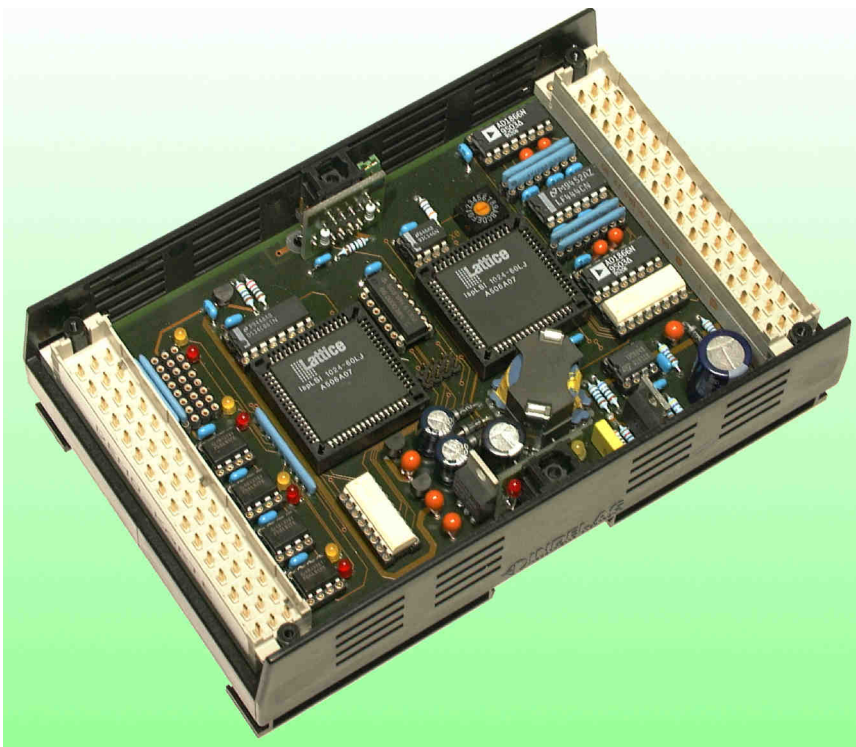


Synchronous Serial Interface

INFO-SSI



**Position Control
Ramp Profiles
Reference Runs
Trajectory Runs**

Technical Data

Sampling rate

- Standard:

| | |
|---------|-------|
| 64 axes | 4ms |
| 32 axes | 2ms |
| 16 axes | 1ms |
| 8 axes | 0.5ms |
- Shorter sampling rates or more axes are possible.

4 SSI channels (Variant 1)

- RS422, TTL or 15..24V
- 24-bit standard telegram
- 16 are evaluated

2 SSI channels (Variant 2)

- RS422, TTL or 15..24V
- 24-bit standard telegram
- 24 are evaluated

4 DAC outputs

- for analog controller activation
- $\pm 10V$ with 0.3mV resolution

4 outputs

- Controller enable
- 24V/10mA individually isolated

5V power supply

- for 4 absolute encoders
- 4 x 50mA max.

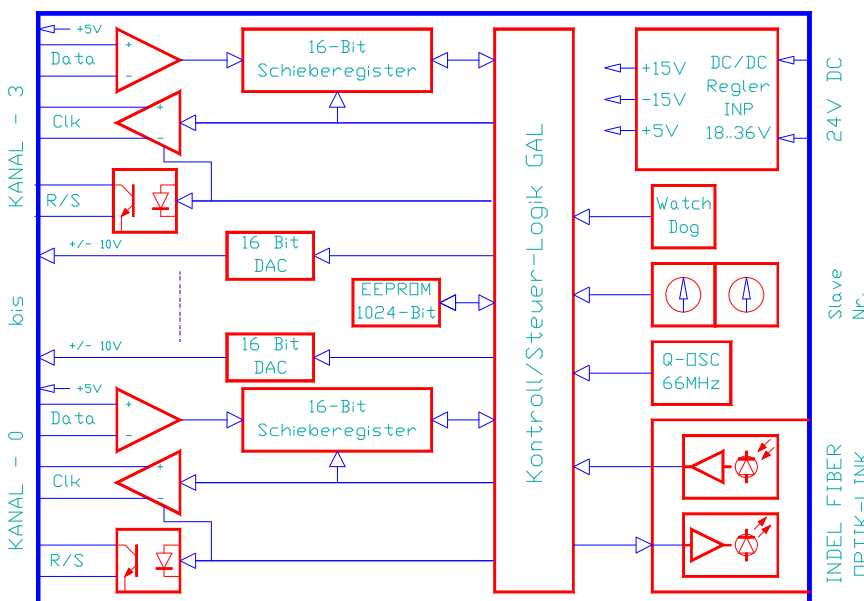
The INFO-SSI is the field bus node for high-precision and very fast positioning and control tasks with absolute path information.

The board is available as required with 4 channels including 16 bit path information, or with 2 channels including 24 bit path information.

An Intel-Master with the PowerPC

RISC-CPU controls up to 64 axes, in addition to performing all the machine control functions. The positioning board is a pure peripheral board, i.e. the control algorithms requiring much computing power are performed by the firmware in the INFO-Master.

The firmware also performs the conversion of increments to $^{\circ}$, m or mm.



OrderNo INFO-SSI 609520000
OrderNo INFO-SSI 609520001-24Bit

Mode of Operation

The INFO-SSI board can activate up to four absolute encoders with a synchronous serial interface.

The board is connected through a fiber-optic line to the INFO-Master in the PC. This minimizes the wiring requirement and also interference.

In addition, four DAC outputs with $\pm 10V$ output voltage and 16-bit resolution (0.3mV/bit) are available, e.g. for control systems.

The four SSI interfaces each have a data input which can be configured as required for TTL, Bipolar (RS422) or 15V. Setting is done by replugging the termination resistors.

The clock is also generated on board and is available as an RS485 signal.

Variant 1

Transmission rate: 250kBaud
Resolution: 16Bit
Channels: 4

The bottom 12 bits of the value contain the absolute position, the top 4 bits contain the number of revolutions of so-called multiturn encoders.

Variant 2

Transmission rate: 400kBaud
Resolution: 24Bit
Channels: 2 (channel 0, 2)

Through another signal, it is possible to switch certain encoder types between incremental and absolute operating modes. For this purpose, however, an INFO-4KP is required in parallel to this board.

Connector Allocations

| | d | | b | | z | |
|----|---|----------|---|----------|---|--------|
| 2 | O | + Vout 0 | O | + Vout 0 | | Shield |
| 4 | O | - Vout 0 | O | - Vout 0 | | Shield |
| 6 | O | + Vout 1 | O | + Vout 1 | | Shield |
| 8 | O | - Vout 1 | O | - Vout 1 | | Shield |
| 10 | O | + Vout 2 | O | + Vout 2 | | Shield |
| 12 | O | - Vout 2 | O | - Vout 2 | | Shield |
| 14 | O | + Vout 3 | O | + Vout 3 | | Shield |
| 16 | O | - Vout 3 | O | - Vout 3 | | Shield |
| 18 | O | KC0 | O | KE0 | | GND |
| 20 | O | KC1 | O | KE1 | - | 15 V |
| 22 | O | KC2 | O | KE2 | + | 15 V |
| 24 | O | KC3 | O | KE3 | | GND |
| 26 | | GND | | | | |
| 28 | | GND | | | | |
| 30 | | + 24 V | | | | |
| 32 | | + 24 V | | | | |

Connector 1

vertical
DIN41612, Type F-48
2.8mm pins

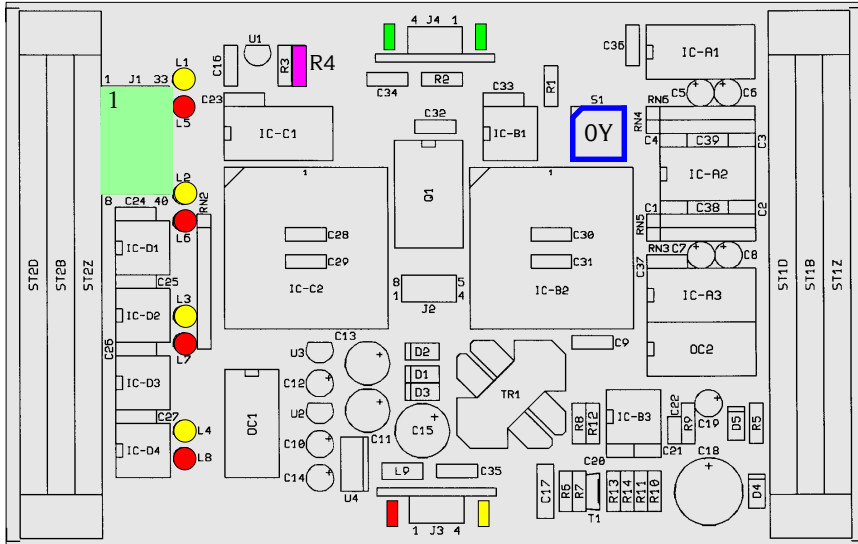
| | d | | b | | z | |
|----|---|--------|---|----------|---|----------|
| 2 | | Shield | O | - CLK 0 | O | + CLK 0 |
| 4 | | Shield | I | - DATA 0 | I | + DATA 0 |
| 6 | | Shield | O | GND | O | + 5 V |
| 8 | | Shield | O | R/SE 0 | O | R/SC 0 |
| 10 | | Shield | O | - CLK 1 | O | + CLK 1 |
| 12 | | Shield | I | - DATA 1 | I | + DATA 1 |
| 14 | | Shield | O | GND | O | + 5 V |
| 16 | | Shield | O | R/SE 1 | O | R/SC 1 |
| 18 | | Shield | O | - CLK 2 | O | + CLK 2 |
| 20 | | Shield | I | - DATA 2 | I | + DATA 2 |
| 22 | | Shield | O | GND | O | + 5 V |
| 24 | | Shield | O | R/SE 2 | O | R/SC 2 |
| 26 | | Shield | O | - CLK 3 | O | + CLK 3 |
| 28 | | Shield | I | - DATA 3 | I | + DATA 3 |
| 30 | | Shield | O | GND | O | + 5 V |
| 32 | | Shield | O | R/SE 3 | O | R/SC 3 |

Connector 2

vertical
DIN41612, Type F-48
2.8mm pins

Assembly

Assembly diagram



Addressing (blue)

| | | |
|---------|----------|-------------------------------|
| S1 (0Y) | Axis | The address switch S2 |
| 0 | 0 bis 3 | is not assembled as standard. |
| ... | | |
| F | 60 to 63 | |

LED

Per channel, 2 LEDs are included, which signalize the following functions:

| | <i>Variant 1</i> | <i>Variant 2</i> |
|---------|------------------|--|
| Red: | Channel active | Free output (see software description) |
| Yellow: | SSI-Enable | Free output (see software description) |

LEDs at receiver module

| | | |
|------------|---|------------------------------|
| LED-red | = | +5V power supply |
| LED-yellow | = | INFO-Link receiver signal OK |

Reference (violet)

The resistor R4 determines the switching threshold in TTL, 15V operation of the SSI inputs (see interfaces, p.5).

Jumpers (green)

The jumpers influence the illumination intensity of the emitting LED and thereby the segment length of the fiberoptic cable to the next board.

| Segment length | Jumper position |
|----------------|-----------------|
| 0 ... 10m | no jumper |
| 8 ... 30m | > 10 |
| 20 ... 50m | > 30 |

Resistor array (light green)

The resistor arrays are used for configuring the input voltage of the encoders. (See p.5)

Specifications

Power supply

+18..36V, ___mA

Climatic conditions

- Ambient temperature:
 - Storage: -20...+80°C
 - Operation: 0 ... +45°C
- Board temperature:
 - Operation: 0...+70 °C
- Relative air humidity
 - no condensation: 95%

SSI inputs

- RS422, TTL or 15 ... 24V
- 250 kBaud read rate
- 24-bit standard telegram
- RS422 with 330Ω termination
- TTL with 2.3V switching threshold
- +15V with 3.5V switching threshold

Clock output

- RS485 signal
- 250kHz clock rate (Variant 1)
- 400kHz clock rate (Variant 2)

DAC outputs

- ±10V / 16-bit
- Resolution 300µV/bit
- Precision better than 10mV
- Offset and gain correction in EEPROM (no potentiometers)
- Offset drift max. -1.8mV/degree
- Gain drift max. ±0.15%/degree
- Internal gain, offset drift and error of the motor end stage are automatically balanced by a software function in position control.

Enable outputs

- Outputs:
 - $V_{off} = 48V$, $I_{on} = 10mA$

5V power supply

- Power supply for absolute encoder
- 5V ±5%, 200mA max.

Mounting

- Connector DIN 41612, Type F-48
- 35mm DIN bar mounting
- Dimensions:
 - 165 x 105 x 45 mm (LxWxH)

Connections

Board power supply

For the board power supply, a 3-phase rectifier without electrolytic capacitor will suffice. But in order to prevent interference, an electrolytic capacitor of 4,700 ... 10,000µF is recommended. The 24V power supply must pass through a line filter.

Shielded lines

It is essential to connect the SSI encoder and its 5V power supply through shielded lines and, wherever possible, with differential signal (RS422).

The DAC output must also be connected through shielded lines to the motor power section.

The shields to the motor controller and the SSI encoder must always be connected at both ends. In order to prevent undesired leakage currents through the shield, it may be necessary to provide a bonding conductor, especially in case of large distances or with different power supplies.

If frequency converters are applied, their motor leads should if possible be installed shielded.

Power supply of the SSI encoders

The DC/DC converter on the board also provides the +5V power supply to the SSI encoders.

This eliminates the need for a special power supply for these transmitters.

Grounding

The INFO-SSI is grounded through the housing. The motor controller must be separately grounded. Make sure that the mounting bar has very good contact with the mounting plate or the chassis to allow interference to be discharged. SSI encoders are often mounted directly on the motor. It is essential to also ground this motor-encoder combination, as otherwise the encoder electronics will be exposed to interference by the motor current.

Connection Example

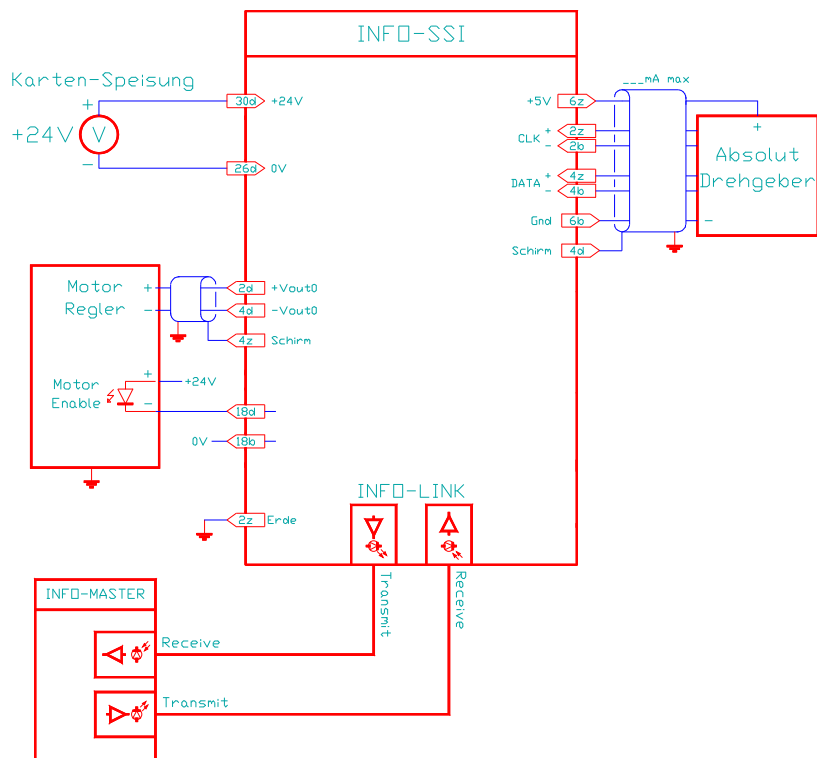


Fig. 1: Connection example INFO-SSI

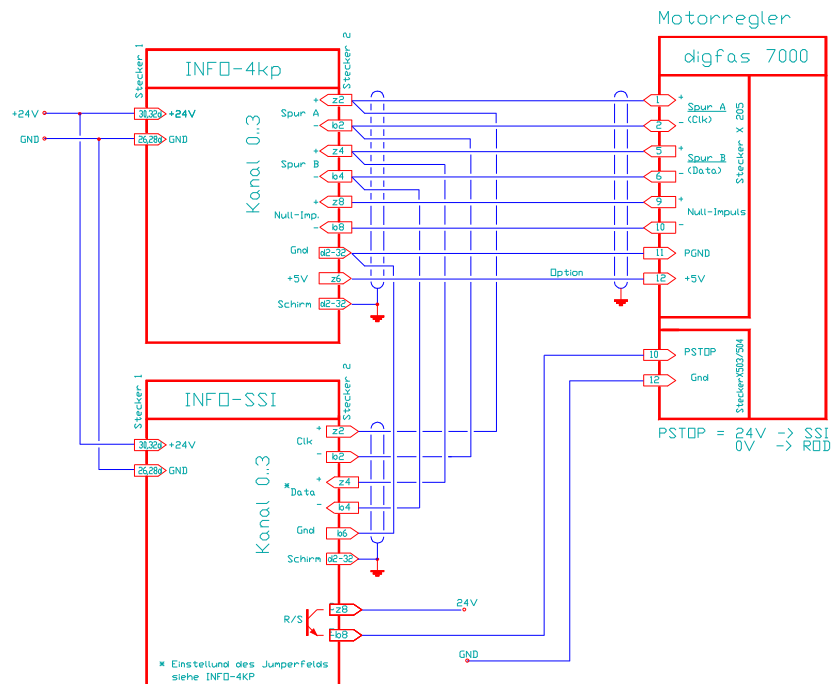
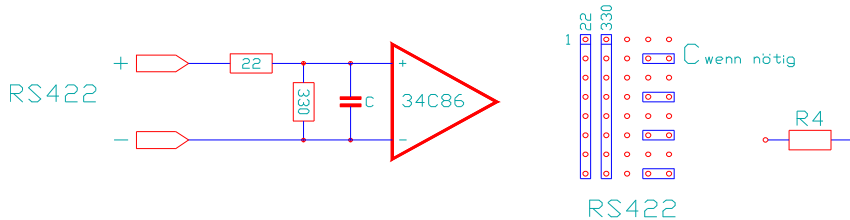


Fig. 2: Connection example of absolute encoder in incremental encoder mode

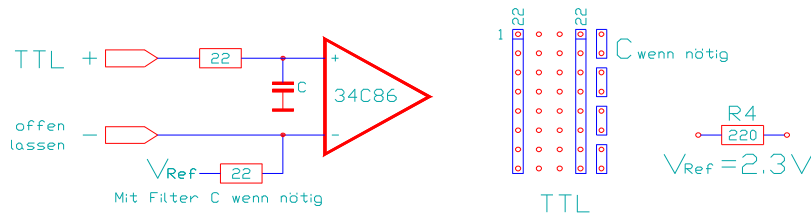
Interfaces

Wiring

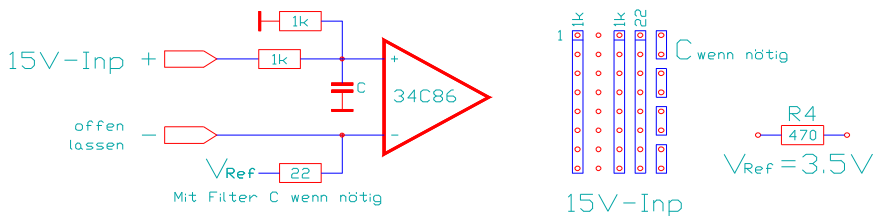
RS422 inputs



TTL inputs



15V inputs



Enable/clock outputs



SSI interface

The inputs of the absolute encoders can be wired for RS422, TTL or 15V inputs. For this purpose, the board has an assembly field into which the resistor arrays can be plugged (see p.3).

Enable/clock outputs

The enable outputs are potential-free. The current loading is typically 10mA, the maximum no-load voltage 48V. The clock outputs are designed for RS485 levels.