Discrete I/O and Teach Function

Features

▲ Recognize up to fifteen different color objects with one sensor

▲ Superior color detection on a wide range of materials—even difficult textures

▲ Eight-reading Teach provides for permissible color variations

▲ Easily optimize performance using the *ColorSense* Setup Wizard

▲ Several sensing area and standoff distance options fit various applications

▲ Discrete inputs and outputs provide compatibility with any 12-24V I/O

▲ Compact 1.3 x 4.0" footprint (33 x 100mm). Height is 4.0" (100mm) not including cables.

▲ Long life LED lighting with temperature, aging, and ambient light compensation.

The CS24D differentiates up to fifteen colors by comparing against Teach values, and communicates the results using four discrete outputs (binary coded, with 0000 = no match).

Teaching is done via a PLC or switches connected to the CS24D's discrete inputs or using the Setup Wizard in Delta's *ColorSense* software.

Lighting is a key element for color sensing. The CS24D's twenty-four LEDs form consistent, diffuse lighting over its wide sensing area.

The CS24D reads the average color within the sensing area. Several sensing areas and standoff ranges are available.

As wonderful as the human eye is, it has only limited ability to differentiate between similar colors unless they are very close together (e.g. after parts are assembled). With the CS24D color sensor, the human eye now has a practical and effective backup.

Applications

▲ Ensure the correct color object is being processed on your automated assembly line

▲ Handle Just-In-Time supply requirements with confidence

▲ Sort objects by color - into as many as 15 categories

▲ Detect presence of coatings

▲ Detect paint marks where bar coding is impractical

CS24D sorting options include Closest Color, Closest Match, and Unique Match, with the latter two options using an adjustable Error Limit. Sorting can use color only, both color and intensity, or can be optimized for the Teach data.

The Setup Wizard in Delta's easy to use Windows based *ColorSense* software automates sensor configuration and optimization.

Parameters and Teach data can be saved to a PC and restored to the sensor for quick line changeovers.
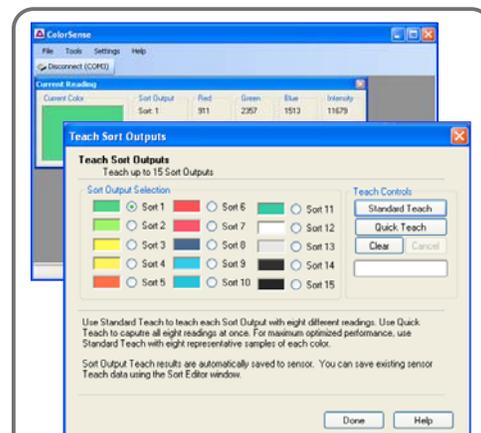
Use *ColorSense* to select options, adjust parameters, and optimize the CS24D to your specific application.

DELTA
COMPUTER SYSTEMS

Allow 3.5 (90mm) clearance for cables

Standoff Distance and Sensing Area shown for model CS24D-02

Nominal Standoff

Standoff Range

Sensing Area

0.156 (4mm) Dia
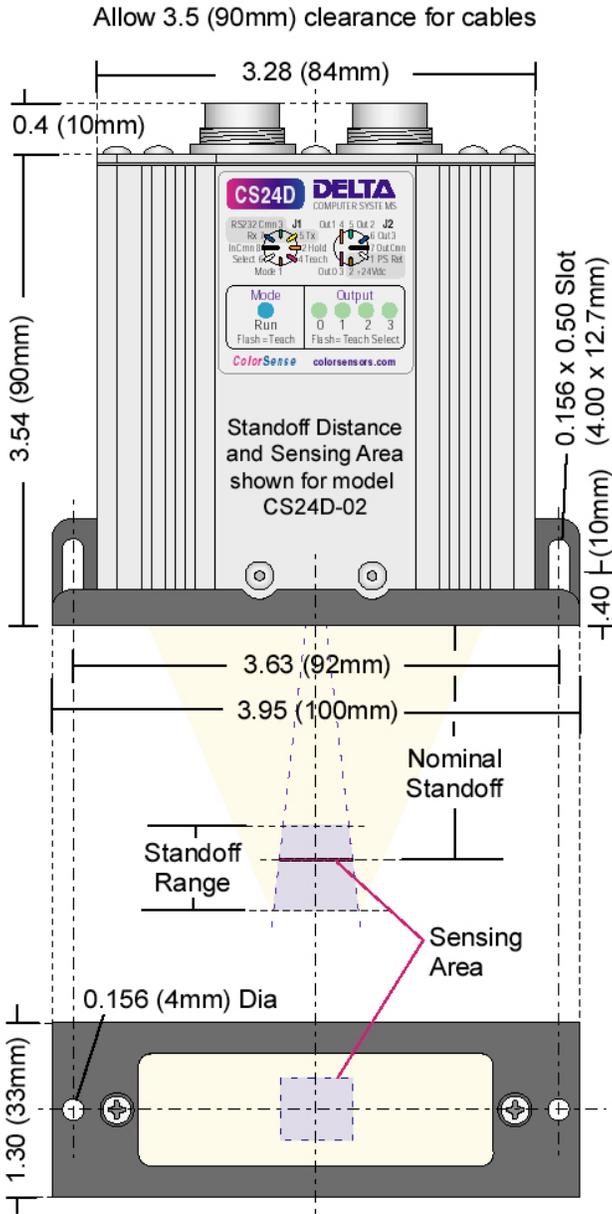
The CS24D is available in several models with a variety of sensing areas and standoff ranges. Standoff ranges include 0.63 to 1.00" (16 to 25mm) and 1.50 to 2.13" (38 to 54mm) shown above.

Company Profile

Delta Computer Systems, Inc. manufactures motion controllers, color sensors, and other electronic controls for a wide variety of industrial applications. You can rely on Delta for practical expertise, reliable products, responsive support and lasting value.

CS24D Common Specifications

Teachable Outputs	Fifteen (binary coded, 0 = no match)
Teach Modes	Closest Color, Closest Match*, Unique Match* (*adjustable threshold)
Teach Criteria	Color Only, Color plus Intensity, or Optimized
Data Averaging	1, 2, 4, 8, 32, or 64 readings (adding that many milliseconds to Response Time)
Response Time	2-3 ms plus averaging time (w/o RS232)
Discrete Inputs	Four, opto-isolated, 12-24V at 5mA max (Teach, Select, Mode, Hold)
Discrete Outputs	Four, opto-isolated SSR, rated 12-24V at 100mA max (binary coded 0, 1, 2, 3)
Power Supply	12 or 24Vdc (11 to 29V range), isolated; 50mA cont max, 500mA startup max
Connectors	Two, 7-pin and 8-pin circular din
Enclosure	Dust tight aluminum, 0.5 lb max *(2,75 kg)*
Environment	+10 to +40°C operating, -25 to +85°C storage; 0-90% humidity, non-condensing

Hold Input (Orange) Pin 2
RS-232 Tx (Yellow) Pin 5
RS-232 Cmn (Green) Pin 3
RS-232 Rx (Blue) Pin 7

Pin 4 (Orange) Output 1
Pin 5 (Green) Output 2
Pin 6 (Blue) Output 3
Pin 7 (Black) I/O Cmn

J1: Serial and Discrete Inputs

J2: Power and Discrete Outputs

Input Cmn (Black) Pin 8
Select Input (White) Pin 6
Mode Input (Brown) Pin 1
Teach Input (Red) Pin 4

Pin 1 (White) PS Return
Pin 2 (Brown) +24Vdc Pwr
Pin 3 (Red) Output 0
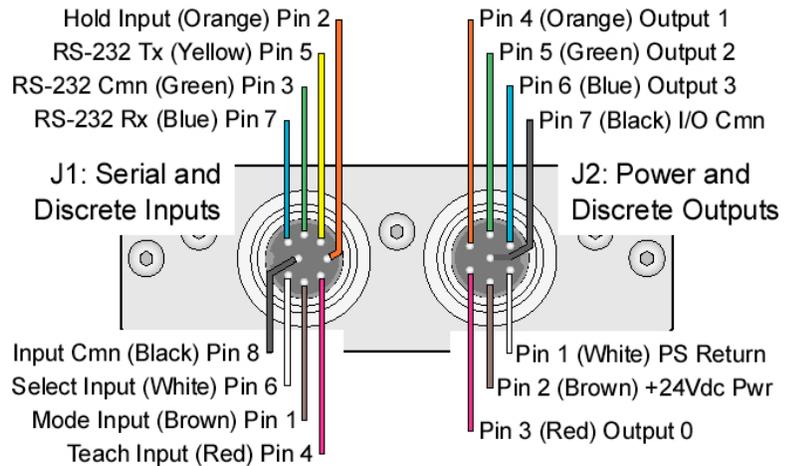
CS24D Ordering Information

Order Number	Standoff Range	Sensing Area	At Standoff
CS24D-00	0.63 to 1.00" (16 to 25mm)	0.28 x 0.32" (7 x 8mm)	0.75" (20mm)
CS24D-01	0.63 to 1.00" (16 to 25mm)	0.16 x 0.16" (4 x 4mm)	0.75" (20mm)
CS24D-02	1.50 to 2.13" (38 to 54mm)	0.47 x 0.54" (12 x 14mm)	1.75" (45mm)
CS24D-03	1.25 to 2.50" (32 to 63mm)	0.27 x 0.27" (7 x 7mm)	1.75" (45mm)

Cables and other accessories are available. Order CS24D-xx-Kit to include standard cables. See colorsensors.com for complete information.

DELTA