The N-Series Addressable Switch combines the look and feel of a traditional electro-mechanical control coupled with a built in PCB and provides a flexible, cost effective alternative to a CAN/LIN based switch. The N-Series produces up to 144 individual switch IDs by using a resistive ladder circuit. Different switch IDs are achieved by changing the resistor values tied to individual loads, which can then be assigned to the specific functions that the switch is controlling. Each switch is connected to an ECU and the application software is written to recognize the switch IDs to determine which load is being controlled as well as the selected actuator position. As a result, the wiring harnesses are more simplified and specific loads can now be rearranged without the need for a costly and time consuming harness redesign, giving designers the ultimate in design flexibility.

**Product Highlights:**
- Cost effective alternative to CAN/LIN based switch
- Sealed to IP67 for Above-Panel Components
- Up to 144 individual switch IDs
- Simplified wiring harnesses
- Readdressable loads without harness redesign

**Typical Applications:**
- On-Highway Transportation Equipment
- Agricultural Equipment
- Construction Equipment
- Marine

**Resources:**
- Download 3D CAD Files
  - IGS
  - STP

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Application Support: team2@carlingtech.com
Phone: 860.793.9281  Fax: 860.793.9231

www.carlingtech.com
**Electrical**

- **Contact Rating**: .4VA @ 28VDC (MAX)
- **Dielectric Strength**: 1250 Volts RMS between pole to pole; 3750 Volts RMS between live parts and accessible surfaces
- **Insulation Resistance**: 50 Megohms
- **Contact Bounce**: 20 milliseconds max.
- **Contacts**: Gold plated
- **Terminals**: Brass or copper/silver plate
  - 3/16" (4.76mm)
  - Quick Connect terminations standard.

**Physical**

- **Lighted**: Incandescent - rated 10,000 hours
  - LED - rated 100,000 hours 1/2 life
  - (LED is internally ballasted for voltages to 24VDC)
- **Seals**: Rocker, base & bracket are sealed.
- **Base**: Nylon 66 GF rated to 85°C with a flammability rating of 94V0
- **Rocker and Paddle**: Nylon 66 Reinforced, rated to 105°C
- **Laser Etched Rocker Lens**: Polycarbonate rated at 100°C
  - Polycarbonate rated at 100°C
  - Front snap-in.
- **Connector**: Nylon 66 rated at 85°C. Polarized.
- **Bracket**: Nylon Zytel

**Actuator Travel (Angular Displacement)**

- **2 position**: 26°
- **3 position**: 13° from center

**Environmental**

- **Environmental**
  - IP67, for above-panel components of actual switch only.
  - -40°C to +85°C
  - Per SAE J1399 "electronic Tachometer Specification" for Class II truck and bus applications.
  - Test Criteria: No change in resistance and no evidence of physical damage.

- **Vibration**
  - Salt Spray
  - Exposure to 95% water, 5% NCI fog solution at 95 degrees F according to ASTM B 117-90 "Standard Method of Salt Spray (fog) Testing". Test Criteria:
  - No visual evidence of corrosion or external physical damage.
  - Samples were exposed to selected temperature profile, while maintaining 90% ± 5% relative humidity for 30 cycles. Test Criteria: No evidence of external physical deterioration.

**Mounting Specifications**

- **Panel Thickness Range**
  - Acceptable Panel Thickness: .030 to .156 (.76mm to 3.96mm)
  - Recommended: .030, .062, .093, .125 and .156

*Manufacturer reserves the right to change product specification without prior notice.*
N4121ANH1-11246-1EK

1 SERIES

2 CIRCUIT
Terminal Orientation

Position: 1 2 3
STANDARD
2 & 4 Connected Terminals 1 & 2
4 ON NONE ON
5 (ON) NONE ON
6 ON ON ON
7 (ON) ON ON
8 (ON) ON (ON)

3 R1 RESISTIVE IDENTIFICATION

1 1020 7 3570
2 1300 8 4320
3 1620 A 5230
4 2000 B 6340
5 2430 C 7870
6 2940 D 10000

4 R2 RESISTIVE IDENTIFICATION

1 1020 7 3570
2 1300 8 4320
3 1620 A 5230
4 2000 B 6340
5 2430 C 7870
6 2940 D 10000

5 RESISTOR CONSTANTS (INDICATES SWITCH STATE)
R3 R4 R5
1 1300 10000 5230
2 825 6650 3830

6 ILLUMINATION
Lamp #1: above terminals 9 & 10 end of switch; Lamp #2 above terminals 11 & 12 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only.

<table>
<thead>
<tr>
<th>Lamps</th>
<th>Illumination Type</th>
<th>Lamp wired to Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>S None</td>
<td>Standard</td>
<td>10+ 12-</td>
</tr>
<tr>
<td>A #1</td>
<td>Standard</td>
<td>11+ 9-</td>
</tr>
<tr>
<td>#2</td>
<td>Special Parallel</td>
<td>11+ 9-</td>
</tr>
<tr>
<td>B #1 &amp; 2</td>
<td>Special Parallel</td>
<td>10+ 9-</td>
</tr>
<tr>
<td>C #1 &amp; 2</td>
<td>Special Parallel</td>
<td>10+ 9-</td>
</tr>
<tr>
<td>1 #1</td>
<td>Independent</td>
<td>10+ 9-</td>
</tr>
<tr>
<td>#2</td>
<td>Independent</td>
<td>12+ 11-</td>
</tr>
<tr>
<td>2 #2</td>
<td>Independent</td>
<td>11+</td>
</tr>
<tr>
<td>3 #1</td>
<td>Independent</td>
<td>10+ 9-</td>
</tr>
<tr>
<td>#2</td>
<td>Independent</td>
<td>12+ 11-</td>
</tr>
<tr>
<td>4 #1</td>
<td>Independent</td>
<td>10+ 9-</td>
</tr>
<tr>
<td>#2</td>
<td>Independent</td>
<td>12+ 11-</td>
</tr>
</tbody>
</table>

7.8 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 7: above terminals 10 & 9; Selection 8: above terminals 12 & 11
No lamp
LED* Red Amber Green
12VDC C
* Consult factory for “daylight bright”, blue/green and white LED options. Typical current draw for LED is 20ma.

9 BRACKET COLOR

<table>
<thead>
<tr>
<th>Standard Bracket</th>
<th>Black</th>
<th>White</th>
<th>Gray</th>
<th>Red</th>
<th>Laser Etched</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockerguard at Lamp 1</td>
<td>L</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>Rockerguard at Lamp 2</td>
<td>L</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
</tbody>
</table>

10 ACTUATOR STYLE AND COLOR

<table>
<thead>
<tr>
<th>Rocker</th>
<th>Black</th>
<th>White</th>
<th>Gray</th>
<th>Red</th>
<th>Laser Etched</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddle</td>
<td>J</td>
<td>N</td>
<td>K</td>
<td>M</td>
<td>D</td>
</tr>
</tbody>
</table>

11 & 12 LENS STYLE AND COLOR

Lens color for LEDs must be clear, white, or match color of LED.

<table>
<thead>
<tr>
<th>Clear</th>
<th>White</th>
<th>Amber</th>
<th>Green</th>
<th>Red</th>
<th>Blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>B</td>
<td>G</td>
<td>M</td>
<td>T</td>
</tr>
<tr>
<td>1</td>
<td>-</td>
<td>C</td>
<td>H</td>
<td>N</td>
<td>U</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>D</td>
<td>J</td>
<td>P</td>
<td>V</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>E</td>
<td>K</td>
<td>R</td>
<td>W</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Laser Etch background color</td>
</tr>
</tbody>
</table>

13 LEGEND ORIENTATION

<table>
<thead>
<tr>
<th>00</th>
<th>No legend this location / no actuator</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Orientation 1 - vertical, lamp 1 on top</td>
</tr>
<tr>
<td>02</td>
<td>Orientation 2 - horizontal, lamp 1 on right</td>
</tr>
<tr>
<td>03</td>
<td>Orientation 3 - vertical, lamp 1 on bottom</td>
</tr>
<tr>
<td>04</td>
<td>Orientation 4 - vertical, lamp 1 on left</td>
</tr>
</tbody>
</table>

14 LEGEND ORIENTATION

<table>
<thead>
<tr>
<th>0</th>
<th>No legend (used with codes 11-18 in selection 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation 1 - vertical, lamp 1 on top</td>
</tr>
<tr>
<td>2</td>
<td>Orientation 2 - horizontal, lamp 1 on right</td>
</tr>
<tr>
<td>3</td>
<td>Orientation 3 - vertical, lamp 1 on bottom</td>
</tr>
<tr>
<td>4</td>
<td>Orientation 4 - vertical, lamp 1 on left</td>
</tr>
</tbody>
</table>

15 ACTUATOR LENS LEGEND

<table>
<thead>
<tr>
<th>00</th>
<th>No legend this location / no actuator</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Custom colors are available. Consult factory.</td>
</tr>
<tr>
<td>02</td>
<td>Switch supplied with .187 tab terminals.</td>
</tr>
</tbody>
</table>

Notes:
1. Custom colors are available. Consult factory.
2. Switch supplied with .187 tab terminals.

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Dimensional Specifications: in. [mm]
### Circuit Diagrams:

<table>
<thead>
<tr>
<th>CIRCUIT CODE</th>
<th>SCHEMATIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td><img src="image1" alt="Circuit Diagram 4" /></td>
</tr>
<tr>
<td>5</td>
<td><img src="image2" alt="Circuit Diagram 5" /></td>
</tr>
<tr>
<td>6</td>
<td><img src="image3" alt="Circuit Diagram 6" /></td>
</tr>
<tr>
<td>7</td>
<td><img src="image4" alt="Circuit Diagram 7" /></td>
</tr>
<tr>
<td>8</td>
<td><img src="image5" alt="Circuit Diagram 8" /></td>
</tr>
</tbody>
</table>

### Lamp Circuit Diagrams:

<table>
<thead>
<tr>
<th>ILLUM CODE</th>
<th>SCHEMATIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td><img src="image6" alt="Lamp Diagram A" /></td>
</tr>
<tr>
<td>B</td>
<td><img src="image7" alt="Lamp Diagram B" /></td>
</tr>
<tr>
<td>C</td>
<td><img src="image8" alt="Lamp Diagram C" /></td>
</tr>
<tr>
<td>1</td>
<td><img src="image9" alt="Lamp Diagram 1" /></td>
</tr>
<tr>
<td>2</td>
<td><img src="image10" alt="Lamp Diagram 2" /></td>
</tr>
<tr>
<td>3</td>
<td><img src="image11" alt="Lamp Diagram 3" /></td>
</tr>
<tr>
<td>4</td>
<td><img src="image12" alt="Lamp Diagram 4" /></td>
</tr>
</tbody>
</table>
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About Carling

Founded in 1920, Carling Technologies is a leading manufacturer of electrical and electronic switches and assemblies, circuit breakers, electronic controls, power distribution units, and multiplexed power distribution systems. With four ISO registered manufacturing facilities and technical sales offices worldwide, Carling Technologies Sales, Service and Engineering teams do much more than manufacture electrical components, they engineer powerful solutions! To learn more about Carling please visit www.carlingtech.com/company-profile.

To view all of Carling's environmental, quality, health & safety certifications please visit www.carlingtech.com/environmental-certifications

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