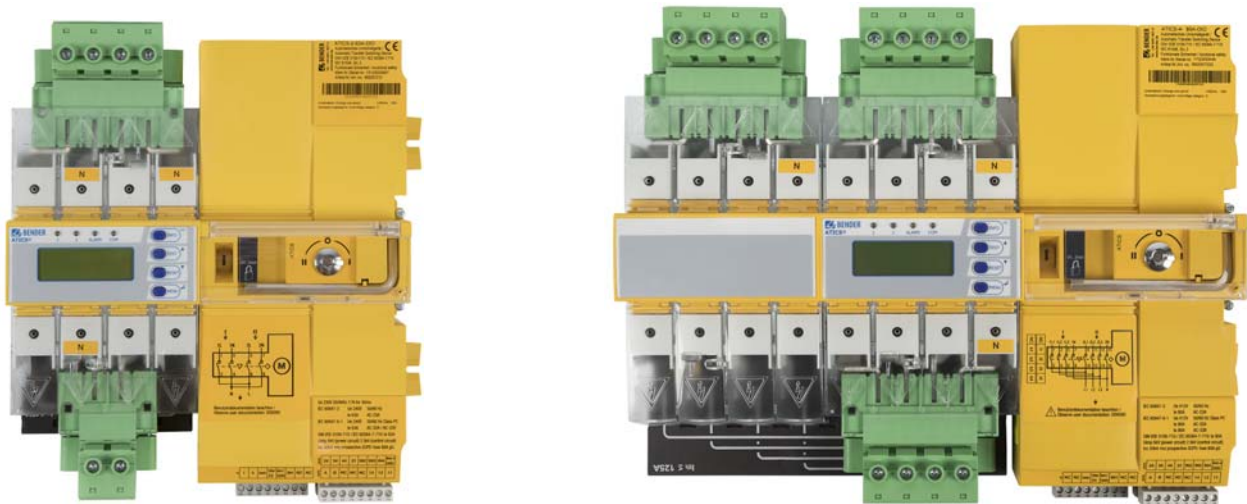




ATICS-2-63A-DIO, ATICS-2-80A-DIO, ATICS-4-80A-DIO, ATICS-4-125A-DIO, ATICS-4-160A-DIO



**Automatic transfer switching devices
for safety power supplies**

**Software version:
D333 V1.2x/D334 V1.2x/D335 V1.0x**



Bender GmbH & Co. KG

P.O. Box 1161 • 35301 Gruenberg • Germany
Londorfer Straße 65 • 35305 Gruenberg • Germany
Tel.: +49 6401 807-0 • Fax: +49 6401 807-259
E-mail: info@bender.de • www.bender.de

Photos: Bender archives.

© Bender GmbH & Co. KG
All rights reserved.
Reprinting only with permission
of the publisher.
Subject to change!

Table of Contents

1. Important information	7
1.1 How to use this manual	7
1.2 Technical support: service and support	8
1.2.1 First level support	8
1.2.2 Repair service	8
1.2.3 Field service	8
1.3 Training courses	9
1.4 Delivery conditions	9
1.5 Inspection, transport and storage	9
1.6 Warranty and liability	9
1.7 Disposal	10
2. Safety instructions	11
2.1 General safety instructions	11
2.2 Work activities on electrical installations	11
2.3 Intended use	11
2.4 Device-specific safety instructions	12
2.5 General safety instructions	12
3. System description	13
3.1 Properties	13
3.1.1 Product description	13
3.1.2 Changeover	13
3.1.3 Messages	13
3.1.4 Other functions	13
3.2 Functional safety	14
3.2.1 Product life-cycle management	14
3.3 Application example	15
3.4 ATICS® tasks	16
3.5 The ATICS® functions	16
3.5.1 The automatic transfer switching device	16
3.5.1.1 Time diagram: Changeover between the preferred and the redundant line	18
3.5.1.2 Time diagram: Staggered switching after complete power failure	19

3.5.1.3	Time diagram: Changeover to generator mode	20
3.5.2	Monitoring the device functions	21
3.5.3	Power supply	21
3.5.4	Manual mode	21
3.6	ATICS-2-DIO front view	22
3.7	ATICS-4-DIO front view	23
4.	Installation and connection	25
4.1	Mounting	25
4.1.1	ATICS-2-DIO dimension diagram	26
4.1.2	ATICS-4-DIO dimension diagram	26
4.1.3	Removing the terminal covers	27
4.1.4	Mounting on DIN rail	27
4.1.5	Screw mounting on plate	28
4.2	Connection	29
4.2.1	Short-circuit protection	29
4.2.2	Connecting ATICS® safely	30
4.2.3	Connection example: ATICS-2-DIO basic configuration	33
4.2.4	Connection example: ATICS-4-DIO basic configuration	34
4.2.5	Connection example: ATICS-2-DIO with bypass switch	35
4.2.6	Connection example: ATICS-2-DIO with bypass switch	36
4.2.7	Instructions for connection	37
4.2.7.1	BMS bus	37
4.2.7.2	MK... alarm indicator and test combination and TM... alarm indicator and operator panels	37
4.2.7.3	SCADA systems (Supervisory Control and Data Acquisition)	37
4.2.7.4	Bypass switch (optional)	37
4.2.8	Fastening, inserting and securing connections	38
4.3	Other functions	39
4.3.1	Sealing the transparent cover of the transfer switching device	39
4.3.2	Manual mode	39
4.3.3	Locking the transfer switching device with a padlock	40
5.	Commissioning, settings and testing	41
5.1	Design and installation	41
5.1.1	Configure MK... or TM...	42
5.1.2	ATICS-2-DIO: Messages on the BMS bus (channel use)	42
5.1.3	ATICS-4-DIO: Messages on the BMS bus (channel use)	43
5.1.4	Tests, decommissioning	44
5.2	Setting and testing according to the checklist	45

5.3	Addressing example	46
6.	Operation	47
6.1	Operating and display elements	47
6.2	Quick reference guide	48
6.2.1	ATICS-2-DIO: Display under normal operating conditions	48
6.2.2	ATICS-4-DIO: Display under normal operating conditions	49
6.2.3	Display during fault condition	50
6.2.4	Test function	51
6.2.4.1	Test menu 1: Autom. changeover	52
6.2.4.2	Test menu 2: Manual changeover	53
6.2.4.3	Test menu 3: Last switch	54
6.2.4.4	Test menu 4: Generator	55
6.2.4.5	Test menu 5: Test communication	56
6.2.5	Reset function	57
6.2.5.1	Reset menu 1: Alarm	57
6.2.5.2	Reset menu 2: SwitchBackLock	58
6.2.5.3	Reset menu 3: Changeover	59
7.	Menu mode: Operation and setting	61
7.1	Switching on and calling up the main menu	61
7.2	Menu overview diagram	62
7.3	Main menu functions	63
7.3.1	Menu 1: Alarm/meas.values	63
7.3.1.1	Alarm/meas. values ATICS-2-DIO	63
7.3.1.2	Alarm/meas. values ATICS-4-DIO	64
7.3.2	Menu 2: Changeover	65
7.3.3	Menu 3: History/Logger	66
7.3.3.1	Operating example: History	67
7.3.3.2	Operating example: Config.logger	67
7.3.4	Menu 4: Settings	68
7.3.4.1	Settings menu 1: Changeover	69
7.3.4.2	Settings menu 2: Voltage	71
7.3.4.3	Settings menu 3: Current	72
7.3.4.4	Settings menu 4: Relay	73
7.3.4.5	Settings menu 5: Digital input	75
7.3.4.6	Settings menu 6: Data logger	77
7.3.4.7	Settings menu 7: Language	79
7.3.4.8	Settings menu 8: Interface	79
7.3.4.9	Settings menu 9: Clock	80

7.3.4.10	Settings menu 10: Password	81
7.3.4.11	Settings menu 11: Service	82
7.3.5	Menu 5: Control	83
7.3.6	Menu 6: Digital Input	83
7.3.7	Menu 7: Info	83
8.	Troubleshooting	85
8.1	Fault and alarm messages	85
8.1.1	Plain text messages	85
8.1.2	Messages with error code or service code	86
8.2	Frequently asked questions	88
9.	Periodic verification and service	91
9.1	Periodic verification	91
9.2	Maintenance	92
9.3	Cleaning	92
9.4	Operation with bypass switch	92
9.5	Replace ATICS®	93
9.5.1	Removing the existing ATICS®	94
9.5.2	Installing a new ATICS®	97
10.	Technical data	99
10.1	Tabular data	99
10.2	TÜV test report according to VDE0100 Part 710	103
10.3	TÜV certificate regarding functional safety	104
10.4	Standards and certifications	105
10.5	Ordering details	106
10.6	Additional documents	107
INDEX	109

1. Important information

1.1 How to use this manual

This manual describes how to operate the ATICS® automatic transfer switching device. Before using the devices, please read this operating manual, the supplement entitled "Important safety instructions for Bender products" and the instruction leaflets supplied with the individual system components.



*This manual is intended for **qualified personnel** working in electrical engineering and electronics, and in particular for those designing, installing and operating electrical equipment in the medical and non-medical sector.*

In this manual, the two redundant supply lines of the power supply are labelled as follows:

- "Preferred supply" or "Preferred line" and
- "Second supply" or "Redundant line".

Devices with displays use the terms "Line 1" and "Line 2" in the text they indicate.

Always keep this manual within easy reach for future reference.

To make it easier for you to understand and revisit certain sections in this manual, we have used symbols to identify important instructions and information. The meaning of these symbols is explained below:



*This signal word indicates that there is a **high** risk of danger, that **will** result in **death** or **serious injury** if not avoided.*



*This signal word indicates a **medium** risk of danger that **can** lead to **death** or **serious injury**, if not avoided.*



*This signal word indicates a **low-level** risk that **can** result in minor or **moderate injury** or **damage to property** if not avoided.*



This symbol denotes information intended to assist the user in making optimum use of the product.

This manual has been compiled with great care. It might nevertheless contain errors and mistakes. Bender cannot accept any liability for injury to persons or damage to property resulting from errors or mistakes in this manual.

ATICS® is a registered trademark of Bender GmbH & Co. KG.

1.2 Technical support: service and support

For commissioning and troubleshooting Bender offers you:

1.2.1 First level support

Technical support by phone or e-mail for all Bender products

- Questions concerning specific customer applications
- Commissioning
- Troubleshooting

Telephone: +49 640 807-760*
Fax: +49 6401 807- 59
In Germany only: 0700BenderHelp (Tel. and Fax)
E-mail: support@bender-service.de

1.2.2 Repair service

Repair, calibration, update and replacement service for Bender products

- Repairing, calibrating, testing and analysing Bender products
- Hardware and software update for Bender devices
- Delivery of replacement devices in the event of faulty or incorrectly delivered Bender devices
- Extended guarantee for Bender devices, which includes an in-house repair service or replacement devices at no extra cost

Telephone: +49 6401 807-780** (technical issues)
+49 6401 807-784**, -785** (sales)
Fax: +49 6401 807- 89
E-mail: repair@bender-service.de

Please send the devices for **repair** to the following address:

Bender GmbH, Repair-Service,
Londorfer Straße 65,
35305 Grünberg

1.2.3 Field service

On-site service for all Bender products

- Commissioning, parameter setting, maintenance, troubleshooting for Bender products
- Analysis of the electrical installation in the building (power quality test, EMC test, thermography)
- Training courses for customers

Telephone: +49 6401 807-752**, -762 **(technical issues)
+49 6401 807-753** (sales)
Fax: +49 6401 807-759
E-mail: fieldservice@bender-service.de
Internet: www.bender.de

*Available from 7.00 a.m. to 8.00 p.m. 365 days a year (CET/UTC+1)

**Mo-Thu 7.00 a.m. - 8.00 p.m., Fr 7.00 a.m. - 13.00 p.m.

1.3 Training courses

Bender is happy to provide training regarding the use of test equipment. The dates of training courses and workshops can be found on the Internet at www.bender-de.com -> Know-how -> Seminars.

1.4 Delivery conditions

Bender sale and delivery conditions apply.

For software products the "Softwareklausel zur Überlassung von Standard-Software als Teil von Lieferungen, Ergänzung und Änderung der Allgemeinen Lieferbedingungen für Erzeugnisse und Leistungen der Elektroindustrie" (software clause in respect of the licensing of standard software as part of deliveries, modifications and changes to general delivery conditions for products and services in the electrical industry) set out by the ZVEI (Zentralverband Elektrotechnik- und Elektronikindustrie e. V.) (German Electrical and Electronic Manufacturer's Association) also applies.

Sale and delivery conditions can be obtained from Bender in printed or electronic format.

1.5 Inspection, transport and storage

Inspect the dispatch and equipment packaging for damage, and compare the contents of the package with the delivery documents. In the event of damage in transit, please contact Bender immediately.

The devices must only be stored in areas where they are protected from dust, damp, and spray and dripping water, and in which the specified storage temperatures can be ensured.

1.6 Warranty and liability

Warranty and liability claims in the event of injury to persons or damage to property are excluded if they can be attributed to one or more of the following causes:

- Improper use of the device.
- Incorrect mounting, commissioning, operation and maintenance of the device.
- Failure to observe the instructions in this operating manual regarding transport, commissioning, operation and maintenance of the device.
- Unauthorised changes to the device made by parties other than the manufacturer.
- Non-observance of technical data.
- Repairs carried out incorrectly and the use of replacement parts or accessories not approved by the manufacturer.
- Catastrophes caused by external influences and force majeure.
- Mounting and installation with device combinations not recommended by the manufacturer.

This operating manual, especially the safety instructions, must be observed by all personnel working on the device. Furthermore, the rules and regulations that apply for accident prevention at the place of use must be observed.

1.7 Disposal

Abide by the national regulations and laws governing the disposal of this device. Ask your supplier if you are not sure how to dispose of the old equipment.

The directive on waste electrical and electronic equipment (WEEE directive) and the directive on the restriction of certain hazardous substances in electrical and electronic equipment (RoHS directive) apply in the European Community. In Germany, these policies are implemented through the "Electrical and Electronic Equipment Act" (ElektroG). According to this, the following applies:

- Electrical and electronic equipment are not part of household waste.
- Batteries and accumulators are not part of household waste and must be disposed of in accordance with the regulations.
- Old electrical and electronic equipment from users other than private households which was introduced to the market after 13 August 2005 must be taken back by the manufacturer and disposed of properly.

For more information on the disposal of Bender devices, refer to our website at www.bender-de.com

-> Service & support.

2. Safety instructions

2.1 General safety instructions

Part of the device documentation in addition to this manual is the enclosed "Safety instructions for Bender products".

2.2 Work activities on electrical installations



Only **qualified personnel** are permitted to carry out the work necessary to install, commission and run a device or system.



Risk of electrocution due to electric shock!

Touching live parts of the system carries the risk of:

- An electric shock
- Damage to the electrical installation
- Destruction of the device

Before installing and connecting the device, make sure that the installation has been de-energised. Observe the rules for working on electrical installations.

If the device is used outside the Federal Republic of Germany, the applicable local standards and regulations must be complied with. The European standard EN 50110 can be used as a guide.

2.3 Intended use

Changeover devices are used everywhere there is dependence on high availability from the power supply. The ATICS® transfer switching device is intended for the application described in the chapter "System description". When the preferred supply fails, ATICS® automatically switches to the second supply.

Areas of application:

- Group 1 and 2 medical locations according to DIN VDE 0100-710 and IEC 60364-7-710
- Hospital main distribution boards (DIN VDE 0100-710)
- Locations open to the public (DIN VDE 0100-718)
- Emergency power supplies
- Heating, air conditioning, ventilation, cooling
- EDP, computer centres
- Fire extinguisher and sprinkler systems

Several versions of ATICS® are available. They differ for example by changing over from two- or four-pole systems or by the load current (see chapter "ATICS® tasks" on page 16). Please heed the limits of the range of application indicated in the technical data.

In order to meet the requirements of applicable standards, customised parameter settings must be made on the equipment in order to adapt it to local equipment and operating conditions.

Intended use includes following all the instructions in the operating manual and complying with the test intervals.

Any use other than that described in this manual is regarded as improper.

2.4 Device-specific safety instructions



Failure to adjust settings may result in malfunction

The settings must be changed in order to adapt the ATICS® transfer switching device to the existing equipment. When doing so, follow the instructions in chapter "5. Commissioning, settings and testing", page 41 et seq.



Functional safety according to IEC 61508 can only be guaranteed when used properly

Please follow the instructions given in this operating manual and in the check list. In particular note the information on the pages: 14, 15, 16, 21, 59 and 88.

2.5 General safety instructions

Bender devices are designed and built in accordance with the state of the art and accepted rules in respect of technical safety. However, the use of such devices may introduce risks to the life and limb of the user or third parties and/or result in damage to Bender devices or other property.

- Use Bender devices only:
 - as intended
 - in perfect working order
 - in compliance with the accident prevention regulations and guidelines applicable at the location of use
- Eliminate all faults immediately which may endanger safety.
- The device may not be opened.
- Do not make any unauthorised changes and only use replacement parts and optional accessories purchased from or recommended by the manufacturer of the devices. Failure to observe this requirement can result in fire, electric shock and injury.
- Reference signs must always be clearly legible. Replace damaged or illegible signs immediately.
- Make sure that the dimensions of the BSV (battery-supported safety power supply), the generator set and the whole wiring is adequate. Abide by the relevant, applicable national and international standards. In the event of an overload and short circuit, this is the only way to guarantee the necessary safety and to ensure that the safety devices respond selectively.
- If the device is overloaded by overvoltage or a short-circuit current load, it must be checked and replaced if necessary.
- The overvoltage protective device required by the standards VDE 0100-443 and VDE 0100-534 must be installed in the electrical installation or system.

3. System description

3.1 Properties

3.1.1 Product description

The ATICS® transfer switching devices provide all functions for changeover between two independent power supplies. The integration of both the electronic system and the switching elements in one flat, compact device reduces space requirements in the switchgear cabinet, minimises the amount of wiring, and reduces the fault probability. For maximum reliability, ATICS® was designed in strict accordance with the guidelines for functional safety.

Connectors at all connecting wires in combination with bypass switches enable ATICS® to be tested during ongoing operation. In case of need for service, it is possible to repair or replace the device without interrupting the power supply. ATICS® considerably enhances the safety level in industry and other sensitive environments like hospitals.

3.1.2 Changeover

- Automatic changeover to the second (redundant) line on loss of the preferred supply or when the values are outside the permissible voltage range
- Voltage monitoring line 1/2 (input) and line 3 (output)
- Automatic return to the preferred line on voltage recovery
- Monitoring for short circuits at the output or at the distribution board downstream of the transfer switching device avoids damaging switching operations
- Manual operation, optionally locked with a padlock

3.1.3 Messages

- Status indication of operating, warning and alarm messages via integrated graphic display and external indication at MK2430/MK800/TM800 alarm indicator and operator panels
- Automatic reminder for prescribed tests and service intervals
- History memory for events, messages, tests and parameter changes
- Exchange of information with alarm indicator and operator panels via BMS bus

3.1.4 Other functions

- Automatic monitoring of all programme and data storage as well as essential internal components and connecting wires for proper functioning
- 4 programmable relay outputs (alarm relays)
- 4 programmable digital inputs

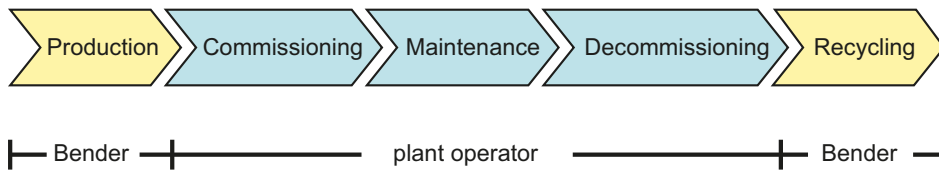
3.2 Functional safety

Functional safety according to IEC 61508 guarantees safety from risks arising from malfunction when used properly. ATICS® is suitable for use in safety-related systems according to SIL2. SIL stands for "Safety Integrity Level".

3.2.1 Product life-cycle management

Safety must be guaranteed over the entire life cycle, from the time it is designed, developed, manufactured, commissioned, maintained to the time it is taken out of service.

Responsibility during the life cycle:



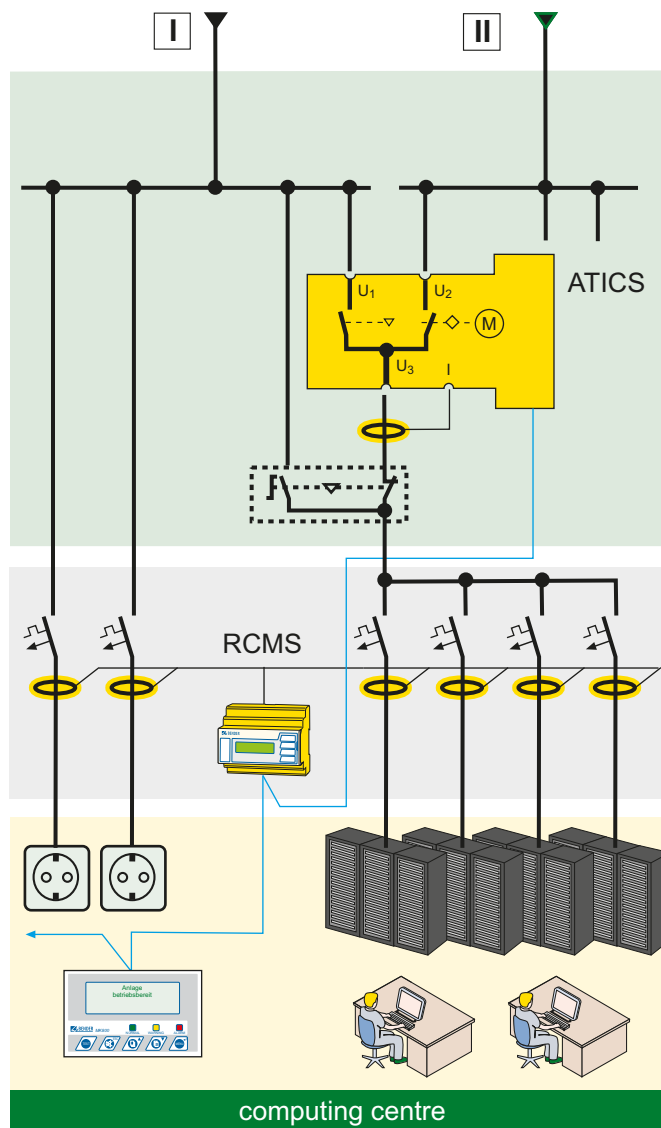
For detailed information refer to

- chapter "5. Commissioning, settings and testing" on page 41
- chapter "9. Periodic verification and service" on page 91

3.3 Application example

- ATICS-2-63A-DIO: Changeover between the preferred and the redundant line
- MK2430/MK800/TM800: Alarm at at least two points with independent power supplies for functional safety
- RCMS: RCMS460 or RCMS490 residual current monitors for localising residual and operating currents in TT and TN-S systems

- I Preferred supply line
- II Redundant supply line (e.g. generator)



3.4 ATICS® tasks

The ATICS® transfer switching device has the following capabilities:

- Two-pole or four-pole changeover of the power supply
- Voltage monitoring for the preferred supply (Line 1)
- Voltage monitoring for the second supply (Line 2)
- Voltage monitoring at the transfer switching device output (line 3)
- Monitoring of the changeover switch for correct switch position
- Internal functional testing, including checking the switching times
- Communication to remote MK... alarm indicator and test combinations, and to TM... alarm indicator and operator panels via BMS bus
- Option for adjusting the time delay for the changeover process according to DIN VDE 0100-710 (VDE 0100 Part 710)
- Possible field of application in systems according to DIN VDE 0100-710 (VDE 0100 Part 710) with a changeover period ≤ 15 s or even ≤ 0.5 s

3.5 The ATICS® functions

3.5.1 The automatic transfer switching device

If the preferred supply fails, ATICS® ensures that the power supply is changed over safely.

The switch contacts are offset on a rotating shaft. This design prevents simultaneous switching of line 1 and line 2. The switch has three positions:

1	Line 1 switched on
0	Both lines switched off
2	Line 2 switched on

Either line 1 or line 2 can be set as the preferred line (setting described in "Settings menu 1: Change-over" on page 69 or "Settings menu 5: Digital input" on page 75).

1. In normal operating condition (fault-free operation) the preferred supply is connected. ATICS® will switch to the redundant line if:
 - the preferred line fails
 - the "TEST" button is pressed
 - a digital input is configured to "TEST" and this input is enabled
 - the setting "Preferred Line" is reconfigured to the other line

2. ATICS® will switch from the redundant line back to the preferred line if
 - the voltage on the preferred line is restored
 - the return transfer delay time $t(2 \rightarrow 1)$ has expired and no switching back interlocking function is enabled
 - immediately after pressing the "RESET" button or when the redundant line fails (even when the switching back interlocking function is enabled)
 - the setting "Preferred Line" is reconfigured to the other line
 - the digital input is configured to "TEST" and this input is reset
 - a test of the transfer switching device is active and the test period has elapsed

**Failure to adjust delay times may result in malfunctions**

The response delay $t(on)$, the return transfer delay time $t(2 \rightarrow 1)$, the delay on release $t(off)$ and the dead time $t(0)$ of ATICS® are adjustable and must be adjusted to the requirements of the specific case, the short-circuit calculation and the requirements of DIN VDE 0100-710 (VDE 0100 Part 710) for automatic changeover devices (see chapter "Commissioning, settings and testing").

The factory settings guarantee a changeover period of $t \leq 0.5$ seconds and switching back within 10 seconds when voltage is restored on the preferred supply. Therefore, ATICS® can be used in IT systems with a requirement for a changeover period $t \leq 0.5$ s (IT systems with operating theatre lights, endoscopic field illumination in operating theatres or other essential sources of light, etc.).

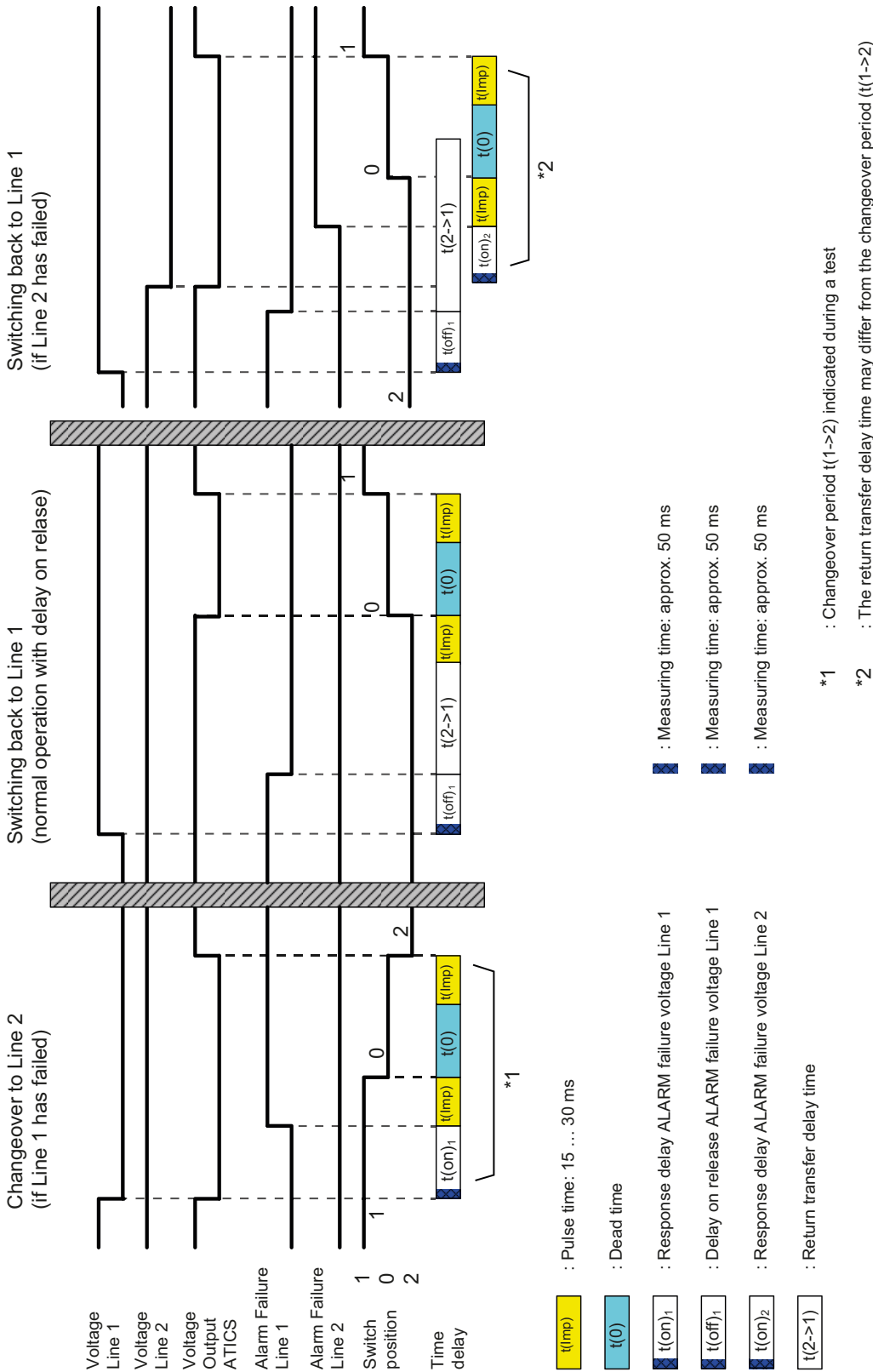
When there is a short circuit downstream of the transfer switching device, the transfer switching device must not continually change back and forth between the two lines. This can occur when the short-circuit current is small and the transfer switching device switches faster than the short-circuit breaker trips. ATICS® monitors the load current downstream of the transfer switching device in order to detect a possible short circuit. If the preferred line fails and a short-circuit current is detected at the same time, ATICS® does not switch over immediately but only once the circuit breaker has tripped.

If ATICS® detects a supply failure or a fault, an alarm appears on the LCD, the "ALARM" LED lights up, the alarm relay trips (if set) and this alarm is forwarded to other Bender devices (such as an alarm indicator and test combination) via the BMS bus.

Phase sequence direction errors are recognised and indicated on the LC display. Even so ATICS® switches over to the redundant line.

3.5.1.1 Time diagram: Changeover between the preferred and the redundant line

Example: Line 1 is set as the preferred line.

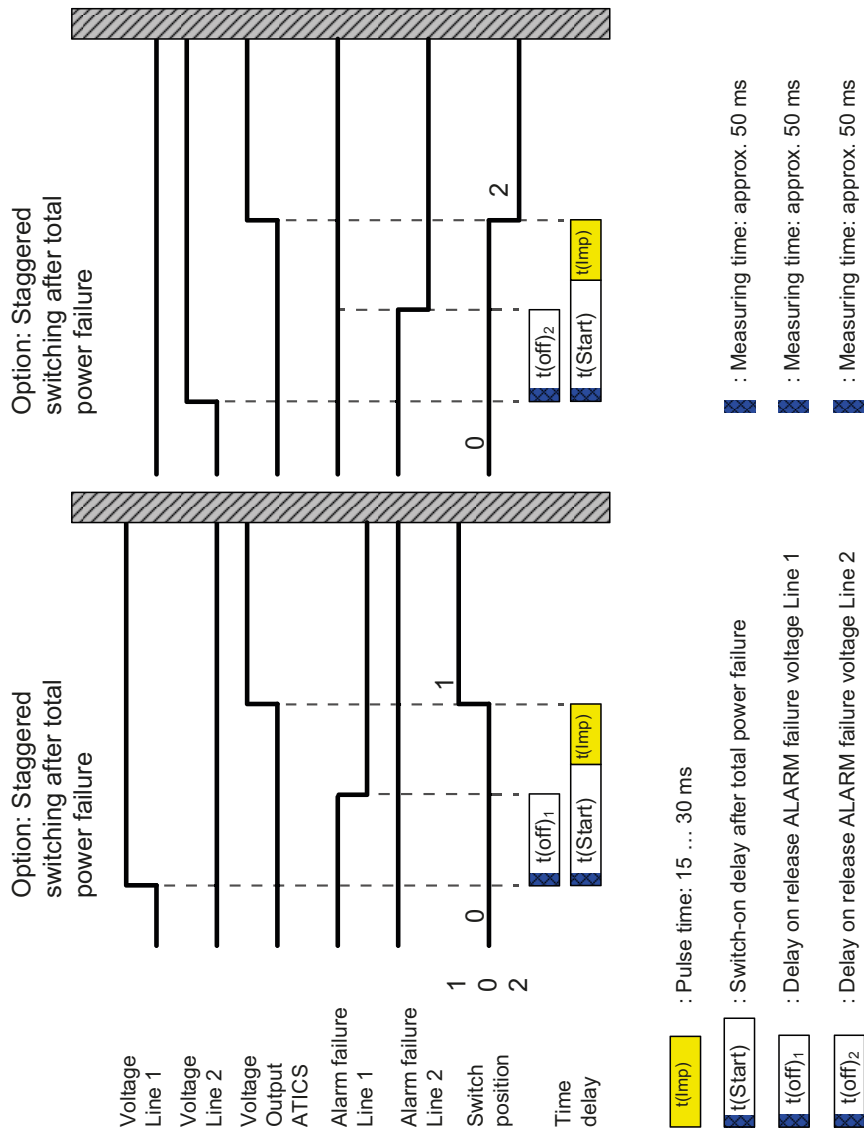


Note: Times are not shown to scale.

3.5.1.2 Time diagram: Staggered switching after complete power failure

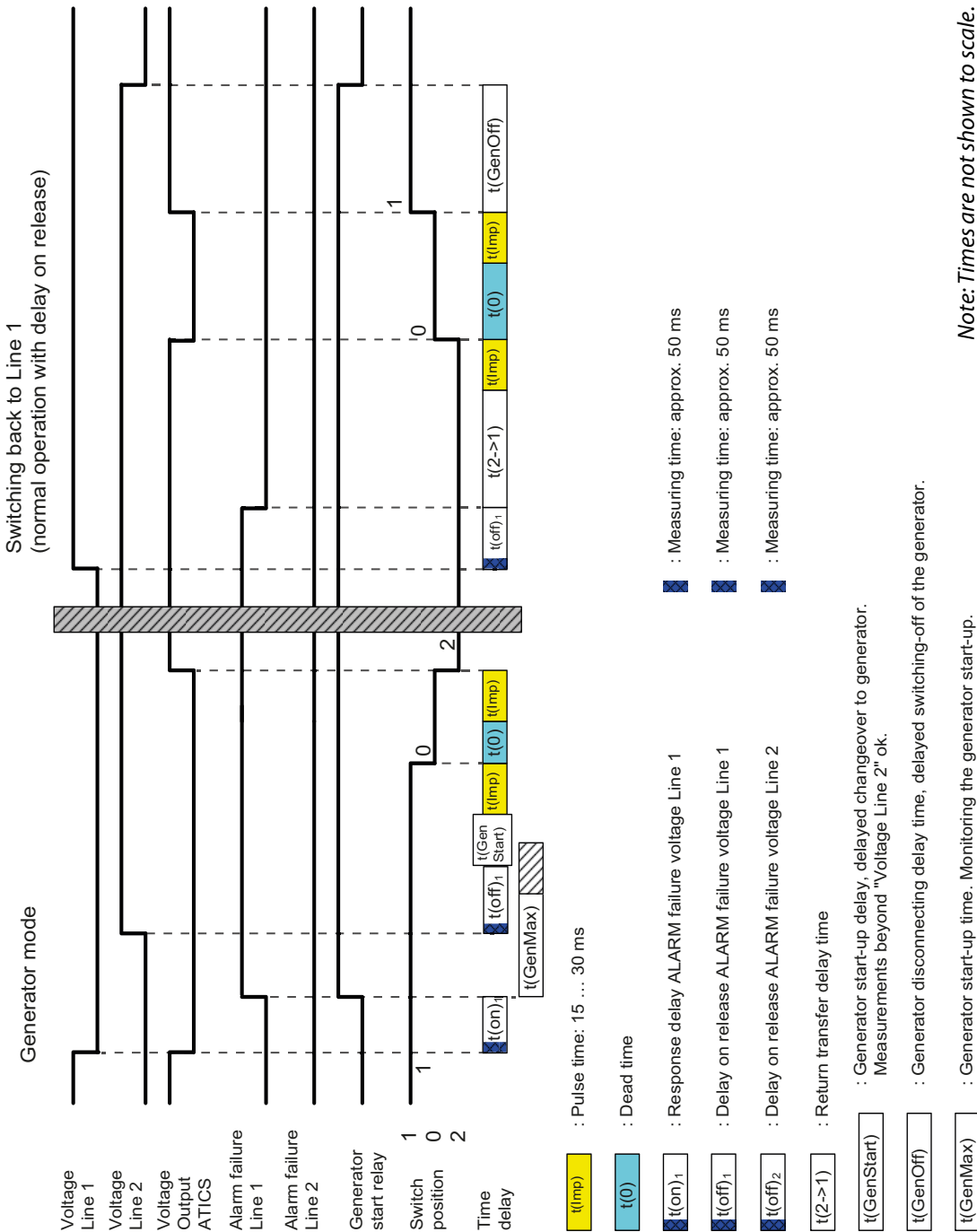
After a complete power failure (i.e. no voltage on either of the power supplies) it is often necessary to switch to the supply at staggered intervals. This prevents all loads being switched on simultaneously. Switch ATICS® to position "0" using an Allen key. When power is restored, ATICS® switches on the supply again with the set delay time $t(\text{start})$.

Example: Line 1 is set as the preferred line.



Note: Times are not shown to scale.

3.5.1.3 Time diagram: Changeover to generator mode



3.5.2 Monitoring the device functions

The control circuits are designed in such a way that, even though it is almost certain that a particular fault will occur, it cannot cause the power supply at the output of the automatic transfer switching device to fail.

ATICS® tests the switch position of the switch as well as coils 1 and 2 of the switch once a day at 12:00 p.m.

ATICS® also continuously monitors:

- Power supplies 1 and 2, which supply the electronics from the systems concerned
- Internal microcontrollers and memory modules
- Important connecting wires, such as the measuring current transformer connection
- For alarm and test combinations and alarm indicator and operator panels, device failure monitoring can also be programmed via the BMS bus (necessary for functional safety).



WARNING

For systems with generator: total power failure possible

If the preferred line fails, ATICS® will start the generator connected to the redundant line. If the generator does not start, the line downstream of the transfer switching device will be dead.

When the generator is switched off, ATICS® cannot check the redundant line. Therefore, regularly test the generator and the transfer switching device to make sure they are working properly (see checklist in the appendix to this manual).

3.5.3 Power supply

The coils of the switching device are each supplied from the line which is not currently switched on. This ensures that it is possible to switch to the redundant line if the preferred line fails, for example.

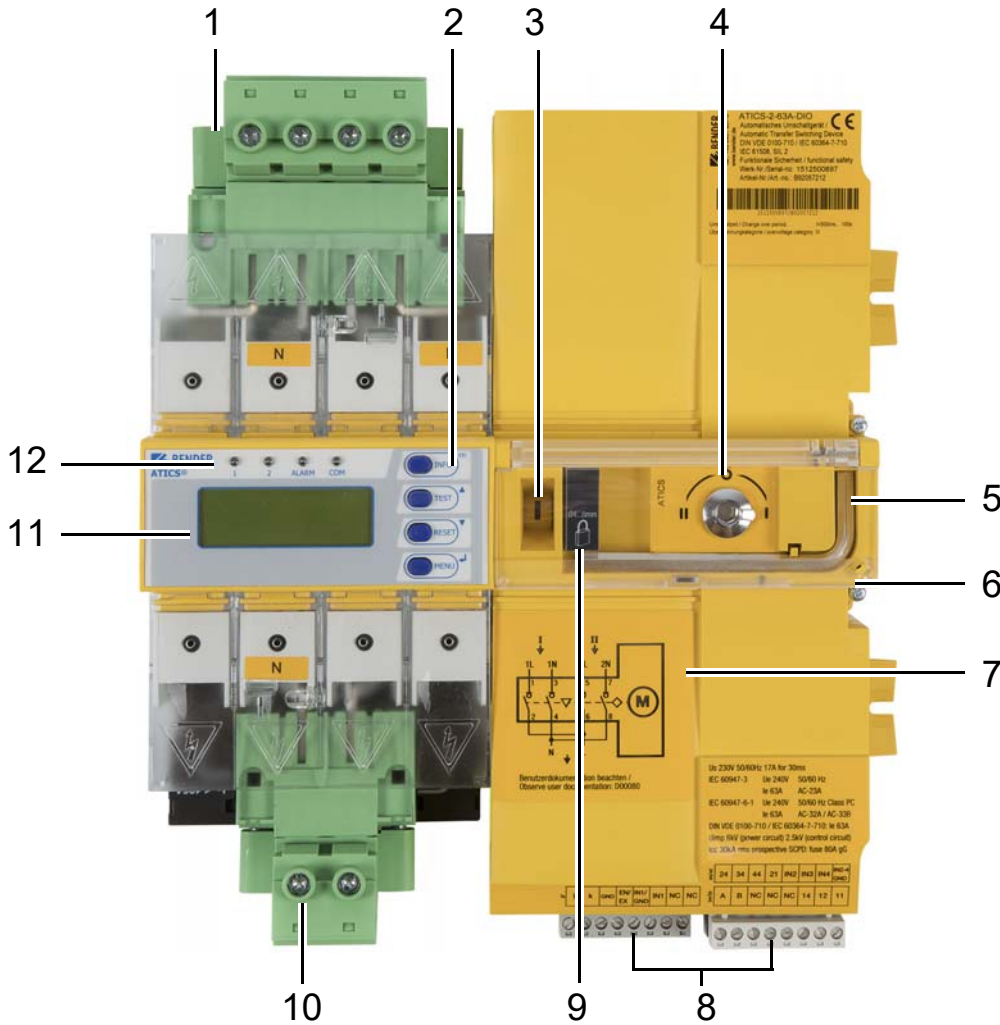
The power supply of the electronic system is of redundant supply from lines 1 and 2. This ensures constant supply to the electronic system even when one line fails.

If both lines fail, the changeover switch remains in the last switch position. Switch ATICS® to position "0" using an Allen key. When power is restored, ATICS® switches on the supply again with the set delay time $t(\text{start})$. If several ATICS® are installed in one system, they can be switched to the preferred line one by one starting from switch position "0" on voltage recovery. This prevents the peak loads that would occur if the lines of several transfer switching devices were switched on simultaneously.

3.5.4 Manual mode

In manual mode, changeover can be achieved using an Allen key. The switching device can be held in switch position "0" and locked with a padlock.

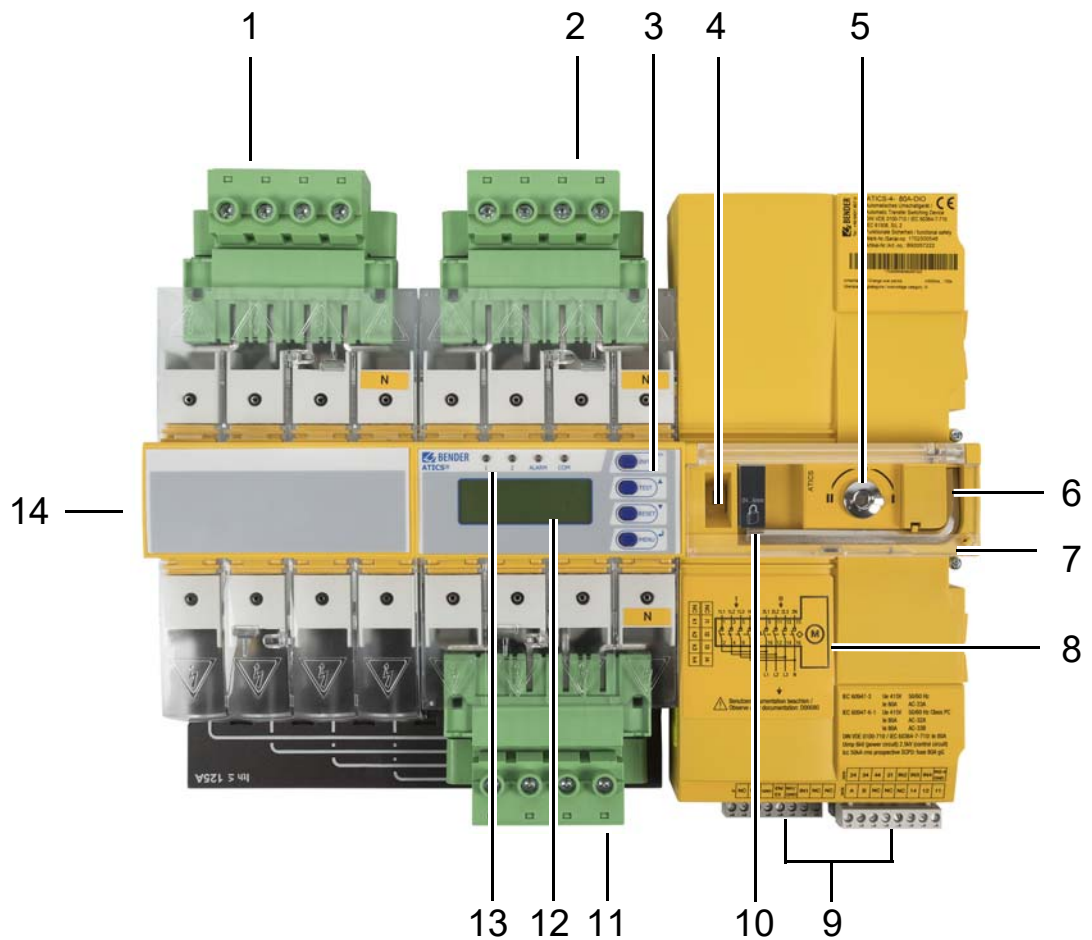
3.6 ATICS-2-DIO front view



Legend

1	Green plug connector for line 1 and line 2
2	Control buttons
3	Inspection window for switch position
4	Manual mode of the transfer switching device, indicates the switch position
5	Allen key for manual mode
6	Transparent cover for changeover switch (manual mode), sealable
7	Wiring diagram for lines 1, 2 and 3
8	Three coded connector plugs
9	Locking device for switch position 0
10	Green plug connector for line 3
11	LCD
12	Operating and alarm LEDs

3.7 ATICS-4-DIO front view



Legend

1	Green plug connector for line 1
2	Green plug connector for line 2
3	Control buttons
4	Inspection window for switch position
5	Manual mode of the transfer switching device, indicates the switch position
6	Allen key for manual mode
7	Transparent cover for changeover switch (manual mode), sealable
8	Wiring diagram for lines 1, 2 and 3
9	Three coded connector plugs
10	Locking device for switch position 0
11	Green plug connector for line 3
12	LCD
13	Operating and alarm LEDs
14	Connector plug for measuring current transformer

4. Installation and connection



Risk of electrocution due to electric shock!

Touching live parts of the system carries the risk of electric shock. Before fitting the device and prior to working on the device connections, make sure that the power supply has been disconnected. Observe the rules for working on electrical installations.



In manual mode, ATICS® can be held in switch position "0" and locked with a padlock.



Disturbance due to loud switching noise

Install ATICS® in a closed electrical operating area or in a sound-proof distribution board.

4.1 Mounting

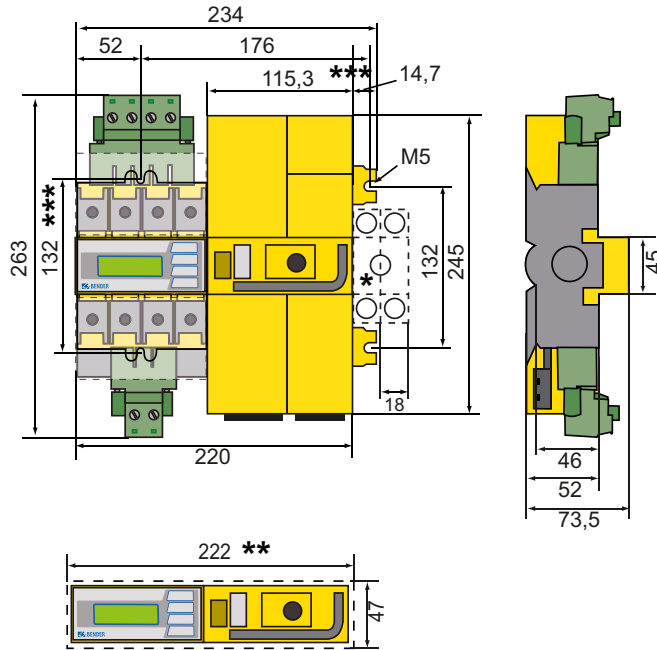


Risk of destruction by plastering

Liquid plaster may run into the device and the device may jam. Do **not** seal the device with plaster.

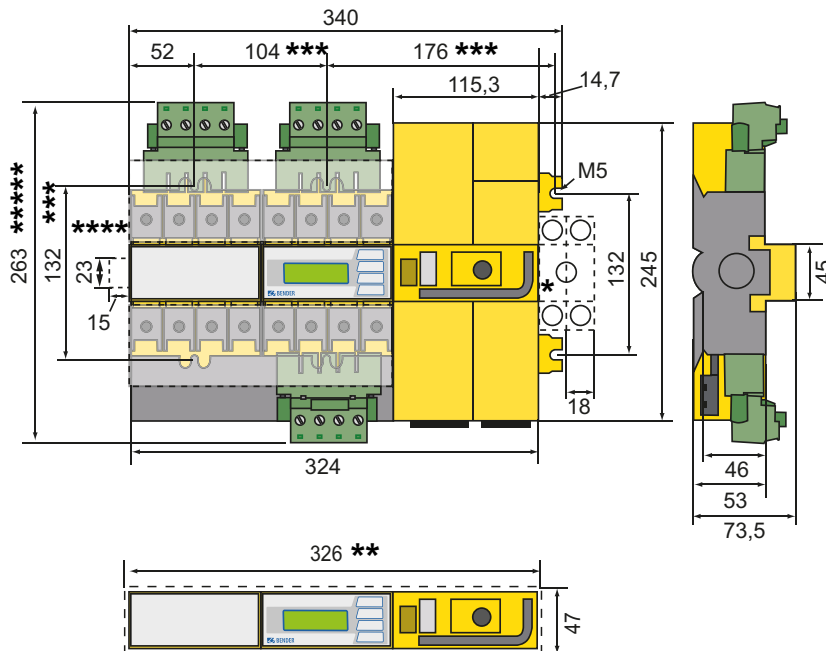
ATICS® is suitable for DIN rail mounting or screw mounting on plate. To guarantee the protection against accidental contact, it is to be installed behind a plastic cover.

4.1.1 ATICS-2-DIO dimension diagram



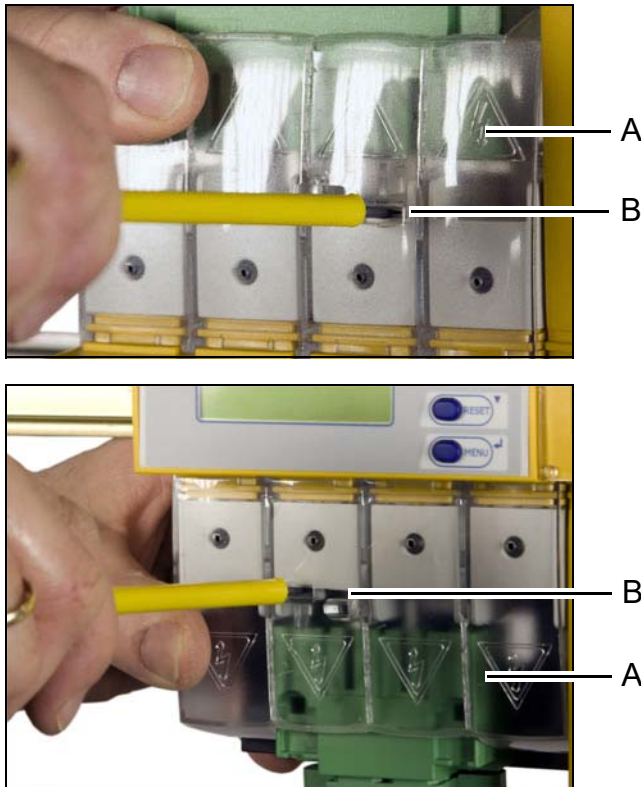
- * Only when using the bypass switch ATICS-BP-...: additional space required for auxiliary contact
- ** Adjust the cutout to the terminal cover
- *** Dimensions for screw mounting on mounting plate

4.1.2 ATICS-4-DIO dimension diagram



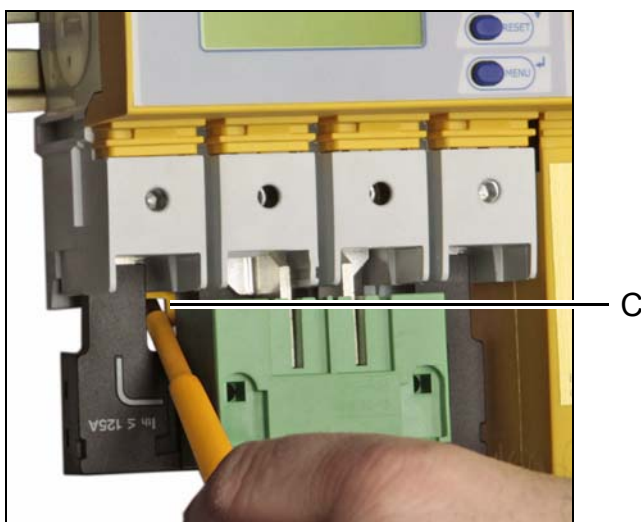
- * Only when using the bypass switch ATICS-BP-...: additional space required for auxiliary contact
- ** Adjust the cutout to the terminal cover
- *** Dimensions for screw mounting on mounting plate
- **** Additional space required for the connector plug of the measuring current transformer
- ***** 80 A/125 A version. 160 A version without plug connector.

4.1.3 Removing the terminal covers



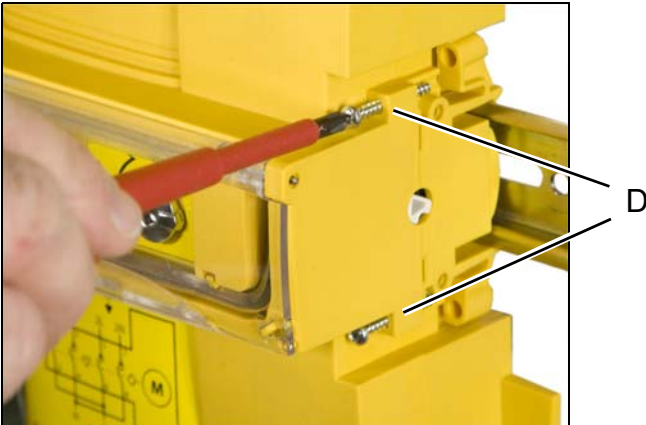
1. Push back the locking hook (B) in the middle of the top and bottom terminal cover (A) using a screwdriver.
2. Remove the terminal cover.

4.1.4 Mounting on DIN rail



1. Place ATICS® on the top edge of the rail.
2. **ATICS-2-DIO:** Use a screwdriver to pull down the lower yellow slide lock (C) and snap ATICS® into place with slight pressure.
ATICS-4-DIO: Remove lower green plug connector. Use a screwdriver to pull down the two lower yellow slide lock (C) and snap ATICS® into place with slight pressure.
Check that the slide locks are properly snapped into position by pulling slightly the lower part of the enclosure.
3. Secure all terminals including the unused terminals with Allen screws.
Tightening torque: 5 Nm.
4. Fasten the terminal covers.

Photo shows ATICS-2-DIO.
The description also applies to ATICS-4-DIO.



5. Always tighten the mounting screws (D) (PZ1, 8,8 lb-in, 1 Nm).



If the screws are not tightened, the vibration occurring during the switching process may damage ATICS®.

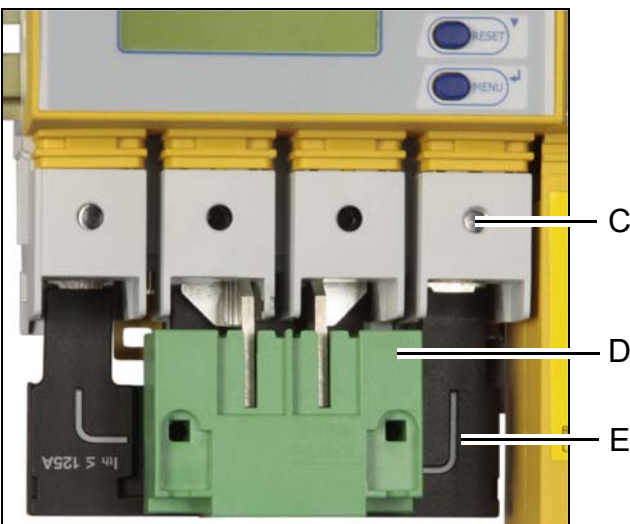
4.1.5 Screw mounting on plate



Provide for sufficient clearance to live conductors (voltage clearance) by using mounting screws with flat screw heads and flat washers.

If mounted on electrically conductive material: the mounting plate has to be earthed and the area under the terminals has to be covered with insulating material.

It is the responsibility of the mounting staff to select the appropriate mounting plate and mounting screws and to keep the prescribed torque setting.



The photo shows ATICS-2-DIO.
The description also applies to ATICS-4-DIO.

1. Undo the Allen screws of the terminals (C).
2. Remove the green plug connectors (D) top and bottom.
3. Remove the black bridge (E) bottom.
4. Fasten ATICS® to the mounting plate with M5 mounting screws, torque setting 22 lb-in, 2.5 Nm (see "ATICS-2-DIO dimension diagram").
5. Insert the black bridge (E), bottom.
6. Plug in the green plug connectors (D) top and bottom.
7. Use Allen screws to tighten all terminals (C) including the unused terminals. Tightening torque: 5 Nm.
8. Fasten the terminal covers.

4.2 Connection

4.2.1 Short-circuit protection

The choice of back-up fuses F should ensure both short-circuit protection for the transformer and selectivity for the overcurrent devices connected downstream in the IT systems.

The connecting wires between the automatic transfer switching devices and the overcurrent protective device downstream are to be laid so that they are short-circuit and earth-fault proof.

When choosing back-up fuses, keep to both the maximum permissible values laid down by the guidelines which apply to the site of use and national and international standards to make sure that the contacts do not weld.

For recommendations on the use of the appropriate fuse, refer to the nameplate of ATICS® and to the ordering details in this manual.

4.2.2 Connecting ATICS® safely



DANGER

Risk of fatal injury from electric shock

If any of the supplies are switched on, some of the parts of the system which are not yet fully installed may be live.

Open the transparent cover of the device for manual mode selection and wait until the display shows "Manual mode".



Turn the Allen key to switch position "0". Leave the transparent cover open and lock the transfer switching device with a padlock to prevent it from starting accidentally.



DANGER

Risk of fatal injury from electric shock

Connecting wires can come loose and fall out if the ferrules being used are too short, the wire ends are tinned or the connection screws have not been tightened enough.

Consider a stripping length of 20 mm and do not use ferrules when connecting lines 1, 2 and 3.

Note the assignment of the terminals. Note especially that the two supplies are always connected to the device from the top.

Use a torque wrench to tighten the terminal screws.

Check all the screws on a regular basis to make sure they are seated tightly.



WARNING

Risk of destruction when insulation and voltage test are carried out

-> Disconnect the device from the mains for the duration of the test.



WARNING

Risk of destruction in the event of phase failure in three-phase systems

If only one of the phases fails, it may result in overvoltages which can damage the connected devices.

-> Install a device for all-pole disconnection in the event of phase failure.

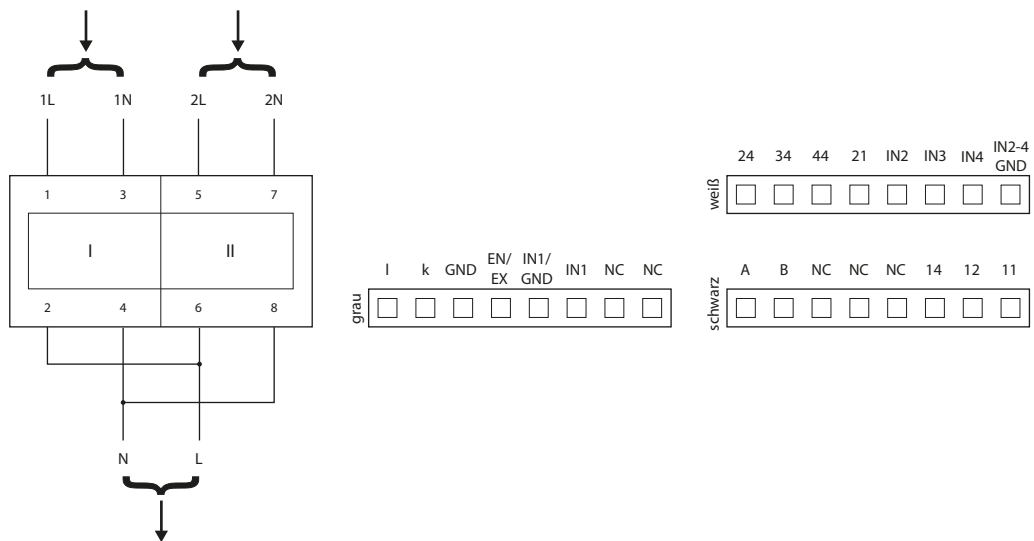


WARNING

Risk of destruction if connected incorrectly

*-> The terminals labelled GND **must not** be connected to PE.*

ATICS-2-DIO terminals



Legend

1L, 1N	Connection line 1 (input line)
2L, 2N	Connection line 2 (input line)
L, N	Connection line 3 (output line)
I, k	Connection measuring current transformer T3 (STW3) for monitoring the load current downstream of the transfer switching device (short-circuit monitoring)
GND, En/Ex	Connection must not be used. Intended for Bender-internal purposes only (12 V).
IN1/GND, IN1	Digital input, configurable (see "Settings menu 5: Digital input" on page 75)
NC	Not used
24, 34, 44, 21	3 alarm relays (1 N/O contact each), 21 = common connection for the three alarm relays
IN2, IN3, IN4, IN2-4 GND	3 digital inputs
A, B	BMS bus connection
14, 12, 11	Alarm relay, programmable function

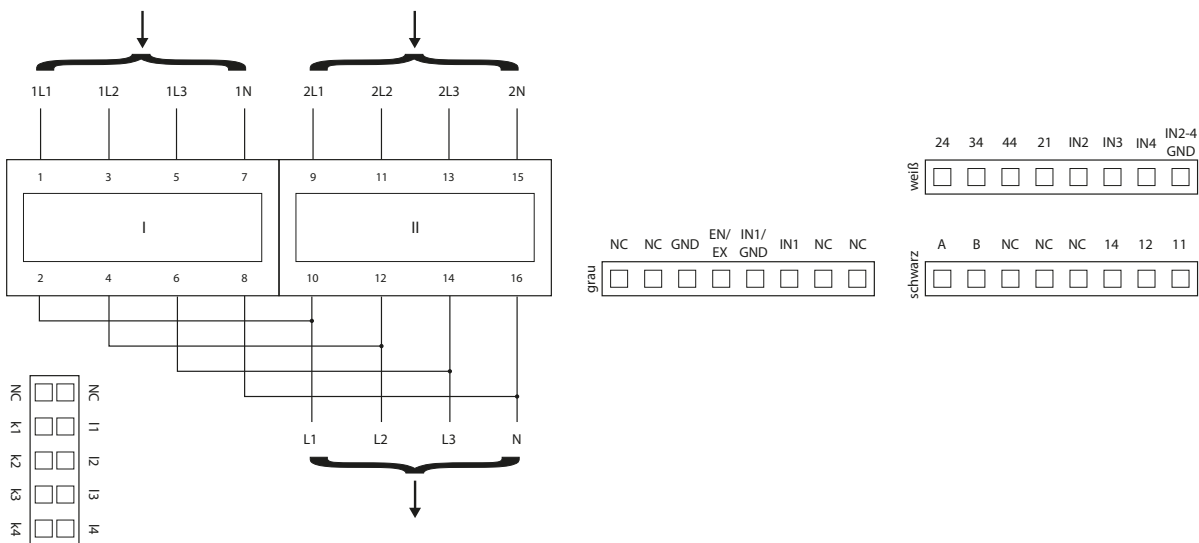
ATICS-4-DIO terminals



**ATICS-4-125A-DIO and ATICS-4-160A-DIO only:
High temperatures may affect the terminals**

The terminals for the connection of line 1, 2, 3 are designed for the specified rated operational current, at room temperature.

-> Avoid higher temperatures or ensure that the load current is reduced.



Legend

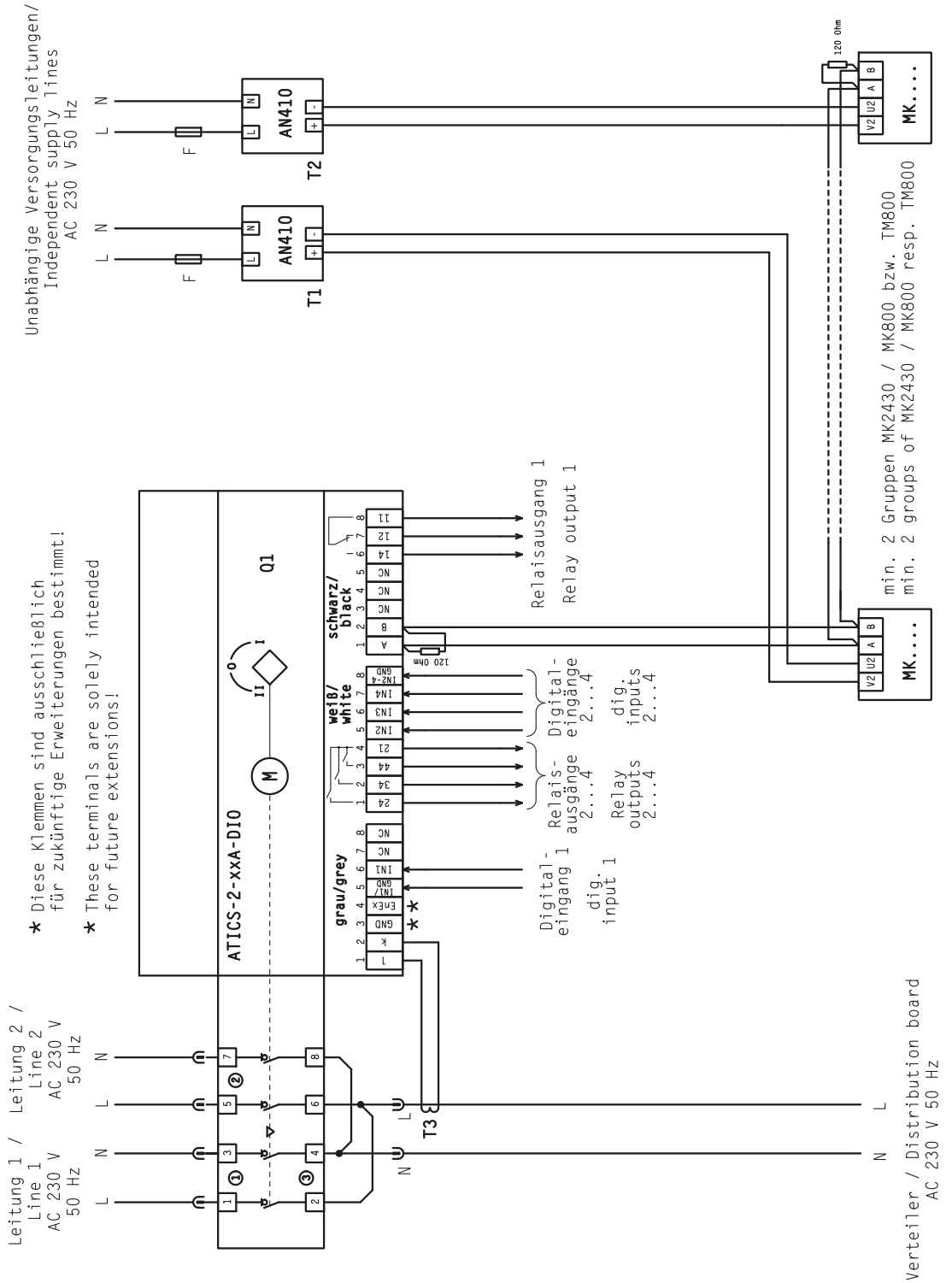
1L1, 1L2, 1L3, 1N	Connection line 1 (input line)
2L1, 2L2, 2L3, 2N	Connection line 2 (input line)
L1, L2, L3, N	Connection line 3 (output line)
NC	Not used
GND, En/Ex	Connection must not be used. Intended for Bender-internal purposes only (12 V).
IN1/GND, IN1	Digital input, configurable (see "Settings menu 5: Digital input" on page 75)
24, 34, 44, 21	3 alarm relays (1 N/O contact each), 21 = common connection for the three alarm relays
IN2, IN3, IN4, IN2-4 GND	3 digital inputs
A, B	BMS bus connection
14, 12, 11	Alarm relay, programmable function
I1, I2, I3, I4, k1, k2, k3, k4	Connection measuring current transformer T1 ... T4 for monitoring the load current downstream of the transfer switching device (short-circuit monitoring). Also refer to "Connection example: ATICS-4-DIO basic configuration" on page 34. Note: Insert the plug until it noticeably clicks into place

4.2.3 Connection example: ATICS-2-DIO basic configuration



Risk of destruction if connected incorrectly

The terminals marked "*" are intended for Bender-internal purposes only. If this is ignored, the ATICS® transfer switching device may be damaged.

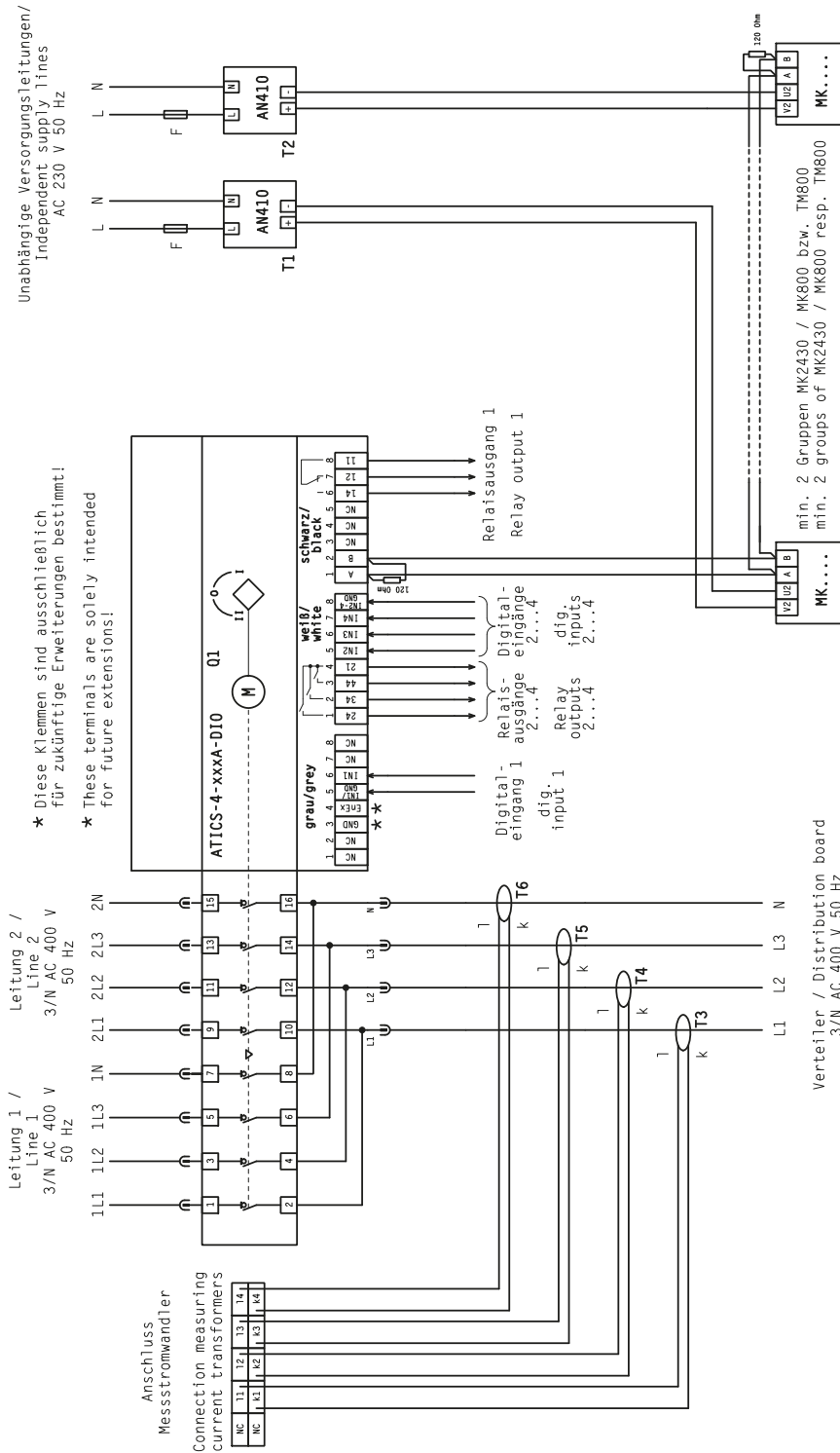


4.2.4 Connection example: ATICS-4-DIO basic configuration



Risk of destruction if connected incorrectly

The terminals marked "*" are intended for Bender-internal purposes only. If this is ignored, the ATICS® transfer switching device may be damaged.



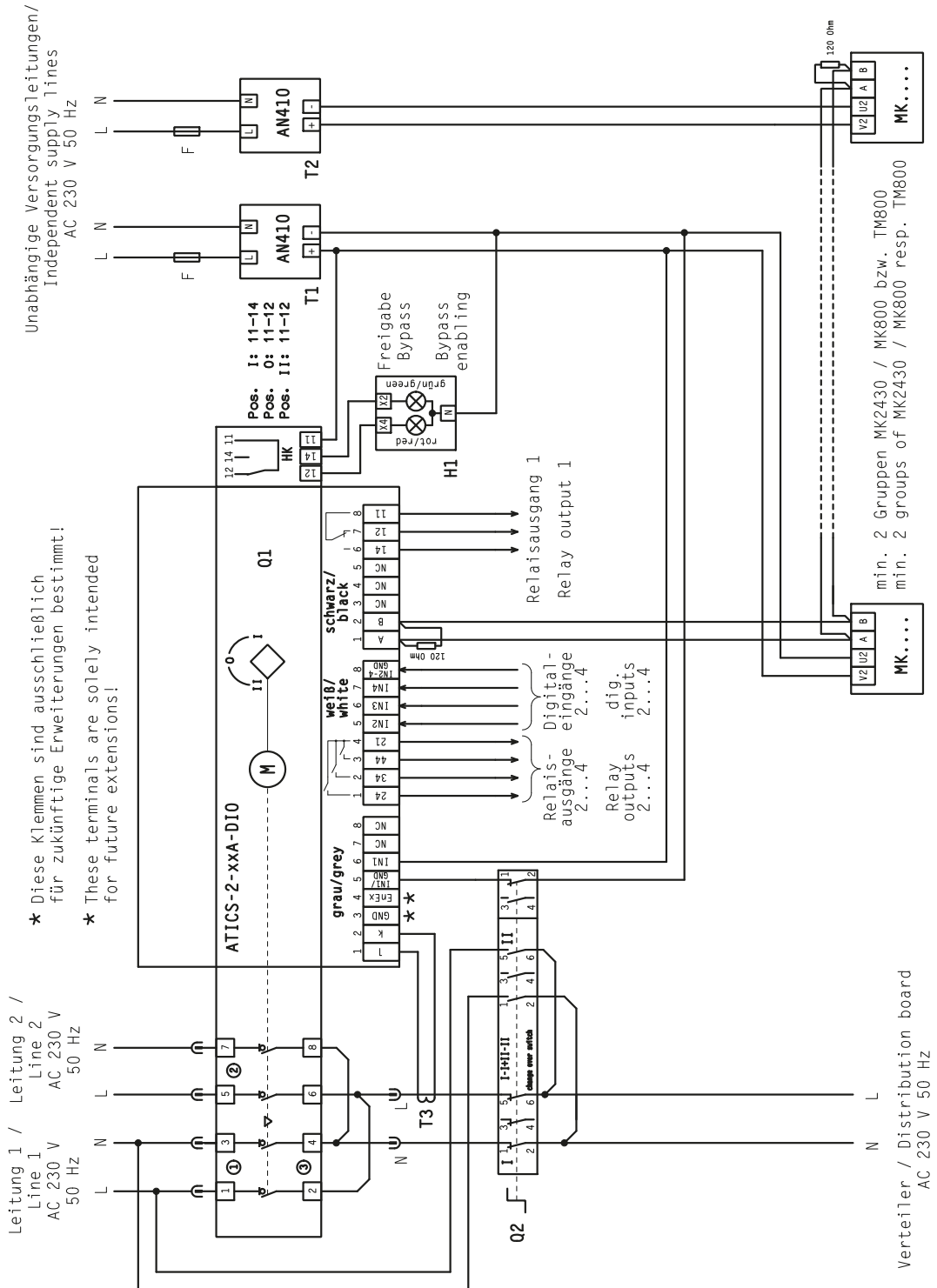
- * Diese Klemmen sind ausschließlich für zukünftige Erweiterungen bestimmt!
- * These terminals are solely intended for future extensions!

4.2.5 Connection example: ATICS-2-DIO with bypass switch



Risk of destruction if connected incorrectly

The terminals marked "*" are intended for Bender-internal purposes only. If this is ignored, the ATICS® transfer switching device may be damaged.



4.2.7 Instructions for connection

4.2.7.1 BMS bus

Ex works, the terminals A and B are available for connecting BMS-enabled devices. Alarm indicator and test combinations, alarm indicator and operator panels or other bus-enabled Bender devices can be connected. The bus line must be terminated at both ends with resistors (120 Ω, 0.25 W). Please note the information in the "BMS bus" manual.

4.2.7.2 MK... alarm indicator and test combination and TM... alarm indicator and operator panels

MK2430, MK800 and TM800 are used. They have the following capabilities:

- Displaying messages of the ATICS® transfer switching device
- Mutual monitoring for failure

4.2.7.3 SCADA systems (Supervisory Control and Data Acquisition)

If messages from the ATICS® transfer switching device are to be forwarded to a SCADA system, the following possibilities exist:

- Protocol converters (gateways, e.g. COM465...)
- Common alarm via the ATICS® relay output
- Alarms via interconnected signal converters SMO480-12 or SMO482-12.
TM800, SMO480-12 and SMO482-12 convert serial signals from Bender devices into potential-free relay contact alarms.

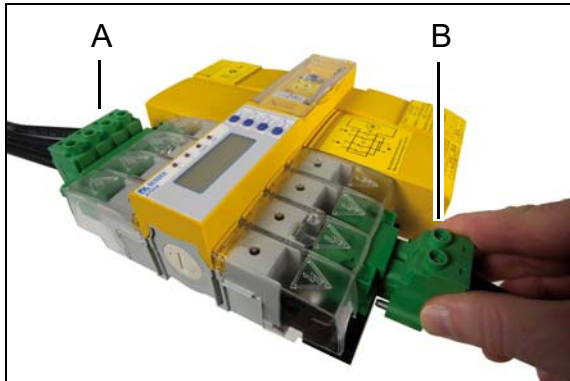
4.2.7.4 Bypass switch (optional)

The ATICS-BP-... bypass switch makes it possible to test and change the two-pole ATICS® transfer switching device without interrupting the power supply to the line downstream of the transfer switching device. Adjusting the settings: see "Operation with bypass switch" on page 92.

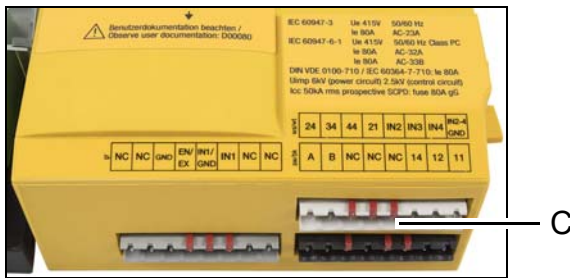
4.2.8 Fastening, inserting and securing connections

Connect the terminals to the plug connectors (A, B) and the connector plugs (C, D) according to the wiring diagram.

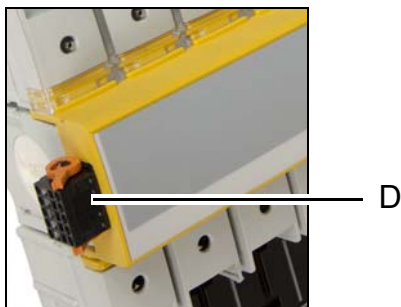
- Connect the lines 1, 2 and 3 to the plug connectors (A, B). Consider a stripping length of 20 mm and do not use ferrules. Use a Torx® screwdriver T20 or a slotted screwdriver of 6.5 x 1.2 mm. Tightening torque: 2.5 Nm ($\leq 25 \text{ mm}^2$) or 4.5 Nm ($\geq 25 \text{ mm}^2$).
- Connect the three connector plugs (C) with a slotted screwdriver of 2.5 x 0.4 mm. Stripping length: 7 mm. Tightening torque: 0.22...0.25 Nm.



Insert bottom green plug connector (B) and secure with mounting screws.
ATICS-2-DIO: After that, insert top green plug connector (A) and secure with mounting screws.
ATICS-4-DIO: Only then insert the two top green connector plugs and secure them with mounting screws.



Insert the three connector plugs (C).



ATICS-4-DIO only:
 Insert the connector plug (D) of the measuring current transformers T1...T4 (D).
 Note:
 The plug must noticeably click into place!

4.3 Other functions

4.3.1 Sealing the transparent cover of the transfer switching device



The transparent cover can only be sealed when it is closed (automatic mode).

4.3.2 Manual mode



CAUTION

Risk of injury from rotating Allen key

When the transparent cover is closed, ATICS® is in automatic mode. ATICS® detects this by means of the button being pressed under the transparent cover. When the transparent cover is opened, the button is no longer pressed and ATICS® switches to manual mode.

When the transparent cover is open, make sure that this button is not pressed accidentally. Check and make sure that the message "Manual mode" appears on the display. Only then can the Allen key be used to set the changeover switch to manual mode.



Manual mode can be enabled in the following ways:

- Open the transparent cover
- Set the digital input. "M/A" function must be set (see "Settings menu 5: Digital input" on page 75).



Manual mode:

- Put the handle on the Allen key
- Use the Allen key to change over
- The switching device can be held in switch position "0" and locked with a padlock.



4.3.3 Locking the transfer switching device with a padlock

It is only possible to lock the selector switch in manual mode (transparent cover open). The locking device can only be locked in switch position "0".

Padlock shackle diameter: 4 mm ... 8 mm (3/16" ... 5/16")

Locking the transfer switching device:



1. Pull out locking device
2. Thread in padlock and close it

The switch position cannot be changed until the lock has been removed and the locking device has been pushed in.

5. Commissioning, settings and testing

5.1 Design and installation



CAUTION

Risk of missing or false messages on the display on MK..., TM... or FTC...

MK... alarm indicator and test combinations, TM... alarm indicator and operator panels or BMS Ethernet gateways COM465..., which, together with ATICS®, are connected to a BMS bus must be loaded with the latest operating software (e.g. MK800/TM800/MK2430 V 4.03 or higher).

Older MK..., TM... or FTC... cannot interpret the alarms of ATICS® because the text modules required for ATICS® are not integrated yet. These devices must either be updated or replaced.

The TMK-SET configuration software must also be the latest version.



CAUTION

Risk that ATICS® does not switch

ATICS® requires enough current (2 pulses of 17 A for 30 ms) for a changeover. If there are several ATICS® in one system it is possible that the current is insufficient, especially when feeding from a battery-powered power supply.

Set the delay time $t(\text{start})$ on the devices in such a way that after voltage recovery the devices switch to the preferred supply one by one.

- Observe the relevant standards and regulations for installation and connection as well as the operating manual of the respective device.
- Provide at least two places for MK... alarm indicator and test combinations or TM... alarm indicator and operator panels. These panels display messages from the ATICS® automatic transfer switching device and monitor each other for failure. **This is an essential part of the safety concept (functional safety, SIL2).**
Application examples of MK... or TM... in hospitals:
 - Medical locations
 - Continuously manned area (e.g. nurses' station)
 - Technical area
- Provide a fail-safe power supply for the MK... or the TM...
- The TM... and MK... for the medical and technical area must be supplied with power from different lines and sources.
Example:
The MK... or the TM... in medical locations is supplied from line 3 of the transfer switching device. The MK... in technical areas is supplied from a fail-safe line backed up by battery.

5.1.1 Configure MK... or TM...



Configure MK... or TM... in a meaningful way

In addition to the alarm, also configure a brief message of what to do or who to notify. Examples:

- Failure line 1. Call building services Tel. -123.

MK... or TM... must display at least the following faults detected by ATICS®:

- Failure line 1, failure line 2
- Device error, device failure ATICS®
- Failure of the other MK... or TM...
- Device error with complete text or error code

5.1.2 ATICS-2-DIO: Messages on the BMS bus (channel use)

BMS channel	Entry in the menu 1.Alarm/meas. values	Description	Operational status message	Alarm message	Error
1	1. Line 1: 228V	Line 1	Voltage	Voltage*	---
2	2. Line 2: 183V	Line 2	Voltage	Voltage*	---
3	3. Position:1	Switch position	0, 1, 2	---	---
4	4. t(2->1):-- or SwitchBackLock	Return transfer delay time is enabled, counting backwards or switching back interlocking function	Seconds	---	---
5	5. Automatic mode	Manual/Automatic mode	---	Manual mode	---
6	6. Status	Device error	---		Error code (see chapter "8.1.2 ")
7	7. I(3):35A	Load current TN system	Current	Current	Connect. fault CT
8	8. Digital input:	Digital input 1	-- **	Alarm text**	---
9	9. Digital input:	Digital input 2	-- **	Alarm text**	---
10	10. Digital input:	Digital input 3	-- **	Alarm text**	---
11	11. Digital input:	Digital input 4	-- **	Alarm text**	---
12	without function				

* Message dependent on the parameter assignment in the "Settings menu 1: Changeover" -> "System" (for details see "Settings menu 1: Changeover" on page 69)

** Message dependent on the input parameter assignment (for details see "Messages for alarm on the digital input" on page 44)

5.1.3 ATICS-4-DIO: Messages on the BMS bus (channel use)

BMS channel	Entry in the menu 1.Alarm/meas. values	Description	Operational status message	Alarm message	Error
1	1. Line 1: 228V	Line 1	Voltage	Voltage*	Phase sequence left, unbalance
2	2. Line 2: 183V	Line 2	Voltage	Voltage*	Phase sequence left, unbalance
3	3. Position:1	Switch position	0, 1, 2	---	---
4	4. t(2->1):-- or SwitchBackLock	Return transfer delay time is enabled, counting backwards or switching back interlocking function	Seconds	---	---
5	5. Automatic mode	Manual/Automatic mode	---	Manual mode	---
6	6. Status	Device error	---		Error code (see chapter "8.1.2 ")
7	7. I(3):35A	Load current on the TN system on phase L1	Current	Current	Connect. fault CT
8	8. I(3):35A	Load current on the TN system on phase L2	Current	Current	Connect. fault CT
9	9. I(3):35A	Load current on the TN system on phase L3	Current	Current	Connect. fault CT
10	10. I(3):35A	Load current in the TN system on neutral conductor	Current	Current	Connect. fault CT
11	11. Digital input:	Digital input 1	-- **	Alarm text**	---
12	12. Digital input:	Digital input 2...4 (common alarm)	-- **	Alarm text**	---

* Message dependent on the parameter assignment in the "Settings menu 1: Changeover" -> "System" (for details see "Settings menu 1: Changeover" on page 69)

** Message dependent on the input parameter assignment (for details see "Messages for alarm on the digital input" on page 44)

Messages for alarm on the digital input

The following operational status and alarm messages may appear depending on the settings in the "Settings menu 5: Digital input":

Menu setting	Function of digital input	Alarm on BMS bus	BMS channel
off	Digital input switched off	No alarm	-
M/A	Enabling manual mode	Alarm "Manual mode"	5
Bypass	Bypass enabled	Alarm "Manual mode"	5
no2->1	Enable switching back interlocking function	Operational status message "Switch-back lock"	4
1<->2	Change preferred line	No alarm	
TEST	TEST- carry out changeover	No alarm	
ALARM	ATICS-2-DIO: Convert message at digital inputs 1...4 into alarms on the BMS bus	Alarm "Digital input"	8, 9, 10, 11
ALARM	ATICS-4-DIO: Convert message at digital inputs 1...4 into alarms on the BMS bus. Channel 11 = DigIn 1 Channel 12 = Common alarm DigIn 2...4 The common alarm code corresponds to the first message, which has triggered the common alarm.	Alarm "Digital input"	11, 12

5.1.4 Tests, decommissioning

- Abide by the relevant local or national regulations for periodic verifications on electrical installations.
- If you notice changes on ATICS®, you must immediately start checking the transfer switching device.

Heed the alarms on the transfer switching device. ATICS® reports in good time when testing or servicing is necessary or if safe operation of the device according to IEC 61508 is no longer guaranteed (e.g. due to component failure) and action must be taken.

5.2 Setting and testing according to the checklist

The settings made at the factory take into account a total changeover period $t \leq 0.5$ s and switching back to the preferred supply within 10 seconds on voltage recovery.

The response delay $t(\text{on})$, the dead time $t(0)$, the delay on release $t(\text{off})$ and the return transfer delay time $t(2 \rightarrow 1)$ of ATICS® are configurable and must be adjusted to the requirements of the specific application case and the requirements of DIN VDE 0100-710 (VDE 0100 Part 710) for automatic changeover devices. If the current monitoring (short-circuit detection) is deactivated in the menu "Settings" > "Current", an additional short-circuit current calculation and configuration of the response time $t(\text{on})$ is required.

- The total turn-off time (from the point at which the fault occurs until the arc in the overcurrent protective device is cleared) must be less than the minimum delay for the changeover of the automatic transfer switching device.
Setting: Response delay $t(\text{on})$
- If several automatic transfer switching devices are connected in series in a power supply system, it is recommended that they are time-graded.
Setting: Response delay $t(\text{on})$, return transfer delay time $t(2 \rightarrow 1)$ and delay on release $t(\text{off})$.
- As part of the response delay (to be custom-set), you must, at the very least, take into account the periods of time when the circuit experiences short interruptions, and the response times of the short-circuit protection equipment upstream or downstream. Regardless of this, a switchover pause corresponding to the installation location should be taken into account, in order to avoid switching overvoltages.
Setting: Response delay $t(\text{on})$, dead time $t(0)$ and return transfer delay time $t(2 \rightarrow 1)$.

The factory settings and system-specific settings of the ATICS® DIO transfer switching device are documented on the checklist. Please carry out all the work outlined in the list and log each test step.

Keep the checklist with this manual near to the device.

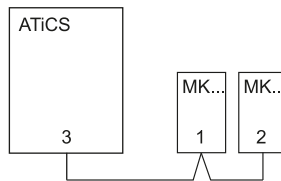
5.3 Addressing example



Insert terminating resistors correctly

Communication via the BMS bus is only guaranteed when there is a terminating resistor at the beginning and at the end of the BMS bus. Other terminating resistors cause malfunctions and must not be used. Please note the information in the "BMS bus" manual.

An automatic transfer switching device with two MK...



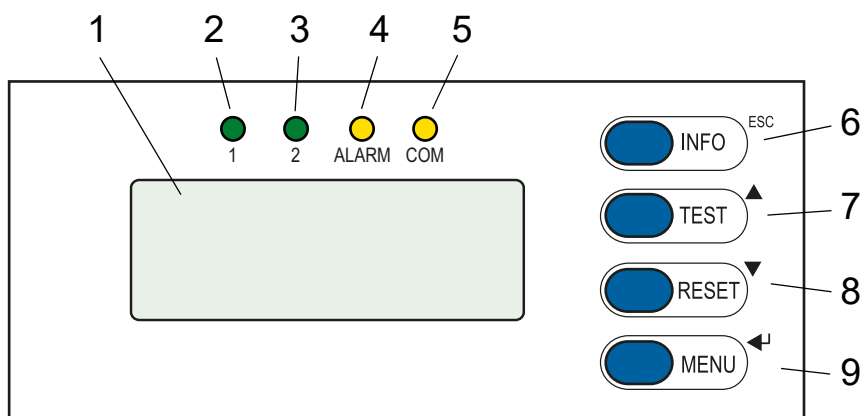
Device	Parameter	Address settings for an automatic transfer switching device
ATICS®	Bus address	3
MK...	Address	1
	Alarm address	3, 2*
MK...	Address	2
	Alarm address	3, 1*

* These alarm addresses are used for MK... or TM... to monitor one another for device failure

6. Operation

This chapter can also be used as a quick reference guide by technical operating personnel.

6.1 Operating and display elements



LED and LCD

1	Illuminated graphic LCD
2	LED "1" lights up when line 1 is ready
3	LED "2" lights up when line 2 is ready
4	LED "Alarm" lights up when there is an alarm message
5	LED "COM" flashes during communication via the BMS bus

The buttons have the following functions:

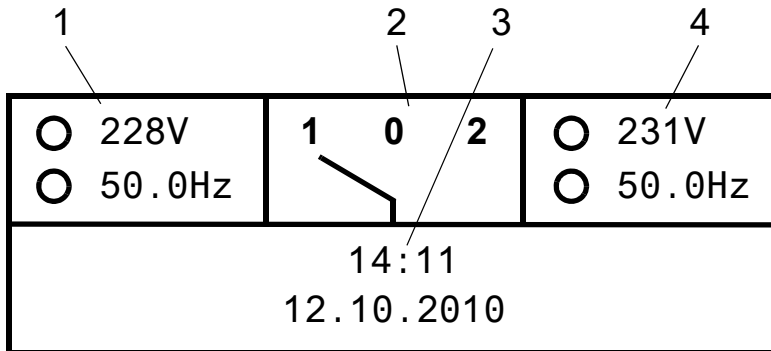
6	"INFO" ESC	Calls up standard information Exits the menu function without changing parameters
7	"TEST" ▲	Calls up test menu Parameter changes, scrolling
8	"RESET" ▼	Resets alarm and fault messages, unlocks switching back interlocking function Parameter changes, scrolling
9	"MENU" ↵	Toggles between the standard display, alarm display and "MENU" Confirms parameter changes (Enter button)

6.2 Quick reference guide

6.2.1 ATICS-2-DIO: Display under normal operating conditions

There is no alarm message. The LCD shows the standard information.

Example:



Legend

1	Line 1: Measured values of mains voltage and frequency
2	Switch position of the transfer switching device
3	Date and time
4	Line 2: Measured values of mains voltage and frequency

The device shows the alarm status for each measured value

<input type="radio"/>	No alarm
<input checked="" type="radio"/>	Alarm

Alternative displays in the bottom line of the display

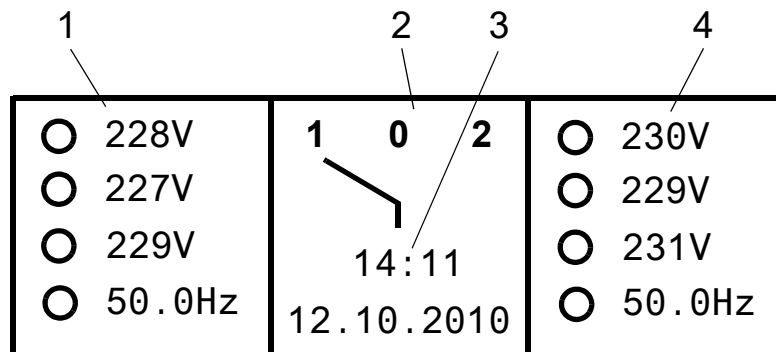
The device displays alarm messages in the bottom line of the display. Also shown there are:

- Switching back interlocking function
- Manual mode
- Countdown timer for return transfer time

6.2.2 ATICS-4-DIO: Display under normal operating conditions

There is no alarm message. The LCD shows the standard information.

Example:



Legend

1	Line 1: Measured values of mains voltage and frequency
2	Switch position of the transfer switching device
3	Date and time
4	Line 2: Measured values of mains voltage and frequency

The device shows the alarm status for each measured value

<input type="radio"/>	No alarm
<input checked="" type="radio"/>	Alarm

Alternative displays in the bottom line of the display

The device displays alarm messages in the bottom line of the display. Also shown there are:

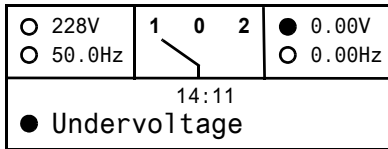
- Switching back interlocking function
- Manual mode
- Countdown timer for return transfer time

6.2.3 Display during fault condition

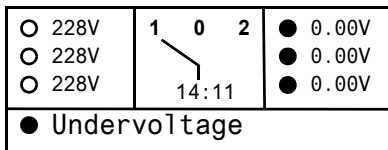
There is an alarm message.

- The yellow "Alarm" LED lights up.
- A detailed message appears on the LC display.

Example: Line 2 has no voltage

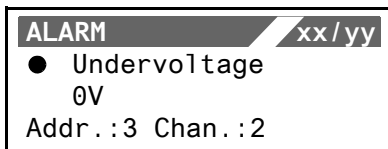


ATICS-2-DIO



ATICS-4-DIO

- Press the button "↓" to display the current alarm.



- Line 1: ALARM
xx = Serial number of the displayed alarm
yy = Number of pending messages
Use the arrow buttons "▲, ▼" to select the previous or next message.
- Line 2: Alarm status and alarm text
- Line 3: Measured value
- Line 4: Address and channel of the device triggering the message

If no button is pressed for a few seconds, the standard display reappears.



The alarm text displayed in case of failure of one line depends on the setting "System" in the "Settings menu 1: Changeover" on page 69.



If individual alarm messages are programmed on a TM... alarm indicator and operator panel or on an MK... alarm indicator and test combination, the display of this device may differ from the display of ATICS®.

- Press "↓" again, then the main menu will appear.

6.2.4 Test function

A test is used to test the functioning of the device. There are several ways to call up a test menu:

- Select standard display and then press the "TEST" button on the front panel of the device for at least one second
- Call up "TEST" mode in the Control menu

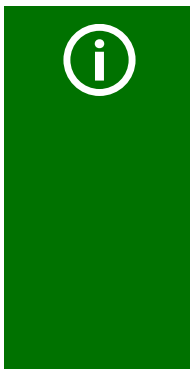
A test of the changeover function can also be triggered via a digital input (function similar to "Manual changeover"). Test menu:

```

Exit
1. Autom. changeover
2. Manual changeover
3. Last switch
    
```

Select:

Menu item	Function	Page
1. Autom. changeover	Test of the changeover function. Switches back automatically after time t(test).	52
2. Manual changeover	Test of the changeover function. Switches back after pressing the "RESET" button.	53
3. Last switch	Save last changeover as test	54
4. Generator	Start generator without changing over. Terminate test by pressing the "RESET" button.	55
5. Test communication	Test communication via the BMS bus. To do this, simulate an alarm and send an alarm message via the BMS bus.	56



Test menus 2...4 are protected by a password (see Settings-> Password -> Test). Password protection is only effective if the password has been enabled (switched on). When an attempt is made to open one of these menus, the password entry screen appears automatically:

```

TEST
Enter password:
  0 0 0
    
```



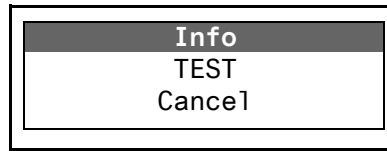
During an "Autom. changeover" test or "Manual changeover" test, changeover does not take place until a delay time has elapsed, which is indicated by the progress bar.



For technical reasons the menu items "Control> Test > Manual changeover" "Control > Test >Generator" and "Control > Test > Communication" cannot be accessed via a gateway (COM465..., CP700, ...).



If manual mode is selected for changeover (transparent cover open or digital input set to "manual changeover") then no changeover can take place under the test menu "Autom. changeover" or "Manual changeover". ATICS® then displays the following fault alarm:

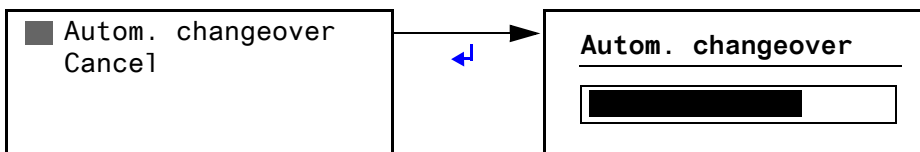


To run a test, the transfer switching device must be in automatic mode.

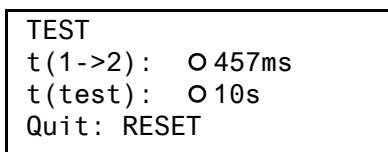


During an "Autom. changeover" or "Manual changeover" test, the changeover period $t(1 \rightarrow 2)$ is displayed. This is the time required for changing over from the preferred line to the redundant line. This time may differ from the return transfer time! Also refer to "Time diagram: Changeover between the preferred and the redundant line" on page 18

6.2.4.1 Test menu 1: Autom. changeover

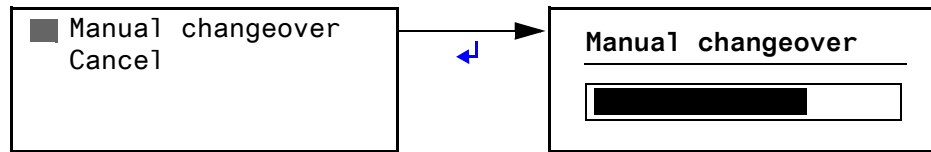


- Autom. changeover Test of the changeover function. The device changes to the redundant line. The changeover period $t(1 \rightarrow 2)$ is displayed. After the set time $t(\text{test})$ has elapsed, the device changes back to the preferred line.
- Cancel Back to test menu



The date of the test is saved in the test data logger to remember the next test once the test interval has elapsed. The messages from this test are also stored in the history memory.

6.2.4.2 Test menu 2: Manual changeover



Manual changeover	Test of the changeover function. The device changes to the redundant line and remains in this switch position. The changeover period $t(1 \rightarrow 2)$ is displayed. The device does not change back to the preferred line until the "RESET" button has been pressed.
Cancel	Back to test menu

```

TEST
t(1->2):  O 346ms
t(test):  O --
Quit:  RESET
    
```

The date of the test is saved in the test data logger to remember the next test once the test interval has elapsed. The messages from this test are also stored in the history memory.



Risk that the test is accidentally not terminated

If the test menu 3: "Manual changeover" is left after changing over to the redundant line, then ATICS® remains in this switch position and in "TEST" mode.

- Wait until "Quit: RESET" appears on the display.
- Press the "RESET" button.
- Check whether ATICS® has changed to the preferred line.



Manual mode aborts manual test

When the transparent cover is opened after changing over to the redundant line, ATICS® switches to manual mode. The test will be aborted. After closing the transparent cover, ATICS® switches back to the preferred line. **No** entry will be made in the test data logger.

6.2.4.3 Test menu 3: Last switch

If ATICS® has changed over due to a failure or a planned shutdown of the preferred line, then the last switching operation can be saved as a test.

Last switch

1. Date: ○20.09.11

2. TEST: ●02.03.11

■ Save

- 1. Date Date of the last changeover
- 2. Test Date on which the next test is due
- Overwrite Date of last changeover is saved as a test date

■ Save

Cancel

Save

- 1. Save Saves the date of last changeover as the test date, as long as that date is later than the previous entry.
 - 2. Cancel Back to test menu "Last switch"
- After saving, the date on which the next test is due is counted up by the test interval (in this case, 6 months).

Last switch

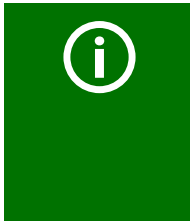
1. Date: ○20.09.11

2. TEST: ○21.03.11

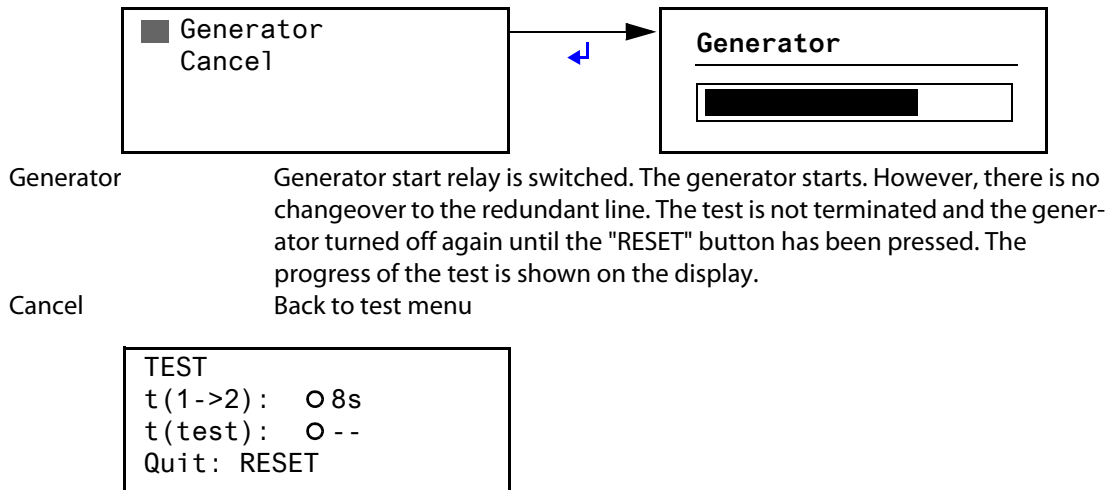
■ Save

The date of the test is saved in the test data logger to remember the next test once the test interval has elapsed. A changeover period is not saved. The messages from this test are also stored in the history memory.

6.2.4.4 Test menu 4: Generator



Executing this function makes sense only when a generator is connected to the redundant line and the associated settings have been carried out (see "Settings menu 1: Changeover" on page 69). To avoid voltage interruptions, in the test menu "Generator", ATICS® does not switch to the redundant line. In order to test the generator and the changeover switch, select "Autom. changeover" or "Manual changeover".



The messages from this test are also stored in the history memory. The date of the test is saved to remember the next test once the test interval has elapsed.



Risk that the generator test is accidentally not completed

If the test menu 5: "Generator" is left after the generator has started, then ATICS® remains in this switch position and in "TEST" mode. This means that the generator is not switched off.

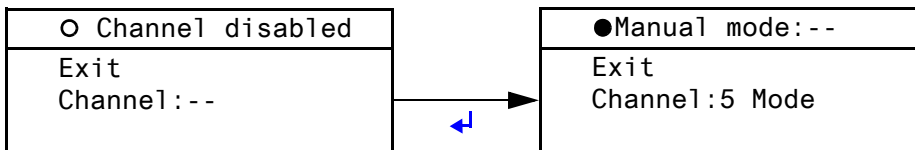
- Wait until "Quit: RESET" appears on the display.
- Press the "RESET" button.
- Check whether the generator is switched off.

6.2.4.5 Test menu 5: Test communication

Test communication via the BMS bus. In order to do this, a fault message is simulated. This alarm message is sent to evaluator devices (e.g. alarm indicator and operator panels, MK800, SMO...). Check that these devices are responding to the alarm message as requested. Select a channel:

1. Use the "▼" arrow button to go to the channel setting. Press the "↵" button.
2. Use the arrow buttons to select the channel for which the alarm message is to be simulated. Press the "↵" button to confirm your selection.
The alarm status will change from **○** (no alarm) to **●** (alarm). If the alarm status **●** is not displayed, then the settings made for ATICS® will not permit simulation of this alarm.

Example of an alarm simulation: "Channel 5: MANUAL MODE" is selected.



ATICS® stays in this menu until it is exited by pressing the "ESC" button. During this time, all the alarms on the BMS bus have the word "TEST".

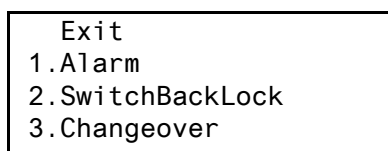


Only the alarm messages listed in the following table can be simulated: "ATICS-2-DIO: Messages on the BMS bus (channel use)" on page 42 and "ATICS-4-DIO: Messages on the BMS bus (channel use)" on page 43.

6.2.5 Reset function

A RESET is used to reset the alarm and fault messages for the device and for reactivating the switching back interlocking function of the changeover switch. There are several ways to call up a test menu:

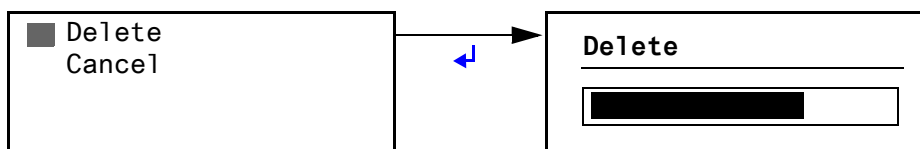
- Select standard display and then press the "RESET" button on the front panel of the device for at least one second.
- Select the "RESET" function from the Control menu. Reset menu:



Select:

Menu item	Function	Page
1. Alarm	Resets alarm and fault messages on the device.	57
2. SwitchBackLock	Reactivates the switching back interlocking function for the change-over function. The device changes back to the redundant line.	58
3. Changeover	Change alarm value for the: - maximum number of changeover operations performed - maximum number of operating hours - maximum number of changeover operations performed which were carried out with overcurrent or short-circuit current	59

6.2.5.1 Reset menu 1: Alarm

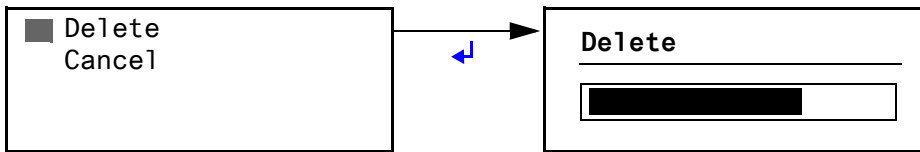


Delete	Resets alarm and fault messages on the device. The progress of the test is shown on the display. The reset is required if one or more alarm-triggering parameters are not constantly monitored so that the end of the alarm condition was not detected.
Cancel	Back to reset menu

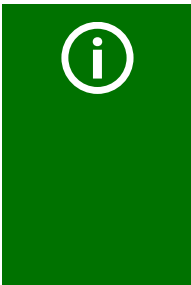
For all pending alarms, the date and time of the reset are entered in the line "End" in the history memory. The "ALARM" LED goes out.

If the fault persists, a new entry is written in the history memory. The "ALARM" LED is still lit.

6.2.5.2 Reset menu 2: SwitchBackLock



- Delete Cancels the switching back interlocking function for changeover. The progress of the test is shown on the display. The device changes back to the redundant line.
- Cancel Back to reset menu



There are different possibilities to deactivate the switching back interlocking function via a gateway (COM4xx, CP700 etc.):

- *Via menu: Select "RESET > Switch-back lock". Requirement: Parameter setting must be possible (menu "Settings > Interface > Settings > On").*
- *Via Modbus control commands: Using the command "Changeover to line 1 or line 2". A test must be allowed (menu "Settings > Interface > Test > On").*

6.2.5.3 Reset menu 3: Changeover

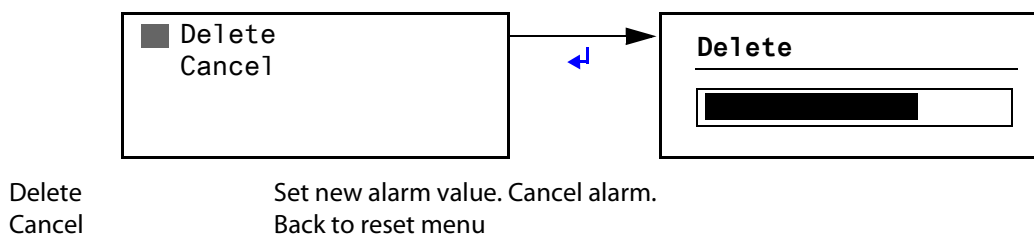
ATICS® monitors the parameters important for its service life. On reaching the set limits, the unit displays an alarm message. Replacement of the device must be initiated. During the period until it is replaced the annoying alarm can be "deleted" by increasing the limits.



Once the stipulated service life has been exceeded, safe operation of the transfer switching device is not guaranteed!
Fatigued components can fail. Replace the device as soon as possible.

Menu	Meaning
Exit	Exit "Changeover" reset menu; go up one menu level
1. ○ Changeover: xxx	Number of changeovers performed
2. Alarm: ○ 8000	Alarm value for maximum number of changeovers performed*
Delete	Increase alarm value by 500 changeovers
4. ○ In operation: xxh	Operating hours counter (h=hours, d=days, mo=months)
5. Alarm: ○ 120mo	Alarm value for maximum number of operating hours*
Delete	Increase value by 200 days (this is only possible when the alarm value is already exceeded)
7. ○ Changeover I>: 0	Number of changeovers performed which were carried out with overcurrent or short-circuit current (see also "Menu 2: Changeover" on page 65)
8. Alarm: ○ 1	Alarm value for maximum permitted number of changeovers performed which were carried out with overcurrent or short-circuit current*
Delete	Increase alarm value by 1 changeover

* for functional safety



7. Menu mode: Operation and setting

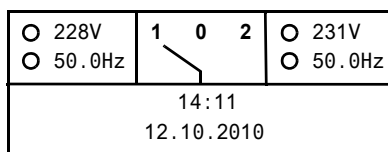
7.1 Switching on and calling up the main menu

When the device is connected to the power supply, the following information appears on the display for approx. 3 seconds.

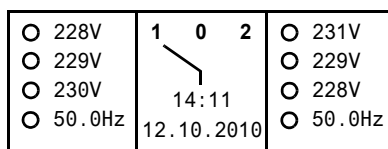


If the device has been without power for several days, the time and date must be reset.

If there are no messages pending, the standard display will appear after the start.

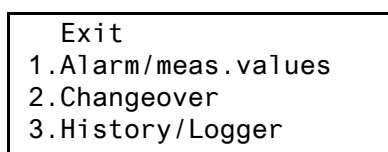


ATICS-2-DIO



ATICS-4-DIO

Press the "MENU" button to open the main menu.



The following buttons can be used in the main menu:

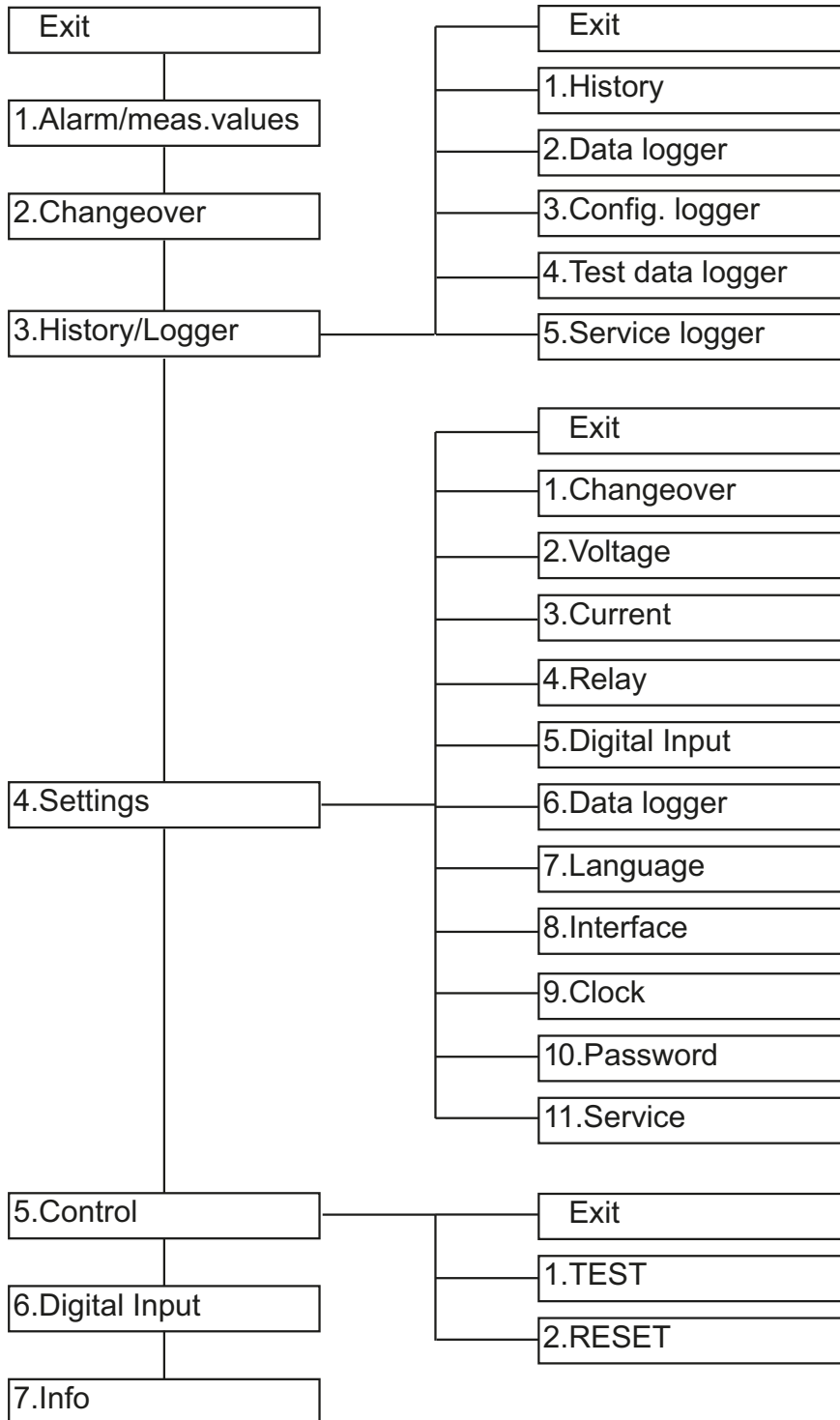
- ▲, ▼ Select menu items
- ↵ Confirm the selected menu item (Enter)
- ESC Exit function or go up one menu level



The menu mode is exited automatically if no buttons are pressed in one of the menus for more than five minutes (exception: "Test communication" in the "TEST" menu).

7.2 Menu overview diagram

The following diagram will help you to navigate through the menus:



7.3 Main menu functions

Menu item	Function	Page
Exit	Exit menu mode	
1. Alarm/meas.values	Displays saved status messages, alarm messages and measured values	63
2. Changeover	Displays information on the changeover function (number, test)	65
3. History/Logger	Displays the history memory, data logger, config. logger, test data logger and service logger	66
4. Settings	Various settings for this device	68
5. Control	Run TEST and RESET for this device	83
6. Digital Input	Display voltage level of the digital inputs	83
7. Info	Display information on device type and firmware versions	83

7.3.1 Menu 1: Alarm/meas.values

Displays current status messages, alarm messages and measured values. The device shows the alarm status for each menu item: ○ = no alarm, ● = alarm.

7.3.1.1 Alarm/meas. values ATICS-2-DIO

Menu	Meaning
Exit	Exit "Alarm/meas. values" menu; go up one menu level
1. ○ Line 1: 228V	Line 1: Measured value mains voltage
2. ● Line 2: 183V	Line 2: Measured value mains voltage
3. ○ Position:1	Switch position of the transfer switching device
4. ○ t(2->1);-- or 4. ○ SwitchBackLock	Return transfer delay time is enabled, seconds counting backwards or Switching back interlocking function enabled
5. ○ Auto mode	○ Automatic mode or ● manual mode
6. ● Status	Device error (e.g.: no BMS bus master present)
7. ○ I(3):35A	Load current on the TN system or "No CT connected" fault
8. ○ Digital Input:	Alarm digital input 1 (see "Settings menu 5: Digital input" on page 75)
9. ○ Digital Input:	Alarm digital input 2 (see "Settings menu 5: Digital input" on page 75)
10. ○ Digital Input:	Alarm digital input 3 (see "Settings menu 5: Digital input" on page 75)
11. ○ Digital Input:	Alarm digital input 4 (see "Settings menu 5: Digital input" on page 75)

Menu	Meaning
12. <input type="radio"/> --	without function
13. <input type="radio"/> Line 1: 50.0Hz	Line 1: Measured value frequency
14. <input type="radio"/> Line 2: 50.0Hz	Line 2: Measured value frequency

7.3.1.2 Alarm/meas. values ATICS-4-DIO

Menu	Meaning
Exit	Exit "Alarm/meas. values" menu; go up one menu level
1. <input type="radio"/> U1(1-N): 230V	Line 1: Measured values mains voltage phase 1 to N*
2. <input checked="" type="radio"/> U2(1-N): 0V	Line 2: Measured values mains voltage phase 1 to N* (here: Line 2 failed)
3. <input type="radio"/> Position:1	Switch position of the transfer switching device
4. <input type="radio"/> t(2->1):-- or 4. <input type="radio"/> SwitchBackLock	Return transfer delay time is enabled, seconds counting backwards or Switching back interlocking function enabled
5. <input type="radio"/> Auto mode	<input type="radio"/> Automatic mode or <input checked="" type="radio"/> manual mode
6. <input checked="" type="radio"/> Status	Device error (e.g.: no BMS bus master present)
7. <input type="radio"/> I(1):35A	Load current in the TN system on phase L1 or "No CT connected" fault
8. <input type="radio"/> I(2):33A	Load current in the TN system on phase L2 or "No CT connected" fault
9. <input type="radio"/> I(3):37A	Load current in the TN system on phase L3 or "No CT connected" fault
10. <input type="radio"/> I(N):0A	Load current in the TN system on neutral conductor N or "No CT connected" fault
11. <input type="radio"/> Digital Input:	Alarm digital input 1 (see "Settings menu 5: Digital input" on page 75)
12. <input type="radio"/> Digital Input:	Alarm digital input 2...4 (see "Settings menu 5: Digital input" on page 75)
13. <input type="radio"/> U1(1-N): 230V	Line 1: Measured value mains voltage phase L1 to neutral conductor N
14. <input type="radio"/> U1(2-N): 230V	Line 1: Measured value mains voltage phase L2 to neutral conductor N
15. <input type="radio"/> U1(3-N): 230V	Line 1: Measured value mains voltage phase L3 to neutral conductor N
16. <input type="radio"/> U1(1-2): 400V	Line 1: Measured values phase L1 to phase L2
17. <input type="radio"/> U1(2-3): 400V	Line 1: Measured values mains voltage phase L2 to phase L3
18. <input type="radio"/> U1(3-1): 400V	Line 1: Measured values mains voltage phase L3 to phase L1
19. <input type="radio"/> Line 1: 50.0Hz	Line 1: Measured value frequency
20. <input type="radio"/> Unbalance: 0%	Line 1: Unbalance of phases L1, L2, L3

Menu	Meaning
21. ○ Phase sequence: left	Line 1: Phase sequence of the phases L1, L2, L3
22. ○ U2(1-N): 230V	Line 2: Measured value mains voltage phase L1 to neutral conductor N
23. ○ U2(2-N): 230V	Line 2: Measured value mains voltage phase L2 to neutral conductor N
24. ○ U2(3-N): 230V	Line 2: Measured value mains voltage phase L3 to neutral conductor N
25. ○ U2(1-2): 400V	Line 2: Measured values phase L1 to phase L2
26. ○ U2(2-3): 400V	Line 2: Measured values mains voltage phase L2 to phase L3
27. ○ U2(3-1): 400V	Line 2: Measured values mains voltage phase L3 to phase L1
28. ○ Line 2: 50.0Hz	Line 2: Measured value frequency
29. ○ Unbalance: 0%	Line 2: Unbalance of phases L1, L2, L3
30. ○ Phase sequence: left	Line 2: Phase sequence of the phases L1, L2, L3

* In the event of an alarm, the phase voltage which has first been detected as faulty and which has triggered the alarm is indicated.



All messages (with the exception of Measured value frequency) are also available on the BMS bus (also refer to "Messages with error code or service code" on page 86).

7.3.2 Menu 2: Changeover

Displays information on the changeover function (number, test). The device shows the alarm status for each menu item: ○ = No alarm, ● = Alarm

Menu	Meaning
Exit	Exit "Changeover" menu; go up one menu level
1. ○ Changeover: xxx	Number of changeovers performed
2. ○ In operation: xxh	Operating hours counter (h=hours, d=days, mo=months)
3. ○ Changeover I>: xx	Number of changeovers performed which were carried out with overcurrent of short-circuit current. These changeovers reduce the service life of the ATICS® transfer switching device. Currents in excess of 130 A (if an STW3 is used) or 250 A (if an STW4 is used) are considered to be overcurrents or short-circuit currents.
4. ○ TEST: dd.mm.yy	Date for next test (changeover)
5. ○ Service: dd.mm.yy	Date for next service
6. ○ TEST: dd.mm.yy	Date of the last test (TEST) or the last changeover (LAST SWITCH).

7.3.3 Menu 3: History/Logger

The device saves the history of alarm messages, measured values, settings, tests and servicing activities in different memories (logger).

See the technical specifications for information about the maximum number of events which can be saved. Once the maximum number of events which can be saved is reached, the latest event is written over the oldest entry (Entry 1).

Menu item	Function
Exit	Exit "History/Logger" menu; go up one menu level
1. History	The "History" menu provides information about alarm messages and tests performed. It also indicates whether an alarm is still pending or when it was acknowledged by pressing the "mute" button on a TM... alarm indicator and operator panel or an MK... alarm indicator and test combination.
2. Data logger	Displays the history of measured values: Voltage line 1, voltage line 2, switch position of the transfer switching device, load current downstream of the transfer switching device I(3).
3. Config.logger	Shows the history of all parameter changes, their origin, modified settings and the date of the change (can only be displayed on the device): Internal Change has been made in the "Settings" menu on the device. External Change has been made via an external device (e.g. BMS-Ethernet gateway COM465...). Auto Automatic change, in response to a change of another parameter. For an example, refer to "Settings menu 4: Relay" on page 73.
4. Test data logger	Displays the history of the tests carried out: date, time and changeover period. Also refer to "Time diagram: Changeover between the preferred and the redundant line" on page 18.
5. Service logger	Displays the history of the service activities carried out: Date, time and service codes. Meaning of the displayed service code: see table "Messages with error code or service code" on page 86.

7.3.3.1 Operating example: History

1. Use the arrow buttons to select the entry you require. The most recent entry appears first on the display. Older messages can be selected using the arrow buttons.

```

History 500/500
Start: 04.12.08/16:00:01
Ack.: 04.12.08/16:00:33
End: 04.12.08/16:03:17

```

2. Press the "↓" button to call up the message text of the selected entry. The path the message took to reach the device is displayed (In this case: undervoltage, BMS bus address 3, channel 1). The table on the following page contains information about other possible displays.

```

History 500/500
● Undervoltage
min.0V/max.0V
Addr.:3 Chan.:1

```

3. Press the "↑" to return to entry selection.

Repeat these operating steps for all messages you need. Then press "ESC" to exit the menu.

The message "TEST" appears in the last line of the history memory alarm text display: Note that the current history memory entry was created as the result of a test initiated on this device.

7.3.3.2 Operating example: Config.logger

1. Use the arrow buttons to select the entry you require. In this case: The settings for the digital input are changed here.

```

CONFIG.LOGGER 10/17
Modific. (auto)
Digital Input
04.10.11/16:03:17

```

2. Press "↓" to call up the additional text for the selected entry. The function of the digital input has been changed from "off" to "0". The last line contains an identification code for the type of modification (in this case: [4/1]). Channel 1 means that the first digital input has been changed. Please contact the Bender service and provide the identification number, when the modification led to an undesirable behaviour of the device.

```

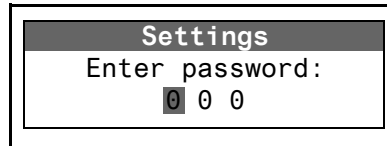
Config.logger 10/17
Function
off -> 0
Channel: 1 [4/1]

```

7.3.4 Menu 4: Settings



The setup menus are protected by a password (see Settings-> Password -> Settings). Password protection is only effective if the password has been enabled (switched on). When an attempt is made to open one of the setup menus, the entry screen for entering the password appears automatically:



Once a valid password has been entered, full access will be granted to all setup menus (except the "Service" menu) until menu mode is exited.

The following menu items are available for configuring the device:

Menu item	Function	Page
Exit	Exit "Settings" menu; go up one menu level	
1. Changeover	Adjusting settings for changeover switch	69
2. Voltage	Adjusting settings for voltage monitoring	71
3. Current	Adjusting settings for current monitoring (short-circuit detection)	72
4. Relay	Setting mode of operation and function of alarm relays	73
5. Digital input	Setting operating behaviour of digital inputs	75
6. Data logger	Adjusting settings for data logger	77
7. Language	Selection of the operating language for the device (English, German or French)	79
8. Interface	Setting the BMS bus address of this device, allowing modification of settings via interface, allowing test to be started via interface.	79
9. Clock	Setting the date and time on the real-time clock on this device. The time setting is synchronised via the BMS bus. The device with address 1 (e.g. MK2430, MK800 or TM... alarm indicator and operator panel) synchronises all other devices every hour.	80
10. Password	The device has two separate passwords for the "Settings" menu and the "TEST" menu. Adjustable in each case: Change password, enable/disable password	81
11. Service	These settings can only be made by authorised Bender service personnel. Retrieve information about the device status, enter settings for special operating conditions and execute a firmware update.	81

7.3.4.1 Settings menu 1: Changeover



The times set in this menu determine the timing of a changeover. Also note the time charts on page 18 et seq.

The following settings for the changeover are available:

Menu	Meaning																														
Exit	Exit settings menu "Changeover"; go up one menu level																														
1. t(start)	Delayed switch-on after total power failure: Setting range: 0 s...100 s Resolution of settings: 50 ms/100 ms/1 s/5 s																														
2. t(0)	Time delay in switch position "0" (dead time): Setting range: 140 ms...100 s Resolution of settings: 10 ms/50 ms/100 ms/1 s/5 s																														
3. t(2->1)	Return transfer delay time to the preferred line: Setting range: 0 s...180 min Resolution of settings: 50 ms/100 ms/1 s/5 s/1 min																														
4. t(test)	Test time for "Autom. changeover": Setting range: 2 s...180 min Resolution of settings: 1 s/5 s/1 min																														
5. System	<table> <tbody> <tr> <td>U1-U2</td> <td>voltage line 1 - voltage line 2</td> </tr> <tr> <td>Line G</td> <td>line 1 - generator</td> </tr> <tr> <td>L1-L2</td> <td>line 1 - line 2</td> </tr> <tr> <td>AV-SV</td> <td>Normal power supply source - Safety power supply source</td> </tr> <tr> <td>SV-AV</td> <td>Safety power supply source - Normal power supply source</td> </tr> <tr> <td>SV-UPS</td> <td>Safety power supply source - Special safety power supply source</td> </tr> <tr> <td>UPS-SV</td> <td>Special safety power supply source - Safety power supply source</td> </tr> <tr> <td>SV-BSV</td> <td>Safety power supply source - Battery-supported safety power supply</td> </tr> <tr> <td>BSV-SV</td> <td>Battery-supported power supply - Safety power supply source</td> </tr> </tbody> </table> <p>The setting also influences the creation of the alarm text which is displayed in case of voltage failure on a line:</p> <table> <thead> <tr> <th>Setting</th> <th>alarm text</th> </tr> </thead> <tbody> <tr> <td>U1-U2</td> <td>Undervoltage, overvoltage, voltage value</td> </tr> <tr> <td>Line G, L1-L2</td> <td>failure line 1, failure line 2</td> </tr> <tr> <td>AV-SV, SV-AV</td> <td>Fail.norm.supply, Fail.safet.supply</td> </tr> <tr> <td>SV-UPS, UPS-SV</td> <td>Fail.safet.supply, Failure UPS</td> </tr> <tr> <td>SV-BSV, BSV-SV</td> <td>Fail.safet.supply, Failure BSV</td> </tr> </tbody> </table> <p><i>Explanation of abbreviations:</i> AV = Normal power supply source SV = Safety power supply source UPS = Special safety power supply source BSV = Battery-supported safety power supply</p>	U1-U2	voltage line 1 - voltage line 2	Line G	line 1 - generator	L1-L2	line 1 - line 2	AV-SV	Normal power supply source - Safety power supply source	SV-AV	Safety power supply source - Normal power supply source	SV-UPS	Safety power supply source - Special safety power supply source	UPS-SV	Special safety power supply source - Safety power supply source	SV-BSV	Safety power supply source - Battery-supported safety power supply	BSV-SV	Battery-supported power supply - Safety power supply source	Setting	alarm text	U1-U2	Undervoltage, overvoltage, voltage value	Line G, L1-L2	failure line 1, failure line 2	AV-SV, SV-AV	Fail.norm.supply, Fail.safet.supply	SV-UPS, UPS-SV	Fail.safet.supply, Failure UPS	SV-BSV, BSV-SV	Fail.safet.supply, Failure BSV
U1-U2	voltage line 1 - voltage line 2																														
Line G	line 1 - generator																														
L1-L2	line 1 - line 2																														
AV-SV	Normal power supply source - Safety power supply source																														
SV-AV	Safety power supply source - Normal power supply source																														
SV-UPS	Safety power supply source - Special safety power supply source																														
UPS-SV	Special safety power supply source - Safety power supply source																														
SV-BSV	Safety power supply source - Battery-supported safety power supply																														
BSV-SV	Battery-supported power supply - Safety power supply source																														
Setting	alarm text																														
U1-U2	Undervoltage, overvoltage, voltage value																														
Line G, L1-L2	failure line 1, failure line 2																														
AV-SV, SV-AV	Fail.norm.supply, Fail.safet.supply																														
SV-UPS, UPS-SV	Fail.safet.supply, Failure UPS																														
SV-BSV, BSV-SV	Fail.safet.supply, Failure BSV																														

Menu	Meaning
6. SwitchBackLock	on Switching back interlocking function is switched on off Switching back interlocking function is switched off Also refer to "Time diagram: Changeover between the preferred and the redundant line" on page 18.
7. Prefer.supply	1 Line 1 2 Line 2 In generator mode, Line 1 is always the preferred line. Note: A parameter change may cause an immediate changeover.
8. Test interval	Interval for testing the changeover function: Setting range: off, 1...24 months Resolution of setting: 1 month
9. Reminder	Warning time for test interval: Setting range: off, 1...30 days Resolution of setting: 1 day
10. Serviceinterv.	Service interval: Setting range: off, 6...48 months Resolution of setting: 6 months
11. Reminder	Warning time for service interval (d=day): Setting range: off, 1...30 days Resolution of setting: 1 day
12. t(Gen.Start)	Time delay for changeover to generator (measured from "Voltage Line 2 = OK"): Setting range: 0 s...100 s (only active, when System=Line G) Resolution of settings: 1 s/5 s
13. t(Gen.Max)	Maximum generator start time. Monitoring whether the generator starts (time to "Voltage Line 2 = OK"). Setting range: 0 s...100 s (only active, when System=Line G) Resolution of setting: 1 s/5 s
14. t(Gen.Off)	Time delay for turning off the generator after changing back to the preferred line: Setting range: 2 s...180 min (only active when System=Line G) Resolution of setting: 1 s/5 s/1 min

7.3.4.2 Settings menu 2: Voltage

In this menu, you can adjust settings for monitoring the voltage on line 1 and line 2 individually or together.

Example: Line 1 is set to "Undervolt: 184 V". If the voltage on line 1 falls below 184 V, the device displays an alarm message. If the voltage on line 2 is within the set range, a change-over to line 2 follows. ATICS® returns to line 1 if the voltage on line 1 exceeds the pre-set value (in this case 184 V): plus the selected hysteresis.

Selecting a line:

1. Use the "▲" arrow button to go to the line setting. Press the "↵" button.
2. Use the arrow buttons to select one line (voltage 1, 2) or both lines (voltage 1...2). Press the "↵" button to confirm your selection.

Setting
a voltage for one line

Voltage:	2
Exit	
1.Undervolt.:	184V
2.Overtoltage:	250V

Setting a voltage for both
lines

Voltage:	1..2
Exit	
1.Undervolt.:	184V
2.Overtoltage:	250V

Adjusting the settings:

Menu	Meaning
Exit	Exit settings menu "Voltage"; go up one menu level
1. Undervolt.	Undervoltage; Setting range: 160...207 V
2. Overtolt.	Overtoltage; Setting range: 240...275 V
3. t(on)	Response delay*: Setting range: 50 ms...100 s Resolution of settings: 50 ms/100 ms/1 s/5 s/10 s
4. t(off)	Delay on release*: Setting range: 200 ms...100 s Resolution of settings: 50 ms/100 ms/1 s/5 s/10 s
5. Hysteresis	Setting range: 2...10 % Resolution of setting: 1 %
6. Unbalance (ATICS-4-DIO only)	Setting range: off, 2...30 % Resolution of setting: 1 %
7. Phase sequence (ATICS-4-DIO only)	on: Phase sequence monitoring switched on off: Phase sequence monitoring switched off

Also note the time charts on page 18 et seq.

7.3.4.3 Settings menu 3: Current

In this menu, you can adjust settings for current monitoring (short-circuit detection) downstream of the transfer switching device.

Settings menu 3: Current for ATICS-2-DIO

The current is detected via a measuring current transformer (T3 in the connection example).

Menu	Meaning
Exit	Exit settings menu "Current"; go up one menu level
1. Mode	on Current monitoring is switched on off Current monitoring switched off
2. CT	STW3 Bender measuring current transformer STW3 STW4 Bender measuring current transformer STW4
3. CT monitor	on CT connection monitoring is switched on off CT connection monitoring switched off Note: External interference from loads can cause false tripping. In this case, the function has to be deactivated.

Settings menu 3: Current for ATICS-4-DIO

The current is detected via the measuring current transformers (T3...T6 in the connection example). If the optional measuring current transformer T6 is not available, its function has to be switched off in the "Current 4" menu. Select measuring current transformer:

1. Use the "▲" arrow button to go to the measuring current transformer setting. Press the "↵" button.
2. Use the arrow buttons to select one (e.g. current 2) or all four measuring current transformers (current 1...4). Press the "↵" button to confirm your selection.

Setting one CT

Current:	2
Exit	
1. Mode:	on
2. CT:	STW3

Setting all four CTs

Current:	1..4
Exit	
1. Mode:	on
2. CT:	STW3

Menu	Meaning
Exit	Exit settings menu "Current"; go up one menu level
1. Mode	on Current monitoring is switched on off Current monitoring switched off
2. CT	STW3 Bender measuring current transformer STW3 STW4 Bender measuring current transformer STW4
3. CT monitor	on CT connection monitoring is switched on off CT connection monitoring switched off Note: External interference from loads can cause false tripping. In this case, the function has to be deactivated.

7.3.4.4 Settings menu 4: Relay

In this menu, you adjust settings for the mode of operation and function of the relay outputs (alarm relays). The function can be set for each relay as follows: alarm message, operational status message. The "GenSt" function (Generator start) can only be selected effectively for relay 1.

The setting of this function has an influence on the following menus. If "Alarm" is set and then "Line 1: on" is selected, the relay will switch when line 1 has failed. If "Active" is set and then "Line 1: on" is selected, the relay will switch when line 1 is in operation. The setting "on" can be selected for several menus simultaneously. The relay switches when at least one of the conditions is met.

If "GenSt" is set for alarm relay 1, the operating mode will always be set to "N/C-T". The other settings of the "Relay 1" menu are disabled. The alarm message "Failure line 2" is suppressed.



If the setting "Line G" is selected in the "Changeover -> System" settings menu, the alarm relay 1 is permanently set to:

- 1. Function: GenSt
- 2. Relay mode: N/C-T
- Menu items 4...9 inactive

Select a relay as follows:

1. Use the "▲" arrow button to go to the alarm relay setting. Press the "↵" button.
2. Use the arrow buttons to select one (e.g. relay 2) or all four alarm relays (relays 1...4). Press the "↵" button to confirm your selection.

Setting one relay

Relay:	2
Exit	
1. Function:	ALARM
2. Relay mode:	N/C-T

Setting all four relays
("GenSt" can be selected but is only set for relay 1, relay 2...4 are set to "ALARM".)
)

Relay:	1..4
Exit	
1. Function:	ALARM
2. Relay mode:	N/C-T

Adjusting the settings:

Menu	Meaning	
Exit	Exit settings menu "Relays"; go up one menu level	
1. Function	ALARM Active GenSt	Relay switches if at least one of the following menus 3...9 is set to "on" and the associated alarm message appears. Relay switches if at least one of the following menus 3...9 is set to "on" and the associated alarm message does not appear (operational status message). If several of these menus are set to "on" none of them must have an alarm in order to be able to activate the relay. Application example: Function = "Active" Line 1 = "on", all other menus (line 2, device error, etc.) are set to "off". -> Relay is activated when line 1 is ready for operation. Relay is used as Generator start relay (alarm relay 1 only)
2. Relay mode	N/O N/C N/O-T N/C-T	N/O operation. Relay only switches in the event of an alarm. N/C operation. Relay only switches in the event of an alarm. N/O operation. Relay switches in the event of an alarm or a test. N/C operation. Relay switches in the event of an alarm or a test.
3. Line 1	on off	Line 1
4. Line 2	on off	Line 2
5. Manual mode	on off	Relay switches in manual mode (transparent cover open or digital input "Manual mode" selected).
6. Device error	on off	Internal device error 1.x, 3.x (except 3.50), 6.x, 7.x, 8.x, 9.x or BMS bus has no master, short-circuit distribution board, failure distribution board, test due, service due.
7. Test interval	on off	Relay switches when a test is due (interval elapsed).
8. Service interval	on off	Relay switches when service is due (interval elapsed).
9. Digital input	on off	Alarm digital input. The relay only reacts to a digital input when at least one of the four digital inputs is additionally set to "ALARM" or "R-OPL" in the menu "Settings -> Digital input".



*The reminders for the test (7. Test interval) or the service (8. Serviceinterval) are always triggered at 12:00 p.m.
If these messages appear at night the time is incorrectly set on the device.*

7.3.4.5 Settings menu 5: Digital input

In this menu, you can adjust settings for the mode of operation and function of the digital inputs. The digital inputs are galvanically isolated. They are designed for an input of AC/DC 24 V.

For each input, selection is possible when the input is set to "24V" (high) or "0V" (low). In the "24V" setting, the selected function (e.g. alarm message) is carried out when there are 24 volts there. In the "0V" setting, the selected function is carried out when there are 0 volts there. It is for this reason that you should always set unused digital inputs to "off".

Select digital input:

1. Use the "▲" arrow button to go to the digital input setting. Press the "↵" button.
2. Use the arrow buttons to select one digital input (e.g. Digital input 3) or all four digital inputs (Digital input 1...4). Press the "↵" button to confirm your selection.

Setting one digital input

Digital input:	3
Exit	
1.Function:	off
2.Resp.value.:	24.0V

Setting all digital inputs

Digital input:	1..4
Exit	
1.Function:	off
2.Resp.value.:	24.0V

Adjusting the settings:



By selecting the function of the digital inputs the recommended response value is automatically adjusted:

- Test, H/A, 1, 0, 2 (switch positions) 24V (cannot be changed)
 - no2->1, 1<->2, bypass, alarm and R-OPL 0 V (can be changed)

The "Bypass" setting can only be changed temporarily for test purposes. After re-starting ATICS® this setting returns to "0 V"!

Menu	Meaning
Exit	Leave the "Digital input" settings menu; go up one menu level

Menu	Meaning
1. Function	<p>Note: A parameter change may cause an immediate changeover.</p> <p>off Digital input switched off</p> <p>M/A Manual/Automatic. Manual mode means that automatic changeover can no longer take place.</p> <p>Bypass Alarm "Manual mode", but TEST changeover possible</p> <p>no2->1 Switching back interlocking function. After changing over to line 2, the transfer switching device remains in this switch position. It stays there even if line 1 returns. It does not switch back to line 1 until the digital input is no longer set, line 2 fails or the "RESET" button is pressed. The display shows the operational status message "SwitchBackLock".</p> <p>1<->2 Changing the preferred line</p> <p>TEST A test changeover is carried out. In generator mode, the generator start relay is also switched. The test is terminated when the output is reset.</p> <p>1 Switch to switch position 1*</p> <p>0 Switch to switch position 0*</p> <p>2 Switch to switch position 2*</p> <p>* Requirement: another digital input is set to "H/A".</p> <p>ALARM Generates a "Digital input alarm". An alarm relay of an external ISOMETER® can be connected here. The alarm message appears on the display and is passed on via the BMS bus. The alarm relay switches when adjusted accordingly. The alarm message has no effect on the changeover function.</p> <p>R-OPL Generates an alarm "Insulation fault, operating theatre lights". Other functions as for the "ALARM" setting.</p>
2. Resp. value	<p>0V At 0 V input is set. The selected function is carried out.</p> <p>24V At 24 V input is set. The selected function is carried out.</p>
3. t(on)	<p>Response delay: 100 ms... 100 s</p> <p>Resolution of setting: starting at 50 ms</p>
4. t(off)	<p>Delay on release: 100 ms... 100 s</p> <p>Resolution of setting: starting at 50 ms</p>



The common alarm for the digital inputs 2...4 is signalled on channel 12 of the BMS bus. If one of these digital inputs is set to "ALARM" and activated, an alarm will be outputted on channel 12. It cannot be recognised which digital input has tripped. Only one alarm will be outputted. Priority is given to the alarm of the digital input with the lowest number.

Example:

Digital input 2 is set to "ALARM" and activated.

Digital input 3 is set to "R-OPL" and activated.

In this case, only the message of digital input 2 (ALARM) will be indicated on channel 12 of the BMS bus. Only when digital input 2 is no longer activated, the message of digital input 3 will be indicated (R-OPL).


Do not set inputs with contradictory functions simultaneously!

For each of the four digital inputs a function can be set. This function is only activated when the input is activated.

Example:

Digital input 1 is set to "1"

Digital input 2 is set to "2"

Digital input 3 is set to "0"

Digital input 4 is set to "H/A"

When the digital inputs 1 and 4 are activated, ATICS® switches to switch position "I". When the digital inputs 2 and 3 are also activated, it will have no effect. The function of the input set first has priority.

If the digital input 1 is no longer activated, the function of the digital input with the next number up will be activated.

7.3.4.6 Settings menu 6: Data logger

ATICS-2-DIO data logger

In this menu, you can adjust settings for the device's data logger. These data loggers (see "Menu 3: History/Logger" on page 66) display the history of measured values:

Data logger	Meaning
1. Line 1	Line 1: Measured value mains voltage phase to neutral conductor N
2. Line 2	Line 2: Measured value mains voltage phase to neutral conductor N
3. Position	Switch position of the transfer switching device
4. I(3)	Load current downstream the transfer switching device

ATICS-4-DIO data logger

In this menu, you can adjust settings for the device's data logger. These data loggers (see "Menu 3: History/Logger" on page 66) display the history of measured values:

Data logger	Meaning
1. U1(1-N)	Line 1: Measured value mains voltage phase L1 to neutral conductor N
2. U1(2-N)	Line 1: Measured value mains voltage phase L2 to neutral conductor N
3. U1(3-N)	Line 1: Measured value mains voltage phase L3 to neutral conductor N
4. U2(1-N)	Line 2: Measured value mains voltage phase L1 to neutral conductor N
5. U2(2-N)	Line 2: Measured value mains voltage phase L2 to neutral conductor N
6. U2(3-N)	Line 2: Measured value mains voltage phase L3 to neutral conductor N
7. Position:1	Switch position of the transfer switching device
8. I(1)	Load current downstream of the transfer switching device on phase L1
9. I(2)	Load current downstream of the transfer switching device on phase L2

Data logger	Meaning
10. I(3)	Load current downstream of the transfer switching device on phase L3
11. I(N)	Load current downstream of the transfer switching device on neutral conductor N

Selecting a data logger:

1. Use the "▲" arrow button to go to the data logger setting. Press the "┐" button.
2. Use the arrow buttons to select a data logger (1, 2, ...) or all data loggers (ATICS-2-DIO: 1...4, ATICS-4-DIO: 1...11). Press the "┐" button to confirm your selection.

Set one data logger

No. : 4 U2(1-N)
Exit
1.Modific.: 10.00 %
2.Overwrite: yes

Set all data loggers

No. : 1..11
Exit
1.Modific.: 10.00 %
2.Overwrite: yes



Risk of premature wear of the memory chip

The service life of the 300 memory locations of the EEPROM memory is limited to about 100 000 memory accesses. If one change to a measured value is saved every second, the end of the service life of the EEPROM is reached after one year. If one change to the measured value is saved every minute, then the service life is increased to 57 years. Select the settings in the "Data logger -> "Modific." settings menu in a way that frequent saving over longer periods of time can be avoided. To protect the memory module, a minimum limit threshold of 10 A for the load currents is incorporated in the data loggers for the TN system downstream of the transfer switching device. Values below this limit threshold are only stored once. A new measured value will be stored in the memory chip only when this limit threshold is exceeded.

Adjusting settings and deleting data loggers:

Menu	Meaning
Exit	Exit settings menu "Data logger"; go up one menu level
1. Modific.	Once the measured value is changed according to the set % value, a new measured value is saved to the data logger. Setting range: 0 ... 100 % Resolution of setting: 1 %
2. Overwrite	yes Once the maximum number of measured values which can be saved is reached, the current measured value overwrites the oldest entry. no Once the maximum number of measured values which can be saved is reached, no further measured values are saved.
3. Delete	Delete Delete data logger Cancel Do not delete data logger

7.3.4.7 Settings menu 7: Language



Selecting the language for the menus and the messages to be displayed (alarm and operational messages) on the device.

Menu	Meaning
Exit	Exit settings menu "Language"; go up one menu level
1. English	Select language. Changes take effect immediately.
2. Deutsch	
3. Français	

7.3.4.8 Settings menu 8: Interface

Setting the device address for connection to the internal BMS bus. Change the device address concerned when several devices are connected to one BMS bus. One device (e.g. MK800) must have the address 1 (master). All other devices are addressed in consecutive order: 2,3,4,... There should be no gaps between the addresses. Only in this way the functionality of the system can be ensured.

Menu	Meaning
Exit	Exit settings menu "Interface"; go up one menu level
1. Address	Setting range: 2...90
2. Settings	on Allow settings to be changed via the interface (e.g. an Ethernet gateway COM465...) off Do not allow settings to be changed via the interface
3. TEST	on Allow a test to be carried out via the interface (e.g., an Ethernet gateway COM465...) off Do not allow a test to be carried out via the interface

Menu	Meaning
4. Failure monitoring	<p>on Indicates when communication with the BMS master has not been detected (anymore).</p> <p>off The presence of a BMS master is not monitored. This setting is required when ATICS® is used as a "Stand-alone" device without BMS master.</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;">  <p>DANGER</p> </div> <div style="border-top: 2px solid red; border-bottom: 2px solid red; padding: 5px;"> <p><i>When this setting is selected, the conditions for functional safety (SIL2) are no longer met.</i></p> </div> </div> <div style="display: flex; justify-content: space-between; align-items: flex-start; margin-top: 10px;"> <div style="text-align: center;">  <p>CAUTION</p> </div> <div style="border-top: 2px solid yellow; border-bottom: 2px solid yellow; padding: 5px;"> <p><i>In the event of a power failure of more than eight hours, the time and date will be reset to the factory settings. If the "Clock" setting is not corrected, all functions depending on this setting (history memory, logger, test interval, service interval...) will lead to unusable results.</i></p> </div> </div>

7.3.4.9 Settings menu 9: Clock

This menu is used to set the date and time for indication on the "History/Logger" menu. The time setting is synchronised via the BMS bus. The device with address 1 (MK800, MK2430 or TM...) synchronises all other devices every hour.

The time setting for ATICS® is required in that rare case when no BMS bus is used. In this case, ATICS® shows the fault message "No Master". The date format, date and time can be set. These settings remain stored for approx. eight hours following a supply interruption. The date and time will then be reset to the factory settings (01.01.2010, 00:00:00).

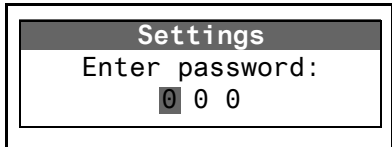
Menu	Meaning
Exit	Exit settings menu "Clock"; go up one menu level
1.Format	d.m.y German format (day.month.year) m-d-y American format
2.Date	Setting the date (e.g. dd.mm.yyyy)
3.Time	Setting the time (hours and minutes)

7.3.4.10 Settings menu 10: Password

The device has two separate passwords for the "Settings" menu and the "TEST" menu.

Menu	Meaning
Exit	Exit settings menu "Password"; go up one menu level
1. Settings	Change the password for the "Settings" menu, switch the password "on/off". Factory setting: Password: 000 Status: off
2. TEST	Change the password for the "TEST" menu, enable/disable password. Factory setting: Password: 000 Status: off

Changing the password menu "Settings"

Menu	Meaning
Exit	Exit settings menu "Password - > Settings"; go up one menu level
1. Password	Change the password for the "Settings" menu. Setting range: 000...999 Resolution of setting: 1
2. Status	<p>Enable the password protection for the "Settings" menu</p> <p>on Password protection is enabled. When an attempt is made to open one of the setup menus, the entry screen for entering the password appears automatically:</p> <div data-bbox="826 1263 1219 1408" data-label="Image">  </div> <p>Once a valid password has been entered, full access will be granted to all setup menus (except the "Service" menu) until menu mode is exited. Password protection is disabled.</p> <p>off</p>

Changing the password menu "TEST"

Menu	Meaning
Exit	Exit settings menu "Password - > TEST"; go up one menu level
1. Password	Change the password for the "TEST" menu. Setting range: 000...999 Resolution of setting: 1
2. Status	<p>Enable or disable the password protection for the "TEST" menu</p> <p>on Password protection of test menus 2...4 is enabled. When an attempt is made to open one of these menus, the password entry screen appears automatically:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center; background-color: #cccccc; margin: 0;">TEST</p> <p style="text-align: center; margin: 0;">Enter password:</p> <p style="text-align: center; margin: 0;">0 0 0</p> </div> <p>off Password protection is disabled.</p>

7.3.4.11 Settings menu 11: Service

Only Bender service personnel are authorised to make settings in the Service menu. It is only accessible to Bender service.

In the Service menu, information about the device status can be called up and settings for specific operating conditions can be made.

7.3.5 Menu 5: Control

This menu offers various options for controlling individual devices or the overall system:

Menu item	Function	Page
Exit	Exit "Control" menu; go up one menu level	
1. TEST	Call up test, see chapter "6.2.4 Test function"	51
2. RESET	Call up a reset, see chapter "6.2.5 Reset function"	57

7.3.6 Menu 6: Digital Input

This menu indicates the voltage level of the digital inputs 1...4.

■	Exit
1. ○	0V
2. ○	0V
3. ○	0V

Exit	Exit "Digital Input" settings menu; go up one menu level.
○ --	The digital input is switched off
1...4	Number of the digital input
○ 0V	Example: The response condition is not met. The input has not been set. The set function will not be carried out.*
● 24.0V	Example: The response condition is met and the response delay has elapsed. The input has been set. The set function will be carried out.*

* Whether the input is set to 0 V or 24 V depends on the set response value (see "Settings menu 5: Digital input" on page 75).

7.3.7 Menu 7: Info

This menu displays information about the device and the software. Use the "▼" button to scroll all the information. Please have this information to hand if you need to contact us for assistance by telephone.

You can also reach the "INFO" menu by choosing standard display and then pressing the "INFO" button on the front panel of the device.

ATICS2-DIO-63
02.03.11 14:59
Address: 3
No. : 1234567890

Line 1:	Device type
Line 2:	Date, time
Line 3:	Address set on the BMS bus
Line 4:	Serial number of the device
Line 5...6:	Software versions of the two controllers of the device
...	Bender address, website
...	Exit. Exit standard information.

8. Troubleshooting

8.1 Fault and alarm messages

In the event of an alarm, the messages of ATICS® will enable you to narrow down the possible causes. Some messages may point to several causes. The following possible faults are indicated by messages on the ATICS® display:

- Plain text messages
- Fault messages with error code

8.1.1 Plain text messages

Fault/message	Description	Action
Failure line xx (xx stands for: 1, 2, AV, SV, UPS, BSV), undervoltage or overvoltage	Voltage is no longer available on line 1 or line 2 Channel 1 = Line 1, Channel 2 = Line 2	- Measure voltage on line xx. - Check cause. - Eliminate fault in the system. - Check the setting for voltage and hysteresis.
Failure line 2 when set to System > Line G	Generator delivers no voltage within the set time t(GenMax)	
Device error + error code	For details about actions to be taken refer to table section "Error code/service code". The message is on channel 6 of the BMS bus.	
Short circuit distribution board	Short circuit detected	- Eliminate short circuit
Failure distribution board	No voltage on line 3, contact of the changeover switch defective. The fault can also be caused by an (impermissible) connection between GND, k or l and PE.	- Replace ATICS®. - Separate connection between GND, k or l and PE.
Overcurrent I(3)	Measuring current transformer T3 resp. one of the measuring current transformers T3...T6 recognised an overcurrent	- Eliminate cause of overcurrent. - Eliminate any damage.
No CT connected	Short circuit or interruption of connecting wire has been detected. Measuring current transformer T3 or T3...T6, channel 7	- Check connecting wire of the measuring current transformer(s).
No master	There is no device with master function or back-up master (device with address "1") available on the RS-485 interface	- Check BMS bus connection cable. - Check whether the master has failed or whether its address has changed. If the device is operated without BMS bus the "Failure monitoring" (see "Settings menu 8: Interface" on page 79) must be deactivated.

Fault/message	Description	Action
Service: __ (date)	Reminder for next service	- Agree date with Bender service.
Functional test: __ (date)	Reminder for next test	- Plan date for test. - Run test.
Manual mode	Message "Manual mode" although manual mode has not been activated	- Check the connections of the digital input.
Phase sequence	This line does not have a right phase sequence. If the direction of the phase sequence of Line 1 is different from Line 2, it may result in malfunctions or failure on connected three-phase devices.	- Install line 1 and line 2 in a way that the direction of the phase sequence of both lines is clockwise (right).
Error during the changeover process	Occurs when the test set-ups do not supply sufficient current for switching the coils of ATICS®.	- Only use test set-ups that provide the necessary peak current of 17 A.

8.1.2 Messages with error code or service code

Error code/ service code	Description	Action
1.xx, 4.xx, 9.xx	Fault message from the internal memory monitoring.	- Contact Bender service.
3.11	Maximum number of operating hours exceeded.	- Plan device replacement. Alarm can be acknowledged (see "Reset menu 3: Changeover" on page 59).
3.12	Maximum number of changeovers exceeded.	- Plan device replacement. Alarm can be acknowledged (see "Reset menu 3: Changeover" on page 59).
3.13	Changeover due to overcurrent or short circuit detected. These changeovers reduce the life of the device. Currents in excess of 130 A or 250 A are considered to be overcurrents or short-circuit currents.	- Have personnel assess the short-circuit load. Contact Bender service. Alarm can be acknowledged (see "Reset menu 3: Changeover" on page 59).
3.5	Service has been carried out. This is not a fault message. Only displayed in the service logger menu.	- No action required.
6.xx, 7.xx, 8.1x	Device error. The internal self monitoring of the device has detected a fault which could impair the safe operation of the device.	- Replace device immediately.

Error code/ service code	Description	Action
8.51 ... 8.52	Fault internal power supply unit.	<ul style="list-style-type: none"> - RESET -> execute alarm, then test the changeover function. - If fault persists: device replacement. - Only use test set-ups that provide the necessary peak current of 17 A.
8.61 ... 8.66	<p>Fault during changeover process. Occurs when the voltage on the new line fails during the changeover.</p> <p>Also occurs when the test set-ups do not supply sufficient current for switching the coils of ATICS®.</p> <p>Can also be caused by missing or improperly installed bridge on the output side.</p> <p>The fault can also be caused by an (impermissible) connection between GND, k or l and PE.</p>	<ul style="list-style-type: none"> - Check connection of the bridge on the output side, if necessary, retighten screws. - RESET -> execute alarm, then test the changeover function. - If fault persists: device replacement. - Only use test set-ups that provide the necessary peak current of 17 A. - In the settings menu 1: Select changeover t(0) ≥ 160 ms. - Separate this connection

If a fault occurs, proceed as follows:

1. Activate manual mode, if necessary.
2. Make a note of what happened prior to the fault: operator inputs, device error messages, ambient conditions, etc.
3. Keep the article and serial number of the device to hand.
4. Speak to Bender Service, describe the type of fault and quote the three-digit error code.

8.2 Frequently asked questions

A series of clicks is always heard at around noon. What does that mean?

ATICS® carries out a coil trigger test once a day. The time is calculated as follows: 12:00:00 o'clock + (own BMS bus address * 10 s).

If configured to "Generator" for the redundant line on settings menu 1 "Changeover", then the coil test will only be run for line 2 when line 2 has a voltage.

When the "TEST -> Generator" is run, the coil test is carried out for line 2 directly after starting the generator.

A thin vertical line runs across the display. Is the display defective?

No. The "Refresh function" of the display is being active refreshing the contents indicated.

Why doesn't ATICS® display the pre-set time?

The time of ATICS® is set by the BMS bus master.

The time for ATICS® only is required in that rare case when no BMS bus is used. In this case, ATICS® shows the fault message "No Master".

How do I eliminate the message "No Master"?

ATICS® is designed for applications where functional safety is of top priority. Therefore, this message is necessary.

For applications where functional safety only plays a subordinate role master monitoring can be deactivated in the menu "Settings > Interface > Failure monitoring" (see page 79).

ATICS® does not change over. In the last line on the display it indicates: "t(0): xx s".

ATICS® is waiting for the time delay $t(0)$ to elapse and displays the remaining time in seconds. Only then can ATICS® change over. The time delay can be due to the following reasons:

- ATICS® is just switching. The adjusted time delay in switch position "0" (dead time) takes several seconds (see "Settings menu 1: Changeover" on page 69)
- ATICS® has just been supplied with voltage. After the expiry of the time delay, ATICS® will be ready for operation.

Within a short period of time, ATICS® carried out more than 12 changeover operations. The time delay is required to cool the system.

ATICS-4-DIO shows the alarm message "Phase sequence". What should be done?

Already during the commissioning of ATICS-4-DIO, make sure that both the preferred line and the redundant line have the same phase sequence direction (right).

This is particularly important when the performance of connected three-phase loads is dependent on the phase sequence direction. Example: The three-phase motor runs in the wrong phase sequence direction (counter-clockwise).

Despite the alarm message "Phase sequence", the ATICS® changes over from the preferred line to the redundant line in the event of failure of the preferred line. This ensures continued operation of loads that are not affected by the phase sequence.

Why does writing back reports/backups lead to error messages?

ATICS® can – like many Bender devices – be monitored and configured by means of a Bender gateway CP700, COM46x... etc. The gateways are operated via a web user interface which is represented by means of an Internet browser.

One of the functions of these gateways is saving reports. A report can be used to save settings and measured values of a bus device. By creating a backup you can avoid data loss (e.g. by accidentally deleting settings). The backup can also be imported to another device of the same type. This can be necessary when a device is to be replaced or when several devices with similar tasks are to be configured.

ATICS® is continuously further developed and maintained. This also influences the content of the report file. If you try to save a report that has been created with an older ATICS® (version older than 1.20)

in an ATICS® with a current firmware, this may lead to error messages.

These error messages are indicated on the web user interface.

- Repeat the saving process of the report in ATICS® several times. This way, the majority of the parameters can be transferred. The remaining error messages indicate the parameters that have to be changed manually.
- To conclude, check all settings saved in ATICS®.
- Save these settings in a new report file.

9. Periodic verification and service

9.1 Periodic verification

The following periodic verification must be performed on electrical installations in compliance with the local or national regulations that apply.

Action	To be performed by	Interval
Functional test of the transfer switching device*: Functional test of the automatic transfer switching device	Bender service or electrically skilled person	Every twelve months/ every six months**
Test the set values and the changeover periods	Bender service or electrically skilled person	Every 12 months
Test of the transfer switching device and the connection to the SCADA system (Supervisory Control and Data Acquisition)* (if applicable) and the interaction between the components on the system. The test encompasses the following: - Inspection: Labels, display elements, mechanical components, wiring, torque settings, parameter settings, connection third-party equipment, evaluation of fault memory - Measurement: Internal/external supply voltages/potentials, bus voltage, bus protocol, bus scan - Testing: Device function, device communication - Documentation: Test results, recommendations for eliminating defects	Bender Service	Every two years (recommended by Bender)

* This test must only be performed by an electrically skilled person who has been appointed to do so in agreement with the medical locations concerned.

** Time interval according to DIN VDE 0100-710 (VDE 0100 Part 710):2012-10: 12 months.

Time interval according to DIN VDE 0100-710 (VDE 0100 Part 710):2002-11: 6 months.

Thereby the minimum requirements are satisfied.

Bender recommends a monthly test to ensure that the operating personnel is familiar with the testing procedure in the event of a fault.

With all the tests, follow the instructions for carrying out functional tests on the checklist in the appendix of this manual. If no local/national directives apply, you should at least perform periodic verification as recommended by DIN VDE 0100-710 (VDE 0100 Part 710) for application in medical locations.

9.2 Maintenance

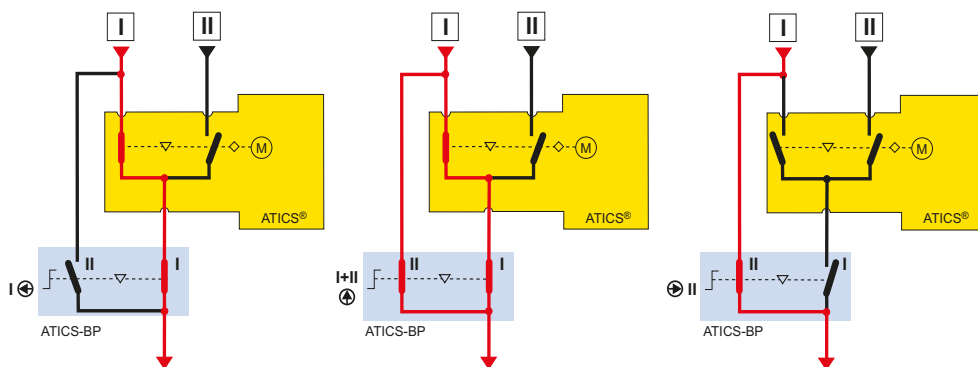
The ATICS® system does not contain any parts that must be maintained. Despite this, the intervals specified for periodic verification should be adhered to. We also recommend regularly checking the Allen screws at the ATICS® and the Torx® screws of the connectors on the incoming and outgoing lines of the automatic transfer switching device to make sure they are tight.

9.3 Cleaning

ATICS® may only be cleaned with a clean, dry, soft and antistatic cloth.

9.4 Operation with bypass switch

ATICS-BP-... bypass switch makes possible parallel supply from Line 3. ATICS® can be connected in any way or replaced without interrupting the power on Line 3.



The green indicator indicates position 1 of the ATICS® device, which at the same time indicates that the bypass switch can be operated. In fault-free condition, line 1 is in position 1 and voltage is applied.



*Only qualified personnel may operate the bypass switch.
Set the bypass switch quickly from position "I" via "I+II" to position "II" and back from "II" via "I+II" to "I".
The time during which the bypass switch is set to position "II" must be reduced to the bare minimum.*



Risk of short-circuit of the "Enable Bypass" light is ignored.
*If ATICS® is not on the line to which the bypass switch is connected, it is possible for a short-circuit to occur between Line 1 and Line 2.
The bypass switch may only be operated when the green "Enable Bypass" light lights up.*

If a voltage drop occurs on line 1 while the switch is set to "II" (=bypass) the switch must not be set to position "I+II" or "I". In this case, the ATICS® device has to be manually switched to position "0" or "I" by means of the Allen key. Only after doing this, the bypass switch can be set to position "I" while the clear cover (manual mode) is open. Afterwards, the clear cover can be closed to activate the automatic mode. If the clear cover is closed before, the ATICS® device switches automatically to line 2.

Conditions for operation with the bypass switch

- Wiring must be carried out according to "Connection example: ATICS-2-DIO with bypass switch" on page 35 or according to "Connection example: ATICS-2-DIO with bypass switch" on page 36.
- The following settings are to be set in the "Settings menu 5: Digital input" menu:
Digital input 1:
 - 1. Mode: Bypass
 - 2. Resp. value: 0 V
 - 3. t(on) response delay: 100 ms
 - 4. t(off) delay on release: 100 ms



Risk of electric shock when touching the contacts on line 1, 2 or 3.
*Mains voltage at the contacts of line 1, 2 and 3.
Plug must not be touched unless the part is isolated.*

9.5 Replace ATICS®

The plug connectors make it easy to replace the device if

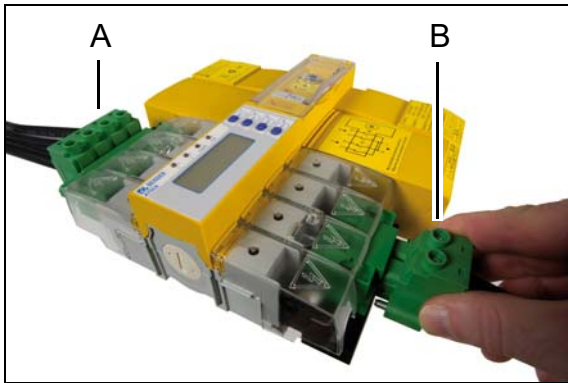
- ATICS® has reached the end of its useful life or
- an event has occurred which jeopardises safety: e.g. overvoltage, switching if there is a short-circuit or component failure.



Risk of fatal injury from electric shock
*Touching live parts of the system carries the risk of electric shock.
Before fitting the device and prior to working on the device connections, make sure that the power supply has been disconnected.
If ATICS® is bypassed by an ATICS-BP-... bypass switch, then the regulations which apply to working on live parts must be followed.*

9.5.1 Removing the existing ATICS®

1. Record settings on the existing ATICS®.
The settings should match the entries on the checklist (see checklist in the appendix of this manual or, if necessary, update checklist).
2. Make device dead or switch on bypass switch. Switch existing ATICS® to manual mode and switch to switch position "0" (see "Connecting ATICS® safely" on page 30).
3. Remove connections

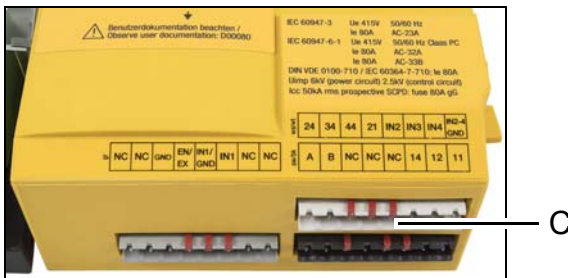


ATICS-2-DIO: Undo the mounting screws on the upper green plug connector and remove the connector (A).

ATICS-4-DIO: Undo the mounting screws on the upper green plug connectors and remove the two plug connectors.

When this has been done, undo the mounting screws of the lower green plug connector and remove the connector (B).

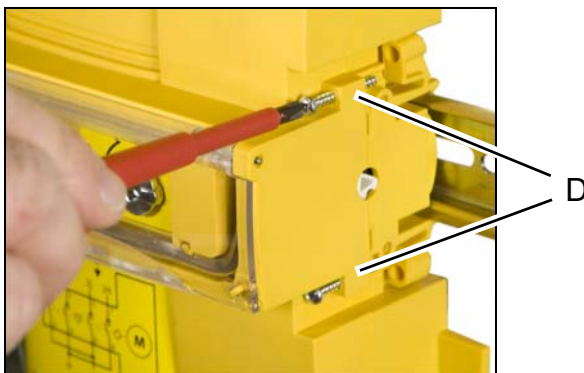
Photo shows ATICS-2-DIO.
The description also applies to ATICS-4-DIO.



Remove the three connector plugs (C).

4. Remove ATICS®

Removing ATICS® from rail mounting

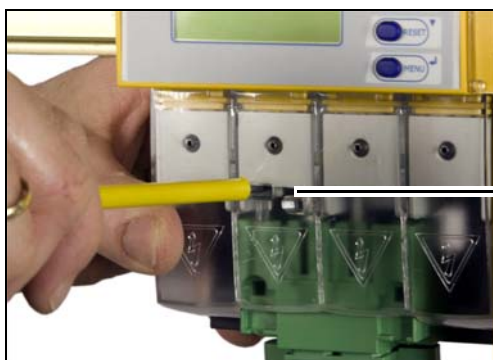


Undo screws (D).

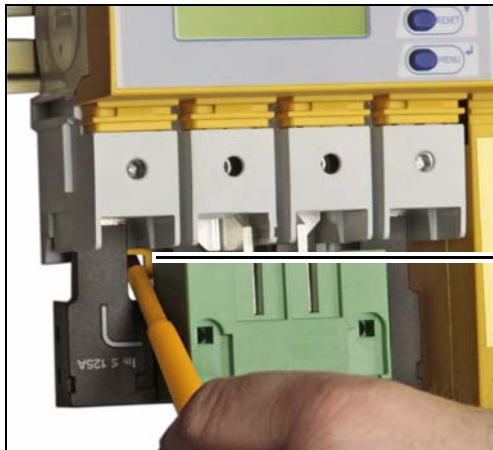


E

Remove the lower and upper terminal covers (E, F) by using a screwdriver to push back the locking hook located approximately in the middle of the cover in each case.



F



G

ATICS-2-DIO: Use a screwdriver to pull the lower yellow slide lock (G) downwards and lift ATICS® slightly from below. Now use a screwdriver to pull the upper yellow slide lock upwards and remove ATICS®.

ATICS-4-DIO: Remove lower green plug connector. Use a screwdriver to pull the two lower yellow slide lock (C) downwards and lift ATICS® slightly from below. Now use a screwdriver to pull the two upper yellow slide locks (C) upwards and remove ATICS®.

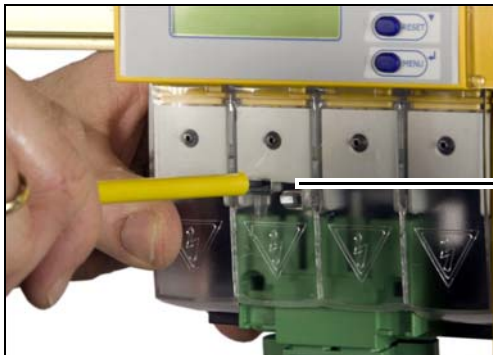
Photo shows ATICS-2-DIO.
The description also applies to ATICS-4-DIO

Remove ATICS® from screw mounting

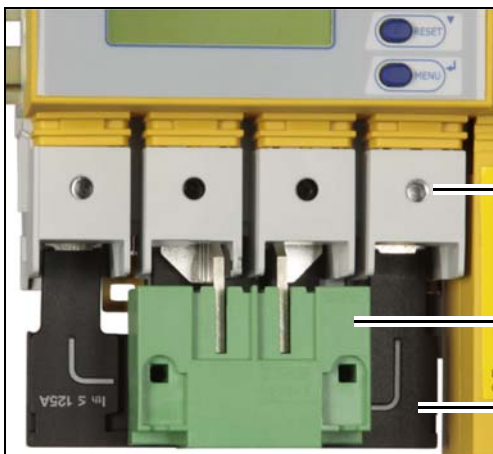


D

Remove the lower and upper terminal covers (D, E) by using a screwdriver to push back the locking hook located approximately in the middle of the cover in each case.



E



F

G

H

Undo the Allen screws of the terminals (F).

Remove the green connectors (G) top and bottom.

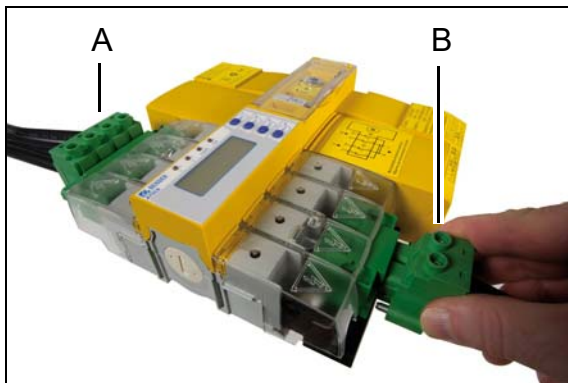
Remove the black bridge (H) bottom.

Undo mounting screws and remove ATICS® from the mounting plate.

Photo shows ATICS-2-DIO.
The description also applies to ATICS-4-DIO

9.5.2 Installing a new ATICS®

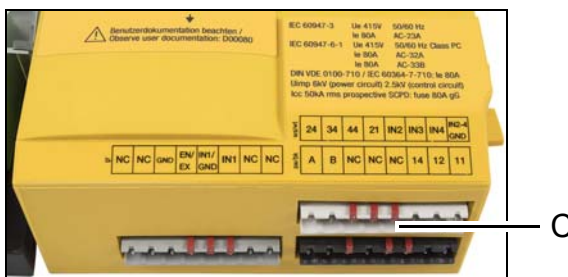
1. Install ATICS®:
 - "Mounting on DIN rail" see page 27
 - "Screw mounting on plate" see page 28
2. Connect ATICS®



Insert bottom green plug connector (B) and secure with mounting screws.

ATICS-2-DIO: After that, insert top green plug connector (A) and secure with mounting screws.

ATICS-4-DIO: Only then insert the two top green connector plugs and secure them with mounting screws.



Insert the three connector plugs (C).

3. Switch on voltage.
4. Adjust ATICS® according to the checklist and check for operation (see checklist in the appendix of this manual).
5. Disable bypass switch.

10. Technical data

10.1 Tabular data

Insulation coordination acc. to IEC 60664-1/IEC 60664-3

Overvoltage category	III
Pollution degree outside, inside	2
Rated insulation voltage ATICS-2-DIO/ATICS-4-DIO	250 V/400 V
Protective separation between	Line 1 – Line 2; Line 1, 2, 3 – RS-485
.....	Line 1, 2, 3 – digital inputs; Line 1, 2, 3 – relay outputs
Voltage test according to IEC 61010-1 (basic insulation/protective separation)	2.21 kV/3.54 kV

Supply voltage

Rated operational voltage U_e	AC 50 . . . 60 Hz, 230 V
Supply voltage U_s	from monitored system
Power consumption ATICS-2-63A-DIO	≤ 16 W
Power consumption ATICS-2-80A-DIO	≤ 23 W
Power consumption ATICS-4-80A-DIO	≤ 39 W
Power consumption ATICS-4-125A-DIO	≤ 87 W
Power consumption ATICS-4-160A-DIO	≤ 119 W
Current during the changeover process	17 A/< 30 ms

Power section/switching elements

Nominal system voltage U_n (operating range) ATICS-2-DIO/ATICS-4-DIO	AC 230 V/3NAC 400 V
Frequency range f_n	48 . . . 62 Hz
Crest factor	≤ 1.2
Number of switching cycles (mechanical)	≥ 8000
Short-circuit currents	refer to table "Short-circuit currents"
Short-circuit current I_{cc} and fuses	refer to table "Utilisation category acc. to DIN EN 60947"

Voltage monitoring/changeover

Frequency range f_n	40 . . . 70 Hz
Undervoltage response value (Alarm 1)	160 . . . 207 V (1-V steps)
Overvoltage response value (Alarm 2)	240 . . . 275 V (1-V steps)
Response delay t_{on}	50 ms . . . 100 s (resolution of setting starting 50 ms)
Delay on release t_{off}	200 ms . . . 100 s (resolution of setting starting 50 ms)
Hysteresis	2 . . . 10 % (1-% steps)
Frequency measurement	40 . . . 70 Hz (resolution 0.1 Hz)
Display range measured value ATICS-2-DIO	20 . . . 276 V
Display range measured value ATICS-4-DIO	20 . . . 520 V
Operating uncertainty	±1 %

Current monitoring (output current)

Measuring current transformers	STW3, STW4
Measuring range I_n (TRMS)	STW3: 0 . . . > 150 A, STW4: 0 . . . > 260 A
Response value for short-circuit detection ATICS-DIO (versions 63 A and 80 A) with STW3	130 A
Response value for short-circuit detection ATICS-DIO (versions 125 A and 160 A) with STW4	250 A
Crest factor	min. 2
Hysteresis for short-circuit alarm	5 %
Cable length:	
Single wire ≥ 0.75 mm ²	0 . . . 1 m
Single wire, twisted ≥ 0.75 mm ²	1 . . . 10 m
Shielded cable	10 . . . 40 m

Cable: twisted pairs, shield to terminal 1 at one end, must not be earthed recommended: J-Y(St)Y min. n x 2 x 0.8

Displays and data memory

Display: graphic display	languages DE, EN, FR
Alarm LEDs	line 1, line 2, alarm, com
History memory	500 data records
Data logger	500 data records/channel
Config. logger	300 data records
Test data logger	100 data records
Service logger	100 data records

Input

Digital inputs	4
Galvanic separation	yes
Control	via potential-free contacts
Mode of operation	active at 0 V (low) or 24 V (high), adjustable
Voltage range high/low	AC/DC 10...30 V/AC/DC 0...0.5 V
Adjustable function	switching back interlocking function, manual/automatic mode, bypass mode, functional test, changeover to the preferred line, alarm input for operating theatre lights, alarm input for other devices

Relay output 1

Switching element	1 potential-free changeover contact
Mode of operation adjustable	N/O or N/C operation
Adjustable function	see "Settings menu 4: Relay" on page 73
Electrical endurance under rated operating conditions, number of cycles	10,000
Contact data according to IEC 61810	
Rated operational current AC (resistive load, $\cos \varphi=1$)	5 A/AC 250 V
Rated operational current DC	5 A/DC 30 V
Overvoltage category	III
Minimum contact rating	10 mA at DC > 5 V

Relay outputs 2...4

Switching element	1 potential-free N/O contact
Mode of operation adjustable	N/O or N/C operation
Adjustable function	see "Settings menu 4: Relay" on page 73
Electrical endurance under rated operating conditions, number of cycles	80,000
Contact data according to IEC 61810	
Rated operational current AC (resistive load, $\cos \varphi=1$)	5 A/AC 150 V
Rated operational current DC	5 A/DC 30 V
Overvoltage category	III
Minimum switching capacity	120 mW

BMS interface

Interface/protocol	RS-485/BMS
Baud rate	9.6 kbit/s
Cable length	≤ 1200 m
Cable (twisted pairs, shielded, shield connected to PE on one side)	recommended: J-Y(St)Y min. n x 2 x 0.8
Terminating resistor	120 Ω (0.25 W)
Device address, BMS bus	2...90

Environment/EMC

EMC	EN 61326 (see CE declaration)
Classification of climatic conditions according to IEC 60721:	
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K3
Long-term storage (IEC 60721-3-1)	1K4
Operating temperature	-25...+55 °C

Classification of mechanical conditions acc. to IEC 60721:

Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Long-term storage (IEC 60721-3-1)	1M3

Terminals

Power section

Connection type (up to 125 A)	pluggable screw terminals
Conductor cross section, rigid min./max.	1.5/35 mm ²
Conductor cross section, flexible min./max.	1.5 mm ² /25 mm ²
Conductor cross section AWG/min./max.	16/2
Stripping length (without ferrules)	20 mm
Tightening torque (Torx® screwdriver T20 or slotted screwdriver 6.5 x 1.2 mm)	2.5 Nm (≤ 25 mm ²)
.....	4.5 Nm (≥ 25 mm ²)
Connection directly on ATICS®, for plug connections and connection of 160 A version	screw-type terminals
rigid (flexible)/conductor sizes	10 . . 95 mm ² (6 . . 70 mm ²)/8 (10) . . 000 (00) AWG
Stripping length.....	15 mm
Tightening torque (hexagon socket 4 mm)	5 Nm
Torque setting for manual operation (Allen 5 mm).....	approx. 6 Nm

Electronics

Connection.....	screw terminals
rigid/flexible/conductor sizes	0.14 . . 1.5 mm ² /28 . . 16 AWG
Stripping length.....	7 mm
Tightening torque (slotted screws, screwdriver 2.5 x 0.4 mm)	0.22 . . 0.25 Nm

Other

Operating mode	continuous operation
Mounting	display-oriented
For use at altitudes	up to 2000 m AMSL
Protection class.....	Class I
Protection class LCD under foil (DIN EN 60529)	IP40
Enclosure material	polycarbonate
Flammability class	UL94V-0
DIN rail mounting acc. to IEC 60715	
Screw mounting	4 x M5
Dimensions incl. terminals (W x H x D)	234 x 270 x 73
Weight ATICS-2-DIO	approx. 3400 g
Weight ATICS-4-DIO	approx. 4800 g

Short-circuit currents

	ATICS- ...63A- DIO...	ATICS- 2-80A- DIO...	ATICS- 4-80A- DIO...	ATICS- 4-125A- DIO...	ATICS- 4-160A- DIO...
Thermal current I_{th} at 40 °C	63 A	80 A	80 A	125 A	160 A
Current rated as conditional short-circuit with fuse gG DIN Conditional short-circuit current I_{cc} (kA eff.) Associated fuse rating (A gG)	30 80	30 100	50 80	50 125	40 160
Current rated as conditional short-circuit with circuit breaker that ensures tripping in less than 0.3 s Current rated as short-time withstand I_{cw} 0,3 s (kA rms)	7	7	7	7	7
Short-circuit operation (switch only) Current rated as short-time withstand I_{cw} 1 s (kA rms) Rated peak withstand current I_{cm} (kA peak)	4 17	4 17	4 17	4 17	4 17

Utilisation category acc. to DIN EN 60947

Type	Ie AC-23A	Ie AC-23B	Ie AC-32A	Ie AC-32B	Ie AC-33B
ATICS-2-63A-DIO	63 A	63 A	63 A	63 A	63 A
ATICS-2-80A-DIO	80 A	80 A	80 A	80 A	80 A
ATICS-4-80A-DIO	80 A	80 A	80 A	80 A	80 A
ATICS-4-125A-DIO	125 A	125 A	100 A	125 A	125 A
ATICS-4-160A-DIO	125 A	160 A	100 A	160 A	125 A

10.2 TÜV test report according to VDE0100 Part 710

Technischer Bericht

Elektrische Sicherheit

Sicht- und Funktionsprüfung

TÜV SÜD Industrie Service GmbH – Westendstr. 199 - 80686 München

Fa. Bender GmbH & Co. KG
Londorfer Str. 65
D – 35305 Grünberg

Hersteller
ATICS Umschalt- u. Überwachungsgerät
Fa. Bender GmbH & Co. KG
Londorfer Str. 65
D - 35305 Grünberg

Hersteller
Modulträger
Fa. bendersystembau GmbH
Robert-Bosch-Straße 10
D – 35305 Grünberg

Service-Auftrags-Nr.: 15346146
Kundenauftrags-Nr.: 2093963

Gegenstand: ATICS Umschalt- und Überwachungsgerät
Typ ATICS-4-80A-DIO inkl. Modulträger
UMA710-4-80-DIO

Sachverständiger: Raimund Gebhart

Zeitraum: 12.11.2013 bis 10.12.2013

Grundlage der Prüfung: Auftrag 4620785 vom 24.10.2013

Art der Untersuchung: Prüfung auf Übereinstimmung des ATICS – Umschalt- und Überwachungsgerät inkl. Modulträger mit den Mindestanforderungen der DIN VDE 0100 Teil 710/10-2012, Abschnitt 710.536.101

Zusammenfassung: Die Umschalteinrichtung für medizinisch genutzte Räume vom Typ ATICS (genau Bezeichnung siehe oben) erfüllt die Anforderungen an selbsttätige Umschalteinrichtungen für medizinisch genutzte Bereiche der Gruppe 2 gemäß DIN VDE 0100 Teil 710/10-2012, Abschnitt 710.536.101

Hinweis: Bedingt durch die konzeptuell nahezu baugleiche Ausführung der Modulträger UMA710-4-63-DIO, UMA710-4-125-DIO, sowie UMA710-4-160-DIO mit dem UMA-4-80-DIO sehen wir keine Bedenken, das obige Ergebnis auch auf diese Varianten zu übertragen.
(weitere wichtige Hinweise siehe Bericht)

München, 19.12.2013

Thomas Wurf
Niederlassung München
Abteilung Elektrotechnik

Raimund Gebhart
Der Sachverständige

Industrie Service

**Mehr Sicherheit.
Mehr Wert.**

Datum: 19.12.2013

Unsere Zeichen:
IS-EG1-MUC/geb

Dokument:
Bender_ATICS-
DIO_131112_Funktionsbewertun
g-Teil 710-2012_SUE-Rev02.doc

Das Dokument besteht aus
4 Seiten.
Seite 1 von 4

Die auszugsweise Wiedergabe des
Dokumentes und die Verwendung
zu Werbezwecken bedürfen der
schriftlichen Genehmigung der
TÜV SÜD Industrie Service GmbH.

Die Prüfergebnisse beziehen
sich ausschließlich auf die
untersuchten Prüfgegenstände.

Das Original dieses Berichts gilt auch wenn ein Wasserzeichen sichtbar ist oder wenn er mit einem grünen Stempel der TÜV SÜD Industrie Service GmbH gekennzeichnet ist.

Sitz: München
Amtsgericht München HRB 96 869
USt-IdNr. DE129484218
Informationen gemäß § 2 Abs. 1 DL-InfoV
unter www.tuev-sued.de/impressum

Aufsichtsrat:
Peter Kardel (Stellv. Vorsitzender)
Geschäftsführer:
Ferdinand Neuwieser (Sprecher),
Dr. Ulrich Klotz, Thomas Kainz

Telefon: +49 89 5791-2432
Telefax: +49 89 5791-2425
www.tuev-sued.de/ils
TÜV®

TÜV SÜD Industrie Service GmbH
Niederlassung München
Abteilung Elektrotechnik
Westendstraße 199
80686 München
Deutschland

10.3 TÜV certificate regarding functional safety

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ CERTIFICADO ◆ CERTIFICAT



Product Service

ZERTIFIKAT

Nr. Z10 15 12 77738 002

Zertifikatsinhaber: **Bender GmbH & Co. KG**
 Londerfer Straße 65
 35305 Grünberg
 DEUTSCHLAND

Fertigungsstätte(n): 77730

Prüfzeichen:



Produkt: **Sicherheitsbauelemente
Umschalteinrichtung**

Modell(e): **ATICS**

Parameter:

Temperatur:	-25°C...+55°C
Betriebsspannung:	250VAC 50 / 60Hz
Strom während Umschaltvorgang:	17A / <30ms

Der Bericht BG83832T und die Benutzerdokumentation in den aktuell gültigen Versionen sind zwingende Bestandteile dieses Zertifikats

Geprüft nach:

EN 61508-1:2010 (bis SIL2)
 EN 61508-2:2010 (bis SIL2)
 EN 61508-3:2010 (bis SIL2)

Das Produkt wurde auf freiwilliger Basis auf die Einhaltung der grundlegenden Anforderungen geprüft und kann mit dem oben abgebildeten Prüfzeichen gekennzeichnet werden. Eine Veränderung der Darstellung des Prüfzeichens ist nicht erlaubt. Die Übertragung eines Zertifikates durch den Zertifikatsinhaber an Dritte ist unzulässig. Umseitige Hinweise sind zu beachten.

Prüfbericht Nr.: BG83659T

Gültig bis: 2020-12-20



Datum, 2015-12-21
 (Peter Weiss)



Seite 1 von 1

TÜV SÜD Product Service GmbH · Zertifizierstelle · Ridlerstraße 65 · 80339 München · Germany



A1 / 04.11

10.4 Standards and certifications

The transfer switching device conforms to the following standards:

- DIN VDE 0100-710 (VDE 0100 Part 710):2002-11*
- DIN VDE 0100-710 (VDE 0100 Part 710):2012-10*
- DIN VDE 0100-710 (VDE 0100 Part 710) supplement 1:2014-06
- DIN VDE 0100-718 (VDE 0100-718):2014-06
- ÖVE/ÖNORM E 8007:2007-12-01
- IEC 60364-7-710:2002-11*

- DIN EN 61508-1 (VDE 0803-1):2011-02*
- IEC 61508-1 (2010-04) Ed. 2.0*
- DIN EN 61508-2 (VDE 0803-2):2011-02*
- IEC 61508-2 (2010-04) Ed. 2.0*
- DIN EN 61508-3 (VDE 0803-3):2011-02*
- IEC 61508-3 (2010-04) Ed. 2.0*
- DIN EN 60947-6-1 (VDE 0660-114):2014-09
- IEC 60947-6-1 (2013-12) Ed. 2.1

Standard-compliant isolating transformer monitoring according to:

- DIN EN 61558-1 (VDE 0570-1):2006-07
- DIN EN 61558-1/Amendment 1 (VDE 0570-1/Amendment 1):2008-11
- DIN EN 61558-1/Amendment 2 (VDE 0570-1/Amendment 2):2008-12
- DIN EN 61558-1/A1 (VDE 0570-1/A1):2009-11

The standards marked with * were part of the test conducted by TÜV Süd.



10.5 Ordering details

Type	Description	Rated operational current I_e	Art. No.
ATICS-2-63A-DIO	Two-pole transfer switching device, 4 digital inputs, 4 relay outputs, short-circuit detection in the TN system, with sealable contact covers on the output and input side, bridges on the output side and screw terminals for all connections. 1 unit measuring current transformer STW3.	AC 63 A	B92057212
ATICS-2-80A-DIO	Two-pole transfer switching device, 4 digital inputs, 4 relay outputs, short-circuit detection in the TN system, with sealable contact covers on the output and input side, bridges on the output side and screw terminals for all connections. 1 unit measuring current transformer STW3.	AC 80 A	B92057213
ATICS-4-80A-DIO	Four-pole transfer switching device, 4 digital inputs, 4 relay outputs, short-circuit detection in the TN system, with sealable contact covers on the output and input side, bridges on the output side and pluggable screw terminals for all connections. 4 units measuring current transformer STW3.	AC 80 A	B92057222
ATICS-4-125A-DIO	Four-pole transfer switching device, 4 digital inputs, 4 relay outputs, short-circuit detection in the TN system, with sealable contact covers on the output and input side, bridges on the output side and pluggable screw terminals for all connections. 4 units measuring current transformer STW4.	AC 125 A	B92057223
ATICS-4-160A-DIO	Four-pole transfer switching device, 4 digital inputs, 4 relay outputs, short-circuit detection in the TN system, with sealable contact covers on the output and input side, bridges on the output side and screw terminals (not pluggable) for lines I, II, III. Pluggable screw terminals for all other connections. 4 units measuring current transformer STW4.	AC 160 A	B92057224
STW3	Measuring current transformer (short-circuit monitoring) for ATICS® < 100 A	AC 100 A	B98021000
STW4	Measuring current transformer (short-circuit monitoring) for ATICS® < 100 A	AC 200 A	B98021001
ATICS-BP-2-63A-SET	Bypass switch set comprising: - Bypass switch 63 A single, two-pole, sequence of operation: I-I+II-II, with auxiliary contact, bridge, terminal cover - Auxiliary contact for ATICS® - LEDs green/red for DIN rail mounting	AC 63 A	B92057252
ATICS-BP-2-80A-SET	Bypass switch set comprising: - Bypass switch 80 A single, two-pole, sequence of operation: I-I+II-II, with auxiliary contact, bridge, terminal cover - Auxiliary contact for ATICS® - LEDs green/red for DIN rail mounting	AC 80 A	B92057253

Type	Description	Rated operational current I_e	Art. No.
ATICS-BP-4-80A-SET	Bypass switch set comprising: - Bypass switch 80 A single, four-pole, sequence of operation: I-I+II-II, with auxiliary contact, bridge, terminal cover - Auxiliary contact for ATICS® - LEDs green/red for DIN rail mounting	AC 80 A	B92057260
ATICS-BP-4-125A-SET	Bypass switch set comprising: - Bypass switch 125 A single, four-pole, sequence of operation: I-I+II-II, with auxiliary contact, bridge, terminal cover - Auxiliary contact for ATICS® - LEDs green/red for DIN rail mounting	AC 125 A	B92057262

10.6 Additional documents

- ATICS® quick-start guide "Installation and connection"
- ATICS® quick-start guide "Commissioning and operation"
- ATICS® Checklist

In addition, the following instructions apply:

- ATICS-BP-3-SET Bypass switch set for ATICS®
- STW2, STW3, STW4 Measuring current transformers
- BMS bus Bender measuring device interface
- BMS-Ethernet gateway for the connection of the Bender measuring device interface to TCP/IP networks
- MK2430 Alarm indicator and test combination
- MK800 Alarm indicator and test combination
- TMK-SET Configuration software for MK2430, MK800 and TM800

INDEX

A

Addressing examples 46
Alarm text display 67
Automatic transfer switching device 16
Auxiliary contact 26

B

Bender service personnel 82
BMS bus (channel use) 42, 43

C

Checklist 45
Cleaning 92
Control 83

D

Device-specific safety instruction 12
Diagram 62

E

Error code 86

F

Factory settings 45
FAQs 88
Frequently asked questions 88
Functional safety 88
Functional test 91

I

in operation
- fault condition 50
- fault-free 48, 49
Intended use 11

L

Language 79
Line 3 16

M

Main menu 63
Maintenance 92

Menu mode 61
Messages 85
Monitoring 21

N

Navigation 62

O

Opening the main menu 61
Operating hours counter 59, 65
Operating theatre lights 17
Operation 47
Ordering details 106
Overcurrent or short-circuit current 59, 65

P

Password 51, 68
Periodic verification 91
Power supply 21
Protocol converters 37

Q

Quick reference guide 47

S

SCADA system (Supervisory Control and Data Acquisition) 37
SCADA systems (Supervisory Control and Data Acquisition) 37
Selectivity 29
Service 8
Service code 86
Service life 65
Service menu 82
Settings 41, 68
Short-circuit protection 29
Standard display 61
Supply
- preferred 16
- second 16
Support 8

T

Test communication 56
Training courses 9
Troubleshooting 85

W

Workshops 9



Bender GmbH & Co. KG

P.O. Box 1161 • 35301 Gruenberg • Germany
Londorfer Straße 65 • 35305 Gruenberg • Germany
Tel.: +49 6401 807-0 • Fax: +49 6401 807-259
E-mail: info@bender.de • www.bender.de

Fotos: Bender Archiv.

optec
energie ist messbar

Optec AG | Guyer-Zeller-Strasse 14 | CH-8620 Wetzikon ZH

Telefon: +41 44 933 07 70 | Telefax: +41 44 933 07 77
E-Mail: info@optec.ch | Internet: www.optec.ch



BENDER Group