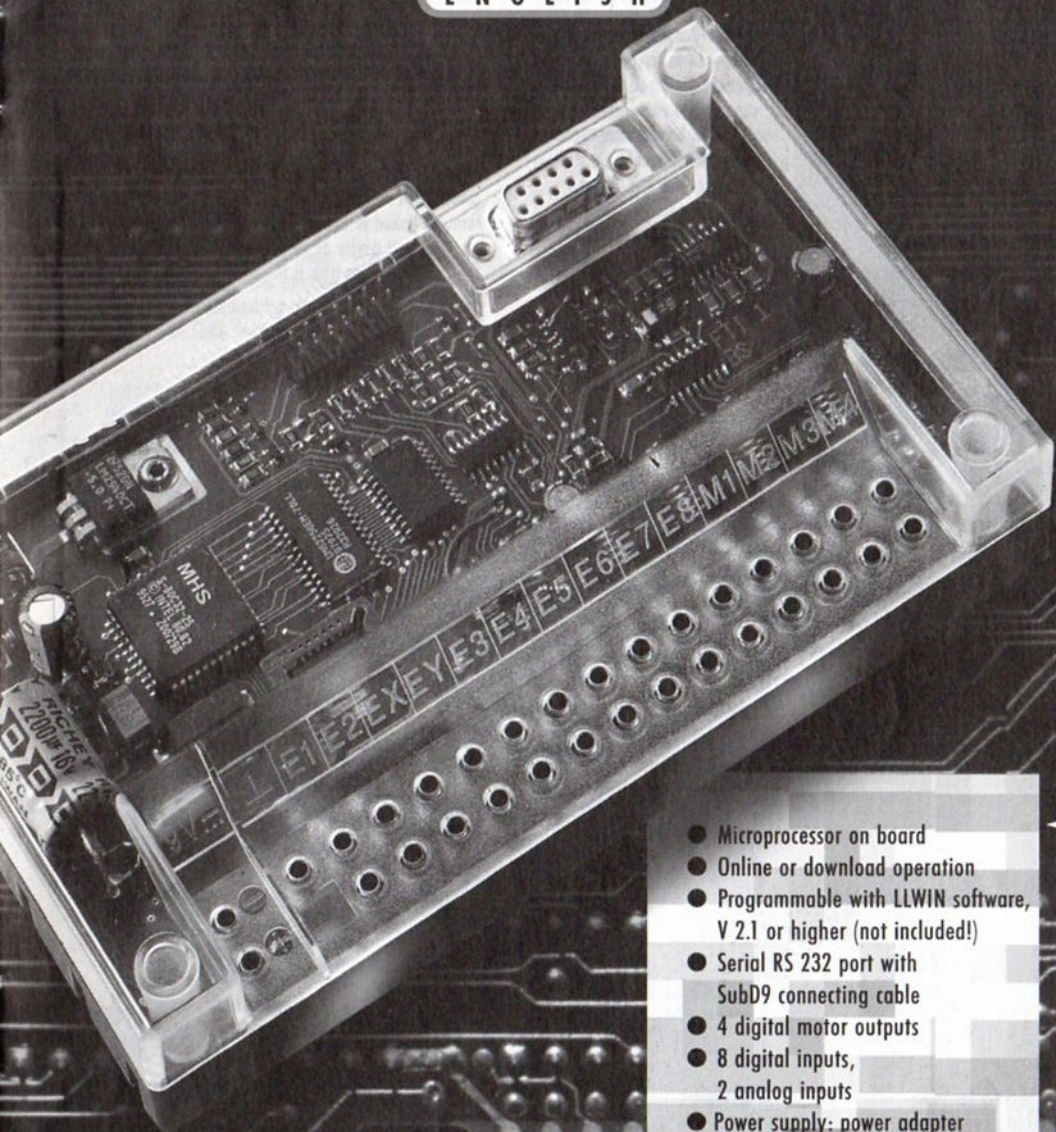


Intelligent Interface

ENGLISH



- Microprocessor on board
- Online or download operation
- Programmable with LLWIN software, V 2.1 or higher (not included!)
- Serial RS 232 port with SubD9 connecting cable
- 4 digital motor outputs
- 8 digital inputs, 2 analog inputs
- Power supply: power adapter 9V \approx /1000mA or battery pack (not included!)

fischertechnik[®] 

CONTENTS

- 1.0 "Intelligent Interface"
- 2.0 Connections
- 3.0 Functional Description
- 3.1 Circuit Diagram
- 3.2 Microprocessor
- 3.3 EPROM
- 3.4 RAM
- 3.5 Input Shift Register
- 3.6 Output Shift Register
- 4.0 Important Notes

1.0 fischertechnik "Intelligent Interface"

● In order to use a computer to control fischertechnik models, you need both an appropriate controlling software and an interface that forms the link between your computer and the fischertechnik model. The interface converts the software commands so that, for example, motors can be started and signals from sensors can be processed.

The interface is equipped with four digital outputs to which motors, lamps, or electromagnets can be connected, as well

as eight digital inputs and two analog inputs to which sensors such as switches, phototransistors, Reed contacts, or NTC resistors can be connected.

The fischertechnik "Intelligent Interface" has its own microprocessor. Connection to your PC is via a serial port. Programs created on the PC can be loaded to the interface's microprocessor, where they can be processed independently of the computer (in the so-called "active" mode). In this way, there is no cable to the PC to limit the motion of mobile robots. When controlling a stationary model such as an arm or a plotter, the model remains linked to the PC, that can then act as the input/output device as well as a display device for variable values (this is the so-called "passive" mode).

2.0 Connections

Power Supply

Power can be supplied by either a fischertechnik power adapter (9V=1000 mA) or the "Power-Block" battery pack,

containing 6 round cells (batteries or accumulators). When a power adapter is connected to the DC socket (+terminal on the inside), the power circuit at the battery connection sockets is automatically interrupted. When the interface has been correctly connected to the power supply, the red LED goes on.

Serial Interface

Connection to the PC is via a serial, RS 232 port with a SubD9 pin connection.

Connect the (supplied) interface cable to one of your PC's open serial ports (e.g., COM1 or COM2).

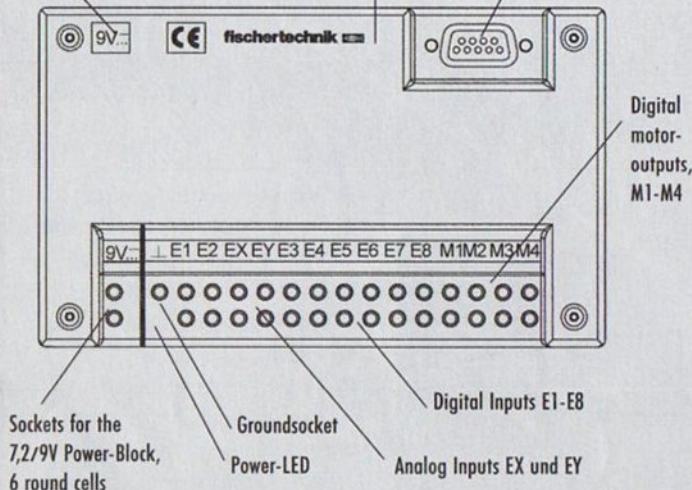
Note:
If your PC is equipped with COM ports with a 25 pin SubD socket, your computer retailer will be able to provide you with an adapter plug.

DC-Socket (+ terminal on the inside) for power supply or 9V =/1000mA power pack

14-pin terminal strip for an expansion module

Serial port to PC RS 232, SubD9 connector

Digital motor-outputs, M1-M4



Digital Outputs M1 - M4

You can connect 4 motors (forward, reverse, off), electromagnets, or lamps to the four digital outputs, M1 - M4.

Continuous current: 250 mA; current limit: 1A; short-circuit protection.

Digital Inputs E1 - E8

These digital inputs are used to connect sensors (e.g., switches, phototransistors, reed contacts).

Voltage range: 9V= (6-12V=)

Analog Inputs EX and EY

You can use the analog inputs to connect potentiometers or heat and brightness sensors. These inputs are designed for resistance measurements from 0 to 5k Ω . The connected resistance load is

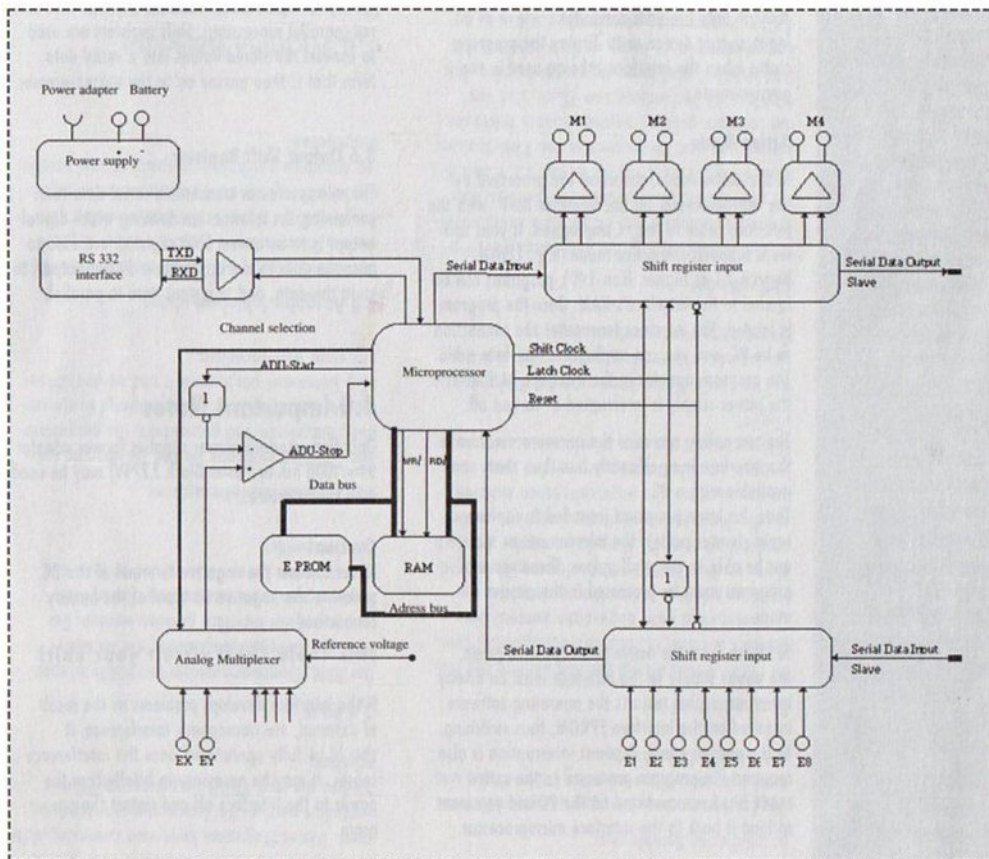
converted into a numeric value between 0 and 1000. The scan rate is 20 ms. The inputs provide an accuracy of approx. 0.2%.

Expansion of the Digital Inputs and Outputs

An expansion module (slave module) that doubles the number of available inputs and outputs can be connected to the 14 pin terminal strip. To do this, unscrew the interface cover. The number of analog inputs cannot be increased. The expansion module should be available by August, 1998.

3.0 Functional Description

3.1 Circuit Diagram



Warranty Terms:

The interface is covered for a period of 6 months after purchase, subject to the following warranty terms and conditions: fischertechnik shall, at no charge to the purchaser, rectify any problems arising from faulty materials or manufacturing errors. Operational problems or damage resulting from improper use are not covered by this free warranty die. The decision of whether to replace the malfunctioning part or replace the unit as a whole will be solely made by fischertechnik. No additional claims are possible. The warranty can only be utilized upon presentation of the receipt of purchase.

In case of technical problems, please contact your local supplier or

fischertechnik
Service
P.O. Box 1152
D-72176 Waldachtal
Germany

Phone:
0 74 43/12-43 69
Fax:
0 74 43/12-45 91

E-Mail:
fischertechnik
@t-online.de

3.2 Microprocessor

The microprocessor is the central control unit of the interface. It carries out the commands stored in RAM and in the EPROM.

The processor has two operating modes known as the "passive" and the "active" mode:

Passive Mode

In the passive mode, the PC performs the actual processing of a program. The interface cable cannot be unplugged from the computer. During each program cycle, the interface gathers the values received at the analog and digital inputs and sends them to the PC. The computer then returns the values for the digital outputs to the interface. The microprocessor on the interface then switches the connected motors, lamps, or electromagnets on or off, as required.

You can only use your computer's screen as an input/output device or to display the program status when the interface is being used in the passive mode.

Active Mode

In the active mode, programs are processed by the microprocessor on the interface itself, with the interface cable to the PC unplugged. If your software supports the active mode (e.g., LLWIN, Version 2.1 or higher, iCon-L[®]), programs can be loaded to the interface's RAM. Once the program is loaded, the interface terminates the connection to the PC, and you can unplug the interface cable. The program remains in the interface RAM until the power supply is interrupted or turned off.

The computing power of the microprocessor on the interface is significantly less than that available with a PC.

Thus, for large programs intended to capture rapid counter pulses, the microprocessor may not be able to count all pulses. These types of programs must be processed in the passive mode.

To switch from the active to the passive mode, the power supply to the interface must be briefly interrupted. This restarts the operating software installed on the interface EPROM, thus switching to the passive mode. A power interruption is also required if a program processed in the active mode has been modified on the PC and you want to load it back to the interface microprocessor.

3.3 EPROM

The EPROM (32 KB fixed value memory) contains the operating software for the microprocessor. This program is not accessible to the user for modification. Any data stored in the EPROM remain intact, even in case of a power interruption.

3.4 RAM

The RAM (32 KB program memory) stores the application programs loaded to the interface in the active mode. If power is interrupted, data stored in the RAM will be lost, and must be reloaded.

3.5 Input Shift Register

All digital inputs are simultaneously read and stored (parallel processing). Shift registers are used to convert the stored values into a serial data term that is then passed on to the microprocessor.

3.6 Output Shift Register

The microprocessor transmits a serial data term containing the information defining which digital output is to be active. Shift registers are used to pass the data to the appropriate digital output, to store the data, and to output data in parallel.

4.0 Important Notes

Only fischertechnik power supplies (power adapter 9V=1000 mA or Power-Block 7.2/9V) may be used with the interface.

Caution!

Never connect the negative terminal of the DC socket to the negative terminal of the battery connection!

This could short circuit your unit!

If the interface develops problems as the result of external, electromagnetic interference, it should be fully operational once the interference ceases. It may be necessary to briefly turn the power to the interface off and restart the program.