

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.

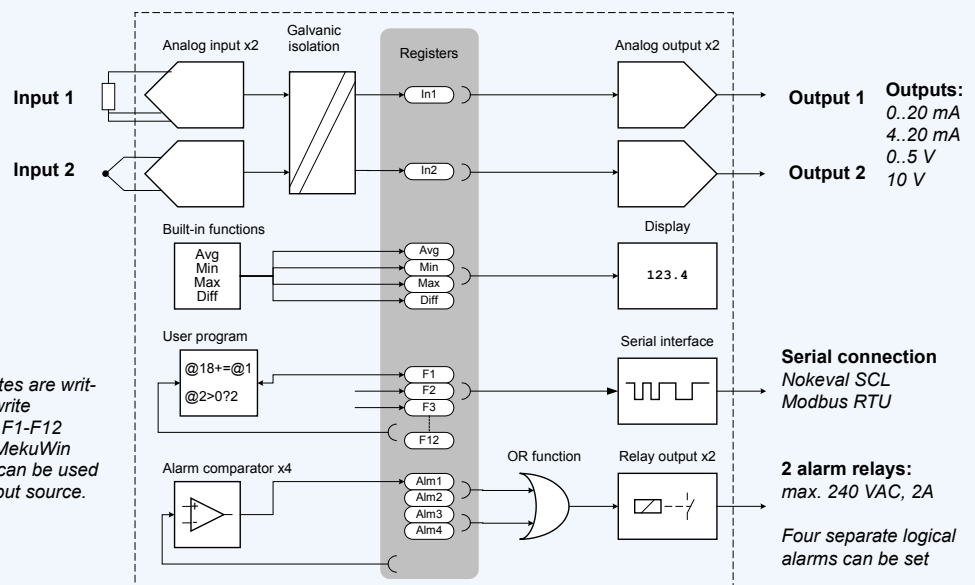
Schematic drawing of transmitter 6821

Inputs:

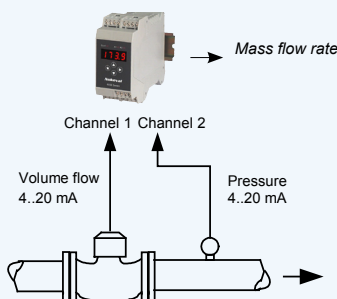
- Pt100, Pt1000, Ni100, KTY83, Cu10
- Thermocouples: B, C, D, E, G, J, K, L, N, R, S, T
- mV inputs: ±55 mV, ±100 mV
- 0..20 mA, 4..20 mA, ±20 mA
- 0..1 V, ±1 V, 0..10 V, ±10 V
- Resistance measurement: 0..400, 0..4 kΩ, 0..40 kΩ

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 |
|-------|---------------|

PtXXX, NiXXX, CuXXX

| | |
|-------|----------------------|
| Range | Same as Pt100, Ni100 |
|-------|----------------------|

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 |
|--------|--|

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

| | |
|---------------|-------------------|
| mA output | |
| 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 baud. |
| 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 ² , 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. |

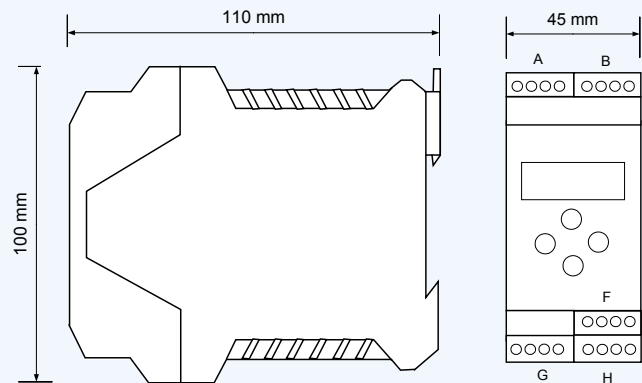
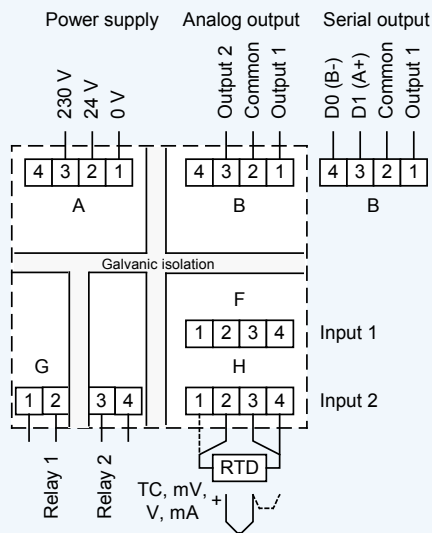
Regulations

| | |
|-------------------|------------------|
| 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



Mounting: 35 mm DIN rail