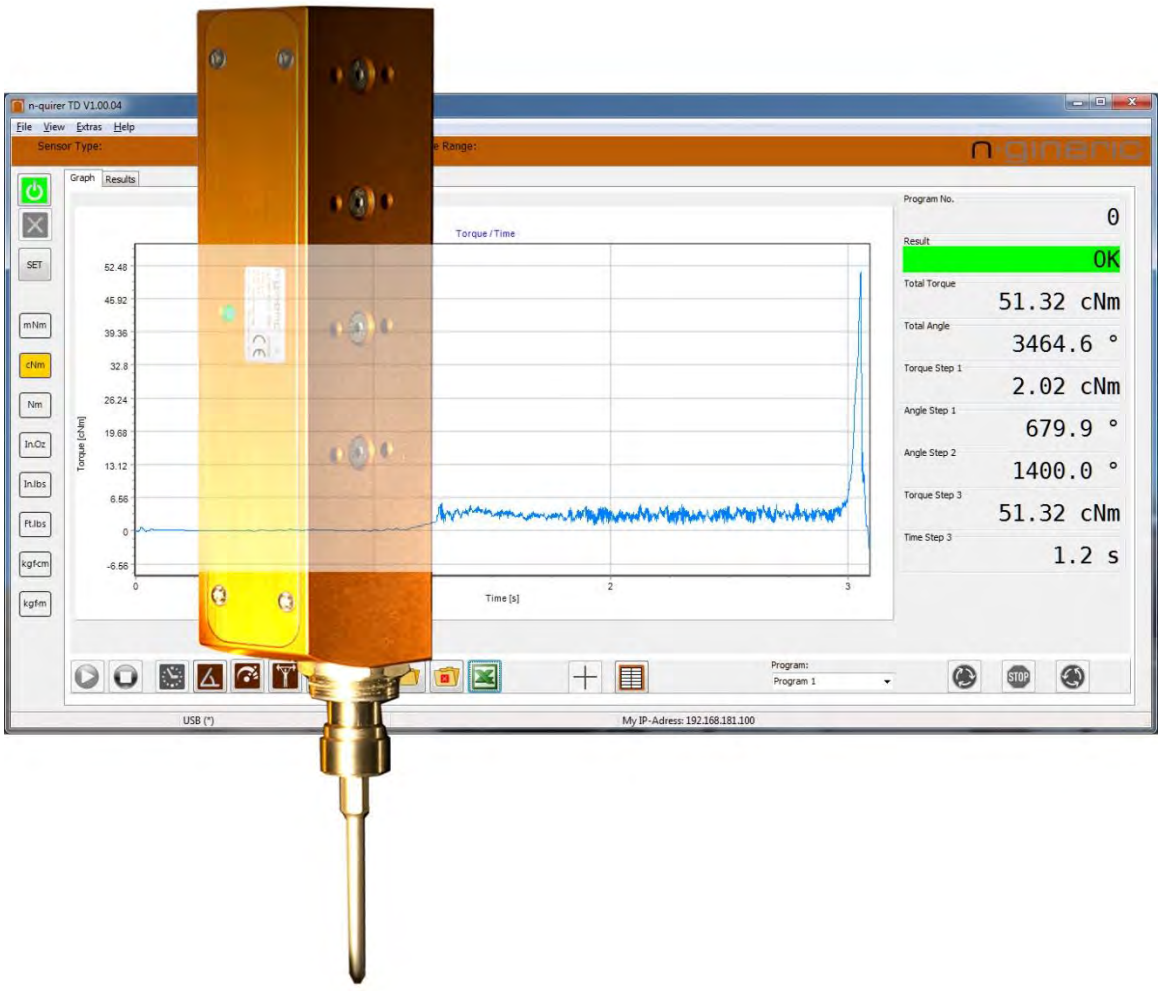
반도체 / 디스플레이 사업부

전력 조정기(SCR) / 노이즈컷 트랜스(NCT) / 가스필터/정제기 / 디퓨저IGS/압력센서 / 저항계

Micro Sensor Torque Driving Systems

- Handheld Micro Sensor Torque Drivers ng-TDH
  - Total Torque Range: 0.01 – 5.0 Nm
  - Contactless Rotary Torque Sensor integrated
  - High Resolution Angle Encoder integrated
  - All Controls integrated
  - Industrie-4.0-compliant
  - Precise in Measurement and highly productive

Micro Sensor Torque Driving Systems



- Stationary Micro-Sensor Torque Drivers ng-TDS
  - Total Torque Range: 0.01 – 5.0 Nm
  - Contactless Rotary Torque Sensor integrated
  - High Resolution Angle Encoder integrated
  - All Controls integrated
  - Industrie-4.0-compliant
  - Precise in Measurement and highly productive

Micro Sensor Torque Driving Systems

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1 Applications

1.1 Manual Screw Tightening

The Handheld Micro-Sensor Torque Drivers ng-TDH provide precise measurement of Torque and Angle by their integrated brushless rotary strain gauge sensor and their highly resolving incremental encoder. The screw tightening process can be defined as a multistep sequence within 1 to 8 steps.

With optional accessories like device holders of a position control system with screw joint counting also the manual screw tightening process can have a very high level of process safety.

1.2 Automated Screw Tightening – Semi-Automation

- Torque Driving Cell for Semi-Automation, Positioning with Desktop-Robot
- Screw Supply via Pick & Place with Vacuum
- Industrie-4.0-compliant by Connection to Manufacturing Execution System (MES)

- Operator-Feedback with Touch-Screen-Monitor
- Prozess Data Documentation

1.3 Automated Screw Tightening – Semi-Automation or Full Automation

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

- Operator-Feedback with Touch-Screen-Monitor
- Prozess Data Documentation

2 Handheld Micro-Sensor Torque Drivers

2.1 ng-TDH10-hu Micro Sensor Torque Driving 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 U/min
Bit Drive	4 mm Half Moon Drive Quick Chuck
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-72	Power Supply Unit	01-91-00003-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable 1.8 m	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

2.2 ng-TDH10-hi Micro Sensor Torque Driving 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 RPM
Bit Drive	4 mm Half Moon Drive Quick Chuck
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDH10-hi Spindle	Torque Driver Handpiece	01-01-00254-01
ng-TD-PS-72	Power Supply Unit	01-91-00003-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01

2.3 ng-TDH20-hu Micro Sensor Torque Driving 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 U/min
Bit Drive	4 mm Half Moon Drive Quick Chuck
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-72	Power Supply Unit	01-91-00003-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

2.4 ng-TDH20-hi Micro Sensor Torque Driving 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 RPM
Bit Drive	4 mm Half Moon Drive Quick Chuck
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDH20-hi Spindle	Torque Driver Handpiece	01-01-00257-01
ng-TD-PS-72	Power Supply Unit	01-91-00003-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01

2.5 ng-TDH100-hu Micro Sensor Torque Driving 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 RPM
Bit Drive	4 mm Half Moon Drive Quick Chuck
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-600	Power Supply Unit	01-91-00002-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

2.6 ng-TDH100-hi Micro Sensor Torque Driving System

Article Number	01-01-00265-01
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 RPM
Bit Drive	4 mm Half Moon Drive Quick Chuck
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDH100-hi Spindle	Torque Driver Handpiece	01-01-00259-01
ng-TD-PS-600	Power Supply Unit	01-91-00002-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90–00002-01

2.7 ng-TDH200-xu Micro Sensor Torque Driving 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 750 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
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-600	Power Supply Unit	01-91-00002-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

2.8 ng-TDH200-xi Micro Sensor Torque Driving 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 750 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDH200-xi Spindle	Torque Driver Handpiece	01-01-00284-01
ng-TD-PS600	Power Supply Unit	01-91-00002-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90–00002-01

2.9 ng-TDH400-xu Micro Sensor Torque Driving 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 750 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
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-600	Power Supply Unit	01-91-00002-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

2.10ng-TDH400-xi Micro Sensor Torque Driving 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 750 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDH400-xi Spindle	Torque Driver Handpiece	01-01-00261-01
ng-TD-PS600	Power Supply Unit	01-91-00002-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90–00002-01

2.11 ng-TDH500-xu Micro Sensor Torque Driving 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 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
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-600	Power Supply Unit	01-91-00002-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

2.12 ng-TDH500-xi Micro Sensor Torque Driving 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 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDH500-xi Spindle	Torque Driver Handpiece	01-01-00263-01
ng-TD-PS-600	Power Supply Unit	01-91-00002-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90–00002-01

3 Stationary Micro Sensor Torque Drivers

Features:

- Housing Material: Aluminum, anodized
- Measurement Technology:
  Integrated brushless rotary torque sensor with digital measurement data transmission, strain gauge based, mounted in front (at the bit chuck)
- Motor Technology:
  BL-DC
- Gear Technology:
  Precision long-life planetary gear
- Steel parts made of Stainless Steel

3.1 ng-TDS10-hu Micro Sensor Torque Driving 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 U/min
Bit Drive	4 mm Half Moon Drive Quick Chuck
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-72	Power Supply Unit	01-91-00003-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

3.2 ng-TDS10-hi Micro Sensor Torque Driving 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 RPM
Bit Drive	4 mm Half Moon Drive Quick Chuck
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDS10-hi Spindle	Torque Driver Spindle	01-01-00230-01
ng-TD-PS-72	Power Supply Unit	01-91-00003-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01

3.3 ng-TDS20-hu Micro Sensor Torque Driving 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 U/min
Bit Drive	4 mm Half Moon Drive Quick Chuck
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-72	Power Supply Unit	01-91-00003-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

3.4 ng-TDS20-hi Micro Sensor Torque Driving 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 RPM
Bit Drive	4 mm Half Moon Drive Quick Chuck
Dimensions	181 x 48 x 24 mm
Weight	0.47 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDS20-hi Spindle	Torque Driver Spindle	01-01-00219-01
ng-TD-PS-72	Power Supply Unit	01-91-00003-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01

3.5 ng-TDS100-hu Micro Sensor Torque Driving 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 RPM
Bit Drive	4 mm Half Moon Drive Quick Chuck
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-600	Power Supply Unit	01-91-00002-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

3.6 ng-TDS100-hi Micro Sensor Torque Driving 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 RPM
Bit Drive	4 mm Half Moon Drive Quick Chuck
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDS100-hi Spindle	Torque Driver Spindle	01-01-00217-01
ng-TD-PS-600	Power Supply Unit	01-91-00002-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90–00002-01

3.7 ng-TDS200-xu Micro Sensor Torque Driving 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 750 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
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-600	Power Supply Unit	01-91-00002-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A /USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

3.8 ng-TDS200-xi Micro Sensor Torque Driving 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 750 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDS200-xi Spindle	Torque Driver Spindle	01-01-00286-01
ng-TD-PS-600	Power Supply Unit	01-91-00002-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A /USB Mini	01-90–00002-01

3.9 ng-TDS400-xu Micro Sensor Torque Driving 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 750 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
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-600	Power Supply Unit	01-91-00002-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A / USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

3.10 ng-TDS400-xi Micro Sensor Torque Driving 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 750 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDS400-xi Spindle	Torque Driver Spindle	01-01-00216-01
ng-TD-PS600	Power Supply Unit	01-91-00002-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A / USB Mini	01-90–00002-01

3.11 ng-TDS500-xu Micro Sensor Torque Driving 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 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
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-600	Power Supply Unit	01-91-00002-01
ng-TD-Cable 3 m	Driver Cable 3 Meters	01-90-00014-01
USB-Cable	Cable USB-A / USB Mini	01-90-00002-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01

3.12 ng-TDS500-xi Micro Sensor Torque Driving 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 RPM
Bit Drive	¼" Hexagon Bit Quick Chuck
Dimensions	212 x 58 x 35 mm
Weight	0.98 kg
Interface	Fully digital to ng-TDX

Scope of Supply

Type	Description	Article Number
ng-TDS500-xi Spindle	Torque Driver Spindle	01-01-00277-01
ng-TD-PS-600	Power Supply Unit	01-91-00002-01
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-TDX	Torque Driver Interface	01-01-00220-01
n-quirer TD	Micro Sensor Torque Driving System Software	01-01-00215-01
USB-Cable	Cable USB-A / USB Mini	01-90–00002-01

4 Torque Driver Communication Interface ng-TDX

Digital Interface Extension for Torque Driver Spindles ng-TDH-_i and ng-TDS-_i

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

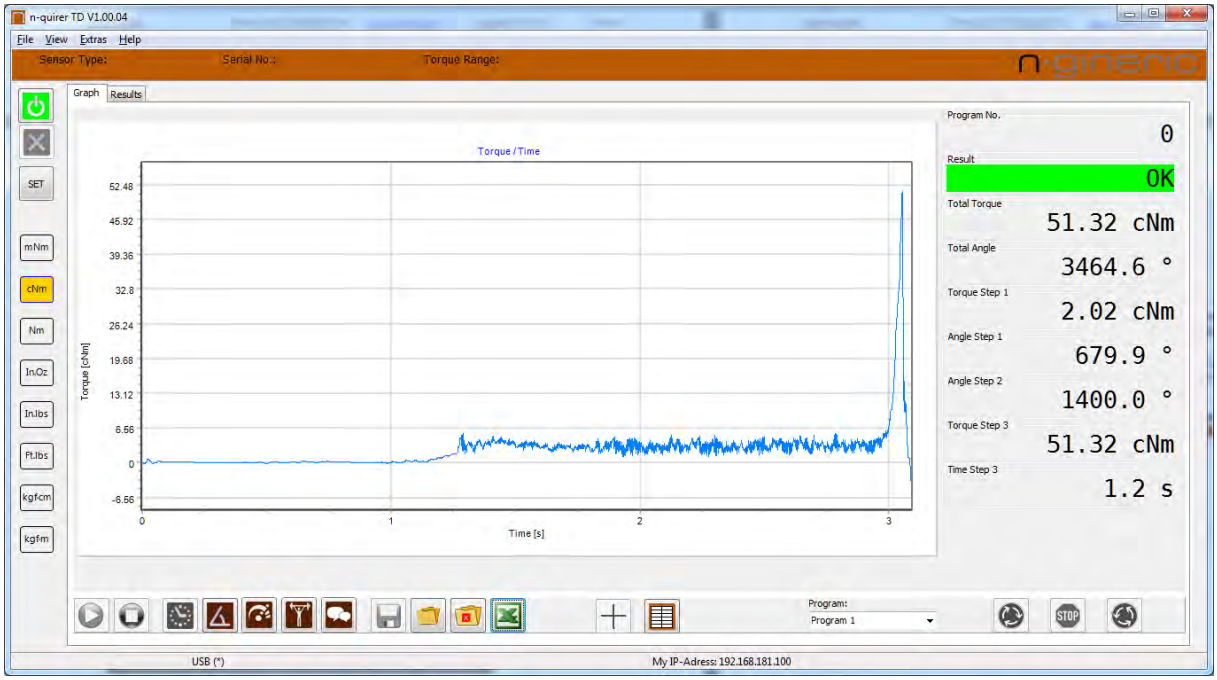
5 n-quirer TD Micro Sensor Torque Driving System Software

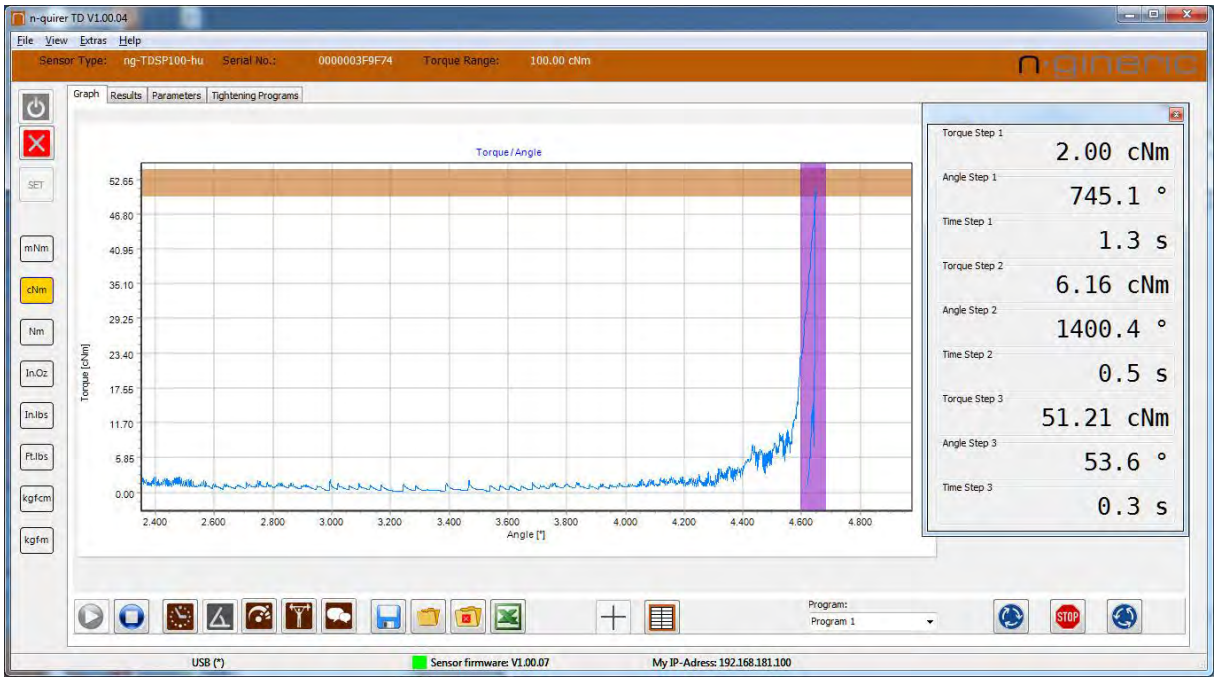
Micro Sensor Torque Driving Systems

n-quirer TD is a software designed for **ng-TDH** and **ng-TDS** Torque Driver 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.

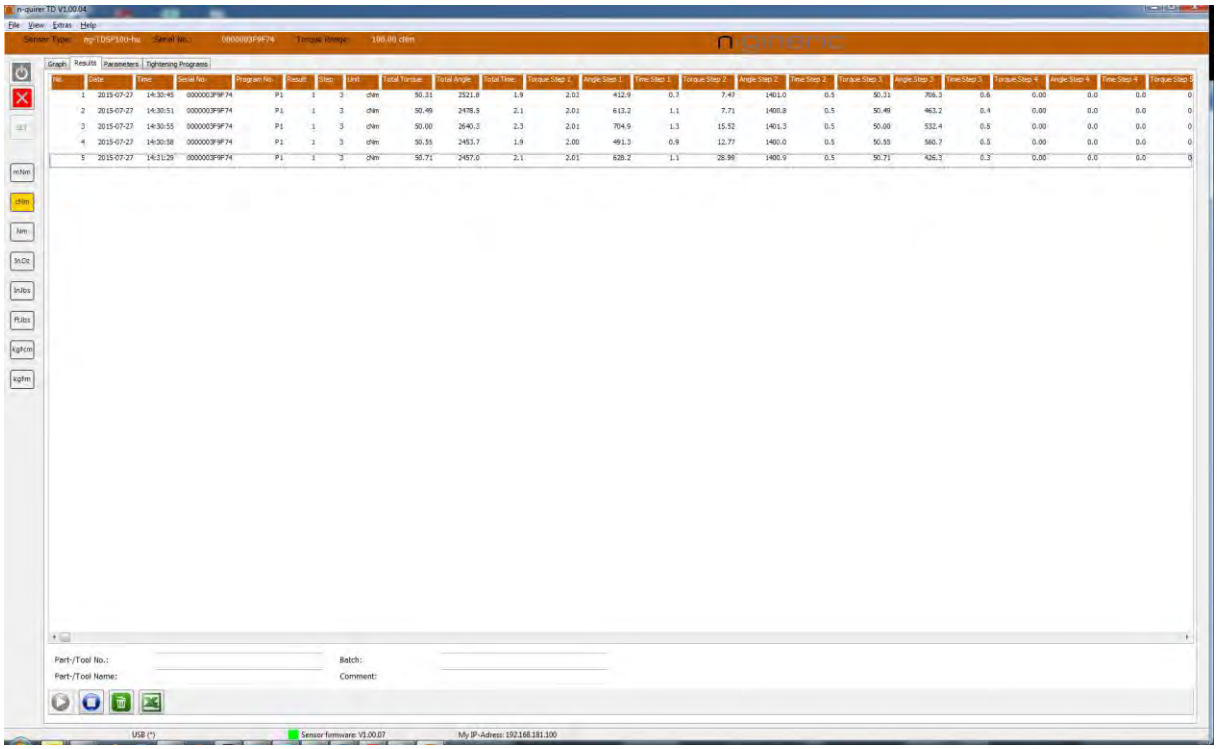
5.1 Graph Tab Sheet

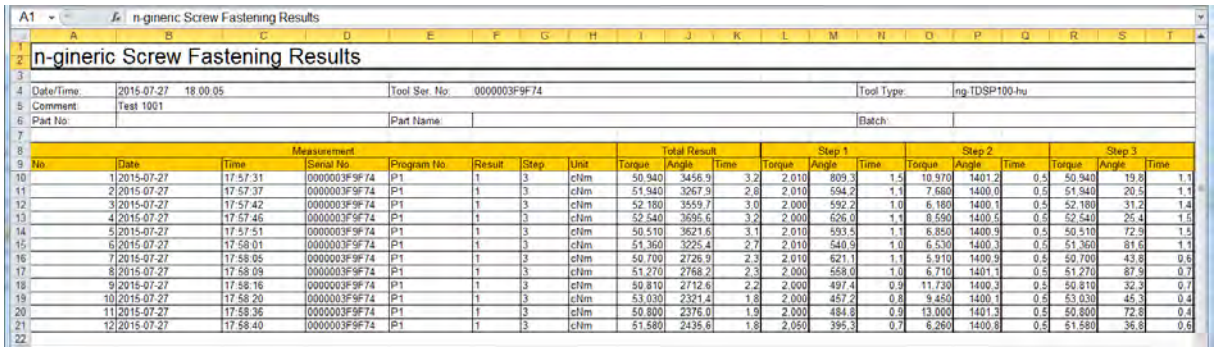




Torque/Angle Windows

5.2 Screw Tightening Results





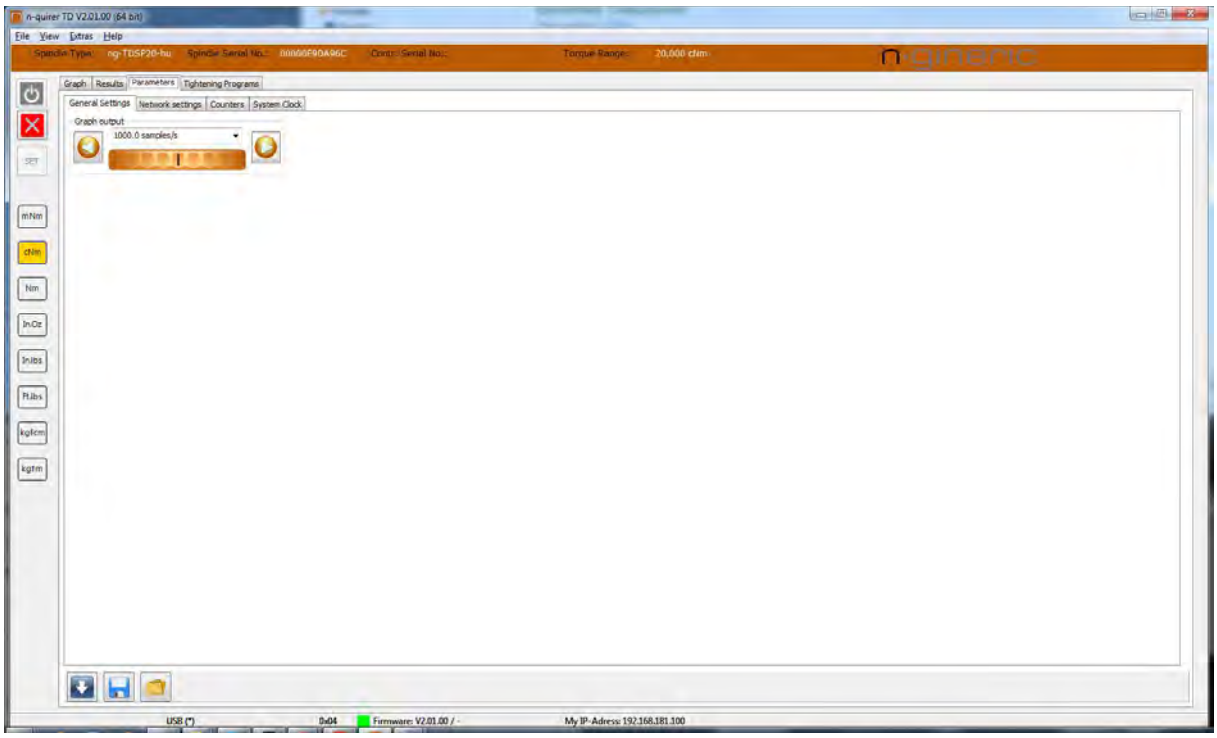
n-gineric Screw Fastening Results

Date/Time:	2015-07-27 18:00:05			Tool Ser. No:	0000003F9F74							Tool Type:	ng-TDSP100-hu							
Comment:	Test 1001																			
Part No:				Part Name:								Batch:								
	Measurement								Total Result			Step 1			Step 2			Step 3		
No.	Date	Time	Serial No.	Program No.	Result	Step	Unit	Torque	Angle	Time	Torque	Angle	Time	Torque	Angle	Time	Torque	Angle	Time
1	2015-07-27	17:57:31	0000003F9F74	P1	1	3	cNm	50,940	3456.9	3.2	2.010	809.3	1.5	10.970	1401.2	0.5	50,940	19.8	1.1
2	2015-07-27	17:57:37	0000003F9F74	P1	1	3	cNm	51,940	3267.9	2.8	2.010	594.2	1.1	7.660	1400.0	0.5	51,940	20.5	1.1
3	2015-07-27	17:57:42	0000003F9F74	P1	1	3	cNm	52,180	3559.7	3.0	2.000	592.2	1.0	6,180	1400.1	0.5	52,180	31.2	1.4
4	2015-07-27	17:57:46	0000003F9F74	P1	1	3	cNm	52,540	3695.6	3.2	2.000	626.0	1.1	8,590	1400.5	0.5	52,540	25.4	1.5
5	2015-07-27	17:57:51	0000003F9F74	P1	1	3	cNm	50,510	3621.6	3.1	2.010	593.5	1.1	6,850	1400.9	0.5	50,510	72.9	1.5
6	2015-07-27	17:58:01	0000003F9F74	P1	1	3	cNm	51,360	3225.4	2.7	2.010	540.9	1.0	6,530	1400.3	0.5	51,360	81.6	1.1
7	2015-07-27	17:58:05	0000003F9F74	P1	1	3	cNm	50,700	2726.9	2.3	2.010	621.1	1.1	5,910	1400.9	0.5	50,700	43.8	0.6
8	2015-07-27	17:58:09	0000003F9F74	P1	1	3	cNm	51,270	2768.2	2.3	2.000	558.0	1.0	6,710	1401.1	0.5	51,270	87.9	0.7
9	2015-07-27	17:58:16	0000003F9F74	P1	1	3	cNm	50,810	2712.6	2.2	2.000	497.4	0.9	11,730	1400.3	0.5	50,810	32.3	0.7
10	2015-07-27	17:58:20	0000003F9F74	P1	1	3	cNm	53,030	2321.4	1.8	2.000	457.2	0.8	9,450	1400.1	0.5	53,030	45.3	0.4
11	2015-07-27	17:58:36	0000003F9F74	P1	1	3	cNm	50,800	2376.0	1.9	2.000	484.8	0.9	13,000	1401.3	0.5	50,800	72.8	0.4
12	2015-07-27	17:58:40	0000003F9F74	P1	1	3	cNm	51,580	2435.6	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 to Excel, e. g. for Statistical Process Control.

5.3 Parameters

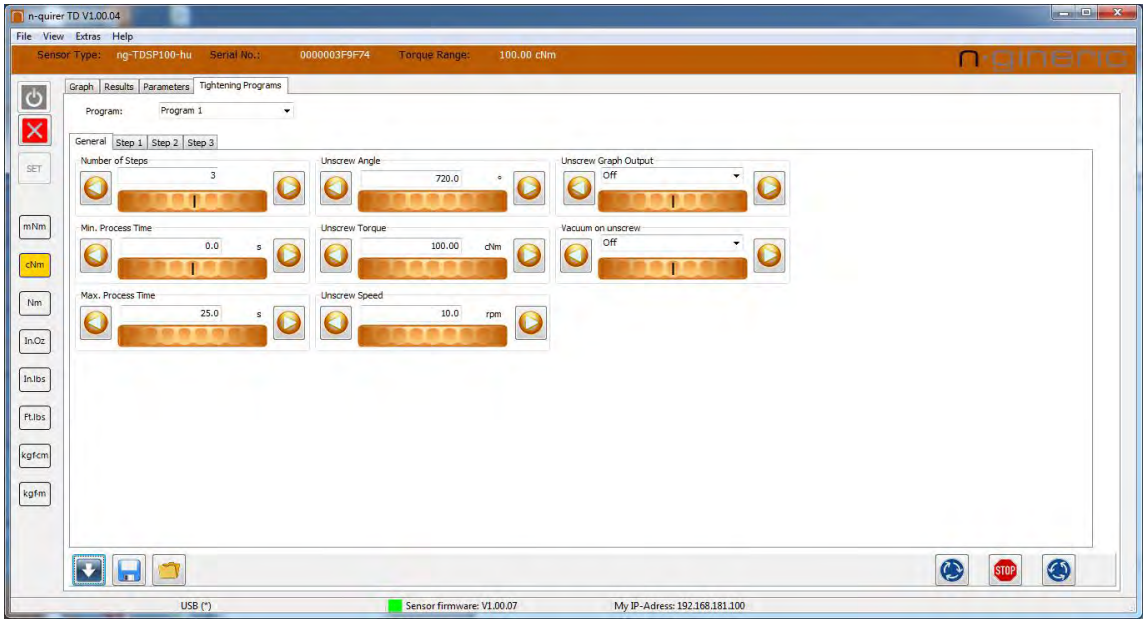
Here you can configure the graph output, network settings, counters and the system clock



5.4 Tightening Programs

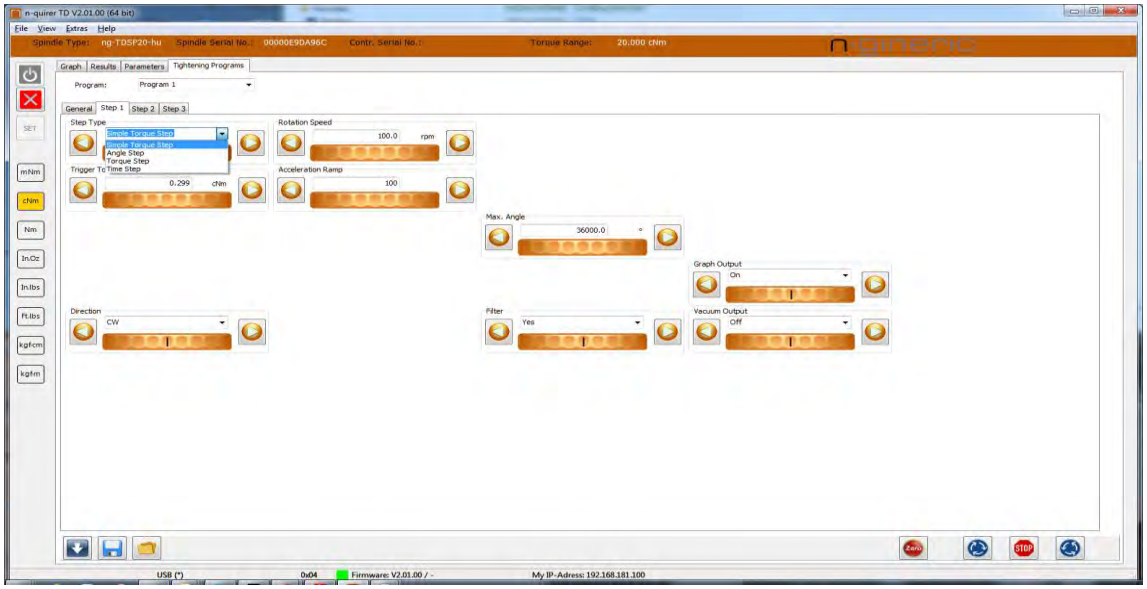
5.4.1 General

General parameters like number of steps per tightening cycle (max 8), unscrew parameter, vacuum function and tightening cycle time limit can be set here.



5.4.2 Screw Tightening Step Types

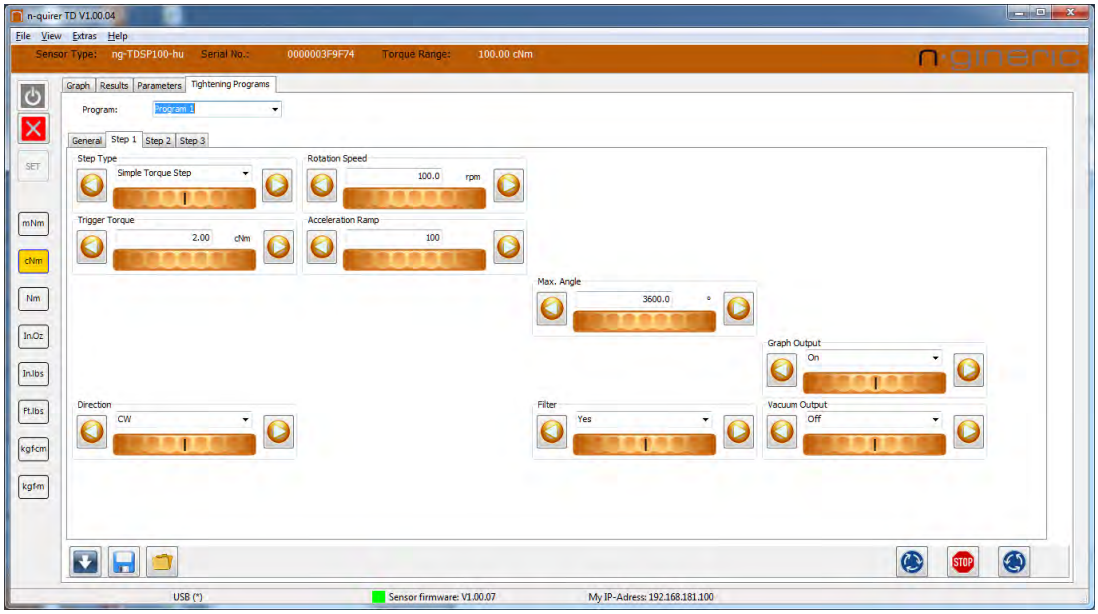
The screw tightening process can be defined by a sequence of 1 to 8 different steps. There are 4 step types available for now:



Simple Torque Step

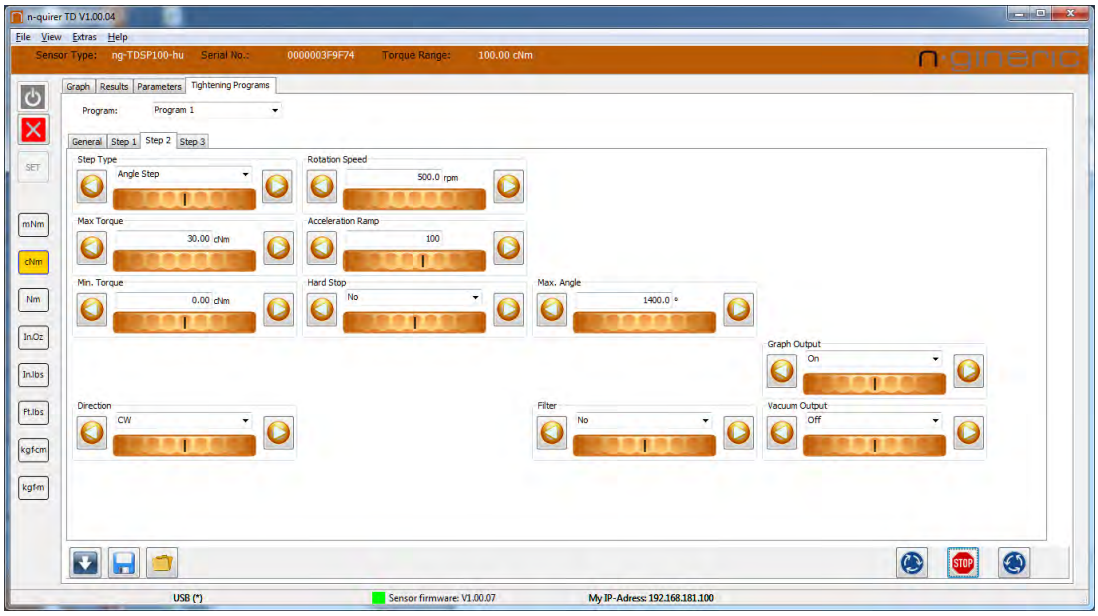
The **Simple Torque Step** facilitates the screw engagement and avoids cross threading.

After reaching the programmed trigger torque the system proceeds to the next step. The acceleration ramp defines the acceleration at the beginning of this step, the max angle starts to be counted from the beginning.



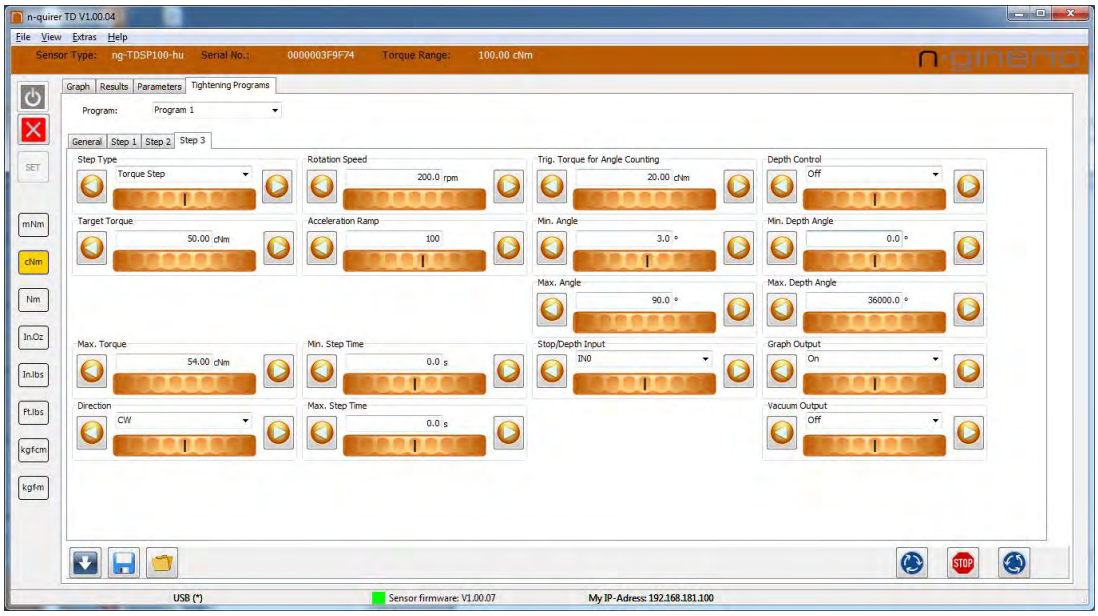
Angle Step

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 is done after the Angle Step has be finished.



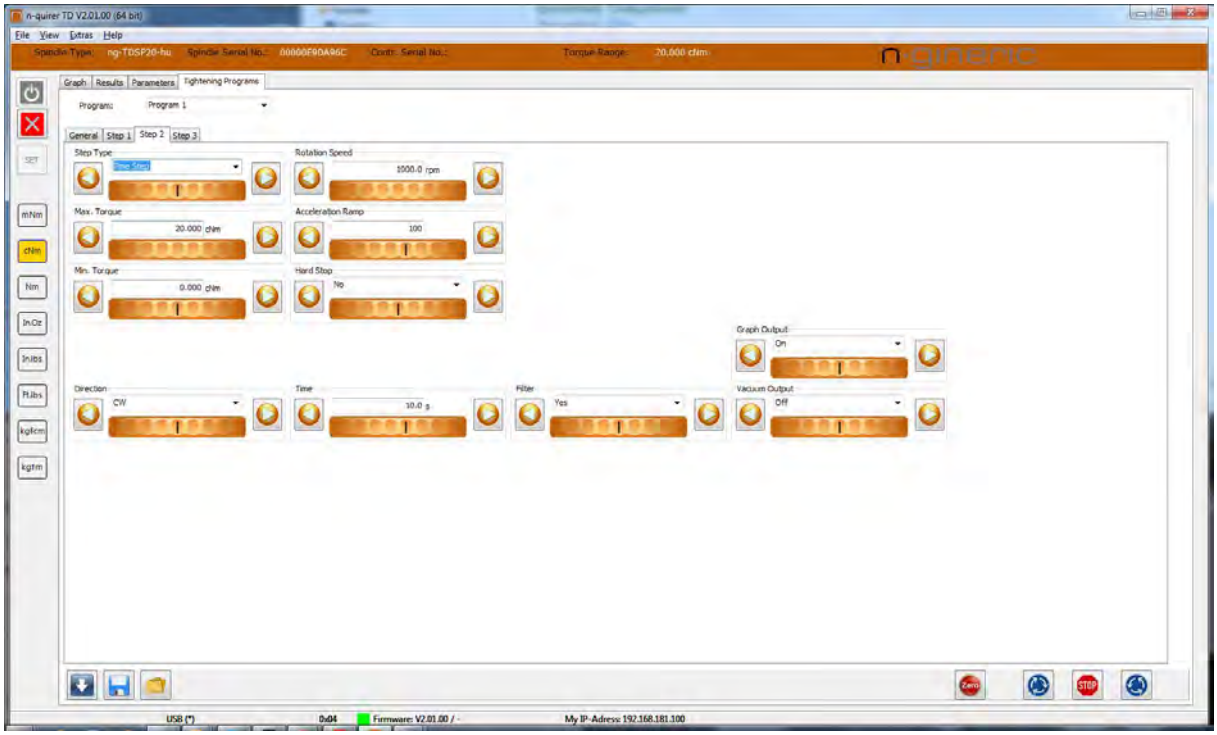
Torque Step

The **Torque Step** provides the best 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.



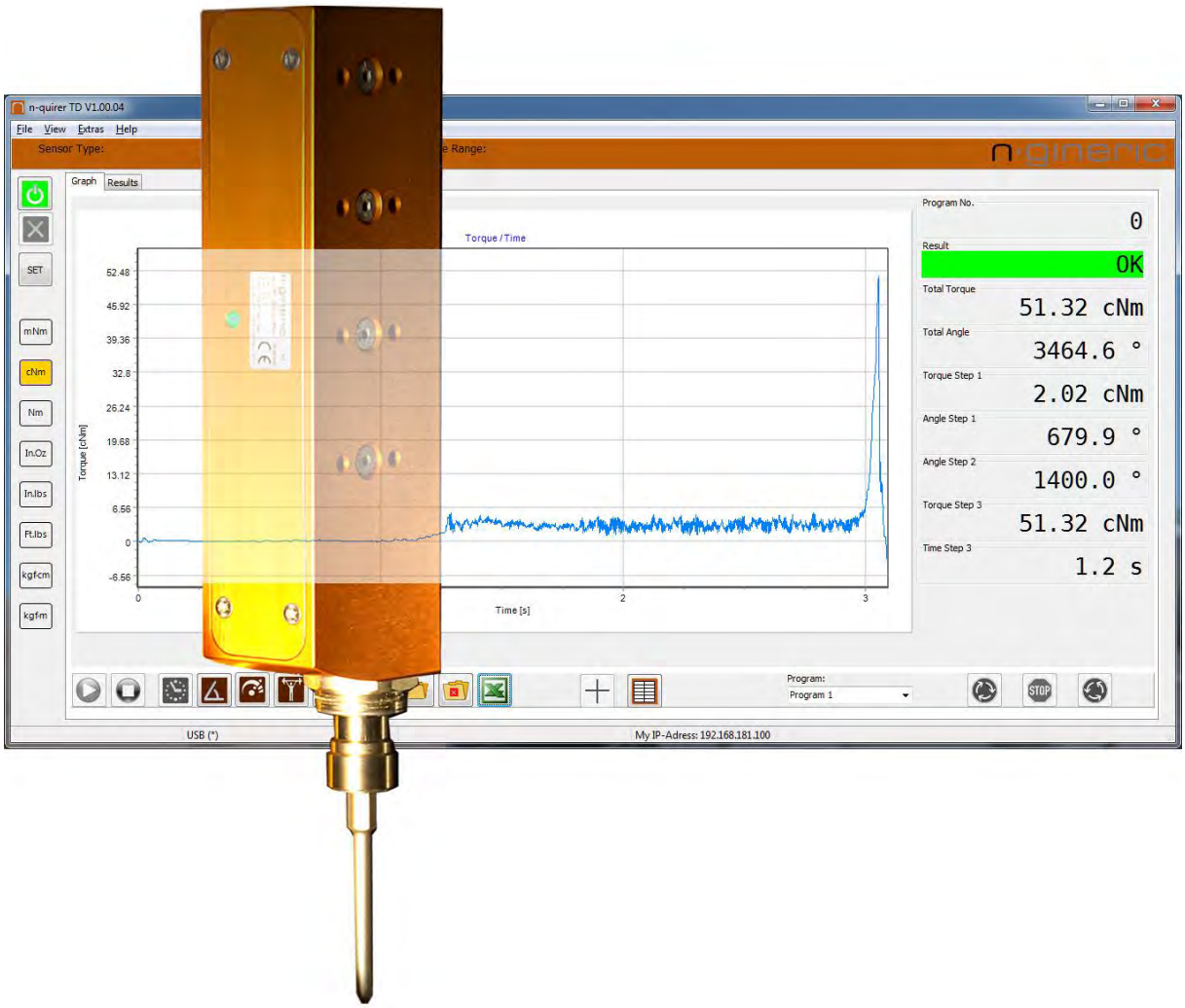
Time Step

This function is for setting a time limited optional pause or turning in CW/CCW direction.



Torque Driver Management Software

n-quirer TD V 1.00



User's Manual

Torque Driver Management Software for Tablet PC, Laptop, Netbook, PC

Torque Driver Management Software

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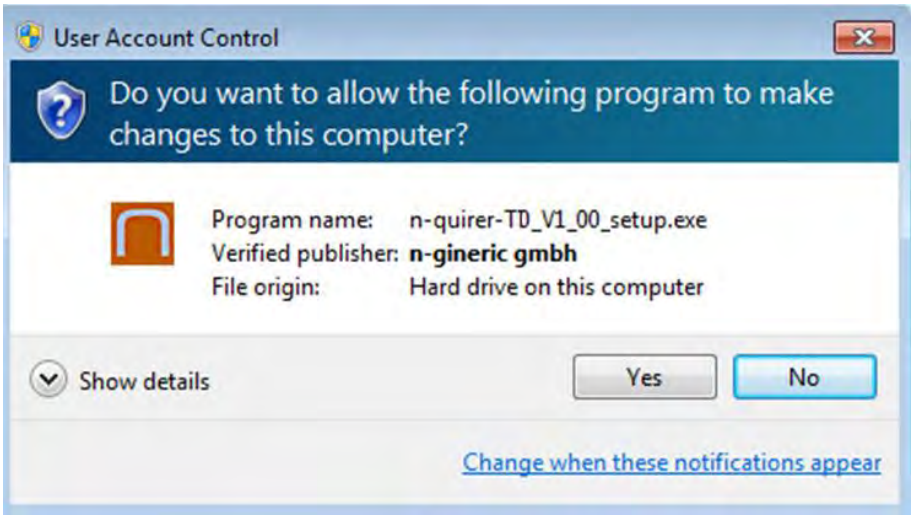
1 Software Installation

1.1 Installation under Windows 7, Windows 8

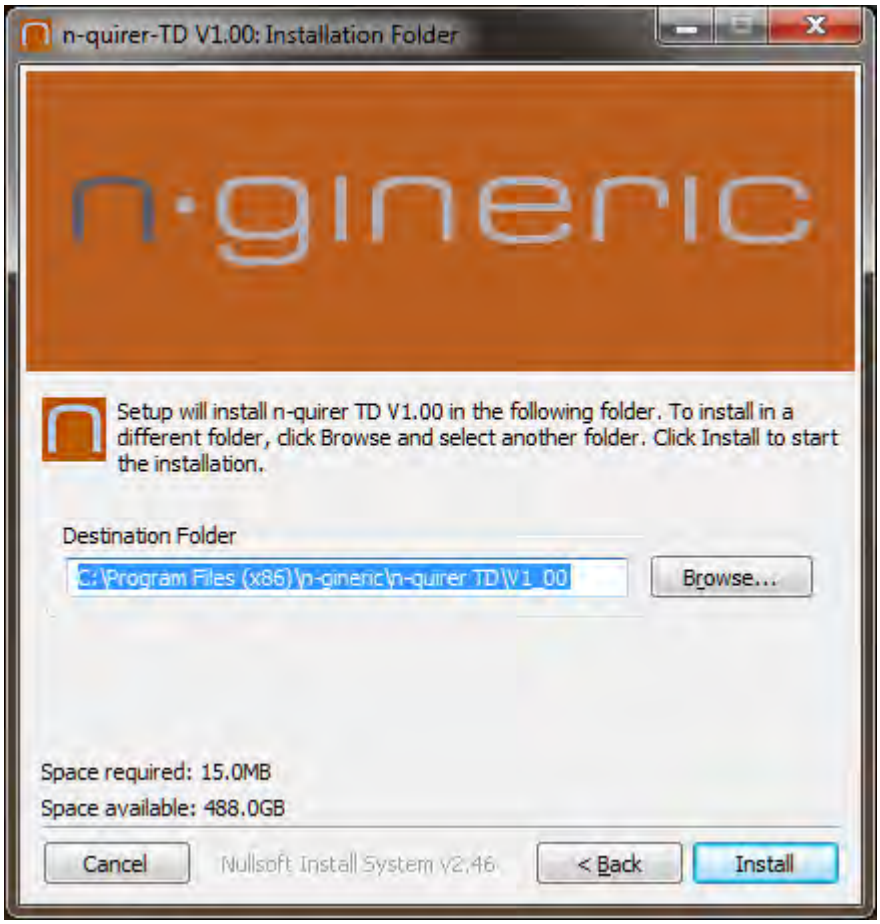
- Before installing the software, connect your ng-TD Torque Driver to your PC system via USB.
- The message “TD device was not successfully installed” might show up for a couple of seconds. This is normal, as the driver has not been installed until now.
- Start the installation of n-quirer TD by clicking the setup file from your media. Click Yes in the following dialog:



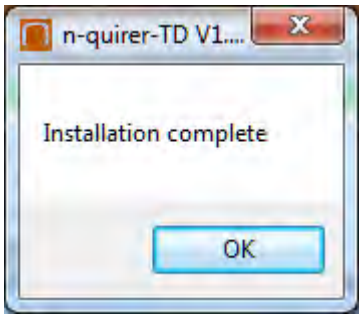
- Chose the language in the drop down menu and click OK.

- Chose the kind of installation. Full installation is recommended. Click NEXT.

- Chose the installation folder. The software will suggest a default which can be changed. Then, click install.



- The installation will be finished successfully when the following message is shown:

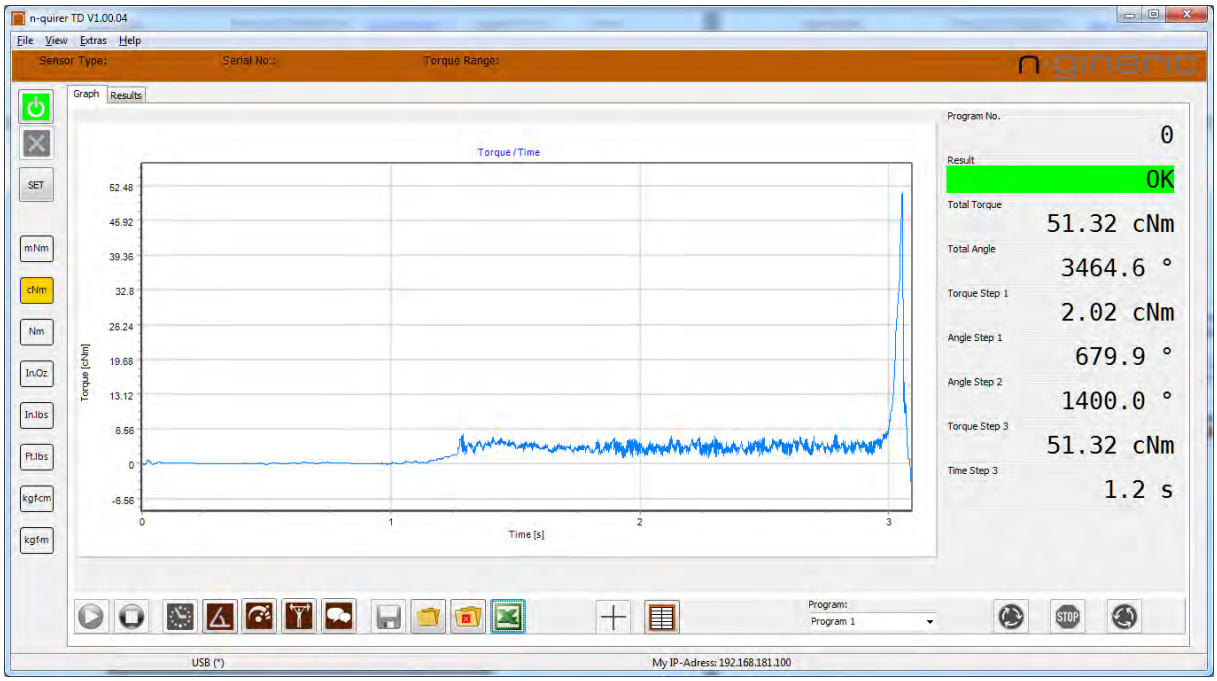


- You will now find the n-quirer TD – icon on your desktop.

2 General Overview

n-quirer TD is a software designed for **ng-TDSP** Torque Driver parameter and program management, graphical visualization, and screw driving process data logging.

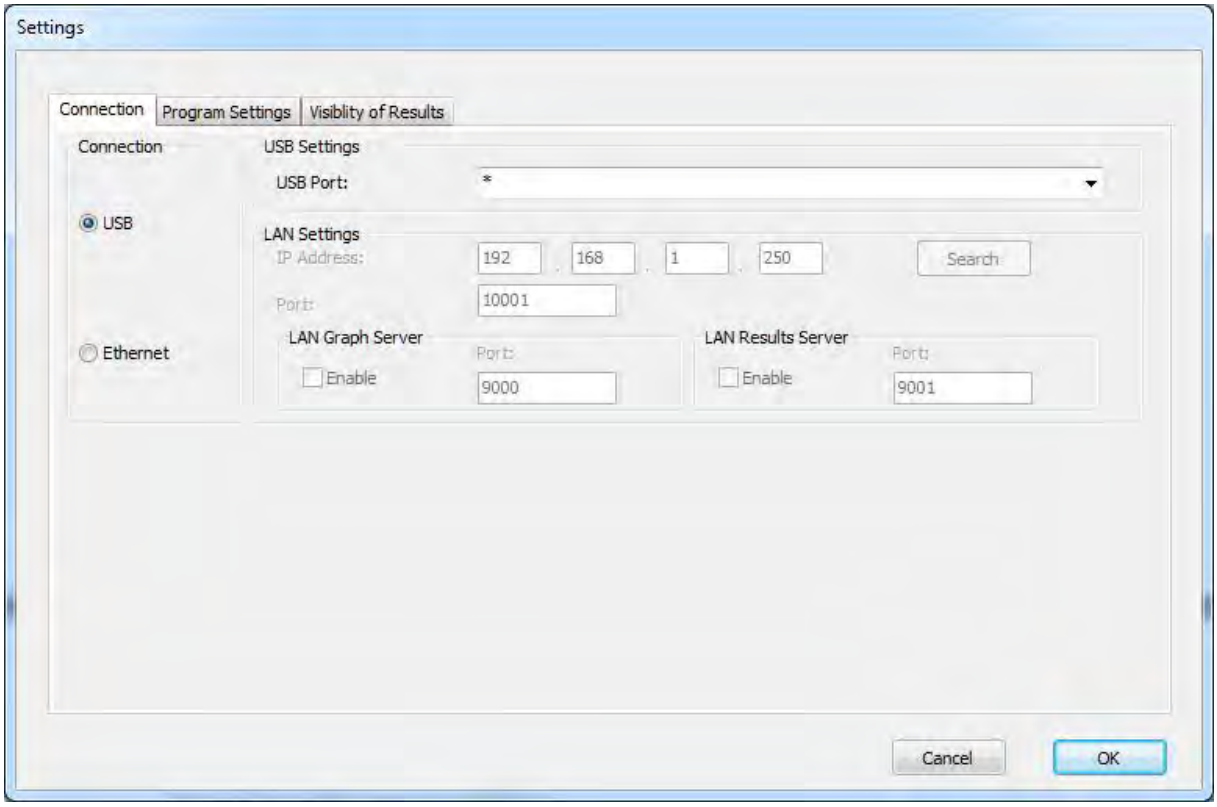
After connecting the Torque Driver, the system is being identified by showing the type, serial number, and torque range in the header line. The Torque Driver firmware version is shown at the bottom line.



3 Settings

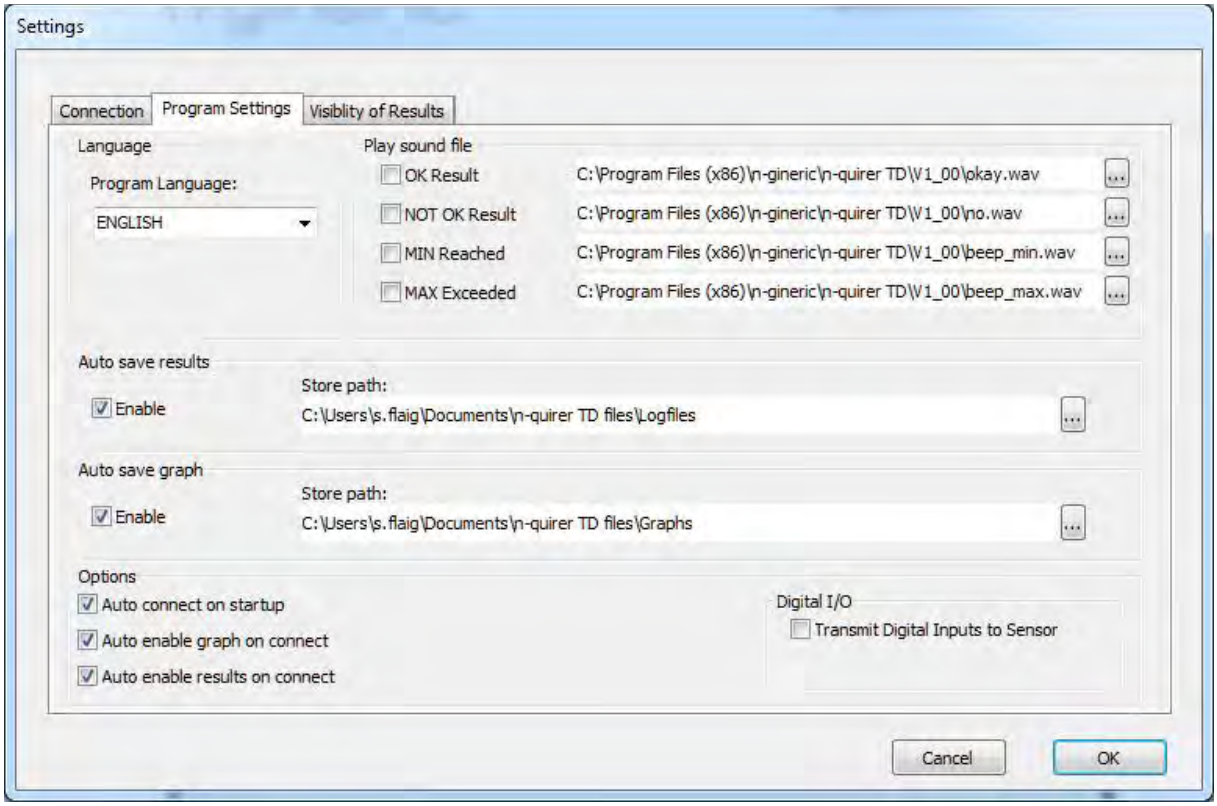
The System Configuration Setup can be accessed by clicking the Set icon on the Graph Tab Sheet, or through the Main Menu under the item File.

3.1.1 Connection Tab Sheet



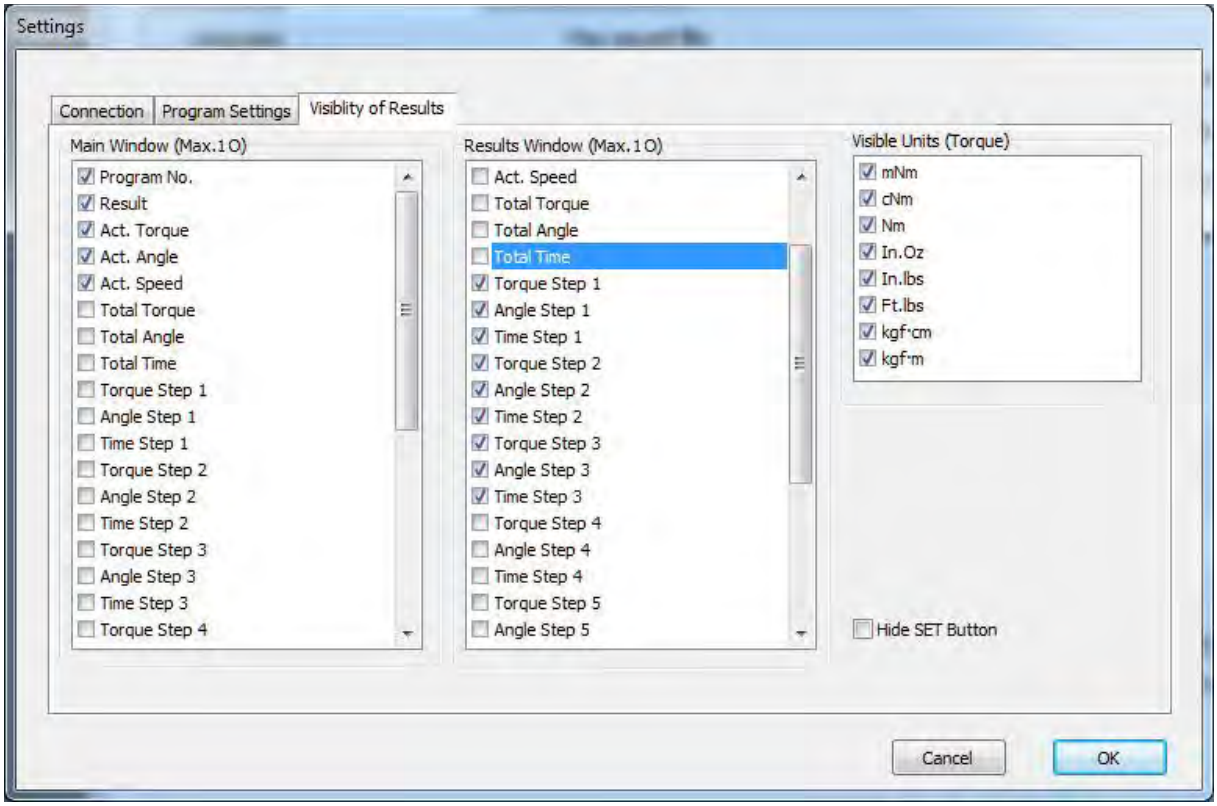
Here, the USB port can be selected. Chose from the list, if more than one devices are connected.

3.1.2 Program Settings Tab Sheet



- The Program Languages available are English and German.
- The Auto Save Results option logs all results redundantly into a daily text file in the according directory. The Torque Driver serial number and the date and time are included in the file name.
- The Auto Save Graphs option saves all graphs in the native **n-quirer TD** format into the according directory. The Torque Driver serial number and the date and time are included in the file name.
- The Auto Connect on Startup Option means, that the first **ng-TD** device found when the n-quirer TD software is started, will be automatically connected.
- The Auto Enable Graph on Connect Option means, that the graph recording starts automatically when the Torque Driver is sending graph data.
- The Auto Enable Results on Connect Option means, that the results listing starts automatically when the Torque Driver is sending results data.
- The Play Sound Options mean that wave files can be played if the result is G/NG/Min. reached/Max. exceeded. The wave files can be replaced by others, if required.
- The Digital I/O option is used in combination with the **ng-TDC** controller.

3.1.3 Visibility of Results Tab Sheet



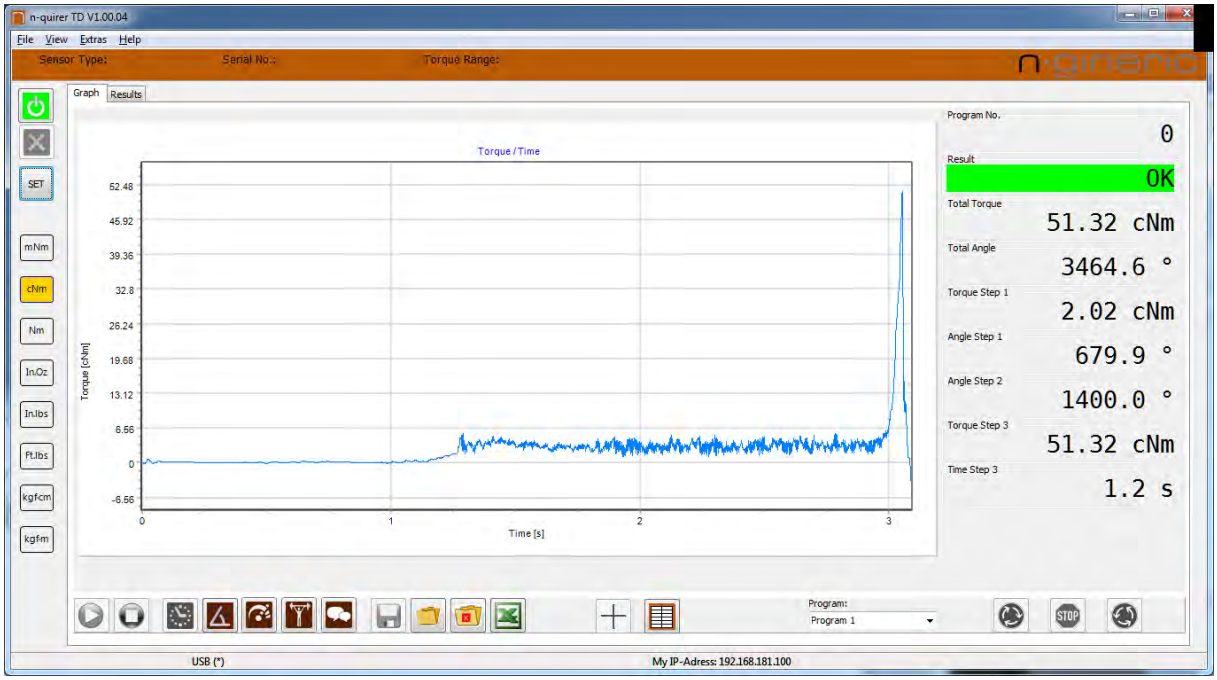
In the **Main Window**, up to 10 items can be selected to be shown on the Graph Tab sheet. The **Results Window** also allows the selection of up to 10 items. It can be enabled/disabled with the Results Window Icon on the Graph Tab Sheet (see 2.2.1).

The **Visible Units** can be selected from the list. Only the checked ones will be shown on the Graph Tab Sheet.

The **Set Button** on the Graph Tab Sheet can be hidden. The Setup is still accessible through the Main Menu.

4 Features

4.1.1 Graph Tab Sheet



On the Graph Tab Sheet, there are the following features available:

- Connect/Disconnect the Torque Driver
- Enter the Setup
- Torque vs. angle and torque vs. time graph recording
- Additional overlay of RPM graph or mechanical power graph
- Start and Stop buttons for CW and CCW rotation
- Cursor Function
- Program Selection drop down field
- Main Window Results
- Results Window
- Physical Units Selection Icons (according to settings)

Torque Driver Management Software

1
2
3
4
5
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9
10
11

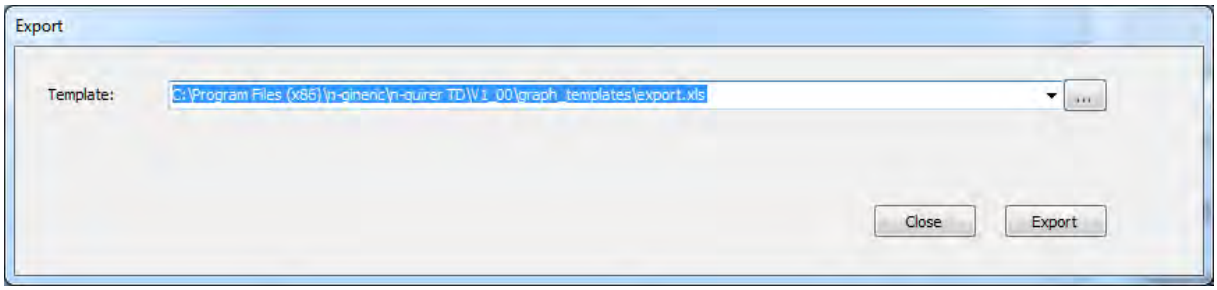
Vertical Icons Description:

No.	Function
1	Start communication to Torque Driver
2	Stop communication to Torque Driver
3	Enter Settings Menu
4 to 11	Physical Units Selection (active one highlighted)

Horizontal Icons Description:

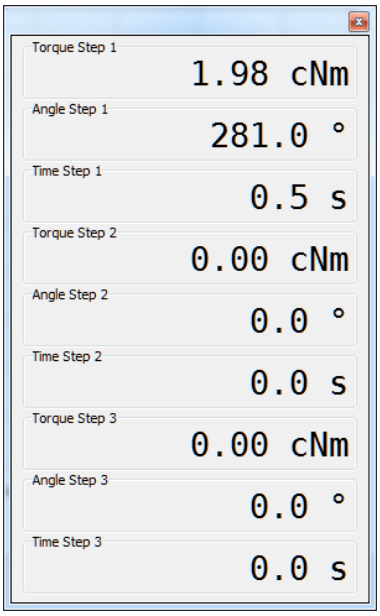
No.	Function
1	Graph recording start
2	Graph recording stop
3	Torque vs. time graph
4	Torque vs. angle graph
5	RPM graph overlay
6	Mechanical power graph overlay
7	n-clude overlay (future function)
8	Save graph to disk
9	Load graph/reference graph from disk
10	Unload reference graph
11	Export graph to Excel
12	Enable cursor (after graph recording stop)
13	Show Results Window

No. 11 requests for an Excel Template which can be modified, if required, and for a file name.



No. 13 enables the Results Window which provides detailed information from each screw tightening Step, according to the setup. The window is hidden again by another click on the icon.

Torque Driver Management Software



4.2 The Results Tab Sheet

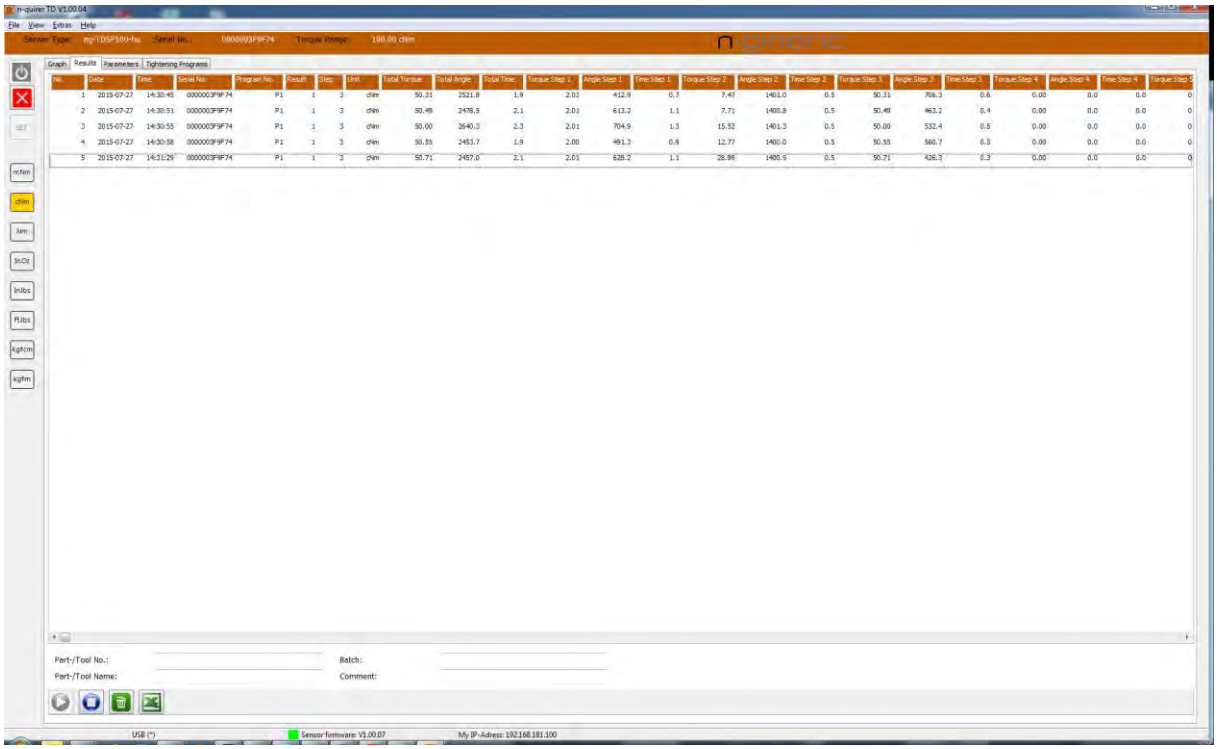
The Results of the screw tightening procedures are listed automatically (if the recording is enabled by clicking the play button). The information saved contains the tie stamp, torque driver serial number, program number, Result/Error Code, the total torque and angle, and the values of torque, angle and time for each of the 8 possible screw tightening steps. Additional information can be entered in the 4 fields at the bottom (Part-/Toon No., Part-/Tool Name, Batch, Comment).

The Result/Error Codes:

01	OK
02	Break
10	Total Time exceeded
11	Min. Total Time not reached
20	Angle too high in Step
21	Angle too low in Step
22	Torque too ligh in Step
23	Torque too low in Step
24	Time exceeded in Step
25	Min. Time not reached in Step

Single lines in the listing can be deleted by clicking the right mouse key on the according line.

Torque Driver Management Software



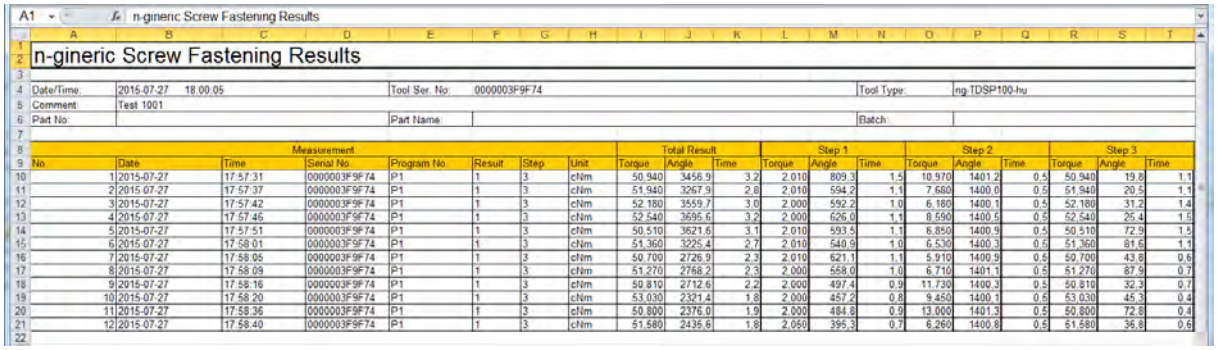
1 2 3 4

Icons Description:

No.	Function
1	Results recording start
2	Results recording stop
3	Delete all results
4	Export results to Excel

Torque Driver Management Software

The listing can be exported to Excel, e. g. for Statistical Process Control.



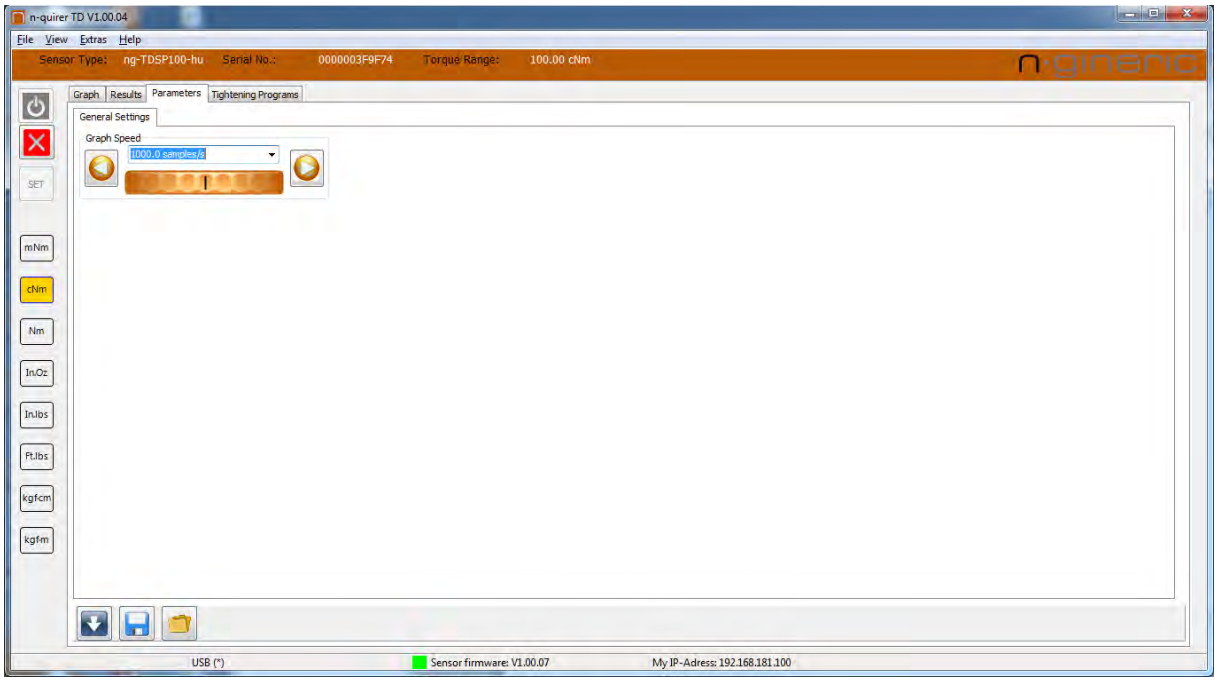
n-gineric Screw Fastening Results

Date/Time:	2015-07-27 18:00:05	Tool Ser. No:	0000003F9F74	Tool Type:	ng-TDSP100-hu
Comment:	Test 1001				
Part No:		Part Name:		Batch:	

	Measurement							Total Result			Step 1			Step 2			Step 3		
No.	Date	Time	Serial No.	Program No.	Result	Step	Unit	Torque	Angle	Time	Torque	Angle	Time	Torque	Angle	Time	Torque	Angle	Time
1	2015-07-27	17:57:31	0000003F9F74	P1	1	3	cNm	50,940	3456,9	3,2	2,010	809,3	1,5	10,970	1401,2	0,5	50,940	19,8	1,1
2	2015-07-27	17:57:37	0000003F9F74	P1	1	3	cNm	51,940	3267,9	2,8	2,010	594,2	1,1	7,660	1400,0	0,5	51,940	20,5	1,1
3	2015-07-27	17:57:42	0000003F9F74	P1	1	3	cNm	52,180	3559,7	3,0	2,000	592,2	1,0	6,180	1400,1	0,5	52,180	31,2	1,4
4	2015-07-27	17:57:46	0000003F9F74	P1	1	3	cNm	52,540	3695,6	3,2	2,000	626,0	1,1	8,590	1400,5	0,5	52,540	25,4	1,5
5	2015-07-27	17:57:51	0000003F9F74	P1	1	3	cNm	50,510	3621,6	3,1	2,010	593,5	1,1	6,850	1400,9	0,5	50,510	72,9	1,5
6	2015-07-27	17:58:01	0000003F9F74	P1	1	3	cNm	51,360	3225,4	2,7	2,010	540,9	1,0	6,530	1400,3	0,5	51,360	81,6	1,1
7	2015-07-27	17:58:05	0000003F9F74	P1	1	3	cNm	50,700	2726,9	2,3	2,010	621,1	1,1	5,910	1400,9	0,5	50,700	43,8	0,6
8	2015-07-27	17:58:09	0000003F9F74	P1	1	3	cNm	51,270	2768,2	2,3	2,000	558,0	1,0	6,710	1401,1	0,5	51,270	87,9	0,7
9	2015-07-27	17:58:16	0000003F9F74	P1	1	3	cNm	50,810	2712,6	2,2	2,000	497,4	0,9	11,730	1400,3	0,5	50,810	32,3	0,7
10	2015-07-27	17:58:20	0000003F9F74	P1	1	3	cNm	53,030	2321,4	1,8	2,000	457,2	0,8	9,450	1400,1	0,5	53,030	45,3	0,4
11	2015-07-27	17:58:36	0000003F9F74	P1	1	3	cNm	50,800	2376,0	1,9	2,000	484,8	0,9	13,000	1401,3	0,5	50,800	72,8	0,4
12	2015-07-27	17:58:40	0000003F9F74	P1	1	3	cNm	51,580	2435,6	1,8	2,050	395,3	0,7	6,260	1400,8	0,5	51,580	36,8	0,6

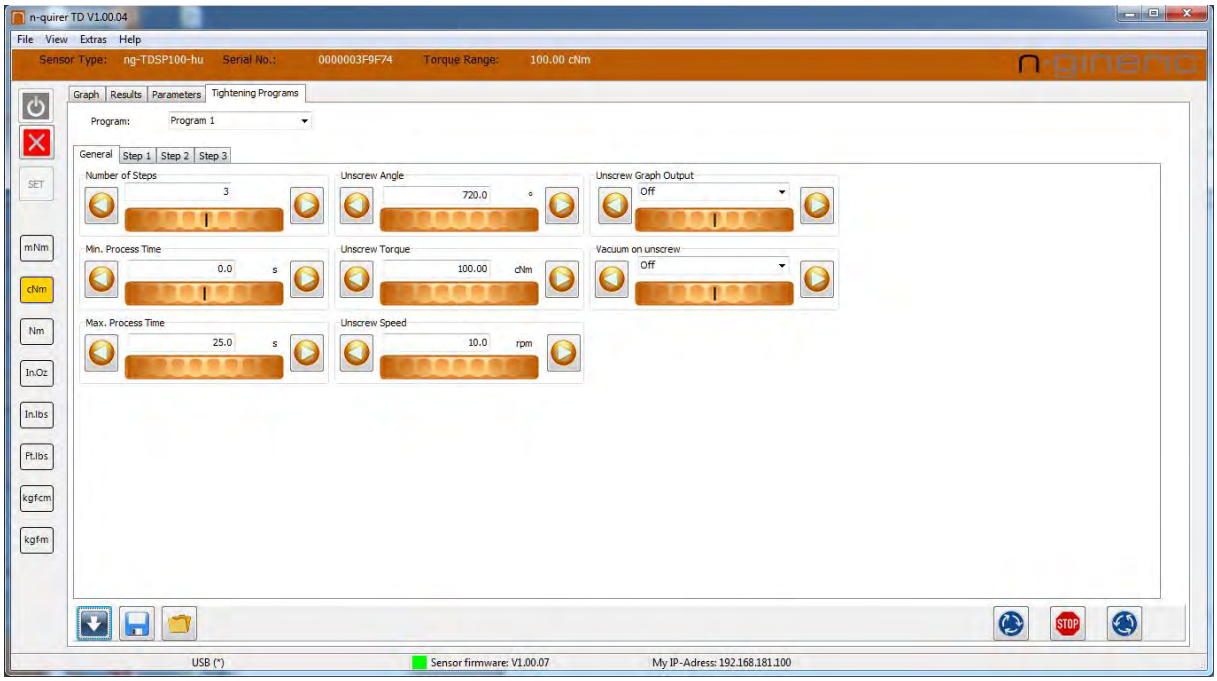
4.3 The Parameters Tab Sheet

4.3.1 General Settings



The Data Rate of the graph output to the PC can be adjusted between 200 and 2,000 data sets per second. Peak values are always transferred independently from this adjustment. For low performance PC systems, it might be useful to reduce the data rate.

4.4 The Tightening Programs Tab Sheet



On top, there is the Screw Driving Program Selection drop down field. One out of 4 programs can be chosen.

With the blue "Arrow-down"-Icon, the tightening parameters can be saved into the Torque Driver's flash memory according to the program selected.

With the disk icon, all 4 programs can be saved to the hard drive. With the folder icon, a program file containing the 4 programs can be loaded from the hard drive.

4.4.1 General Tightening Parameters

The general Parameters of each screw driving programs are:

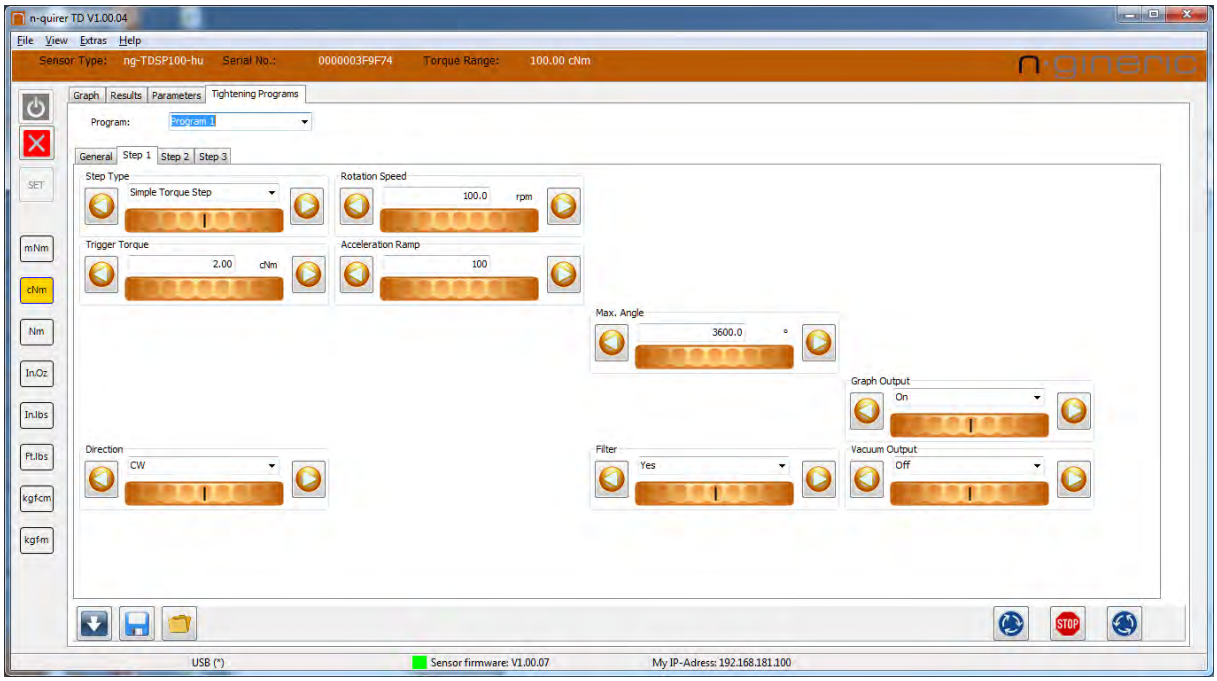
- The Number of Steps. A step sequence from 1 to 8 can be chosen.
- The Min. Process Time. If this is not reached at the end of the screw driving process, an error message is displayed.
- The Max. Process Time: If this is has been exceeded at the end of the screw driving process, an error message is displayed.
- The Unscrew Angle: The angle of CCW rotation can be programmed here.

- The Unscrew Torque: If this is reached during the CCW rotation, an error message is displayed.
- The Unscrew Speed: The RPM for the CCW rotation can be adjusted here.
- The Unscrew Graph recording can be enabled / disabled here.
- The Vacuum on Unscrew can be enabled here to remove screws (only with the ng-TDC Screw Drive Controller).

4.4.2 Screw Tightening Step Types

4.4.2.1 Simple Torque Step

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



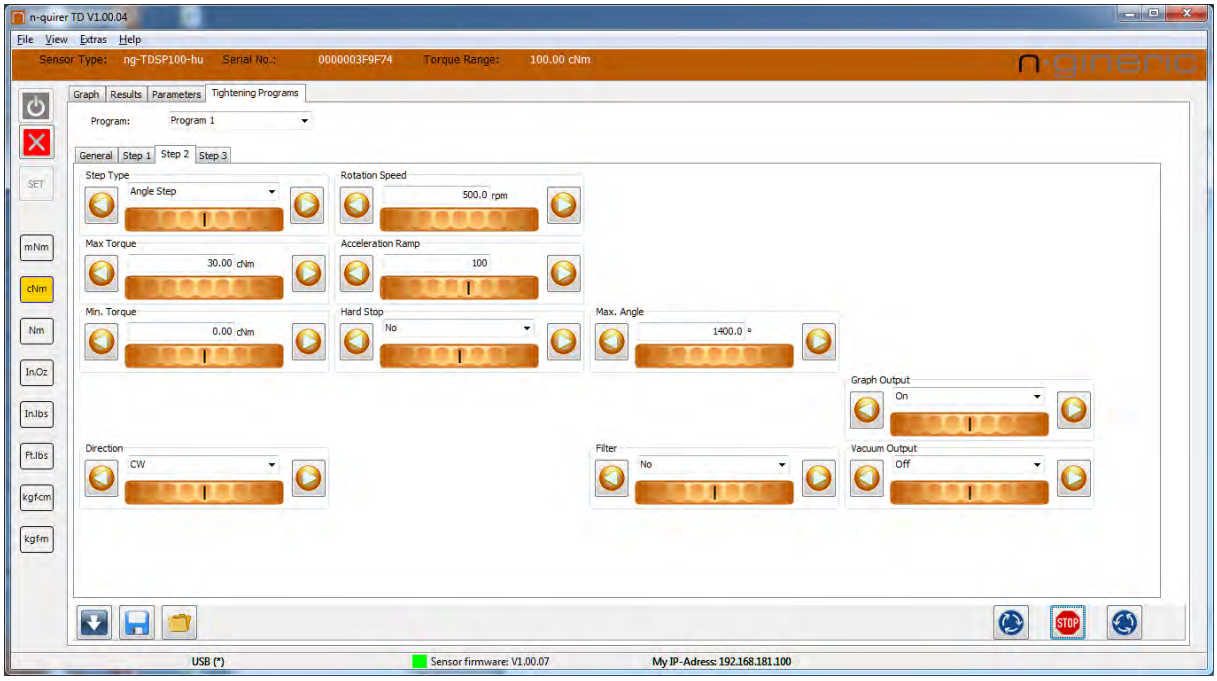
The **Simple Torque Step** Parameter are

- The **Trigger Torque**: The Screw tightening step sequence proceeds to the next step as soon as this torque level is reached.
- The **Direction** of the Rotation can be CW or CCW. CW is the default value.
- The **Rotation Speed** can be adjusted here. Relatively low RPM is recommended to facilitate screw engagement.
- The **Acceleration Ramp** only needs to be changed in special cases. Normally, the default value can be maintained.
- The **Max. Angle** of the Simple Torque Step can be limited here. If the Max. Angle is reached during this step, an error message is displayed.

- An additional **Filter** can be enabled / disabled to smoothen the graph in the Simple Torque Step. The default status is enabled.
- The **Graph Output** can be enabled / disabled in the Simple Torque Step. The default status is enabled.
- The **Vacuum Output** can be enabled/ disabled in the Simple Torque Step. The default status is enabled (only with the **ng-TDC** Screw Driver Controller).

4.4.2.2 Angle Step

The **Angle Step** provides a 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 is done after the Angle Step has be finished.



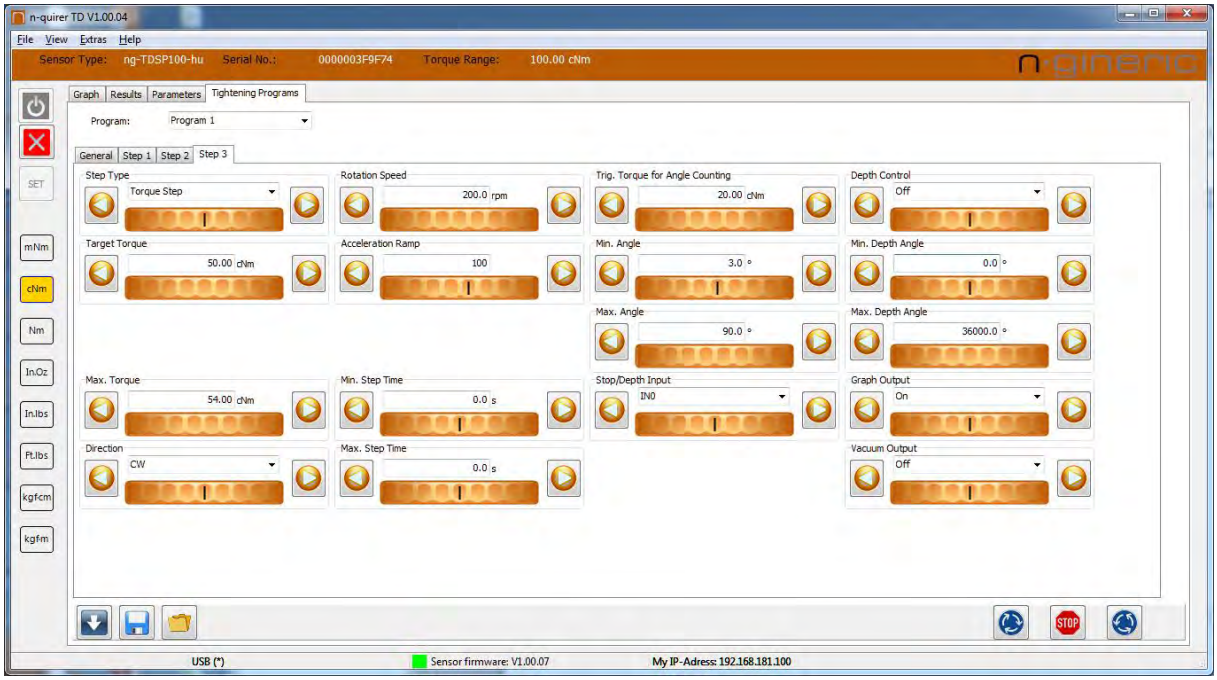
The **Angle Step** Parameters are

- The **Max. Torque** which must not be reached during the Angle Step. If so, an error message is displayed.
- The **Min. Torque** which needs to be reached during the Angle Step. If not, an error message is displayed.
- The **Direction** of the Rotation can be CW or CCW. CW is the default value.
- The **Rotation Speed** can be adjusted to a high level to minimize the process time.
- The **Acceleration Ramp** only needs to be changed in special cases. Normally, the default value can be maintained.
- The **Hard Stop** can be enabled, if there is a hard joint and the RPM setting is high. The Torque Driver then stops before proceeding with to the following step.
- The **Max. Angle** is the setting which has to be absolved. If the Max. Torque is reached before the Max. Angle, an error message is displayed.

- An additional **Filter** can be enabled /disabled to smoothen the graph in the Simple Torque Step. The default status is disabled.
- The **Graph Output** can be enabled/disabled in the Angle Step. The default status is enabled.
- The **Vacuum Output** can be enabled/disabled in the Angle Step. The default status is disabled (only with the ng-TDC Screw Driver Controller).

4.4.2.3 Torque Step

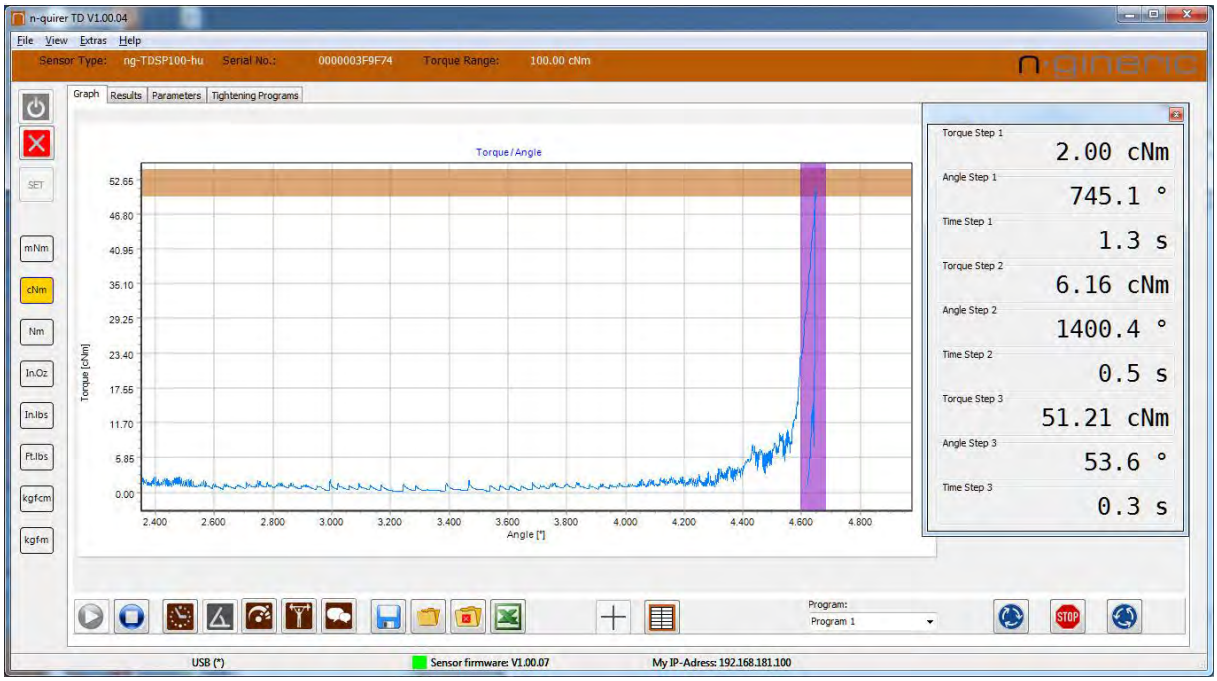
The **Torque Step** provides the best level of process security by monitoring the torque window, the time window, the angle torque/angle gradient, and, as an option, the screw insertion depth.



The **Torque Step** Parameters are

- The **Target Torque** which must not be reached by the end of the Torque Step. If not, an error message is displayed.
- The **Max. Torque** which must not be reached during the Torque Step, as this means exceeded torque. If so, an error message is displayed.
- The **Direction** of the Rotation can be CW or CCW. CW is the default value.
- The **Rotation Speed** can be adjusted here. Relatively low RPM is recommended especially for hard joint, not to exceed the Target torque too much.
- The **Acceleration Ramp** only needs to be changed in special cases. Normally, the default value can be maintained.
- The **Min. Step Time**. If this is not reached at the end of the screw driving process, an error message is displayed.

- The **Max. Step Time**: If this is has been exceeded at the end of the screw driving process, an error message is displayed.
- The **Trigger Torque for Angle Counting** allows the monitoring of the angle from the point where the screw head is seated. The Trigger Torque has to be adjusted to a level beyond the torque required to get the screw seated. The torque/angle gradient provides additional process security because it detects material failure.



As an example, the orange horizontal bar in the graph shows the torque window (50 to 54 cNm), the purple vertical bar the clamping angle window (3 to 90 degrees starting from the trigger torque of 20 cNm).

- The **Stop/Depth Input** can be configured in combination with the **ng-TDC** Screw Driver Controller. A proximity switch which signalizes that the minimum insertion depth is reached is connected to the ng-TDC.
- The **Depth Control** can be enabled/disabled (only with the **ng-TDC** Screw Driver Controller).
- The **Min. Depth Angle** has to be reached from the point that the Depth Control Switch gives its signal. If it is not reached, an error message is displayed.
- The **Max. Depth Angle** must not be reached from the point that the Depth Control Switch gives its signal. If it is reached, an error message is displayed.
- The **Graph Output** can be enabled/disabled in the Torque Step. The default status is enabled.
- The **Vacuum Output** can be enabled/disabled in the Torque Step. The default status is disabled (only with the ng-TDC Screw Driver Controller).

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