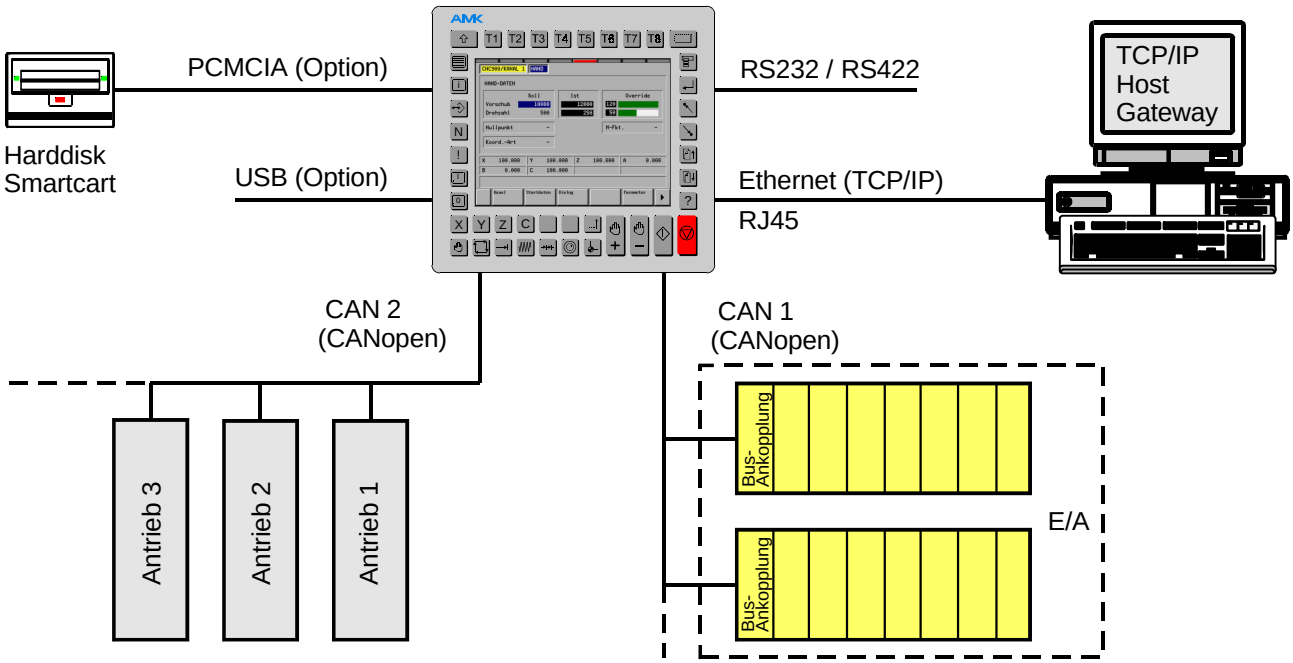
# 1 Compact controls CNC 903 / CNC 905

## 1.1 Introduction

The compact controls CNC 903 / CNC 905 are conceived for the application with CAN Bus. Communicate to they over the CAN Bus with the drives and the I/O bus.
The CNC Control actual in the operating panel integrates. The operating panels have fully graphicable color LC displays and foil keyses with mechanical pressure point.




Interfaces

| | |
|---|---|
| CAN Bus | 1000kbit for CANopen Drives |
| CAN Bus | 500kbit for I/O box bus system according to CANopen Specification |
| Ethernet | (TCP/CIp) RJ45 |
| Serially | RS232, RS422 |
| PCMCIA | e.g. for external hard disk (CNC 905 option) |
| USB | (CNC 905 option) |

## 1.2 Characteristics and functions

### Functions of the control

- Operating system BWO real-time kernel
- Logs TCP/IP stack, CANopen stack
- Soft PLC
- Construction of a simple CNC controller in connection with soft PLC and soft NC
- BWO file server
- Programming of the control surface also PROMA
- Block-by-block reloading with larger programs
- Graphic cycle programming
- Free DLL for the implementation of own programs

### CPU data

| | |
|---|---|
| Static RAM | 512kB |
| Run-time memory DRAM | 16MB |
| Flash-disk-memory for operating system and control surface | 8MB |
| Flag memory | 60kB |
| NC memory | 193kB |
| Remanent flags | 4096 |
| Parameter | 20000 |

### Programmable box bus coupler

| | | |
|---|---|---|
| I/O knot for input/outputs | | 5 |
| with in each case | digital inputs | 64 |
| | digital outputs | 64 |
| | analog inputs | 2 x16bit |
| | analog outputs | 2 x16bit |

## 1.2 Characteristics and functions

| Versions | CNC 903 | CNC 905 |
|---|---|---|
| NC channel | 1 | 1 |
| Axes / Spindles | 4 | 8 |
| Spindle in C axes operation | 1 | 1 |
| Linear interpolation (Axes) | 3 | 3 |
| Cirkular interpolation (Axes) | 2 | 3 |
| Screw interpolation (Axes) | 2+1 | 2+1 |
| Spline interpolation | - | • |
| Polynominal interpolation | - | • |
| Polar transformation | - | • |
| Scara transformation | - | • |

Symboles: • Functions are possible
- Functions are not possible

### CNC Characteristics and functions

- Tangential axis
- Axes couple, reflect and exchange
- Restarting after abort
- Feed, corners, circle and outline dynamics
- Electronic gears and Handwheel
- Polar coordinates system
- Axes simulation
- Coordinates turn, reflect and shift
- Measuring and processing cycles
- Interpolation plane selection
- Tool radius path correction
- Automatic selection of linear and circular interpol.
- Zero points / zero shift
- Outline path short programming
- Parameter calculation
- Diagnostic functions
- Graphic cycle programming
- Graphic simulation

## 1.2 Characteristics and functions

### Operating panel data

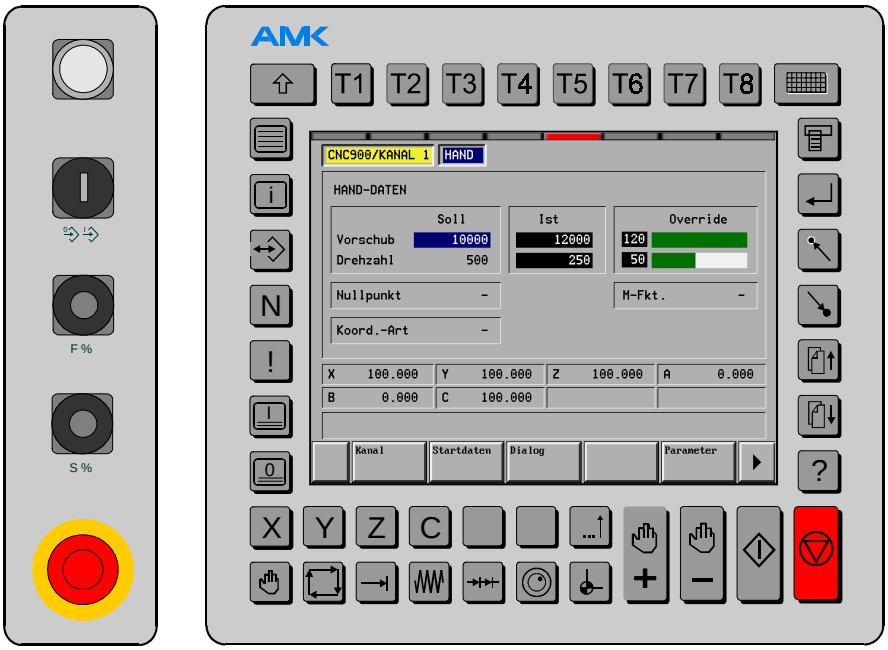
LCD display in TFT version.
Resolution 640 x 480, 256 off 4096 colours
display size with CNC 903 / CNC 905 10.4”
Touch screen with resolution of 1024 x1024

42 function keys, of it 15 freely shapable,
PLC keys with display on LCD display,
Operating voltage 24V
Battery buffer for the clock

### Connections

CNC 903 / CNC 905 on separate machine operating panel
4 Override Potentiometer
1 Handwheel (TTL level cable length 1m, +5V)
1 Key-operated switsch
1 Joystick (in place of 3 override Potentis)

## 1.2 Characteristics and functions




Compact controls CNC 903 / CNC 905 with additional machine operating panel

| | |
|---|---|
| Dimensions (B x H in mm) | 328 x 310 |
| Machine operating panel (option) | 80 x 310 |

## 1.3 Software

### Programming software XPLC

XPLC actual a programming software for the compact controls CNC 903 / CNC 905. The software actual on PC executably.

With XPLC all functions of the control with stored program (PLC) with the compact controls can be taken in operation.

Details in addition in this manual paragraph 4. and 5.

### Standard interface for CNC

The standard adaption contains a list of the free, pre-allocated and reserved flag areas.

Details in addition in this manual paragraph 6.

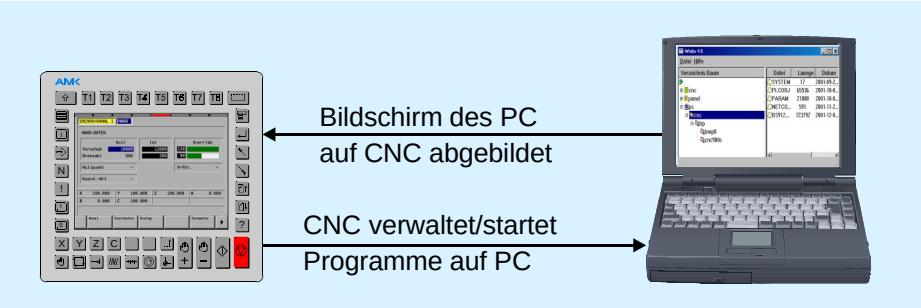
### Programming software NC

With the programming software can NC programs with the available functions in the compact controls be created. Details in addition in the NC manual.

## 1.3 Software

### Operating system management program WINBV

Software on a PC to controlling of the CNC.



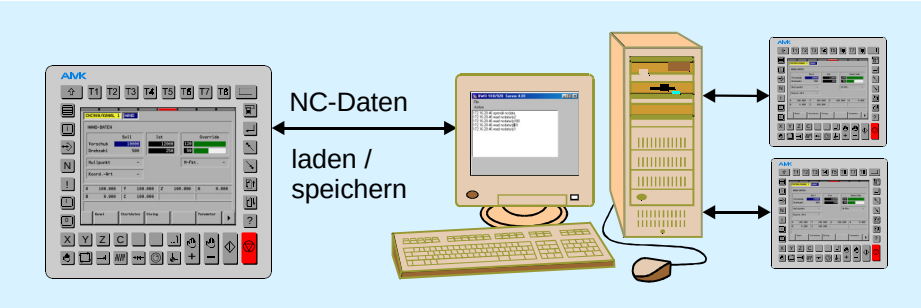

The display of the CNC is illustrated on a PC. The control can be served then from the PC.

Thus can be implemented:
- Diagnosis locally
- On-line remote diagnostics
- Operating system care
- Data adminstration
- Data protection
- NC archiving

Details in addition in this manual paragraph 7.

### Data transfer on one SERVER

Software on a PC for data transfer with the CNC.




By the CNC can be accessed the drive assemblies of a server. Several controls can be connected at a server and load NC data from the server or save on the server.

## 1.4 Notes for the line-up

Memory resets (see the also following pages)

With the line-up and with unclear conditions in the FLASH memory the following steps should be executed:

- Passing through of the switching on check with test parameter: No Restore
  test NC memory: No Restore

Reset parameter and NC memory without store back of machine data and NC programs from the FLASH memory.

- Loading of the machine data (channel descriptors, axis definitions, axis data) over I/O traffic.

- Machine and axis configuration check.

- Memory of the characterized machine data into the FLASH memory of the CPU (see q10).

- System switch off and restart.

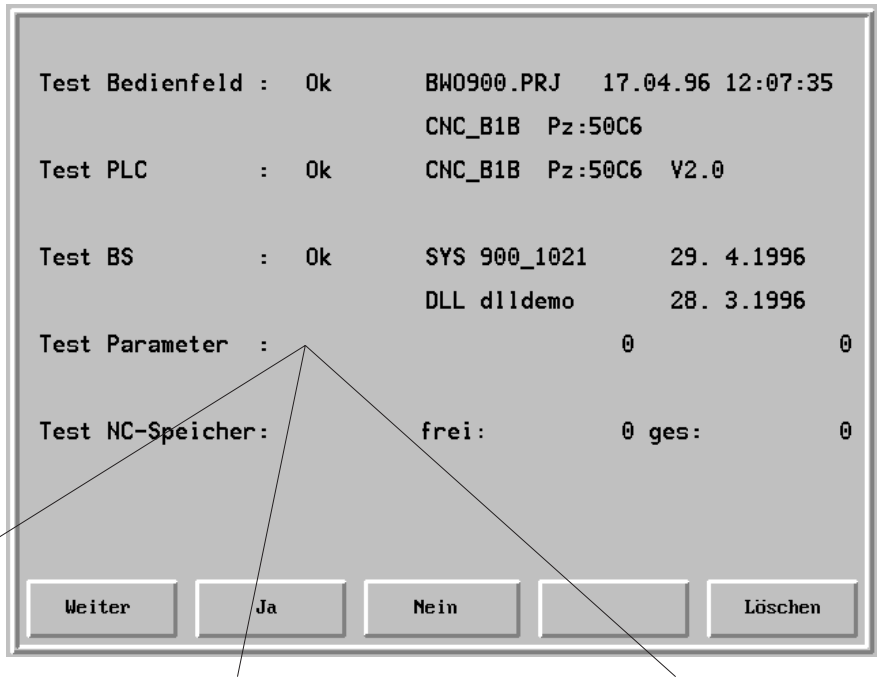
- In the switching on checks in the test parameter ‘ resetting ‘ ‘ input Yes ‘
  and in the test NC memory ‘ resetting ‘ ‘ input Yes ‘.

## 1.4 Notes for the line-up (continuation)

**Test parameter**

Possible internal messages with the passing through of the switching on checks with the displays of ‘ ok ‘ or ‘ defect ‘:

- ‘ far ones ‘
- ‘ resetting ‘ with Restore
- ‘ resetting ‘ without Restore




Display **Ok**

Key of ‘ far ones ‘ (F1) press

Effect:
- The parameter values remain received.

- Machine data becomes from THE FLASH memory not loaded.
- Channels and channel descriptor are defined in accordance with parameter value.

Display **Ok / Defect**

Key (reset) press
**Reset??**

Key ‘ Yes ‘ (F2) press

Effect:
- The total parameter memory is cleared.
- Parameter basic adjustment one executes.
- Machine data becomes from the FLASH memory loaded (Restore) (q10).
- Channels and channel descriptor are defined in accordance with parameter value.

display **Ok / Defect**

Key (reset) press
**Reset??**

Key (picture off) press
**NO Restore??**
Key ‘ Yes ‘ (F2) press

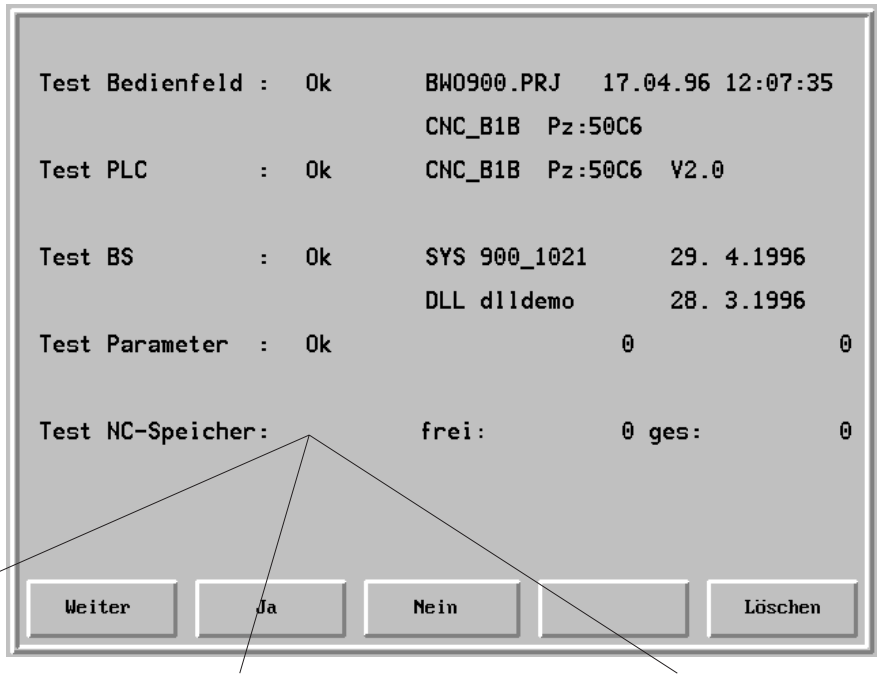
Effect:
- The total parameter memory is cleared.
- Parameter basic adjustment one executes.
- Machine data becomes from the FLASH Memory not loaded (No Restore).
- channels and channel descriptor are defined in accordance with parameter reason in position.

## 1.4 Notes for the line-up (continuation)

**Test NC memory**

Possible internal messages with the passing through of the switching on checks with the displays of ‘ ok ‘ or ‘ defect ‘:

- ‘ far ones ‘
- ‘ resetting ‘ with Restore
- ‘ resetting ‘ without Restore




display **Ok**

Key of ‘ far ones ‘ (F1) press

Effect:

- the NC programs remain received.

display **Ok / Defect**

Key  (reset) press
**Reset??**

Key ‘ Yes ‘ (F2) press

Effect:

- the total NC memory one resets.
- NC programs become from the FLASH memory into the NC RAM memory loaded (Restore) (see also q10).

display **Ok / Defect**

Key  (reset) press
**Reset??**

Key  (picture off) press
**NO Restore??**

Key ‘ Yes ‘ (F2) press

Effect:

- the total NC memory one resets.
- NC programs become from the FLASH Memory <u>not</u> into the NC RAM memory loaded (NO Restore), (see q10).

NC memory remains empty.