

## 6821 Programmable dual-channel transmitter

- 2 analog inputs, 0/4..20 mA or 0..5/10V, mV, Pt100, thermocouples
- 2 analog outputs 0/4..20 mA or 0..5/10V
- 2 alarm relays
- Mathematical and conditional operations using easy logic language (ELo)
- Serial communication RS-485
- Modbus RTU and Nokeval SCL protocols
- Power supply 90..240 VAC or 24 VDC
- Configuration using MekuWin PC program or using front panel buttons



6821 is a rail-mounted two-channel measurement unit for temperature sensors and other electrical inputs. The unit has two analog outputs or alternatively one analog and one serial output.

The serial output can accept Nokeval SCL and Modbus RTU commands. Up to four logical alarms can control two common alarm relays. The inputs are galvanically isolated from the outputs and the supply voltage, but not from each other.

Mathematical and conditional operations may be realized with a simple programming language. There is a four-digit display and four push-buttons, that can be used to monitor the readings and to change the settings. The settings can also be edited from a personal computer using the RS-485 serial connection.

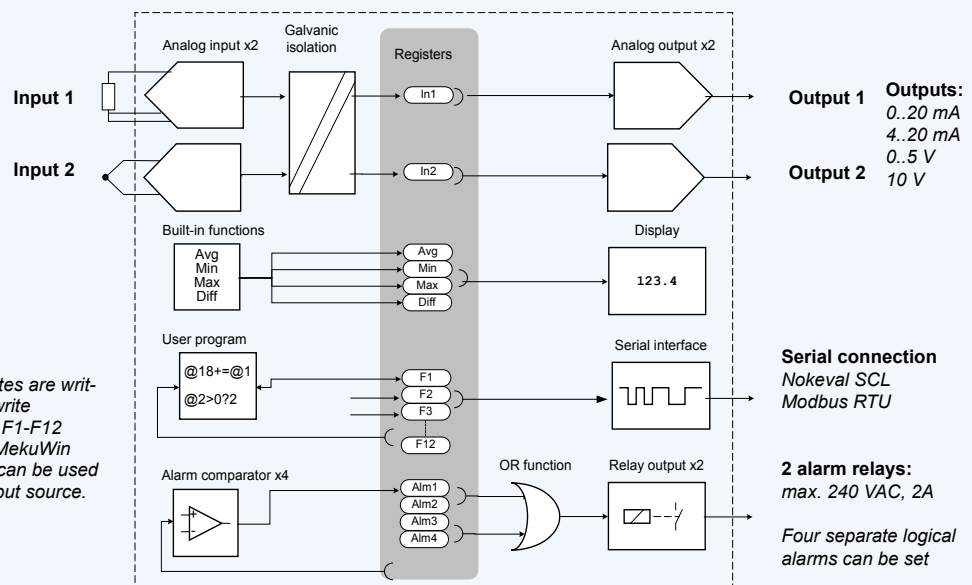
### Schematic drawing of transmitter 6821

#### Inputs:

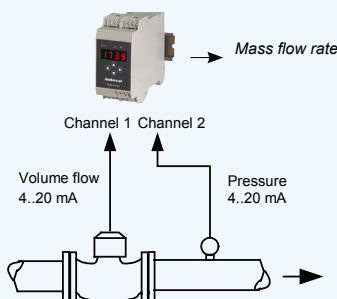
- Pt100, Pt1000, Ni100, KTY83, Cu10
- Thermocouples: B, C, D, E, G, J, K, L, N, R, S, T
- mV inputs:  $\pm 55$  mV,  $\pm 100$  mV
- 0..20 mA, 4..20 mA,  $\pm 20$  mA
- 0..1 V,  $\pm 1$  V, 0..10 V,  $\pm 10$  V
- Resistance measurement: 0..400, 0..4 k $\Omega$ , 0..40 k $\Omega$

#### Writing your own functions

Measurement results and alarm states are written into registers. Users can easily write simple programs to modify registers F1-F12 using Nokeval's ELo language and MekuWin configuration program. Any register can be used in the programs and used as an output source.



#### Flow sensor pressure compensation example



Mass flow rate can be easily calculated using 6821 transmitter. Use channel 1 to measure the flow, channel 2 to measure the pressure and write a small program using ELo language. For example, the program for the equation "Out1=(Ch1 x Ch2) x 1.12/1000" is found from programming examples.

#### Programming examples using ELo language (MekuWin)

Input channels 1 and 2 correspond to registers @1 and @2, any register can be used as an output source.

#### Channels multiplied

@18=@1\*@2 // The result is placed in register 18 (F1)

#### Peak hold

@1<@18?2 // If current rdg is smaller, skip the next line  
@18=@1 // Store the new peak in register 18 (F1)

#### Clock

@18+=@0 // Register 18 (F1) will indicate seconds

#### Mass flow rate

@19=@1\*@2 // Channels multiplied, result in register 19 (F2)  
@18=@19\*0.00112 // Register 18 = (Ch1 x Ch2) x 1.12/1000

# Technical specification

## RTD Inputs

### Pt100

Range	-200...+700 °C
Accuracy	0.05% rdg + 0.2°C (3W) 0.05% rdg + 0.1°C (4W)
Thermal drift	0.01°C / °C
Sensor current	0.25 mA, multiplexed

### Ni100

Range	-60...+180 °C
Accuracy	0.05% rdg + 0.1°C

### Cu10

Range	-200...+260 °C
Accuracy 1°C	

### KTY83

Range	-55...+175 °C
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### PtXXX, NiXXX, CuXXX

Range	Same as Pt100, Ni100
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## Thermocouple inputs

TC	range	±lin.error °C
B	400...1700°C	±0.3
C	0...2300°C	±0.5
D	0...2300°C	±1
E	-100...900°C	±0.2
G	1000...2300°C	±2
J	-160...950°C	±1
K	-150...1370°C	±0.5
L	-150...900°C	±0.5
N	0...1300°C	±0.1
R	0...1700°C	±0.5
S	0...1700°C	±0.5
T	-200...400°C	±1

Thermal drift	0.02°C / °C (ref 25°C)
Accuracy	0.05% rdg + 0.5°C + lin. error + thermal drift

## mV inputs

Ranges	±55 and ±100 mV
Accuracy	0.1% rdg + 0.01 mV
Load	>1 MΩ

## Voltage Inputs

Ranges	1V (-1...+1 V) 2.5V (-1...+2.5 V) 10V (-5...+10 V)
Accuracy	0.05% rdg + 0.01 V
Load	~800 kΩ (1, 2.5V) >1 MΩ (10V range)
Drift	50 ppm/°C

## mA-inputs

Range	±20 mA
Accuracy	0.005 mA
Drift	50 ppm/°C
Load	50...80 Ω

## Resistance inputs

Ranges	0...400 Ω 0...4000 Ω 0...40000 Ω
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## Common

A/D conversion	16 bits (±32767)
Speed	All channels in 0.25 sec.
Warm-up time	30 min (Tc inputs), 5 min (other inputs)
Transmitter supply:	+15 V 50 mA (if 4-wire connection on input 2 is not used)

## Analog outputs

<b>mA output</b>	
Range	0...20 mA or less
Accuracy	0.008 mA
Load	0...600 Ω
Thermal drift	1 µA/°C

## Voltage output

Range	0...10 V or less
Accuracy	0.005 V
Thermal drift	2 mV/°C

## Serial connection

Connection	RS-485
Protocols	Nokeval SCL Modbus RTU
Baud rates	1200, 2400, 4800, 9600, 19200, 38400, 57600

Bits	SCL: 8N1 Modbus: 8E1
Min response time	3.5 characters
Max response time	SCL: typ 3, max 25 ms Modbus: typ 5, max 15 ms (after changing settings, 300 ms for the next command)
Reading all chs	SCL: 100 ms @57600 baud. Modbus: 30 ms @57600
Termination	Jumper selectable: None or 110 Ω + 1 nF

## Alarms

Response	Same as meas. cycle + definable delay
Relays	2 A, 250 VAC
Device unpowered	Relay 1 open, 2 closed.

## Supply voltage

24V model	24 V ±15%, <200 mA
230V model	85-260VAC, <5 W

## General

Weight	250 g
Mounting	35 mm DIN rail
Connectors	2.5 mm <sup>2</sup> , detachable
Power-up time	1.5 sec
Oper. temperature	-10...+60 °C

Galvanic isolation:	see picture below
Note:	Input channels are separated from each other by semiconductor switches.

## Regulations

EMC immunity	EN 61326
EMC emissions	EN 61326 class B
Electrical safety	EN 61010-1

## How to order:

**Type 6821-230 VAC or 6821-24 VDC**

## Connectors, galvanic isolation and dimensions

