f/I - f/f converter 2255

- Programmable f/I converter
- Programmable decimal divider / decimal multiplier
- Programmable frequency generator
- Relay output as option
- Supply voltage 24 VDC

General

The 2255 f/I - f/f converter is configured to the requested function by means of a menu-driven dialog with keys and display in the front. Typical signalling device may be pulse generators e.g. flow meters, tacho-generators or inductive sensors.

The **f/I function** is used for frequency to current / voltage conversion within the frequency range from 0.001 Hz to 20 kHz and for speed control with the digital output as frequency watch.

The **f/f function** is used for division or multiplication of pulses and as a buffer for fast pulse trains.
Max. input frequency 20 kHz.
Max. output frequency 1 kHz.

The **frequency generator function** is for instance used as a time base or a clock generator. Max. output frequency 20 kHz.
The 2255 can be delivered pre-configured according to specifications.

Technical characteristics

Input

Programmable input for connexion of standard pulse generator. Input filter may be selected for pulse width > 0.02 ms/max. 20 kHz, or > 10 ms/max. 50 Hz. By contact input, the filter for 10 ms/50 Hz should be used.

Auxiliary supplies

(selected by input configuration)

NAMUR supply: 8 VDC ±0.5 V / 8 mA for supply of NAMUR sensors.

S0 Supply: 15 VDC. Imax. 25 mA. Imin. (800 Ω load) 10 mA.

Special supply: As option special voltage supplies within the range 5...15 VDC / 30 mA.

Output(s)

Standard current output (pin 3) programmable within the range 0...20 mA.
Min. span 5 mA. Max. span 20 mA.
Max. offset of 50% of the max. value.
Current limit: Max. 26 mA.

Standard voltage output (pin 2) is obtained by leading the current signal through an internal shunt resistor.
With internal dipswitches a 50 Ω or a 500 Ω shunt resistor is selected, which results in a voltage output of 0...250 mV and 0 / 0.2...1 V (50 Ω) and 0...2.5 V and 0 / 2...10 V (500 Ω).
With a special internal shunt resistor, units with other output voltages can be delivered (max. 12 VDC).
Current and voltage signals are referring to the supply gnd. but if both signals are used simultaneously, only the voltage signal has gnd. as reference.

NPN pulse output (option) for relay, electromechanical counter or equivalent load. The output is current-limited to 130 mA with a PTC resistor.

The **relay output** (option) with change-over contact. 300 VA, max. 150 VRMS, 2 A.

Status indication

2255 is equipped with 3 status indicators in the front.

f in:	Indicates active input (inactive by the NPN input). Input frequencies > 50 Hz are shown by fixed light.
Dig. out:	Indicates active output.
Error:	Indicates sensor error by NAMUR input.

Electrical specifications

Environmental conditions

Operating temperature	-20 to +60°C
Calibration temperature	20...28°C
Relative air humidity	< 95% RH (non-cond.)
Protection degree	IP50

Mechanical specifications

Dimensions (HxWxD) (D is excl. pins)	80.5 x 35.5 x 84.5 mm
Weight	125 g

Common specifications

Supply voltage	19.2...28.8 VDC
Internal consumption	2.4 W
Isolation, test / operation	1400 VAC / 150 VAC
Warm-up time	1 min.
Signal / noise ratio	Min. 60 dB
Signal dynamics, output	16 bit
Response time (programmable)	60 ms to 999 s + period time
Temperature coefficient	< ±0.01% of span / °C
Linearity error	≤ ±0.1% of span
Effect of supply voltage change	< 0.005% of span / VDC

Auxiliary voltages:

NAMUR supply	**8 VDC ±0.5 VDC / 8 mA**
S0 supply	**15 VDC / 25 mA**
Special (acc. to order)	**5...15 VDC / 30 mA**
Immunity influence	**< ±0.5%**

Input

General

Measurement range	0...20 kHz
Min. measurement range	0.001 Hz
Low cut off	0.001 Hz
Max. offset	90% of selec. max. value
Min. pulse width	25 µs

NAMUR input

Trig-level LOW	≤ 1.2 mA
Trig-level HIGH	≥ 2.1 mA
Input impedance	1000 Ω

Sensor error detection

Short-circuit	≥ 7.0 mA
Breakage	≤ 0.2 mA
Response time	≤ 400 ms

Tacho input

Trig-level LOW	≤ 100 mV
Trig-level HIGH	≥ 200 mV
Input impedance	≥ 100 kΩ
Max. input voltage	80 VAC pp

NPN / PNP input

Trig-level LOW	≤ 4.0 V
Trig-level HIGH	≥ 7.0 V
Input impedance	Typ. 3.48 kΩ

TTL input

Trig-level LOW	≤ 1.2 VDC
Trig-level HIGH	≥ 1.7 VDC
Input impedance	100 kΩ

S0 input

Trig-level LOW	≤ 4.5 mA
Trig-level HIGH	≤ 6.2 mA

Analog output

Current output

Signal range	0...20 mA
Min. signal range	5 mA
Max. offset	50% of selec. max. value
Updating time	20 ms
Load (max.)	20 mA / 600 Ω / 12 VDC
Load stability	< ±0.01% of span/100 Ω

Voltage output through internal shunt

Signal range	0...10 VDC
Min. signal range	250 mV
Max. offset	50% of selec. max. value
Load (min.)	500 kΩ

NPN output

Max. current	130 mA
Max. voltage	28 VD

f/f converter output

Signal range	0...1000 Hz
Min. pulse width	500 µs
Max. pulse width	999 ms
Max. duty cycle	50%

Frequency generator

Pulse width

f < 50 Hz	Min. 10 ms, max. 999 s
f ≥ 50 Hz	50% duty cycle

Relay output

Max. frequency	20 Hz
Max. voltage	150 VAC / VDC
Max. AC current	2 A
Max. AC power	300 VA
Max. DC current, resistive load:	
@ U_{relay} ≤ 30 VDC	2 ADC
@ U_{relay} >30 VDC	[1380 x U_{relay}^{-2} x $1.0085^{U_{relay}}$] ADC