

Pulse Input Module

2-channel pulse/quadrature input

8123-PI-QU

- 2 input channels with power supplies or single quadrature input
- 1 Hz to 50 kHz signal capability
- Frequency & acceleration measurement
- 2-alarm/repeater retransmitted output channels
- 2- and 3-wire pulse transmitter format
- Pulse counting (with gate control)
- Channels independently configurable
- Open circuit, short circuit and missing pulse detection

MODULE SPECIFICATION

See also System Specification

INPUTS

PULSE/FREQUENCY

Number of channels

- 2

Frequency range

- 50 kHz
- In quadrature mode - 12.5 kHz

Accuracy (25°C)

- ± 0.05% of span

Temperature Stability

- 0.005% / °C

CONTROL GATE (FOR GATING CHANNEL 1 ONLY)

Switching thresholds

- 1.2 mA / 2.1 mA

Input impedance

- 1 kΩ

Supply voltage

- 8.1 V (nom.) at 8 mA

SENSOR INPUT CHARACTERISTICS

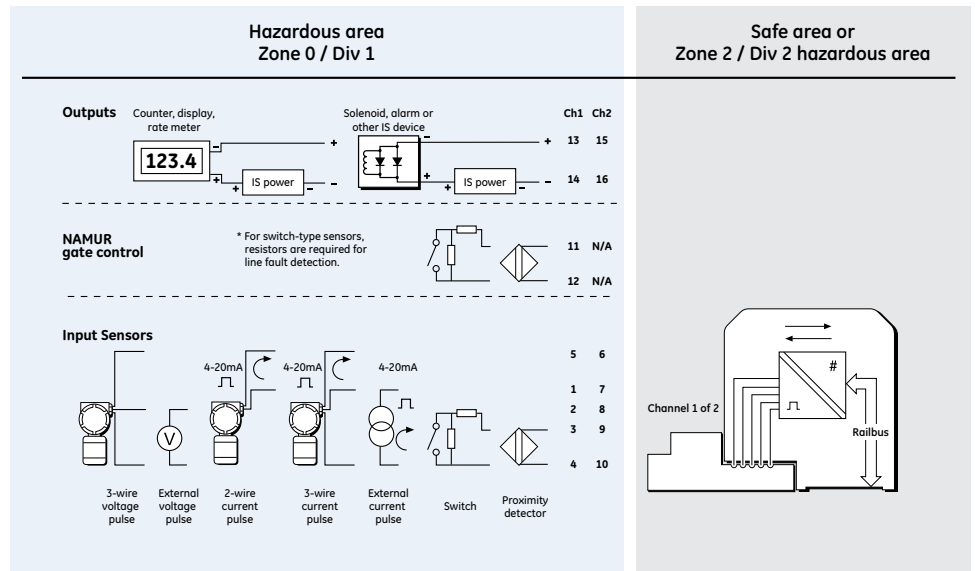
NAMUR 1

Switching thresholds

- 1.2 mA / 2.1 mA

Input impedance

- 1 kΩ



Supply voltage

- 8.1 V (nom.) at 8 mA

CURRENT

Input signal

- 20 mA (max.)

Threshold

- Configurable in 8 levels

Input impedance

- 25 Ω

Open circuit current

- < 0.5 mA

Short circuit current

- > 21.5 mA

VOLTAGE

Input signal

- 0 - 24 V dc (50 V max.)

Threshold

- Configurable in 8 levels

Input impedance

- > 10 kΩ

Switching hysteresis

- 100 mV

SWITCH

Input voltage range

- 0 - 10 V dc

OUTPUTS

The outputs are **open-collector** type for separately powered devices such as LED clusters, annunciators or solenoids

Number of channels

- 2

OFF state voltage

- 30 V (max)

OFF state leakage current

- 10µA (max)

ON state voltage drop

- <1.0V @ 50 mA

ON state current

- 100 mA

Retransmission bandwidth

- 1 - 2000 Hz

CONFIGURABLE PARAMETERS

INPUTS

Channel

- Enable / Disable

Sensor type

- NAMUR prox. type (select low / high speed)
- Current pulse input
- Voltage pulse input
- Switch input

Frequency ranges

- 0.1, 0.3, 0.5, 1, 3, 5, 10, 30, 50, 100* kHz

Sample period

- 20 ms to 200 s

Quadrature

- Enable / Disable

Threshold level

- User defined values

Triggering

- Rising edge / falling edge

Filtering

- Off, 1, 5, 20, 100 kHz

Alarms

- Frequency / acceleration

Alarm limits

- High / low

Alarm deadband (hysteresis)

- User defined value

Line fault detect

- Enable / Disable

Channel status

- Active / Inactive

Counter

- Enable / Disable

Counting direction

- Count up / Count down

* While measurements can be made in the upper half of this range, the stated accuracy applies only to frequencies up to 50 kHz.

DISCRETE OUTPUT

Function selection

- Disabled
- High / low alarm
- Acceleration alarm
- Counter preset value reached
- Quadrature output (channel 1 only)
- Scaled retransmission (channel 1 only)

Retransmission scaling (K factor Channel 1 only)

- 1-256

AUXILIARY DISCRETE INPUT

Counter (channel 1)

- Start (count) / pause

DYNAMIC DATA (READ ONLY)

PROCESS VALUES

Frequency

- 16 bit unsigned

Count

- 32 bit signed

Acceleration

- 16 bit signed

STATUS VALUES

Frequency/acceleration alarms

- High / Low
- Missing pulse detect

Line fault detect

- Open / Short circuit

Quadrature direction

- 1 =clockwise, 2 =anti-clockwise

Counter alarms

- Preset value reached

CONTROL DATA (WRITE ONLY)

Counter preset value

- 32 bit signed
- Load preset value = 0 to disable

Counter commands

- Start / stop / reset

NOTE: Channel 1 counter can also be controlled by control gate input: 1= start (count), 0 = pause

ISOLATION

Any channel to Railbus

- 100 V ac

Between input channels

- None (common 0 V connection)

Between output channels

- 30 V ac

RESPONSE TIMES

Signal change to availability on Railbus

- 25 ms (max.)

POWER SUPPLIES

Railbus current (both channels @22 mA)

- 300 mA (max.)

Bussed field power

- 20 mA @ 24 ± 10% V dc

Power dissipation (both channels @22 mA)

- 2.8 W (max.)
- No load – 2.0 W (max.)

MECHANICAL

Module Key Code

- F2

Module width

- 42 mm

Weight

- 260 g

TERMINAL ASSIGNMENTS

Terminal	Description
1	Current input
2	Voltage input
3	NAMUR input
4	Common
5	Power supply +ve
6	Power supply + ve
7	Current input
8	Voltage input
9	NAMUR input
10	Common
11	NAMUR gate/control input
12	Common
13	Output +ve
14	Output -ve
15	Output +ve
16	Output -ve

FIELD TERMINALS

Field Wiring	Recommended Field Terminal
General purpose	8602-FT-ST Standard
Class 1, Div 2 or Zone 2 hazardous area	8601-FT-NI Non-incendive

SAFETY

Field wiring protection

- Non-incendive

FM and ATEX Cat 3 NON-INCENDIVE

FIELD WIRING PARAMETERS

The following figures are for Gas Groups A/B (IIC) unless otherwise stated.

Current inputs (Ch1 & Ch2)

- $U_o \leq 0.6$ V, $I_o \leq 0.5$ mA, $P_o \leq 75$ μ W
- $C_a = 1000$ μ F, $L_a = 1000$ mH

3-wire current inputs (Ch1 & Ch2)

- $U_o 30$ V, $I_o \leq 102.5$ mA, $P_o \leq 765.7$ mW
- $C_a = 0.165$ μ F, $L_a = 6$ mH, $L_a/R_a = 82$ μ H/ Ω

Voltage inputs (Ch1 & Ch2)

- $U_o \leq 5.5$ V, $I_o \leq 0.58$ mA, $P_o \leq 0.8$ mW
- $C_a = 535$ μ F, $L_a = 1000$ mH

3-wire voltage inputs (Ch1 & Ch2)

- $U_o \leq 30$ V, $I_o \leq 102.6$ mA, $P_o \leq 765.8$ mW
- $C_a = 0.165$ μ F, $L_a = 6$ mH, $L_a/R_a = 82.1$ μ H/ Ω

NAMUR inputs (Ch1 & Ch2)

- $U_o \leq 9.1$ V, $I_o \leq 10.6$ mA, $P_o \leq 24$ mW
- $C_a = 20$ μ F, $L_a = 490$ mH

NAMUR gate input (Ch1)

- $U_o \leq 9.1$ V, $I_o \leq 10.6$ mA, $P_o \leq 24$ mW
- $C_a = 20$ μ F, $L_a = 490$ mH

Discrete outputs (Ch1 & Ch2)

Each pair of field terminals may be considered as non-incendive when connected into a field circuit with the following parameters

- $V_{max} = 30$ Vdc, $I_{max} = 100$ mA, $C_i = 0$ μ F, $L_i = 0$ mH

LED INDICATORS

POWER - Green LED

OFF	ON	FLASHING
Power failure	Power OK	Not Applicable

FAULT - Red LED

OFF	ON	FLASHING
In running state	Fault	Awaiting module training

PULSE INPUT CHANNEL - Yellow LED

OFF	ON	FLASHING
Channel inactive	Channel active and operating normally	Channel active but in alarm condition

DIGITAL OUTPUT CHANNEL - Yellow LED

OFF	ON	FLASHING
Channel inactive	Channel active and operating normally	Not applicable