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Four Channel – Rack Mount Detector With Optional Timers

Model N224-2/N224-2E Features:

- Extend and Delay Timing (E Model)
- 7 selectable sensitivities per channel
- 4 selectable frequencies per channel
- Presence or pulse modes per channel
- Separate detect and fault indicators per channel
- Fault diagnostics differentiate between open, short and excessive inductance changes
- Meets NEMA TS-1, TS-2 specifications



The N224-2 & N224-2E has been specifically designed and engineered for use in the demanding Traffic Control industry. With standard operations including: seven sensitivities, four frequencies and pulse or presence modes. The N224-2 & N224-2E covers your detection needs.

The N224-2 & N224-2E's wide inductance range allows for use with the wide variety of loops found in the Traffic Control industry (for recommended loop sizes please consult the Northstar Loop Information Guide).

Separate indicators for detect and fault provide for quick visual verification of proper operation. Loop diagnostics are easily viewed with the front panel fault indicator, differentiating between current and historical faults thus facilitating troubleshooting.

Reliable operation and long field life are key engineering goals in every Northstar product.

N224-2 & N224-2E Specifications

Specifications/Selections

Operating Mode:

Presence = 30 minutes
Pulse = 125ms +/- 25ms.

Pulse Paralysis:

When used in pulse mode, a pulse paralysis time of 2 seconds is incorporated to prevent multiple pulses being produced when a vehicle remains over the loop for an extended period.

Scanning:

Each channel is activated independently, minimizing crosstalk between adjacent loops connected to different channels of the same unit.

Front Panel Selections

Sensitivity:

7 levels of sensitivity are available selected by front panel DIP switch.

- 1 = Low Sensitivity (0.64%)
- 8 = High sensitivity (0.01%)

Setting	Level dL/L	Setting	Level dL/L
S0+S0+S0	OFF	S0+S0+S4	0.08%
S1+S0+S0	0.64%	S1+S0+S4	0.04%
S0+S2+S0	0.32%	S0+S2+S4	0.02%
S1+S2+S0	0.16%	S1+S2+S4	0.01%

* Set to position S0+S0+S4 initially and adjust to obtain detection of desired vehicles.

Response Time:

Response times shown are with both channels set to the same sensitivity and in fail-secure operation.

Setting	ResponseTime	Sensitivity	ResponseTime
0	OFF	4	8 +/- 2ms
1	3 +/- 1ms	5	14 +/- 4ms
2	4 +/- 1ms	6	30 +/- 6ms
3	6 +/- 1ms	7	50 +/- 10ms

Frequency:

Four separate settings controlled by front panel DIP switches.
Frequency range: 15 to 150 KHz.

- F1+F2 = High
- F0+F2 = Medium High
- F1+F0 = Medium Low
- F0+F0 = Low

* Frequency changes by a minimum of 7% between settings.

Timing Options:

Output signal may be Extended from 0 to 15.75 seconds in .25 second increments and Delayed from 0 to 63 seconds in 1 second increments. Both functions are activated by board mounted DIPswitches. Delay timing may be overridden on a per-channel basis by the application of a logic-ground true signal to the respective timer control input at the edge connector.

Reset:

Each channel may be reset by front panel ON/OFF (DIP) switch or by temporarily selecting another sensitivity/mode setting then returning to the desired value. The detector itself may be reset by the application of a logic-ground true signal applied to pin C of the edge connector.

Factory Settings:

- Set to HI frequency
- Set to Medium sensitivity (S0+S0+S4)
- Presence time set to Short (15 minutes)
- Pulse length set to 125ms
- Relay = fail-safe

Ordering Information:

N222-2 = Dual channel rack mount detector
N222-2E = Dual channel rack mount detector with extend & delay timing.
N224-2= Four channel rack mount detector
N224-2E Four channel rack mount with extend & delay timing

Outputs:

Optically Isolated Solid State.
Solid State Output rated Maximum Voltage 47V, ON voltage <1.5V at 50mA.

Failsafe:

A constant detect is provided during the following present conditions: power failure*, open, short or 25% inductance change.
* when connected to a NEMA TS-2 compatible input.

Supply Voltage:

10.8 to 30VDC

Tuning:

Automatically tunes to proper loop and lead-in with application of power.

Inductance Range:

20uH to 2000uH with a Q factor greater than 5.

Temperature Range:

-40 C to +80 C.

Lead-In Length:

Up to 5000 ft. with proper lead-in and loop.

Lightning and Transient Protection:

Loop inputs will withstand discharge of 2000V from a 10uF capacitor across the loop connections or from either loop input to ground.

Mechanical:

International size card: 4.5" H x 7" L, conformal coated, 44 contact (2 x 22), gold plated double sided edge connector.

Weight:

9 oz.

Indicators:

Front panel indicators include:

Detect – Red, solid during detect. Flashes to indicate current fault.
Fault – Yellow, flashing for current or historical fault.

Fault flash sequence is related to the type of fault sensed.

- Open = 1 blink, 1 space
- Short = 2 blinks, 1 space
- 25% inductance change = 3 blinks, 1 space

N224-2 & N224-2E Detector Connector –

Pin #	Functions	Pin #	Functions
A	D.C. (-) Common	1	Ch. 1 Timer Control
B	D.C. (+) Power	2	Ch. 2 Timer Control
C	Reset	3	Ch. 3 Timer Control
D	Loop Ch. 1	4	Loop Ch. 1
E	Loop Ch. 1	5	Loop Ch. 1
F	Output Ch. 1, Collector	6	
H	Output Ch. 1, Emitter	7	Status Output Ch. 1
J	Loop Ch. 2	8	Loop Ch. 2
K	Loop Ch. 2	9	Loop Ch. 2
L	Chassis Ground	10	Ch. 4 Timer Control
M	No Connection	11	No Connection
N	No Connection	12	No Connection
P	Loop Ch. 3	13	Loop Ch. 3
R	Loop Ch. 3	14	Loop Ch. 3
S	Output Ch. 3, Collector	15	
T	Output Ch. 3, Emitter	16	Status Output Ch. 3
U	Loop Ch. 4	17	Loop Ch. 4
V	Loop Ch. 4	18	Loop Ch. 4
W	Output Ch. 2, Collector	19	
X	Output Ch. 2, Emitter	20	Status Output Ch. 2
Y	Output Ch. 4, Collector	21	
Z	Output Ch. 4, Emitter	22	Status Output Ch. 4

Note: The above connection is shown with correct power supplied and no vehicle present.

Specifications are subject to change without notice.

Northstar Controls L.L.C. warrants this product against defects in Manufacturing and workmanship for one year from date of shipment from the Northstar Controls L.L.C. factory.



L N224-2 Rev B