SINGLE MONITORED INPUT/OUTPUT UNIT – BN-304

Interactive fire detection systems
Product Datasheet

Features

- Interactive
- For interfacing and controlling external units to Autronica's interactive fire detection systems
- Multi function unit: Function selected by switch setting.
- Input/Output signals
- 1 non-isolated input: on/off function with end-of-line monitoring
- 1 output: Potential free contact without end-of-line monitoring
- 1A 30 VDC dry relay contact for the output port
- Includes the SelfVerify function for reduced maintenance/testing and increased reliability on the input for critical alarm functions
- Short-circuit isolator of detection loop in each unit
- Automatic addressing
- Proven technology
- Wall mounted
- Designed to meet the requirement of the major maritime classification societies
- Approved according to EN 54-17 and EN 54-18

Product overview

The Single Monitored Input/Output Unit BN-304 has been designed for use with Autronica's fire detection systems, AutroSafe (version 4.3.1 or newer) and Autroprime (2.1.3 or newer).

IMPORTANT:
Due to an important safety update in Autroprime version 2.1.3 the unit must not be used with Autroprime version older than 2.1.3.

The unit includes the SelfVerify function. This function ensures the highest grade of reliability and reduces the need for manual testing because the panel is able to continuously and automatically check all units that include this function.

Note: External devices attached to this interface unit require a separate power source (they can not be powered by the detector loop).
SelfVerify: The unit's ability to initiate alarm is regularly checked.



Function options / Switch settings

The internal DIP switch S1 selects the function performed by the BN 304 unit. For location of the DIP switch, refer to circuit board drawing on the next page. Refer to detailed descriptions of each function on this datasheet (Descriptions of function options A-K). The available functions include:

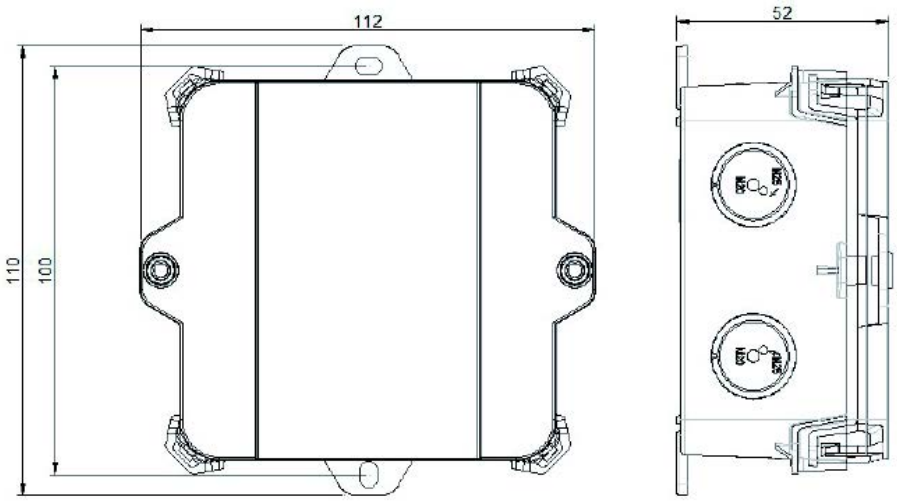
- Function A
  Alarm condition signalling input unit with relay feedback
- Function B
  Pre Alarm condition signalling input unit with relay feedback
- Function C
  Fault condition signalling input unit with relay feedback
- Function D
  Uncommitted input unit (Output follows input)
- Function E
  Pre Alarm and Alarm condition signalling input unit with configurable input delay and relay feedback
- Function F
  Fault, Pre Alarm and Alarm condition signalling input
- Function G
  Alarm condition signalling input unit with relay output used for reset
- Function H
  Alarm condition signalling input and independent relay output function
- Function I
  Uncommitted input unit and independent relay output function
- Function J
  Relay output function (Input not in use)
- Function K
  Relay output function with activation feedback (input)

Technical Specification	
Dimensions (mm)	112 x 110 x 50
Weight (g)	192
Housing material	Polyamide 6.6.
Colour	Light grey
Mounting	Wall mounting, 100 mm bolt space
Power	Unit connects to AL_Com only
Voltage	16-26 VDC
Peak current consumption (during communication)	359µA
Average current consumption	<60µA
Temperature range	-25 to +70 °C
Humidity	10% - 95% RH (non-condensing)
Degree of protection Membrane inlets: PG inlets (PG-13,5):	 IP54 IP66
Communication loop	Autronica loop communication protocol (AL_Com)
Cable terminals	Max 2.5 mm² single core wires
Cable requirements AL_Com	Refer to specification for Autroprime or AutroSafe
Maximum input cable length	10 m
Maximum cable capacitance	10nF
Response time	<= 1 second
Output relay rating	1A 30 VDC resistive load
Output relay type	Dry contact, latching type; keep state on loss of power. No EOL monitoring
Threshold	Short circuit: 0-235 Ω Activate: 260-1000 Ω Normal: 1200-4800 Ω Open circuit: 5400-∞ Ω
Approvals	EN54, MED. For detailed info, see Autronica's product web http://product.autronicafire.com/products/

RECOGNIZED COMPONENT
Conforms to UL Std. 864
ETL LISTED US
Intertek
5022802

Product name	Part number	Description
BN-304	116-BN-304	Single monitored input/output unit
6571-011.6020	116-6571-011.6020	Membrane gland TSS M20, grey
Optional		
6571-011.1920	116-6571-011.1920	Gland IP67
6531-006.1920	116-6531-006.1920	Backnut for gland

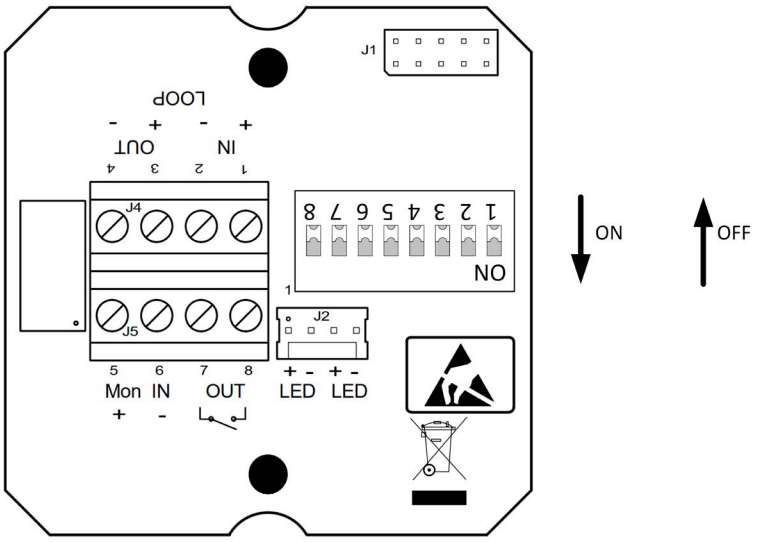
Dimension (mm)



Connectors

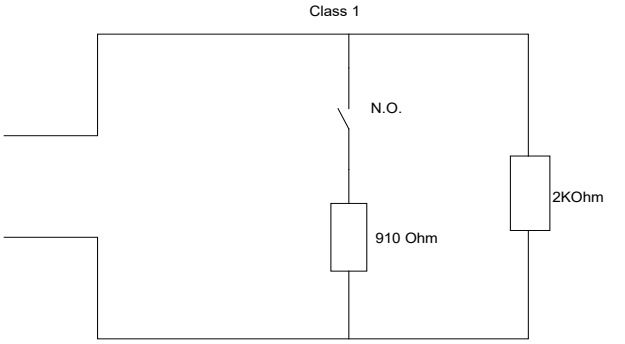
Terminal	Description
1	AL_Com In (+)
2	AL_Com In (-)
3	AL_Com Out (+)
4	AL_Com Out (-)
5	Input (+)
6	Input (common)
7	Relay contact
8	Relay contact

Connectors and DIP switches on circuit board

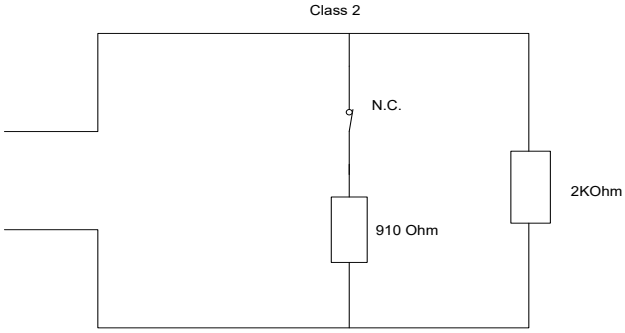


Descriptions of connection options

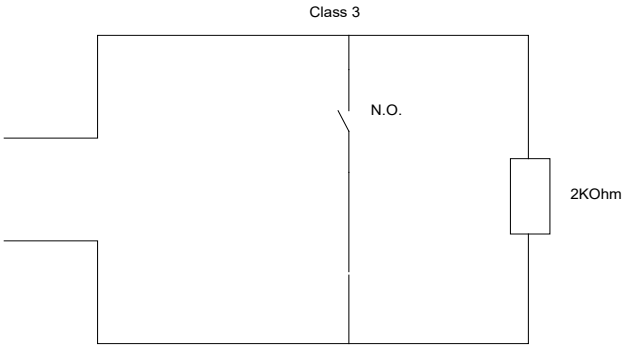
Input configuration A



Input configuration B



Input configuration C



Input configuration D

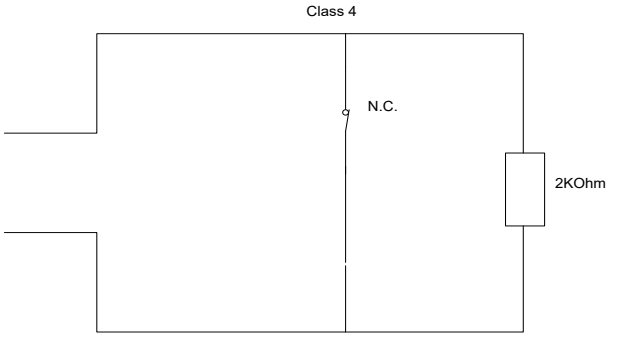


Figure 1

The electrical connection options for the input to the unit are shown in Figure 1. The various electrical input configurations allow a user to select under what condition the unit will be 'triggered' to provide a signal the fire alarm system indicating the selected condition.

The four different behaviours can be configured by DIP switch 5 and 6 in order to be able to monitor different setups of the input contact (s). (Switch 8 is not used).

(See location and dip switch no. on the circuit board drawing.)

The following table summarizes the expected state:

Confi-guration	Measured resistance (Ω)			
	0	910 (625)	2000	High
A	Fault: SHORT	Active	Normal	Fault: OPEN
B		Normal	Active	
C	Active	-	Normal	
D	Normal	-	Active	

Input configuration A: Normally Open contact with 'activate' resistor that activates when the contacts are closed. Fault monitored for an electrical wiring fault in the form of an open or short-circuit, between the contacts and the unit.

S1.5	S1.6
OFF	OFF

Input configuration B: Normally Closed contact with 'activate' resistor that activates when the contacts are opened. Fault monitored for an electrical wiring fault in the form of an open or short-circuit, between the contacts and the unit.

S1.5	S1.6
OFF	ON

Input configuration C: Normally Open contact without 'activate' resistor that activates when the contacts are closed. Fault monitored for an electrical wiring fault in the form of an open circuit (but not short-circuit). A short-circuit in the wiring will activate the unit.

S1.5	S1.6
ON	OFF

Input configuration D: Normally Closed contact without 'activate' resistor that activates when the contacts are opened. Fault monitored for an electrical wiring fault in the form of an open circuit (but not short-circuit). Normally Open contact with 'activate' resistor, fault monitored for open and short-circuit.

S1.5	S1.6
ON	ON

Output configuration

The output relay can be set to Normal Open or Normal Closed operation by DIP switch 1.7:
- DIP 1.7 OFF = Normally Open
- DIP 1.7 ON = Normally Closed

DIP switch 1.8 determines the state of output if the unit loses its power.
- DIP 1.8 OFF = Relay remains in current state
- DIP 1.8 ON = Relay switches to initial state as chosen by DIP 1.7

Descriptions of function options

(See location of DIP switch S1 on the circuit board drawing)

Function A

S1.1	S1.2	S1.3	S1.4
OFF	OFF	OFF	OFF

Function: Alarm condition signalling input unit with feedback function.
The relay contact will follow the state of the input.

Number of addresses: 1

Application include:
- Fire alarm push buttons
- Flame, heat or beam detectors with relay contacts

Function B

S1.1	S1.2	S1.3	S1.4
ON	OFF	OFF	OFF

Function: Pre Alarm condition signalling input unit with feedback function.
The relay contact will follow the state of the input.

Number of addresses: 1

Application include:
- Manual input for Pre Alarm
- Pre Alarm input from a detector with relay output
- Sprinkler contacts, etc.

Function C

S1.1	S1.2	S1.3	S1.4
OFF	ON	OFF	OFF

Function: Fault condition signalling input unit with feedback function.
Relay contact closes when the fault state is entered, and opens when the unit is reset.

Number of addresses: 1

Application include:
- Monitoring of associated equipment for faults
- Monitoring of detectors with relay contacts

Function D

S1.1	S1.2	S1.3	S1.4
ON	ON	OFF	OFF

Function: Uncommitted input.

Number of addresses: 1

Applications:
A typical application is monitoring of the power fault contact in the power supply or a fire pump. This unit can be used for:

- Monitoring of water level detection systems
- Monitoring of smoke control damper systems
- Monitoring of extinguishing systems
- General Alarm Push Button (GAPB)
- Autroprime: Supervisory condition

The relay contact will follow the state of the input.

Function E

S1.1	S1.2	S1.3	S1.4
OFF	OFF	ON	OFF

Function: Delayed Alarm condition signalling input unit with feedback function.
Input delay 2 seconds (configurable in AutroSafe).
Configurable delays for entering Pre Alarm and Alarm condition.
Default delays: Pre Alarm 10 seconds, Alarm 20 seconds (timers are configurable).

Relay contact closes when the alarm state is entered, and opens when the input goes to normal.

Number of addresses: 1

Application include:

- Sprinkler contacts, etc.

Function F

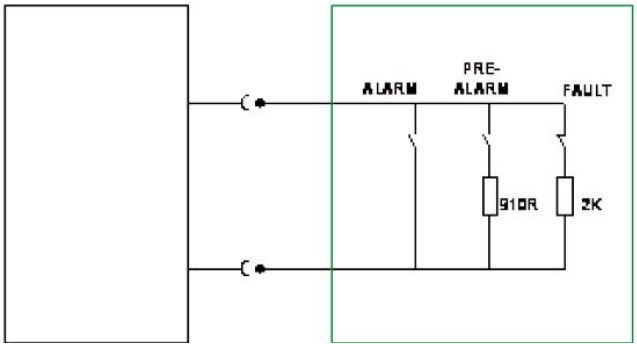
S1.1	S1.2	S1.3	S1.4
ON	OFF	ON	OFF

Function: Fault, Pre Alarm and Alarm condition.

Number of addresses: 1

Applications include:
- Fire detectors with two-level output (Pre Alarm and Alarm).

Relay contact activates for a configurable period when the unit is reset. This provides a 5 seconds (configurable) pulse for resetting the external detector.



Function G

S1.1	S1.2	S1.3	S1.4
OFF	ON	ON	OFF

Function: Alarm condition signaling input unit with reset function for external detector.
Relay contact activates for a configurable period when the unit is reset. This provides a 5 seconds (configurable) pulse for resetting the external detector.

Number of addresses: 1

Applications include:
- Flame, heat or beam detectors with relay contacts.

Function H

S1.1	S1.2	S1.3	S1.4
ON	ON	ON	OFF

Function: Alarm condition signalling input and independent relay output function.

Number of addresses: 2

Input application includes:
- Fire Alarm push buttons
- Flame, heat or beam detectors with relay contacts
- Sprinkler contacts, etc.

The output unit contains a potential free contact, which can be activated from a detector or a combination of several detectors or other preconfigured cause and effect relationships. No end-of-line monitoring on output function.
The output can be used for:
- Door release
- Sprinkler control/functions
- Control of fire dampers
- FPE/FAD without bell patterns

Function I

S1.1	S1.2	S1.3	S1.4
OFF	OFF	OFF	ON

Function: Uncommitted input and independent relay output function.

Number of addresses: 2

Applications:
A typical application is monitoring of the power fault contact in the power supply or a fire pump. This unit can be used for:
- Monitoring of water level detection systems
- Monitoring of smoke control damper systems
- Monitoring of extinguishing systems
- Autroprime: Supervisory condition

The output unit contains a potential free contact, which can be activated from a detector or a combination of several detectors or other preconfigured cause and effect relationships. No end-of-line monitoring on output function.
The output can be used for:
- Door release
- Sprinkler control/functions
- Control of fire dampers
- FPE/FAD without bell patterns

Function J

S1.1	S1.2	S1.3	S1.4
ON	OFF	OFF	ON

Function: Relay output function (input not in use)

Number of addresses: 1

Applications:
The output unit contains a potential free contact, which can be activated from a detector or a combination of several detectors or other preconfigured cause and effect relationships. The output can be used for:
- Door release
- Sprinkler control/functions
- Control of fire dampers
- FPE/FAD without bell patterns

Function K

S1.1	S1.2	S1.3	S1.4
OFF	ON	OFF	ON

Function: Relay output function with activation feedback monitoring.
Default delay for change of position is 15 seconds. At activation there is a 30 seconds delay before a technical alarm is initiated if the door is not closed within that timer. When the door closes an indication of this status is given immediately. When the door is closed, an indication of the new status is sent after 120 seconds. All delays are configurable.

Number of addresses: 1

Applications:
- Door control and monitoring
- Fire damper control and monitoring
- Low location lights control and monitoring
- Other equipment