Desigo™ Integral Migration

Adapter for Integral NK modules

Integrates existing Integral periphery into Desigo

This adapter, combined with a modular Desigo PX automation station, serves as a replacement for the modular Integral automation stations NRUA/A, NRUB/A, NRUC/A and NRUD/A.

For details on support in different Desigo versions see page 2.

- Same housing, adapter can be plugged into existing NHGB housing.
- Same periphery interface (plug compatible).
- Existing periphery can be assumed without a change.
- Use existing panel wiring.

TX-I/O modules are used for plant expansions.
Functions and compatibility

Existing Integral module supports NTIM / NTOM / NTOMS can be connected using the same plug to the adapter PXC NRUD.

The adapter converts signals from Integral NK module to island bus signals.

The automation station function is provided by:
- PXC64-U or PXC128-U with a pre-switched bus interface module TXB1.PBUS.
- From Desigo V4.1: PXC100/200.D / PXC100/200-E.D together with a TXS1.12F10 power supply module.
- From Desigo V5.0: PXC50.D / PXC50-E.D together with a TXS1.12F10 power supply module.

Type summary

<table>
<thead>
<tr>
<th>Device</th>
<th>Type</th>
<th>Data point mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapter for 48 physical data points.</td>
<td>PXC NRUD</td>
<td>8   8  32</td>
</tr>
</tbody>
</table>

Equipment combinations

- Integration in Desigo: PXC50/100/200.D / PXC50/100/200-E.D automation station, together with a TXS1.12F10 power supply module .
- Integration in Desigo: PXC64-U / PXC128-U automation station, together with a TXB1.PBUS bus interface module .
- Field level: Integral NK module in module support NTIM, NTOM, NTOMS.
- Expansion: with TX-I/O modules

Note: The TXS1.EF10 bus connection module only works in conjunction with a TXS1.12F10 power supply module.

Technical design

The device essentially includes
- 6 sockets, for connecting the NK module and the supply voltage AC 24 V
- A 3-pole plug with screw terminal block for the island bus.
- The modified electronics for 6 TX-I/O modules.
- LED displays.
- Two rotary switches to set the start address for the first TX-I/O module.
- Internal island bus connector for forwarding the island bus to neighboring adapters.
- DIP switch to switch on the island bus connection (to establish I/O islands).
- DC 15 V supply voltage for the NK modules.
Design

**Mechanical setup**
The adapter consists of a plug-in circuit board with front plate. It is inserted into an existing card housing NHGB.

**Connections**
A ribbon cable with a maximum length of 2 meters is used to connect the module supports NTIM / NTOM / NTOMS; plugged into the socket. A module support NTIM / NTOM / NTOMS can hold up to eight plug-in terminal modules. The module support NTOMS also serves as the power connection AC 24 V for the adapter.

**Front plate**
The front plate is attached to the circuit board. It includes the following elements:

- Upper handle with label.
- Island bus plug
- LED "RUN"
- LED "TX / RX"
- LED "STATUS"
- Connection plugs for terminal module support.
- Lower handle with type label.

- Island bus supply DC 24 V for PXC-NRUD
- Island bus signal
- Island bus ground
LED displays

**LED 1 (green)**
- **ON**
  - AC 24 V power supply for terminal module support NTOMS OK.
- **"RUN"**
  - ON
  - AC 24 V power supply for terminal module support NTOMS not OK.
- **OFF**

**LED 2 (yellow)**
- **"TX / RX"**
  - **ON**
    - Island bus signal = "Logical 1".
  - **OFF**
    - Island bus signal = "Logical 0".
  - **Flickering**
    - Activity on the island bus

**LED 3 (green/red)**
- **Green**
  - Island bus power supply OK (DC 24 V available).
- **Red**
  - Island bus power supply not OK (island bus ground ⊥ missing).
- **OFF**
  - No AC 24 V supply voltage on the terminal module support.

Input / output, supply voltage

<table>
<thead>
<tr>
<th>Plugs</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>8 digital inputs.</td>
</tr>
<tr>
<td>5</td>
<td>8 digital outputs.</td>
</tr>
<tr>
<td>4</td>
<td>8 universal inputs.</td>
</tr>
<tr>
<td>3</td>
<td>8 universal outputs.</td>
</tr>
<tr>
<td>2</td>
<td>8 universal inputs.</td>
</tr>
<tr>
<td>1</td>
<td>8 universal outputs</td>
</tr>
</tbody>
</table>

- + supply voltage AC 24 V.

Plugs are mechanically secured by a rotary knob.

Circuit board

The adapter can be inserted or pulled out on two handles.

The front plate locks in place in the housing frame when inserted.

**Caution!** Do not touch circuit board! Electrostatic discharge may damage electronic components.

Address switches

The island bus address for the first of 6 internal I/O modules can be set using two rotary switches (tens and ones) in a range from 00 to 99.
**Island bus connection**

The bus contacts connect one adapter to a neighboring adapter. The connection can be switched on using DIP switches on the circuit board, allowing the formation of up to 3 separate islands.

Additional islands can be established by connecting the island bus with plugs to the front plate (refer to installation).

![Island bus connection diagram]

**Island bus (I/O points on neighboring adapters).**

![Island bus plug on front plate.]

**I/O points on the circuit board.**

The factory setting of the 5 DIP switches is OFF. The switches are protected by an adhesive strip.

We recommend to always migrate a complete rack of 16 Integral NRU… to Desigo. Integral NRU../A and PXC-NRUD adapters can also be run in neighboring NHGB housings, but in this case the island bus of the PXC-NRUD adapters must be connected in the front, and the DIP switches must remain OFF.

**Housing**

The adapters are supplied without housing. The cards are plugged into the existing NHGB housings.

**Disposal**

The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.
Mounting

The adapters are plugged into the existing NHGB housing. The housing can be installed as follows in the panel:
- Screwing the housing directly to the panel's base plate.
- Install on two standard rails.
- Installation in a set or hinged 19" standard rack.

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Working with printed circuit boards

Remove:
Hold the front plate on both holders and press both locking levers. Carefully pull out the circuit board.

Insert:
Hold the front plate on both handles. Insert the printed circuit board in the guide on the right side of the housing and carefully push it in until the locking levers lock in place.

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Caution!
Conduct all activities at protected workspaces (wrist band with grounding wire, conductive surfaces) to prevent damage to printed circuit boards caused by electrostatic discharges. Never remove or insert printed circuit boards connected to power!

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Installation

Binding documentation
The electrical diagram for the specific project is binding for executing the given panel wiring.

Basic implementation
The diagram below illustrates the wiring for power and bus line based on an example.

Note
The AC 230 V wiring is not described in detail.
Wiring example for PXC64-U / PXC128-U automation stations

**Key**

- **T1** Transformer on the Desigo side
  - Powers PXC..U, TXB1.PBUS bus interface module and island bus.
- **T2** Transformer Integral side (electrically isolated)
  - Powers NK module and PXC NRUD adapters.
- **K** Terminal block for star distribution of AC 24 V and ⊥.
- **N1** Automation station PXC64-U or PXC128-U.
- **N2** TXB1.PBUS bus interface module with built-in power supply and optional TX-I/O modules U11 .. U13
- **U1 .. U3** Adapters PXC NRUD
- **U11 .. U13** Extension with TX-I/O-Modules
- **NK...** Integral NK modules
- (***) Earthing according to local regulations
Wiring example for PXC50/100/200.D / PXC50/100/200-E.D automation station (Desigo V4.1 or later)

Key

T1 Transformer on the Desigo side
   → Powers PXC....D, TXS1.12F10power supply module and island bus.

T2 Transformer Integral side (electrically isolated)
   → Powers NK module and PXC NRUD adapters.

K Terminal block for star distribution of AC 24 V and ⊥.

N1 PXC50/100/200.D or PXC50/100/200-E.D automation station.

N2 TXS1.12F10 power supply modules and optional TX-I/O modules
   U11 .. U13

U1 .. U3 Adapters PXC NRUD

U11 .. U13 Extension with TX-I/O-Modules

NK... Integral NK modules

(*) Earthing according to local regulations
**Transformer rules**

- The P-bus interface module N2 supplies only the island bus driver on the printed circuit board (electrically separated).
- The I/O electronics on the printed circuit board and the field devices are supplied by T2 via the NTOMS terminal module support.
- For the automation station PXC... and the P-bus interface module N2, the existing transformer T2 for the Integral plant or a separate transformer T1 may be used.
- A separate transformer T1 is recommended when TX-I/O modules are used for system expansions.
- Earthing according to local regulations.

**Multiple I/O islands**

The data points that are connected to a 19" rack are distributed to several automation stations (max. 200 DPs per pro PXC64-U / PXC50/100/200.D / PXC50/100/200-E.D).

The I/Os connected to one automation station form an "I/O island", that means they are connected to the same island bus.

The connection of several adapters to form one I/O island is done with
- the island bus contacts, connected by the DIP switches (max three different I/O islands)
- the island bus connectors on the front plate of the adapters (from the fourth I/O island).

**Example: 4 I/O islands**

The example below, 4 I/O islands are formed from 16 adapters in a 19" rack:
- Adapters 1 ... 3 are connected via island bus CD1.
- Adapters 4 ... 8 are connected via island bus CD2.
- Adapter 9 is connected via island bus CD3.
- Adapters 10 ... 16 are connected via the island bus plug on the front plate.

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![Diagram of I/O islands](image-url)
# Technical data

<table>
<thead>
<tr>
<th>Adapter power supply (Via socket 1 from NTOMS)</th>
<th>Operating voltage</th>
<th>Max. power consumption.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Island bus driver power supply (via island bus plug).</td>
<td>Operating voltage</td>
<td>DC 22.5 ... 26 V (SELV/PELV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>electrical isolation of the Integral system and from the adapter electronics.</td>
</tr>
<tr>
<td></td>
<td>Max. power consumption</td>
<td>1.5 W.</td>
</tr>
<tr>
<td>DC output for power supply to the NK modules and their periphery.</td>
<td>Output voltage</td>
<td>DC 15 V ±10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electronically separated from AC 24 V.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max. 500 mA.</td>
</tr>
<tr>
<td>Fuses</td>
<td>Various NTC.</td>
<td></td>
</tr>
<tr>
<td>Protection.</td>
<td>All connections for the NK modules</td>
<td>Against short circuit and incorrect wiring using AC/DC 24 V.</td>
</tr>
<tr>
<td>Inputs / outputs</td>
<td>Digital</td>
<td>8 DI, 8 DO.</td>
</tr>
<tr>
<td></td>
<td>Universal</td>
<td>32 UI / UO.</td>
</tr>
<tr>
<td></td>
<td>Wiring</td>
<td>See TX-I/O engineering and installation manual: CM110562.</td>
</tr>
<tr>
<td></td>
<td>Plug-in screw terminals</td>
<td>Solid or stranded wire 0.25 ... 2.5 mm² or 2 x 1.5 mm².</td>
</tr>
<tr>
<td>Connection for NK modules.</td>
<td>Ribbon cable.</td>
<td>Length</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 or 20 pin.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max. 2 m.</td>
</tr>
<tr>
<td>Classifications per EN 60730</td>
<td>Automatic action</td>
<td>Type 1</td>
</tr>
<tr>
<td></td>
<td>Pollution degree</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Protection class</td>
<td>III (Device also suitable for use in protection class II equipment)</td>
</tr>
<tr>
<td>Housing type.</td>
<td>Protection as per EN 60529</td>
<td>IP 20 (when built in NHGB housing).</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Operation</td>
<td>Class 3K5 as per IEC 60721.</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
<td>0 ... 50 °C.</td>
</tr>
<tr>
<td></td>
<td>Humidity</td>
<td>&lt; 95 % r.h. (no condensation)</td>
</tr>
<tr>
<td></td>
<td>Transportation</td>
<td>Class 2K3 per IEC 60721.</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
<td>– 25 ... 70 °C.</td>
</tr>
<tr>
<td></td>
<td>Humidity</td>
<td>&lt; 95 % r.h. (no condensation)</td>
</tr>
</tbody>
</table>
Standards, directives and approvals.

- Product standard: EN 60730-1
- Electromagnetic compatibility (Applications) According to EN 55014-1 & 2
- EU conformity (CE) CM2T9761xx *)
- RCM-conformity (EMC) CM1T9222en_C1 *)
- EAC conformity
- Eurasia conformity

Environmental compatibility

- Product environmental declaration (contains CM2E9761 *) data on RoHS compliance, materials composition, packaging, environmental benefit, disposal)

Dimensions

- Refer to dimensions

Weight

- Unpackaged / packaged 292 / 410 g

*) The documents can be downloaded from http://siemens.com/bt/download.

Dimensions

All dimensions in mm

Device dimensions

Drilling diagram for attaching screws.

186

200

262

255,4 ± 0,1

2,5

30

30