



# User Manual Internal DC/DC converter

Galvanic isolated power supply

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# 1 About this manual

## 1.1 Target group

This manual is intended for qualified specialist personnel.

It serves to complete their knowledge about proper assembly, commissioning and maintenance of the device.

However, the manual does not replace expert knowledge.

## 1.2 Requirements

A prerequisite for the understanding and proper implementation of the descriptions in this document are skills for basic installation, for software installation, and for the maintenance of technical devices.

## 1.3 Signal words

The following signal words are used in this document:

<b>Danger</b>	<i>Danger</i> indicates warnings which could lead to death or serious injury if ignored.
<b>Warning</b>	<i>Warning</i> indicates warnings which could lead to minor injury or severe material damage if ignored.
<b>Caution</b>	<i>Caution</i> indicates warnings which could lead to minor material damage if ignored.

## 1.4 Symbols

The following symbols are used in this document:

### 1.4.1 Indicative symbols

This manual contains instructions which must be observed to ensure your personal safety and to prevent damage to property.



Warning regarding general dangers in association with one of the signal words **Caution**, **Warning**, or **Danger**.



Warning regarding dangers involving electricity in association with one of the signal words **Caution**, **Warning**, or **Danger**.



Warning regarding dangers involving electrostatic discharge in association with one of the signal words **Caution**, **Warning**, or **Danger**.



Warning regarding dangers involving hot surfaces in association with one of the signal words **Caution**, **Warning**, or **Danger**.



Warning regarding dangers of explosion in association with one of the signal words **Caution**, **Warning**, or **Danger**.



Warning regarding corrosives in association with one of the signal words **Caution**, **Warning**, or **Danger**.



**Information** on the use of the product.

Failure to heed this information can result in an undesirable incident or an undesirable condition.



Cross—reference to other chapters.

### 1.4.2 List symbols

- List
  - Subitem in a list
- Instruction which consists of only 1 step.
- 1. Instruction which consists of several steps. The steps must be performed in the specified order.

## 1.5 Distinctions

The following distinctions are used in this document:

Distinction	Description
<i>Italics</i>	Emphasis
<b>Bold</b>	Product name or strong emphasis
<code>Courier</code>	Term of software interfaces (GUI) and device labels

## 1.6 Abbreviations

The following abbreviations are used in this document:

Abbreviation	Description
<b>IPC</b>	Industrial <b>PC</b>
<b>DC</b>	Direct <b>c</b> urrent
<b>IGNS</b>	<b>I</b> gnition and <b>S</b> ignal input

## 2 Intended use

The "Internal DC/DC converter" unit provides a wide-range input for the DC supply voltage and a galvanic isolation. It is installed in a noax industrial PC as an optional component.

Use of the IGNS function (IGNS = ignition key switch and programmable signal input) is optional. This function must be purchased separately.

It is not intended for any other use. The user or operator of the device is solely liable for any resulting damage. This also applies to unauthorized modifications to the unit or the Industrial PC.

Intended use includes in particular compliance with the safety instructions described in this manual.

The unit has been manufactured according to current technical standards and complies with approved safety regulations.

- ❗ If the optional unit is installed, the use of **extension cards in slot 2 of the Industrial PC will not be possible.**
- ❗ When **extension cards** are used in slot 1, please ensure that the power consumption in the 12 V power supply of the plug does not exceed 0.5 A.  
This limit applies to PCI cards anyway. For PCIe cards, only cards of the 10 W class may be used, in which case the 0.5 A limit also applies. But many cards do not adhere to these specifications. Therefore, caution is required in the selection of cards, especially those that supply **power to external consumers.**
- ❗ If noax **RS232 modules** are used in the device to supply **5 V / 12 V to external devices** (pin 4 / pin 9 of the RS232 module), the total maximum power consumption may not exceed 2.4 W for both RS232 modules together (0.20 A for 12 V / 0.48 A for 5 V).



### **Danger**

The "Internal DC/DC converter" unit may be operated only with Industrial PCs of the C12, S12, C15, P15, S15, and S15-G2 types and an N11 mainboard. Operation with other devices may result in irreparable damage to the device and to the unit. Danger to the operator due to improper use cannot be ruled out.



### **Danger**

The "Internal DC/DC converter" unit may not be operated in areas with explosive atmospheres.



### **Warning**

The "Internal DC/DC converter" unit may not be operated in aircraft, on ships, in hospitals or in other medical environments.



Use in life support or critical security systems in which a malfunction can be indirectly or directly life-threatening is not allowed.



### 3 General safety instructions

When using products which come into contact with electrical voltages, the valid VDE/ IEC/EN regulations must be observed.

#### Documentation

- Failure to follow the user manual or connecting instructions, e.g. mixing up the terminals, can lead to damage to the unit, and causes the operator to lose potential liability and warranty claims.
- Keep this documentation and make sure to include it when passing on the device.



**In addition, please make sure that you also heed the information and safety instructions in the operating instructions for the industrial PC.**

#### Handling the device

- Only use the device if it is in perfect condition. Replace defective devices or components immediately, especially when:
  - The power supply cables are damaged
  - Liquid has entered the device
  - The device no longer works as described in the documentation
  - The housing is damaged
- IP protection:  
Prevent liquids or aggressive fumes (e.g. from cleaning detergents) from entering IP-protected areas such as the connector area.
- Any additions and modifications to the device are prohibited unless expressly approved by noax.
- Follow the disposal instructions in the user manual (see section 10)

#### General maintenance and repair



ESD protection measures must be taken when work is being done on the “Internal DC/DC converter” unit or on the Industrial PC itself (for example, use proper ESD guard band). The unit or the IPC contains highly integrated components that are very sensitive to static discharges.



#### Warning

Generally, work on the “Internal DC/DC converter” unit may be performed only by authorized specialists.

In addition, do not perform any repairs on this unit yourself. Always contact the noax Service Hotline and send in your device for repair, if necessary. Please refer to the rating plate of the Industrial PC for necessary information. Important information about the features of your device is documented here.



**Warning**

noax recommends that you do not replace hard drives, solid state disks and memory modules yourself for Industrial PCs with the option “Internal DC/DC converter”. Always contact the noax Service Hotline for this purpose.



**Warning**

Make sure that the three connectors between the unit PCB and the mainboard of the IPC are in the correct position. Otherwise the unit and possibly the mainboard as well will be damaged.



**Warning**

noax is not liable for damages resulting from improper handling and failure to heed the safety instructions.

## **4 Scope of delivery**

The scope of delivery consists of the following components:

- Unit “Internal DC/DC converter” installed in the Industrial PC
- 6-pin connector for the unit
- This User Manual

## 5 Function description

### 5.1 General

The “Internal DC/DC converter” is designed as a stand-alone unit. This unit is installed in a noax industrial PC as an option.

The DC/DC converter provides a wide-range input for the DC supply voltage and isolates the supply voltage galvanically from the Industrial PC. In addition, parasitic disturbances are filtered from the DC supply voltage by filtering measures.

This way, an Industrial PC with this unit can be connected directly to a suitable DC supply voltage of a vehicle or another suitable DC supply voltage.

- ① When ordering, you can choose between different input voltage ranges for the DC supply voltage.

 Please refer to the technical data in section 11.

### 5.2 “IGNS – ignition and signal input” function

- ① **This function can be purchased as an option**

The “IGNS – ignition and signal input” function allows the use of the ignition input and of the programmable signal input.

#### 5.2.1 Ignition input – connection “IGN”

The ignition input (= ignition key switch input) can be used to start and shut down the Industrial PC.


If the voltage level of the IGN input exceeds 3.5 V, the input is detected as active (the ignition is on). If the voltage level falls below 3.5 V, the input is detected as not active (the ignition is off).

 See section 8.1 for possible settings for the ignition key function

#### 5.2.2 Programmable signal input – connection “IN2”

The programmable signal input can be used to control various functions of the Industrial PC such as the display backlight or the touch input option.

If the voltage level of the IN2 input exceeds 3.5 V, the programmable signal input is detected as active. If the voltage level falls below 3.5 V, the programmable signal input is detected as not active.

 See section 8.1.1 for possible settings for the digital control input

## 5.3 “Deep Sleep switch” function

① This function can be used only in combination with the “IGNS” function

- “ON” switch setting  
This switch position enables the Deep Sleep mode.
  - “OFF” switch setting  
This switch position disables the Deep Sleep mode.
- ① This switch setting is the factory setting.



### Warning

The Deep Sleep mode can be used only in combination with the enabled ignition key function. If the ignition key function is not used, but Deep Sleep mode is still enabled, the IPC will no longer be able to be started in the normal way after the operating system has been shut down. **Set the Deep Sleep switch to “OFF” when the ignition key function is not active.**

### Deep Sleep switch “ON”

Deep Sleep mode is enabled.

If the signal on the IGN ignition key input is no longer active or is no longer present, the input voltage will be disconnected completely from the IPC (=Deep Sleep state) after the operating system has been shut down. Thus the further supply of power to the IPC is prevented by the input voltage source, for example, to save the battery power of a vehicle.

This will reduce the power consumption to a few mA (< 10 mA).

Because the input voltage circuit is completely disconnected from the IPC in the Deep Sleep state, the IPC can be started again only by the ignition key function. The ON/OFF button cannot be used to switch the IPC on and off in the Deep Sleep state.

- ① If the ignition key function is not used, the Deep Sleep function cannot be used either. The switch must then be set to “OFF”.

### Deep Sleep switch “OFF”

Deep Sleep mode is disabled.

If the signal on the IGN ignition key input is no longer enabled or is no longer present, the input voltage will **not be disconnected** from the IPC after the operating system has been shut down. The IPC standby power will be supplied from the input voltage source. This can cause the vehicle battery to be discharged inadvertently, for example. Here, the power consumption is the power consumed by the IPC in standby mode (see technical data in the IPC manual).

- ① If Deep Sleep mode is disabled (switch position “OFF”), the ignition key function can still be used.

## 6 Connection panel

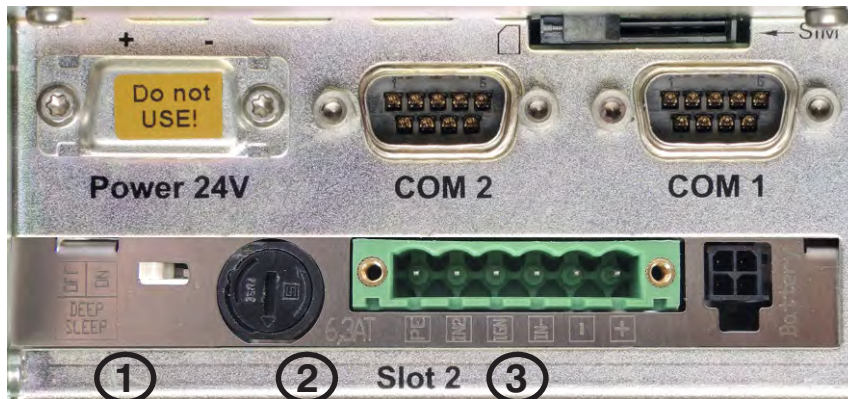


Fig. 1 Connection panel of the “Internal battery UPS”

- ① Deep Sleep switch
- ② Input fuse
- ③ 6-pin input connector

### 6.1 Input connector pin assignment

The 6-pin input connector of the unit is used to connect the power supply instead of the existing power plug on the mainboard.

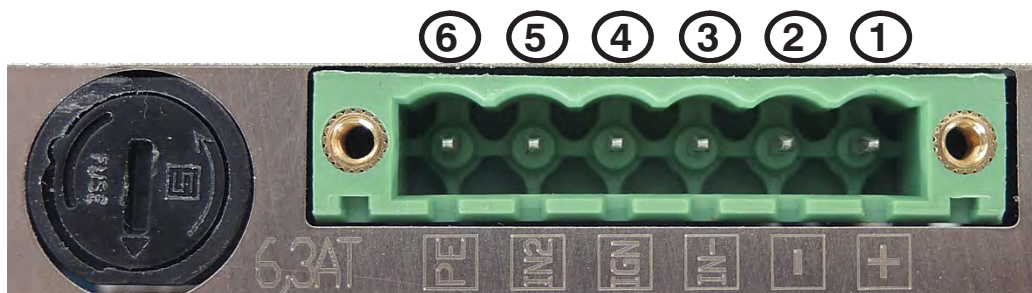


Fig. 2 Input connector pin assignment

- Pin 1 (“+”): Positive pole of the input voltage
- Pin 2 (“-”): Negative pole of the input voltage
- Pin 3 (“IN-”): Signal common for IGN and IN2 (ground / negative pole)
- Pin 4 (“IGN”): Ignition input (Control input for ignition key function)
- Pin 5 (“IN2”): Programmable signal input
- Pin 6 (“PE”): Functional ground for grounding the Industrial PC (see section 7)



#### **Important note**

When the “Internal DC/DC converter” unit is installed, the mainboard power plug cannot be used to supply power to the IPC. For this reason, the power plug is covered by a safety cap.

#### 6.1.1 Input fuse

The fuse can be replaced from the connector area. The input voltage must be protected by a **5x20 mm, 6.3 A T glass tube fuse (micro fuse)** (6.3 A, “slow-acting” tripping behavior according to IEC 60127-2).

## 7 Commissioning

A DC voltage supply at the input of the unit is required to supply voltage to an Industrial PC with an “Internal DC/DC converter” option.



**The limits for the input voltage can be found in the technical data in section 11.**

Mainly the following types of DC voltage supply are used:

- Connection to a vehicle electrical system
- Supply via a noax power supply

For all connection types, it is important to ensure that the input voltage is within the admissible limits.



### **Warning**

For any type of DC voltage supply, it is mandatory that the Industrial PC housing is connected via the “PE” port of the input connector (= functional ground) to a suitable grounding point on the vehicle or grounded to the installation site.  
(For the input connector pin assignment, see section 6.1)

### 7.1 Safety instructions for commissioning



#### **Danger**

An Industrial PC with the “Internal DC/DC converter” option may not be operated in areas with explosive atmospheres.



#### **Danger**

To prevent sensitive electronic devices from being affected, an Industrial PC with an “Internal DC/DC converter” option may not be operated in aircraft, hospitals or other medical environments without prior approval.



#### **Danger**

No additions or modifications may be made to the Industrial PC or the “Internal DC/DC converter” unit unless expressly approved by the manufacturer.



#### **Warning**

It is mandatory that the Industrial PC housing is connected via the “PE” port of the input connector (= functional ground) to a suitable grounding point on the vehicle or grounded to the installation site.

(For the input connector pin assignment, see section 6.1)



#### **Warning**

Ensure that no potential differences are balanced thru the device, for example, by ground loops.



#### **Caution**

Pay attention to the ambient conditions from the technical data for the IPC when selecting a location to use the Industrial PC with an “Internal DC/DC converter” option.

**Caution**

When connecting the power supply, make sure the cable is not damaged, modified, stretched, excessively bent or twisted. Do not place heavy and/or sharp-edged objects on the cables.



**Also make sure that you heed the safety instructions in the operating instructions for the Industrial PC.**

## **7.2 Connection to the supply voltage**

### **7.2.1 General information**

The “Internal DC/DC converter” unit provides a galvanic isolation of the DC input voltage to the internal supply voltage.

The galvanic isolation separates the electrical potentials of the DC input voltage and the internal supply voltage from each other and both circuits are potential-free from each other.

The metal housing of the Industrial PC is connected to the functional ground. In turn, the functional ground is connected to the ground of the mainboard and the “PE” port of the Internal DC/DC converter unit.

The mainboard ground is also the ground for all data ports on the mainboard.



## 7.2.2 Power supply from a vehicle electrical system

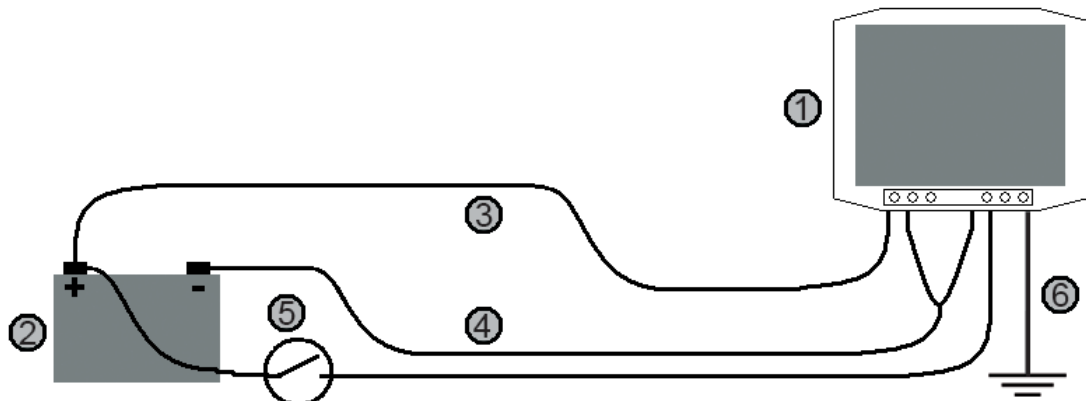


Fig. 3 Example of a connection to a vehicle electrical system

- ① noax Industrial PC with integrated “Internal DC/DC converter” unit
- ② Vehicle battery as an example of the vehicle electrical system
- ③ Positive terminal cable of the vehicle electrical system to the Internal DC/DC converter unit in the Industrial PC
- ④ Negative terminal cable of the vehicle electrical system to the Internal DC/DC converter unit in the Industrial PC
- ⑤ Ignition key switch
- ⑥ IPC functional ground connection to the vehicle ground



### Warning

For a connection to a vehicle electrical system, adherence to the limits for the DC supply voltage is mandatory.

 See the technical data in section 11



### Warning for forklift electrical systems

When you are connecting to forklift electrical systems, special attention must be paid to the electric potentials.

There are forklifts where the vehicle ground is connected to the positive terminal of the vehicle battery instead of the negative terminal. In this case, attention must also be paid to the electric potentials when connecting and installing peripheral devices. Otherwise, severe damage to all devices may occur.



## Notes regarding the cabling

- ① For the input connector pin assignment, see section 6.1

The positive terminal of the vehicle electrical system (here, the vehicle battery) is connected to pin 1 (“+”) and the negative terminal is connected to pin 2 (“–”) of the input connector on the Internal DC/DC converter unit.

In order to use the ignition input (for the ignition key function) and/or the programmable signal input, a signal common (ground / negative pole) is required for these inputs to pin 3 (“IN–”).

When connected to a vehicle electrical system, this signal common is usually equal to the negative terminal of the vehicle electrical system. In this case, a short cable must be used to connect both the “–” and the “IN–” connections (pins 2 and 3) of the input connector.

The signal from the ignition key switch is connected to pin 4 (“IGN”).

The signal for the programmable signal input is connected to pin 5 (“IN2”).



### **Warning**

It is mandatory that the Industrial PC housing is connected via pin 6 (“PE” = functional ground) of the input connector to a suitable grounding point.

- ① **Note regarding cables**

The cables to be used must have a cross section of at least 1.5 mm<sup>2</sup> and must not be longer than 197 inch (5.0 m). Especially the cables for the positive and negative poles must meet these requirements, because otherwise the voltage drop in the cables will be too great.

For selecting the cables, noax recommends a electric strength of at least 60 V and a temperature range from –30°C to +70°C (still).

### 7.2.3 Supply via a noax power supply

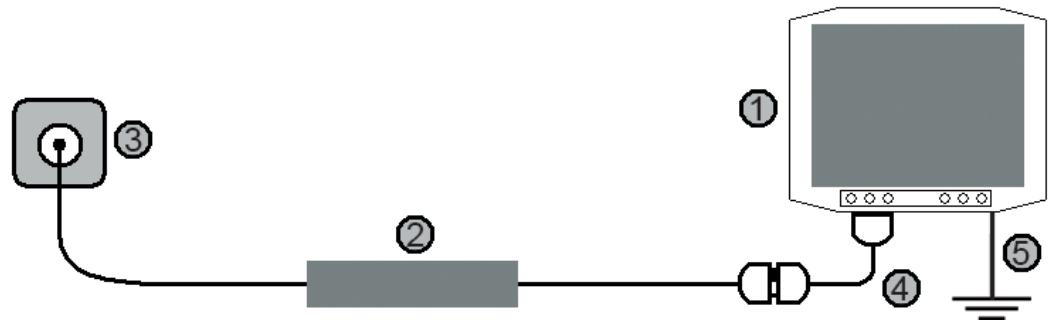


Fig. 4 Supply via a noax power supply

- ① noax Industrial PC with integrated “Internal DC/DC converter” unit
- ② noax power supply for N11 (24 V DC output voltage)
- ③ Power supply (socket)
- ④ Power adapter for Power supply – Internal DC/DC converter
- ⑤ IPC functional ground connection to the installation site

❗ **The power adapter for the noax power supply connection to the “Internal DC/DC converter” unit is optional and must be ordered separately.**

The power adapter is connected between the DC output cable of the power supply and the “Internal DC/DC converter” unit.



#### Warning

It is mandatory that the Industrial PC housing is connected to a suitable grounding point via pin 6 (“PE” = functional ground) of the input connector.

❗ For the input connector pin assignment, see section 6.1

### 7.2.4 Note for switching on the Industrial PC

If the optional “IGNS” function is purchased, the ignition input (= ignition key signal input) is available as a additional option for starting the IPC.

Another signal can be used instead of the ignition key signal. Here, special attention must be drawn to the signal common and the voltage limits of the “IGN” control input.



See section 11 for the technical data and section 5.2 for the “IGNS” function

The settings for starting the Industrial PC can be changed by the “nSMART™” software. For example, in the **Power On** area, the option **Power-On IPC when external power is applied** can be enabled. This will cause the Industrial PC to start up as soon as the supply voltage is present.



See section 8.1 for setting options via “nSMART™”.

## 8 Setting options via nSMART™



### Important note:

The setting options shown in the areas “Ignition / Vehicle ignition key” and “Programmable signal input” are displayed only if the optional “IGNS – ignition and signal input” function was also ordered.

If you have any questions, please contact the noax Hotline.



The current version of the “nSMART™” configuration software can be downloaded from the following area of the noax website **www.noax.com**:

**“Service & Support” – “Download-Center” – “Software - Driver” – “Tools”**

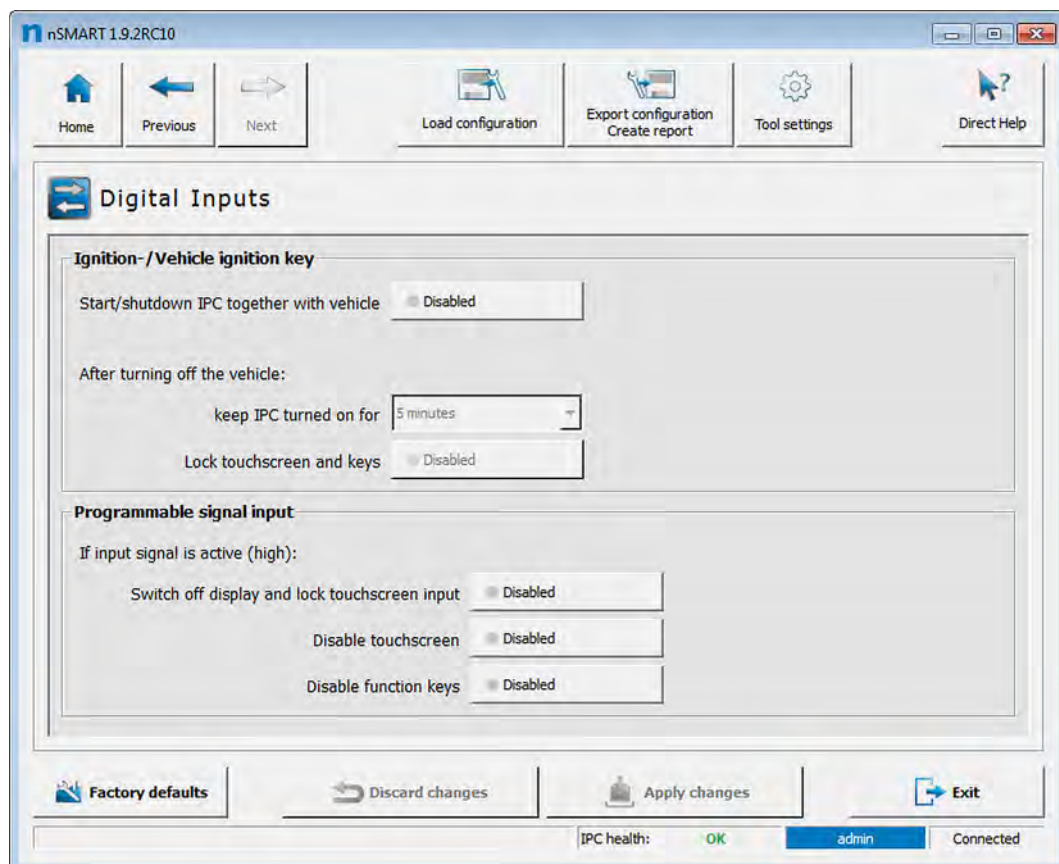




Fig. 5 Setting window for the “IGNS” function digital inputs



The illustration shows the factory setting for the setting options displayed.

## 8.1 Settings in the section “Ignition / Vehicle ignition key”

-  **These settings are available only if the optional “IGNS” function was ordered.**
-  If the ignition input for the ignition key signal is not used, the following settings have no effect.
- **Option Start/shutdown IPC together with vehicle**  
**Disabled:** (default)  
The control for starting and shutting down the operating system via a signal on the “IGN” control input is not enabled.  
Use of the Deep Sleep function is not possible.  
**Enabled:**  
If the “IGN” control input is detected as active (= vehicle ignition on), the operating system is started. This functions from the Deep Sleep state.  
If the control input is detected as not active (= vehicle ignition off), a shutdown of the operating system is triggered according to the setting *Keep IPC turned on for*.
  - **Setting Keep IPC turned on for**  
Setting the operating system “shutdown delay time” after the vehicle ignition has been switched off. The setting can be between 10 seconds and 60 minutes (Default: 5 minutes).
  - **Option Lock touchscreen and keys**  
**Disabled:** (default)  
During the “shutdown delay time”, the operating system can be operated by the touchscreen and keys.  
**Enabled:**  
During the “shutdown delay time”, operation of the operating system by the touchscreen and keys is blocked.

### Example:

Control by the ignition key can be used to start and shut down the operating system conveniently.

The adjustable “shutdown delay time” can be configured so that the operating system does not have to shutdown and be restarted every time, for example, when the vehicle is not in operation for short periods of time (when the ignition key is not inserted).

In addition, the “Lock touchscreen and keys” option can also be used to prevent unauthorized access to the operating system when the vehicle is not in operation.



See also section 5.2 for a description of the “IGNS” function

### 8.1.1 Settings in the section “Programmable signal input”

① **These settings are available only if the optional “IGNS” function was ordered.**

① If the programmable (digital) signal input is not used, the following settings have no effect.

As long as the programmable signal input “IN2” is detected as active (input level = high), the following options will also be active, if enabled:

- **Option Switch off display and lock touchscreen input**  
**Disabled:** (default)  
 No action when signal input is active.  
**Enabled:**  
 The display backlight is switched off and input by touchscreen is blocked.
- **Option Disable touchscreen**  
**Disabled:** (default)  
 No action when signal input is active.  
**Enabled:**  
 Only input by touchscreen is blocked.
- **Option Disable function keys**  
**Disabled:** (default)  
 No action when signal input is active.  
**Enabled:**  
 The function keys are switched off.

#### **Example:**

The programmable signal input can be used to perform safety functions, for example.

When the drive signal of a forklift is used as the input signal, the display can be switched off when the forklift is being driven, for example, and input by touch can be blocked to prevent the forklift driver from being distracted.



See also section 5.2 for a description of the “IGNS” function

## 9 Troubleshooting

### 9.1 FAQ – Frequently Asked Questions

On our homepage [www.noax.com](http://www.noax.com) under “**Service & Support**”, there is an FAQ section with frequently asked questions.

The information included there may already help solve one problem or the other.

### 9.2 Replacing a fuse



#### **Danger**

Fuses may be replaced by authorized specialist personnel only. Compliance with the stated values and technical data of the fuses is mandatory in all circumstances!



#### **Caution**

Before the fuse is replaced, the input connector for the Internal battery UPS and the battery must always be disconnected.

### 9.3 Repairs

You can contribute to a rapid and smooth repair process by observing the following points:

- Please use our service repair ticket that is available as a PDF file for you to download from our homepage under [www.noax.com](http://www.noax.com). Fill out the form as completely as possible and include it with the return shipment.
- Please ensure that transportation is safe and suitable packaging is used. Use the original packaging if possible. **We are not liable for any damages that may occur during transport.**
- We recommend using UPS Standard for shipping. You must prepay for shipping. Within the warranty period, noax also accepts UPS standard consignments freight collect if a written confirmation by noax Service exists. noax does not accept extra services such as express services, etc.
- In urgent cases, we offer loan equipment for the duration of the repairs for a small fee. Please contact our hotline.
- Upon receipt of the device you will receive confirmation of receipt from our service department.

Hotline Europe		Hotline North America	
Tel.	+49 (0) 8092 8536 33	Tel.	+1 704 992 1606
Fax	+49 (0) 8092 8536 55	Fax	+1 704 992 1712
eMail:	hotline@noax.com	eMail:	hotline@noaxna.com

## 10 Disposal

The “Internal DC/DC converter” unit contains components that may not be disposed of as normal household waste at the end of their service life.

This unit must be returned to noax for disposal.

For more information on the disposal of the unit, please contact the noax Hotline.

By reusing, recycling or utilizing old devices in any other way, you are making an important contribution to the protection of our environment.



### **Warning**

The “Internal DC/DC converter” units may not be disposed of in the normal household waste

## 11 Technical data

The “Internal DC/DC converter” unit is available in two variants that differ in the voltage limits for the DC supply voltage.

noax part no.:	
14764	Internal DC/DC converter; In 9–32 V for N11
14765	Internal DC/DC converter; In 18–60 V for N11



### Warning

For an Industrial PC with “Internal DC/DC converter” option, the technical data for extension cards that deviate from the normal Industrial PC must be observed and adhered to.

 See section 2 for the intended use.

### 11.1 General data

<b>Description of the option</b>	Galvanically isolated power supply, integrated in the Industrial PC.
<b>Connection</b>	6-pin input connector Type Phoenix Contact MSTB 2.5 HC/ 6-GF
<i>Connector (included)</i>	Phoenix Contact MSTB 2.5 HC/ 6-STF (part no. 1912113) or comparable
<b>Controls</b>	DeepSleep switch (see sections 5.3 and 6)

### 11.2 Electrical data

Product	Internal DC/DC converter; In 9–32 V	Internal DC/DC converter; In 18–60 V
<b>Input voltage</b>	9 V DC to 32 V DC, galvanically isolated	18 V DC to 60 V DC, galvanically isolated
<b>Starting voltage</b>	10.5 V DC	18 V DC
<b>Input fuse</b>	5x20 mm, glass tube fuse (micro fuse) 6.3 A, “slow-acting” triggering behavior according to IEC 60127-2	
<b>Ignition input “IGN”</b>		
<i>Control voltage</i>	0 V DC to 30 V DC, galvanically isolated	
<i>Switching threshold</i>	3.5 V	
<b>Prog. signal input “IN2”</b>		
<i>Control voltage</i>	0 V DC to 30 V DC, galvanically isolated	
<i>Switching threshold</i>	3.5 V	
<b>Electrical protection class</b>	Protection class III – SELV – safety extra–low voltage	



**noax recommends that an input power of at least 70 W be provided**



## 12 Declarations of conformity

### 12.1 CE conformity

All noax units described in these operating instructions comply with the applicable standards and regulations for CE conformity.

### 12.2 FCC conformity

All noax units described in these operating instructions comply with the applicable standards and regulations for FCC conformity.

The following supplementary information is necessary to meet the FCC requirements:

- This equipment has been tested and found to comply with the limits for a Class B 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.

### 12.3 WEEE

In order to comply with the Electrical and Electronic Equipment Disposal (WEEE) directive, the company noax Technologies AG (ear Reg. No. DE27359889) offers to take back old devices for disposal free of charge (with the exclusion of transport costs to the company noax Technologies AG).

### 12.4 Declarations of conformity as downloads

The current declarations of conformity can be download from the following area of the **www.noax.com** website:

**“Service & Support” – “Download-Center” – “Certificates”**

If the website cannot be accessed, the noax Hotline can help.

## **13      Your notes**





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