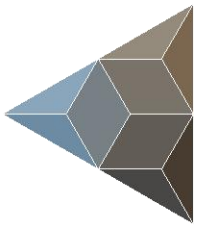
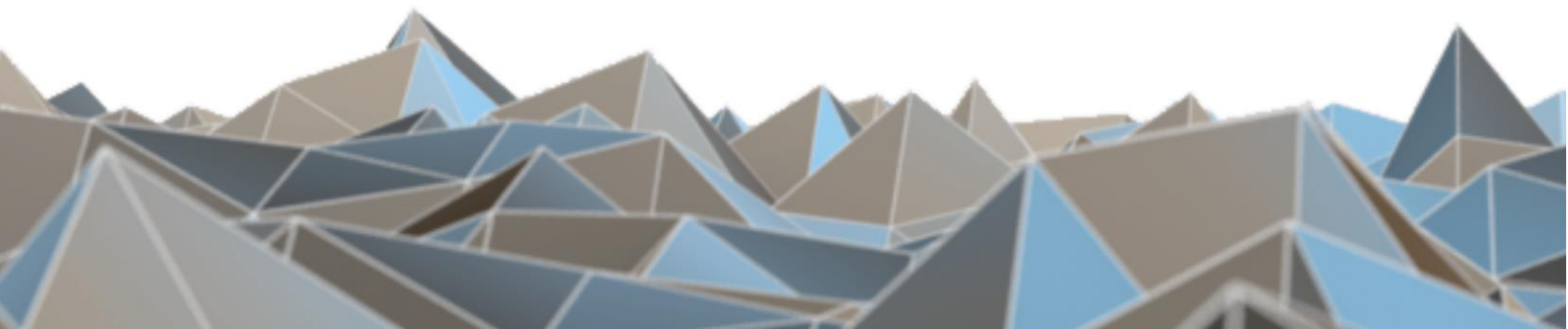


BLUETECHNIX
Embedding Ideas

Argos3D-P220

Hardware User Manual

Version 2



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Argos3D-P220 – Hardware User Manual

Subject to change without notice. Errors excepted.

Table of Contents

The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics.

Terms of delivery and rights of technical change reserved.

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BECOM BLUETECHNIX takes no liability for any damages and errors causing of the usage of this board. The user of this board is responsible by himself for the functionality of his application. He is allowed to use the board only if he has the qualification. More information is found in the General Terms and Conditions (AGB).

Information

For further information on technology, delivery terms and conditions and prices please contact BECOM BLUETECHNIX (http://www.bluetechnix.com).

Warning

Due to technical requirements components may contain dangerous substances.

1 General Information

This guide applies to the Argos3D-P220 camera platform from BECOM BLUETECHNIX GmbH. Follow this guide chapter by chapter to set up and understand your product. If a section of this document only applies to certain camera parts, this is indicated at the beginning of the respective section.

The document applies to product V1.5.

1.1 Symbols Used

This guide makes use of a few symbols and conventions:

Warning

Indicates a situation which, if not avoided, could result in minor or moderate injury and/or property damage or damage to the device.

Caution

Indicates a situation which, if not avoided, may result in minor damage to the device, in malfunction of the device or in data loss.

Note

Notes provide information on special issues related to the device or provide information that will make operation of the device easier.

Procedures

A procedure always starts with a headline

1. The number indicates the step number of a certain procedure you are expected to follow. Steps are numbered sequentially.

This sign ➤ indicates an expected result of your action.

References

This symbol indicates a cross reference to a different chapter of this manual or to an external document.

1.2 Certification

X-Grade Version

X-Grade versions of the product are not fully qualified yet and are intended for test and evaluation purposes. Specification of X-Grade products is subject to change without prior notice.

2 Argos3D-P220 Components

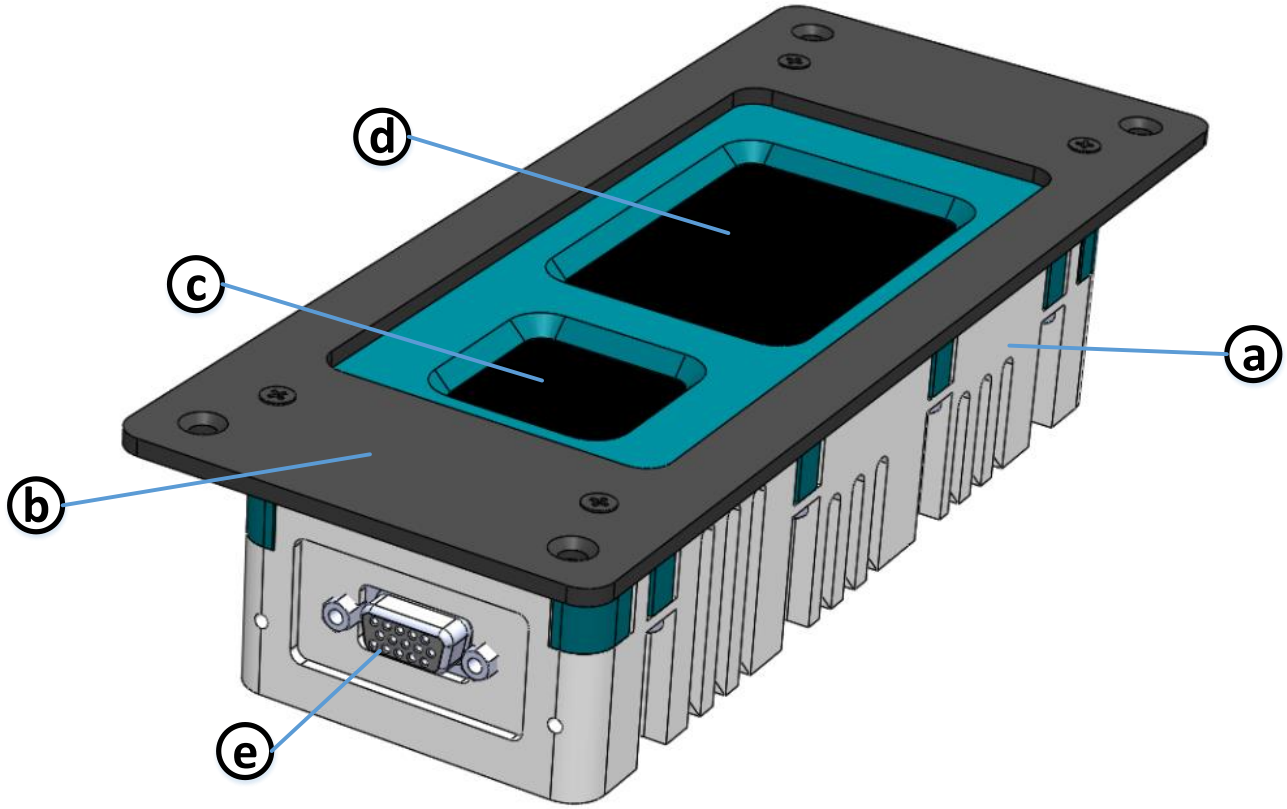

Figure 2-1 Argos3D-P220 components

a. Case
b. Cover plate (can be removed by unscrewing)
c. Viewing window for 3D sensor
d. Viewing window for illumination module
e. IP67 compliant connector

3 Mechanical Description

3.1 Dimensions

All dimensions are in mm, tolerance +/-0,2mm.

3.1.1 In-wall mounting with cover panel

Please use M4 screws for in-wall mounting using the cover panel.

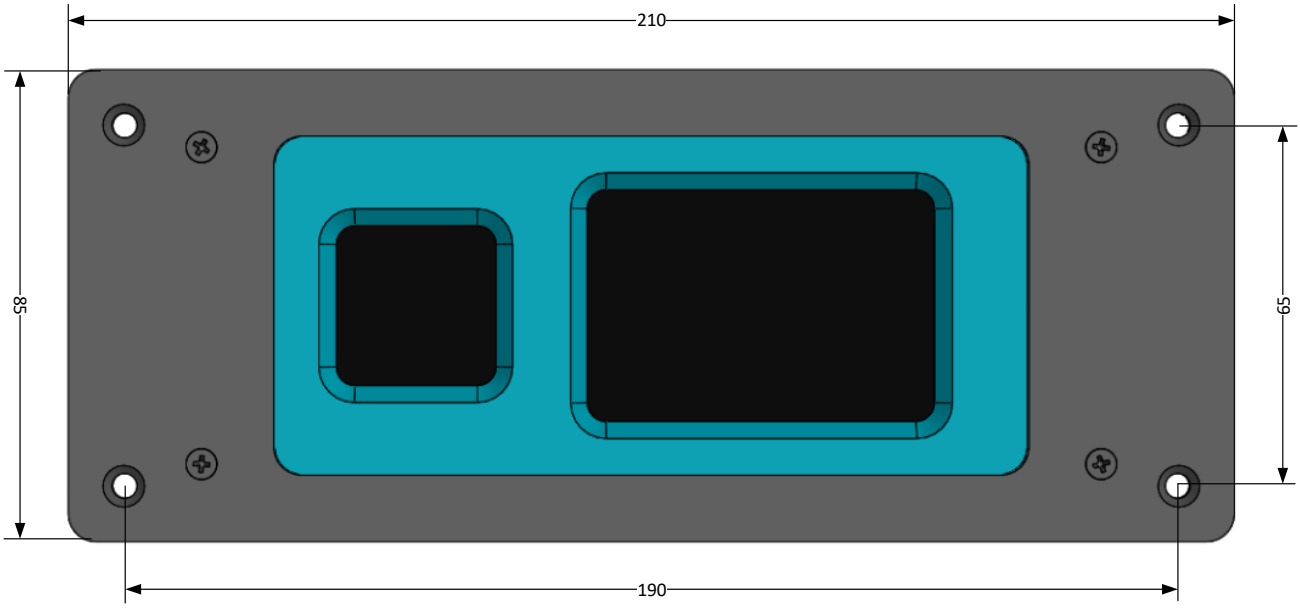

Figure 3-1: Dimensions for in-wall mounting with cover panel

3.1.2 Top view

Top mounting hole size: M3

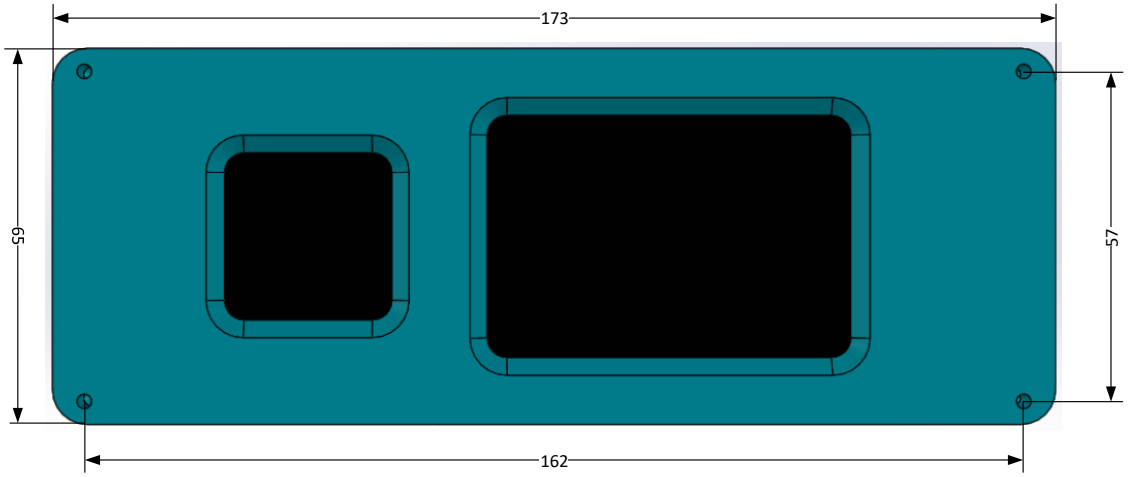

Figure 3-2: Top view dimensions without cover panel

3.1.3 Front view

Front mounting hole size: M3

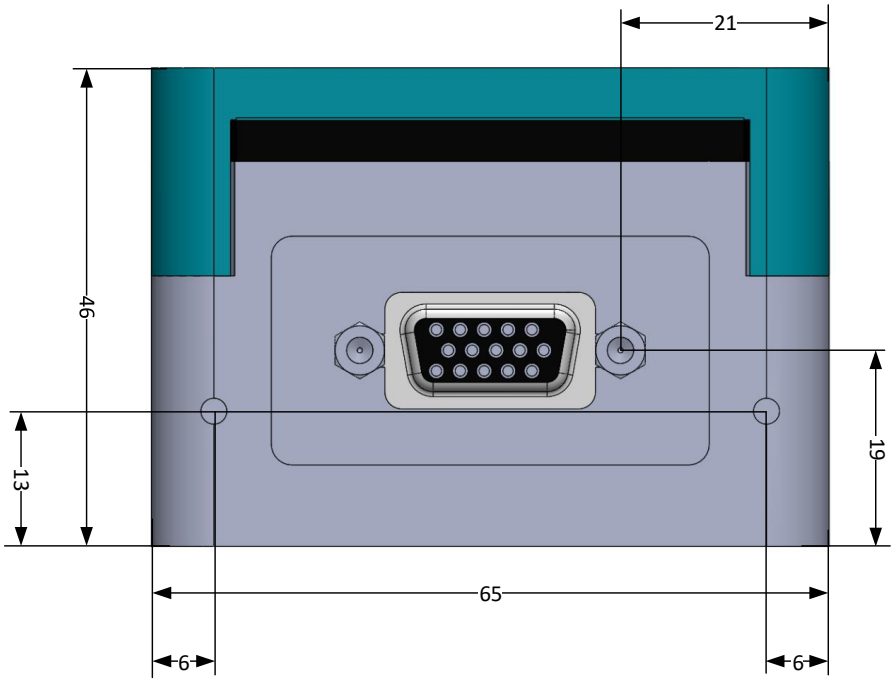

Figure 3-3: Front view without cover panel

3.1.4 Back view

Back view mounting hole size: M3

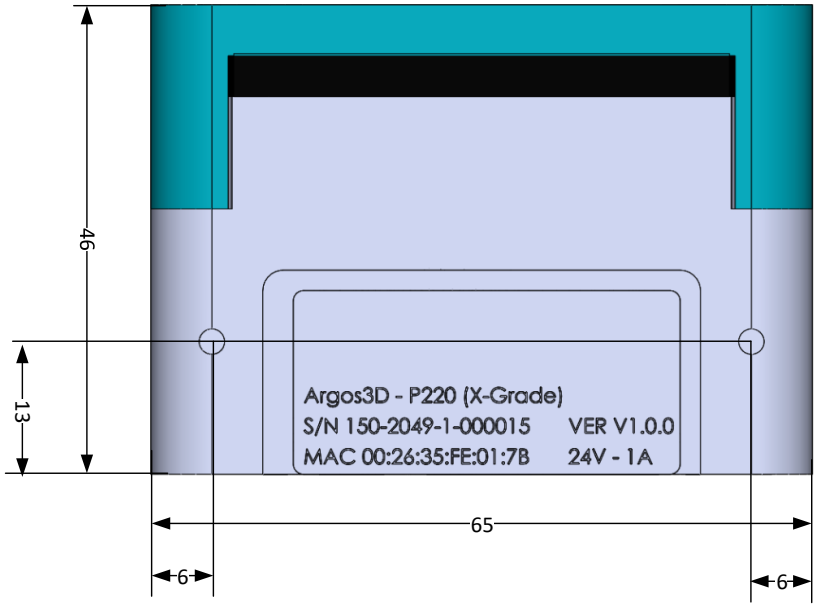

Figure 3-4: Back view without cover panel

3.1.5 Side view

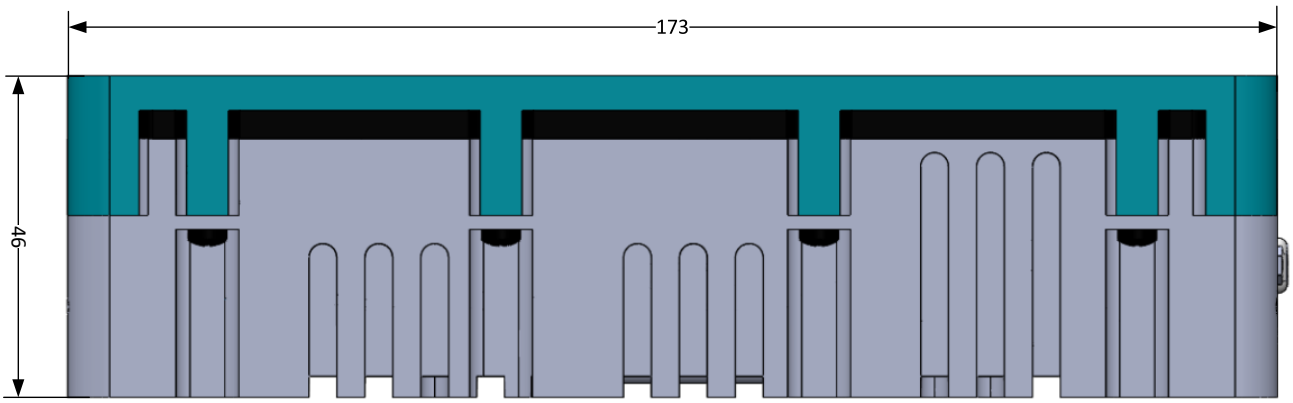

Figure 3-5: Side view without cover panel

3.1.6 Mount Spacing

Caution

Case may become hot!
The user is responsible to take care for an appropriate cooling.

To prevent the Argos3D-P220 from overheating, it is strongly recommended, to keep away nearby objects. This guarantees a constant airflow for proper cooling. This bounding box may be violated, when other cooling techniques are provided.

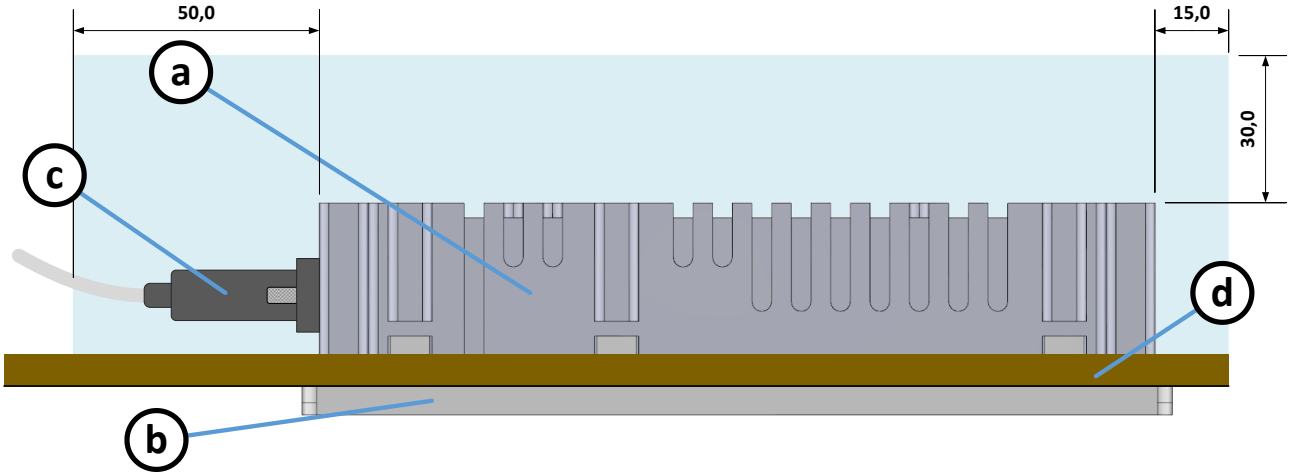

Figure 3-6: Bounding box

a. Argos3D-P220 Case
b. Argos3D-P220 Cover plate
c. Mating IP67 connector
d. Wall or mounting panel

4 Interface Description

4.1 Signal naming

Signal names are usually written in capital letters. They are noted in positive logic (positive asserted). If the signal is negative asserted an “n” will be added as prefix to the signal name.

Type:

The type describes the electrical characteristics of the signal. The following types are available:

- I Input
- O Output
- DN Negative Differential I/O
- DP Positive Differential I/O
- P Power supply
- 3.3V TTL TTL compatible signal with 3.3V high level and 0V low level.
- 50V tolerant Accepts input voltage levels up to 50V (2.5V high voltage threshold)

4.2 Connector Numbering

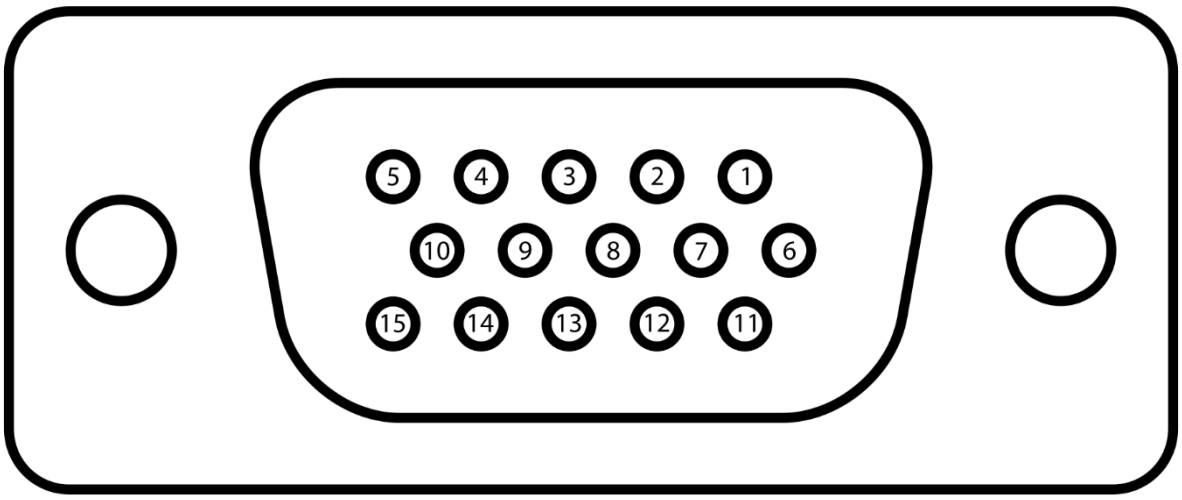

Figure 4-1: Connector Pin Numbering

4.2.1 Connector description

No.	Signal	Type	Description
1	ETH-B_N	DN	Ethernet Lane B
2	ETH-B_P	DP	Ethernet Lane B
3	GND	P	DIO Reference Ground
4	DIO	IO (50V tolerant)	Digital I/O Signal
5	V+	P	Positive Power Supply
6	ETH-C_N	DN	Ethernet Lane C

No.	Signal	Type	Description
7	ETH-C_P	DP	Ethernet Lane C
8	ETH-D_N	DN	Ethernet Lane D
9	ETH-D_P	DP	Ethernet Lane D
10	nTRIGGER	IO (3V3 TTL)	Trigger Input
11	ETH-A_N	DN	Ethernet Lane A
12	ETH-A_P	DP	Ethernet Lane A
13	GND	P	DI Reference Ground
14	DI	I (50V tolerant)	Digital Input Gignal
15	V-	P	Power Ground

Table 4-1: Connector Description

4.2.2 Power supply

The power supply pins are protected against wrong polarity.

Voltage range: 16V to 52V.

Note

Use inherently limited power sources only!

4.2.3 DIO

The digital Input-Output interface has an optical isolated input and output stage. Driven by the GPIOs 1 (output) and GPIO 3 (input). See the Software User Manual specifications for GPIO functionality.

The output stage is a solid state relais, and gives the possibility to use the output as a simple switcher. The current is limited to 200mA.

If this interface is used as input, the corresponding output must be set to logically 0. Otherwise the input is constantly shorted. The maximum LOW input detection voltage is 2V, the minimum HIGH input detection volte is 5V.

4.2.4 Trigger In

The trigger Input is not optically isolated to minimize the propagation delay. But the input is protected against 50V clamp voltages. A standard 3.3V TTL signal should be used.

4.2.5 RS485 Mounting Option

For some Applications a RS485 communication could be needed. Therefore the internal hardware could be modified to route the RS485-A and –B signals to the connector in state of DI (RS485-A) and DIGND (RS485-B).

Ask BECOM BLUETECHNIX for custom modifications.

4.3 Mating Parts

The mating IP67 connector is an A-HDS15-HOOD-WP from ASSMANN WSW components GmbH and available for purchase e.g. at Digi-Key.

4.3.1 Interconnection cable

4.3.2 Development Adapter

For development purposes there is an adapter available with standard Ethernet RJ45 interface and a 2.1mm DC power supply socket.

Figure 4-2: Adapter for Argos3D-P220

4.3.3 Interconnection Adapter

For interconnection there is an adapter available with standard Ethernet RJ45 interface and 2 pole headers for IO and power supply.

Figure 4-3: Interconnection adapter for Argos3D-P220

5 Software

5.1 Firmware

For a description of the firmware related interfaces, protocol descriptions, register settings, etc. please refer to the Software User Manual.

5.2 Demo Application

For the first evaluation of the camera and to evaluate different settings and configurations a .NET demo application for Microsoft Windows is provided: BLT-ToF-Suite. The demo application can be downloaded from our support web site support.bluetechnix.com.

5.3 Getting Started Software Development Example

To facilitate the integration of the Argos module in your own application a getting started example will be available on our download site. Please refer to our support site support.bluetechnix.com.

6 Appendix

6.1 Operating Conditions

Symbol	Parameter	Min	Typical	Max	Unit
V_{IN}	Input supply voltage	16	24	52	V
I_{IN}	Input current [1)]	TBD	TBD [1)]	TBD	mA
	Input current without Interface-Board [1)]	TBD	TBD	TBD	mA
	Input current (Mainboard only) [3)]	TBD	TBD	TBD	mA
T	Operating Temperature [2)]	TBD		TBD[2)]	°C
T	Storage Temperature	-40		+125	°C
FITP[4)]	Frame-rate Integration Time Product			TBD	

Table 6-1: Operating Conditions

1) Note

Valid for a frame-rate of 30fps and an integration time of 3500µs. The input current depends on the applied frame-rate and integration time.

2) Note

The maximum operating temperature depends on the frame-rate and integration time.

6.1.1 Input current

The input current depends on the selected frame-rate (fps) and the integration time (t_{INT}). The following figure shows typical values. The values for the x axis shows the FITP which has been calculated with the following equation:

$$FITP = t_{INT}\,[ms] \cdot fps\,\left[\frac{1}{s}\right] \cdot 4$$

TBD

Figure 6-1: Input power depending on frame-rate integration time product

6.2 Optical Characteristics

Symbol	Parameter	Min	Typical	Max	Unit
#LEDs	Nr. of LEDs		6		
$\Lambda_{CENTROID}$	Centroid-Wavelength of Illumination		850		nm
$\Delta\lambda$	Spectral Bandwidth		30		nm
I_e	Radiant intensity		TBD		W/sr
FoV_H	Horizontal Field of View		90		Deg
FoV_V	Vertical Field of View		67		Deg

6.3 Measurement Specifications

6.3.1 Measurement Environmental Conditions

All the following measurements have been acquired at the following constant environmental conditions.

Parameter	Value
Temperature	23 °C
Humidity	35 %
Ambient light	500 Lux
Modulation Frequency	22,1 MHz
Frame-rate	30 fps

Table 6-2: Environmental Specification

6.3.2 Typical Reproducibility

TBD

The following table shows the standard deviation over 100 samples.

Measuring range [mm]	White target (90%) [mm]	Integration time [ms]	Gray target (18%) [mm]	Integration time [ms]
100	TBD		TBD	
300	TBD		TBD	
500	TBD		TBD	
700	TBD		TBD	
900	TBD		TBD	
1100	TBD		TBD	
1300	TBD		TBD	
1500	TBD		TBD	
1700	TBD		TBD	
1900	TBD		TBD	
2100	TBD		TBD	
2300	TBD		TBD	
2500	TBD		TBD	
2700	TBD		TBD	
2900	TBD		TBD	

Table 6-3: Typical Reproducibility

6.3.3 Typical Integration Time

Measuring range [mm]	Integration time for white target (90%) [ms]	Integration time for gray target (18%) [ms]
500	TBD	TBD
1000	TBD	TBD
1500	TBD	TBD
2000	TBD	TBD
2500	TBD	TBD
3000	TBD	TBD

Table 6-4: Typical Integration Time

6.3.4 Typical Range

Integration time [ms]	Minimum distance for white target (90%) [mm]	Maximum distance for white target (90%) [mm]	Minimum distance for gray target (18%) [mm]	Maximum distance for gray target (18%) [mm]
TBD				
TBD				
TBD				
TBD				
TBD				
TBD				
TBD				
TBD				

Table 6-5: Typical Range

6.3.5 Accuracy of Distances

The following table has been determined by a frame-rate of 30fps and an integration time of 3,5ms.

Measuring range [mm]	White target (90%) [mm]	Integration time [ms]	Gray target (18%) [mm]	Integration time [ms]
500	TBD		TBD	
1000	TBD		TBD	
1500	TBD		TBD	
2000	TBD		TBD	
2500	TBD		TBD	
3000	TBD		TBD	

Table 6-6: Accuracy of Distances

6.4 Environmental considerations

TBD

6.4.1 Temperature at the case

The following figure shows the expected case temperature depending on the frame-rate integration time product (FITP) and the ambient temperature. The FITP has been calculated as follow:

$$FITP = t_{INT}\,[ms] \cdot fps\,\left[\frac{1}{s}\right] \cdot 4$$

TBD

Figure 6-2: Expected cooling plate temperature depending on frame-rate integration time product

The temperature on the cooling plate can be reduced by mounting an additional heat sink on the cooling plate.

6.4.2 Integration Time vs. Frame-rate

The following table shows recommended frame-rate integration time combinations depending on the ambient temperature.

Caution

Be careful to not stress the device beyond the limits, otherwise you may damage the device.

TBD

Figure 6-3: Integration time vs. frame-rate

The diagram takes care to limit the FITP in a way that the temperature on the cooling plate doesn't exceed 70°C. Using an appropriate heat sink higher values of the FITP may be applied.

Caution

The user is responsible to take care for an appropriate cooling if the Sentis is mounted into a case.

6.5 Sensor Location

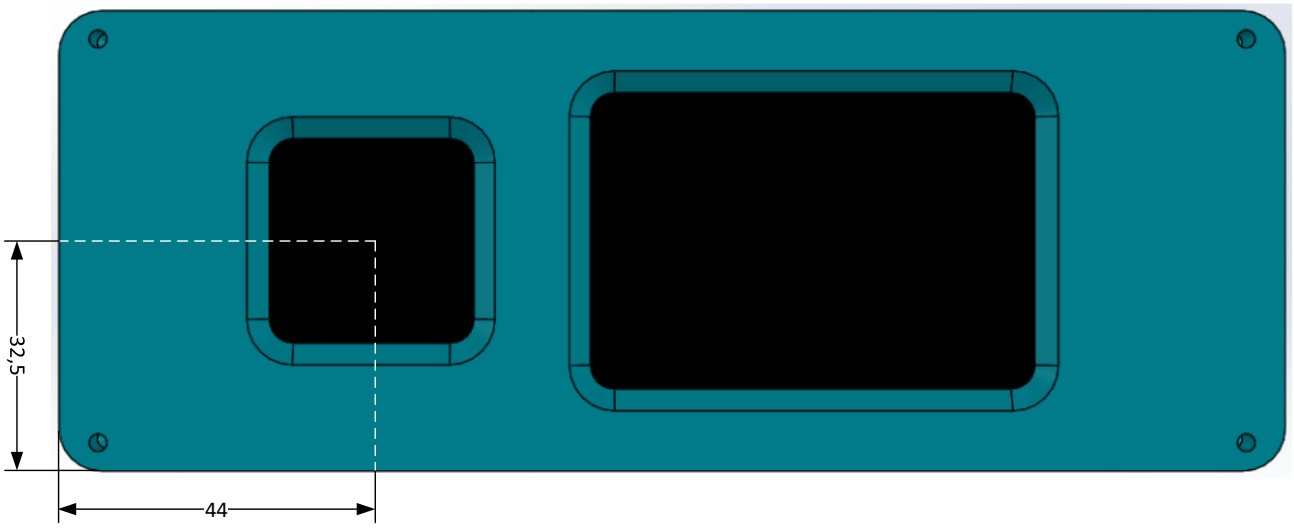

Figure 6-4: Location of optical center of sensor

7 Support

7.1.1 General Support

General support for products can be found at BECOM BLUETECHNIX' support site

Support Link

https://support.bluetechnix.at

7.2 Related Products

- TIM-UP-19kS3-ETH
- LIM-U-LED-850-6

8 Product History

8.1 Version Information

8.1.1 Argos3D-P220

Version	Type	Release date
V1.0.0	X-Grade	December 2016
V1.5.0	X-Grade	January 2018
V1.6.0	Series	Planned for May 2018

Table 8-1: Overview Argos3D-P220 product changes

Note

Please refer to our support site for additional information about product changes.

8.2 Anomalies

Applies to	Date	Description
V1.0.0		No anomalies reported yet.
V1.5.0		No anomalies reported yet.

Table 8-2 – Product anomalies

8.3 Document Revision History

Version	Date	Document Revision
1	2016 12 22	First preliminary of the document
2	2018 03 20	- Updates for V1.5.0 - Company name changed - Some typos corrected

Table 8-3: Revision history