Operating manual

Branching and Connection Box AAB
Branching and Connection Box AAB
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Subject to technical changes!
Abstract

The Advanced Discovery System (in short: ADICOS) is used for early detection of fire scenarios in the industrial environment. It comprises different, independent detector units that enable interference-resistant fulfillment of the detection objective defined during planning via suitable layout and parameterization.

The detector units are connected using the ADICOS M-bus to a central unit, which enables voltage supply and parameterization of every individual detector, and which stores all sensor data for statistical analyses.

ADICOS branching and connection boxes are used as a wiring accessory.
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1 About this manual

1.1 Objective
This manual describes the proper assembly, wiring, commissioning, and operation of ADICOS branching and connection boxes. After commissioning, they are used as reference work in the case of faults. It is exclusively addressed to knowledgeable specialist personnel (→ Chap. 2, Safety instructions).

1.2 Explanation of symbols
This manual features a continuous structure for best possible comprehension. The following labels are used.

Action objectives
Action objectives describe the result to be achieved by the subsequent instructions. Action objectives are presented in **bold font**.

Action instructions
Action instructions describe the activities to be performed in order to achieve the action objective previously mentioned. Action instructions are presented as follows.

► Individual action instruction

1 First of several sequential action instructions
2 Second of several sequential action instructions
3 etc.

Intermediate states
In case of describable intermediate states or results, which are the result of action steps (e.g. displays, internal function steps, etc.), they are presented as follows.

▷ Intermediate state

Warning signs
This manual uses the following information types.

NOTE!
This information type provides information directly important for further system operation.
1.3 Abbreviations

This manual uses the following abbreviations.

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADICOS</td>
<td>Advanced Discovery System</td>
</tr>
<tr>
<td>AAB</td>
<td>ADICOS Branching and Connection Box</td>
</tr>
<tr>
<td>BMZ</td>
<td>ADICOS Central Fire Alarm Panel BMZ-30</td>
</tr>
<tr>
<td>M-BM</td>
<td>ADICOS M-Busmaster</td>
</tr>
<tr>
<td>NT</td>
<td>ADICOS Power Supply NT V40-A3</td>
</tr>
<tr>
<td>FDnet</td>
<td>Field Device Network (fire alarm bus of SIEMENS fire alarm systems)</td>
</tr>
<tr>
<td>LSN</td>
<td>Local Security Network (fire alarm bus of BOSCH fire alarm systems)</td>
</tr>
<tr>
<td>FAS</td>
<td>Fire Alarm System</td>
</tr>
</tbody>
</table>

1.4 Storing the manual

Store this manual easily reachable and in direct vicinity of the system to enable use as needed.
2 Safety instructions

ADICOS branching and connection boxes (in short: AAB) ensure operational safety assuming proper installation, commissioning, operation, and maintenance. For this purpose, it is absolutely required to completely read, understand, and follow this manual and the safety instructions contained.

**WARNING!**
Installation and operating errors can lead to fatal and severe injuries and damage to the industrial system.
- Read and follow this manual carefully!

2.1 Intended use

ADICOS AABs are distribution boxes for the electrical connection of ADICOS detectors with the fire alarm cable of ADICOS systems. They additionally enable feeding-in an external voltage supply using the ADICOS power supply NT V40-A3. In this context, the operating parameters described in Chap. 11, »Technical data« must be met. Any deviating use requires prior consultation with the manufacturer.

Compliance with this manual as well as all applicable country-specific provisions is also part of the intended use.

2.2 Standards and regulations

The safety and accident prevention regulations applicable for the specific application must be observed during AAB installation, commissioning, maintenance, and test.

The following standards and directives are of particular importance when handling fire alarm systems:

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDE 0100</td>
<td>Erection Of Power Installations With Rated Voltages Below 1000 V</td>
</tr>
<tr>
<td>VDE 0800</td>
<td>Telecommunications - General Concepts - Requirements And Tests For The Safety Of Facilities And Apparatus</td>
</tr>
<tr>
<td>VDE 0833</td>
<td>Alarm Systems for Fire</td>
</tr>
<tr>
<td>VDE 0845</td>
<td>Protection Of Telecommunication Systems Against Lighting, Electrostatic Discharges and Overvoltages From Electric Power Installations; Measures Against Overvoltages</td>
</tr>
<tr>
<td>VdS 2095</td>
<td>Guidelines For Automatic Fire Detection And Fire Alarm Systems - Planning And Installation</td>
</tr>
<tr>
<td>DIN 14675</td>
<td>Fire Detection And Fire Alarm Systems - Design And Operation</td>
</tr>
</tbody>
</table>
2.3 Personnel qualification

Any work on ADICOS systems may only be performed by qualified personnel. Persons, who can perform work on electrical systems and recognize possible dangers based on their professional education, knowledge, and experience as well as knowledge of the applicable provisions, are considered qualified personnel.

![WARNING!]
Installation, commissioning, and maintenance may only be performed by respectively trained personnel

2.4 Modification

Any form of unauthorized modifications or extensions are expressively prohibited! In case of doubt, contact the manufacturer.

3 Scope of delivery

The following components are included in the scope of delivery of the ADICOS AAB:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ADICOS AAB with 3 cable glands and 2 dummy cable glands</td>
</tr>
<tr>
<td>2</td>
<td>M20* cable glands</td>
</tr>
</tbody>
</table>

* Are located inside the enclosure at the time of delivery
4 Structure

4.1 Overview

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Enclosure screws (4x)</td>
</tr>
<tr>
<td>②</td>
<td>Enclosure cover</td>
</tr>
<tr>
<td>③</td>
<td>Enclosure base</td>
</tr>
<tr>
<td>④</td>
<td>AAB circuit board with connection terminals</td>
</tr>
<tr>
<td>⑤</td>
<td>Blind cable glands (2x)</td>
</tr>
<tr>
<td>⑥</td>
<td>Cable glands (3x)</td>
</tr>
</tbody>
</table>
4.2 Connections

### 4.2.1 Connection terminals

<table>
<thead>
<tr>
<th>LOOP IN</th>
<th>Input for fire alarm loop</th>
</tr>
</thead>
<tbody>
<tr>
<td>+24V</td>
<td>Voltage supply (+)</td>
</tr>
<tr>
<td>0V</td>
<td>Voltage supply (–)</td>
</tr>
<tr>
<td>X7 (fault)</td>
<td>Normally closed contact, fault</td>
</tr>
<tr>
<td>X6out (alarm)</td>
<td>Normally open contact, alarm</td>
</tr>
<tr>
<td>X6in (alarm)</td>
<td>Normally open contact, alarm</td>
</tr>
<tr>
<td>LOOP B</td>
<td>External fire alarm LOOP B in SIEMENS FDnetA – BOSCH LSN b1 in</td>
</tr>
<tr>
<td>LOOP A</td>
<td>External fire alarm LOOP A in SIEMENS FDnet + BOSCH LSN a in</td>
</tr>
<tr>
<td>MBus A</td>
<td>ADICOS M-Bus</td>
</tr>
<tr>
<td>MBus B</td>
<td>ADICOS M-Bus</td>
</tr>
</tbody>
</table>
### LOOP OUT

**Output for fire alarm loop**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+24V</td>
<td>Voltage supply (+)</td>
</tr>
<tr>
<td>0V</td>
<td>Voltage supply (–)</td>
</tr>
<tr>
<td>X7 (fault)</td>
<td>Normally closed contact, fault</td>
</tr>
<tr>
<td>X6out (alarm)</td>
<td>Normally open contact, alarm</td>
</tr>
<tr>
<td>X6in (alarm)</td>
<td>Normally open contact, alarm</td>
</tr>
</tbody>
</table>

**LOOP B**
- External fire alarm LOOP B out
- SIEMENS FDnet-B (–)
- BOSCH LSN b2 out

**LOOP A**
- External fire alarm LOOP A out
- SIEMENS FDnet +
- BOSCH LSN a out

**MBus A**
- ADICOS M-Bus

**MBus B**
- ADICOS M-Bus

### GSME

**Detector connection**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+24V</td>
<td>Voltage supply +24 V DC (red)</td>
</tr>
<tr>
<td>0V</td>
<td>Voltage supply 0 V (black)</td>
</tr>
<tr>
<td>MBus A</td>
<td>ADICOS M-Bus (blue/red)</td>
</tr>
<tr>
<td>MBus B</td>
<td>ADICOS M-Bus (gray/pink)</td>
</tr>
<tr>
<td>B1</td>
<td>Coupling module B - in (pink)</td>
</tr>
<tr>
<td>A1</td>
<td>Coupling module A - in (blue)</td>
</tr>
<tr>
<td>B2</td>
<td>Coupling module B - out (purple)</td>
</tr>
<tr>
<td>A2</td>
<td>Coupling module A - out (gray)</td>
</tr>
<tr>
<td>X6e</td>
<td>Normally open contact, alarm (yellow)</td>
</tr>
<tr>
<td>X7e</td>
<td>Normally closed contact, fault (green)</td>
</tr>
<tr>
<td>X6a</td>
<td>Normally open contact, alarm (white)</td>
</tr>
<tr>
<td>X7a</td>
<td>Normally closed contact, fault (brown)</td>
</tr>
</tbody>
</table>

### Power supply

**Coupling of external power supply**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0V</td>
<td>External power supply 0 V</td>
</tr>
<tr>
<td>+24V</td>
<td>External power supply +24 V DC</td>
</tr>
<tr>
<td>PE</td>
<td>Protective conductor</td>
</tr>
<tr>
<td>PE</td>
<td>Protective conductor</td>
</tr>
</tbody>
</table>
4.3 Cable glands

The following assignment is an example only and varies by system configuration.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ADICOS primary line</td>
</tr>
<tr>
<td></td>
<td>(ADICOS M-Bus / power supply / limit value- detection line)</td>
</tr>
<tr>
<td>2</td>
<td>ADICOS primary line</td>
</tr>
<tr>
<td></td>
<td>(ADICOS M-Bus / power supply / limit value- detection line)</td>
</tr>
<tr>
<td>3</td>
<td>FAS loop</td>
</tr>
<tr>
<td></td>
<td>(External fire alarm LOOP) (optional)</td>
</tr>
<tr>
<td>4</td>
<td>FAS loop</td>
</tr>
<tr>
<td></td>
<td>(External fire alarm LOOP) (optional)</td>
</tr>
<tr>
<td>5</td>
<td>ADICOS connection cable for ADICOS detector</td>
</tr>
</tbody>
</table>

4.4 Display elements

**Power LED**

The power LED is located on the upper edge of the AAB board, centered between the connection terminals for the fire alarm loop.

It lights up green, if power supply is connected to the ADICOS AAB.
5 Installation

5.1 Selecting the mounting location

The following aspects must be considered when selecting the installation location.

- The installation floor must be sufficiently firm and as vibration-free as possible.
- The installation environment must meet the climate conditions specified in the technical data.
- Install the ADICOS AAB in close proximity to the connected detector and well accessibly.

5.2 Opening the enclosure cover

NOTE!
The protection class of the enclosure specified in the technical data is only given with the closed enclosure cover and cable glands.

- **Close enclosure cover and cable glands prior to commissioning!**

1. Loosen the enclosure screws using a sufficiently large slotted screwdriver (4x)
2. Lift off the enclosure cover
5.3 Wall mounting

Mounting the ADICOS AAB to a wall

1. Depending on the underground, drill mounting holes for sufficiently dimensioned screws and/or wall plugs (4x) (see drilling plan)
2. Press in wall plugs
3. Open enclosure cover
4. Insert sufficiently dimensioned mounting screws through the tightening channels of the enclosure screws in the enclosure base so that the screws protrude from the rear side of the enclosure (4x)
5. Place the enclosure base with the screws onto the mounting holes with wall plugs
6. Tighten the screws (4x)
7. If wiring is not completed immediately, close the enclosure cover
5.4 Wiring

**WARNING!**
Improper installation of the ADICOS AABs can lead to faults and failures of the detector system.
- Wiring may only be performed by specialist personnel!  
  (→ Chap. 2.3, Personnel qualification)
- Use ADICOS connection cables for detector wiring only!
- Only use suitable fire alarm cables for the ADICOS primary line and FSA loop!

**NOTE!**
The protection class of the ADICOS AAB specified in the technical data is only given if all cables are routed into the enclosure through the cable glands and the glands are then securely tightened.

The wiring plan of the ADICOS AAB varies depending on system configuration and topology. The following procedure applies for all wiring variants.

**Wiring the ADICOS AAB**

1. Open enclosure cover
2. Open cable glands
3. Route cables through the cable glands into the enclosure according to Chap. 4.3
4. Connect the wires to the connection terminals according the wiring diagram
5. Close cable glands
6. Close enclosure cover
In the case of wiring variants with more than 3 cables:

**Installing additional cable glands**

1. Open enclosure cover
2. Take the loose additional cable glands from the enclosure
3. Unscrew the blind plugs ☐ and ☐ (→ Chap. 4.3) using the large slotted screwdriver
4. Screw in the additional glands to the M20 threads using a 25 mm torque wrench (6.0 Nm tightening torque)

5.4.1 **ADICOS BMZ / M-BM (voltage supply via M-Bus)**

![Diagram of ADICOS BMZ-M-BM connection]
5.4.2  ADICOS BMZ / M-BM and external power supply

ADICOS BMZ-30  
M-Busmaster

+24 V  
0 V  
M-Bus

ADICOS ext.  
power supply  
NT V40-A3

+24 V  
0 V  
PE

ADICOS-AAB

+24 V  
0 V  
X7 (Stoer)  
X6aus (Al)  
X6ein (Al)  
LOOP B  
LOOP A  
M-Bus A  
M-Bus B

ADICOS connection cable / detector
5.4.3 Limit value detection lines "Fault" and "Alarm"

Non-ADICOS fire alarm panel

ADICOS-AAB

At the end of the line:
ADICOS connection cable / detector

Terminal resistor wire break detection

Terminating resistor

Non-ADICOS fire alarm panel

+24 V
0 V
XT (Stör)
X6aus (Al)
X6ein (Al)
LOOP B
M-Bus A
M-Bus B
0 V
+24 V
PE
PE

+24 V
0 V
XT (Stör)
X6aus (Al)
X6ein (Al)
LOOP B
LOOP A
M-Bus A
M-Bus B

ADICOS-AAB
5.4.4 Fire alarm LOOP with LSN / FDnet (internal coupling module)

NOTE!
For integration in BOSCH or SIEMENS fire alarm systems, ADICOS detectors must be equipped with a coupling module by the manufacturer!
5.4.5 Fire alarm LOOP with other bus (external coupling module)

NOTE!
For integration in other Non-ADICOS fire alarm systems suitable external coupling modules are required.
5.4.6 Primary cable shielding
6 Commissioning

**WARNING!**
The Advanced Discovery System works with electrical current, which can lead to system damage in the case of improper installation.
- Prior to system commissioning, make sure that all ADICOS components are properly mounted and wired!
- Commissioning may only be performed by specialist personnel!

**NOTE!**
The ADICOS-AAB is a passive component. Separate commissioning is not required.

► ADICOS system commissioning is to be performed according to the instructions of the central unit (ADICOS BMZ-30 / M-Busmaster) used.

► The green power LED lights up, when the ADICOS system is switched on (→ Chap. 4.4)

7 Operation

**NOTE!**
The ADICOS-AAB is a passive component. Its operating state depends on the superordinate central unit.

The green power LED (→ Chap. 4.4) lights up during operation.

8 Fault

If the green power LED does not light up, although the system is switched on:

► Check wiring (→ Chap. 5.4)
► Check fuse and replace as needed (→ Chap. 9.1)
9 Maintenance

In general the ADICOS AAB does not require special maintenance.

9.1 Replacing the fuse

The ADICOS AAB features an internal fuse to prevent system destruction and/or ignition caused by too high currents in the case of electrical short circuits. The fuse is located in the upper left area of the circuit board.

Replacing the fuse

1. Disconnect the ADICOS system from the mains
2. Open enclosure cover
3. Pull fuse vertically from bracket
4. Insert new fuse (4A, slow-blowing) into the bracket
5. Close enclosure cover
6. Switch on ADICOS system

10 Disposal

Return the product to the manufacturer after the end of the useful life. The manufacturer ensures environmental-friendly disposal of all components.
### 11 Technical data

<table>
<thead>
<tr>
<th><strong>General information</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions: mm</td>
<td>110 x 110 x 60 (W x H x D)</td>
</tr>
<tr>
<td>Weight: kg</td>
<td>0.38</td>
</tr>
<tr>
<td>Enclosure:</td>
<td>Polystyrene (corrosion-resistant)</td>
</tr>
<tr>
<td>Installation:</td>
<td>Surface-mounted</td>
</tr>
<tr>
<td>Cable gland tightening torque: Nm</td>
<td>6.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Electrical properties</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage range: V</td>
<td>20 ... 40</td>
</tr>
<tr>
<td>Max. power loss (LED): mW</td>
<td>330</td>
</tr>
<tr>
<td>Internal fuse: A (slow-blowing)</td>
<td>4</td>
</tr>
<tr>
<td>Max. cable cross-section: mm²</td>
<td>2.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Environmental conditions</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range: °C</td>
<td>-10 ... +50</td>
</tr>
<tr>
<td>Humidity range: %</td>
<td>0 ... 95 (non-condensing)</td>
</tr>
<tr>
<td>Installation environment:</td>
<td>Vibration-free</td>
</tr>
<tr>
<td>Protection class: IP</td>
<td>65</td>
</tr>
</tbody>
</table>