ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Cognex 821-0015-2R* at our website: ***Click HERE***

Checker® 3G Series



User's Guide

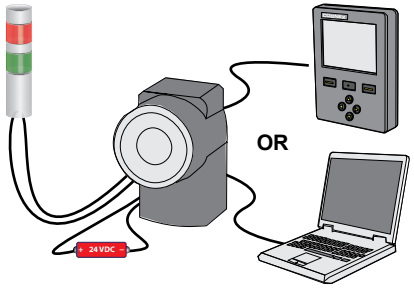
HVS System
DISTRIBUTEUR CONSEIL DEPUIS 1985
AUTOMATION SOLUTION PROVIDER ASP COGNEX
2 rue René Laennec 51500 Taissy France
Fax: 03 26 85 19 08, Tel: 03 26 82 49 29
Email:hvssystem@hvssystem.com
Site web : www.hvssystem.com
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisa

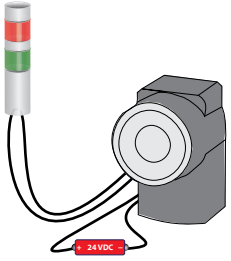
What is Checker 3G and what does it do?

Checker 3G is a programmable vision sensor that verifies the presence and appearance of objects.

You configure Checker 3G by creating one or more ***Jobs*** using a SensorView Teach Pendant or a PC connected to the Checker 3G's USB port.

Checker's One-Click™ sensors let you check the presence, absence, appearance, and size of part features with a single click





Once configured, Checker 3G is placed in **Run Mode**. In Run mode Checker 3G automatically detects and inspects parts, drawing power from and communicating with your other automation devices through its built-in power and I/O connector.

You can connect a SensorView Teach Pendant or a PC to a running Checker 3G at any time to view part images, review statistics, or control the operation of Checker 3G

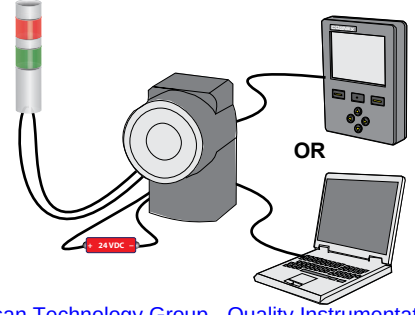
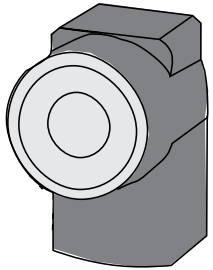


Table of Contents

Checker 3G Products and Accessories 4
Dimensions and Features 6
Getting Started 8
Verify Checker is Working -- Teach Pendant 10
Verify Checker is Working -- PC 11
Checker User Interface -- Teach Pendant 12
Checker User Interface -- PC 14
Checker Part Triggers 16
Part Finding Sensor 18
Presence Sensors 20
Measurement Sensors 22
Advanced Measurement Sensor Features 24
Job Control 26
External Retrain 28
Run Time Display 30
Run Time Recording 31
Filmstrip Control -- SensorView 32
Filmstrip Control -- PC 34
Input/Output Wiring 36
Circuit Diagrams (Typical) 37
Input/Output Wiring Examples 38
Working Distance and Field of View 40
Adjusting Focus 41
Changing Lenses. 42
Mounting Checker 44
Specifications 46
Precautions 47

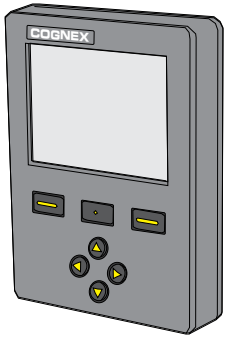
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Checker 3G Products and Accessories



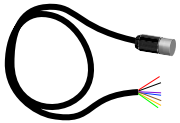
Checker 3G Series Systems

	3G1
Part Detection	√
Trigger Input Line	√
Discrete Outputs	2
Personalities	2
Presence	√
Measurement	√



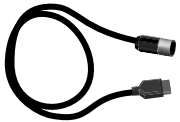
SensorView Teach Pendant (SV-350-001)

Standalone control panel that lets you configure, manage, and monitor a Checker 3G sensor.



Flying Lead Cable (C3G-CBL-001)

Connects Checker directly to your equipment (5m).



M12 USB Cable (CKR-200-CBL-USB)

Provides an IP67-compliant USB connection from Checker to the PC (5m).



I/O Extender (CKR-200-CBL-EXT)

Power and I/O extension cable (5m).



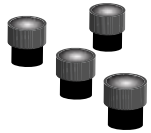
Right-Angle Cable (CKR-200-CBL-RT-003)

Power and I/O extension cable with low-profile right-angle connector for Checker sensor (1m).



Mounting Bracket (CKR-200-BKT)

Provides flexible mounting options for Checker.

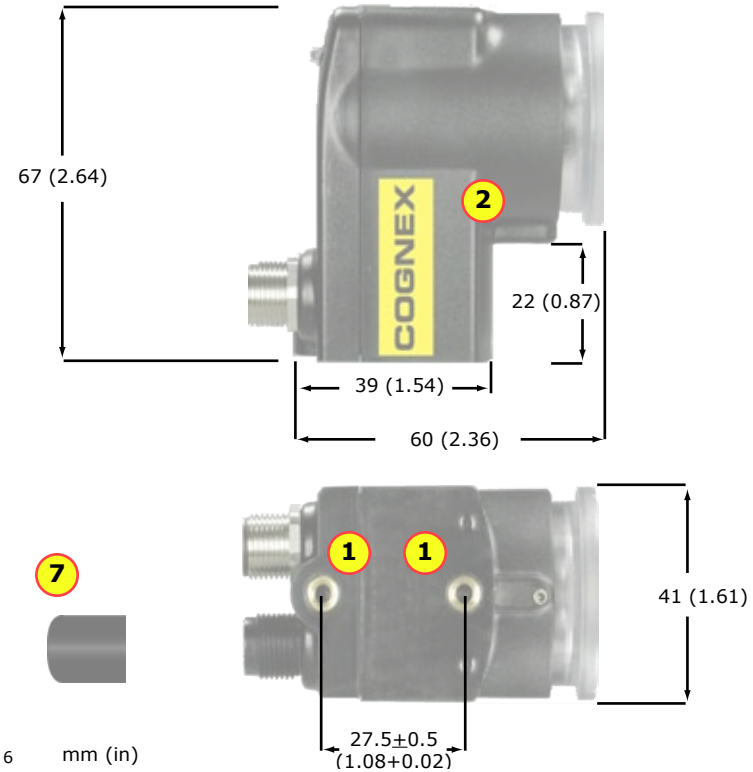


Lens Kit (CKR-200-LENSKIT)

Set of 3.6mm, 8mm, 16mm, and 25mm lenses that provide expanded field of view and working distance options.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Dimensions and Features







1	Mounting holes (M4 x 4 mm)
2	Focus lock (M3, use 2.5 mm hex key)
3	Lens cover/focus ring
4	Status LED (GREEN): • On: Run mode • Slow blink: Setup Mode • Fast blink: Internal error
5	Part detect LED (RED)
6	USB connector with M12 plug
7	USB connector cover (cover or IP67 USB cable must be used for IP67 protection)
8	Power and I/O connector with M12 plug

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Getting Started

Step	Using SensorView Teach Pendant	Using a PC
1: Review system requirements	• SensorView Teach Pendant v 2.4 or newer • 24 VDC power supply, 525 mA (250 mA for Checker 3G, 275 mA for SensorView Teach Pendant) • USB cable	A PC with: • Microsoft® Windows® 2000™ SP4, Windows XP™, or Windows Vista™ • 128 MB RAM • USB 1.1 (2.0 recommended for best performance) • 1024 x 768 (96 DPI) or 1280 x 1024 (120 DPI) display and • 24 VDC power supply, 250 mA • USB cable
2. Install SensorView Teach Pendant or Checker PC software	Install SensorView Teach Pendant by following instructions in *SensorView Teach Pendant User Manual*.	1. Insert CD-ROM. 2. If installer does not start automatically, double-click *setup.exe*. 3. Follow installer prompts.
3. Connect Checker 3G to power	Connect Checker 3G to 24 VDC power supply and I/O equipment, as described on page 36. Verify that Checker 3G's illumination LEDs are lit.	Connect Checker 3G to 24 VDC power supply and I/O equipment, as described on page 36. Verify that Checker 3G's illumination LEDs are lit.
4. Connect Checker 3G to SensorView Teach Pendant or PC	Connect Checker 3G to SensorView Teach Pendant using USB cable (use either USB port on SensorView Teach Pendant).	Connect Checker 3G to PC using USB cable.
5. Select Personality	Verify that SensorView Teach Pendant is displaying the **Select Personality** screen. Select **Presence** if you are using this sensor to check presence/absence or appearance. Select **Measurement** if you are using this sensor to verify part or feature dimensions. Checker only prompts you to select its personality the first time it is started. You can change Checker 3G's personality at any time by selecting **Main Menu ►Select Personality.**	• Start the Checker software (select **Cognex->Checker Vision Sensors->Checker** from the Windows **Start** menu). • Click **Get Connected**. • Select your Checker 3G and click **Connect**. In the **Select Personality** screen select **Presence** if you are using this sensor to check presence/absence or appearance. Select **Measurement** if you are using this sensor to verify part or feature dimensions. Checker only prompts you to select its personality the first time it is started. You can change Checker 3G's personality at any time by selecting **Checker->Select Personality...**

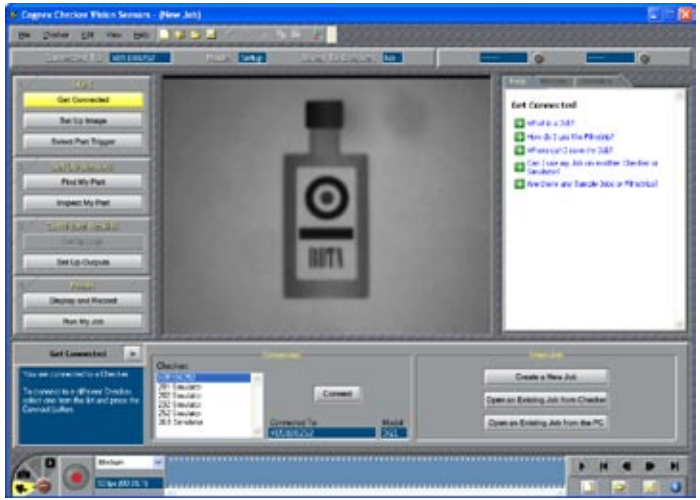
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Verify Checker is Working -- Teach Pendant



SensorView should display the Setup mode home screen, as shown here.

Verify Checker is Working -- PC



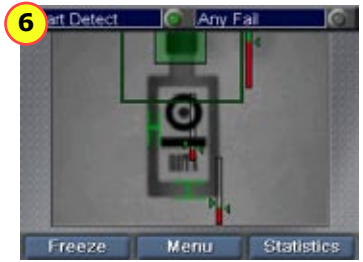
The PC software should automatically connect to Checker 3G and display an image.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Checker User Interface -- Teach Pendant

SensorView Teach Pendant provides an interactive interface that lets you configure, manage, and monitor a Checker 3G. For general information on how to use this interface, see the *SensorView Teach Pendant Users Guide and Reference*.





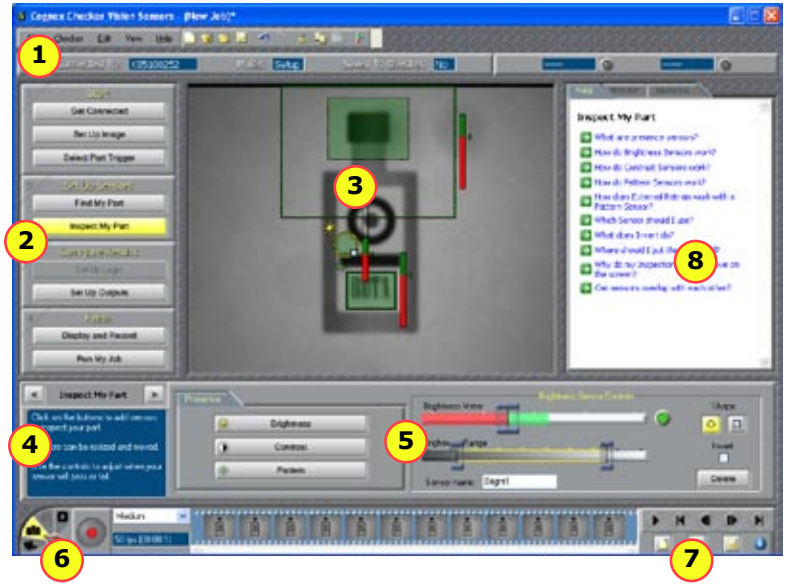


1	Setup mode home screen. Each of the four steps at the left includes substeps to let you create and modify Checker 3G jobs.
2	**Navigation keys.** Use these keys to select which item is active on the Checker 3G screen. If a full-screen view is shown, the navigation keys let you select individual items or controls on the screen.
3	**Select** softkey. Pressing this key activates or selects whatever item has been selected using the navigation keys. If there are outstanding changes to an object, this key's name changes to **Apply**. If Checker is asking for input, this key's name changes to **Yes**.
4	**Main Menu** or **Back** softkey. In most contexts, this key returns to the previous screen. If you are at a top-level screen, it opens the Main Menu. If Checker is asking for input, this key's name changes to **Cancel**.
5	**Help** softkey. Press this key for context-specific help. If Checker is asking for input, this key's name changes to **No**.
6	**Run Mode** screen. Displays images or statistics for a running Checker 3G or Checker 200.
7	**Main menu** screen. Provides access to system settings, lets you connect to other devices.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Checker User Interface -- PC

The **Checker User Interface** is PC software that lets you control Checker. You use this program to view Checker images, create and modify Checker Jobs, and to monitor running Checkers.

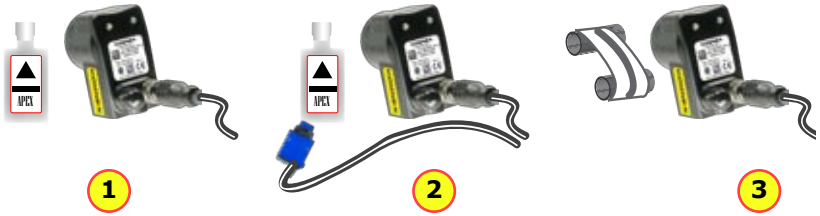


1	Menu bar and status pane. The menu bar lets you open and save jobs and manage Checker personalities and system settings. The status pane shows which Checker is connected, the Job name and if it has been saved, along with results for the most recent image.
2	Checker steps. Click each button in turn to build a Checker application.
3	Image display. Shows live video from Checker or individual images from a Filmstrip.
4	For each Checker step, instructions about what to do next are displayed here.
5	Control pane. The controls and information for each Checker step are displayed here.
6	Filmstrip recording controls: Video, Snapshot, External Trigger, and Playback mode.
7	Filmstrip playback controls (only enabled in Playback mode). Lets you load and display images recorded earlier or on another Checker.
8	Questions and answers related to the current step.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Checker Part Triggers

A part *trigger* tells Checker that a part is ready to be inspected. Checker supports three trigger types.



1	**Internal Part Trigger**: Checker uses its Part Finding Sensor to detect when a part is present and ready to be inspected. You create and configure the Part Finding Sensor by selecting a feature on your part that is always present.
2	**External Part Trigger**: Checker uses an external signal that your equipment supplies to detect when a part is present and ready to be inspected. You use an External Trigger by configuring a device such as a photoelectric sensor, contact switch, or proximity sensor, then connecting it to Checker's Trigger input line.
3	**Free Running**: Checker inspects each and every image that it acquires, not just the images that contain a part or for which an external trigger is received.

Choosing a Trigger Type

You set the trigger type in the ***Start*** ►***Select Trigger*** step on SensorView Teach Pendant or the **Select Part Trigger** step on the PC.

In most cases, it is simplest to use the Internal Part Trigger, since no external equipment is required. You create a Part Finding Sensor in the ***Set Up Sensors*** ►***Find My Part*** step on SensorView Teach Pendant or the **Find My Part** step on the PC.

If the appearance of your parts is highly variable, or if your line already has a device or sensor that produces a part trigger signal, you can use an External Trigger.

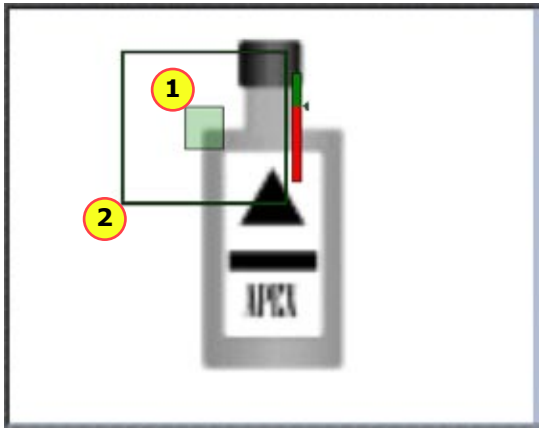
Free Running mode is useful for several types of applications:

- Checking objects that move continuously and which cannot be detected with a Part Finding sensor, such as a moving web of paper or metal.
- Checking parts that move in multiple ways, such as a part that moves into the field of view and then rotates in place.
- Performing continuous inspection of non-moving objects to check for changes in appearance.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Part Finding Sensor

A *Part Finding Sensor* detects and locates your part in the image. You create a Part Finding Sensor by drawing a box around a feature of part that is present on both good and bad parts.



1	The feature Checker is looking for.
2	The Search Region (where Checker looks for the feature).

Part Finding Sensors and Trigger Types

Part Finding Sensors are used differently for different trigger types.

- With an Internal Trigger, a Part Finding Sensor is *required*. The Part Finding Sensor tells Checker that a part is present.
- With an External Trigger, a Part Finding Sensor is optional. If you do not use a Part Finding Sensor, then the presence or measurement sensors will run in fixed positions. If you use a Part Finding Sensor, then both the Part Finding Sensor and the External Trigger must indicate a part before Checker will check it.
- In Free Running mode, a Part Finding Sensor is optional. If you do not use a Part Finding Sensor, then the presence or measurement sensors will run in fixed positions. If you use a Part Finding Sensor, then the Part Finding Sensor must detect a part in an image before Checker will check it.

In all cases, if a Part Finding Sensor is used, then Checker uses the part's detected location to position the presence or measurement sensors.

Modifying a Part Finding Sensor

You can change the location where Checker looks for the part by simply moving the Part Finding Sensor search region.

To change *what* a Part Finding Sensor looks for, you must either

- Create a new Part Finding Sensor in Setup mode.
- Use the External Retrain feature in Setup mode or Run mode.

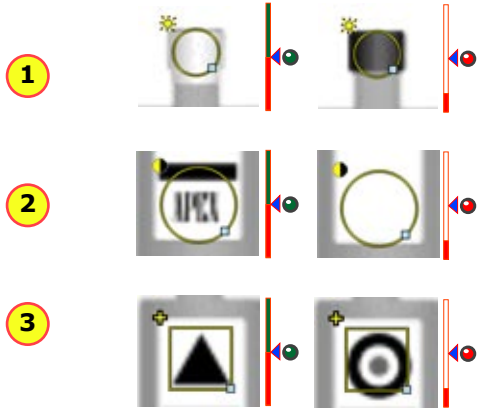
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Presence Sensors

Presence Sensors evaluate part of a Checker image to determine if a feature is present or not.

Presence sensors support one-click setup; simply click on the feature you want to check to create and configure the sensor in a single step.

There are three types of presence sensors:



1	**Brightness Sensor**: Use when the feature of a good part is much lighter or much darker than the same feature of a bad part.
2	**Contrast Sensor**: Use when the feature of a good part has more or less distinct dark and light areas than the same feature of a bad part.
3	**Pattern Sensor**: Use when the feature of a good part has the shape you want and the same feature of a bad part does not, or when inconsistent lighting conditions cause Brightness or Contrast sensors to fail.

Sensor Threshold

The sensor threshold slider sets the level below which a sensor fails and above which a sensor passes. In many cases, the default value works well. If you adjust the slider, set it so that it is mid-way between the level for good parts and bad parts.

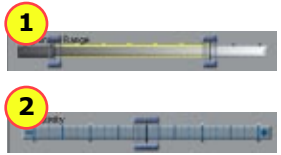
If you check **Invert**, the Sensor passes with levels below the threshold and fails with levels above the threshold.

Modifying a Sensor

To change the location of a sensor, click and drag on the sensor border. To resize a sensor, click and drag on the handle on the sensor border. Checker automatically re-trains a Pattern sensor whenever you move or resize it.

Advanced Sensor Tuning

Brightness and Contrast Sensors have controls that let you tune the sensors to maximize the reported difference between good and bad parts.



1	**Brightness Range**: Two sliders set the range of brightness levels used by the sensor.
2	**Contrast Sensitivity**: Slider increases or decreases sensitivity to contrast differences.

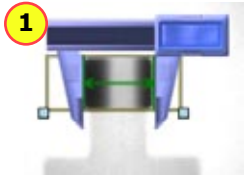
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Measurement Sensors

Measurement Sensors evaluate part of a Checker image to determine if a feature is within a specified size range.

Measurement sensors support one-click setup; simply click on the center of the feature you want to measure to create and configure the sensor in a single step.

There are three types of measurement sensors:



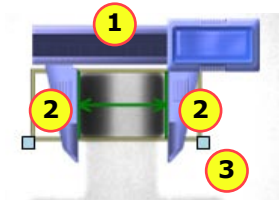


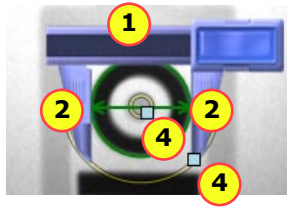


1	**Width Sensor**: Use to measure the width of a feature with vertical edges.
2	**Height Sensor**: Use to measure the height of a feature with horizontal edges.
3	**Diameter Sensor**: Use to measure the diameter of a circular feature

How to use the Measurement Sensor Controls

In most cases, there is no need to change the one-click setup sensor. Features that are too large or too small will fail, while features that are the correct size will pass. You use the controls shown below to adjust a measurement sensor.







1	**Drag bar**: Click and drag here to reposition the sensor.
2	**Blades**: Click and drag here to select different feature edges.
3	**Width and Height Sensor Region**: Set the region for the feature. Use this to exclude features you don't want to measure.
4	**Diameter Sensor Region**: Set the inner and outer limits of the search region.
5	**Low Threshold:** Features smaller than this fail.
6	**High Threshold:** Features larger than this fail.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Advanced Measurement Sensor Features

Selecting the Edge Search Rule

Normally, width and height sensors measure the edges that are closest to the caliper blades while diameter sensors measure the strongest edges.

You can select a different rule for edge selection using the **Search For** rule.

Closest	The sensor uses the edges that are closest in spacing and position to the edges that it found when you created the sensor (or when you adjusted the sensor position).
Narrowest/Smallest	The sensor uses the edges that are the closest together (Width and Height sensor) or smallest in diameter (Diameter sensor).
Widest/Largest	The sensor uses the edges that are furthest apart (Width and Height sensor) or largest in diameter (Diameter sensor).
Strongest	The sensor uses the edges with the strongest contrast (the greatest difference in brightness between the two sides of the edge).

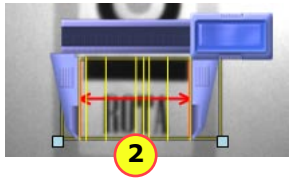
If a measurement sensor locks onto the wrong edges for some parts, you can select a different **Search For** rule to force the sensor to measure the correct edges.

You can set a different **Search For** rule for each sensor in your job.

Adjusting Edge Sensitivity

The sensitivity control for measurement sensors controls how many edges the sensor evaluates when measuring your feature. As you move the sensitivity slider, the sensor displays the edges that it finds as yellow lines.





1	**Sensitivity Slider**: slide right to detect more edges, slide left to detect fewer edges.
2	**Edge Display**: Found edges shown in yellow, as long as slider is clicked.

▶ *If you are unable to get a measurement sensor to lock onto the edge you want to measure, try increasing the sensitivity. If the sensor locks onto the wrong edge, try reducing the sensitivity.*

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Job Control

Checker 3G has eight *Job slots*. You can assign saved Checker Jobs to Job slots, then load them while Checker is running by sending Job Select and Job Change signals to Checker through its input lines.

You can assign a Job saved on a Checker to any Job slot using the **Main Menu ►Job Control** screen on SensorView Teach Pendant or selecting **Checker->Set up Job Control** on the PC.

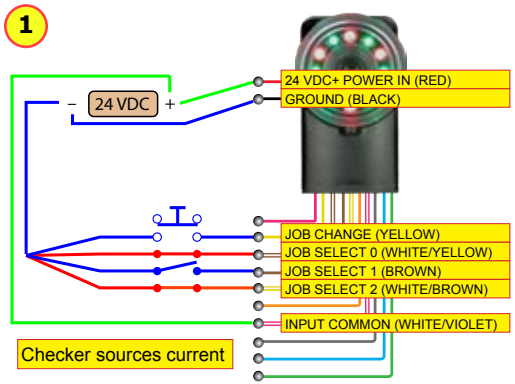
In the **Job Control** dialog box, each Job slot, from 0 through 7, has a menu that you use to specify the Job. You can specify the same Job for multiple slots.

To load a Job from a Job slot while Checker is in Run mode, you must apply +24 VDC to the four input lines that you use to load a Job from a Job slot. The JOB SELECT 0, JOB SELECT 1, and JOB SELECT 2 lines specify the 3-bit Job slot number. You use the JOB CHANGE line to load the Job.

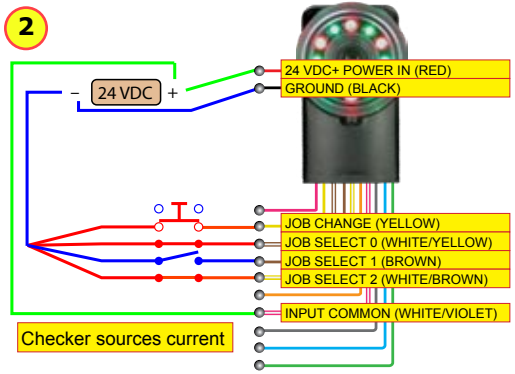
Checker indicates that a Job Change succeeded by flashing its lights twice quickly. A failed Job Change is indicated by three slow flashes. You can also configure a Checker output line to signal when a Job Change succeeds or fails.

The **Job Control** dialog box also lets you select the Boot Job (the Job Checker runs when it is restarted after a power cycle in Run mode).

The example below shows how to load the Job in slot 5:



1	Raise JOB SELECT 0 and JOB SELECT 2 lines (101 binary = 5 decimal).



2	Apply a pulse (minimum 15 ms) to JOB CHANGE line to load the Job in Job Slot 5.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

External Retrain

You can configure both Part Finding Sensors and Pattern Sensors to be retrainable by checking **External Retrain** in the sensor control panel.

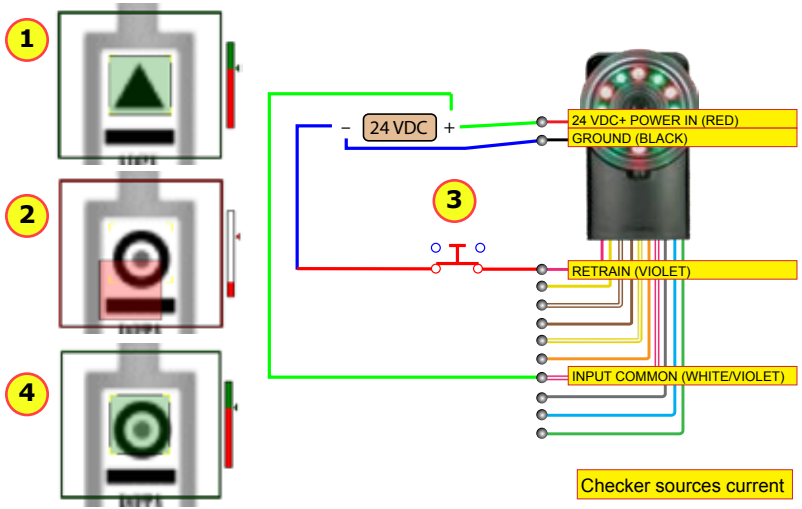
Whenever Checker receives a signal on the RETRAIN line, Checker retrains any retrainable Part Finding Sensors and Pattern Sensors using the part of most recently acquired image that lies within the retrain region.

When External Retrain is enabled for a sensor, the yellow corner markers indicate the region that is used to retrain the Sensor when an External Retrain signal is received. Sensors can be retrained in both Setup mode and in Run mode.

In Setup mode, can manually signal an External Retrain by clicking ***Main Menu ►External Retrain*** on SensorView Teach Pendant or selecting **Checker->Retrain** or pressing F9 on the PC.

Checker indicates that it has successfully retrained by quickly blinking its lights twice. If it could not retrain the part, it blinks its lights slowly three times. You can also configure a Checker output line to signal when an External Retrain succeeds or fails.

This example shows Part Finding Sensor being retrained:



1	Part finding sensor detects part normally.
2	With a new part, the Part Finding Sensor fails.
3	Apply a pulse (minimum 15 ms) on RETRAIN line.
4	After retraining, Part Finding Sensor now finds new part.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Run Time Display

Run Time Display lets you control what images, if any, are displayed by Checker in Run mode.

You configure Run Time Display from the ***Main Menu ►Display and Record*** screen on SensorView Teach Pendant or the **Display and Record** step on the PC.

The **Display:** menu lets you pick which images to display in Run mode. You can choose from among any of the current Checker results, including those that you define with ladder logic. When Checker sees an image that makes the result true, it displays it.

The **Freeze On:** menu lets you control when the display is frozen (no longer updated with new images). Whenever Checker sees an image that makes the **Freeze On:** result true, Checker stops updating the Run-Time Display until you click **Live**.

Checker indicates that the Run-Time Display is frozen in two ways:

- The **Frozen** button is highlighted.
- The display itself includes the words **Display Frozen**.

To restart live display, click on the **Live** button.

Run Time Recording

Run Time Recording lets Checker record and save specific images while it is running, even when not connected to SensorView Teach Pendant or a PC. You can choose from among any of the current Checker results.

When Checker sees an image that makes the specified result true, it records it. The next time you connect to Checker with SensorView, the images are saved to a filmstrip (which you can save to a USB flash drive). When you connect to a PC and enter Setup mode, the images are automatically copied to the Filmstrip.

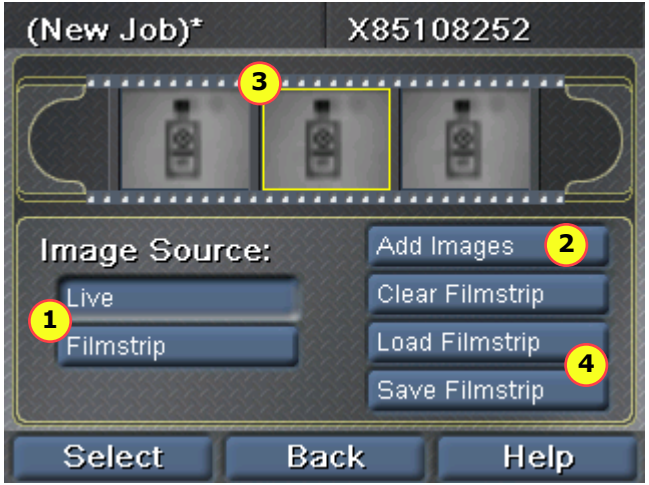
Checker has space for about 150 saved images. If you select **Most Recent** in the **Type:** menu, then when the image storage space is full, the oldest images are discarded when new images arrive.

If you select **Most Marginal**, then the images which came closest to not making the selected answer true are saved. For example, if you specify the **All Pass** answer, then the images with the sensors that came closest to failing are saved.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Filmstrip Control -- SensorView

The Filmstrip Control lets you record and play back Checker images.

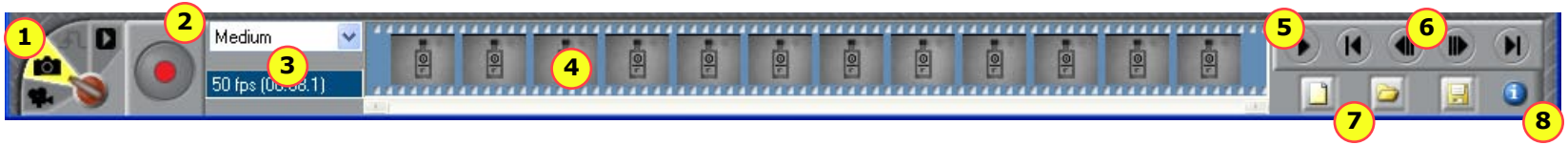


1	Image source selector: Controls source of images in Setup mode.
2	Click to add one or more images to the Filmstrip.
3	Filmstrip display. Click on an image to view it. Blue bars separate images of a single detected part (in Internal Part Trigger mode).
4	Filmstrip clear, load, and save controls.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Filmstrip Control -- PC

The Filmstrip Control lets you record and play back Checker images.



1	Filmstrip mode selector
2	Record button. Click (or press F5) to add an image to the Filmstrip.
3	Recording rate. How many images per second are added to the Filmstrip.
4	Filmstrip display. Click on an image to view it. Blue bars separate images of a single detected part (in Internal Part Trigger mode).
5	Playback button (only enabled in Playback mode). Press to start or stop image playback.
6	Filmstrip navigation buttons. Click the inner buttons to advance or rewind by a single frame. Click the outer buttons to advance or rewind by a single part.
7	Filmstrip clear, load, and save controls.
8	Information button. Hover the cursor here to view information about the selected Filmstrip image.

Filmstrip Mode Selector

The Filmstrip mode selector controls whether the Filmstrip is recording or playing back images, and if it is recording, when images are recorded to the Filmstrip.



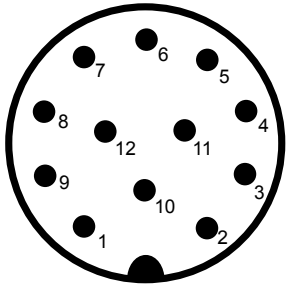
9	Video mode. Pressing trigger button starts or stops continuous image capture to Filmstrip.
10	Snapshot mode. Pressing trigger button adds one image to Filmstrip.
11	External Trigger mode. When an external trigger is received, an image is added.
12	Playback mode.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Input/Output Wiring

The leads in the flying lead cable (C3G-CBL-001) are color-coded to indicate which signal is carried on which line. The corresponding pins on the M12 connector are provided as well.

Lead Color	Signal	M12 Pin
RED	24 VDC +	7
BLACK	24 VDC –	8
VIOLET	RETRAIN	5
YELLOW	JOB CHANGE	1
WHITE/YELLOW	JOB SELECT 0	2
BROWN	JOB SELECT 1	3
WHITE/BROWN	JOB SELECT 2	4
ORANGE	TRIGGER	10
WHITE/VIOLET	INPUT COMMON	6
BLUE	OUTPUT 0	11
GREY	OUTPUT 1	12
GREEN	OUTPUT COMMON	9

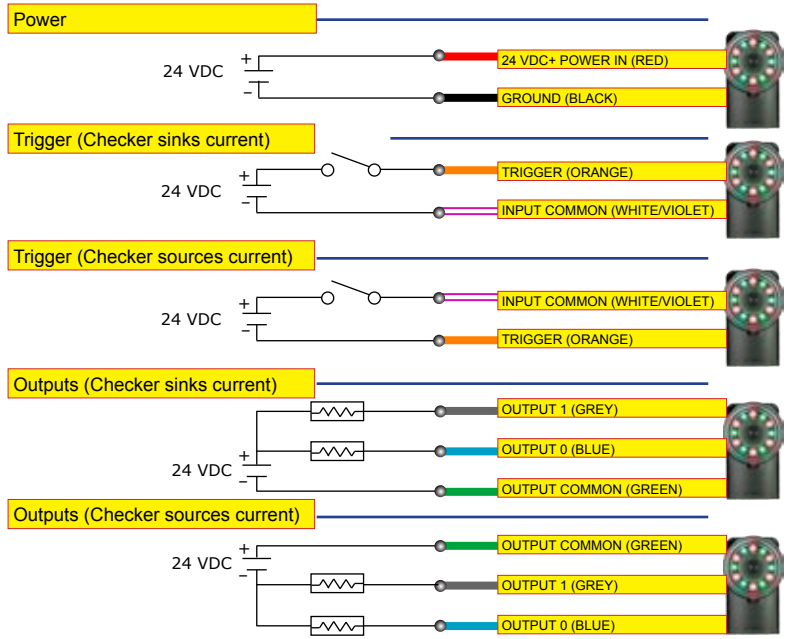


Note: Pin numbers for male connector on Checker 3G are shown.

When wiring Checker 3G, observe the following precautions:

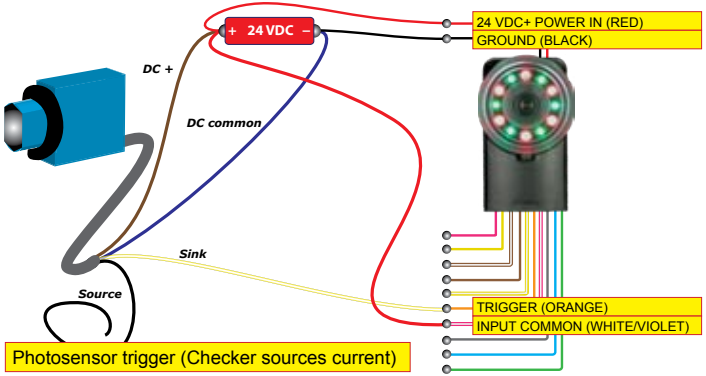
- Use a listed power supply with an output rated 24 VDC, at least 250 mA, and marked Class 2, Limited Power Source (LPS). Any other voltage creates a risk of fire or shock and can damage Checker.
- Connect the cable or connector shield to earth ground.
- Make sure that no voltage potential exists between the USB ground on the PC and the Checker chassis ground.
- To reduce the risk of damage or malfunction, route all cables and wires away from high-voltage power sources.

Circuit Diagrams (Typical)



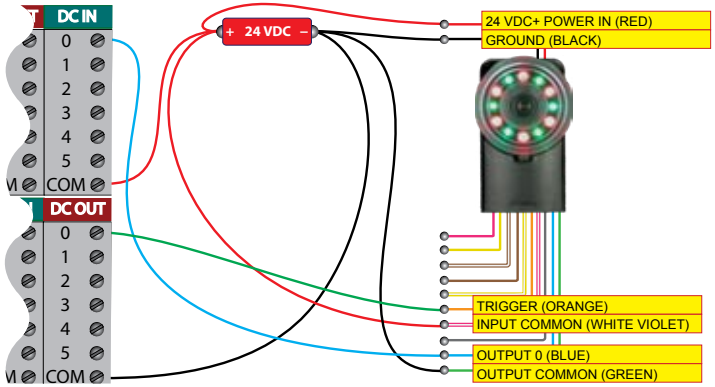
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

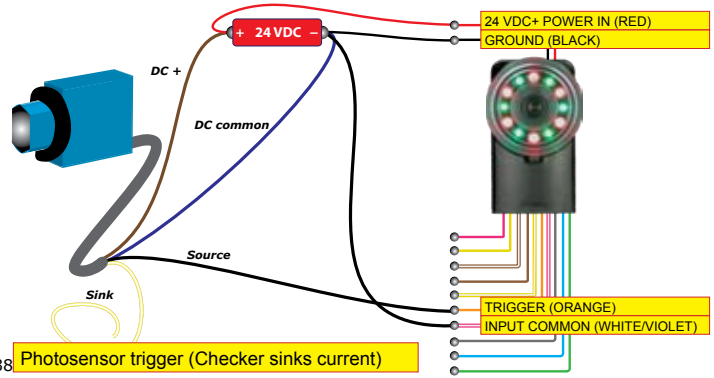
Input/Output Wiring Examples



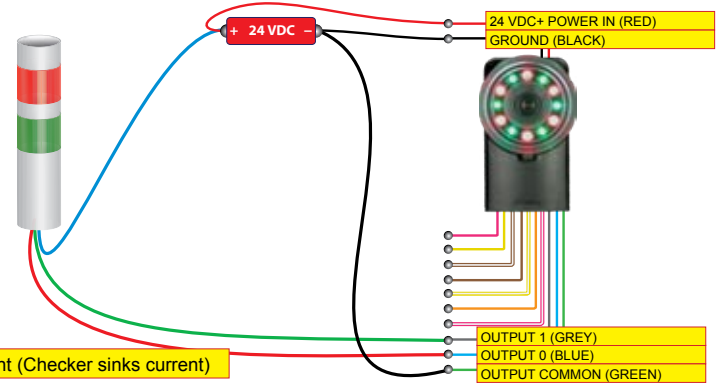
Photosensor trigger (Checker sources current)

Trigger from PLC (Checker sources current) and Ouput to PLC (Checker sinks current)





Photosensor trigger (Checker sinks current)



Stack light (Checker sinks current)

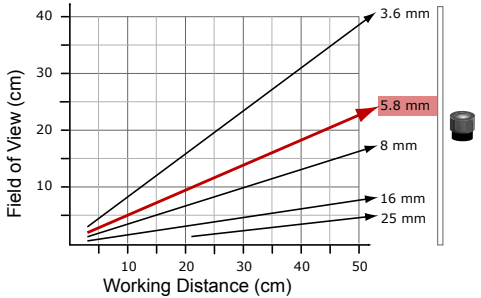
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Working Distance and Field of View

The distance from Checker's lens cover to your part is the working distance; the field of view is what Checker can see at that distance. As the working distance increases, so does the size of the field of view.

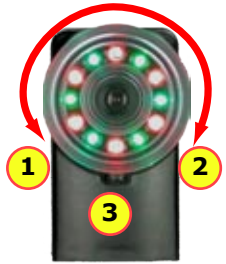
These charts show the field of view provided by the standard 5.8mm lens at various working distances, as well as the fields of view provided by the lenses included in the optional Checker Lens Kit (CKR-200-LENSKIT).





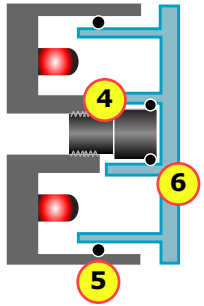
Adjusting Focus

Adjust focus using the clear ring on Checker. Using the supplied 2.5 mm hex key, you can lock the focus adjustment by tightening the focus lock.



1	Closer
2	More distant
3	Focus lock

The lens cover both seals the front of Checker and lets you adjust the lens focus.



4	Lens is threaded into Checker housing.
5	Large O-ring seals lens cover to Checker housing.
6	Small O-ring rotates lens when lens cover is rotated.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Changing Lenses

To remove the Checker lens, follow the steps listed below.

Note: Failure to follow these instructions can cause damage to your Checker.

1	Unscrew lens cover. Lens is secured to lens cover by small internal O-ring.
2	When lens is fully released, remove cover with lens in place.
3	Remove lens from lens cover. Take care not to lose O-ring that secures lens to lens cover.







To install the Checker lens, follow the steps listed below.

Note: Failure to follow these instructions can cause damage to your Checker.

1	Screw lens into Checker at least five full rotations.
2	Make sure both outer and inner O-rings are seated in place on the lens cover.
3	Firmly and evenly press the lens cover onto Checker until it snaps into place.
4	Screw in the lens cover to bring Checker into focus.





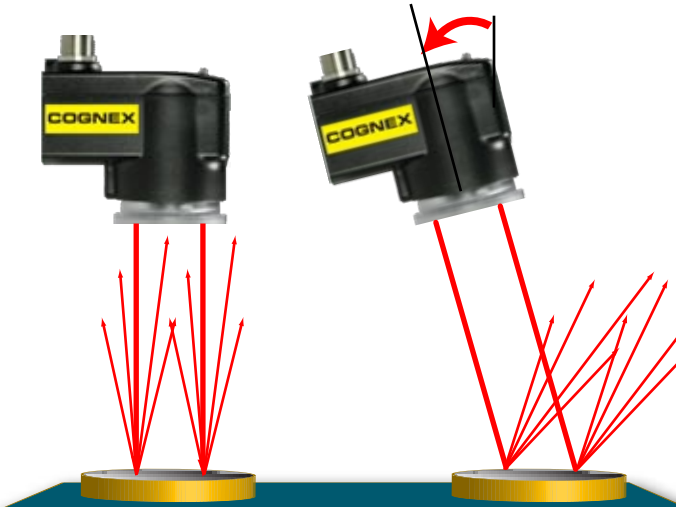


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

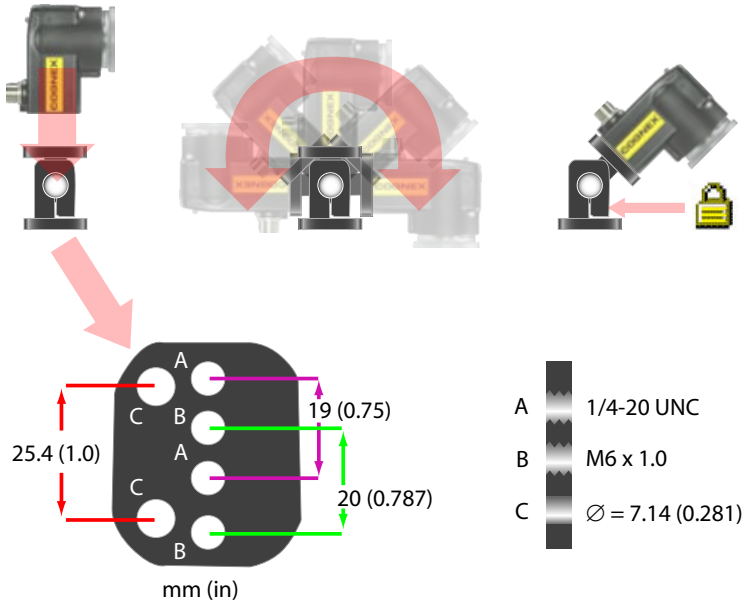
Mounting Checker

- ***Caution: Do not use a mounting screw with an exposed thread depth of greater than 5mm. Allowing the mounting screw to bottom in the mounting hole can damage Checker.***
- ***Caution: The maximum torque for a mounting screw is 1.8 nM (16 inch-pounds). Exceeding this torque value can damage Checker.***

Mounting Checker at a slight angle can reduce reflections from your part's surfaces, improving performance. Adjust the mounting angle to provide the clearest image of the part features you are checking.



The optional Checker mounting bracket lets you easily position and adjust Checker on your line.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Specifications

Cable	24AWG, 5 m, M12 connector (power and I/O)
Power requirements	**Voltage:** +24 VDC (22-26 VDC) **Current:** 250 mA max
Discrete Inputs	**Input ON:** > 10 VDC (≥ 6 mA) **Input OFF:** < 2 VDC (≤ 1.5 mA) **Protection:** Opto-isolated, polarity-independent
Discrete Outputs	**Output:** Solid state switch **Rating:** 100 mA, 24 VDC Max **Max voltage drop:** 3.5 VDC @ 100 mA **Max load:** 100 mA **Protection:** Opto-isolated, protected from short circuit, overcurrent, and reverse polarity.
24V power fuse	500 mA, 60 V rated resetable fuse that will recover after an overload is removed. Protects against over voltage and reverse wiring.
Output fuse	200 mA, 30 V rated resetable fuse that will recover after an overload is removed. Protects each output from over current.
Weight	3.5 oz. (100g)
Environmental limits	Operating temperature: 32° to 122°F (0° to 50°C) Storage temperature: -22° to 176°F (-30° to 80°C) Operating humidity: 0% - 90% non-condensing Maximum operating altitude: 4000 meters Protection: IP67 Pollution degree: 2
Shock	80Gs for 5ms on each axis (per IEC 68-2-2)
Vibration	10Gs (10-500Hz) at 100 M/sec2 / 15mm for 2 hours in each axis (per IEC 68-2-6)
Certification	

Precautions

Observe these precautions when installing Checker to reduce the risk of injury or equipment damage:

- **Do not use Checker in applications where an incorrect or absent output signal could cause human injury.**
- Checker is intended for indoor use only.
- Do not attempt to adjust Checker's focus when moving parts and/or equipment are present.
- Use a listed power supply with an output rated 24 VDC, at least 250 mA, and marked Class 2, Limited Power Source (LPS). Any other voltage creates a risk of fire or shock and can damage Checker.
- Connect the cable shield to earth ground.
- Make sure that no voltage potential exists between the USB ground on the PC and the Checker chassis ground.
- An IP67-compliant plug or cable must be fitted to the USB connector for Checker to meet the IP67 protection standard.
- Do not install Checker in locations that expose it to environmental hazards such as excessive heat, humidity, impact, vibration, corrosive substances, flammable substances, or static electricity.
- To reduce the risk of damage or malfunction, route all cables and wires away from high-voltage power sources.
- Do not extend I/O and power cables longer than 30 meters.
- Make sure that the mounting screws do not bottom in the mounting holes; using too long a mounting screw can damage Checker.
- Do not attempt to modify Checker. Modifications will void the warranty.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Copyright © 2009 Cognex Corporation All Rights Reserved. This document may not be copied in whole or in part, nor transferred to any other media or language, without the written permission of Cognex Corporation. Cognex, the Cognex logo, Checker, and the Checker logo are trademarks, or registered trademarks, of Cognex Corporation.

This product is covered by one or more of the following US patents and one or more pending US and foreign patents, which, when issued are listed on the Cognex web site at http://www.cognex.com/patents.

5583954, 5602937, 5964844, 6215915, 6381375, 6421458, 6931602, 7305114, and 7417803

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

DISTRIBUTEUR CONSEIL DEPUIS 1985

2 rue René Laennec 51500 Taissy France
Fax: 03 26 85 19 08, Tel : 03 26 82 49 29

Email:hvssystem@hvssystem.com
Site web : www.hvssystem.com

san Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisa

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP