Digital/Analogous Converter

INFO-DAC

Voltage ±10V Current 0 ... 20mA

Technical Data

Analog outputs
- 8 analog voltage or current outputs
- Voltage range: ±10V
- Current range: 0 ... 20mA

Resolution
- 16 bit; 1/65,000 of measurement range

15V power supply
- For 8 current outputs
- 8 x 20mA

Reference
- Automatic alignment of zero point and full scale

Emergency stop
- Enable input, +24V
- Elecrically isolated

15V power supply (on-board)
- Additional ±15V supply

**Board power supply**
- Elecrically isolated
- Power supply 18 ... 36V

The INFO-DAC board outputs 8 voltages of ±10V or currents of 0 ... 20mA with a resolution of 16 bit.

It is suitable, for example, for the activation of flow controllers and proportional valves or for controlling the shaft speed of motors and frequency converters. Offset and gain have been separately measured for voltage and current channels, and the values have been saved for each channel in the on-board EEPROM. The INFO-Master corrects all outputs by the appropriate factors during operation. There are no potentiometers on the board; there is nothing to align or vary. The ADC module has a board enable allowing emergency stop functions to be implemented.

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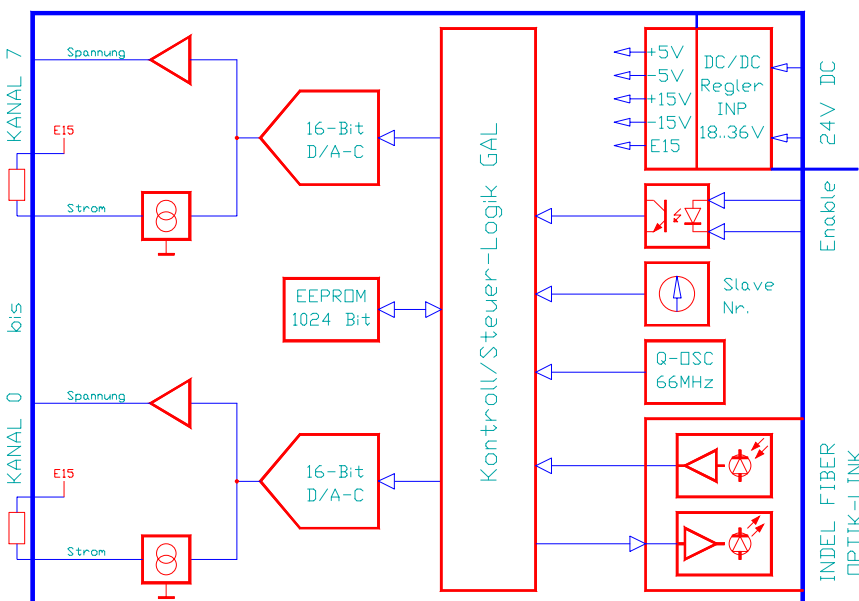
Mode of Operation

The INFO-DAC board can output eight voltages of ±10V or currents of 0...20mA with a resolution of 16 bit. The channel allocation (voltage or current) is set by a software function.

The board is connected via a fiberoptic line to an INFO-Master. This minimizes the wiring requirement and thereby also interference (EMC, ground loops).

For the 0...20mA outputs, the DC/DC converter supplies additional ±15V on the board so that the need for an external power supply is eliminated.

With the standard firmware, 1 channel per board is transmitted per ms so that after 8ms all DAC values will be updated. Faster refresh rates are available upon request.

All alignments of the output stages have been made during quality checking at INDEL. The values of each channel are saved in an on-board EEPROM.
During operation, the offset and drift correction is made for all channels with the data from the EEPROM. The outputs thereby achieve high precision and stability, especially in the presence of wide temperature fluctuations.
There are no potentiometers on the board; there is nothing to align or vary!

Connector Allocations

		d		b		z
2	I	+Enable				
4	I	- Enable				
6						
8						
10						
12						
14						
16						
18					O	GND
20					O	- 15 V
22					O	+ 15 V
24					O	GND
26	I	GND				
28	I	GND				
30	I	+ 24 V				
32	I	+ 24 V				

Connector 1
vertical
DIN 41612, Type F-48
2.8mm pins

	d		b		z
2	Shield	O	GND	O	Vout 0
4	Shield	O	+ 20mA	O	- 20mA 0
6	Shield	O	GND	O	Vout 1
8	Shield	O	+ 20mA	O	- 20mA 1
10	Shield	O	GND	O	Vout 2
12	Shield	O	+ 20mA	O	- 20mA 2
14	Shield	O	GND	O	Vout 3
16	Shield	O	+ 20mA	O	- 20mA 3
18	Shield	O	GND	O	Vout 4
20	Shield	O	+ 20mA	O	- 20mA 4
22	Shield	O	GND	O	Vout 5
24	Shield	O	+ 20mA	O	- 20mA 5
26	Shield	O	GND	O	Vout 6
28	Shield	O	+ 20mA	O	- 20mA 6
30	Shield	O	GND	O	Vout 7
32	Shield	O	+ 20mA	O	- 20mA 7

Connector 2
vertical
DIN 41612, Type F-48
2.8mm pins

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Rev. 0006

Digital/Analogous Converter

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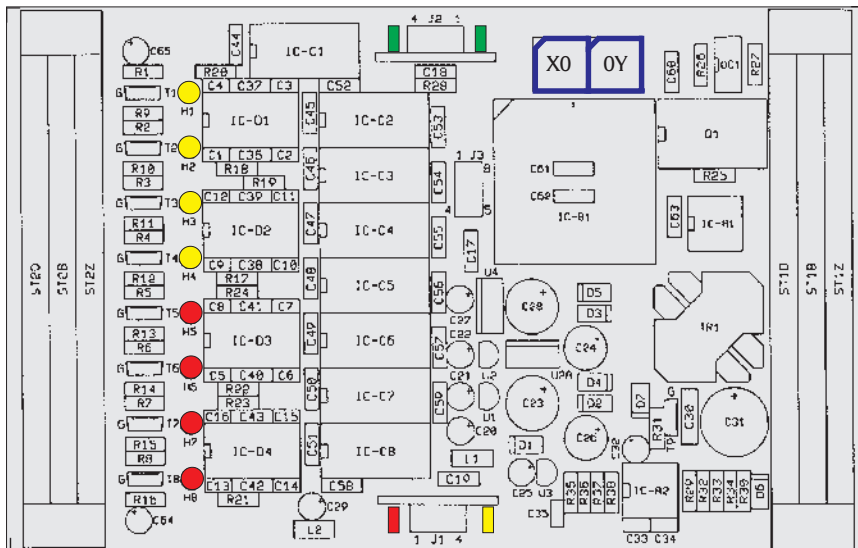
Assembly

Addressing (blue)

S1 (0Y)	Measurement board
0	0
…	…
F	15

The address switch S2 is not assembled as standard.

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

LEDs

The four red and four yellow LEDs signalize operation of the 20mA outputs. The voltage outputs are not indicated.

LEDs on receiver module

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

Customized modifications are available as needed.

Specifications

Power supply
+18 ... 36V, __mA max.

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

DAC outputs
8 voltage or current outputs
- Voltage: ±10V / 16-Bit
- Resolution: $300\mu V$ / Bit
- Current: $I_{max}=5mA$
- Internal resistance:
  $R_i=1...10\Omega$

- Current: 0...20mA/15-bit
- Resolution: $0.8\mu A$ / bit

- Refresh rate per channel : 1ms

Precision and drift
- Ambient temperature: 25°C
- Voltage output: 2mV
- Current output: $10\mu A$
- Drift: 50ppm/ΔK

Option
- Upon request, boards are also available with higher precision.

Warm-up time
- The board reaches optimal stability of the measurement values after approx. 15 min. operating time.

EMERGENCY OFF
- As long as no 24V are present at the ENABLE input, the board will output 0V bzw. 0mA on all channels.

15V power supply
- ±15V ±10%, 100mA max.

Mounting
- Connector DIN 41612, Type F-48
- Mounting on 35mm DIN bar
- Dimensions:
  105 x 165 x 45mm (WxDxH)

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Connections

Connection Example

Board power supply

For the board power supply, a 3-phase rectifier without electrolytic capacitor will suffice. But 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

All analog signal lines must be shielded. The shield must 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.

Grounding

The INFO-DAC is grounded through the housing. Make sure that the mounting bar has very good contact with the mounting plate or chassis to allow interference to be discharged.
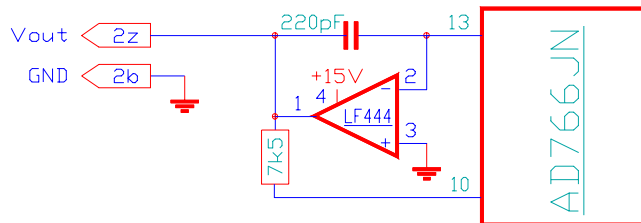
See also INDEL Wiring Guidelines and INDEL Design Guidelines.

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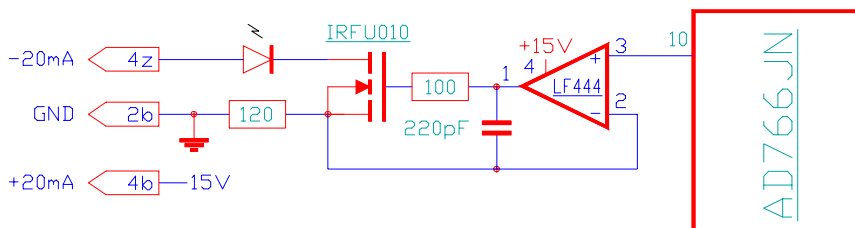Tüfiwis 26

Rev. 0006

Interfaces
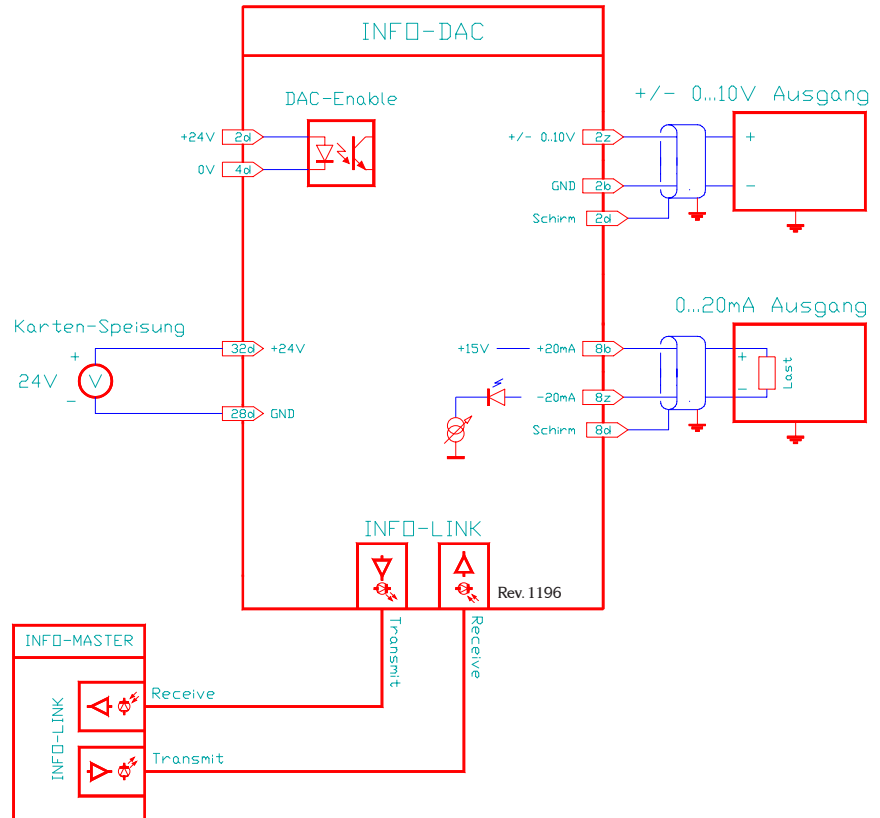
Voltage outputs
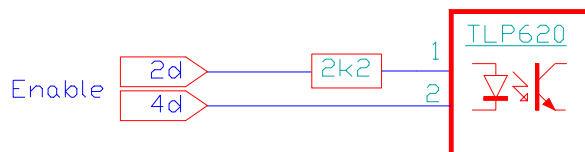

Voltage outputs
Wiring of the voltage output.

Current outputs

Current outputs
The board supplies the current for the 20mA outputs from a separate 15V power supply. No additional voltage source is required.

Enable input

Enable input
At the Enable input, 24V must be present to ensure that the board will output the current and voltage values.