

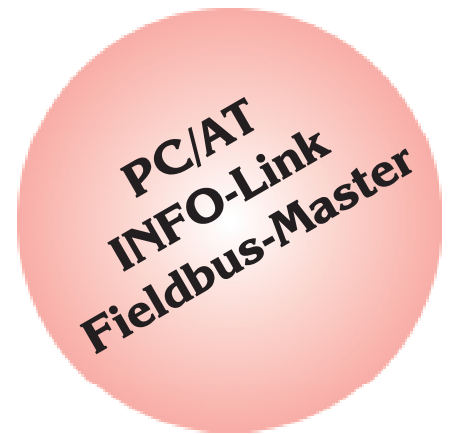
INFO-Master for PC/AT



The INFO-PCMaster-Card equals the Fieldbus-Master via an INFO-Link. It is available as ISA-Bus Plug-In Card and can be operated without special Driver in any Personal (PC) or Industrial Computer (IPC). The Master's Center is built by the 32/16Bit CPU NS32FX16-25 MHz with Floating Point Unit. The Master's Real Time Multitasking Operating System takes care of the Machine's/Unit's whole Control System. This means that the Master works

completely autonomous and the Processor Capacity of the PC/IPC is not affected. Thanks to this Separation, the PC can be used for higher-ranked functions such as Visualization and Operating-Data-Registration. The Master's Programming is performed with the proven INDEL-Multitask-System ISM 6.0. Thanks to the INFO-Master Cards, up to 250 INFO-Modules can be connected to each PC/AT via Optical Fibers (OF).

INFO-PCM



Technical Data

Operating System

- Multitasking Operating-System
- Real-Time capable

32/16-Bit CPU

- National NS32FX16-25MHz
- Floating Point Unit NS32081-25MHz
- 15 or 25MHz Clock Speed

Memory / Interfaces

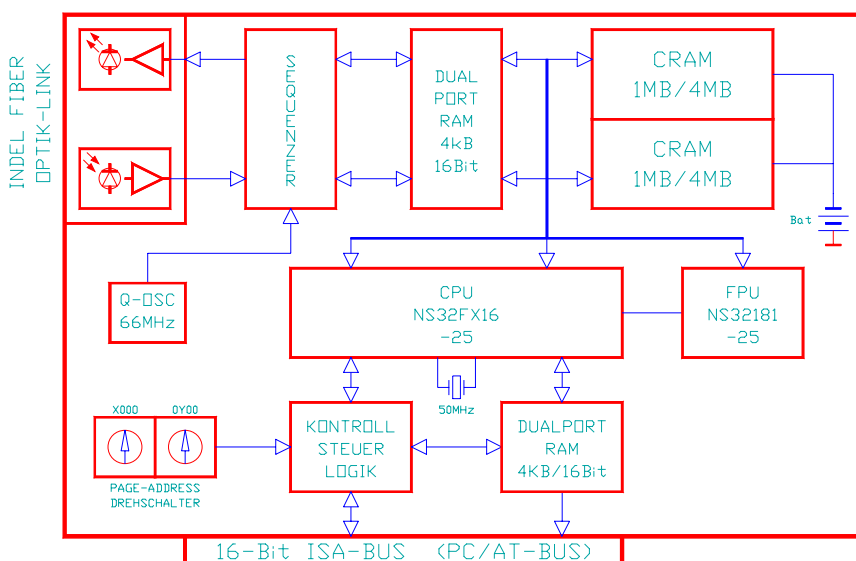
- 256kByte CRAM Battery buffered
- extendable up to 1MByte
- 4kByte Dualport RAM as Interface to the PC/AT
- 4kByte Dualport RAM as Interface to the INFO-Link

INFO-Link

- Fiber Glass Medium
- Ring-Topology with deterministic Access-Time
- 11MBit/s Transmission-Rate
- up to 250 Fieldbus-Knots
- Link-Cycle-Period: 1ms (250 Participants)

PC-Interface

- 16-Bit ISA-Bus



Function

The Master's Structure

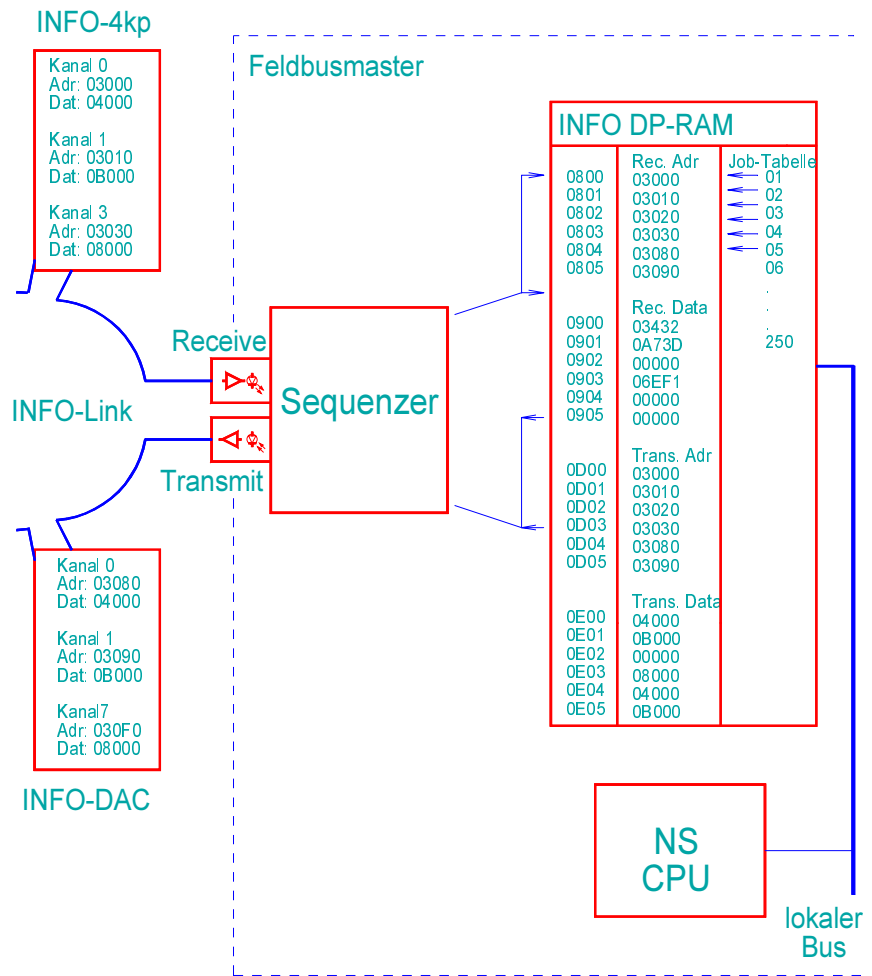
The Fieldbus-Master disposes of two Interfaces as Dualport-RAMs in order to communicate with the PC and the Fieldbus.

Incoming and Outgoing Address- and Data-Words of single Fieldbus-Knots as well as a Job-Table are located in the INFO DP-RAM between Fieldbus and Master. Every Fieldbus-Participant occupies one single or several addresses and one single or several Jobs. An INFO-4 KP-Card, for example, occupies one Address and one Job for each Channel. The Sequencer-Logic, implemented with Hardware, is working off the max. 250 Jobs and is then sending addressed Telegrams to the existing Bus-participants. This Process is carried out processor-independent and does not reduce the CPU-Capacity. To address a 16-Bit Participant, the Sequencer needs only 4µs, in case of a 32-Bit Participant only 6µs. All max. 250 Participants are addressed once during the Bus-Cycle-Period of 1 ms!

Data-Processing

The incoming Process-Data like Temperatures, Values of Incremental Decoders, analogous Measuring-Values and so on are directly processed by the Master's Operating-System. The automatic Offset- and Fullscale-Correction as well as the Conversion in the corresponding Unit is carried out by the Master for all analogous Values. Temperature-Measuring-Values are sensor-specificly linearized and converted in degrees Centigrade. Also Increments of Position-Cards are converted in degrees, meters or mm. The whole Process-Image, including Configuration Parameters, is prepared in the 4kByte PC Dualport-RAM which represents the Interface to the PC. The Configuration-Data is available via the name-based Operating-System. A Memory-Range of 2kByte of the DP-RAM is reserved for the Data-Transmission to the Visualization. The PC can always access the actual Process-Image. Via DLL, the Master can be addressed with any higher Programming-Language.

Bloc Circuit-Diagram



Functioning of the Sequencer

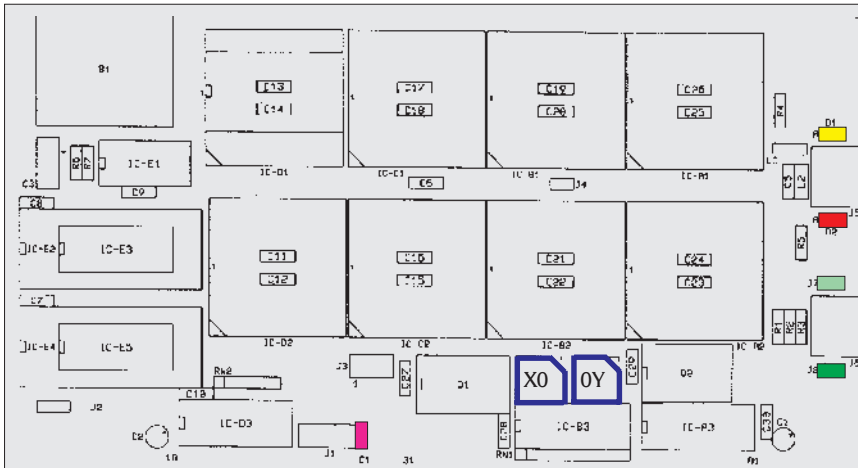
Regulations

The PC-Master is capable to take care of high-performing and very quick Regulation Tasks: The Firmware controls up to 8 Axis (Sampling Rate 4ms) with trapezoid Profiles by standard. The Sampling Rate can be reduced to 2ms by standard, if only 4 Axis should be regulated. Also Special-Functions like Temperature-Regulation can be added.

Operating-System

The Multitasking Operating-System can work off 32 different Tasks in parallel and in real-time kind. In case of time-critical and complex Units, the Master ideally controls all the Machine-Processes while the PC/IPC takes care, for example in WINDOWS95/NT, of the Visualization and the Operating-Data-Registration. The Programming of the Master is performed in the proven INDEL Multitask-System ISM 6.0.

Equipment



Jumper (green)

The two Transmitter-Jumpers influence the Sending-LED's Shining-Intensity and therefore the length of the Light-Path up to the next Card.

In order to adapt the Sending-Light-Intensity correctly to the Cable-Loss, the Jumpers are plugged as follows:

Segment-Length	Jumper-Position
0 ... 10m	no Jumper
8 ... 30m	> 10 (light green)
20 ... 50m	> 30 (green)

The exact Moment of Re-Plugging also depends - among other Items - on the Number and the Tightness of the Bending-Radiuses in case of Cable-Laying. To be sure whether the Light-Intensity has enough capacity, a Light-Amount-Measuring-Device can be used.

For a quick Result, just bend the OF for 180° around your finger in every Section (Diameter 15...20 mm). This causes an additional Dampening the Link has to run on with, but without the Error-Counter counting on (see Software Operating Instructions).

A Light-Amount-Measuring-Device is provided for the INFO-Link and assists with the Verification of the individual Sections, especially in cases where the OF are laid in inaccessible Channels.

LEDs at the Receiver Module:

LED-Red	=	+5V Supply
LED-Yellow	=	INFO-Link Receiver-Signal OK; lights in case of every Telegram that is determined to this Module

Customer specific Modifications are always possible.

Specifications

Supply

+5V, 820mA max.

Cooling

- The Card produces approx. 4W Power Dissipation. An additional Cooling is not required.

Climatic conditions

- ambient-temperature: bearing: -20...+80°C
- operating: 0 ... +45°C
- card temperature operating: 0...+70 °C
- relative humidity no condensation: 95%

Standard-Version

- NS32FX16-25MHz CPU with Floating Point Unit
 - 256kByte CRAM with Battery
- With the Standard-Version, all Special Functions, such as Motor Controlling and so on, can be operated.

Options

- 1MByte CRAM

Interrupt (violet)

The INFO PC-Master can, for Special Functions via Dualport RAM, initiate an Interrupt in the PC. This can, by means of a Jumper (light green), be switched to IRQ 5, 7, 10, 11, 12 or 15.

Addressing

The Address XY00 (blue) is adjusted by the Rotary Switches X and Y, for example CE00. The Card occupies an 8kByte Address-Range. If there are used virtual Memory-Managers (for example QEMM, 386MAX or WINDOWS), this Range must be left out of consideration.

Installation

- 16-Bit ISA-Bus-Plug-Plate PC/AT
- half size PC/AT Plug-In-Card
- 107 x 190mm

Battery

- Service Life of 5 Years assured.

INFO-PCM

INFO-Master for PC/AT

INFO-Link

INFO-Link

The INFO-Link-Connection is identical respective to all INFO-Cards. The TOS-Link Module with the two Jumpers is always the Transmitter, the Module with the two LEDs the Receiver.

Structure

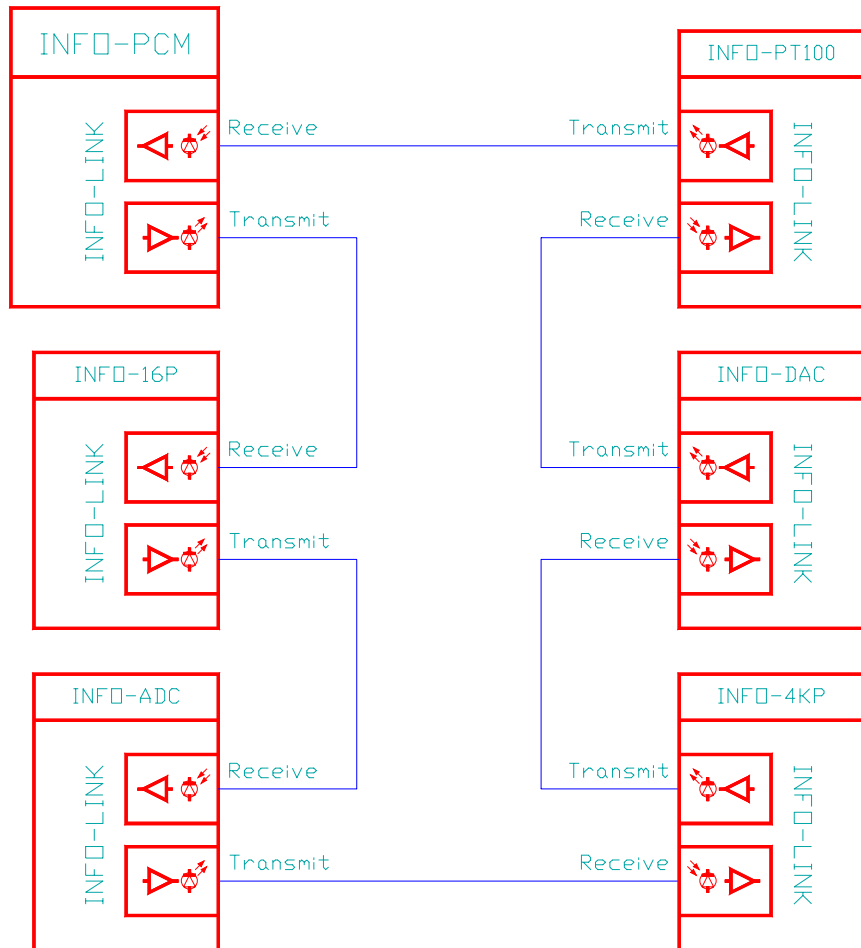
The PC-Master and the available INFO-Cards (Slaves) are to be connected serially according to the Connecting-Example. The Sequence of Slave Numbers at the INFO-Link is freely selectable.

OF (Optical Fiber)

The APF-Fiber (all plastic fiber) can be used as Fieldbus-Cable up to a max. Line-Length of 30...50m in case of Standard Design. When special PCF-Fiber (plastic cladding silica fiber) is applied, the Transmission-Distance can be up to 1000m. But at a length of more than 100m, the INFO-Modules must be equipped with special TOS-Link Transmitter-Modules that operate in the invisible Infrared-Range.

When the Cable-Channels are opened or closed, you have to make sure that the Bending-Radiuses of the laid OF are not tightened again. As optimal Protection, general Pneumatic Hoses, covering the OF, are recommended.

Connecting Example



Troubleshooting

Error

Because all INFO-Modules are arranged in Series Connection, the Link is interrupted as soon as a Module is without Power Supply. You therefore have to make sure that all Cards are delivered with Power (the red LED at the Receiver-Module must shine).

Some INFO-Modules of former Sets (for example INFO-16P, INFO-4KP) have integrated Safety-Devices. If these are fused, an LED lights below the defective Safety-Device. If necessary, remove the covering to find out whether a Safety-Device has failed.

If the Master is active (TRANS is completed successfully), it continuously sends Data through the INFO-Link. To find out whether the Master is active and operates correctly, link the Master-Transmitter directly to the Master-Receiver with an Optical Waveguide. (Remove the Transmit-Power-Control-Jumper if the OF is shorter than 10m.) Now the yellow LED on the Master must shine.

Plug the first INFO-Card in the OF now and set the Transmit-Power-Control-Jumper according to the OF-Length. If this Module is correctly addressed by the Master, the yellow LED must light here too.

Plug all other INFO-Modules in the OF accordingly until all Modules are working and the last yellow LED shines in the circle as well as on the Master. Now the Link is completely set and OK.

Obviously, the Link is closed and OK. Either your Module is not plugged in this circle or it is not addressed by the Master. Check whether the Card-Type and the Address-Switch correspond to your Configuration in the Config-File. In case of customer-specific Cards, the corresponding Software must be loaded in the Master too.

A Sequence that is located in your Link can obviously be disturbed. Mostly, the Cause is a Lack of incoming Light at the Receiver's, but sometimes there also can be too much Light. Check first, in any case, if the Transmit-Power-Control-Jumpers are correctly adjusted on all INFO-Modules as well as on the Master and if there is enough Light Capacity available (see page 3).

Electrically spoken, the Receiver is the most sensitive Part on every INFO-Module because here, the Light-Pulses are transformed in Currents of only a few pA. Even though the INFO-Module's Casing is built of especially shielding, ferruginous plastic-material, unfavourably arranged Relays or Contactors with Contacts may disturb the Receiver. Keeping Distance and using earthed shielding Plates are the best Measures in this case. (See also INDEL Wiring and Installation Instructions.)

Red LED does not shine

Yellow LEDs do not shine

Yellow LED shines at the Master but not at the external Module

Error- or LinkDown-Counter counts