

Control Units and Software SCHMIDT[®] PressControl 75, 700, 7000 RT and 7000 HMI







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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 700



SCHMIDT[®] PressControl 7000 RT



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.



>>press parameter<<
presstime endposition 0,5 s
>>counter<<
preselect counter off
preselect quantity 10 pcs

Technical Data

24 V DC
< 3 A
0 – 40 °C
IP 54
CANopen for PRC - Gateway or
CANopen Compact Box IP 2401
All connections are pluggable
2.8" touch screen
Process information
4 function keys
3 languages, switchable
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
Piece- or preselection counter
Set-up mode
BDC dwell time
User Management
90x120x60 (hxwxd)
Fastening screws, optional magnet holder

Data input



Data output



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 FileX-change 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)
- Ianguage switchable



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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



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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

Driving promes 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.

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".

combined as desired.

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)

Experience shows that these standard driving profiles and com-

binations cover most applications. Up to 8 motion blocks can be















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)







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 qualitycritical areas can be precisely monitored. If the tolerances are not adhered to in the monitored curve areas, appropriate applicationspecific 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 Patented 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 Interface for data evaluation and control

To cover the versatile requirements in the field of data management, **SCHMIDT Technology** offers modular software tools. It includes possibilities in the area of machine control, data storage and exchange as well as visualization and analysis. This enables versatile requirements of quality assurance, traceability and optimization of production processes can be realized. A large number of up-to-date interfaces are available at Fieldbus level and allow the press system to be easily integrated into higher-level systems. The data obtained during the pressing process allows conclusions to be drawn about quality fluctuations in components or even preliminary processes in production. Therefore, not only data acquisition and storage, but also analysis and evaluation play a central role. **SCHMIDT® PRC DataBase** and **PRC FileXchange** offer a wide range of options for this purpose. An evaluation can be carried out either with on-board tools or by user IT systems to which the process results are transferred.

Ethernet		Fieldbus	
SCHMIDT.	SCHMIDT® PRC DataBase		SCHMIDT® PRC DataXchange
снирт.	Copyright 2017 SCHMIDT Technology GmbH. At rights reserved.	SCHMIDT	SCHMIDT® PRC OpenFieldBus
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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



visualization example

import

Create configuration file	×	S Import properties
Target directory C1PRCFX_Setup_V1_0_0_24	Management of product configuration files	Automatic import Manual import
File name		C/IPRCFX_Setup_V1_0_0_24/vm-sp405-rt
Product A		File name
		Product C
Description		Description
Pessing in buth Tplerance windows A-01, A-105 Stroke tolerance A-554	Transfer of process param- eters via xml-file	
Control name		Control name
vm-sp405-rt	user	vm-sp405-rt

Generating configuration files (Parameters for particular joining processes) Automatic or manual import into the press control

user



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 statesPress 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



Master-PLC

Data exchange via SCHMIDT® PRC OPC UA

OPC UA represents a universal and manufacturer-independent possibility for data transmission used for industrial applications.

The OPC server retrieves relevant process data via Ethernet based on the communication protocol of the **SCHMIDT® PressControl** and makes it available as OPC objects. The OPC client can use all the relevant data items provided by the server and use it for analysis or control according to customer requirements.



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



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
- Ioad 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® PressControl 7000 RT with 7000 HMI or 700 HMI

