DSM Messtechnik GmbH

Flexible automation solutions for first-class assembly processes

ENGLISH

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... we support you in the realisation of your projects

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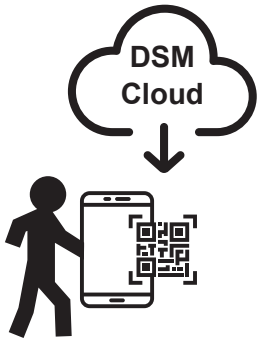

Catalogoues, data sheets, videos

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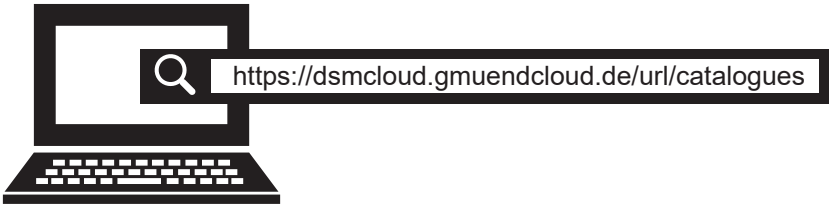
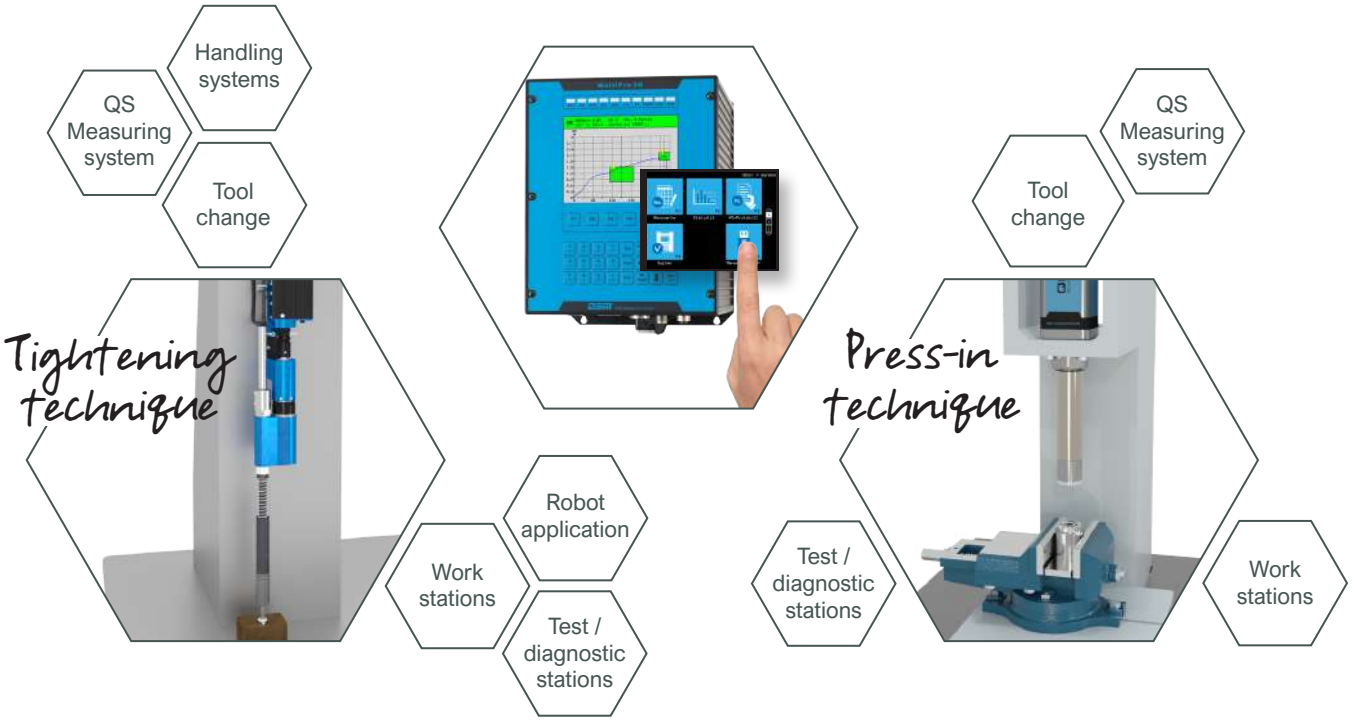


Control system

MultiPro 3G, the control system for **tightening** and **press-in processes**. Thanks to its scalable performance, it is the flexible solution in assembly for simple and complex tasks.

MultiPro 3G hardware unit – configurable with standardised option modules, firmware for tightening or press-in, extension level for scope of performance as well as with additional processes and functions.

Space-saving control system with integrated servo controller, compact in one housing for quick installation.



Nutrunners

The requirements placed on a nutrunner are diverse.
The DS series offers you products which are specially configured for your applications. In the right size, with the correct torque, in the required precision, with the appropriate attachment.
Thanks to in-house production, individual adjustments can also be made.

0,01 up to 2400 Nm
Torque

Press-in units

The right press-in unit for press, joining and forming tasks.
DSM offers you press-in units which are specially configured for your applications. In the right size, with the correct force, in the required precision, with an appropriate stroke.
If required, we can equip the press-in unit with backstop or with electromechanical brake.
Thanks to in-house production, individual adjustments can also be made.

50 up to 120 000 N
Force

Tightening and press-in technology – both under one roof, both excellently designed.
This is a rarity. One which is sought after on an international scale: As a traditional and innovative expert in the field of tightening, press-in and measuring technique, we at DSM are regarded as one of the leading global providers of precision technology for assembly processes.
DSM Messtechnik is an independent, owner-managed family company.

Our clear commitment to a German location is a common theme which has featured in our company's history of almost 40 years.
As well as our high quality standard.
The two go hand in hand: At our headquarters in Aalen, our experienced specialist team develops and produces all DSM products in an efficient manner and to a high quality.
Regardless of whether serial production or a customer-specific solution is involved.

Consultation

The earlier we at DSM are involved in a project, the better. Thanks to well-founded expertise, we are well-versed in recognising and analysing specific needs and requirements, and consulting our customers in a purposeful manner. Application case, tightening process, safety, tools, torque and rotational angle measuring devices, feeding technology, equipment of the workstation or system – for perfect results everything must be tailored.
This is where our core competences can be found.

Also interesting: Test / diagnostic stations equipped with DSM technology for use in prototype construction or in quality assurance, e.g. for determining tightening torques / breakaway torques for quality assessment.

Process know-how

We are continually further developing our technologies and aligning them with the individual requirements of our customers.
Indeed, DSM customers currently have a choose: In addition to a wide range of standard products with many variants, we offer high-performance, custom-fit special designs and unique items.
Regardless of which DSM product is chosen, it will be designed and produced in our headquarters in Aalen.

Software and hardware development, production, mechanical processing, quality testing …
All at one site, all defined by our Swabian inventive spirit, our precision, expertise and our commercial way of thinking.

In addition to an extraordinary wide range of products, this manufacturing depth allows us a high degree of flexibility and quality:
Within no time at all, DSM is able to convert specific customer demands into market-ready, high-quality, and reliable products.

Process know-how

Tightening

Radial clearance measurement
Flexing torque testing
Screw breakage detection
Redundant measuring circuit
Sheet metal screw joints
Self-tapping screws
Stop and coupling nuts, micro-encapsulated screws
Stick-Slip screw connection
Detection of head contact
Envelope curve monitoring
Gradient monitoring
External sensors ...

Process know-how

Press-in

Hold force / position
Force linearisation
Stroke linearisation
Friction coefficient determination
External length (stroke)
Envelope curve monitoring
Redundant measured value acquisition
Clip point detection
Review stroke ...

Process know-how

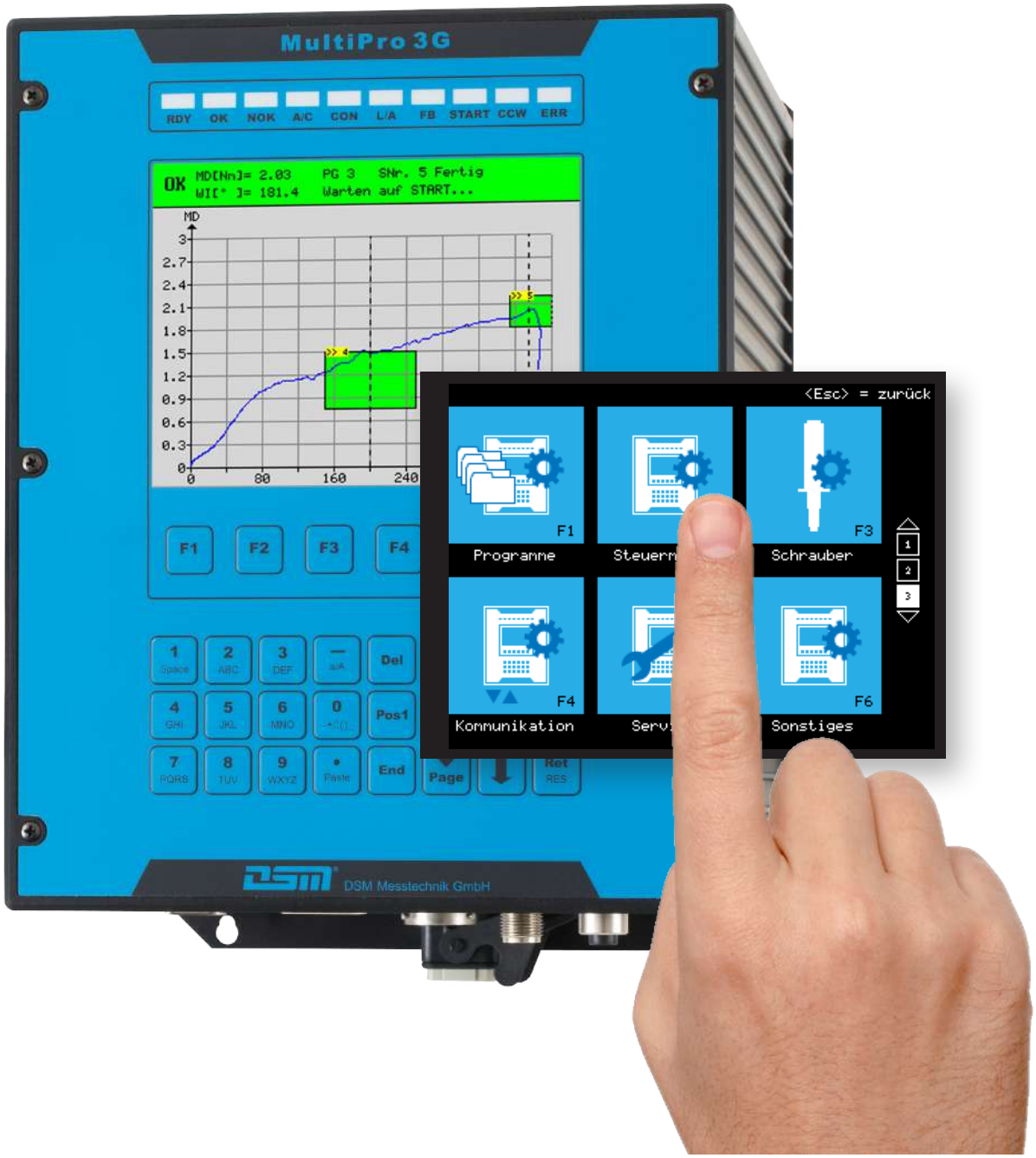
Automation

DSM is a competent partner for manual workplaces, for fully automatic assembly stations, for test / diagnostic stations as well as for robot applications.
With our experience we are on hand to provide you with support and advice.
Whether it is as component supplier or system supplier – DSM is your reliable partner.

MultiPro 3G

The combination of intuitive user-friendliness and a modular hardware and software concept created a basis that meets the current and future requirements in assembly 4.0.
Flexible in application, because the activated firmware defines the use of the MultiPro 3G as a tightening or press-in system.
Furthermore, the MultiPro 3G technology with the scalable functional area enables the individual configuration of the performance. All additional functions and procedures are integrated in the firmware and can be activated via a licence if needed. Your benefit, everything can be unlocked for testing.

DSM implements special modifications in a customer oriented and professional manner – a new generated function can be quickly integrated into the control system.



Product link

MultiPro 3G with digital measurement signal processing and a concept of standardised hardware and software components.

Firmware for tightening and press-in

The perfect choice for hand-held, semi-automatic and (fully) automatic tightening processes in combination with the nutrunners of the DS series.

But also for simple and high-precision pressing, joining and forming tasks in use with our press-in units of the SMP, QMP and XMP series in manual workstations as well as in automatic stations.

Modular design

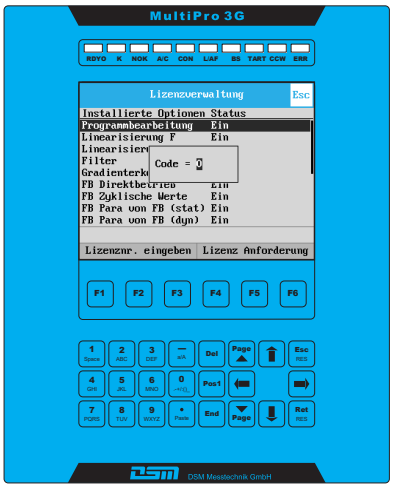
The compact control system consists of the MultiPro 3G control module and the basic module (servo controller) and therefore requires little space and no control cabinet.

Slots for expanding the MultiPro 3G with communication and performance modules complement the flexibility.

Scalable firmware architecture with extension levels and function extensions, according to your requirements.

Flexibel in price and performance.

Control module



HA

Hardware extension

TCP module, Fieldbus modules, Measuring module, DIP PC module, WLAN module, BT module

Basic module

The basic module supplies the MultiPro 3G control module and the connected DSM tool (nutrunner / press-in unit) – different types are available depending on the power requirements.
The unit with the STO (Safe Torque Off) safety function is ready for integration into a customer's protection concept.

Activated firmware

- ✓ **TIGHTEN** (including standard tightening procedures and functions)
- ○ **PRESS-IN** (including standard press-in procedures and functions)

Extension level, specifies the performance of the MultiPro 3G

S ○	M ✓	L ○
Extension level Small	Extension level Medium	Extension level Large
Programming only on PC	Programming only on PC	Programming on device / on PC
16 startable programs	64 startable programs	128 startable programs
Meas. data storage 50 data sets	Meas. data storage 500 data sets	Meas. data storage 1000 data sets
5000 measuring points per graphic	10000 measuring points per graphic	20000 measuring points per graphic

Tool licence(s)

Sensor controlled MDW ✓	Sensor controlled FL ○	Current controlled SA ○

Function extensions (Licences)

FU — Firmware function extensions as single licence or in a bundle

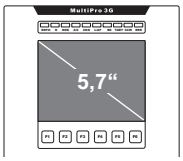
e.g. result selection, head contact (TIGHTEN), external sensors, move to gradient (PRESS-IN), gradient detection, linearisation, envelope monitoring ...

Scalable firmware architecture with licence management

The scalable MultiPro 3G is suitable for use in non-critical assembly as well as for safety and quality critical processes.

Control module **MultiPro 3G hardware unit** (MS-1003250)

Display



5,7“ touch colour display (14,48 cm diagonal)
Resolution 320 x 240 Pixel, TFT 262k colours, touch screen, measured value display, statistic display, graphic display with full screen mode and zoom function, user interface with intuitive icons

Status LED

12 LEDs
Ready, OK, NOK, Memory A / C, Connection, Network, Fieldbus, Start, Left / Right rotation, Error

Keyboard

6 function keys for configuration and programming directly on the device
15 keys (alphanumeric), 8 navigation keys

Internal memory

2 GB + 4 MB RAM
Measured data storage, graphics storage, error storage, statistics storage for each stage

External memory

Option USB memory stick 2 GB Industrial Grade with SLC technology
Saving measured value and graphic data, screenshots, parameters (backup); firmware update

Programming

255 programme positions:
1 - 128 = startable programs, 129 - 255 = subroutines (for recurring process sequences)
PG 1-16 (extension level S), PG 1-64 (extension level M), PG 1-128 (extension level L)

Max. 200 lines (instructions) per program / max. 3000 total programme lines

Up to 60 instructions are available for sequence programming

A selected procedure forms a tightening or a press-in stage
Up to 99 stages per programme can be used to implement the assembly process

Extension level S, M: Configuration on device, programme editing only by the MPEC
Extension level L: Configuration and programme editing directly on the unit or via MPEC
MPEC programming, parameterisation and analysis software (free download of the freeware version)

Dimensions and weight

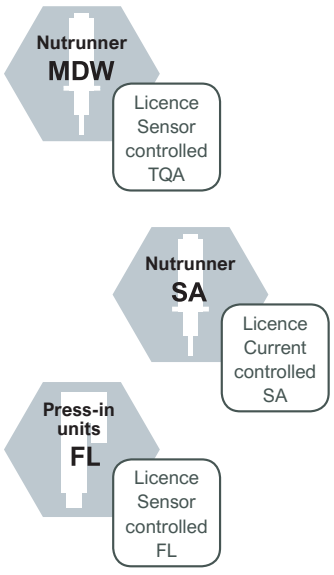
Width:
201 mm

Height:
246 mm

Depth:
128 mm / 231 mm
(depending on type)

Weight: 1,5 kg
(max. 15 kg with basic modul)

Useable with ...



TIGHTEN

Firmware 1300 TIGHTEN (free download from the DSM Cloud)
> For using the MultiPro 3G as a tightening control system

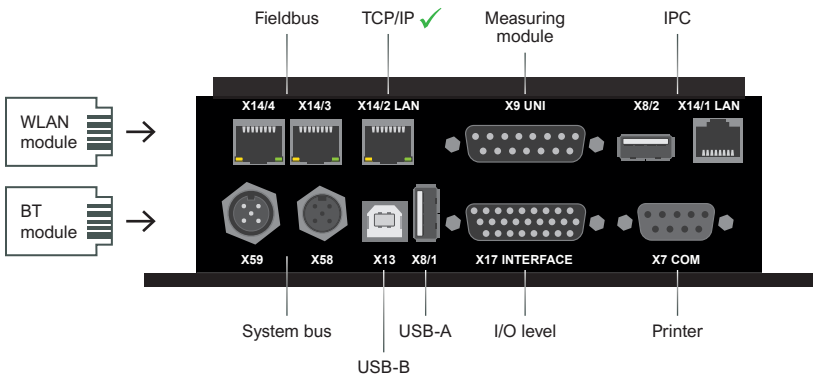
Input / Output	MDW: Torque values in Newton meter [Nm], SA: Torque values in percent of the nominal value [%]
Torque unit adjustable	Nm / dNm / cNm / Nmm / lbf ft / lbf in / ozf ft / ozf in
Measuring signal processing	Torque measurement with digital torque transducer, Torque accuracy 0,5%, Torque tolerance better than 5% acc. to ISO 5393, Classification of torque measurement acc. to VDI/VDE 2862:1
	Angle of rotation measurement with digital absolute angle encoder, Angle of rotation resolution 0,1°
	Angle of rotation measurement via motor sensors, Angle of rotation resolution depending on type of nutrunner
Tightening procedures (standard)	Turn in: Torque / Angle of rotation / Initiator, Turn out: Torque / Angle of rotation
Additional procedures / functions	Turn in: Yield strength / Head contact / on external sensor, Turn out: Turn out until thread entry is detected
	Linearisation moment, angle / Filter (low pass, smoothing, head contact) / Gradient detection / Result selection / Hold torque, hold position / Parameterisation via fieldbus / Envelope monitoring / Fracture detection / ...

PRESS-IN

Firmware 3300 PRESS-IN (free download from the DSM Cloud)
> For using the MultiPro 3G as a press-in control system

Input / Output	Force values in Newton [N] / kilonewton [kN]
Force unit adjustable	in preparation
Measuring signal processing	Force measurement with digital load cell, SMP series: Accuracy 1%, QMP series: Accuracy 0,5 % XMP series: Accuracy KU 0,5% / KO 1%
	Force measurement based on VDI/VDE 2862,
	Stroke measurement with digital absolute angle encoder, Stroke resolution 0,01 mm
Press-in procedures (standard)	Move to starting position / Move empty / Move to force / Move to length / Move to initiator
Additional procedures / functions	Move to external length / Move to gradient
	Linearisation force, length / Filter (low pass, smoothing) / Gradient detection / Result selection / Hold force, hold position / Parameterisation via fieldbus / Envelope monitoring / Review window / ...

Connections



System bus	System bus devices, Networking
Fieldbus	Profinet, EtherCAT, Profibus, further via external gateway devices
TCP/IP | USB-B	MPEC software
USB-A	Memory stick
I/O level	8 Inputs / 8 Outputs extendable to 128 I/O

Technical data – Basic modules

Flexible in application – the modular system concept not only allows to change the control module, or example when upgrading to the MultiPro 3G, but also allows the base module to be replaced when process conditions change.

In addition to supplying power to the control module and tool, the base module regulates and monitors the drive and controls the voltage and status of the hall sensor as well as the temperature, current and voltage of the servomotor.

The basic module is divided into different types due to the different performance requirements and is assigned to the DSM tools in a fixed manner.

Basic module	**with STO** (Safe Torque Off)	**designed for hand-held nutrunner / built-in nutrunner**
BM-S-1 (ML-2000210) 230 VAC	**BM-S-1-STO** (ML-2001210) 230 VAC	DSH 26 /005; DS 26/005
BM-S-2 (ML-2000220) 230 VAC	**BM-S-2-STO** (ML-2001220) 230 VAC	DSH 26 /01/02/04; DS 26 /01/02/04
BM-S-5 (ML-2000250) 230 VAC	**-**	DSH 16 /0025/005
BM-L-1 (ML-2000310) 230 VAC	**BM-L-1-STO** (ML-2001310) 230 VAC	DS 34 /025/05
BM-L-3 (ML-2000330) 230 VAC	**BM-L-3-STO** (ML-2001330) 230 VAC	DS 44 /025/05/10/20
BM-L-4 (ML-2000340) 230 VAC	**BM-L-4-STO** (ML-2001340) 230 VAC	DSH 34 /05/10/20; DS 34 /10/15; DSH 38 /05/10/15; DSH 44 /20/30/40/60
BM-L-5 (ML-2000350) 230 VAC	**BM-L-5-STO** (ML-2001350) 230 VAC	DS 44 /35
BM-H-4 (ML-2000840) 230 VAC	**BM-H-4-STO** (ML-2001840) 230 VAC	DS 57 /25/50/70/90/140
BM-V-4 (ML-2000940) 400 VAC	**BM-V-4-STO** (ML-2001940) 400 VAC	DS 80 /220/300/420/500/600; DS 80-130 /900/1000/1500/2000/2400

Basic module with STO (Safe Torque Off)	**designed for press-in unit**
BM-L-3-STO (ML-2001330) 230 VAC	SMP 300 /005/01/02
BM-H-2-STO (ML-2100820) 230 VAC	SMP 400 /05/10
BM-H-5-STO (ML-2100850) 230 VAC	XMP 90 /05/12,5/25; QMP 80 /025/05/10/20/25
BM-V-5-STO (ML-2100950) 400 VAC	QMP 100 /30/40/50/60; QMP 140 /70/100/120; SMP 500 /20/30/50/70
BM-V-7-STO (ML-2100960) 400 VAC	XMP 120 /50/75; XMP 300 /250/500

WLAN connection
(WLAN module)

PC applications

Bluetooth® connection
(BT module)

PC applications*

Remote indication*

Barcode scanner*

* Bluetooth®-enabled device, pair component with BT module

OPC UA
(IPC / Gateway module)

USB

Memory stick

I/O Extension

Socket box ToolControl

Position monitoring (Handling systems)

System bus
(info on p. 82)

Control of external DC motor

Status display, start button, Program pre-selection

Networking of control systems MultiPro 3G

External sensors via QS Box

USB / LAN (TCP module)

Setup and analysis software MPEC

RS232

Printer, PC (ASCII)

Fieldbus (Fieldbus module)

PLC

(Measuring module)

External sensors

DSM tool (nutrunner or press-in unit)

Interface I/O (24 V)

Program start, status outputs, inputs / outputs

or

Interface I/O Expander

4 Ports
Start signal, external release, return stop, holding brake

or

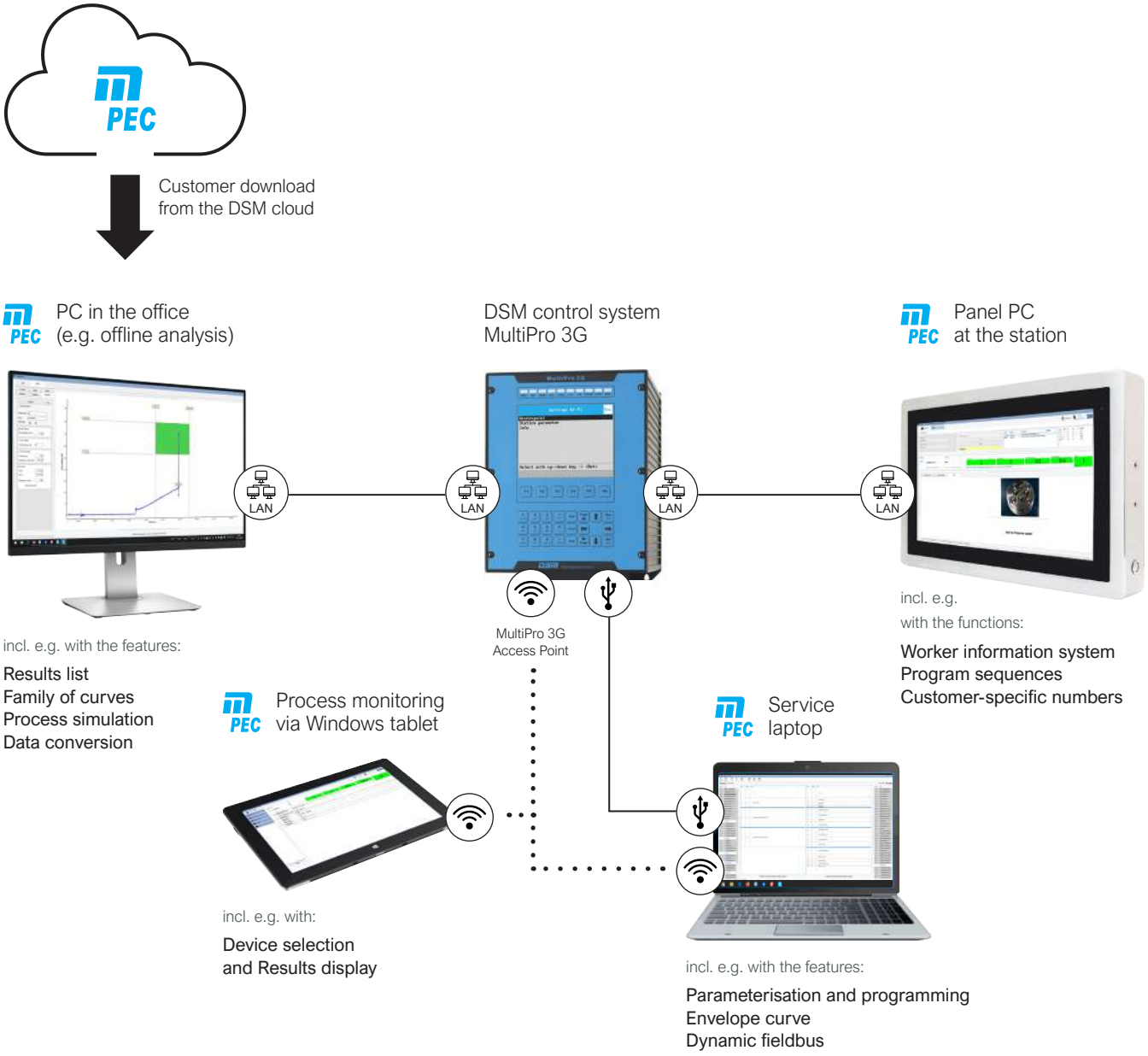
Interface I/O Expander

8 Ports
8 Inputs and 8 outputs

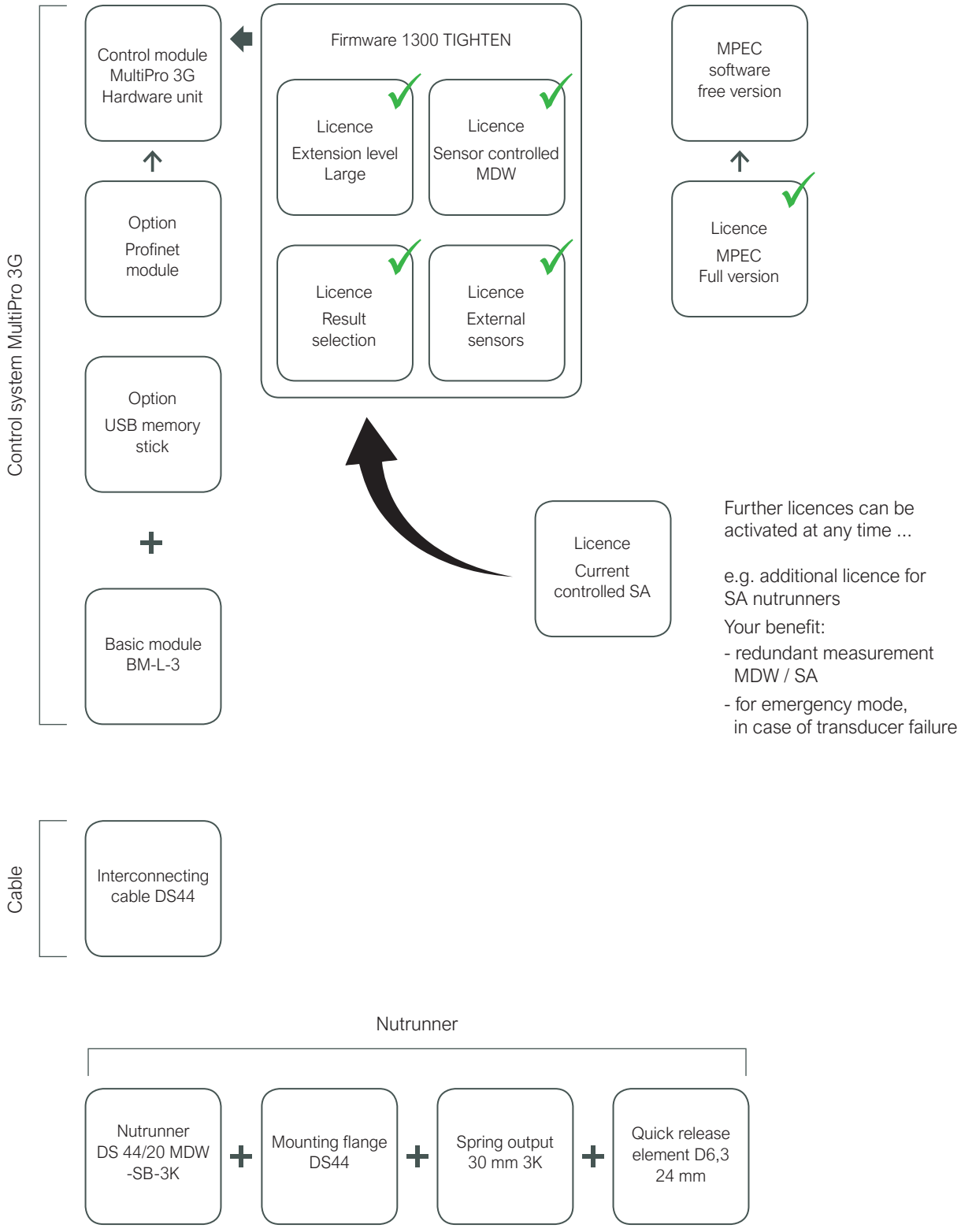
Protective device

DSM software application MPEC

MPEC offers a multifunctional platform for administration and monitoring of all your MultiPro 3G control systems.
To always keep an eye on every assembly process – whether measuring results or graphics, tightening tasks or press-in processes, measured values from external sensors.
Side menu bar and pop-up windows allow a quick parameter input, the creation of sequence programs, the execution of analysis functions and the simulation of processes.
Powerful diagnostics with powerful function tools – such as the generation of a curve chart from recorded measured values – for process optimisation and for the identification of trends and the Predictive Maintenance.



The MPEC freeware version is part of the MultiPro 3G control system and enables parameterisation, programming, data recording as well as analysis and process optimisation.
Professional versions and function extensions are optionally available – matched to the assembly process and to the requirements of the MPEC User Interface.


Control system MultiPro 3G
Control module MultiPro 3G Hardware unit
Option Profinet module
Option USB memory stick
+
Basic module BM-L-3
Firmware 1300 TIGHTEN
Licence Extension level Large
Licence Sensor controlled MDW
Licence Result selection
Licence External sensors
MPEC software free version
Licence MPEC Full version
Licence Current controlled SA
Further licences can be activated at any time ...
e.g. additional licence for SA nutrunners
Your benefit:
- redundant measurement MDW / SA
- for emergency mode, in case of transducer failure
Cable
Interconnecting cable DS44
Nutrunner
Nutrunner DS 44/20 MDW -SB-3K
+
Mounting flange DS44
+
Spring output 30 mm 3K
+
Quick release element D6,3 24 mm

Reliable hand-held tightening technique with the highest quality

DSM offers a variety of high-performance tightening tools for virtually every field of application.
Digital hand-held tightening technique, reliable function and excellent quality, first-class ergonomics as well as an enormous range of versions stand for handheld and pistol nutrunners from DSM.

High-precision torque transducers and angle of rotation encoders – in combination with the MultiPro 3G – ensure assembly accuracy and complete documentation of the production data.

Thanks to the variability of our tightening procedures, the DSH nutrunners provide you with a high-performance system for error-free tightening in safety and quality-critical assembly.

0,05 Nm up to 60 Nm
Torque

Hand-held nutrunners

DSH 16
0,25 / 0,5 Nm

DSH 26
0,5 / 1 / 2 / 4 Nm

DSH 34
5 / 10 Nm

DSH 34-WA
5 / 10 / 20 Nm

DS 34-P
2,5 / 5 / 10 / 15 Nm

DSH 38
5 / 10 / 15 Nm

DSH 44
20 / 30 Nm

DSH 44-WA
40 / 60 Nm

DS 44-P
2,5 / 5 / 10 / 20 / 35 Nm

Components of DS hand-held nut-runners

Maintenance-free brushless servo motor

Robust housing out of stainless steel and aluminium

Ergonomic handle

Wear-free operating elements

Various output variants

And much more ...

Crow foots as well as individual technical solutions, suspension elements, balancer, socket boxes, handling equipment

The illuminated field on the nutrunner indicates the status of the tightening process.

OK

RUN

NOK

The nutrunner has an independent decentralised intelligence for an error-free setup.

Programmable function switch / Switching ring

Advantages of DS hand-held nutrunners

Insensitive against electro-magnetic radiation due to digital data transfer

Change-over between programs via function switch (different processes)

Illuminated field for indication of the tightening status

Simple programmable at the control unit or via PC

MDW or SA – with or without torque transducer

MDW nutrunners have a digital torque transducer. With this, the upcoming torque can be collected very precise. By SA nutrunners, the torque and the angle of rotation are collected via the motor. The accuracy-deviation depands on the adjustment.

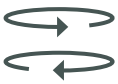
Impressive installation solutions from DSM

Great products are the result of flawless processes.
In the case of industrial manufacturing, perfect production is paramount. Screw connections in particular should not cause product deficiencies. Digital tightening technique from DSM is a solid choice for high quality.

All DSM products are characterised by their perfect integration into new or existing production lines. High-precision torque transducers and absolute angle encoders – in combination with the MultiPro 3G – ensure assembly accuracy and complete documentation of the production data.

Thanks to the variability of our tightening procedures, the DS nutrunners provide you with a high-performance system for error-free tightening in safety and quality-critical assembly.

0,05 Nm up to 2400 Nm
Torque



Built-in nutrunners

DS 26
0,5 / 1 / 2 / 4 Nm

DS 34
2,5 / 5 / 10 / 15 Nm

DS 44
2,5 / 5 / 10 / 20 / 35 Nm

DS 57
50 / 70 / 90 / 140 Nm

DS 80
220 / 300 / 420 / 500 / 600 Nm

DS 80-130
900 / 1000 / 1500 / 2000 / 2400 Nm

Produkt-Link

Komponenten von DS-Schraubern

Wartungsfreier, bürstenloser Servomotor

Robustes Gehäuse aus Edelstahl und Aluminium

Diverse An- und Abtriebsvarianten

Advantages of DS nutrunners

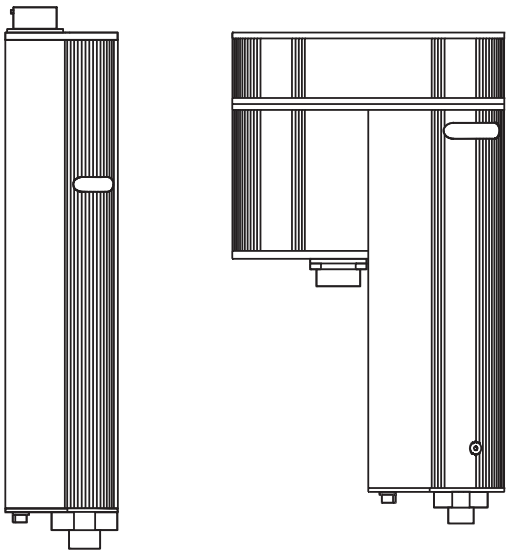
Insensitive against electro-magnetic radiation due to digital data transfer

Absolut measuring system enables positioning (MDW)

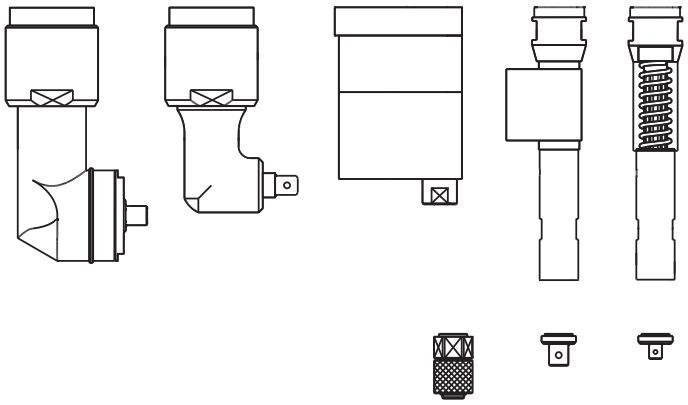
Illuminated field for indication of the tightening status

Simple programmable at the control unit or via PC

Motor modules



Output modules



The illuminated field on the nutrunner indicates the status of the tightening process.

OK

RUN

NOK

The nutrunner has an independent decentralised intelligence for an error-free setup..

Connection possibility for start function

And much more . . .

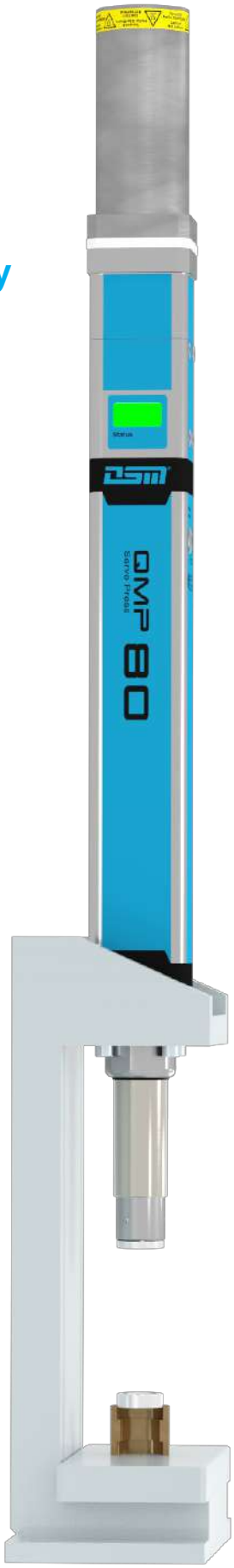
Crow foots as well as individual technical solutions, socket boxes, handling systems, complete workstations.

MDW or SA – with or without torque transducer

MDW nutrunners have a digital torque transducer. With this, the upcoming torque can be collected very precise.
By SA nutrunners, the torque and the angle of rotation are collected via the motor.
The accuracy-deviation depands on the adjustment.

Fields of application of DSM press-in technology

Precision press-in
Press-in to end stop
Clinch
Bending
Embossing / Forming
Testing / Measuring
Caulking
Clipping
Test switch / snap-in point
Calibration
...



The correct press-in unit for press-in, joining and forming operations

In the field of electromechanical press-in units, DSM covers a range from 20 N to 120 000 N.

With the SMP, QMP and XMP series, a variety of high-performance press-in units is available for almost any application.
Compressive forces, tensile forces, high speeds, slow movements, different stroke variants, electromechanical brake, backstop as well as redundant force measurement are just some of the reasons why DSM press-in technique is so versatile.

High-precision force transducers and an absolute displacement measuring system – in combination with the MultiPro 3G – gensure assembly accuracy and complete documentation of the production data.

Thanks to the variability of our press-in processes, the DSM press-in units provide you with a high-performance system for use in quality-critical assembly.

0,02 up to 120 kN
Force

Press-in units QMP series

Press-in units of the QMP series are designed for press and pull forces and have a very slim design in a square stainless steel housing.
The digital load cell, which is protected against overload, is located directly in the plunger.

The stroke is measured via an absolute stroke measuring system. LED status displays on the press-in unit show the operating status and the processing result.

QMP 80
2,5 / 5 / 10 / 20 kN
200 / 300 / 500 mm Hub
200 mm/s

QMP 100
30 / 40 / 50 / 60 kN
200 / 300 / 500 mm Hub
200 mm/s

QMP 140
70 / 100 / 120 kN
200 / 300 / 500 mm Hub
100 mm/s

Press-in units SMP series

Press-in units of the SMP series are only designed for press forces and have a very robust and low-maintenance construction.
The simple construction convinced in the rough industrial environment.

The load cell is located in the direct vicinity of the plunger. The stroke is measured via an absolute stroke measuring system.
No optional accessories are available for the SMP series.

SMP 300
0,5 kN
100 / 200 / 400 mm Hub
350 mm/s

SMP 300
1 / 2 kN
100 / 200 / 400 mm Hub
350 mm/s

SMP 400
5 / 10 kN
100 / 200 / 400 mm Hub
200 mm/s

SMP 500
20 / 30 / 50 / 70 kN
100 / 200 / 400 mm Hub
150 mm/s

Press-in units XMP series

XMP, the electromechanical press-in unit with the „X“ – the crossover of experience and innovation combines the best of the QMP and SMP series with future-oriented press-in technology.

A press-in unit with huge modularity:
Execution load cell, press force, press and pull force, redundant force measurement, gear variants ...

Available from 06 / 2022

XMP 60
0,5 / 1 / 2 kN

XMP 90
5 / 12,5 / 25 kN
200 / 400 mm Hub
800 / 400 / 200 mm/s

New

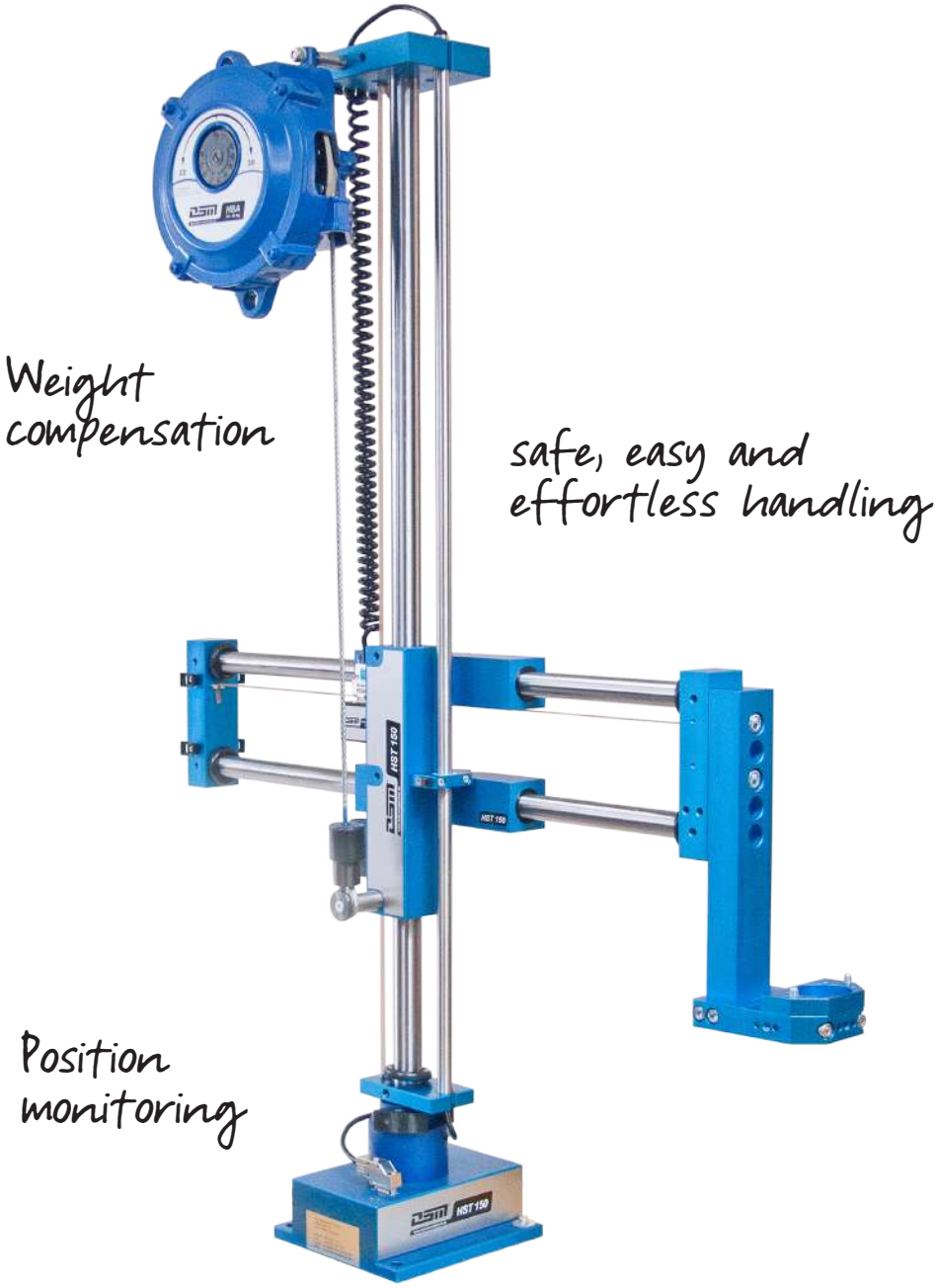
Available from 01 / 2022

XMP 120
50 / 75 kN

Available from 10 / 2022

XMP 300
250 / 500 kN

Simply working better – handling systems from DSM



Daily recurring operations makes the tool with time heavier and heavier for the user – if you also considers the reaction torque and incorrect holding of the tool, a disorder of the hand-arm-shoulder system cannot be excluded.
Preserve the health of your employees!

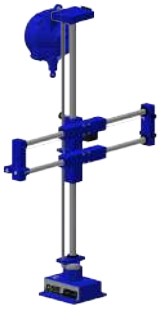
A torque support with weight compensation is essential for fatigue-free work in assembly. The additional control of the position of the tool enables cost-effective monitoring of complex tightening sequences in the manual assembly.

With the HST series and the HSA series, DSM offers advanced handling devices for the tasks and applications of manually guided and semi-automated assembly.

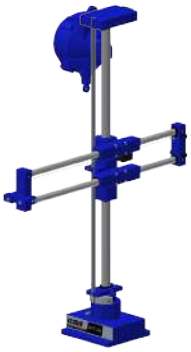
Equipped with absolute sensor technology and integrated position controller, the HST handling stand and the HSA handling swivel arm extend the functionality of your tightening system.
The position electronics in conjunction with a higher-level control system check whether a defined sequence of operations is maintained.
No screw will be forgotten and even complex tightening sequences can be specified and monitored – or call up the corresponding sequence in your DSM control system via the screw position.

Handling stand HST

HST-40 | HST-40-XY
Up to 40 Nm
Tool weight max. 5 kg
Stroke Y: 300 mm Z: 400 mm



HST-150 | HST-150-XY
Up to 150 Nm
Tool weight max. 15 kg
Stroke Y: 450 mm Z: 720 mm



HST-300 | HST-300-XY
Up to 300 Nm
Tool weight max. 30 kg
Stroke Y: 600 mm Z: 850 mm

HST-600 | HST-600-XY
Up to 600 Nm
Tool weight max. 40 kg
Stroke Y: 550 mm Z: 750 mm

Handling swivel arm HSA

HSA-40 | HSA-40-XY
Up to 40 Nm
Tool weight max. 5 kg
Working radius max. 883,5 mm

HSA-150 | HSA-150-XY
Up to 150 Nm
Tool weight max. 15 kg
Working radius max. 1151 mm

HSA-300 | HSA-300-XY
Up to 300 Nm
Tool weight max. 25 kg
Working radius max. 1500 mm

Your benefit – a robot tightening system for several assembly tasks with different screw geometries

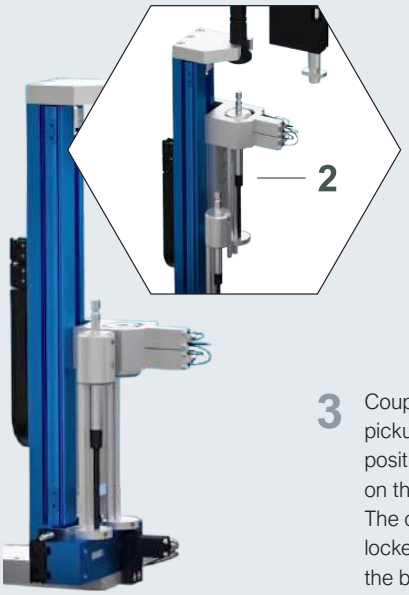
DSM tightening technology in connection with the applications **tightening unit SEL** and **bit changing machine BWA** for robot-controlled process automation.

The tightening unit SEL has a modular design – it consists of the basic module with nutrunner which is adapted to the robot and the coupling module with vacuum mouthpiece. The coupling modules, designed for different screw geometries, can be exchanged without tools and are coupled to the base module and locked pneumatically.

Additionally integrate the BWA bit changer into your line layout and increase the flexibility of the assembly and the possible variants in your station.

The BWA is equipped with a vertical and a horizontal lifting unit and enables the automatic change of the screwdriver bit.
The bit holder modules can be adapted to different bit geometries and are permanently assigned to a tool position.

2 The robot moves the tightening unit to the bit changing machine and places it in the stand-by position.
Robot moves up and disconnects the bit which is then picked up by the bit holder.
The lifting unit moves down and places the bit holder at the assigned tool position.
The horizontal lifting unit moves to the bit suitable for the screw connection; the vertical lifting unit moves downwards and picks up the bit holder moves upwards and the robot couples the bit into the quick-change unit.



3 Coupling modules are in pickup position. The robot positions the basic module on the suitable mouthpiece. The coupling module is locked and connected to the basic module.

4 The vacuum mouthpiece picks up the screw with negative pressure and is placed at the screwdriving point by the robot – the tightening process starts.
The screw is screwed in a few turns, the mouthpiece is lifted from the screw head and the screw is screwed in until the final tightening – this prevents torque distortion due to frictional torque.

1 The robot arm moves to the tool change position and disconnects the coupling module.

Detects when a tool is removed

When a tool is removed, ToolControl automatically calls up the correct sequence program on the linked control system. After appropriate activation, ToolControl shows the operator the tool that is required for the current assembly process.

The DSM control system automatically identifies the connected ToolControl systems; in the case of external presetting, ToolControl communicates with the external control system / PLC via field bus.

- Processor monitored tool removal
- Status reports via LCD plain text display
- Status indication for each tool
- Cast aluminium housing with mounting brackets
- Customised tool inserts
- Cascatable up to 32 tools

TC2 | TC2-E

2 Tools

72 mm max. Ø

TC4 | TC4-E

4 Tools

40 mm max. Ø

TC8

8 Tools

25 mm max. Ø

ToolControl

TC2 TC4 TC8

Basic system

TC2-E TC4-E

Expansion system

Produkt-Link

Precise and exactly to the point: Reference measuring system QS Box

In addition to the control systems for tightening and press-in technique, DSM also offers a digital measuring system for the quality assurance of process operations.
The QS Box reference measuring device can be used for monitoring and checking as well as for adjusting or calibrating tightening and press-in systems.
This flexibility allows the use of plug-in modules for the most common measuring sensors.
The advantage of the modern digital measuring system is an interference-free signal transmission, direct status display in the immediate vicinity of the measuring point and an intelligent memory module. The stored sensor data are set automatically when connected to the QS Box.
With recurring calibrations, only the sensor is calibrated and not the entire measuring chain.

- Measuring equipment for monitoring and calibration
- Exchangeable plug-in modules for analogue and digital measuring signals
- Measurements possible in online and offline mode
- Measurement value recording and graphic monitoring
- Data storage directly on CF card or PC
- Test equipment monitoring with integrated measuring system

Plug-in modules

Digital

DSM Digital

The QS Box unfolds its complete potential with DSM-Digital:
Insensible signal transfer
Direct status report at the measuring sensor
Automatic recording of the sensor data's
Automatic adjustment of the measuring parameters

Further modules:

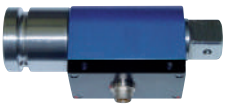
± 1 mV/V	**± 5** V
± 2 mV/V	**± 10** V
4-20 mA	**± 15** V

SCI module

We convert your analogue sensors. Equipped with a SCI module, every existing transducer can be connected to the digital-interface of the QS Box. This allows you to use all advantages of the digital system cost-effectively.

Measuring sensors

According to requirements, DSM delivers analogue and digital measuring sensors of any type: force load cell, length sensors, torque transducers and temperature sensors



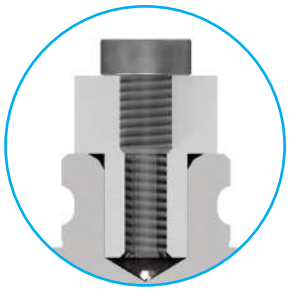
Produkt-Link

Tightening simulators of the TSM series – for the countermeasuring in the station

Compact tightening simulators for checking and adjusting of relevant torque and angle of rotation result values in the tightening process.

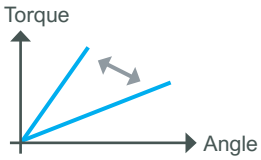
Suitable for your application – integrated torque sensor adjusted to the measuring range of the nutrunner, insert with drive feature of the screw as well as disk spring stack for the simulation of the tightening application.

Easy integration into the station by assembly threads for horizontal and vertical assembly.



Insert specified for the drive feature of the screw

The screw of the simulator is tighted against a disc spring stack by the rotation of the nutrunner.
Thereby the stacking of the disc springs determines the slope of the torque curve.
Hard and soft tightening applications can be simulated by the disc springs.



TSM series

4 sizes,
available in the variants:

max. 12 Nm,
max. 63 Nm,
max. 200 Nm,
max. 500 Nm

Compact design, adapted for the sensors of the LMW series

Disc spring stack, user-defined adjustable

Digital torque sensor traceable calibrated, exchangeable

Linear module LM26, LM34, LM44

DSM linear modules for tool-free assembly of measuring equipment[1] on a DS26, DS 34 / DS 44 nutrunner without long process interruptions.
In basic position the nutrunner is fixed by a locking device at the output. The nutrunner can be manually moved with the linear slide by pulling the locking bolt and can be fixed on two further snap-in points for the integration / assembly of the torque transducer. Precondition for this is a firm connection between linear module and output (e.g. spring output) as well as the direct mounting of the nutrunner at the linear slide.

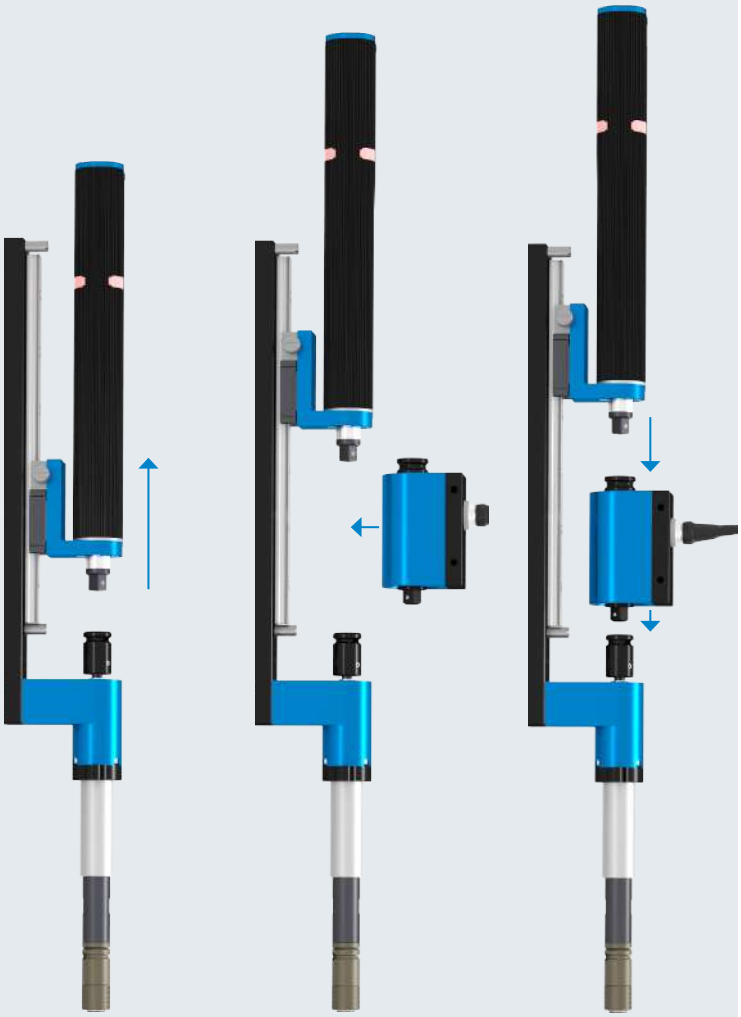
[1] rotating torque transducer

Normal operation

Standard use of the nutrunner in the assembly process.

Tool-free assembly of the torque transducer

Move the nutrunner manually with the linear slide and fix it at a snap-in point for the integration of the measuring sensor.
Assemble the torque transducer without tools.



Measuring mode

Measure during production and record the data with the QS Box.

Produkt-Link

Individual solutions tailor-made, typically DSM – Tightening and press-in stations

In addition to individual components for tightening and press-in technique, DSM also offers complete individual workstations and conversions to existing stations.
With our long-term experience in these fields, you can rely on a cost-effective, excellent overall solution, in which all components are ideally tailored to each other.

All dimensions can be individually tailored.
We equip your workstation with the desired DSM products and, if desired, also with components from other manufacturers.
Personal safety according to current standards is ensured, for example, by a light curtain, lockable automatic lifting doors or two-hand control elements.

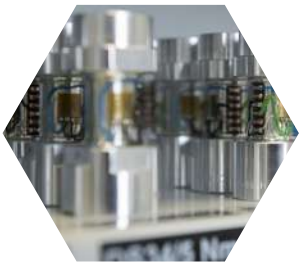
Special solutions

Individual technical solutions, as well as hardware and software, are our strengths.
Beyond our varied standard range, we produce special designs and completely new products for you.
In close cooperation with you, we develop tailored solutions for the tightening technique, press-in technique and quality assurance fields of application.

Play it safe right from the beginning with the expert service from DSM

Comprehensive after-sales service for our delivered components and systems is of course part of our overall solution package. This is not limited to original spare parts, wear parts supply, maintenance and repair as well as on-site operator training: Thanks to telephone support and remote maintenance, we can provide you with competent and fast support for fault diagnostics and changeover procedures.
We test your measurement systems and sensors in our calibration laboratory in Aalen monitored by the Deutschen Akkreditierungsstelle GmbH (DAkkS) or on-site with you.

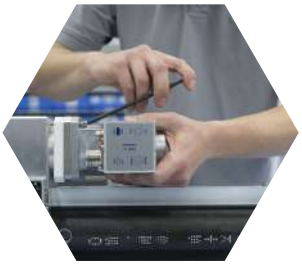
Calibration



Commissioning

Training

Spare parts and repair



Calibration. DSM operates a calibration laboratory accredited and monitored by the German Accreditation Body (DAkkS) according to DIN EN ISO/IEC 17025:2005. For many DSM customers, it is a real advantage which often saves time and money. At the site in Aalen, we calibrate measurement systems and sensors in our quality-monitored calibration laboratory. In addition to DSM products, we calibrate nutrunners and measuring sensors of other brands.

Commissioning and maintenance. DSM escorts you during the entire lifecycle of your products. Regardless of whether this is an initial commissioning, extension or conversion – we take care of the perfect integration of DSM products into your operations on site for you. Experienced DSM specialists support you when starting up your system, during the process specification and training of your employees. If the occasion arises, we will provide unbureaucratic help with restoring flawless operation in no time at all.

Training. Our training centre in Aalen provides state-of-the-art technology and a pleasant atmosphere. All DSM products are available to those attending the training there. We also provide devices of tightening and press-in technique as well as calibration for on-site training at your site. Our experts not only share how to correctly handle DSM products, they also share their long-term expertise in tightening and press-in processes. The detail of the training content is individually tailored to the requirements of those attending.

Spare parts and repair. As the user, the durability of products is a top priority – we guarantee the best production quality for you. Our products are developed with the highest of standards and with an industrial environment in mind. Regardless of whether continuous use or strong loads are involved: even the best DSM product can sometimes be damaged. In this case, contact our repair and spare parts service.

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