Control Units and Software

SCHMIDT® PressControl 75, 700, 7000 RT and 7000 HMI

SCHMIDT® PressControl
Machine control units

SCHMIDT® PressControl **75**, **700** and **7000** are the latest generation of controls, which allow the design of modern production processes – from the single workstation to complete automation. You benefit from our knowledge in:

- Safety technology – EC type approved machines
- Process measurement technology – simultaneously measuring while processing
- Process documentation

The control systems have the following features:

- Efficient due to intuitive user interfaces on touch / multi-touch screen
- Fast and safe setup of processes in an easy-to-read window, simple parameterization for manual ram movement and transfer of the actual parameters force and path to the motion blocks (teach-in) for the PressControl 700 and 7000 controls in combination with ServoPress/TorquePress/ElectricPress
- The integrated PLC allows the control of additional inputs/ outputs or sensors/actuators and thus the application-specific set-up of the workstation or system
- The integrated measurement data acquisition is insensitive to interferences (EMC). This results in a high measurement reliability of the entire system
- With the integrated safety technology, the entire system becomes an EC type-approved single workstation
- Service functions enable simple and efficient maintenance
- Guarantee of complete process documentation with clearly traceable component assignment

SCHMIDT® PressControl 75

SCHMIDT® PressControl 7000 RT

SCHMIDT® PressControl 700

SCHMIDT® PressControl 7000 HMI

SCHMIDT® PressControl 75
Compact functionality

Highly compact yet multifunctional **SCHMIDT®** PressControl 75 available for these press systems:

- **SCHMIDT®** ElectricPress
- **SCHMIDT®** PneumaticPress
- **SCHMIDT®** HydroPneumaticPress

It's easy and intuitive touchscreen allows for quick and efficient process set-up or change-over. Process specific data can be stored in up to 24 datasets.

The **SCHMIDT®** **SafetyModule** allows the design of single workstations with safety technology that meets the latest global standards for two-hand cycle initiation, guarding or light-curtain protection.

Data input

Data output

Technical Data	
Supply voltage	24 V DC
Current	< 3 A
Operating temperature	0 – 40 °C
Protection class	IP 54
Interfaces	■ CANopen for PRC - Gateway or CANopen Compact Box IP 2401
Electrical connections	All connections are pluggable
Display	■ 2.8" touch screen
	■ Process information
Operation	■ 4 function keys
	■ 3 languages, switchable
Modes of operation	■ Two-hand release with SafetyModule
	■ Light curtain with SafetyModule
	■ Start button for operation without SafetyModule
	■ Workpiece control
	■ Activation of sliding table
	■ Return stroke initation with external signal
	■ Blow-out/blow-off
Operating functions	■ Piece- or preselection counter
	■ Set-up mode
	■ BDC dwell time
	■ User Management
Dimensions	90 x 120 x 60 (h x w x d)
Mounting	Fastening screws, optional magnet holder

Data output

SCHMIDT® PressControl 700
"All in one" control and visualization for the single workstation

The **SCHMIDT® PressControl 700** for single workstations is used for the control and monitoring of pressing and joining processes. In addition to precise assembly tasks, the fast acquisition of extensive process data and bidirectional data exchange is becoming more and more important.

The **SCHMIDT® PressControl 700** real-time controller communicates with the process components via the high-performance and fast field bus EtherCAT with a transmission rate of 100 Mbit/s and a transmission speed of 0.5 ms. With this the press control meets the requirements for fast processing of large data volumes. The leap into other fieldbus worlds is realized by using optional fieldbus gateways.

Process visualization takes place directly on the PressControl 700. Via the Ethernet interface, the control communicates with MES systems and external PCs as well as PRC DataBase and PRC FileXchange software.

The press control system is optimally designed for **SCHMIDT® press systems**. Thanks to the integrated PLC, process visualization, the best possible compatibility and performance is achieved. All components are tested and matched to each other in the network and are therefore ready for immediate use.

User Surface

- 10.1" Full HD multi-touch-screen
- setup and setting of parameters via "drag & drop"
- compact display of the entire process in the home view
- individual sizing of the process windows (splitter function)
- language switchable

Technical Data	
Industrial PC	Intel E3990 processor 2 GB main memory 16 GB on-board Flash (eMMC) 4 GB CFAST Linux operating system
Interfaces	2 x USB 2.0 2 x USB 3.0 1 x Ethernet, M12 (LAN1) 1 x Ethernet, M12 (LAN2) 1 x EtherCAT-P, M8
Power supply	24 V DC (EtherCAT-P)
Current consumption	max. 1,3 A
Weight	ca. 1,9 kg
Ambient Temperature	0 °C … +40 °C
Humidity	0 … 90 % relative humidity (not condensing))
IP Rating	IP 54

SCHMIDT® PressControl 7000
Compact system control for intelligent process control

The **SCHMIDT® PressControl 7000 RT** for single workstations is used for the control and monitoring of pressing and joining processes. In addition to precise assembly tasks, the fast acquisition of extensive process data and bidirectional data exchange is becoming more and more important.

The **SCHMIDT® PressControl 7000 RT** real-time controller communicates with the process components via the high-performance and fast field bus EtherCAT with a transmission rate of 100 Mbit/s and a transmission speed of 0.5 ms. With this the press control meets the requirements for fast processing of large data volumes. The leap into other fieldbus worlds is realized by using optional fieldbus gateways.

Process visualization takes place directly on the PressControl 700. Via the Ethernet interface, the control communicates with MES systems and external PCs as well as **PRC DataBase** and **PRC FileXchange** software.

The press control system is optimally designed for **SCHMIDT® press systems**. Thanks to the integrated PLC, process visualization, the best possible compatibility and performance is achieved. All components are tested and matched to each other in the network and are therefore ready for immediate use.

SCHMIDT® PressControl 7000 HMI

- 21.5" Full HD multi-touch screen
- Multi-axis applications can be visualized
- Setup and setting of parameters via "drag & drop"
- Installation of optional software tools such as **SCHMIDT® PRC DataBase** or **PRC FileXchange** is prepared

Technical Data PressControl 7000 RT	
Industrial PC	Intel E3990 Processor 2 GB main memory 16 GB on-board flash (eMMC) 4 GB CFAST Linux operating system
Interfaces	1 x display port 2 x USB 2.0 2 x USB 3.0 3 x Ethernet, RJ45 (LAN1 via integrated switch on 3 ports) 1 x Ethernet, RJ45 (LAN2) 1 x EtherCAT, RJ45 Universal Fieldbus, integrated compartment for installation
Power supply	24 V DC (via 3-pin plug)
Current consumption	1 A
Weight	approx. 0.73 kg
Ambient temperature	0 °C … +65 °C
Storage temperature	-20 °C … +70 °C
Humidity	0 … 90 % relative humidity (not condensing)
IP Rating	IP 20; PressControl 7000 RT placed in electrical cabinet

Technical Data PressControl 7000 HMI	
Industrial PC	Intel i5-7xxx Processor 64 GB CFAST operating system 512 GB HDD data memory Operating system Windows 10
Monitor	21.5'' full HD monitor (1920 x 1080) with capacitive multi-touchscreen
Interfaces	1 x HDMI 2 x USB 2.0 2 x GBit Ethernet, M12, X-coded (LAN1, LAN2) 2 x integrated loudspeaker
Power supply	24 V DC (via 4-pin M12 plug, T-coded)
Current consumption	2 A
Weight	approx. 9.5 kg
Ambient temperature	0 °C … +40 °C
Storage temperature	-20 °C … +60 °C
Humidity	5 … 90 % relative humidity (not condensing)
IP Rating	IP 54
Assembly	VESA 75

User surface for professional assembly
For **PressControl 700** and **7000**

The user interface for professional assembly is installed in the **SCHMIDT®** PressControl 700 and **7000**. The functionality has been developed specially for assembly operations with immediate reaction in the process.

The following functions are available
- process visualization
- process data management
- development tool (PLC editor)
- **SCHMIDT®** PRC DataBase, PRC FileXchange, PRC OPC optional

Process Monitoring
- high graphical curve resolution for detailed view of curve segments
- three graphic displays; force/stroke, force/time and stroke/time for process analysis and optimization
- extensive tool library
- result visualization OK/NOK (green/red)
- tolerance observers

Process Output
Actual system statuses are displayed both text-oriented and graphically and thus enable a transparent process overview for quick analysis and troubleshooting.

Software Options
The comprehensive software packages for process data management and process optimization can be activated individually and specifically stored in data sets.

Characteristics
- easy and fast setting of parameters for the processes
- definition of data sets and motion profiles by parameter setting
- process optimization by switching the process display (F/s, F/t, s/t)
- easy definition and evaluation of processes via quality observers
- 12 QA observers can be defined as F/s windows or stroke tolerances as required
- safe detection of bad parts (NOK)
- Clear documentation and part assignment
- software PLC to freely program sequences
- service functions for diagnosis and system updates

User Interface **SCHMIDT®** PressControl 700

1 + **2** All tolerances can also be used inverted (blocking ranges)   **3** Stroke tolerances can be adapted to curve gradient

SCHMIDT® ServoPress/TorquePress
Driving profiles and applications

SCHMIDT® ServoPress / TorquePress enable simple configuration of the driving profiles with motion blocks. In order to realize a quick setup, different standard driving profiles are available.

Experience shows that these standard driving profiles and combinations cover most applications. Up to 8 motion blocks can be combined as desired.

Positioning to "stroke"
Normal driving profile, typically combined with bending compensation.

Closed loop "force" control
For processes in which the force achieved is a measure of the process quality, e.g. material compressing processes.

Driving on touch force and "delta stroke".
For processes in which component tolerances must be detected. The press scans the surface and presses in to a specific differential dimension as soon as the defined force is reached.

Driving on "Force increase"
The return stroke is initiated at a defined force increase (slope)
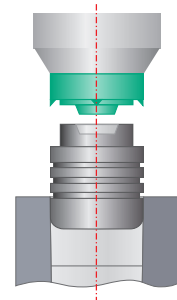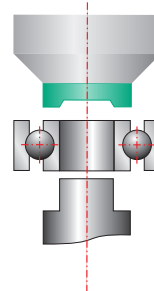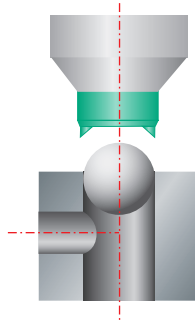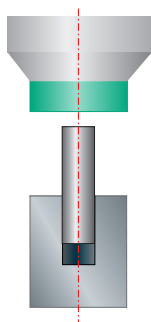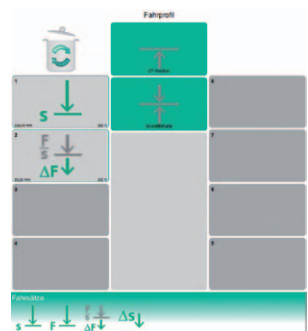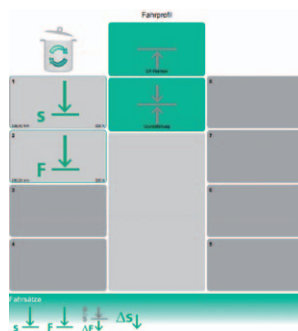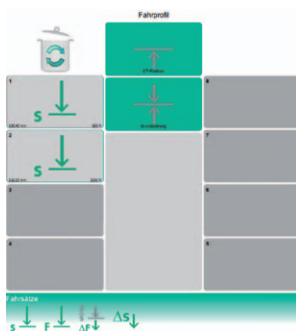
Pressing until reaching a specified position leads to precise results in connection with bend up compensation.

Plugging blind bores – a sphere is pressed in and crimped. Force output correlates to material displacement to determine density and retain force independent of stroke or the safe seating of bearings on shafts

Pressing to a functional dimension with force-controlled touching of the body edge and subsequent relative movement (delta stroke)

Pressing in expanders or crimping cable shoes. The sealing or holding function depends on the correlation of force and displacement.
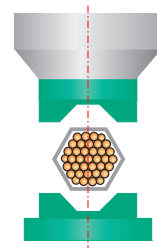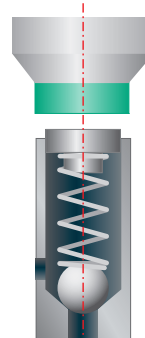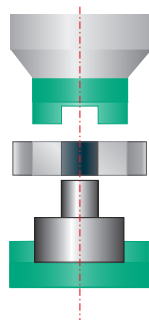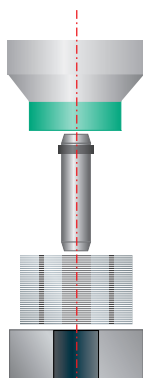
Visualization and process analysis
for **PressControl 700** and **7000**

Visualization user surface

Important parameters for assessing the quality of press fits are the press force and the press stroke. The data of these measured variables are recorded during the process and displayed by the software as a force-displacement curve F/s or F/t or s/t.

For quality assurance of the joining process, freely definable tolerances are provided in the form of force-stroke windows and stroke tolerances. With the help of these criteria, the quality-critical areas can be precisely monitored. If the tolerances are not adhered to in the monitored curve areas, appropriate application-specific reactions can take place (e.g. selection measures).

Tolerance criteria can be created very easily and progression curves can be displayed exactly. Not only the working stroke but also the return stroke are important for the evaluation of the curves. The high resolution of our measuring systems allows a large number of measuring points, which are necessary for a process-reliable evaluation. Integrated zoom and measurement functions allow detailed statements on the joining processes.
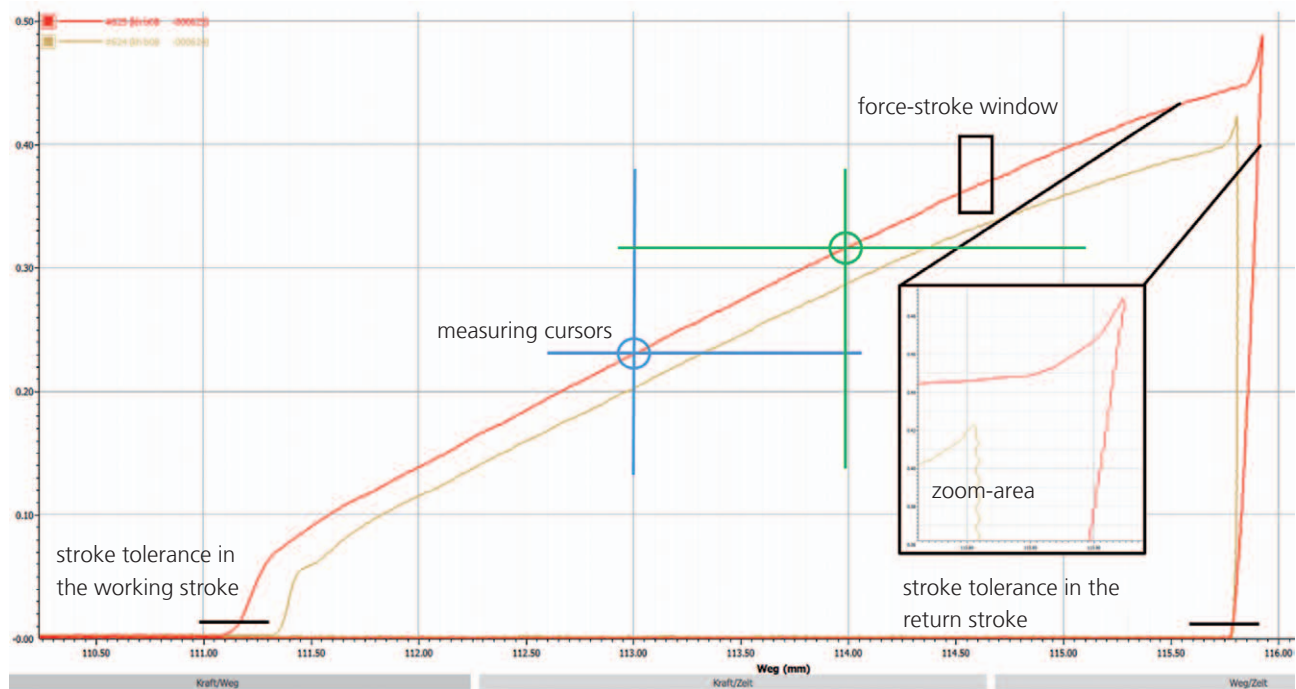
Process analysis – graphic display force over stroke

SCHMIDT® MoveTol
Offset of tolerance, data software for **PressControl 700** and **7000**
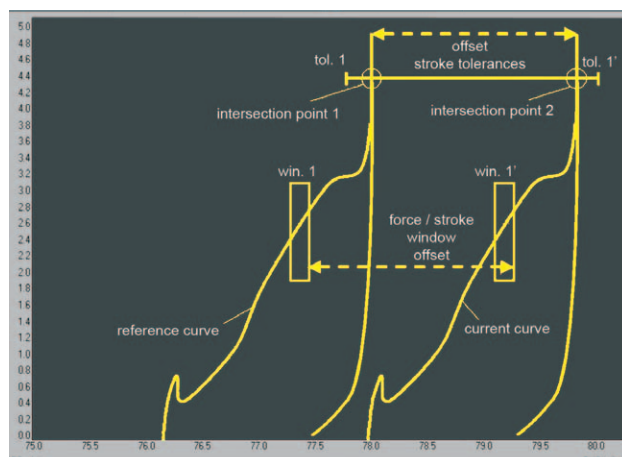
Assembly parts are subject to certain manufacturing tolerances. Height deviations of the parts result in an offset of the curves in the curve window. The curves of the parts with larger tolerance deviations can then lie outside the created tolerance limits and are declared as bad parts.

The height tolerances of the parts can be taken into account with the "Tolerance data offset" function. The defined tolerance windows and stroke tolerances are shifted by the distance to a reference position. The good/bad evaluation is then performed.

Offset of the tolerance data is relative to freely selectable references.

SCHMIDT® Software Tools
For Archiving, Evaluation, and Control.

SCHMIDT Technology offers modular software tools to meet the diverse requirements in data management.

- **SCHMIDT®** PRC OPCUA
- **SCHMIDT®** PRC DataXchange
- **SCHMIDT®** PRC DataBase
- **SCHMIDT®** PRC FileXchange

These include options in the areas of system control, data storage and exchange, visualization, and analysis. This allows for the implementation of a wide range of requirements in quality assurance, statistical process control, traceability, and optimizing production processes.

SCHMIDT® PRC OPC UA
Ethernet-Based Data Exchange, Platform-Independent, Secure.

Our OPC UA server offers all process data (such as working parameters, process results, PLC variables, etc.), which can be subscribed to by an OPC client individually.

These subscribed data form the basis for higher-level data management systems such as SCADA, MES, and others. Bidirectional data transfer also enables process adjustments, for example, based on process outcomes.
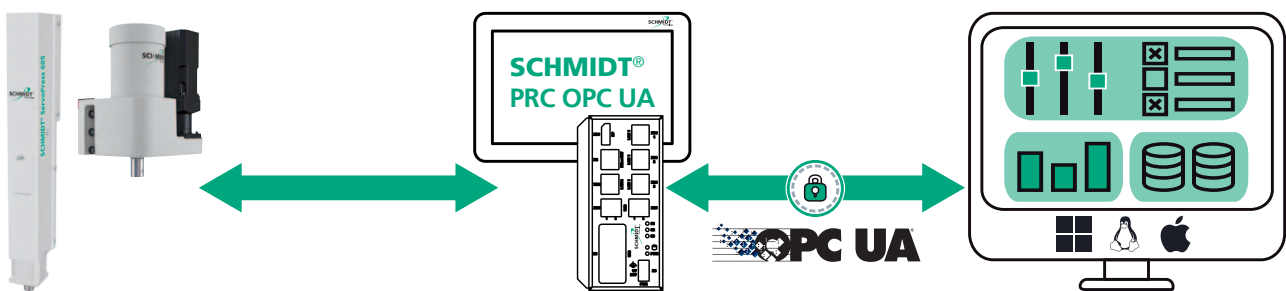
SCHMIDT® PRC DataBase
Database software for **PressControl 700** and **7000**

SCHMIDT® PRC DataBase is an optional software for the modular control system **SCHMIDT® PressControl 7000** or **SCHMIDT® PressControl 700**. The database software is used for storing and analysing the data of the control system – process specifications and process results – particularly under quality assurance aspects.
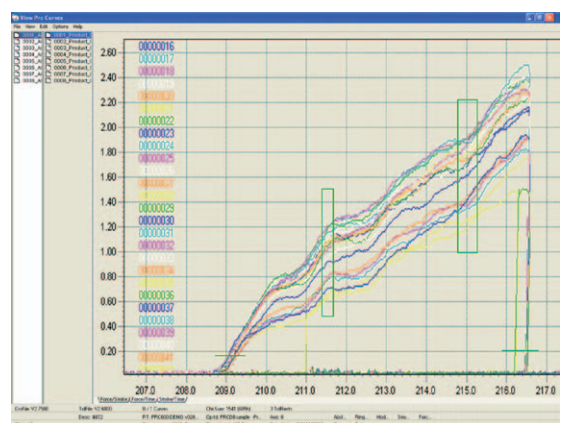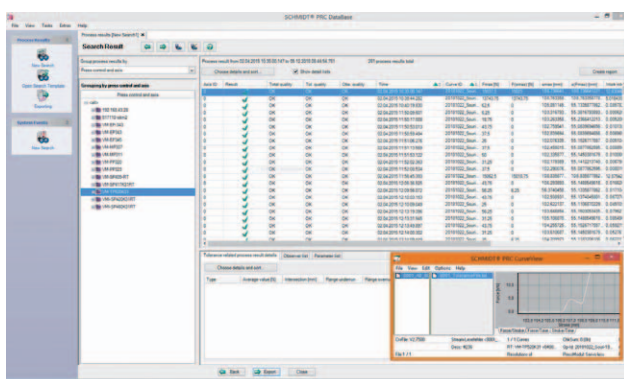
Characteristics

- Documentation
- Analysis
- Quality assurance
- Traceability
- Data export in CSV format
- Q-DAS interface with certification

SCHMIDT® PRC FileXchange
Safe exchange of process data

In addition to data exchange within an automation solution via Fieldbus, data exchange can also be performed via data files. For every press process all relevant process results, tolerances, observer, and parameters are written into a file whose format and content can be configured via an intuitive user interface.

The following output formats are available:

- Microsoft Excel (CSV)
- Q-DAS
- **SCHMIDT® CRV/TOL**
- XML

The transmission of production data is synchronized from Press-Control to PC (File System). That means if the connection between PressControl and PC is interrupted the process is stopped, the event is recorded. Once the connection is re-established the data of the last press process will be transmitted again.

It is also possible to import default values for press processes from a configuration file. A production range which comprises several different products can, for example, be managed via standard PC application and thus be used as production database.

The respective product-specific configuration file can be created by the **SCHMIDT® PressControl HMI** for all relevant process parameters and transferred to the customer's management software via xml file.
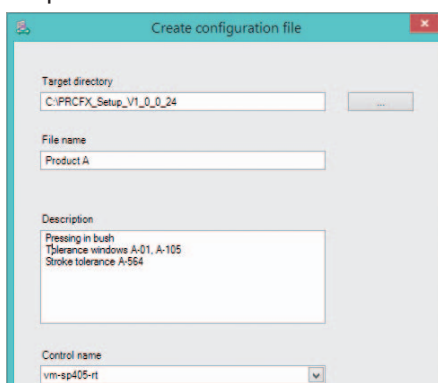
export
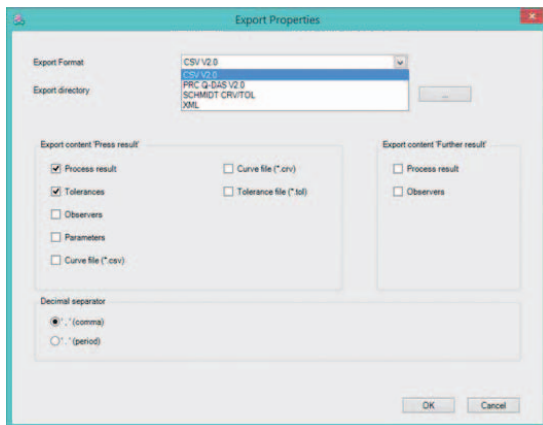
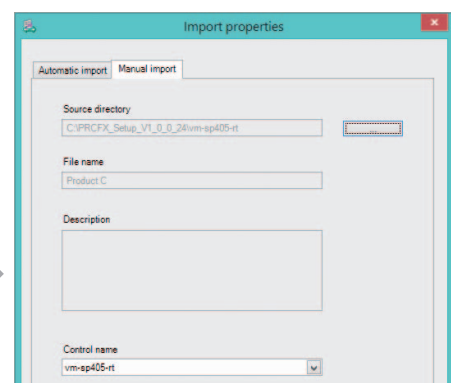Configuration of output format and content
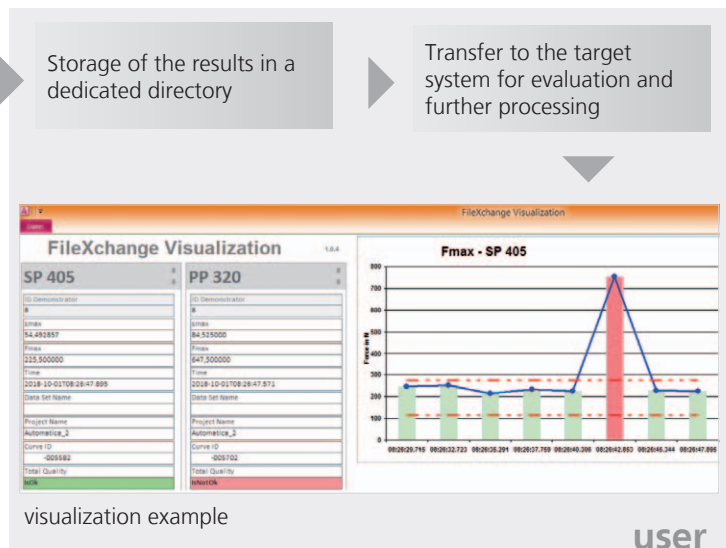
visualization example

import

Generating configuration files
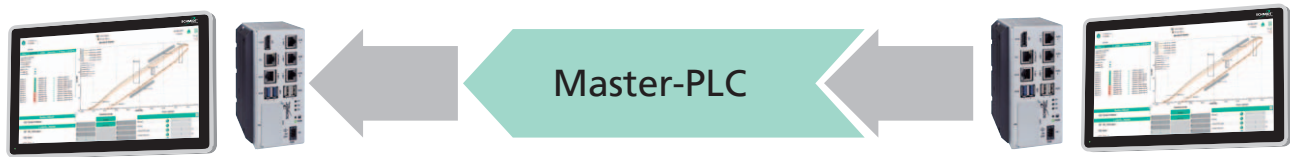(Parameters for particular joining processes)

Automatic or manual import into the press control

SCHMIDT® PRC DataXchange
Bi-directional data exchange with higher-level controls

The **PRC DataXchange** interface is available for communication between a **SCHMIDT® press system** and a higher-level control system.

DataXchange Input

Parameter-Transfer to PressControl

Dynamic adaptation of processes
- Control type (force, stroke, ext. signal, relative position, …)
- Position
- Speed
- Force
- Motion block change (stopping, flying, ext. trigger signal)
- Dwell time

DataXchange Output

Data-Transfer to Master PLC

for connection to MES and ERP systems
- Reached position
- Reached force
- Actual values position and force
- Curve results
- Tolerance values
- Status signals of the system
- Error states
- Press axis information

SCHMIDT® PRC OpenFieldBus

OpenFieldBus allows a completely custom specification and programming of driving profiles and sequences by a master control as well as the bidirectional transmission of all relevant data. To implement individual requirements in the press process, the complete command set can be accessed. At the same time, the advantages of the integrated force-stroke monitoring and control of the press system with all evaluation functions can be utilized

Characteristics
- Access to the entire command set of the **SCHMIDT® press control**
- Transmission of process results to the master controller
- Individual definition of joining processes, driving sets and data exchange
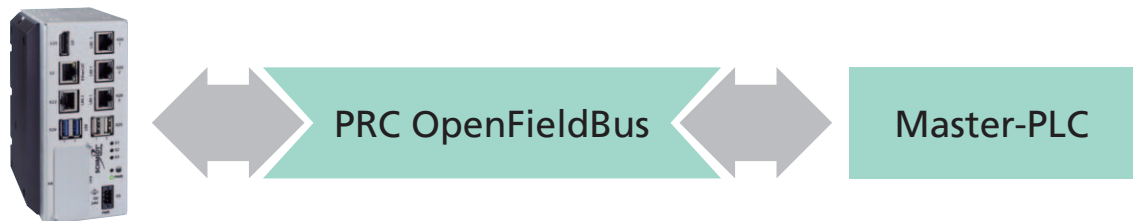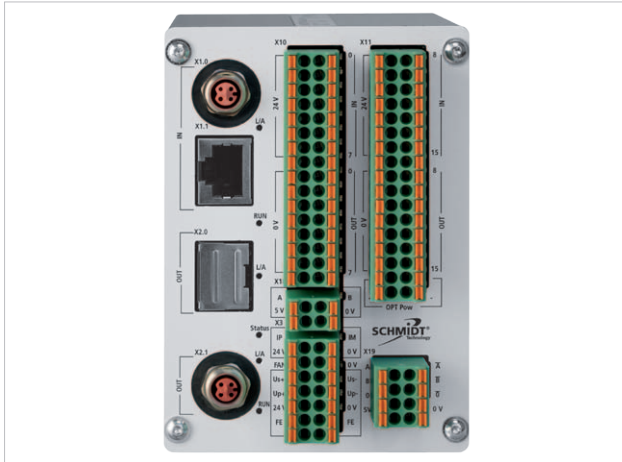
SCHMIDT® Hardware-Tools
Proven components for system integration

SCHMIDT® **PressControl 700** and **7000** communicate with higher-level control systems via a standardized interface program. All relevant system states as well as bad part detection performed by simple signal exchange from one control to the other.

SCHMIDT® PRC Gateway

- EtherCAT-connections to PressControl (Master) und PDA (Slave), with 24 V-power supply via EtherCAT-P
- 24 V-Interface with 16 inputs and 16 outputs (up to 0.5 A / output)
- short circuit proof and overload protected
- status-LEDs for EtherCAT-Bus and In- / outputs
- encoder-interface
- interface for external hand wheel as handheld
- top-hat rail mounting
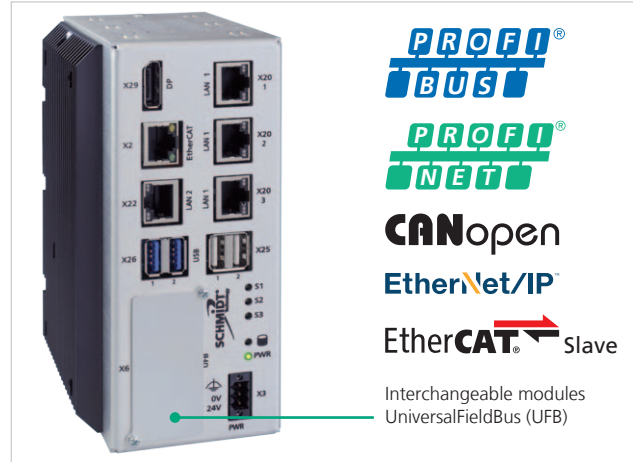
Communication via fieldbus-systems

All common physical interfaces can be used for signal exchange with the automation environment.

- interchangeable modules UniversalFieldBus (UFB)
- further fieldbus interfaces via external gateway
- USB

Interchangeable modules UniversalFieldBus (UFB)

External handwheel as handheld

for **SCHMIDT®** **PressControl 700** and **7000 RT** in combination with **SCHMIDT® ElectricPress** with process monitoring or **SCHMIDT® ServoPress/TorquePress**, connection via **SCHMIDT® PRC Gateway**

EtherCAT-P Compact Box

- 8 digital channels, usable as inputs or outputs
- signal connection by screwing via M8 plug connector
- power supply (24 V) via EtherCAT-P
- load currents of the outputs up to 0.5 A
- total current of all outputs 3 A
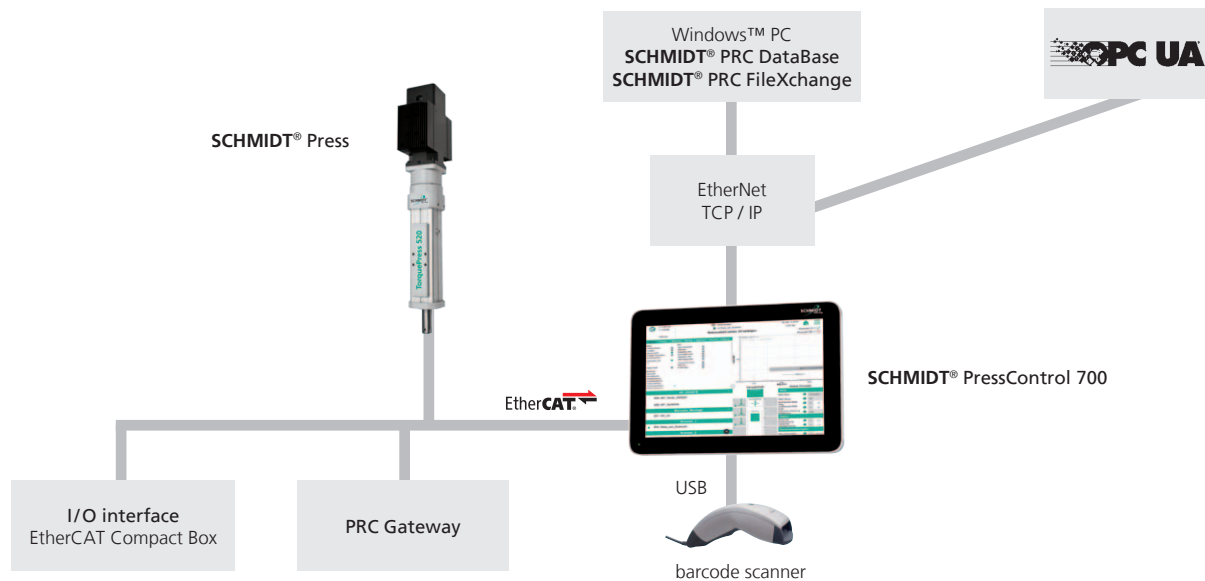
SCHMIDT® PressControl
System architecture

SCHMIDT® PressControl does work as a system control and takes over the process monitoring. The hard- and software components forming a system concept with real time characteristics. This is guaranteed by a system architecture with CANopen fieldbus. Press force monitored **SCHMIDT®** **ManualPress**,

SCHMIDT® (Hydro-)PneumaticPress, **SCHMIDT® ElectricPress** or **SCHMIDT® ServoPress/TorquePress** will be activated via fieldbus. The collected measuring data as well as in-/output data will be exchanged by the fieldbus.

SCHMIDT® PressControl 700
system architecture

SCHMIDT® Press

Windows™ PC
SCHMIDT® PRC DataBase
SCHMIDT® PRC FileXchange

OPC UA

EtherNet
TCP / IP

EtherCAT.

SCHMIDT® PressControl 700

USB

barcode scanner

I/O interface
EtherCAT Compact Box

PRC Gateway

SCHMIDT® PressControl 7000 RT with 7000 HMI or 700 HMI
system architecture

SCHMIDT® PressControl 7000 HMI

SCHMIDT® Press

SCHMIDT® PressControl 700 HMI

Windows™ PC
SCHMIDT® PRC DataBase
SCHMIDT® PRC FileXchange

OPC UA

EtherNet
TCP / IP

SCHMIDT®
PressControl
7000 RT

EtherCAT.

Master PLC

UFB (In / Out)
Universal Field Bus

Fieldbus gateway

EtherCAT.

USB

barcode scanner

EtherCAT. CANopen PROFI BUS

PROFI NET . . .

I/O interface
EtherCAT Compact Box

PRC Gateway