



# ***GIN-SAM4***

Hardware

**User Manual**

Version: 1.06  
Date: 19.06.2020  
Language: English



## Table of Contents

<b>1.</b>	<b>General</b>	<b>4</b>
1.1.	About this manual	4
1.2.	Sales and Service	4
1.2.1.	Manufacturer	4
1.3.	Copyright	4
1.4.	Revisions	5
1.5.	Terms	5
<b>2.</b>	<b>Product Identification</b>	<b>6</b>
2.1.	Accessories	6
2.2.	Scope of delivery	6
2.2.1.	GIN-SAM4	6
2.3.	Label	6
2.3.1.	GIN-SAM4, with additional information like serial number.	6
<b>3.</b>	<b>Technical Description</b>	<b>7</b>
3.1.	Rotary- Switch	7
3.2.	Mounting	7
3.2.1.	Box mounting	7
3.2.2.	Shielded lines	7
3.2.3.	Grounding	7
3.2.4.	Shielding plate	8
3.3.	Caution, laptop users	8
<b>4.</b>	<b>Technical Specifications GIN-SAM4</b>	<b>9</b>
4.1.	General	9
4.2.	Power Supply	9
4.3.	Environmental Conditions	10
<b>5.</b>	<b>Pinout GIN-SAM4</b>	<b>11</b>
5.1.	Power Supply, on top	11
<b>6.</b>	<b>Connectors</b>	<b>12</b>
6.1.	Connectors Enclosure Front/ Top	12
6.1.4.1.	Connectors Enclosure Bottom	13
6.2.	Connector Top Detail (PowerSupply)	13
<b>7.</b>	<b>Internal Expansion (max. possibilities)</b>	<b>14</b>
<b>8.</b>	<b>Mechanical Drawings</b>	<b>15</b>
8.1.	Mechanical Dimensions GIN-SAM4	15

## **1. General**

### **1.1. About this manual**

This manual is about the GIN-SAM4 motion controller board from Indel AG.

### **1.2. Sales and Service**

#### **1.2.1. Manufacturer**

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### **1.3. Copyright**

© Indel AG

#### 1.4. Revisions

Version	Date	Author	Comment
Rev 1.00	17.01.2017	QFU	• First Release
Rev 1.01	03.04.2017	QFU	• Detail X29
Rev 1.02	08.06.2017	QFU	• Company logo updated
Rev 1.03	18.04.2019	QFU	• Single core version replaced by dual core option
Rev 1.04	14.08.2019	QFU	• Storing information, battery replacement
Rev 1.05	11.06.2020	QFU	• Corrections, added option Multilink
Rev 1.06	19.06.2020	QFU	• Typing errors corrected

#### 1.5. Terms

Acronym	Meaning
GinLink	Indel fieldbus, 1Gbit/s Ethernet based
PE-Line	Earth conductor
Fieldbus Master	Master of the GinLink fieldbus

## 2. Product Identification

The following versions of the GIN-SAM4 master are available

Typ	Option	Prod. Nr.	Description
GIN-SAM4	1x2.0G	611451410 <i>No longer available, replaced by 611451420</i>	Single Core, 2.0GHz PowerPC 32/64Bit CPU, 512kB L2 Cache, 1MB L3 Cache, 1300MBit/s DDR3 RAM 1x2GB, 2MB MRAM, 2 x GinLink, 2 x SIO, 1 x mSATA, 2 x mPCIe
GIN-SAM4	2x2.2G	611451420	Dual Core, 2.2GHz PowerPC 32/64Bit CPU's, 2 x 512kB L2 Cache, 2 x 1MB L3 Cache, 1600MBit/s DDR3 RAM 2x2GB, 2MB MRAM, 2 x GinLink, 2 x SIO, 1 x mSATA, 2 x mPCIe
GIN-SAM4	4x2.2G	611451440	Quad Core, 2.2GHz PowerPC 32/64Bit CPU's, 4 x 512kB L2 Cache, 2 x 1MB L3 Cache, 1600MBit/s DDR3 RAM 2x2GB, 2MB MRAM, 2 x GinLink, 2 x SIO, 1 x mSATA, 2 x mPCIe
GIN-SAM4	4x2.2G/ ML	611451442	Quad Core, 2.2GHz PowerPC 32/64Bit CPU's, 4 x 512kB L2 Cache, 2 x 1MB L3 Cache, 1600MBit/s DDR3 RAM 2x2GB, 2MB MRAM, 2 x GinLink, 2 x SIO, 1 x mSATA, 2 x mPCIe, 1 x EtherCAT or 1 x PowerLink

Concerning the supported functionality in software of the hardware features, contact Indel AG, please.

### 2.1. Accessories

Prod. Nr.	Label	Description	
610839800	SIO-Adapter RJ-12	Adapter cable for SIO, RJ-12 to D-SUB male, length 20 cm	

### 2.2. Scope of delivery

#### 2.2.1. GIN-SAM4

The order includes:

- Fieldbus master GIN-SAM4
- Power connector 24V, Phoenix Contact FK-MPC 1.5/3-ST-3.5 with Indel labeling

Not included:

- RJ-12 connectors for COMx ports, Ethernet cables

### 2.3. Label

#### 2.3.1. GIN-SAM4, with additional information like serial number.

### 3. Technical Description

The GIN-SAM4 is a high-performance fieldbus master board by Indel. The powerful master is perfectly suited for high-speed applications with complex and high technical requirements.

As a fieldbus master for the Indel GinLink, the GIN-SAM4 can control and coordinate the entire peripheral equipment of a machine with a closed-loop bus frequency of up to 64kHz.

#### 3.1. Rotary- Switch

With the help of the rotary switch certain basic modes of operation can be selected. The newest information can always be found in the Wiki.

Rotary Switch Position	Emergency System	Default IP	Description
0x0			not used
0x1			not used
0x2			not used
0x3			not used
0x4			not used
0x5	x		Emergency system
0x6		x	Application with default IP (192.168.1.251)
0x7	x	x	Emergency system with default IP
0x8 ... 0xF	not used		

#### 3.2. Mounting

##### 3.2.1. Box mounting

The standalone box should be mounted on a grounded wall with two M5 screws. You have to ensure adequate air circulation for cooling.

##### 3.2.2. Shielded lines

It is essential to operate the RS232 interfaces with shielded leads. The shielding must be connected inside the connector at both ends. The RS422 interface can be operated with twisted pair wires. For short distances, an unshielded cable will suffice. For RS422 connections over long distances (>400m), it is advisable to use a shielded twisted pair cable.

##### 3.2.3. Grounding

The GIN-SAM4 board is grounded via its front panel. Make sure that the connection between the rack housing and the control cabinet is conductive (EMC grounding). This is best achieved using chromatinized mounting bars. The box is grounded via the conductive backplane.

#### 3.2.4. Shielding plate

If the StandAlone Master is installed together with drives of the SAC series in the same rack, a shield plate must be inserted between the master and the drives. In addition, the manufacturer recommends a minimum distance of 5 ... 10cm between the master and power-voltage-carrying boards. Possibly provide an empty space.

### 3.3. Caution, laptop users

Observe the following sequence when connecting a laptop to a GIN-SAM4:

- Isolate the power supply of the laptop so that it is only supplied with power from the battery.
- Connect the GIN-SAM4 and the laptop by an appropriate serial cable.
- Reconnect the power supply.

Reason: As a result of the electrical isolation, the laptop power supply levels are raised to a potential of 110V (providing the laptop is supplied via the mains). Because there is no assurance with conventional SUB-D connectors that the shield will contact before the signal lines, there is a risk of potential equalization taking place via the signal ground line. This can destroy the related SIO channel.



## 4. Technical Specifications GIN-SAM4

### 4.1. General

General		GIN-SAM4
Vibration		
Shock		
Emission standard for industrial environments		EN 61000-6-4
Immunity to interference		EN 61000-6-2
Weight	kg	1.1

### 4.2. Power Supply

Logic Supply		GIN-SAM4
Operating Voltage	$V_{DC}$	24 <sub>-5% / +15%</sub>
Galvanic Isolation		no
Fuse protection	A	8, quick-acting
Current Draw	A	3
Max. potential between GND and earth	$V_{DC}$	50

### 4.3. Environmental Conditions

The operator is responsible that the GIN-SAM4 is used under the specified conditions. Indel does not guarantee the functionality if the product is used outside the environmental conditions below:

Storage Temperature	°C	-20 ... 80
Operational Environmental Temperature <sup>1)</sup>	°C	0 ... 40
Max. Temperature Read out Value	°C	tbd
Degree of Protection		IP 20
Installation Position		Vertically or horizontally mounted. the user has to make sure that the cooling (fan) openings are free.
Max. Installation Altitude without Power Reduction	m a. s. l.	1000
Max. Installation Altitude with Power Reduction	m a. s. l.	2000 -1.0% / 100m
Rel. Air Humidity, no Condensation		80%
Degree of Pollution		2 (EN 50178)

1) The operator has to make sure that the device is used within the environmental specifications.

#### Storing (remarks):

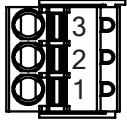
Make sure that the above environmental conditions are met during storing the device as spare part, too. The SAM4 uses a secondary battery coin cell for time keeping (type: ML2032). Indel AG recommends to check the battery once per year during shelf times to make sure that time keeping without supply voltage is working as soon as you put the SAM4 into operation.

#### **Attention:**

Never use a primary CR2032 coin cell battery instead of the required ML2032 secondary battery cell (charging of the secondary cell ML2032 could be activated anytime by software)!

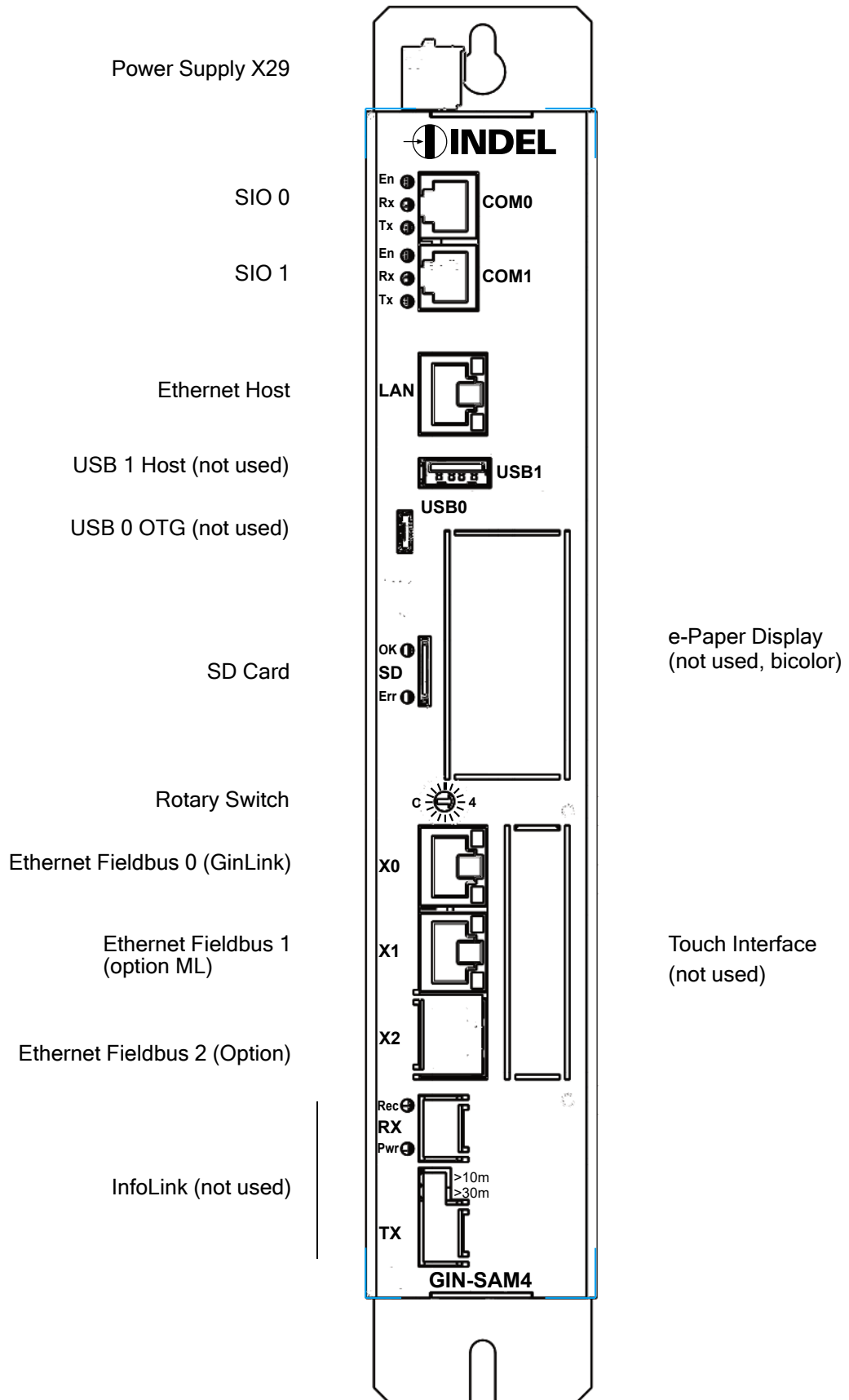
5. Pinout GIN-SAM4

5.1. Power Supply, on top

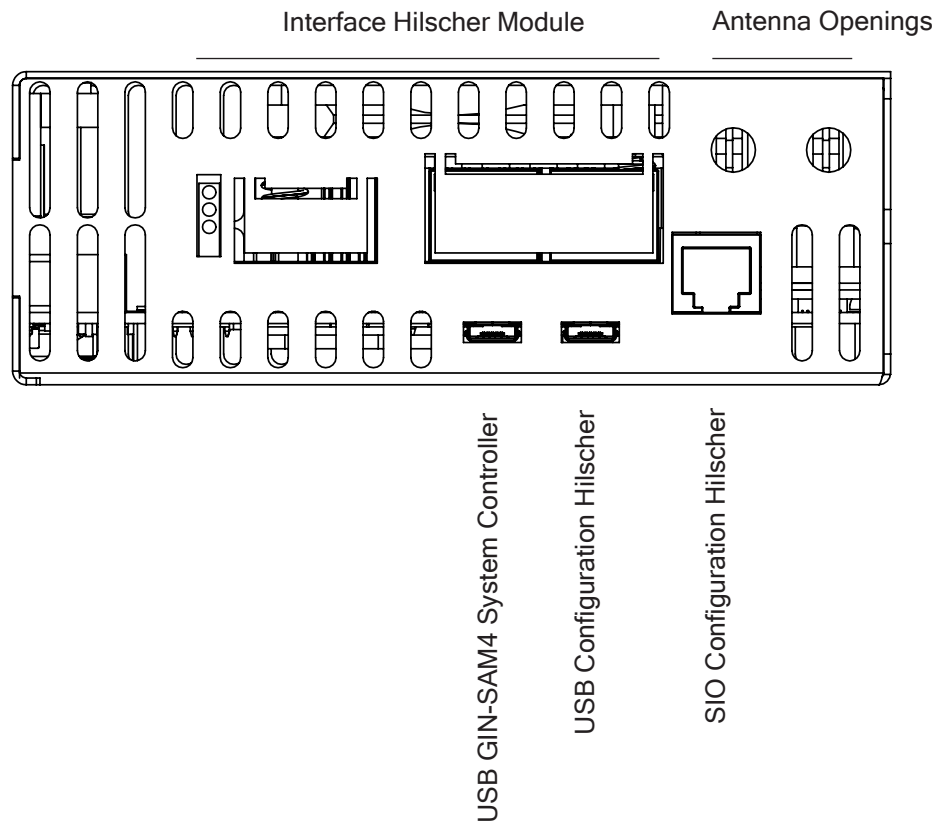
Connector Delimiter	Figure	Pin Nr.	Pin Name
X29		3	PE
		2	0V
		1	24V

6. Connectors

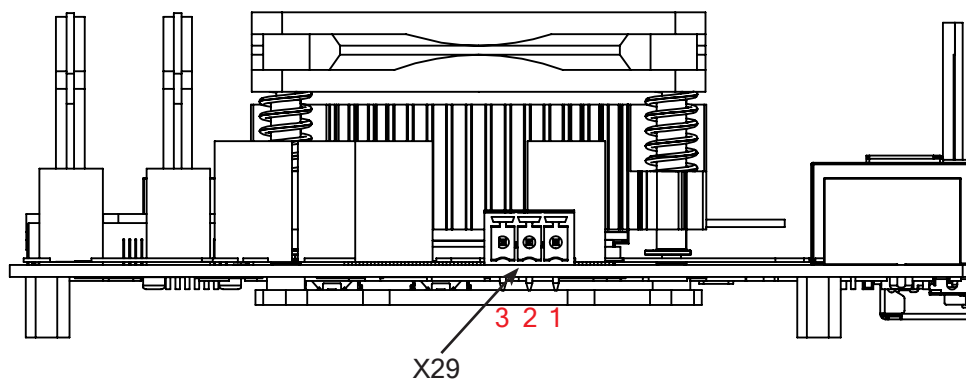
6.1. Connectors Enclosure Front/ Top



6.1.4.1. Connectors Enclosure Bottom



6.2. Connector Top Detail (Power Supply)

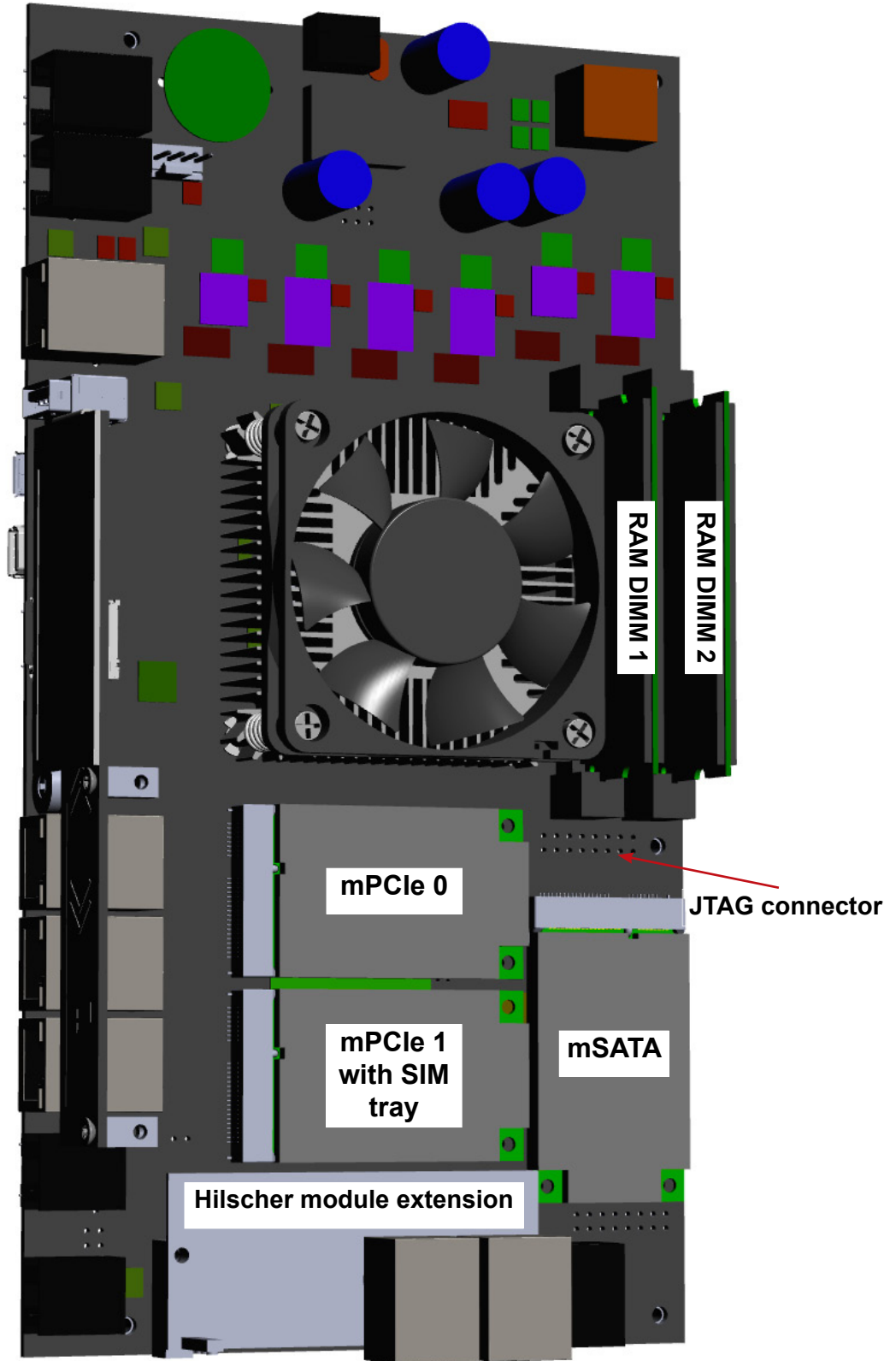


The delimiter of the power connector is X29.

- The pinout is as follows (it is compatible with other Indel products, too):
  - 1: 24V
  - 2: GND
  - 3: EARTH/ FRAME
- Power Supply:
  - Make sure, please that you are using a power supply that can deliver a regulated output voltage of 24V and a current of 3A @ 24V at least.

### 7. Internal Expansion (max. possibilities)

Please take care: The availability is not guaranteed. To make sure that an option is supported by Indel at all, get in touch with Indel AG.



8. Mechanical Drawings

8.1. Mechanical Dimensions GIN-SAM4

