



# APPLICATION NOTE

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**Products:** Cutler-Hammer Enhanced 50 Series Photoelectric Sensors  
**Part No.:** 1151E-6543, 1251E-6543, 1351E-6543, 1451E-6543, 1452E-6543  
**Subject:** Replacing Allen-Bradley 9000 Series Photoelectric Sensors with Cutler-Hammer Enhanced 50 Series Sensors

**Number:** AN-SEN-008  
**Date Issued:** 10/20/05  
**Revision:** Original

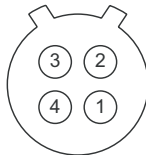
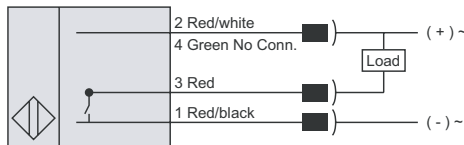
Wiring changes are required when replacing A-B 9000 Series sensors with C-H Enhanced 50 Series sensors.

The Allen-Bradley model 9 \_\_ 3-QD1 sensors are a family of AC/DC sensors with 3-wire output configuration terminated with a dual key micro AC connector. Currently, the nearest Cutler-Hammer replacements are Enhanced 50 Series sensors with model numbers ending in the "-6543" suffix. These models have a 4-wire output configuration terminated in the same 4-pin dual key micro AC connector.

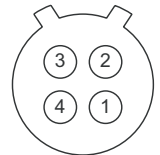
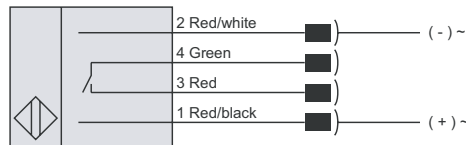
**While the replacement Cutler-Hammer sensor will attach to the existing mating cable, external wiring changes are required before the sensor's output will function.**

The following wiring diagrams and table show the wiring differences between the 9000 Series and Enhanced 50 Series sensors.

Allen-Bradley 9 \_\_ 3-QD1 Sensors



Cutler-Hammer "-6543" Sensors



Sensor	Mating Cable Color Code	Connector Pin	Wire Color	AC Mode	DC Mode
<b>Allen-Bradley 9000 Series</b>	<b>North American</b>	1	Red/black	AC hot	DC common
		2	Red/white	AC neutral	DC positive
		3	Red	Switched AC output	NPN output
		4	Green	Not used	Not used
<b>Cutler-Hammer Enhanced 50 Series</b>	<b>North American</b>	1	Red/black	AC hot	DC positive
		2	Red/white	AC neutral	DC common
		3	Red	Switched AC output	NPN output
		4	Green	AC hot *	DC common
	<b>IEC</b>	1	Brown	AC hot	DC positive
		2	Blue	AC neutral	DC common
		3	Black	Switched AC output	NPN output
		4	White	AC hot	DC common

\* Note: Using a green wire for a current carrying conductor is a violation of National Electrical Code. For this reason, we recommend using a connector cable with IEC color codes, such as ADC (and Cutler-Hammer) part number CSAS4A4CY2202.

## Technical Assistance

If you have any questions regarding this Application Note, please contact Technical Support at 770-844-4200.

