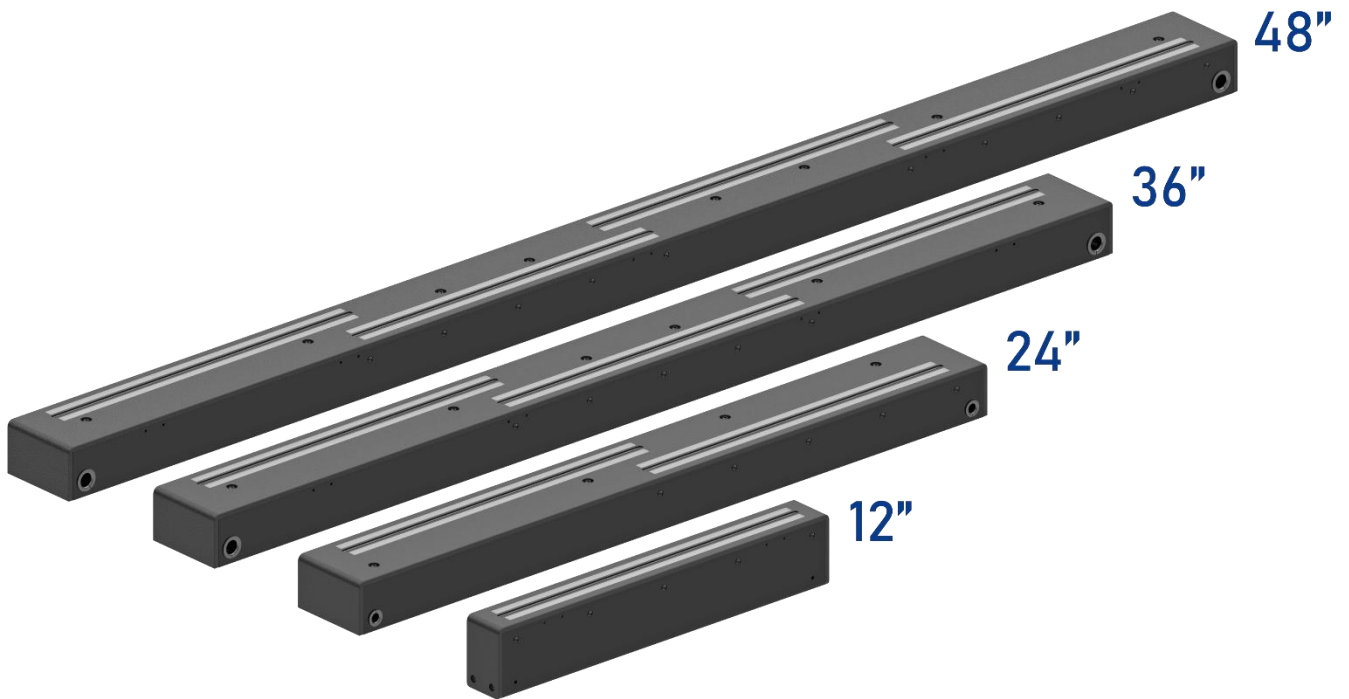


# WideSCAN

## Technical Specifications



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Change	Version	Date	Name
First Draft, Preliminary	0.1	14.09.2023	TI
10GB PC added, mechanical outline added.	0.2	02.09.2024	TI
Bandwidth added	0.3	10.09.2024	MBL

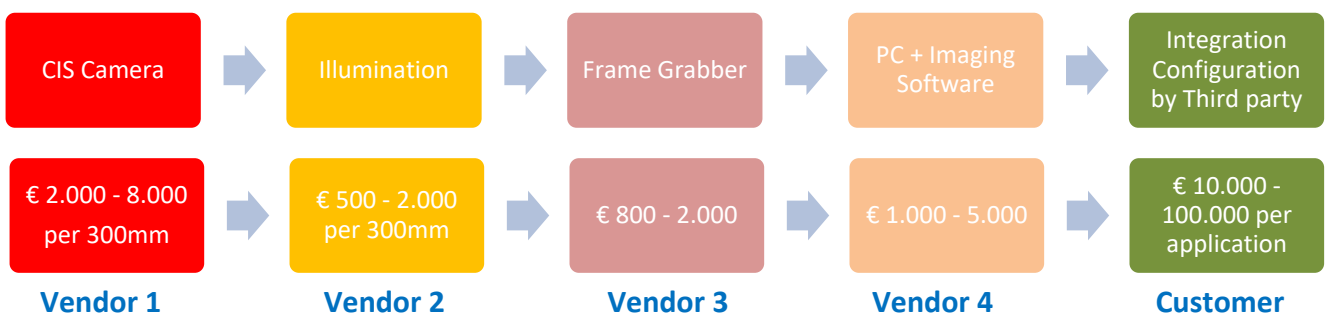
## 2. Introduction

Image Access is manufacturing wide format scanners of the Bookeye and WideTEK brand since more than 30 years. With this background of camera technologies and experience, we have designed a new family of line scan bars called WideSCAN. These come in various sizes in 12” increments starting at 12”. They are the most compact and easy to use line scan bars in the industry. They are also extremely affordable due to the high production numbers for our existing scanners. Even the largest configuration of 3m scanning width sells at less than € 30.000 opening application never envisioned before.

### Wide Range of Applications

<b>Surface Inspection</b>	<b>Quality Control</b>	<b>Print Verification &amp; Calibration</b>
<b>Paper</b>	<b>Coatings</b>	<b>Nozzle Calibration for Large Printers</b>
<b>Foils</b>	<b>Glass Panels</b>	<b>LED Calibration for LFPs</b>
<b>Textiles</b>	<b>Solar Panels</b>	<b>Verification of Thermal Printer Output</b>
<b>Metal &amp; Composites</b>	<b>Flat Panels</b>	

### Traditional Machine Vision System



Various vendors offer CIS cameras in different width. Some of them have illumination built in, in some cases they need to be added to the bill of material. After the camera is chosen by the customer, a frame grabber is needed to get the images into a PC. Whether the interface is GigE, Camera Link or other, the cabling is significant and bulky. At the end of the process the components delivered by three or four parties have to be integrated by the customer to create the final application.

### WideSCAN Machine Vision System

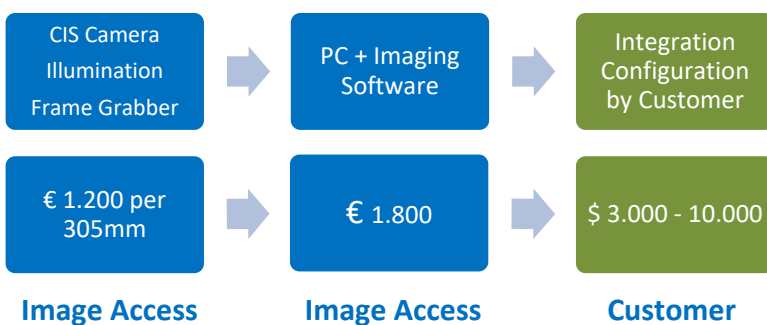


Image Access has a completely different approach to the traditional machine vision task. The WideSCAN CIS-cameras integrate multiple 305mm (12”) wide cameras, the illumination and the necessary frame grabbers into one very sturdy and small scanbar with a cross section of only 80\*50mm including connectors and cables. They come in 305mm (12”), 610mm, (24”), 915mm (36”) and 1.220mm (48”) scanning width.

### 3. WideSCAN Configurations

WideSCAN cameras are available in 305 mm, 610 mm, 915 mm and 1,220 mm (12", 24", 36" 48") optical widths in a single module. If a larger width is to be scanned, the cameras can be arranged in two rows up to a maximum width of 120" (3,050 mm). Even at maximum width, only one PC is needed to combine all 10 camera signals into a single image. The standard 180W external power supply (EPS) is suitable to support even the largest configuration of 10 cameras.

305mm, 12"	WS 12		
610mm, 24"	WideSCAN 24		
915mm, 36"	WideSCAN 36		
1220mm, 48"	WideSCAN 48		
1.525mm 60"	WideSCAN 24	WS 12	WideSCAN 24
1.830mm 72"	WideSCAN 24	WideSCAN 24	WideSCAN 24
2.135mm 84"	WideSCAN 24	WideSCAN 36	WideSCAN 24
2.440mm 96"	WideSCAN 36	WideSCAN 24	WideSCAN 36
2.745mm 108"	WideSCAN 36	WideSCAN 36	WideSCAN 36
3.050mm 120"	WideSCAN 36	WideSCAN 48	WideSCAN 36

## 4. Scanning Speed

The scanning speed is the same for WideSCAN 12, 24, 36 and 48. This is due to the unique design of the WideSCAN cameras, which incorporates one USB 3.1 frame grabber per two cameras. A WideSCAN 48 f.e. has two USB 3 connectors, 24V power and Sync, that's it.

Scanning Speed	RGB-Color 600x600dpi	RGB-Color 600x300dpi	RGB-Color 300x300dpi	Grayscale 600x600dpi	Grayscale 600x300dpi	Grayscale 300x300dpi
Speed [mm/s]	128	257	514	385	770	1541
Speed [inch/s]	5	10	20	15	30	60
Speed [m/min]	7.6	15.2	31	23	46	92
Speed [km/h]	0.45	0.9	1.8	1.35	2.7	5.5
Bandwidth [MB/s] per 1 USB (12")	149	149	149	149	149	149
Bandwidth [MB/s] per 1 USB (24")	298	298	298	298	298	298
Bandwidth [MB/s] per 2 USB (36")	447	447	447	447	447	447
Bandwidth [MB/s] per 2 USB (48")	596	596	596	596	596	596

## 5. Optical System

Scan Width WideSCAN 12	7.344 pixels, 310mm, 12,2 inch, optical active scan width
Scan Width WideSCAN 24	14.544 pixels, 615mm, 24,2 inch, optical active scan width
Scan Width WideSCAN 36	21.744 pixels, 920mm, 36,2 inch, optical active scan width
Scan Width WideSCAN 48	28.944 pixels, 1.225mm, 48,2 inch, optical active scan width
Pixel Dimension	42,3µm * 42,3µm
Line Frequency	3,6 KHz @ 600dpi, 6,85 KHz @ 300dpi
Illumination	Two lines with high quality RGB LEDs and optical diffusors
Color Depth (internal)	48 bit color, 16 bit gray scale
Color Depth (external)	24 bit color, 8 bit gray scale
Scan Modes	24 bit color, 8 bit grayscale, bitonal, enhanced halftone
File Formats	Multipage PDF (PDF/A) and TIFF, JPEG, JPEG 2000, PNM, PNG, BMP, TIFF (Raw, G3, G4, LZW, JPEG), AutoCAD DWF, JBIG, DjVu, DICOM, PCX, Postscript, EPS, Raw data and more

## 6. Illumination System

Light Source	Two linear lamps with individually controlled red, true green and blue LEDs, integrated converging lens, integrated optical diffusor
Warm-up Time	None
Temperature Dependency	Neglectable
UV / IR Emission	None
Lamp Lifetime	50,000 hours typ. Lamps are covered by the optional Extended Warranty Option

## 7. Electrical Specification

### External Power Supply

<b>Model</b>	<b>TR9CI7500YL4CIMR6B</b>
Voltage	100 – 240 V AC
Frequency	47 – 63 Hz
Operating Temperature	5 to 40 °C (40 to 105 °F)
Relative Humidity	20 to 80% (non-condensing)
ECO Standard	CEC level VI

### WideSCAN Camera Power Input

WideSCAN Camera	WideSCAN 12	WideSCAN 24	WideSCAN 36	WideSCAN 48
Voltage	24V ± 2V	24V ± 2V	24V ± 2V	24V ± 2V
Current during standby, no lamps	0,15A	0,3A	0,45A	0,6A
Current during scanning, typ.	0,35A	0,7A	1,05A	1,4A
Current during scanning, max.	0,4A	0,8A	1,2A	1,6A
Total power from 24V and USB3.1	10W	20W	30W	40W
Maximum case temperature above ambient, free air convection cooling	< 10°	< 10°	< 10°	< 10°

### WideSCAN Camera Interface

The build-in frame grabbers support up to two cameras per USB 3.1 link while each camera covers appr. 305mm (12 inch), scanning width. The following table shows how many USB 3.1 connections are needed:

WideSCAN 12	WideSCAN 24	WideSCAN 36	WideSCAN 48
1 x USB 3.1 Gen 1	1 x USB 3.1 Gen 1	2x USB 3.1 Gen 1	2 x USB 3.1 Gen 1

Transmission Standard	Power over each USB	Data Rate max, typ	Cable Length
USB 3.1 Gen 1	5V, 100mA	400 MB/s, 320MBs	3m, maximum 5m (1)

(1) Depending on cable quality

### Computer Power Input

<b>Model</b>	<b>S2N-ITXPC-A</b>
Voltage	24V ± 2V
Current	2A max. (without WideSCAN cameras)
Power	50W max.

<b>Model</b>	<b>S2N-ITXPC-B</b>
Voltage	24V ± 2V
Current	2,2A max. (without WideSCAN cameras)
Power	55W max.

### Computer Interface and Power Output

Model	S2N-ITXPC-A
Interface USB	4 * USB 3.1 external; 2 * USB 2.0 external; additional USB 2.0 internal
Interface Monitor	2 * DVI external
Interface Motor	2 *Stepper motor, 2 phase, 1,8A per winding; 2 reference switch inputs
Interface Power Output	2 * 24V, 3A, maximum combined power output 120W
Interface Network	1 * 1Gigabit TCP/IP

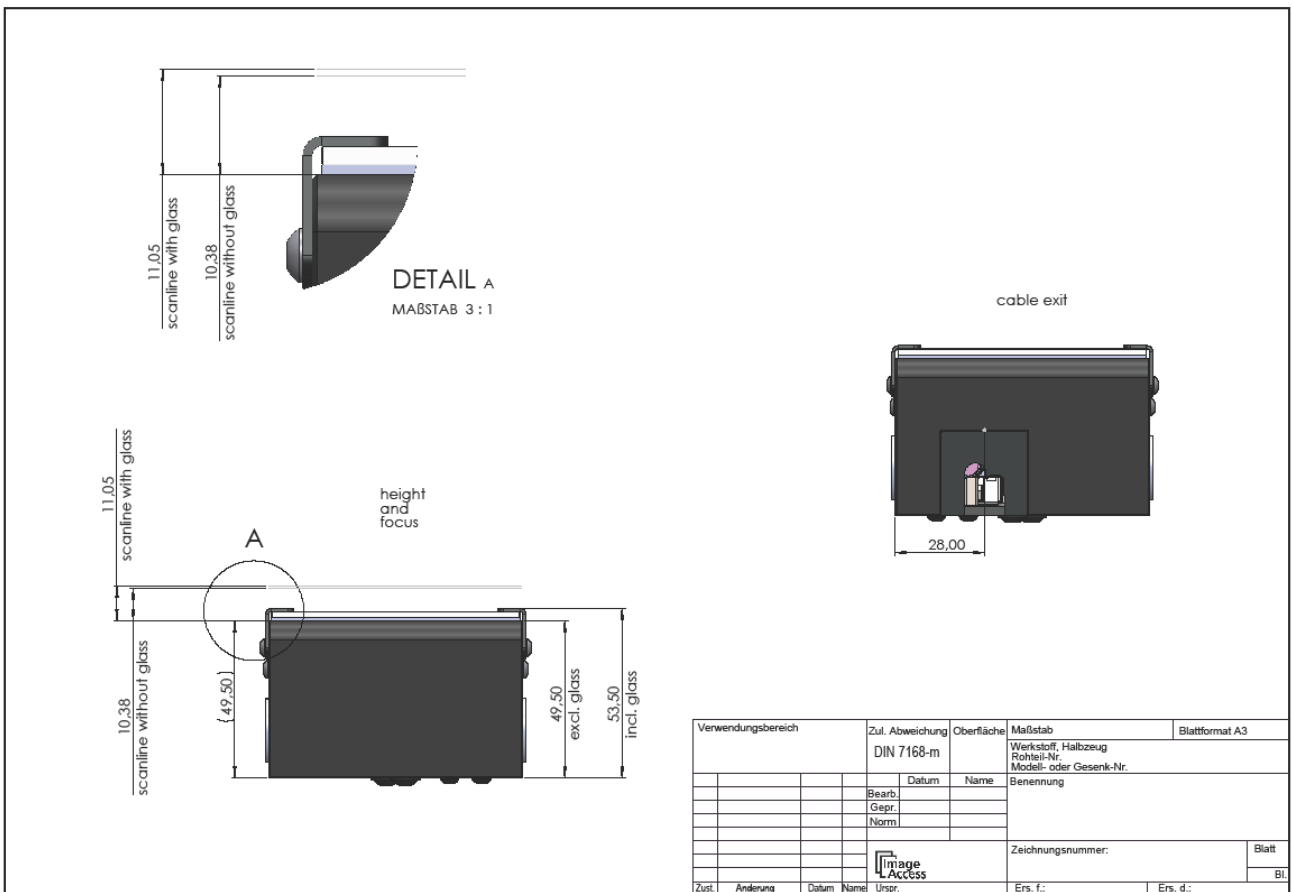
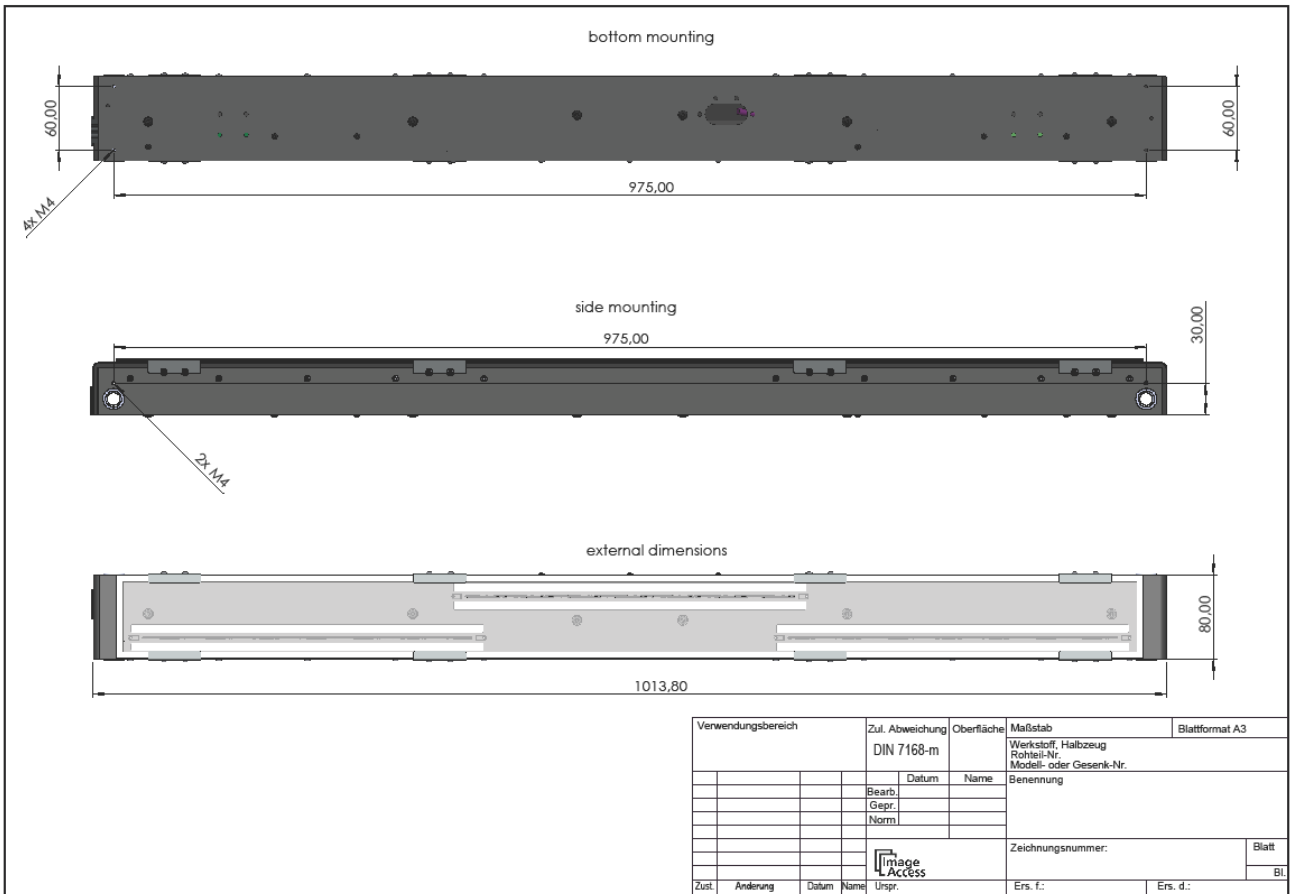
Model	S2N-ITXPC-B
Interface USB	4 * USB 3.1 external; 2 * USB 2.0 external; additional USB 2.0 internal
Interface Monitor	2 * DVI external
Interface Motor	2 *Stepper motor, 2 phase, 1,8A per winding; 2 reference switch inputs
Interface Power Output	2 * 24V, 3A, maximum combined power output 120W
Interface Network	1 * 10Gigabit TCP/IP

## 8. Mechanical Dimensions WideSCAN Cameras

The WideSCAN cameras come with a protective glass plate of 2mm thickness which can be removed for additional clearance in clean environments. Due to the optical properties the distance between the case's surface varies. Without the protective glass, the focal point is at 10.4mm above the case and the guaranteed clearing is 9mm. With the protective glass, the focal point is at 11mm at the expense of a reduced clearing to 7mm. Because the protective glass is protected from mechanical obstruction only by the 1mm brackets that hold it, precautions have to be taken to ensure that no object hits the scan bar even if it objects behave unruly.

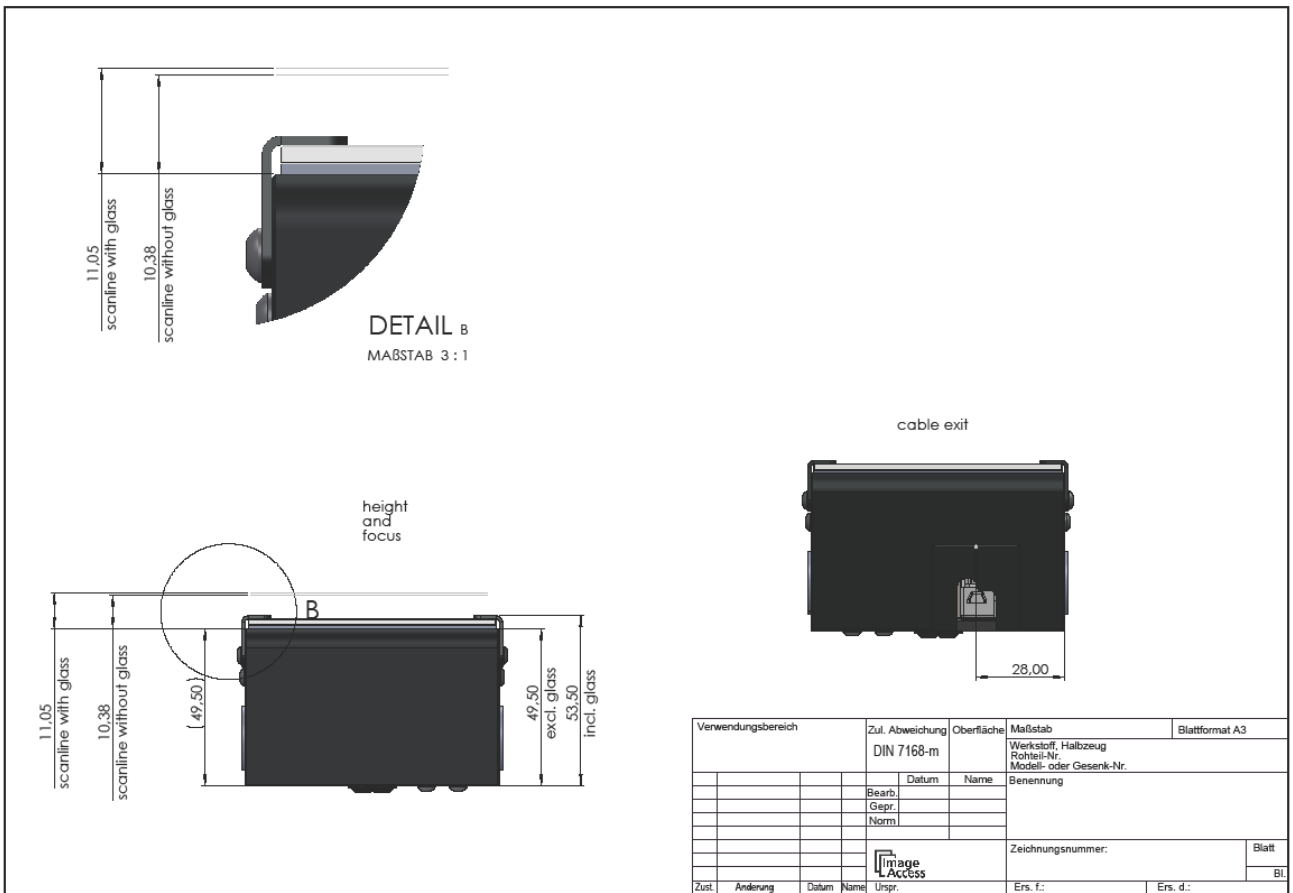
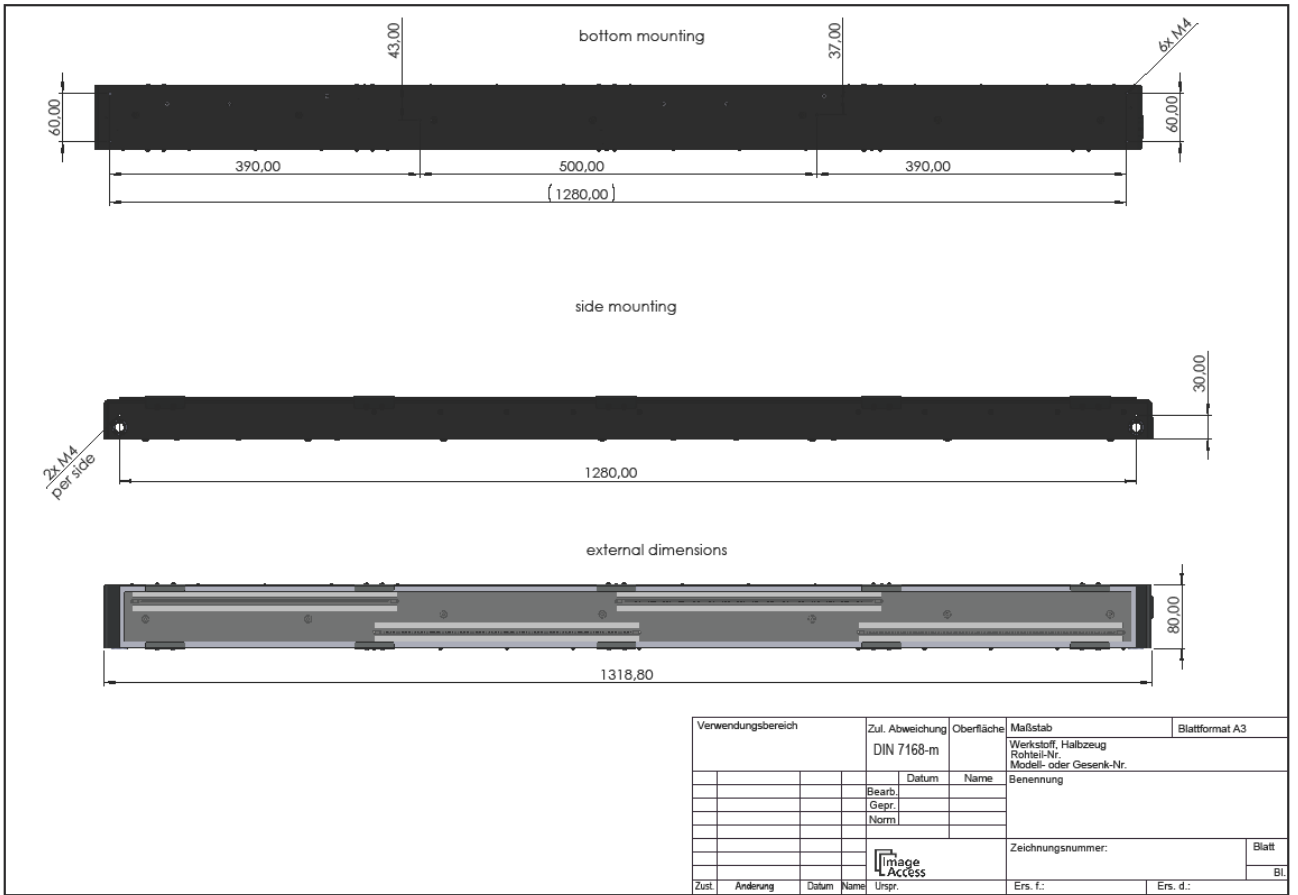
Overall Dimensions	WideSCAN 12	WideSCAN 24	WideSCAN 36	WideSCAN 48
Width	373mm	710mm	1.015mm	1.320mm
Depth	42mm	80mm	80mm	80mm
Heights	67mm	50mm	50mm	50mm
X-Offset between 12" segments	none	39mm	39mm	39mm
Y-Offset between 12" centers	none	304,8mm	304,8mm	304,8mm
Focal point above case, no glass	10,4mm	10,4mm	10,4mm	10,4mm
Guaranteed clearance, no glass	9mm	9mm	9mm	9mm
Focal point above case, 2mm glass	11 mm	11 mm	11 mm	11 mm
Guaranteed clearance, 2mm glass	7mm	7mm	7mm	7mm

### WideSCAN-36





### WideSCAN-48



### 9. Mechanical Dimensions Computer

Overall Dimensions	S2N-ITXPC-A
Width	230mm
Depth w/o. connectors	200mm
Depth incl. connectors	250mm
Heights	73mm

Do not obstruct case fan.



Overall Dimensions	S2N-ITXPC-1-A
Width	230mm
Depth w/o. connectors	200mm
Depth incl. connectors	250mm
Heights	83mm

Do not obstruct case fan.



Overall Dimensions	180W EPC
Width	70mm
Depth	170mm
Heights	40mm



### 10. Ambient Condition

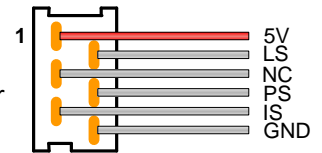
Operating Temperature	5 to 40 °C (40 to 105 °F)
Storage Temperature	0 to 60 °C (32° to 140 °F)
Relative Humidity	20 to 80% (non-condensing)
Noise Computer	< 35 dB(A) (Operating); case fan and CPU fan < 25 dB(A) (Standby) case fan only
Noise WideSCAN	0 dB(A); WideSCAN operates without fan, convection cooling only

## 11. Internal and External Trigger

WideSCAN cameras are running at speeds programmed through the Web Interface like a normal scanner. It is advisable and recommended in most cases to use the precisely controlled internal line synchronization signals. To suit special application, the WideSCAN cameras additionally provide a method to be synchronized from external sources. The line sync signal is important to make sure, the pixels scanned are squared. It is expected to be asserted once per scan line.

A more common external control is the page sync signal which defines the start and the end of a page. The signals and their behavior are described in detail in this chapter.

Each WideSCAN camera unit has an internal connector named "Rotary". This connector is a Lumberg Micromodul™ connector, pitch 1.27 mm with carries 5V power and GND as well as four signals.

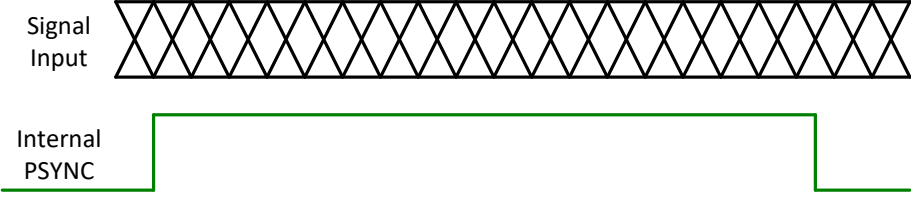
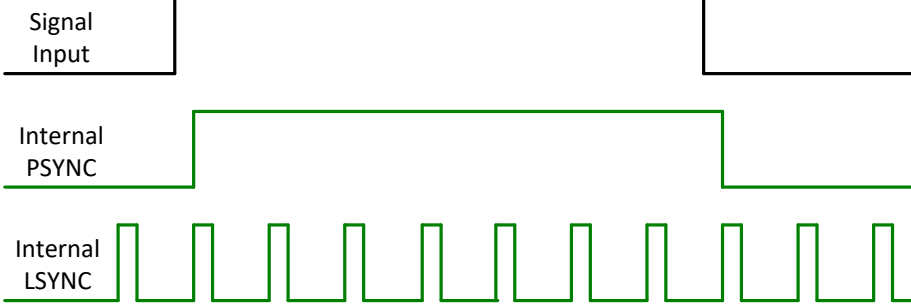
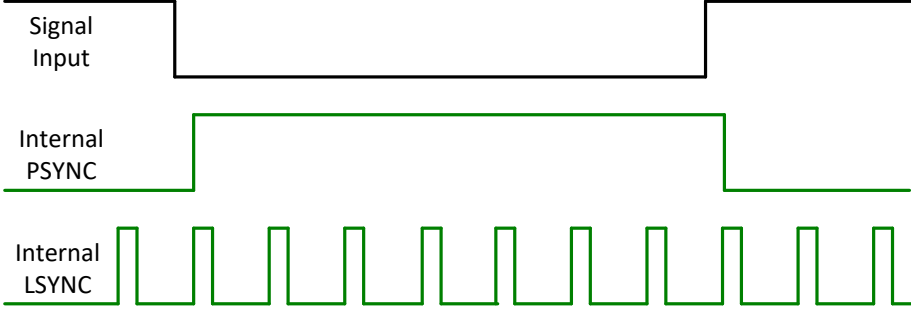


Signal Name	Pin	Type	Description
5V	1	Power	5V, 100mA power supply for external sensors, actuators etc.
LS	2	Input	External line sync input, 3,3V & 5V compliant.
NC	3	none	Not connected
PS	4	Input	External page sync input, 3,3V & 5V compliant.
IS	5	Output	Internal sync used for the camera, 3,3V CMOS level.
GND	6	Power	Ground

### Line Synchronization Options

Name / Description	Signal Diagram
<b>FR-LSYNC</b> Free running internal line sync.	
<b>LE-LSYNC</b> Leading edge externally triggered line sync.	
<b>TE-LSYNC</b> Trailing edge externally triggered line sync.	
<b>DE-LSYNC</b> Dual edge externally triggered line sync.	

### Page Synchronization Options

Name / Description	Signal Diagram
<p><b>FR-PSYNC</b> Free running externally triggered page sync.</p>	 <p>The diagram shows three signals over time. The top signal, 'Signal Input', is a continuous sawtooth wave. The middle signal, 'Internal PSYNC', is a single high pulse that occurs once. The bottom signal, 'Internal LSYNC', is a series of regular, narrow pulses.</p>
<p><b>AH-PSYNC</b> Active high externally triggered page sync.</p>	 <p>The diagram shows three signals over time. The top signal, 'Signal Input', is a high pulse. The middle signal, 'Internal PSYNC', is a high pulse that occurs during the high pulse of the signal input. The bottom signal, 'Internal LSYNC', is a series of regular, narrow pulses.</p>
<p><b>AL-PSYNC</b> Active low externally triggered page sync.</p>	 <p>The diagram shows three signals over time. The top signal, 'Signal Input', is a low pulse. The middle signal, 'Internal PSYNC', is a high pulse that occurs during the low pulse of the signal input. The bottom signal, 'Internal LSYNC', is a series of regular, narrow pulses.</p>