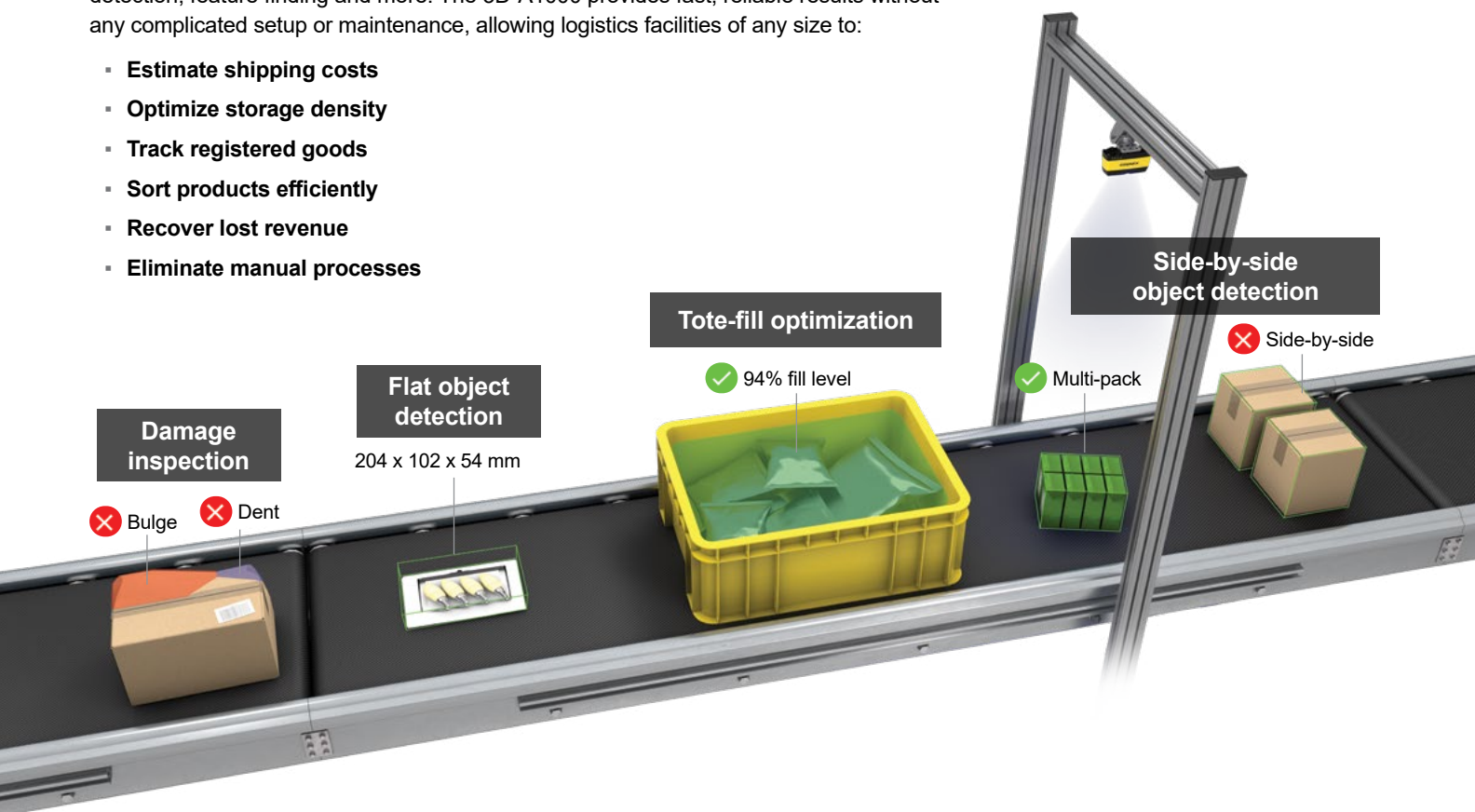


## 3D-A1000 DIMENSIONING SYSTEM

Fast, accurate, and intuitive dimensioning for logistics applications

The 3D-A1000 dimensioning system is a compact and industrial smart camera, capable of capturing moving objects in both 3D and 2D. The system is equipped with powerful vision tools that automate tasks like container fill measurement, damage detection, feature finding and more. The 3D-A1000 provides fast, reliable results without any complicated setup or maintenance, allowing logistics facilities of any size to:

- Estimate shipping costs
- Optimize storage density
- Track registered goods
- Sort products efficiently
- Recover lost revenue
- Eliminate manual processes

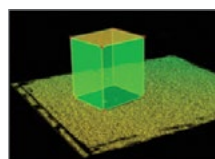


## Innovative 3D and 2D technology for powerful inspections

Unlike conventional methods, the 3D-A1000 uses patented 3D symbolic light technology to freeze motion with a single image. This generates more accurate 3D point cloud data, eliminating the need for complex calibration and encoder integration. Embedded processing enables the use of powerful Cognex vision tools to run additional 3D and 2D inspections.



3D symbolic light

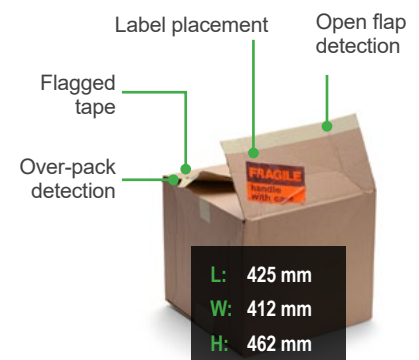


3D point cloud



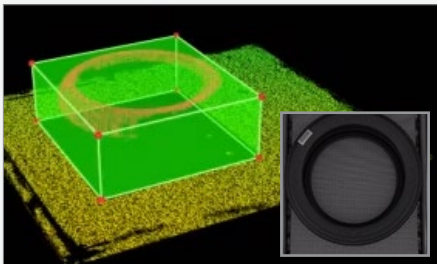
2D image

## System capabilities and output



<5 mm (0.2") dimensional accuracy on cuboidal and irregular objects

## Key features



2D and 3D calibrated images deliver accurate inspections even on difficult target surfaces



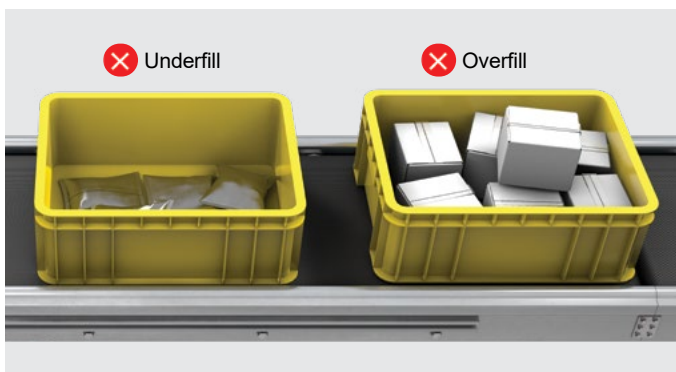
Instant, in-motion snapshot capability enables fast image acquisition (no encoder required) that overcomes uneven transitions, speed changes, or curved conveyance



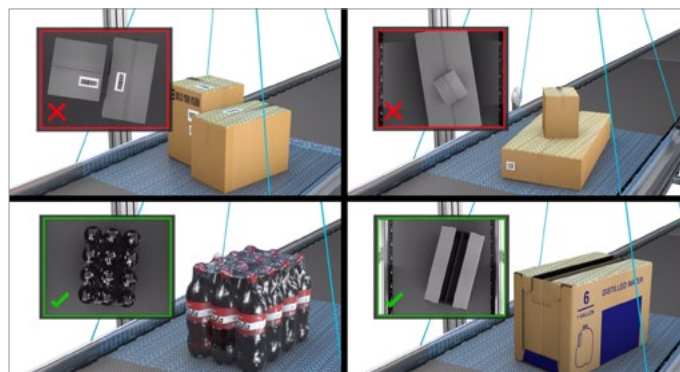
Factory calibration enables “plug and play” deployment, with visual setup assistance and real-time feedback to optimize application performance

## Application examples

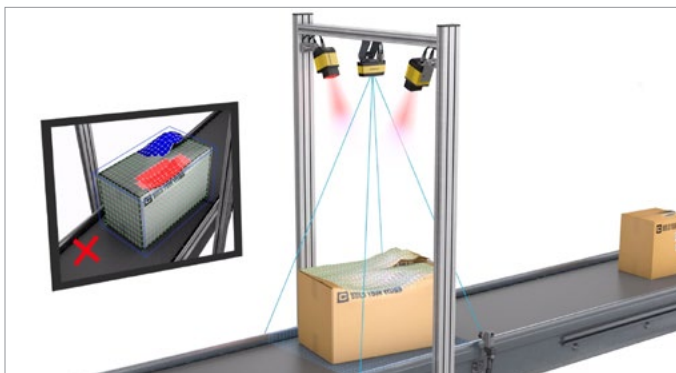
### Tote-fill volume verification



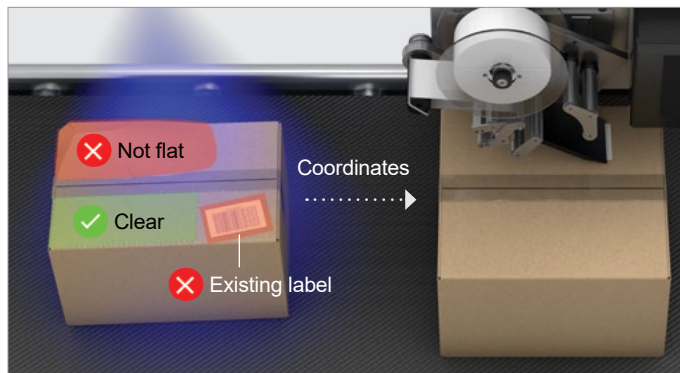
### Side-by-side object detection



### Top-side damage inspection



### Label placement guidance and verification



# Elevate dimensioning with the 3D-A1000 Multi-Head Dimensioning System

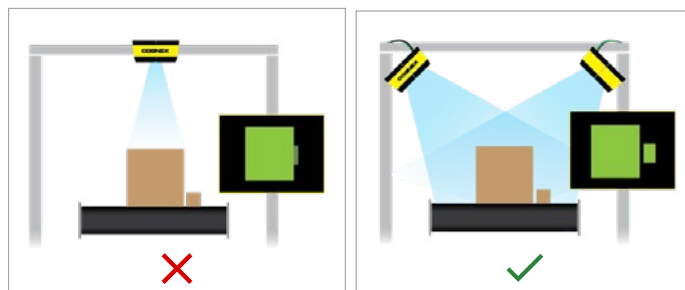
## Unlock powerful dimensioning capabilities with a configurable system built for speed

Discover the power of advanced dimensioning with the 3D-A1000 Multi-Head Dimensioning System. Using multiple devices, this fully configurable system offers expanded coverage to create a comprehensive, multi-perspective view. This adaptable solution ensures increased accuracy and faster speeds. Enjoy easy setup and precise measurements, even with smaller gaps and higher belt speeds.



### Increase product throughput

- Smaller gaps
- Faster belt speeds
- Minimal processing time



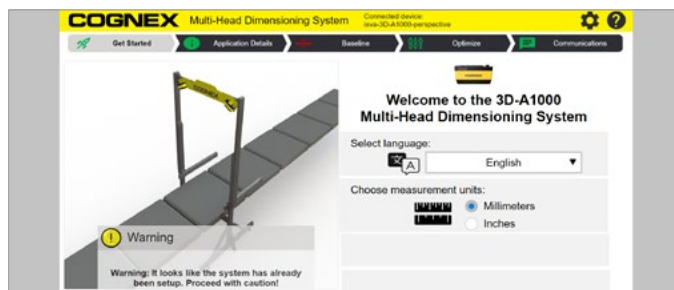
### Improve accuracy with true dimensioning

- Multi-side perspective
- Increased side-by-side accuracy
- Shadow-free dimensioning



### More resolution for larger footprints

- Increased coverage for larger belt widths and package sizes
- Intelligent image stitching

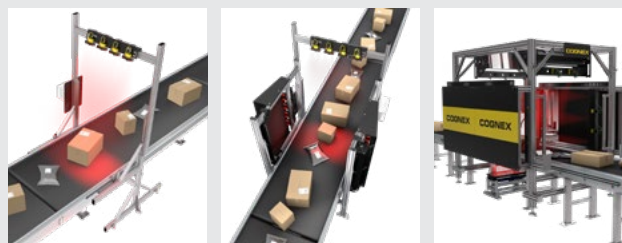


### Effortless setup and calibration

- Setup to deployment in 15 minutes or less
- 2-step calibration
- No special equipment required

The 3D-A1000 Multi-Head Dimensioning System solves applications as a standalone system or can be seamlessly integrated into Cognex standard solutions, including Modular Vision Tunnels.

This configurable solution can accommodate a wide variation of dimensioning applications in logistics.





## Out of the box functionality offers easy integration and maintenance

The 3D-A1000 is factory calibrated and ready for immediate system integration. Unlike conventional systems that can take a skilled engineer 3 to 6 hours to install and calibrate, the 3D-A1000 can be installed by anyone in under 15 minutes, using an intuitive setup wizard.



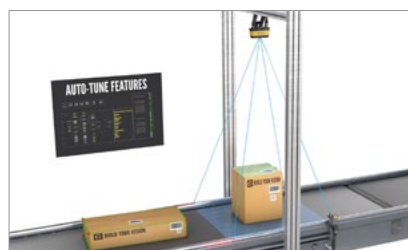
**Step 1.** Connect without the hassle of software downloads and installation procedures.



**Step 2.** Intuitive wizard simulates the installation environment to assist with mounting and optimization.



**Step 3.** In under 15 minutes, the system is ready to run and auto-certify with performance analysis tools.



**Step 4.** Once installed, continued feedback provides statistical insight into production and processes for data-driven optimization.

### 3D-A1000



Small footprint for easy integration



Anyone can set up in **<15 minutes**



Factory calibrated



Automated verification

## Conventional System



Bulky installation



Takes a skilled engineer **3–6 hours** to set up

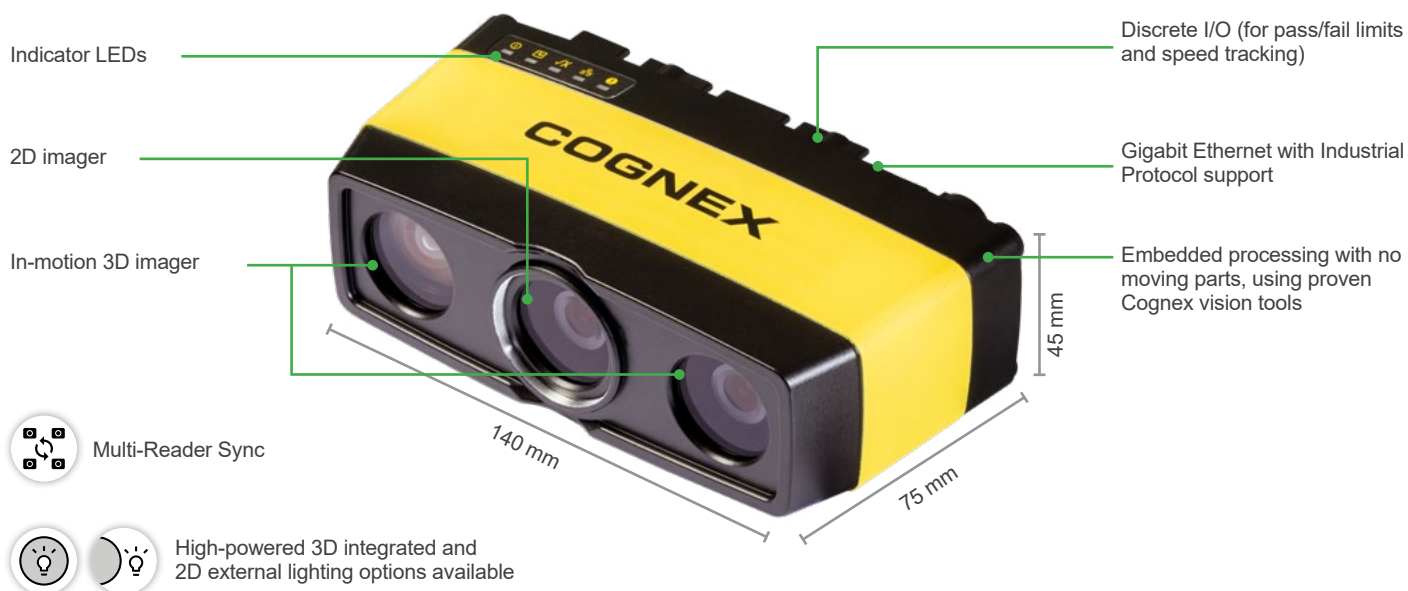


Requires complex calibration procedure




Manual, unreliable testing

## Powerful and compact turnkey system



## SINGLE HEAD SPECIFICATIONS

Technologies	3D Symbolic Light
Acquisition Rate	Up to 3 Hz (acquisition and on-board processing)
Trigger	Trigger input voltage limits: 24 VDC Input ON: >10 VDC (>6 mA) Input OFF: <2 VDC (<1.5 mA)
Power	Voltage: +24 VDC (22–26 VDC) Current: 3 A max
2D Vision	1280 x 960 resolution Modular external lighting & filter
Communication	GigE, TCP/IP, PROFINET, EtherNet/IP™, M/S
I/O	2 fixed inputs, 2 fixed outputs
Operating Temperature	0–40 °C (32–104 °F)
Storage Temperature	-10–60 °C (14–140 °F)
Operating Humidity	<85% (non-condensing)
Weight	485 g (17.1 oz)
Protection	IP65
Certifications	CE, FCC, KCC, TUV SUD NRTL, RoHS, NTEP 

## SINGLE HEAD MODEL COMPARISON

Model		L	Q	X
Measurement	Dimensioning	✓	✓	✓
	Position	✓	✓	✓
	Volume	✓	✓	✓
	Fill*		✓	✓
	Extended Range**	✓	✓	✓
Detection	Categorization	✓	✓	✓
	Flats		✓	✓
	Side-by-side		✓	✓
	Tote Tracking		✓	✓
	Damage Detection			✓
	Pattern Location*		✓	✓
	Label Guidance			✓
Utilities	Basic Scripting	✓	✓	✓
	Analysis Report	✓	✓	✓




## MULTI-HEAD SYSTEM SPECIFICATIONS

Acquisition Rate	Up to 8Hz for multi-head applications
Dimensions	240 x 82 x 242 (9.45" x 3.23" x 9.53")
Housing	Fanless aluminum extrusion, steel
Power Input	9–48 VDC 5-pin terminal block
LAN Ports	3 GbE LAN ports
Digital I/O	8-bit Isolated Digital I/O
Processing Power	Hexa Core
Accessories	Power Adaptor
Operating Temperature	-40–70 °C (-40–158 °F)
Storage Temperature	-40–85 °C (-40–185 °F)
Humidity	10–95%
Protection	IP50
Regulatory Compliance	FCC 47 CFR Part 15, CE, Additional Safety and EMC certifications pending WEEE Directive (2002/96/EC), ErP Directive (2009/125/EC), RoHS 2 (2011/65/EU), RoHS 3 (2015/863/EU), REACH, EN 45545-2, EN 50121-3-2, EN 55032, EN 55035, EN 62368-1, IEC 60068-2-27, IEC 60068-2-64, MIL-STD-810G Test

## MULTI-HEAD SYSTEM FEATURES

Model		L
Measurement	Dimensioning	✓
	Position	✓
	Volume	✓
Detection	Side-by-side	✓
Utilities	Scripting	✓
	Analysis Report	✓

## MULTI-HEAD SYSTEM CONFIGURATION TYPES

Top down	Perspective	Isometric
		
<ul style="list-style-type: none"> <li>High speed</li> <li>Dense top-side data</li> <li>Improved side-by-side performance</li> </ul>	<ul style="list-style-type: none"> <li>High speed</li> <li>3-sided data</li> <li>Improved side-by-side performance</li> </ul>	<ul style="list-style-type: none"> <li>5-sided dimensioning</li> <li>Maximum bounding box</li> </ul>

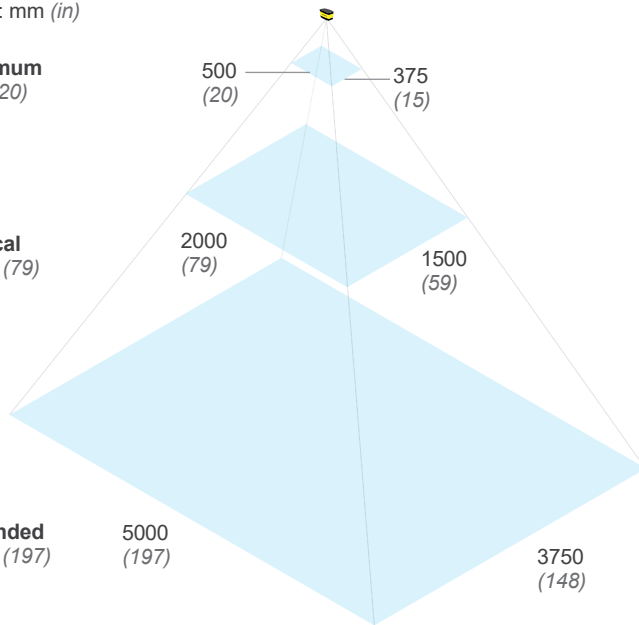
# Field-of-view diagram

Working distances  
Units: mm (in)

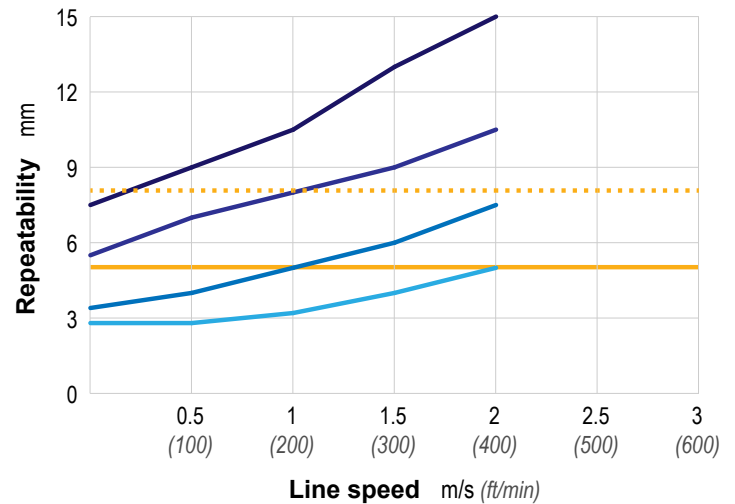
Minimum  
500 (20)

Typical  
2000 (79)

Extended  
5000 (197)



## Repeatability vs Line Speed (by mounting configuration)



Single head  
— BW=900  
— BW=750  
— BW=600  
— BW=450





Multi head, top down  
... BW=1000  
— BW=800  
— BW=700

Multi-head, perspective  
— BW=800  
— BW=700  
— BW=600

Multi-head, isometric  
... BW=800  
— BW=700  
— BW=600

Repeatability specifications valid for +/-3σ on cooperative cuboidal objects.

## FIELD OF VIEW MEASUREMENTS Units: mm (in)



















Mounting Type	Max Belt Width (BW)	Min. Object (L x W x H)	Max. Object (L x W x H)	Mounting Height	Mounting Separation
Single head 	450 (17.7)	25 x 25 x 10 (1.0 x 1.0 x 0.4)	550 x 400 x 400 (21.6 x 15.7 x 15.7)	1000 (39)	N/A
	600 (23.6)	35 x 35 x 15 (1.4 x 1.4 x 0.6)	750 x 550 x 550 (29.5 x 21.6 x 21.6)	1350 (53)	N/A
	750 (29.5)	45 x 45 x 20 (1.8 x 1.8 x 0.8)	900 x 650 x 650 (35.4 x 25.6 x 25.6)	1650 (65)	N/A
	900 (35.4)	55 x 55 x 25 (2.1 x 2.1 x 1.0)	1100 x 800 x 800 (43.3 x 31.5 x 31.5)	2000 (78)	N/A
Multi-head top down 	700 (27.6)	100 x 100 x 20 (3.9 x 3.9 x 0.8)	2500 x 700 x 800 (98.4 x 27.6 x 31.5)	1250 (49.2)	800 (31.5)
	800 (31.5)	100 x 100 x 25 (3.9 x 3.9 x 1.0)	2500 x 800 x 925 (98.4 x 31.5 x 36.4)	1350 (53)	900 (35.4)
	1000 (39.4)	100 x 100 x 30 (3.9 x 3.9 x 1.2)	2500 x 1000 x 1150 (98.4 x 39.4 x 45.3)	1600 (63)	1100 (43.3)
Multi-head perspective 	700 (27.6)	100 x 100 x 30 (3.9 x 3.9 x 1.2)	2500 x 700 x 750 (98.4 x 27.6 x 29.5)	1150 (45.3)	1600 (63)
	800 (31.5)	100 x 100 x 30 (3.9 x 3.9 x 1.2)	2500 x 800 x 850 (98.4 x 31.5 x 33.5)	1300 (51.2)	1800 (70.9)
Multi-head isometric 	600 (23.6)	100 x 100 x 35 (3.9 x 3.9 x 1.4)	2500 x 600 x 650 (98.4 x 23.6 x 25.6)	1000 (39)	1700 (66.9)
	700 (27.6)	100 x 100 x 35 (3.9 x 3.9 x 1.4)	2500 x 700 x 750 (98.4 x 27.6 x 29.5)	1150 (45.3)	1980 (78)
	800 (31.5)	100 x 100 x 40 (3.9 x 3.9 x 1.6)	2500 x 800 x 850 (98.4 x 31.5 x 33.5)	1300 (51.2)	2230 (87.8)



The above scenarios are typical for a given mounting distance. Mounting distance will vary based on specific applications as guided by our software.




Longer objects can be handled with the inclusion of an encoder.




Mounting height is measured from the belt and mounting separation is measured between the two devices.

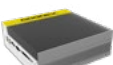
# Components and accessories

COGNEX IO		
	Product ID	Description
	CPS-4A-78-L	Emparro Power Supply 4A 7/8" - L
	CPS-8A-78-L	Emparro Power Supply 8A 7/8" - L
	CIO-MB-PNP	Master Breakout Board (MBB)
	CIO-PD-4	Power Distribution Board (PDB)
	CIO-HS-4	Hybrid Switch (HS)
	CCB-CPS-A3N01-200/ CCB-CPS-A3E01-200	US plug Emparro input or EU plug Emparro input (2 m)
	CCB-CIO-40021-XX	External/light cable (1–4 m)
	CCB-CPS-344557-XXX	Two channel Emparro output 7/8" to A-coded (0.5 m, 1–5 m)
	CCB-CPS-P4541-XXX	Emparro output 7/8" to L-coded
	CCB-CIO-53001-200	Primary cable 12 pin (2 m)
	CCB-CIO-P4141-XX	L-coded power chain (0.5 m, 1–5 m)
	CCB-84901-2001-XX	X-coded Ethernet to RJ45 (2 m, 5 m, 10 m, 15 m)
	CCB-CIO-51001-XX	X-coded Ethernet chain (0.5 m, 1–5 m, 10 m, 15 m)
	CCB-CIO-40507-XX	Power cable (0.5 m, 1–5 m)
	CCB-CIO-X0116-XX	Two channel A-coded to A-coded (0.5 m, 1–5 m)
	CCB-PWRIO-XX	Power and I/O breakout cable, M12-12 to flying lead (5 m, 10 m, 15 m)
	CCB-CPS-A3E11-XXX	Emparro Input 7/8" to C14 (1 m, 2 m)
	LGM-CBL-IEC-XX	Cable, IEC lock (US, UK, EU, CN, JP, KR)

MOUNTING BRACKET		
	Product ID	Description
	DM100-PIVOTM-01	Pivot mounting bracket
	BKT-LVS-01	Universal mounting bracket

POLARIZER AND BANDPASS FILTERS		
	Product ID	Description
	IMPF-PR032-30.5	Polarizer
	IMBF-BP470-30.5	Blue bandpass filter (470 nm)
	IMRF-BP635-30.5	Red bandpass filter (635 nm)

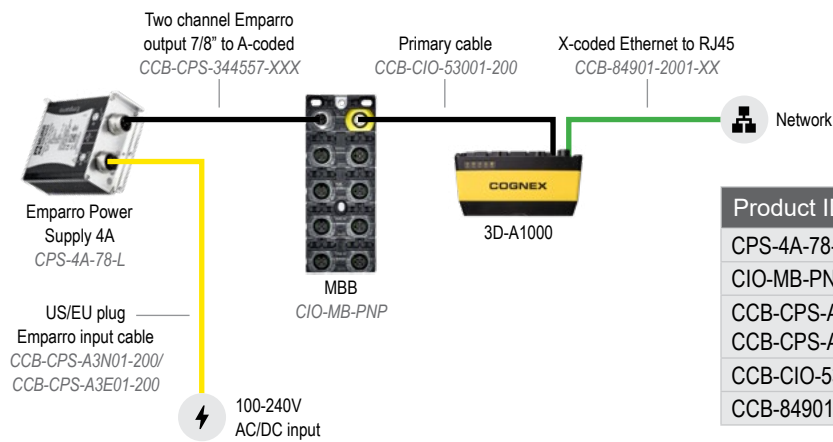
EXTERNAL LIGHTING		
	Product ID	Description
	IVSL-A1000-WHI	High Powered Illumination Accessory (HPIA) White with light mounting bracket
	IVSL-A1000-470	High Powered Illumination Accessory (HPIA) Blue (470 nm) with light mounting bracket
	CCB-M12-IVSL-Y	Lightning Cable, Y Split of Power/IO

VISION CONTROLLER		
	Product ID	Description
	LST-VA-700-L	Vision controller

ENCODER AND PHOTOEYE	
Product ID	Description
LST-ENCODER-000	Encoder kit with M12 connector cable
LST-PHOTOEYE-PB	Photoeye kit with M12 connector cable
CCB-CIO-12721-A	Male A-coded field wireable cable

KITS FOR 3D-A1000 MULTI-HEAD DIMENSIONING SYSTEM	
Product ID	Description
LST-MHDS-DIM	<b>Acquisition heads and cables.</b> Includes: Two 3D-A1000 acquisition heads, universal mounting brackets, power cables, Ethernet cables.
LGM-MHDS-PANEL-X	<b>IO panel including vision controller.</b> Includes: Vision controller, Power Distribution Board, Emparro Power Supply 8A, Master Breakout Board, Hybrid Switch, Emparro input 7/8" to C14, Emparro output 7/8" to L-coded, External/light cable, L-coded power chain.
LST-MHDS-ACCS	<b>Encoder and photoeye kits.</b> Includes: Encoder kit with M12 connector cable, photoeye kit with M12 connector cable.

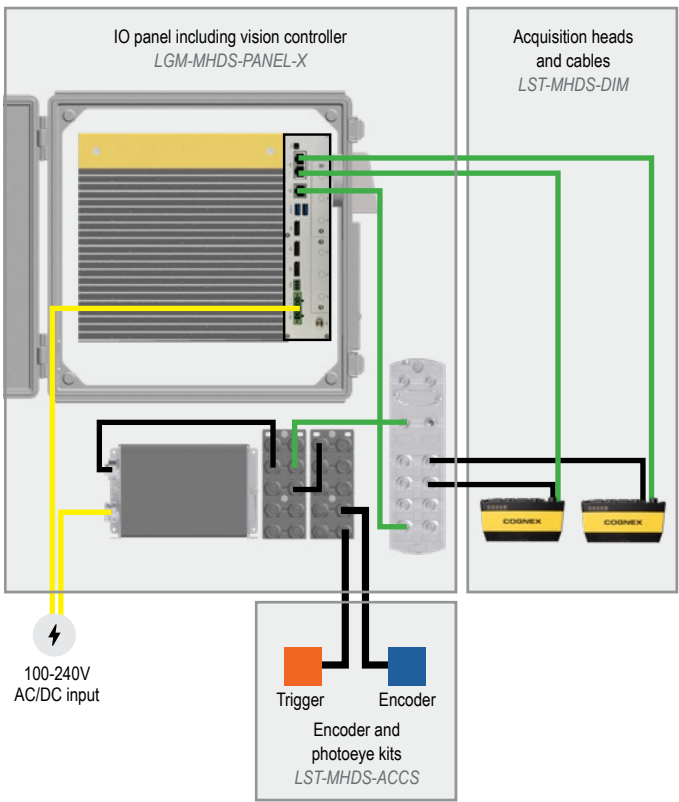
Recommended minimum components required for single 3D-A1000 installation



Product ID	Description
CPS-4A-78-L	Emparro Power Supply 4A 7/8"- L
CIO-MB-PNP	Master Breakout Board (MBB)
CCB-CPS-A3N01-200/ CCB-CPS-A3E01-200	US plug Emparro input or EU plug Emparro input (2 m)
CCB-CIO-53001-200	Primary cable 12 pin (2 m)
CCB-84901-2001-XX	X-coded Ethernet to RJ45 (2 m, 5 m, 10 m, 15 m)

Fully kitted system for Multi-Head Dimensioning System

Image is not to scale.



Product ID	Description
LST-MHDS-DIM	<b>Acquisition heads and cables.</b> Includes: Two 3D-A1000 acquisition heads, universal mounting brackets, power cables, Ethernet cables.
LGM-MHDS-PANEL-X	<b>IO panel including vision controller.</b> Comes fully configured and wired in a single easy-to-install unit. Includes: Vision controller, Power Distribution Board, Emparro Power Supply 8A, Master Breakout Board, Hybrid Switch, Emparro input 7/8" to C14, Emparro output 7/8" to L-coded, External/light cable, L-coded power chain.
LST-MHDS-ACCS	<b>Encoder and photoeye kits.</b> Includes: Encoder kit with M12 connector cable, photoeye kit with M12 connector cable.

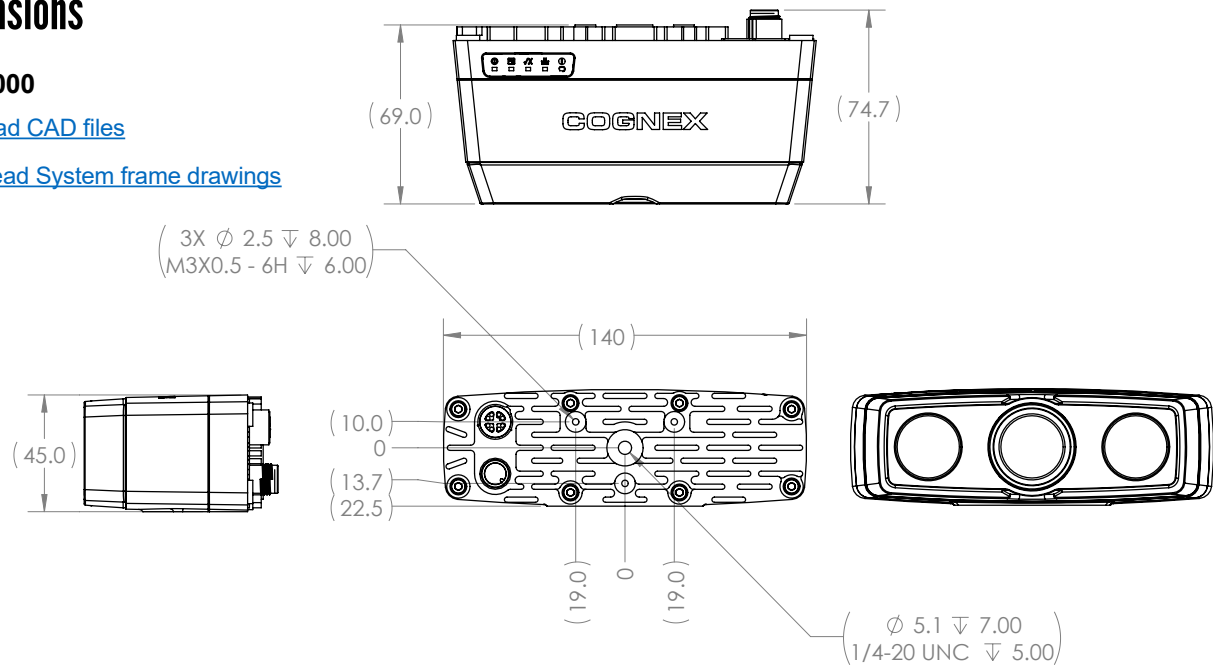


# Dimensions

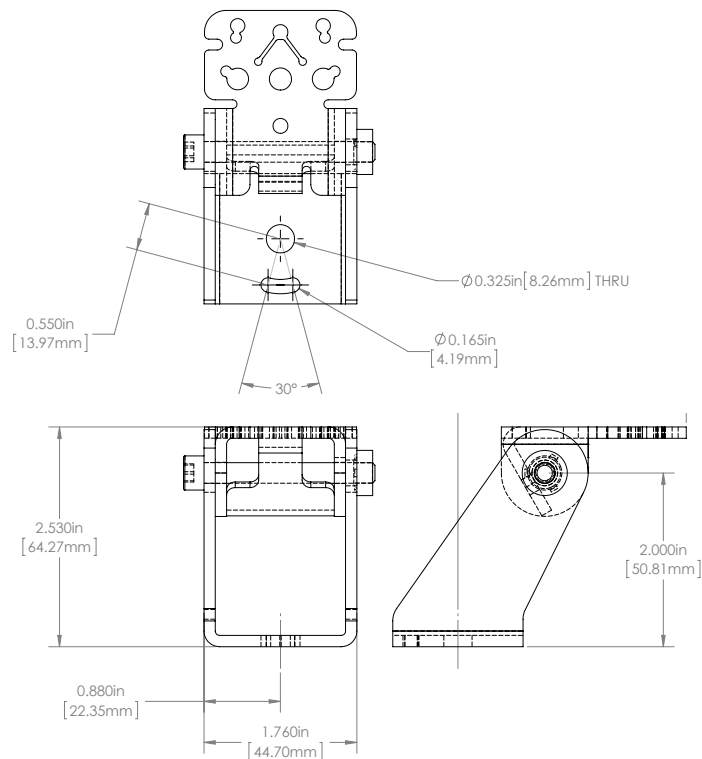
## 3D-A1000

[Download CAD files](#)

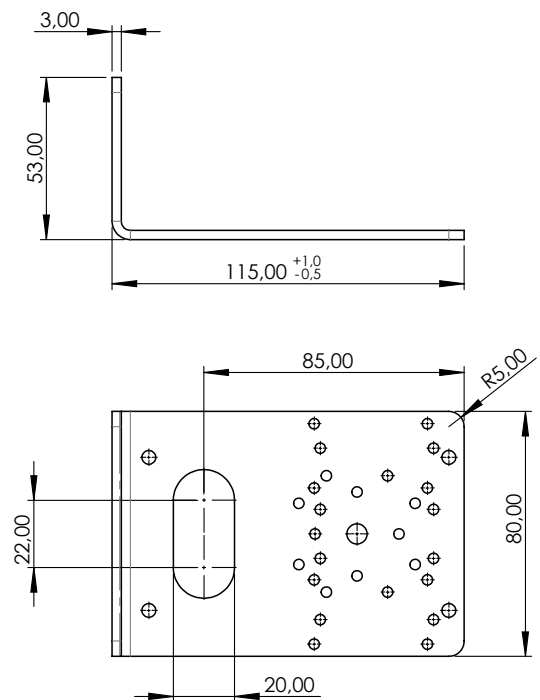
[Multi-Head System frame drawings](#)



## Pivot mounting bracket

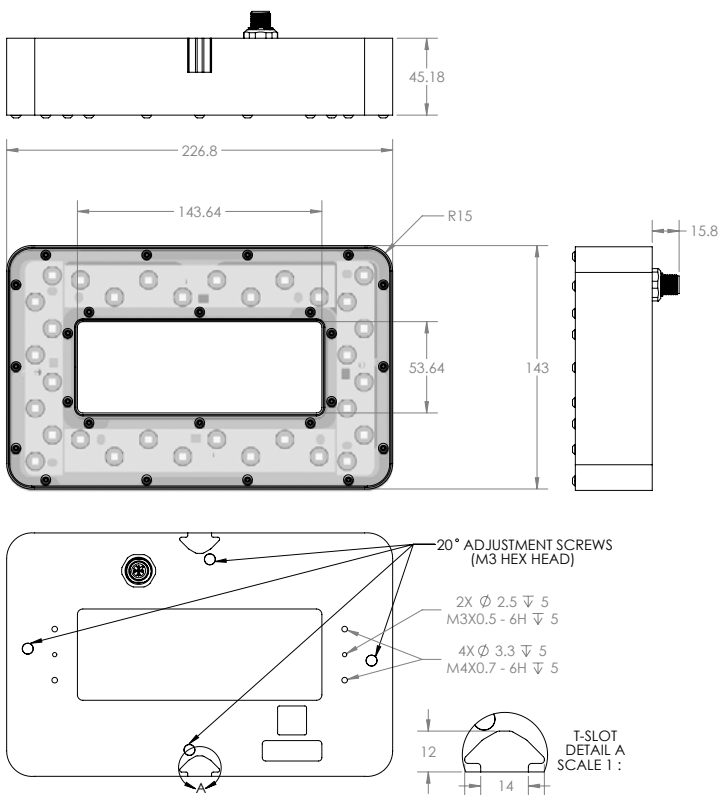


## Universal mounting bracket (Required for Multi-Head Dimensioning System)

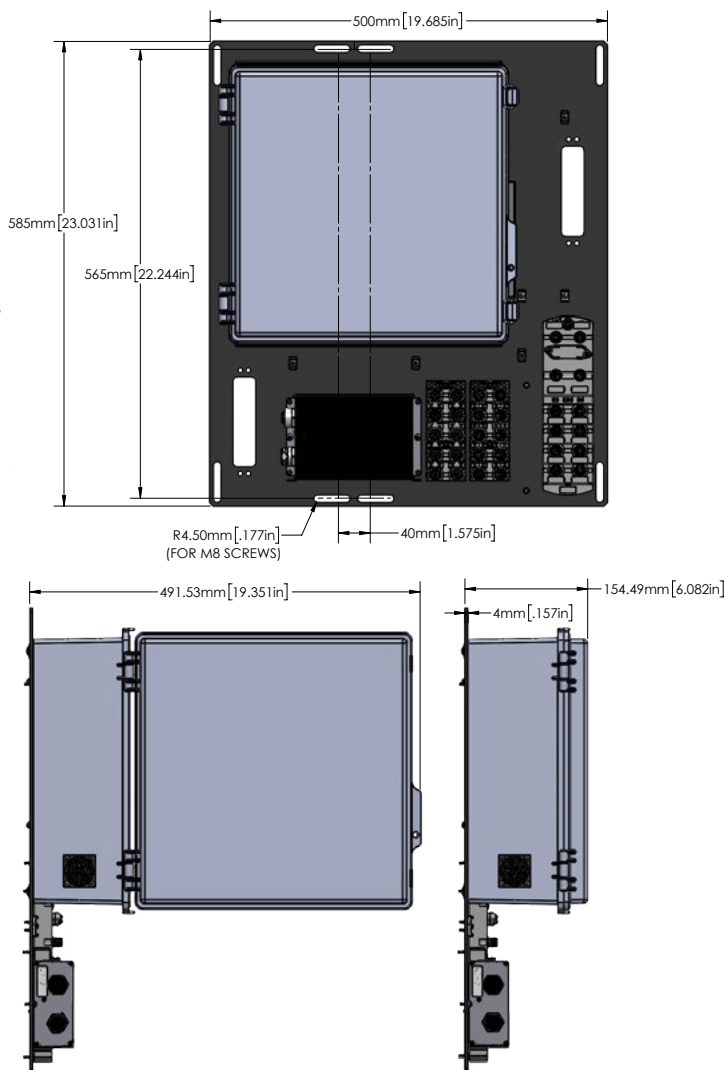


## High-Powered Illumination Accessory (HPIA)

HPIA provides the brightest image with the highest contrast for very high speed logistics applications.



## IO Panel for Multi-Head System



For more information, including software downloads, application examples, and product collateral, please visit:

[cognex.com/dimensioning](https://cognex.com/dimensioning)

# COGNEX

Companies around the world rely on Cognex vision and barcode reading solutions to optimize quality, drive down costs and control traceability.

**Corporate Headquarters** One Vision Drive Natick, MA 01760 USA

### Regional Sales Offices

#### Americas

North America +1 844 999 2469  
Brazil +55 11 4210 3919  
Mexico +800 733 4116

#### Europe

Austria +43 800 28 16 32  
Belgium +32 289 370 75  
Czechia +420 800 023 519  
France +33 1 76 54 93 18  
Germany +49 721 958 8052  
Hungary +36 800 80291

Ireland +353 21 421 7500  
Italy +39 02 3057 8196  
Netherlands +31 207 941 398  
Poland +48 717 121 086  
Romania +40 741 041 272  
Spain +34 93 299 28 14  
Sweden +46 21 14 55 88  
Switzerland +41 445 788 877  
Turkey +90 216 900 1696  
United Kingdom +44 121 29 65 163

#### Asia-Pacific

Australia +61 2 7202 6910  
China +86 21 2279 9455

India +91 7305 040397  
Indonesia +62 21 3076 1792  
Japan +81 3 5977 5400  
Korea +82 2 539 9047  
Malaysia +6019 916 5532  
New Zealand +64 9 802 0555  
Philippines +63 2 8539 3990  
Singapore +65 3158 3322  
Taiwan +886 02 7703 2848  
Thailand +66 6 3230 9998  
Vietnam +84 98 2405167

© Copyright 2023, Cognex Corporation.  
All information in this document is subject to change without notice. All Rights Reserved. Cognex is a registered trademark of Cognex Corporation. All other trademarks are property of their respective owners. Lit. No. 3DA1000DimDS-EN-04-2023

[www.cognex.com](https://www.cognex.com)