

# Nutrunner Controls

## Nutrunner Control SMX20

H 1.6.3

### Single-Channel

#### ■ General Information

#### High-end control in compact design without touch display

The SMX20 is a high-end nutrunner control, which can handle more extensive tasks than just controlling the fastening process. The use of a PC in 3.5" format enables unlimited functionality.

The SMX20 offers the same fastening and cycle functions as our other Master controls (SMX30, SMXP). However, the SMX20 does not have an integrated display. The SMX20 was developed specifically for applications which do not require a graphic display. This might be the case, for example, if a control is not located within the worker's field of vision or if visualisation units at the customer's will be used.

#### Flexibility through integrated PC

An integrated PC expands SMX20 functionality considerably, when compared to conventional controls. For example, it allows you to establish a direct connection to your host computer.

The operating system, programs, and system data are stored on a write-protect Compact-Flash card, with temporary data stored on a second CompactFlash card. The operating system, Windows XP Embedded, is condensed to provide only the necessary functions, while offering maximum protection against network virus attacks.

#### Programming complex nutrunning processes

The SMX20 offers programming capabilities for complex nutrunning processes. All torque and angle-based algorithms are available as base modules. These modules, along with additional commands for process control, can be linked with a user-friendly parameter software to create complex nutrunning processes. Conditional program statements can be based on rundown results, which enable, for example, loosening operations with or without repeated nutrunning. In addition, the control offers advanced nutrunning and monitoring processes, such as yield control, retrospective nutrunning monitor, and friction measurement.

#### Operation, configuration, parameterization and display

SMX20 operation, configuration, parameterization and display is controlled by the network or by direct connection of a monitor, mouse, or keyboard.



#### Automatic tool identification

Handheld tools from AMT are equipped with data storage, in which all tool-specific parameters are stored. When the tool is connected to the SMX20 control, this data is read and compared with the archived data stored on the control.

If these data do not agree, then the tool is not accepted by the control, and a fault message is issued. If the operator acknowledges the situation manually, the new data can be transferred.

#### Fastening case analysis

A user-friendly operator interface is available for analyzing fastening cases. Up to 999 fastening curves can be displayed and stored for later evaluation. This display is activated by date and time, as well as a value for the number of fastening curves requested. The displayed curves can be scanned and zoomed, as needed. For further analysis, up to 99 curves can be overlaid so that the intersection of each curve can be placed on the swell torque.

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#### ■ Special Features – Technical Data

##### Assembly

- Four assembly mounting holes in wall console
- IP54 protection

##### Display and Operator Controls

- 7-digit display for status and error messages
- 4 LEDs to display individual nutrunning and operational status

##### Programming und Parameter Definition

- User-friendly programming software via network
- Connection of external monitor, mouse and keyboard.

##### Nutrunning Processes

- Torque-controlled tightening
- Torque-controlled with angle monitor
- Angle-controlled with torque monitor
- Yield-controlled tightening
- Angle-controlled and torque-controlled loosening
- Shutdown based on digital signal with torque and angle monitor
- Friction measurement
- Retrospective nutrunning monitor
- Redundant motor current control
- Nutrunning time monitor

##### Interfaces

- 2 x Ethernet
- RS232, RS485
- USB
- Field bus systems available with expansion cards (optional)

##### Peripheral Equipment

- Operator console
- Socket tray
- Signalers (e.g., stacklight, alarm horn, etc.)
- I/O modules (parallel)
- Barcode reader, read/write devices (e.g., Moby E)

##### Number of Programs

- Max. 31



##### Enhanced Functions

- Part-based OK / fault information using counter function (available for multiple programs)
- Interface to part-based nominal data defaults from host computer
- Tightening data transfer to higher level systems
- Tightening location recognition (e.g. by ultrasound triangulation, iTeleskop)
- Load-dependent maintenance management for carrying out preventive maintenance on handheld tools
- Integration in our RailNet system for wireless power supply and positioning of nutrunner control on assembly line
- Centralized parameter management

##### Spindle Types

- Hand tools from HCR, HCRK, PCR, HCX and PCX series with reaction torque sensors or action torque sensors
- Built-in tools from ECR1 and ECR2 series with reaction torque sensors or action torque sensors

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#### ■ Overview Nutrunner Controls SMX20

#### Designation code:

#### SMX20 40ASH 02 EA

SMX = Designation nutrunner control generation

20 = Nutrunner control type

40A = Power class of output stage

SH = Internal designation

02 = Version number

EA = Parallel I/O interface

IBS = Interbus Slave interface

IBM = Interbus Master interface

PBS = Profibus Slave interface

DNS = Device Net Slave interface

Further interfaces on request



Type	Dimensions control (HxWxD) in mm	Dimensions wall console (HxWxD) in mm	Total dimensions (HxWxD) in mm	Weight in kg	Ident-No.
SMX20 40ASH 02	330x180x316	330x180x63	330x180x379	approx. 12,5	700 9938
SMX20 40ASH 02 EA	330x180x316	330x180x63	330x180x379	approx. 12,5	700 9945
SMX20 40ASH 02 IBS	330x180x316	330x180x63	330x180x379	approx. 12,5	700 9946
SMX20 40ASH 02 IBM	330x180x316	330x180x63	330x180x379	approx. 12,5	700 9947
SMX20 40ASH 02 PBS	330x180x316	330x180x63	330x180x379	approx. 12,5	700 9948
SMX20 40ASH 02 DNS	330x180x316	330x180x63	330x180x379	approx. 12,5	700 9949

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#### ■ Options

**For your information:**

The following options are already included in the nutrunner control part number.

**Parallel I/O board**

PC104 slot

- Part No. 701 6617

The PC104 DIGIO16/16 is a digital I/O module. The 16 inputs and 16 outputs are designed for 24V operation and are isolated by an opto-electronic coupler (3kV). The digital outputs can be switched 24V/500mA (high-side) and are protected against overload and/or overheating.

**Interbus board Slave**

PC104 slot

- Part No. 701 7664

The slave communications interface in the InterBus network independently transfers data between the bus subscribers and the nutrunner control. The process image is held in dual-port memory and is, therefore, directly available to the application.

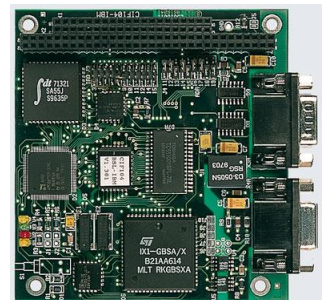


**Interbus board Master**

PC104 slot

- Part No. 701 7665

The master communications interface in the InterBus network independently transfers data between the bus subscribers and the nutrunner control. The process image is held in dual-port memory and is, therefore, directly available to the application.



# Nutrunner Controls

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#### ■ Options

##### For your information:

The following options are already included in the nutrunner control part number.

##### Device Net Slave

Anybus slot

- Part No. 701 7908



The communications module provides optimized connection of our nutrunner control to an automation device. It is typically used where larger amounts of data need to be transferred at high speed. The DeviceNet module supports a bandwidth of max. 256 Byte input and 256 Byte output data, as well as all transfer rates from 125 - 500 Kbit/s. The module offers the complete functional range of a DeviceNet adapter for implicit und explicit messaging and supports UCMM. The DeviceNet interface is completely isolated galvanically. "Polled I/O", "bitstrobed I/O", "change of state" and "cyclic I/O" are all supported. In addition to the standard DeviceNet objects "identity", "message router", "DeviceNet", "assembly", "connection" und "acknowledge handler", the following manufacturer-specific objects are pre-defined: "I/O data input", "I/O data output", "diagnostic", "parameter input", and "parameter output". Two diagnostic LEDs signal the current DeviceNet status and any fault messages. The module is supplied with the mandatory 5-pin DeviceNet threaded terminal clamp.

##### PROFIBUS Slave

Anybus slot

- Part No. 701 7907



PROFIBUS (Process Field Bus) is a universal fieldbus which has broad application in manufacturing and process automation. PROFIBUS enables communication between our nutrunner control and your SPS without the need for special interface adaptation.

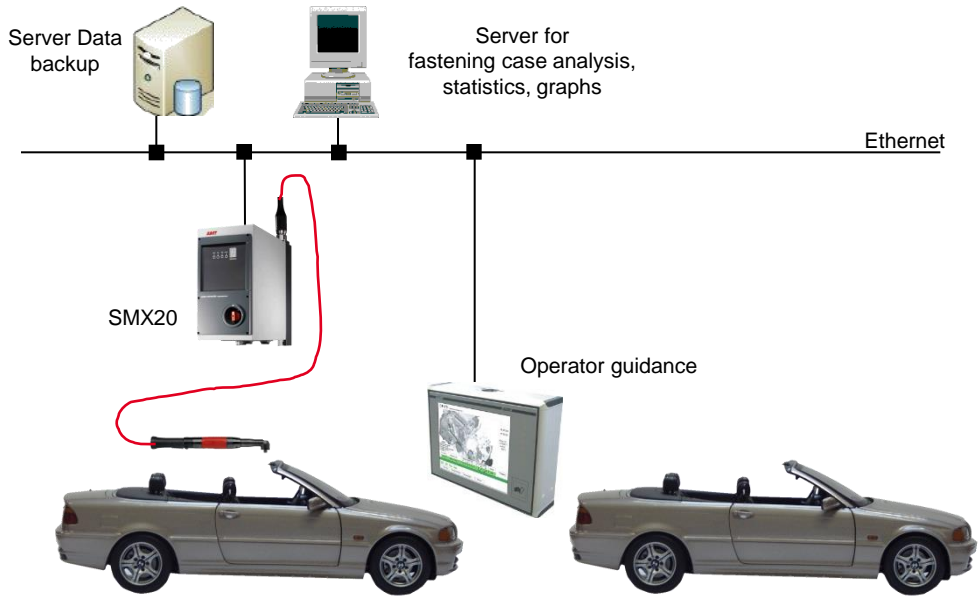
PROFIBUS is suitable for fast, time-critical applications, as well as complex communication tasks. The PROFIBUS Slave board contains bus access authorization, i.e. only received messages are acknowledged or, upon request from the Master, messages can be transmitted. The module supports a maximum PROFIBUS bandwidth of 244 Bytes for cyclic I/O data and additional acyclic data and diagnostic messages. The PROFIBUS transfer speed is recognized automatically in the range of 9.6 Kbit/s up to 12 Mbit/s. Two diagnostic LEDs signal the current DeviceNet status and any fault messages. The bus is connected by the mandatory 9-pin D-Sub jack.

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#### Configuration Examples

■ **SMX20, connected to a customer-supplied graphic display unit**



■ **SMX20 + SMX10, connected to a customer-supplied graphic display unit**

