

# f/I - f/f CONVERTER



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



## General:

In the programmable version, the 2255 f/I - f/f converter is configured to the requested function by means of a menu-driven dialogue with keys and a display in the front. Typical signalling devices may be pulse generators, for instance 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 a 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 is 20 kHz.

The 2255 can be delivered pre-configured according to specifications, please see the options index.

## Technical characteristics:

### Input:

Programmable input for connection of standard pulse generator.

Input filter may be selected for a pulse width > 0.02 ms/ max. 20 kHz, or > 10 ms/max. 50 Hz.

At contact input, the filter for 10 ms/50 Hz should be used.

### Auxiliary supplies:

(selected at input configuration)

#### NAMUR supply:

8 VDC  $\pm 0.5$  V / 8 mA for supply of NAMUR sensors.

#### S0 Supply:

15 VDC.  $I_{max}$ . 25 mA.  $I_{min}$ . (800  $\Omega$  load) 10 mA.

#### Special supply:

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

## Outputs:

**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 DIP-switches, a 50  $\Omega$  or a 500  $\Omega$  shunt resistor is selected, which results in a voltage output of 0...250 mV and 0 / 0.2...1 V (50  $\Omega$ ), and 0...2.5 V and 0 / 2...10 V (500  $\Omega$ ).

With a special internal shunt resistor, units with other output voltages can be delivered (max. 12 VDC).

Current and voltage signals refer 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.

**Relay output** (option) with change-over contact. 300 VA, max. 150 VRMS, 2 A. Max. DC load at 24 VDC is 1 A.

## Status indication:

2255 is equipped with 3 status indicators in the front.

f in: Indicates active input (inactive at NPN input).  
Input frequencies > 50 Hz are shown by a permanent light.

Dig. output: Indicates active output.

Error: Indicates sensor error at NAMUR input.

**Electrical specifications:****Specifications range:**

-20°C to +60°C

**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
Calibration temperature.....	20...28°C
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

EMC immunity influence ..... &lt; ±0.5%

Humidity .....	< 95% RH (non-cond.)
Dimensions (HxWxD).....	80.5 x 35.5 x 84.5 mm
Tightness .....	IP50
Weight .....	125 g

**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

**Analogue 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 VDC

**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 VRMS
Max. AC current .....	2 A
Max. AC power.....	300 VA
Max. load at 24 VDC .....	1 A

**GOST R approval:**

VNIIM, Cert. no. .... Ross DK.ME48.V01899

**Observed authority requirements: Standard:**

EMC 2004/108/EC	Emission and immunity .....	EN 61326
LVD 73/23/EEC.....		EN 61010-1

**Of span** = Of the presently selected range

**Options index 2255:**

**f/I converter**  
(Fun 001)

**Password (PAS)**  
(default 040)

**Input type (InP)**  
PNP : (PnP)  
NPN : (nPn)  
TTL : (ttL)  
NAMUR : (nUr)  
S0 : (S0)  
Tacho : (tAC)

**Input filter: (Fit)**  
LO: 50 Hz  
HI: 20 kHz

**f-in low (InL)**  
Specify min. frequency: \_\_ Hz

**f-in high (InH)**  
Specify max. frequency: \_\_ Hz

**Analogue output:**

**Current / voltage output 0%:**  
Specify: \_\_ V / mA

**Current/voltage outp. 100%:**  
Specify: \_\_ V / mA

**Response time (RSP):**  
Specify: \_\_ s

**Digital output**

**Digital output action: (dOA)**  
Activate for incr. freq. : (InC)  
Activate for decr. freq. : (dEC)  
Activate outside window: (UOF)  
Activate inside window : (UOn)

**Setpoint low (dLO):**  
Specify: \_\_ % of range

**Setpoint high (dHI):**  
Specify: \_\_ % of range

**Hysteresis (HSt):**  
Specify: \_\_ % of range

**Digital output function: (dOF)**  
Trip amplifier: (L)  
Trip amp. + sensor error: (LC)  
Sensor error: (C)

**f/f converter**  
(Fun 002)

**Password (PAS)**  
(default 040)

**Input type (InP)**  
PNP : (PnP)  
NPN : (nPn)  
TTL : (ttL)  
NAMUR : (nUr)  
S0 : (S0)  
Tacho : (tAC)

**Input filter: (Fit)**  
LO: 50 Hz  
HI: 20 kHz

**Function:**  
**Multiplication:**  
Specify multiplier: \_\_

**Division:**  
Specify divisor: \_\_

**Output:**

**Pulse width:**  
Specify: \_\_ ms/s

**Frequency generator**  
(Fun 003)

**Password (PAS)**  
(default 040)

**Frequency:**  
Specify: \_\_ Hz

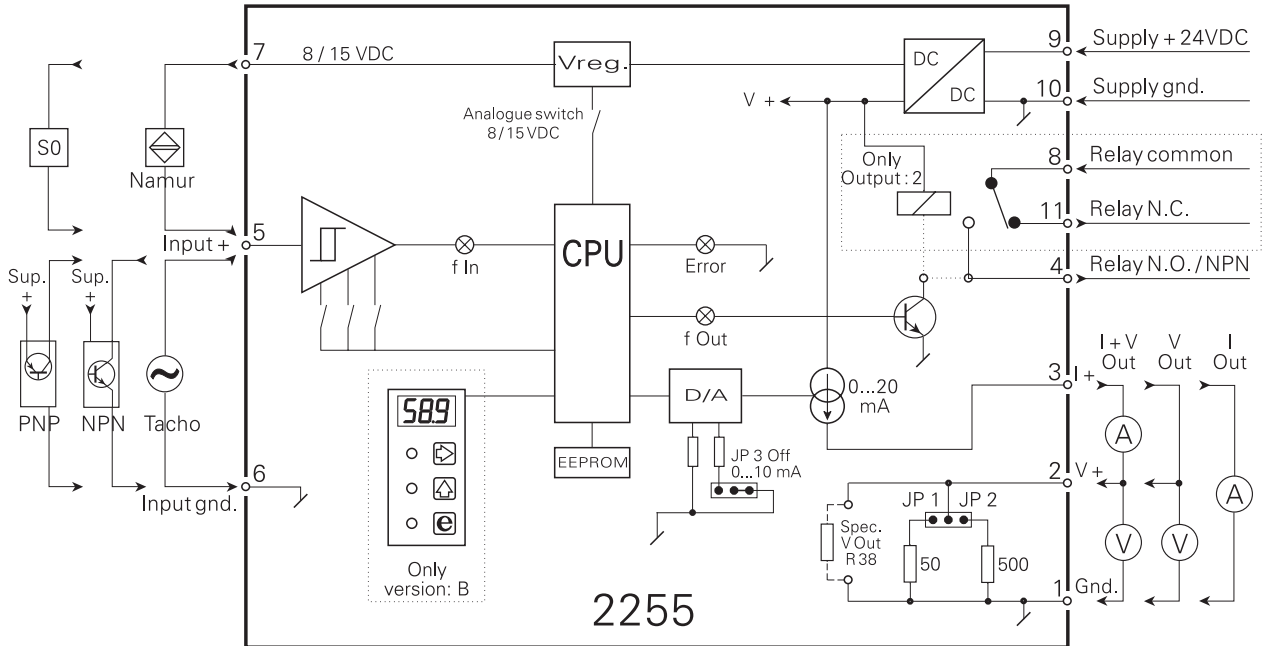
**Pulse width:**  
Specify: \_\_ ms/s

**Display scaling:**  
Specify: Hz / kHz / MHz

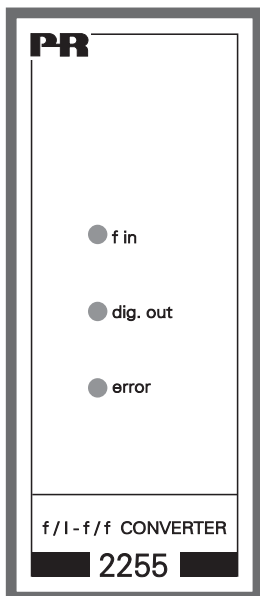
Order: 2255

Type	Version	Output
2255	Fixed : A	Analogue + NPN output : 1
	Programmable : B	Analogue + relay output : 2

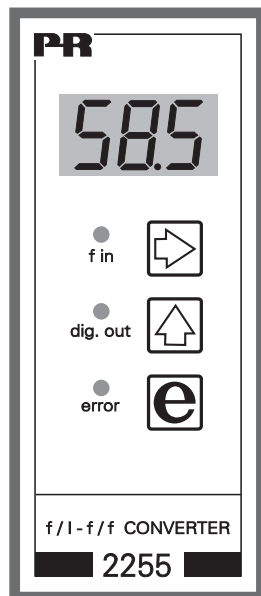
**Block diagram:**



**Front layout:**



Fixed



Programmable

**Analogue output programming:**

Output range	JP3	JP2	JP1
0...10 mA (current only)	OFF	-	-
0...20 mA (current only)	ON	-	-
0...10 mA / 0...0.5 V	OFF	OFF	ON
0...20 mA / 0...1.0 V	ON	OFF	ON
0...10 mA / 0...5.0 V	OFF	ON	OFF
0...20 mA / 0...10.0 V	ON	ON	OFF
Special voltage output: (Resistor R38 mounted)	ON or OFF	OFF	OFF