UFM Line5
UFM Line5s

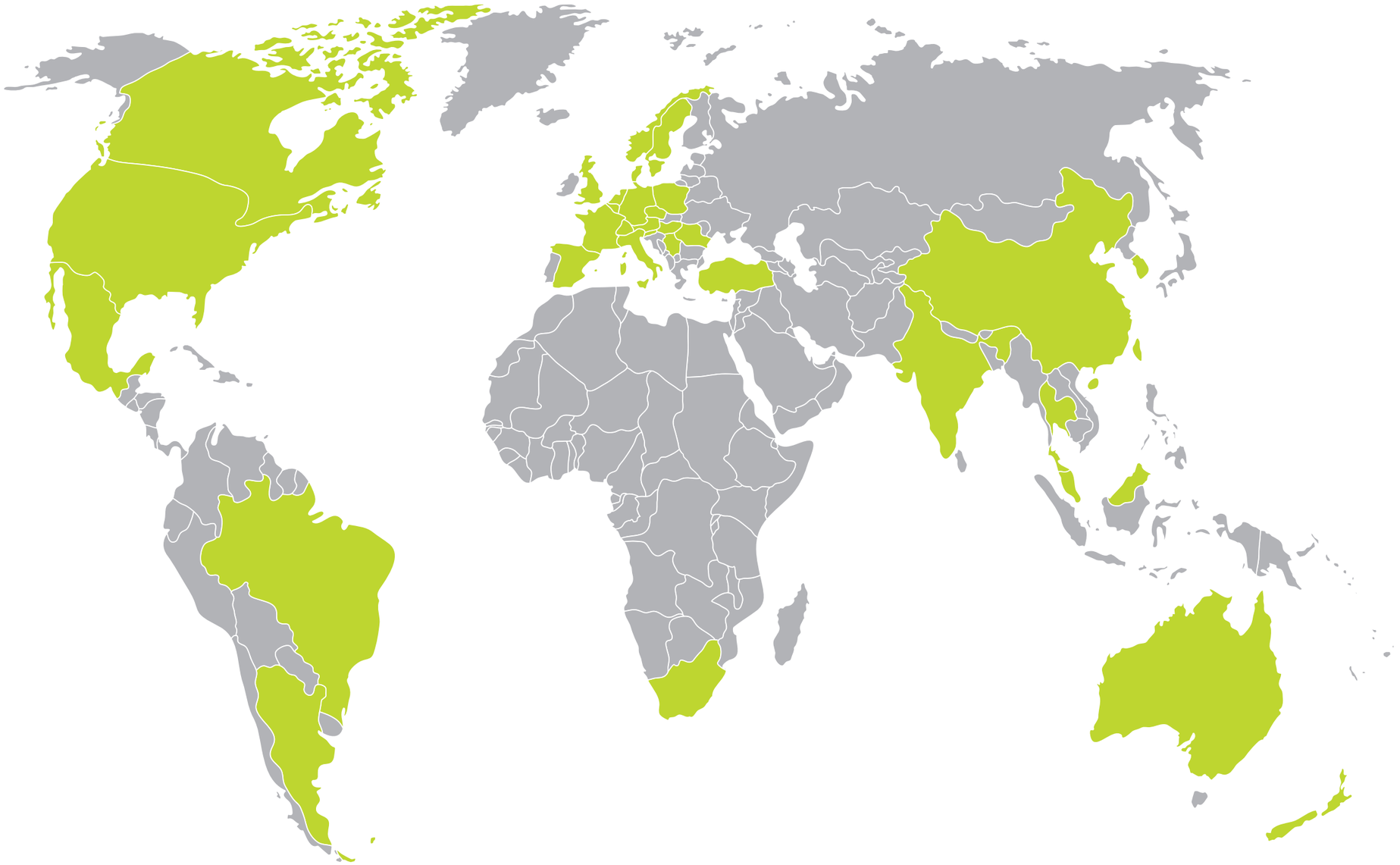
PROMESS assembly presses for assembly and joining applications with force-distance monitoring

For more efficiency.

PROMESS
ASSEMBLY + SENSOR TECHNOLOGY

Your partner in the field of assembly and testing technology

Gerhard Lechler founded the company PROMESS in 1977 as an engineering office in the field of technical measurement in Berlin. Initially, the company distributed handmade patented measuring bearings for tool condition monitoring before the electro-mechanical assembly press (UFM) with integrated NC control was born at the end of the 1980s. Right from the beginning it was the strength and the passion of Gerhard Lechler to develop technical solutions for his customers. And this has not changed until today. This passion has continued so that the core competence of PROMESS is still the development of complete technological systems for solving the individual and complex assembly and testing tasks and requirements of our customers. From process development to preliminary testing, from initial installation to daily production, PROMESS offers holistic expertise from a single source. Our specialist teams have comprehensive knowledge of our products and offer prompt and effective advice worldwide. Today PROMESS is one of the global leaders in the manufacturing of electro-mechanical assembly presses with the widest range of presses in this field. Currently, more than 15,000 presses are operating in heavy industrial applications. In almost 30 countries all over the world our sales and service partners are looking forward to your enquiries and questions.



Australia
Austria
Argentina
Belgium
Brazil
Canada
China
Czech Republic
Denmark
France
Germany
Great Britain
Hungary
India
Italy
Korea
New Zealand
Malaysia
Mexico
Netherlands
Norway
Poland
Romania
Serbia
Singapore
Slovakia
Slovenia
South Africa
Spain
Sweden
Switzerland
Thailand
Turkey
USA

UFM Line5 | UFM Line5s

The UFM Line5/UFM Line5s range includes standard press designs with an optimum price/performance ratio. They are well suited for assembly and joining applications with force-distance monitoring and can be integrated in automated assembly lines, test stations or manual workstations.

Advantages:

- Standard model includes absolute encoders that eliminate the need for referencing
- Only the power amp is required, no need for an additional external monitoring system
- Multi measurement with 24-bit resolution
- Multi range calibration for force input (optional for Line5)
- Sensor system can be easily extended using versatile PROMESS-BUS
- Field busses can be optionally expanded using plug-in modules
- Utilization of window and envelope technologies
- No PLC knowledge required
- Movement and monitoring as an integrated solution
- Slim internal micrometer
- Automatic grease unit optionally available (optional for Line5)
- Integrated program memory
- PLe for STO by default

Overview of Press Types

UFM Line5 Inline and Parallel

Force (kN)	Stroke (mm)	Vmax (mm/s)
200	750, 550, 350, 200 parallel	100
100		200
60		250
30		250
10	200	300

UFM Line5s Inline

Force (kN)	Stroke (mm)	Vmax (mm/s)
3	200	200
1	200	200

Mechanics

The Line5 universal joining module is robustly designed thus making it well suited for heavy duty cycles. The mechanical system consists of the following components:

AC servo motor with integrated absolute encoder, precision gearbox (from 30 kN on), integrated force transducer, robust housing, screw assembly, non-rotating press ram.

The units use an inline design, i.e., the shaft is driven by a motor spindle in line with the shaft. The excellent rotational characteristics of this system provide excellent dynamic response. However for compact installation spaces, we recommend joining the modules UFM Line 5 using an angled motor spindle. The integrated absolute encode ensures precise positioning and eliminates the need for referencing at the start of a cycle.

Design basis:

$F_{Nominal} = 2,5 \times C_{Dyn}$

This guarantees an extremely long life cycle (min. 12 million strokes on average for standard assembly processes)

1 **Servo motor with absolute encoder**

2 **Integrated strain-gauge force transducer**

3 **Housing**

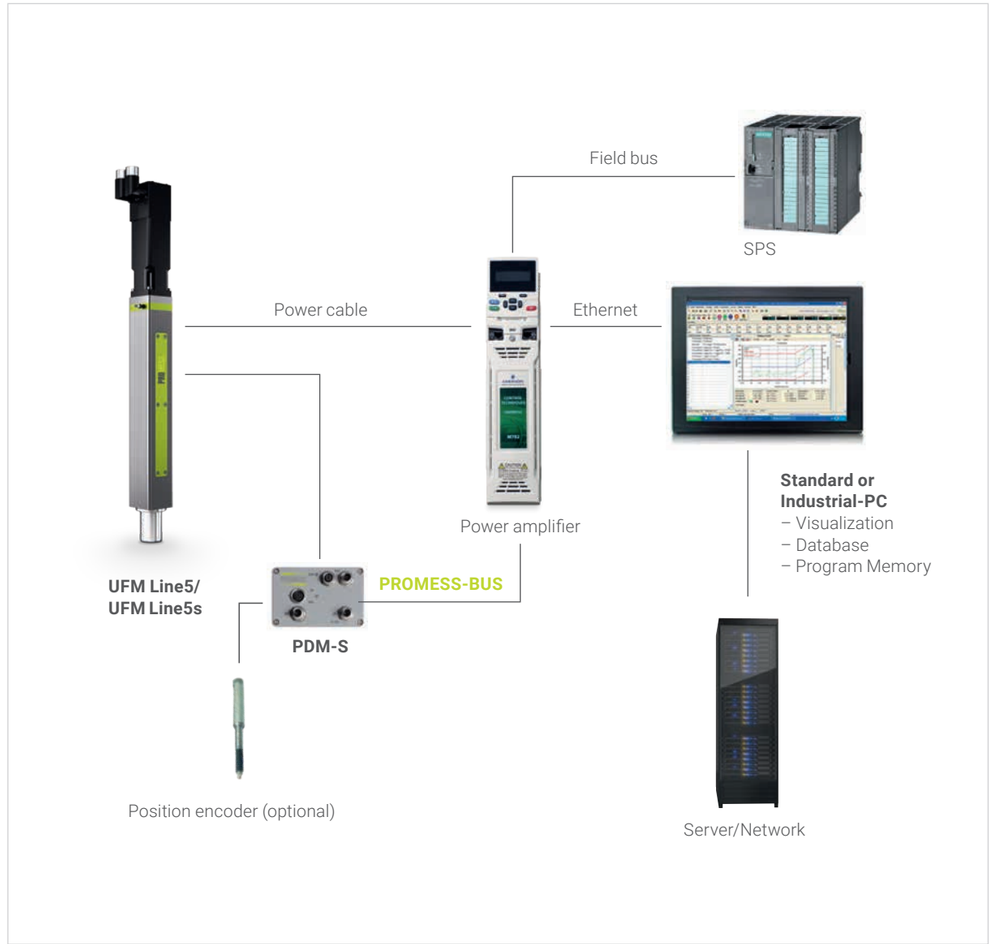
4 **Non-rotating press ram**

System Design

The mechanical system is controlled by a power amplifier with an integrated NC module. The internal RISC processor coordinates the joining module and can be easily programmed and operated using a conventional PC/display.

The controller coordinates the mechanical motion of the press as well as monitoring the force and distance. The force-distance characteristic can be monitored using envelopes and/or window methods.

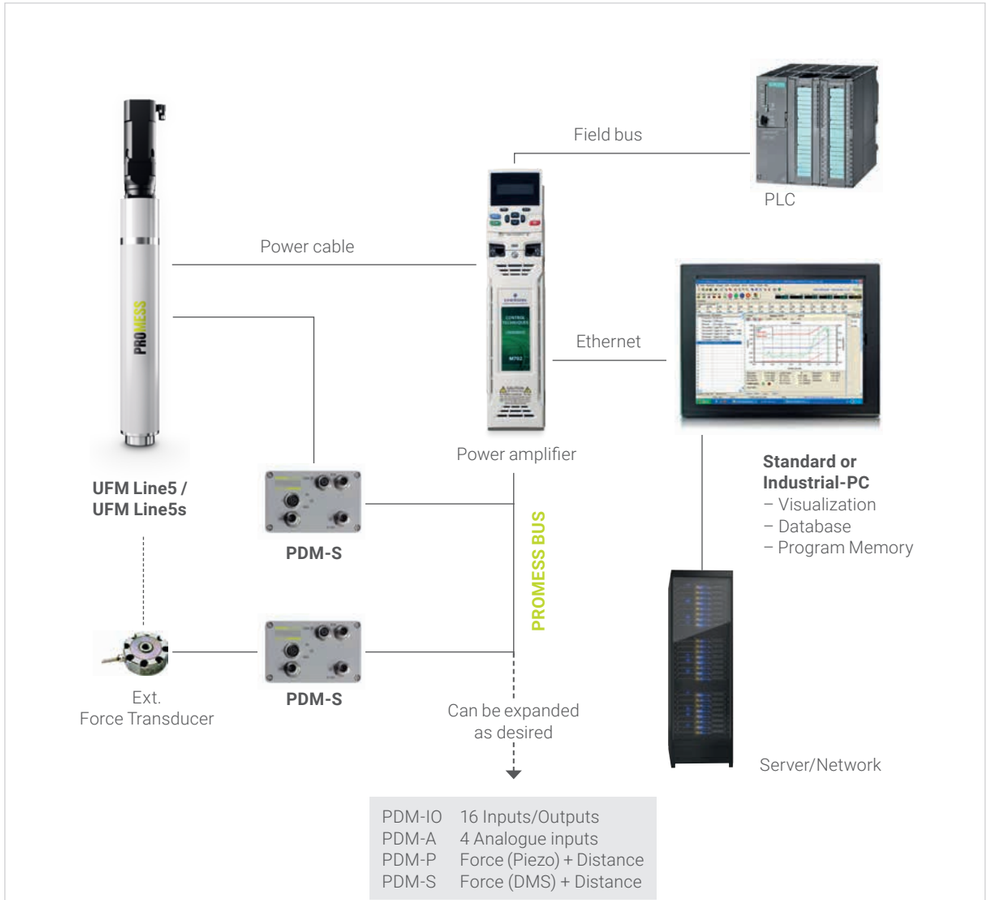
The data can be edited numerically and graphically so that each individual process can be easily monitored. The automatic learning function allows customers to eliminate the need for custom programming and simply learn the processing limits using a good part. Quality assurance data is stored using the database plugin and can be re-used at any time.



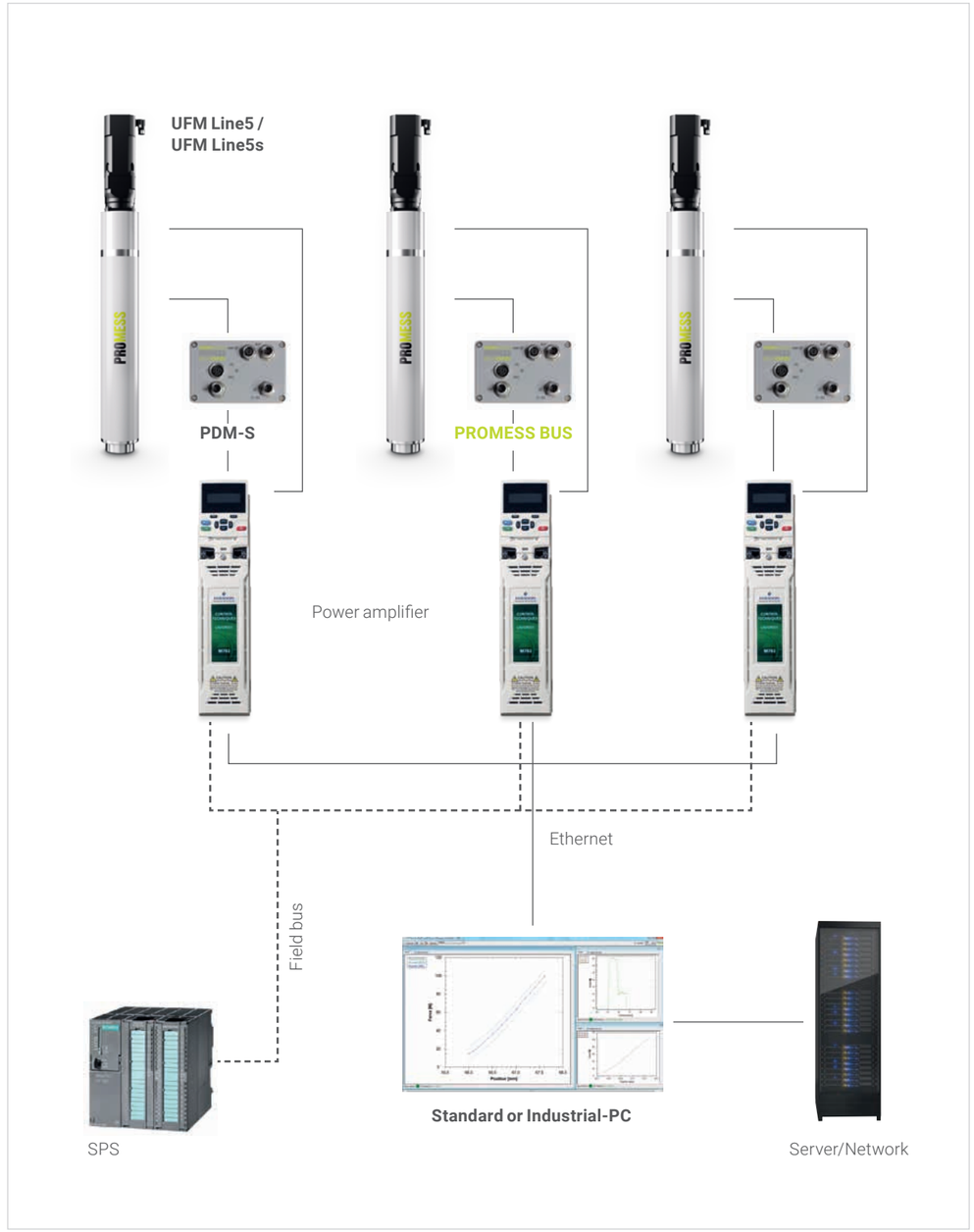
Basic version

The system utilizes a digital preamplifier, PROMESS digital module PDM-S. This transfers the force signal at a resolution of 24-bit almost trouble-free. When the characteristics are calibrated, the joining system achieves a system accuracy of 0.3 % from the final value. The characteristic calibration process is comparable to a multispan calibration for 10 spans. The characteristic map is created automatically using the UFMR Calibrate plugin. The results are stored in a calibration report and can be printed out.

The PROMESS Digital Module PDM-S contains an input for connecting a force transducer (strain gauge) as well as an encoder input for connecting digital sensors. The PDM-S is digitally connected to the UFM control via the PROMESS BUS.



Extension/Options



Line configuration

Software

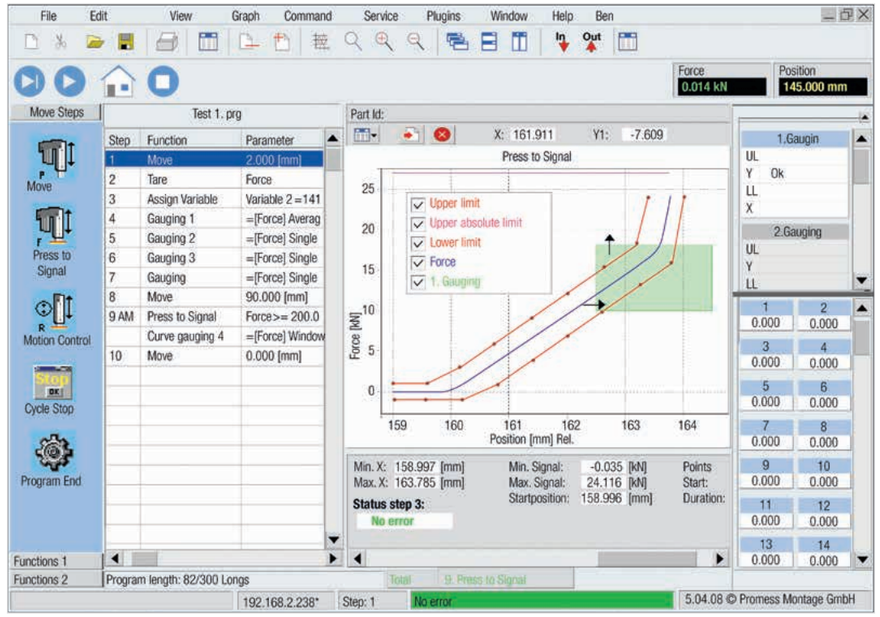
The servo presses UFM Line5/UFM Line5s come **with our programming software UFM V5.xx.** It allows the creation of the press program, of the recording and displaying of the quality data and of the storage of the process data. The software is intuitive to operate and does not require any PLC expertise. It can be used to create simple or advanced assembly processes.

The transparent and concise program surface allows users to quickly create programs.

The main window lists all programming steps together with their **functions**. The function screens can be opened successively to enter the process values. Thus the force, displacement, time, speed, acceleration and braking rate can be easily programmed for each step. Once the required input screens have been defined, the joining program is completed and the steps are processed automatically.

The **monitoring of the joining process** is achieved by window and/or envelope technology using force-distance sensors and the analysis and evaluation of the data by our UFM V5.xx software and the DB Viewer. A force-distance analysis of the joining process enables a 100% control of every part in real time. The data of the analysis is numerically and graphically editable so that the course of the process can be controlled individually. The customer can also pass on the individual programming by using the teach mode functionality. The limit curve will then be learned automatically by a good part. Data for quality control will be stored by the database plugin and can be used anytime.

The software features an **integrated User** Administration with different permission levels and logging for process safety. Changes to the program are documented by the log and are thus traceable. Each user profile can be exported and then imported to another station. Thus it is possible to integrate a user administration system and also to connect the system to a higher-level permission system using the .Net interface or fieldbus (e.g. Euchner EKS system).



Main window

Highlights for demanding applications:

- **Positioning on force slope:**
  Joining components until a definite slope (increasing force) or relatively once a knee-point has been detected.
- **Controller module:**
  This module allows you to easily solve processes by controlling the process variables and main taining constant signals, e.g., rolling processes with constant force controlling.
- **Measurement data system:**
  Measurement data can be captured relative to positions and force, but also relative to freely definable reference points (e.g., relative to achieving a specific threshold).
- **Strain compensation:**
  Not only customizable for separate systems but, also for specific processes and components.

ONLY WITH US

Triggertechnology by PROMESS

The triggers are „pulse points“ that can be set within the program steps **Move, Press to Signal and the controller module.** The trigger provokes an action as soon as the defined condition within the program step is fulfilled. The conditions are set by the user. He can set up to seven trigger points in one program step in order to react to processing events during movement. These reactions can include:

- Smooth speeds
- Set the outputs in real time
- Change target parameters during movement
- Correct process tolerances during movement

Modern Database Structure

All process data including the curves are stored in a database. All common database formats such as Oracle, MS SQL and Access are supported. A separate database is created for each station. Programs can be stored and reused at any time. Thus program changes are traceable and thereby the entire production.

The database can be analyzed using the DB Viewer with its extensive querying and filtering options. Graphs can be superimposed on each other for comparisons and analyses. Envelopes can be edited and reloaded into the press. The data can also be exported in Excel format at any time.

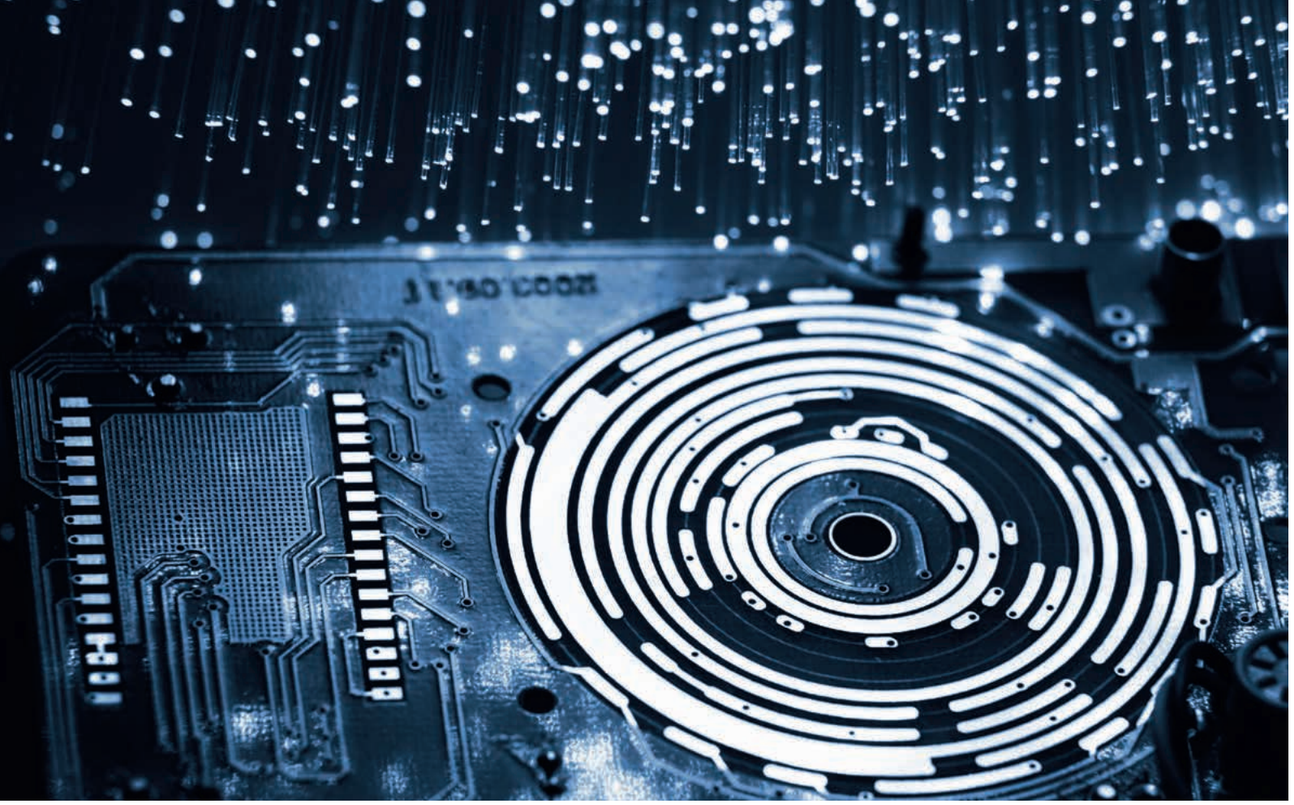
The standard models include the database software package and DB Viewer.

Software Highlights:

- Press to signal, press to force, press to an external signal (e.g., analogue or TTL signals)
- Force and speed can be programmed individually during the joining process
- Variables can be used to transmit setpoints, perform calculations using PLC and generate counters
- 100 % quality control using window and/or envelope methods
- 100 % process documentation using modern database structure
- 100 % process analysis using standardized interface to QS-STAT (optional), alternative to process data management software IPM (optional) – can be expanded using .net interface
- Trigger function for demanding applications
- High controller accuracy (minimization of overshoot in control processes)
- Display of two graphs in one diagram
- Quick printout of a graph report (screenshot)

Scope of Delivery for Components:

- Universal joining module Line5/Line5s
- Power amplifier incl. application module and UFM V5 firmware
- Brake resistance (except UFM Line5s)
- Digital preamplifier PDM-S
- Cable, field bus and more accessories on demand



Accessories / Options

PROMESS has developed extensive accessories for the UFM Line5/UFM Line5s range of presses that provide them with additional functionality. Drawing on our many years of expertise, we provide you with complete technologies for solving your own complex assembly and testing tasks.

Safety Box PSB

As an option to our assembly presses UFM Line5/ UFM Line5s we offer our PROMESS Safety Box PSB as an alternative to the integration in electrical cabinets. The device features all safety and power components for this purpose.

It can easily and quickly be connected by plug & play. All cables are pluggable. Due to the compact design, the PSB can be mounted next to the assembly press so that cable lengths can be reduced and wiring becomes unnecessary. By using the PSB your assembly press will be ready for production instantly.

Advantages

- No integration in electrical cabinets
- Reduction of cable lengths
- No wiring work
- No adaption of electrical diagrams
- Short connection time: plug & play
- PLe for STO by default
- Extention on SLS, SS1, SS2 possible
- IP Code 54
- Extremely compact design

PSB010G1

UFM Line5 UFM Line5s	1 kN	3 kN	10 kN	30 kN	60 kN	100 kN	200 kN
Item no.	PSB001G2	PSB003G2	PSB010G2	PSB030G2	PSB060G2	PSB100G2	PSB200G2
Connection voltage	3 AC 380 V - 480 V, +/- 10 %, 48-65 Hz						
Connected load at 400 V	8,7 kVA			10 kVA	18,3 kVA	19 kVA	
Protection class	IP 54						
Weight	17 kg			18 kg	28 kg		
Recommended protection	IEC 20 A Class gG				IEC 40 A Class gG		
Temperature range	0° C ... +40° C						
Power loss	368 W			493 W	654 W	756 W	
PC Interface	Ethernet						
Option PLC fieldbus interface	Profibus, Profinet, EtherCAT (add. on request)						

Safety Module PSD

The PSD safety module is delivered tested and ready to install. It contains the power electronics and safety controller for the joining unit. It offers the following safety functionality: STO in PLe in accordance with DIN ISO 13849-1; optional: SSx and SLS in PLd in accordance with DIN ISO 13849-1 (for UFM Line5 with safety brake).

The safety module simplifies and accelerates the installation procedure for the joining unit.

The PSD is suitable for our UFM Line5 units with and without brakes. As a prerequisite, it must be controlled using a field bus.

Advantages

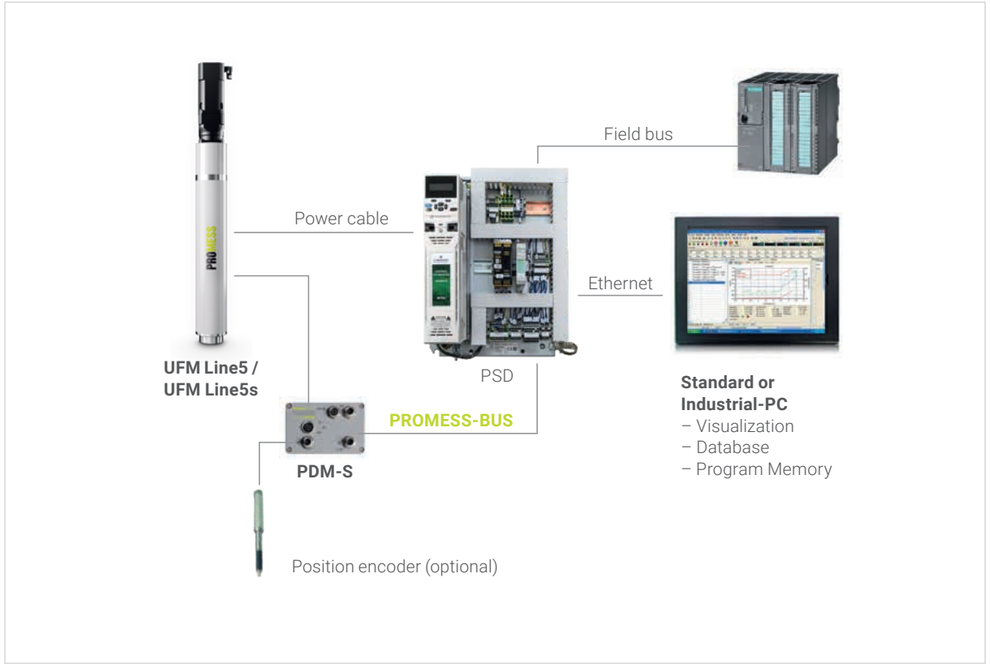
- Short installation times
- No wiring necessary
- Completely inspected and tested
- EMC tested

PSD 010G1

Connected Components

- AC servo amp with NC module
- Brake resistance
- EMC components, main power filter
- Safety controller: Safety functionality
- STO in PLe in accordance with DIN ISO 13849-1; optional: SSx and SLS in PLd in accordance with DIN ISO 13849-1 (for UFM Line5 with safety brake)
- Field bus interface (must be ordered separately)
- Set of cables (must be ordered separately)
- Required connectors (connected to pins): Power supply
- 24-volt emergency stop circuit

System Design



System Design

Technical Data

UFM Line5/ UFM Line5s	Item no.	WxHxD (mm)	Supply - Voltage	Frequency	Operating-temperature range	Control voltage
1 kN	PSD001YG2	350 x 475 x 300	380-480 VAC +/-10%, 3 ph	50 – 60 Hz	5 – 40 °C	24 VDC, +/- 10 %
3 kN	PSD003YG2					
10 kN	PSD010YG2					
30 kN	PSD030YG2	500 x 500 x 300				
60 kN	PSD060YG2	500 x 500 x 320				
100 kN	PSD100YG2					
200 kN	PSD200YG2	500 x 500 x 350				

PROMESS Digital Modules PDM

PROMESS offers four different multifunction amplifiers PDM. The modules are digitally connected to the UFM control via the PROMESS bus. They feature the following charateristics:

PDM-S

Item no. 14650

Digital preamplifier for strain gauge force transducer, multi range calibration optional

Input Force Transducer	
Accuracy class	0.1%
Sensitivity	0.1 ...5mV/V
Analogue bandwith	10 kHz typ. (-3dB)
Resolution A/D converter	24 bit
Housing	Aluminium die-cast
Protection class EN 60529	IP 40
Dimensions WxHxD	125x80x57 mm (height without connectors)
Input Encoder	
Tracks	A+, B+, A-, B-
Level	Rectangle TTL 5V
Counter	16 bit

PDM-P

Item no. 14655 / 56

Digital preamplifier for piezo force transducer, multi range calibration optional

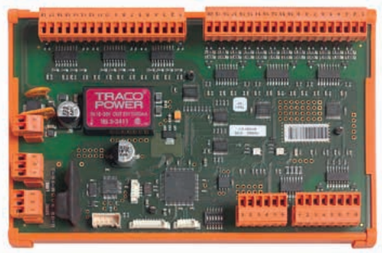
Input Force Transducer	
Accuracy class	0.1%
Analogue bandwith	10 kHz typ. (-3dB)
Resolution A/D converter	24 bit
Housing	Aluminium die-cast
Protection class EN 60529	IP 40
Dimensions WxHxD	125x80x57 mm (height without connectors)
Input Encoder	
Tracks	A+, B+, A-, B-
Level	Rectangle TTL 5V
Counter	16 bit

PDM-A

Item no. 14711

Four analogue inputs

Analogue Inputs	
Precision class	0.25 %
Analogue bandwith	10 kHz typ. (-3dB)
Resolution A/D converter	24 bit
Housing	Aluminium die-cast
Protection class EN 60529	IP 40
Dimensions WxHxD	125 x 80 x 57 mm (height without connectors)
Supply voltage	24 VDC
Input Encoder	
Tracks	A+, B+, A-, B-
Level	Rectangle TTL 5V
Counter	16 bit



PDM-IO

Item no. 14700

16 digital in- and outputs

Digital in- and outputs	
Input protection	Electrically isolated
Output protection	Electrically isolated
Eingangsspannung	24 VDC
Ausgangsstrom	24 VDC
Case mounting	Cap rail
Protection class EN 60529	IP 40
Dimensions WxHxD	165x109x55 mm

Frames and Accessories

PROMESS offers matching C- and four-column frames for each type of press in the UFM Line5/UFM Line5s range.

C-Frame

C-Frames

The robust C-frames are easily accessible from the front and sides and provide high stiffness. The max. bending is 0.2 mm under nominal load. They are mainly suitable for use in assembly lines or machines.

By default, the lower plates are equipped with a center hole and 2-T grooves as optimum tool mounts. The upper plates are pre-fabricated to hold a specific joining module.

Four-Column Frame

Four-Column Frame

Four-column frames are suitable for applications with a central axial application of force. They offer low bending that is solely parallel.

By default, the lower plates are equipped with a center hole and 2-T grooves as optimum tool mounts. The upper plates are pre-fabricated to hold a specific joining module.

External Force Transducer

The force transducers in the UFM Line5/UFM Line5s range are designed to measure tension and compression forces both statically and dynamically. They offer high measurement precision and a low installation height.

Cable Track Module

PROMESS offers different modules for moving the force transducer cable safely without wear and tear.

Flange Plate

PROMESS offers corresponding flange plates for fastening the joining modules.

External Force Transducer

Cable Track Module

Flange Plate

Sensors (Displacement Transducers)

The PROMESS NC controller allows the connection of various additional sensors for measuring force, distance, temperature or other variables.

Sensor / Accessory	Cable	Stroke	Resolution
Precision sensor ST 1278	axial	12 mm, neutral position extended	+/- 0,001 mm
Precision sensor ST 1278	radial	12 mm, neutral position extended	
Precision sensor ST 1277	axial	12 mm, pneumatic retracted	
Precision sensor ST 3078	axial	30 mm, neutral position extended	

Connecting cables have to be ordered separately.

Connector Sets

If a cable set is not ordered,
a connector set will be required.

UFM Line5	Item no.
10 kN	750100LNM
30 kN	750300LNM
60 kN	750600LNM
100 kN	751000LNM
200 kN	752000LNM

Cable Sets

The cable sets are available
in lengths of 5*, 10, 15 and 20 m.

UFM Line5	Item no.
10 kN	750105LNM*
30 kN	750305LNM*
60 kN	750605LNM*
100 kN	751005LNM*
200 kN	752005LNM*

Field Busses

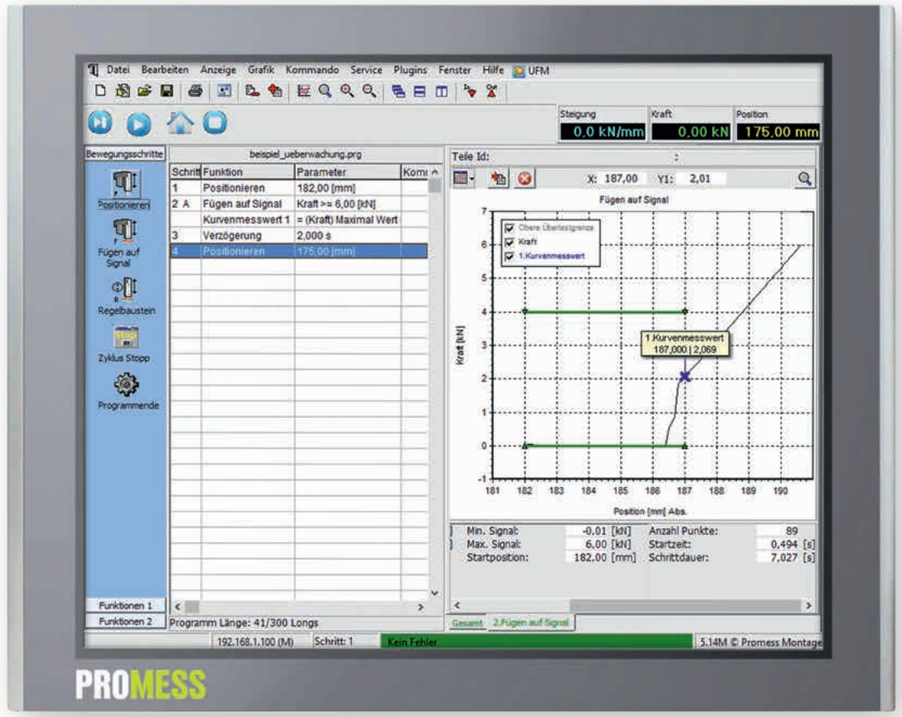
PROMESS offers various field busses
for communicating between the PLC
and NC controller of the press.

UFM Line5	Item no.
Profibus	3302005550
Profinet	3302005585
EtherCAT	3302005595
EtherNet/IP	3302005590

Additional field busses on request.

Display and PC

As a programming unit for editing NC programs and for visualizing signals,
PROMESS offers an industrial PC and different displays.



Panel-PC

- Display size 19‘‘
- Resolution 1280 x 1024
- Fanless
- Touchscreen: resistiv

Display

PROMESS offers different
displays on request.

Software Plugins

PROMESS offers a range of custom plugins for its powerful UFM V5.xx programming software. These can be connected to the software through the .net interface. This allows the software to be modified on a case-by-case basis and optimized for specific applications without having to update or change the firmware. The expanded database is also linked to the plugin.

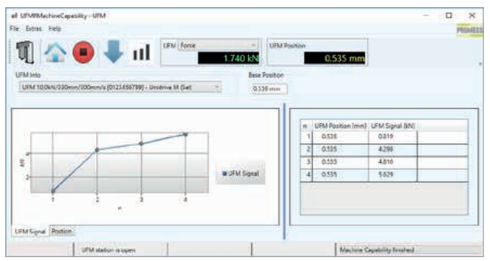
Excerpt from the plugin library:

- **UFMR Barcode**

  The UFMR Barcode plugin can be used to change the program within the UFM software using a barcode scanner. While the program runs, the barcode scanner can be used, for instance, to transfer a Part ID using the UFM dialog function.

- **UFMR MachineCapability**

  The plugin UFMR MachineCapability is used to determine the machine capability of force measurements in an electromechanical assembly press. The machine capability test is performed by repeatedly running of a UFM program running to a given force value while reading the position and force values of the joining unit as well as optionally the values of a reference transducer.

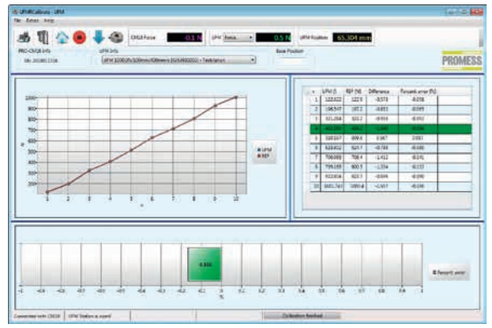


UFM Machine Capability

- **UFMR Calibrate**

  The plugin UFM Calibrate was developed for the calibration of the force transducer of our electromechanical assembly presses. It supports the 2-point calibration of the analog preamp as well as the characteristic calibration with the integrated range calibration of our digital preamp PDM-S.

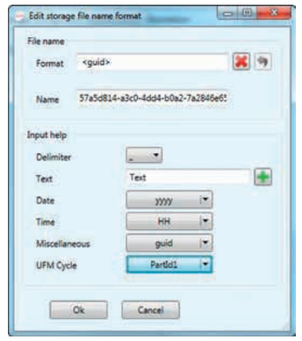
  PROMESS offers a calibration set consisting of a reference force transducer and a KT-V5 analysis unit with display for the calibration. The KT-V5 is connected to the USB port of the computer where the servopress is operated in order to read in the values of the reference force. The values of the reference force transducer are automatically detected by the integrated TED5 and are displayed into a calibration protocol that can be exported to Excel.
  It is also possible to perform the calibration using other non-integrated references. In this case, the base point values of the reference transducer are entered manually.



Calibration plugin

- **URMR XML-Writer**

  The XML Writer plugin is used to export date generated during the joining process, such as gaugings, curve data and variable values, to an XML file. The XML files can be used for any further processing and analysis.



URMR XML-Writer

- **UFMR QDE**

  The UFMR QDE plugin allows you to export quality data into the statistics software Qs-STAT from the Q-DAS company and thus helps you to control and optimize your production process. You can export measurement data as characteristic data, as well as supplementary data and description data for every joining program. Exports are supported for “dfq“ as well as “dfd“ and „ dfx” file formats.

- **UFMR IPM**

  The plugin UFMR IPM also supports the control and optimization of your assembly process and helps you to detect production failures early. You can export process

Our services for you

From development to after-sales service, we offer the complete package from a single source. On request, we support you from process development through to the use of our assembly presses at your premises. Whether you are using our assembly presses for the first time or are already familiar with them is not important. We offer you the necessary service for a long and sustainable use of our products at every stage.

The service of our products includes the following services:

- Process development
- Preliminary tests
- Rental units
- Start-up operation
- Documentation
- Training courses
- Remote / maintenance
- Calibration service
- Emergency, repair and spare parts service
- Sale of used assembly presses
- Consignment warehouse
- Worldwide sales and service network

PROMESS CUSTOMER SERVICE

Express deliveries

On request, we deliver within two weeks by express delivery for up to five units for an additional charge.

For more „green“ efficiency

CO_2

By choosing a universal joining module from PROMESS, you are choosing a long-lasting, energy-efficient drive system. We design your joining module individually in advance, which avoids overdimensioning and increased energy consumption. This saves you energy costs and conserves resources. Where possible, we take back used assembly presses, rework them and bring them back into the product cycle. The refurbished modules are state-of-the-art and have short delivery times. In addition, you receive a 12-month warranty and contribute to climate protection.

Maintenance

Preventive maintenance is the easiest way to reduce costly downtimes, increase machine service life and boost productivity. A maintenance contract for regular preventive maintenance by our trained personnel ensures maximum use of your products.

Our maintenance contract includes one service assignment per year with the following services:

- Re-grease all lubrication points
- Change of transmission oil as required (if applicable)
- Visual and noise inspection of mechanical and safety-relevant components
- Replacement of worn parts as required and if spare parts are in stock
- Update of the software as required and requested by the customer
- Checking / setting the zero point as required
- Checking the force curve over the nominal stroke
- Preparation of a machine condition report and quotation for the rectification of any defects
- Calibration and adjustment of the force signal, issue of a calibration certificate
- Adjustments (e.g. belt tension) as required
- Travelling expenses included
- Warranty extension by 12 months after maintenance (maximum of 5 years after delivery)
- 10% discount on spare parts
- 10% discount on services and training

Calibration service

Deutsche Akkreditierungsstelle D-K-21209-02-00

Our assembly presses are supplied with a factory calibration. After this, we recommend regular calibration to ensure the reliability of your measuring equipment and to prevent incorrect process parameters from occurring. On request, PROMESS can support you with the calibration and adjustment of your force measuring system with appropriate calibration services. Choose between a factory calibration or a calibration according to an accredited in-house procedure. Both services are carried out by our experienced service technicians on your premises.

Our calibration laboratory is accredited in accordance with DIN EN ISO/IEC 17025:2018 by the German Accreditation Body (DAkkS) and carries out calibrations in the accredited area.

Calibration services

Factory calibration	Accredited calibration
■ Factory calibration of the force measuring system ■ Factory calibration certificate ■ Traceable calibration ■ Conformity assessment	■ Calibration of the force measuring system according to accredited in-house procedure ■ Internationally recognised calibration certificate (with ILAC and DAkkS logo) ■ Traceable calibration ■ Conformity assessment (optional) ■ Fulfilment of the requirements of the DIN EN ISO/IEC 17025 ■ Recognised measurement uncertainties for each measuring point ■ Determination of the reversal margin (hysteresis) (optional)

- Adjustment of the force measuring system
- Checking the distance measuring system
- Function check for noise and wear
- Lubrication
- Testing the machine capability (optional)

What are the advantages of calibration according to an accredited procedure compared to factory calibration??

- Calibration in accordance with the accredited procedure fulfils the requirement 7.1.5.3.2 external laboratories from the IATF 16949 standard.
- You will receive an internationally recognised calibration certificate that meets the requirements of DIN EN ISO/IEC 17025 and bears the DAkkS logo.
- Measurement uncertainties are shown and assigned directly to each measuring point.
- Determination of the reversal span (hysteresis) on request.
- You have the verification of a traceable calibration.
- We can carry out a conformity assessment for you on request.

Calibration set

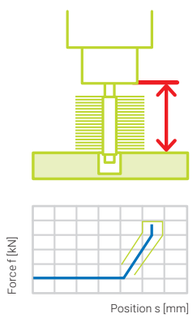
Alternatively, you can calibrate or test the machine capability of your assembly press yourself using our calibration set. The process can be automated using the optionally supplied software. Finally, a log is created that can be exported to Microsoft Excel.

The PROMESS calibration set contains

- Reference transducer
- Evaluation unit for the reference transducer with display and USB interface for connection to a PC
- Calibration certificate of the reference transducers as a factory calibration certificate or as a “DAkkS calibration certificate” possible
- PROMESS UFMR Calibrate software (optional)
- Case

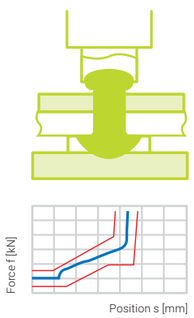
Calibration set	1 kN	5 kN	10 kN	20 kN	50 kN	100 kN	200 kN
Item no.	5106	5107	5104	5101	5103	5105	5108
Force transducer	KAM/1kN/0,2	KAM/5kN/0,2	KAM/10kN/0,2	KAM/20kN/0,2	KAM/50kN/0,2	KAM/100kN/0,2	KAM/200kN/0,2
Base plate	XKM 096			XKM 094		Without	
Diameter/height	Ø40 / 12			Ø90 / 25			
Plug	XKC 041						
Display	KT-V5						
Factory calibration	XKW 221						

Application Examples



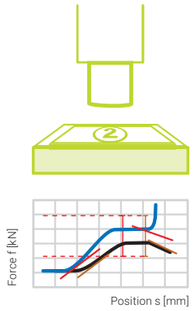
Precision Joining

- Precision joining < 0.002 mm, collision-free due to electronic bending compensation.



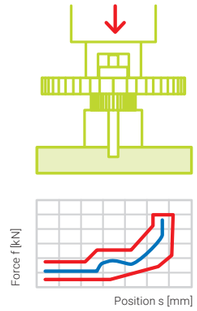
Riveting

- Rivet press with programmable press force and control of power press.



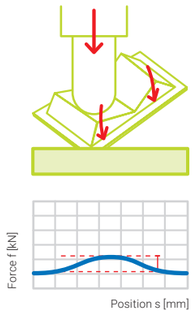
Stamping/Forming

- Stamping and forming with detection of part height and relative forming distance.



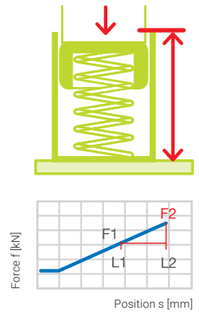
Join on Contact

- Joining on contact with precise shutdown once absolute shoulder position has been reached.



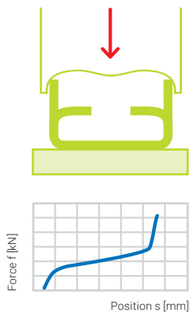
Surface Checks

- Logging of force-distance data for multiple switch points.



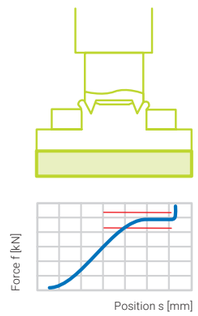
Testing/Measuring

- Logging of force-distance data for multiple positions.



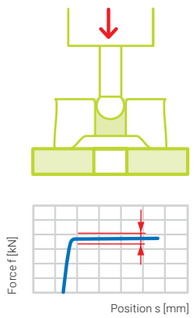
Bending

- Monitored bending of straps, brackets etc. on safety components.



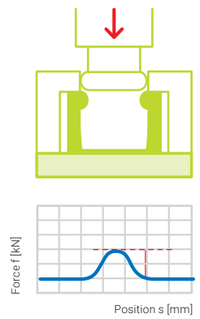
Press-fitting

- Press-fitting with controlled force for relative displacement.



Calibrating

- Calibration with quality assurance through monitored force.



Clipping

- Joining of plastic and medtech parts with monitoring of snapping force.

PROMESS. For more efficiency.

PROMESS
Gesellschaft für Montage-
und Prüfsysteme mbH

Nunsdorfer Ring 29 | D-12277 Berlin
Phone +49 (0)30 / 62 88 72 - 0
promess@promessmontage.de

www.promessmontage.de

PROMESS
ASSEMBLY + SENSOR TECHNOLOGY