



ATICS-2-63A-ISO / ATICS-2-80A-ISO

Automatic transfer switching devices with monitoring functions for unearthed safety power supplies

Software version: D333 V1.3x, D334 V1.3x, D335 V1.0x, D308 V1.2x

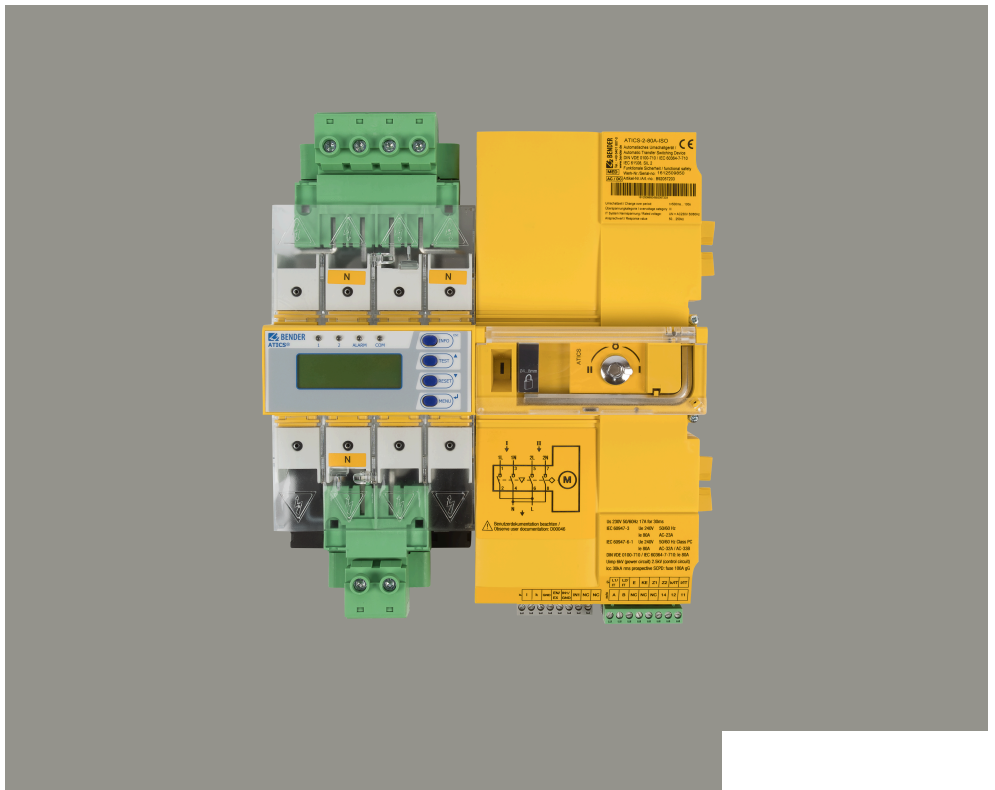


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1 General information

1.1 How to use the manual



ADVICE

This manual is intended for qualified personnel working in electrical engineering and electronics! Part of the device documentation in addition to this manual is the enclosed supplement "Safety instructions for Bender products".



ADVICE

Read the operating manual before mounting, connecting and commissioning the device. Keep the manual within easy reach for future reference.

1.2 Indication of important instructions and information



DANGER

Indicates a high risk of danger that will result in death or serious injury if not avoided.



WARNING

Indicates a medium risk of danger that can lead to death or serious injury if not avoided.



CAUTION

Indicates a low-level risk that can result in minor or moderate injury or damage to property if not avoided.



ADVICE

Indicates important facts that do not result in immediate injuries. They can lead to malfunctions if the device is handled incorrectly.



Information can help to optimise the use of the product.

1.3 Service and Support

Information and contact details about customer service, repair service or field service for Bender devices are available on the following website: Fast assistance | Bender GmbH & Co. KG.

1.4 Training courses and seminars

Regular face-to-face or online seminars for customers and other interested parties:

www.bender.de > know-how > seminars.

1.5 Delivery conditions

The conditions of sale and delivery set out by Bender GmbH & Co. KG apply. These can be obtained in printed or electronic format.

1.6 Inspection, transport and storage

Check the shipping and device packaging for transport damage and scope of delivery. In the event of complaints, the company must be notified immediately, see "www.bender.de > service & support."

When storing the devices, observe the information under Environment / EMC in the technical data.

1.7 Warranty and liability

Warranty and liability claims for personal injury and property damage are excluded in the case of:

- 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.
- The use of accessories or spare parts that are not provided, approved or recommended by the manufacturer.
- Catastrophes caused by external influences and force majeure.
- Mounting and installation with device combinations not approved or recommended by the manufacturer.

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

1.8 Disposal of Bender devices

Abide by the national regulations and laws governing the disposal of this device.



Bender GmbH & Co. KG is registered in the waste from electrical and electronic equipment (WEEE) register under the WEEE number: DE 43 124 402. For more information on the disposal of Bender devices, refer to www.bender.de > service & support.

2 Safety

If the device is used outside the Federal Republic of Germany, the applicable local standards and regulations must be complied with. In Europe, the European standard EN 50110 applies.



DANGER Risk of fatal injury due to electric shock!

Touching live parts of the system carries the risk of:

- Risk of electrocution due to electric shock
- Damage to the electrical installation
- Destruction of the device

Before installing the device and before working on its connections, make sure that the installation has been de-energised. The rules for working on electrical systems must be observed.

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.
- Do not open the device.
- 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 has been 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.

Device-specific safety instructions

Malfunction due to failure to adjust the settings

The settings must be changed in order to adapt the ATICS® automatic transfer switching and monitoring device to the existing equipment.

Follow the instructions in chapter "Design and installation", page 39.

No functional safety according to IEC 61508 in case of improper use

Follow the instructions given in this operating manual and in the check list.

3 Intended use

Transfer switching devices are used everywhere there is dependence on high availability from the power supply. The ATICS® automatic transfer switching and monitoring device is intended for the application described in the chapter “System description”, page 10. When the preferred supply fails, the 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, data centres
- Fire extinguisher and sprinkler systems

Several versions of ATICS® are available. They differ for example by switching over from two- or four-pole systems or by the load current (see “ATICS® tasks”, page 12).

In order to meet the requirements of the applicable standards, customised parameter settings must be made on the equipment in order to adapt it to local equipment and operating conditions. Please heed the limits of the range of application indicated in the technical data.

Intended use also includes

- the observation of all information in the operating manual and
- compliance with test intervals.

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

4 System description

4.1 Properties

4.1.1 Product description

The ATICS® automatic transfer switching devices provide all functions for changeover between two independent power supplies and for monitoring unearthed 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 the optional bypass switch, enable the ATICS® to be tested or replaced during service works without interruption of the power supply. ATICS® considerably enhances the safety level particularly in intensive care units and in operating theatres.

4.1.2 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, with optional locking by means of a padlock

4.1.3 Messages

- Status indication of operating, warning and alarm messages via
 - integrated graphic display and
 - external indication on MK.../TM.../CP...
- 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

4.1.4 Other functions

- Automatic monitoring of all programme and data storage as well as essential internal components and connecting wires for proper functioning
- Programmable relay output (alarm relay)
- Programmable digital input

4.2 Functional safety

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

4.2.1 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:

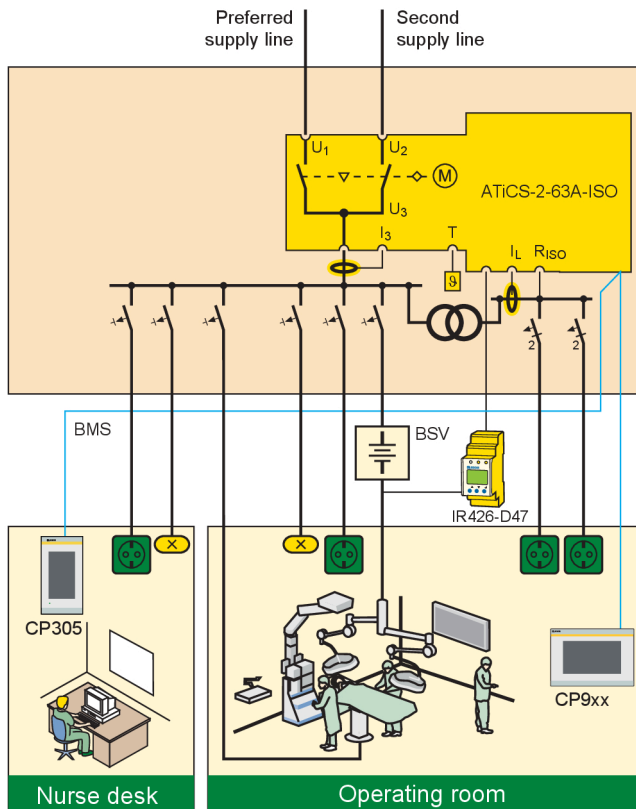


For detailed information refer to:

- "Commissioning, settings and testing", page 39
- "Periodic verification and service", page 77

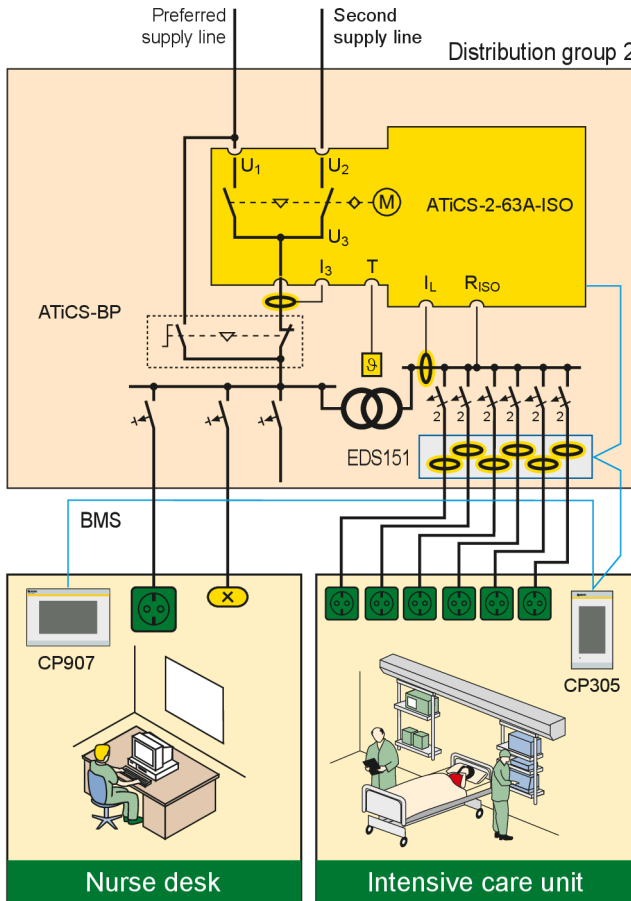
4.3 Application examples

4.3.1 Application example operating theatre



- ATICS-2-63A-ISO: Changeover between the preferred and redundant line while monitoring the medical IT system with transformer load and temperature monitoring
- IR426-D47: Monitoring of the operating theatre light IT system (optional)
- MK.../TM.../CP...: Alarm at at least two points with independent power supplies for functional safety

4.3.2 Application example intensive care unit



- ATICS-2-63A-ISO: Changeover between the preferred and redundant line while monitoring the medical IT system with transformer load and temperature monitoring
- EDS151: Insulation fault locator for fast insulation fault location (recommended)
- ATICS-BP: Bypass switch for uninterrupted test/maintenance (recommended)
- MK.../TM.../CP...: Alarm at at least two points with independent power supplies for functional safety

4.4 ATICS® tasks

- Two-pole changeover of the power supply
- Voltage monitoring of the preferred supply (line 1)
- Voltage monitoring of the second supply (line 2)
- Voltage monitoring at the automatic transfer switching device output (line 3)
- Monitoring of the changeover switch for correct switch position
- Internal functional testing, including checking the switching times
- Monitoring of the insulation resistance in the IT system
- Monitoring of the IT system transformer load current
- Monitoring of the IT system transformer temperature

- Communication with remote alarm indicator and test combinations, and with 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

4.5 ATICS® functions

4.5.1 The automatic transfer switching device

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

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

The switch has three positions:

- 1: Line 1 is connected.
- 0: Both lines are disconnected.
- 2: Line 2 is connected.

Either line 1 or line 2 can be set as the preferred line (setting described in "Settings menu 1: Changeover", page 61 or chapter "Settings menu 6: Dig. input", page 66).

1. In the normal operating condition (fault-free operation) the preferred supply is connected. ATICS® switches 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 changed to the other line.
2. ATICS® switches from the redundant line back to the preferred line if
 - the voltage on the preferred line is restored and the return transfer delay time $t(2 \rightarrow 1)$ has elapsed and no switch-back lock is enabled,
 - the "RESET" button is pressed,
 - the redundant line fails (even when the switch-back lock is enabled),
 - the setting "Preferred line" is changed to the other line,
 - the digital input is configured to "TEST" and this input is reset,
 - a test of the automatic transfer switching and monitoring device is active and the test period has elapsed.
3. Only for "-ES" version of ATICS® with ATICS-ES energy storage device: ATICS® switches to position "0" and remains there if the following conditions are fulfilled simultaneously:
 - Line 1 and line 2 have failed.
 - Automatic mode is active.
 - There is no short circuit downstream the transfer switching device.
 - The "Load disconn." setting is set to "on" and the external ATICS-ES energy storage device is connected.

**WARNING Malfunction possible if delay times are not adjusted**

The response delay $t(\text{on})$, the return transfer delay time $t(2 \rightarrow 1)$, the delay on release $t(\text{off})$ and the dead time $t(0)$ of ATICS® must be adjusted to the requirements of the specific case, the short-circuit calculation and the requirements of DIN VDE 0100-710 (VDE 0100-710) for automatic transfer switching devices. See chapter "Commissioning, settings and testing", page 39.

The factory settings guarantee a changeover period of $t \leq 0.5$ s and switching back within 10 seconds when voltage is restored on the preferred supply. Therefore, the 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.).

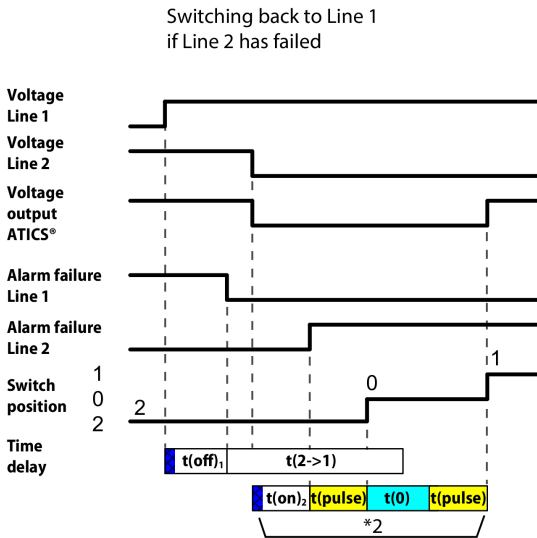
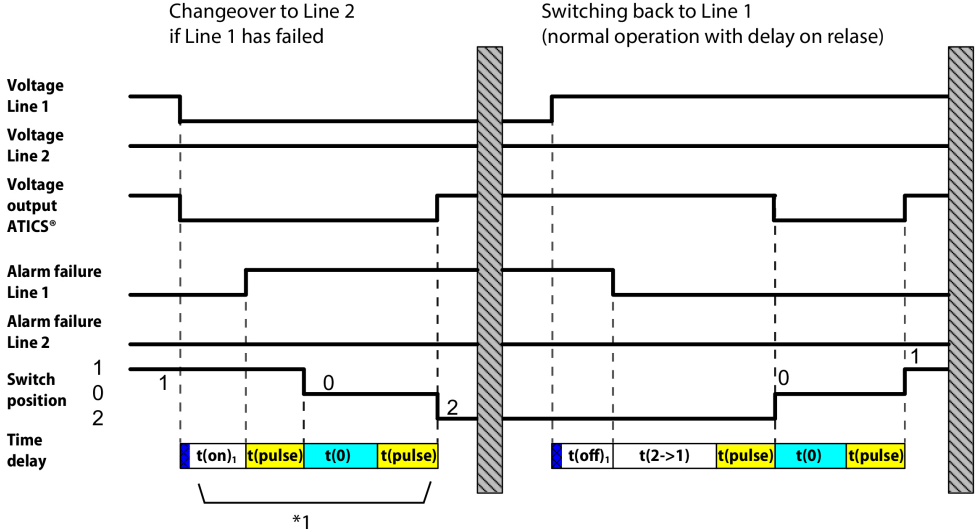
When there is a short circuit downstream of the automatic transfer switching device, the automatic transfer switching device must not continually change back and forth between the two lines. This can occur if the short-circuit current is small and the automatic transfer switching device switches faster than the short-circuit breaker trips. ATICS® monitors the load current downstream of the automatic 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 the 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.

4.5.1.1 Time diagram: Changoover between preferred and redundant line

i Time diagrams: Times are not shown to scale.

Example: Line 1 is set as preferred line.



Legend

- t(pulse)** Pulse time: 15 ... 30 ms
- t(0)** Dead time
- t(on)₁** Response delay ALARM failure voltage line 1
Measuring time: approx. 50 ms
- t(off)₁** Delay on release ALARM failure voltage line 1
Measuring time: approx. 50 ms
- t(on)₂** Response delay ALARM failure voltage line 2
Measuring time: approx. 50 ms
- t(2->1)** Return transfer delay time
- *1** Changoover period t(1->2) indicated during a test
- *2** The return transfer delay time may differ from the changoover period t(1->2)

4.5.1.2 Time diagram: Staggered switching on after complete power failure

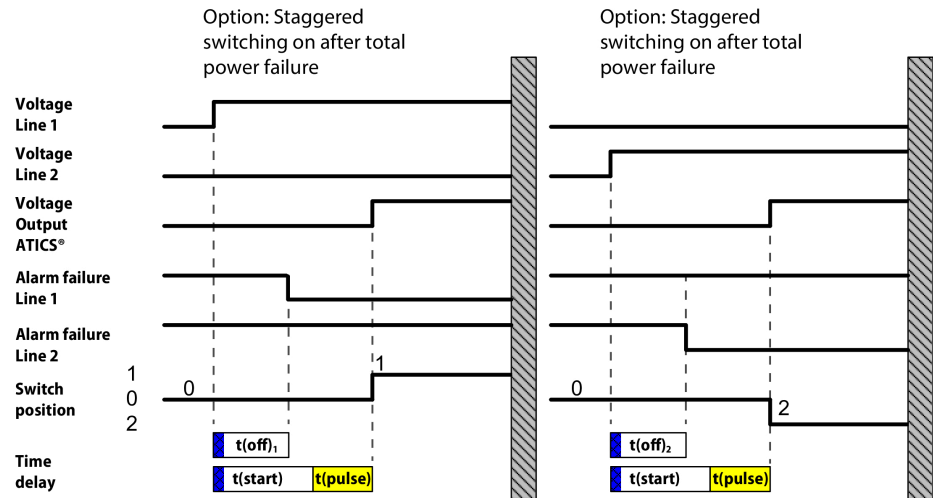
Switching on at staggered intervals after a complete power failure (no voltage on either of the power supplies) prevents all loads from being switched on at the same time.

For automatic switching on at staggered intervals, the ATICS® “-ES” version and the external ATICS-ES energy storage device (optional, see “Ordering information”, page 90) are required.

If there is no voltage on either of the power supplies, ATICS® switches to position “0”. Manual method: Switch ATICS® to position “0” using the 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.

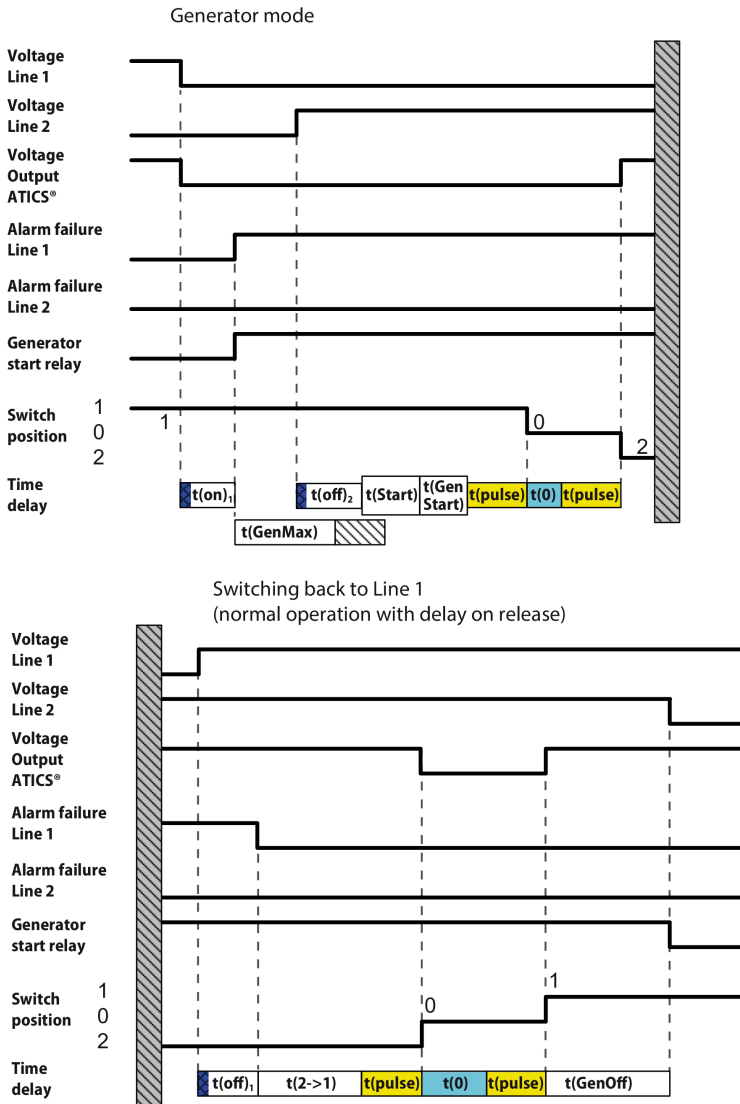


Legend

t(pulse)	Pulse time: 15 ... 30 ms	
t(start)	Switch-on delay after complete power failure	Measuring time: approx. 50 ms
t(off)₁	Delay on release failure voltage line 1	Measuring time: approx. 50 ms
t(off)₂	Delay on release failure voltage line 2	Measuring time: approx. 50 ms

After a complete power failure and restart of ATICS®, $t(\text{off})$ and $t(\text{start})$ start simultaneously. The time that is longer determines the behaviour. After switching on, ATICS® performs a quick measurement of the voltage with $t(\text{off}) = 100$ ms. If the voltage is within the permissible range, the set value of $t(\text{off})$ is ignored. If the voltage is too low, ATICS® waits until the set time $t(\text{off})$ has elapsed.

4.5.1.3 Time diagram: Changoover to generator mode



Legend

t(pulse)	Pulse time: 15 ... 30 ms
t(0)	Dead time
t(on)₁	Response delay ALARM failure voltage line 1 Measuring time: approx. 50 ms
t(Start)	Switch-on delay after complete power failure and restart of ATICS® Measuring time: approx. 50 ms
t(off)₁	Delay on release ALARM failure voltage line 1 Measuring time: approx. 50 ms
t(off)₂	Delay on release ALARM failure voltage line 2* Measuring time: approx. 50 ms
t(2->1)	Return transfer delay time
t(GenStart)	Generator start-up delay, delayed changeover to generator. Measured from voltage line 2 ok
t(GenOff)	Generator disconnecting delay, delayed switching-off of the generator
t(GenMax)	Generator start-up time. Time until generator supplies correct voltage. The message "Failure line 2" is suppressed until then.

* After switching on, ATICS® measures the voltage with t(off) = 100 ms. If the voltage is within the permissible range, the value set for t(off) is ignored. If the voltage is too low, ATICS® waits until t(off) has elapsed.

4.5.2 IT system monitoring

Insulation monitoring

The integrated insulation monitoring device measures the insulation resistance on AC IT systems, which may also contain DC voltage components. Adaptation to the system leakage capacitances is automatic. The measuring time increases as the system leakage capacitances increase.

Load current measurement

The load current on the IT system is measured using an STW2 measuring current transformer.

Temperature monitoring

The temperature in the transformer winding is measured via PTC thermistors.

Evaluation

If any measured value is outside the limits, an alarm is triggered. A message 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.

Locating current injector

When an insulation fault is detected in an IT system, the integrated locating current injector generates a locating current signal to locate the insulation fault. The locating current is limited to max. 1 mA. This function can be enabled or disabled (see chapter "Settings menu 4: IT system", page 64).

4.5.3 Monitoring the device functions

The control circuits are designed in such a way that a single fault, which must be expected to occur, cannot lead to failure of the power supply at the output of the automatic transfer switching device.

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

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
 - measuring current transformer connection
 - temperature sensor connection
 - power supply and PE connection
- For alarm and test combinations and alarm indicator and operator panels, device failure monitoring can also be programmed via the BMS bus. (Required for functional safety, see chapter “Setting parameters of indicator devices”, page 39.)

4.5.4 Power supply

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

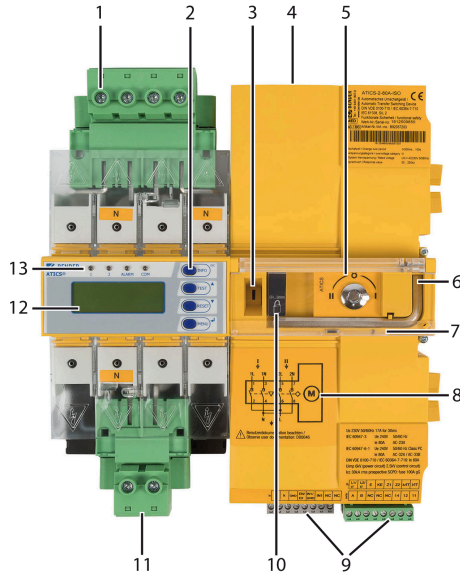
If both lines fail, ATICS® remains in the last switch position. Switch ATICS® to position “0” using an Allen key. When power is restored, ATICS® switches on the supply again with the set delay time $t(\text{start})$. If several ATICS® are installed in one system, they can be switched to the preferred 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.

Optionally, the “-ES” version of ATICS® can be used with the external ATICS-ES energy storage device to supply the two coils as well as the electronics. This means that the switching to position “0” is automatic if both supply lines fail.

4.5.5 Manual mode

In manual mode, changeover can be achieved using an Allen key. The switching device can be locked in position “0” with a padlock.

4.6 ATICS-2-ISO front view



Legend

- 1 Green plug connector for line 1 and line 2
- 2 Control buttons
- 3 Inspection window for switch position
- 4 Connection for ATICS-ES energy storage device (only for "-ES" version) / Connection for supply voltages (only for "-400" version)
- 5 Manual mode of the 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

5 Mounting and connection

**DANGER Danger to life due to electric shock**

Touching live parts of the system carries the risk of electric shock.

- ▶ Before installing the device and prior to working on the device connections, make sure that the power supply is disconnected.
- ▶ Observe the rules for working on electrical installations.



Disturbance due to loud switching noise! Install ATICS® in a closed electrical operating area or in a sound-proof distribution board.

5.1 Mounting

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

**ADVICE****Risk of destruction by plastering**

Liquid plaster may enter the device and block it.

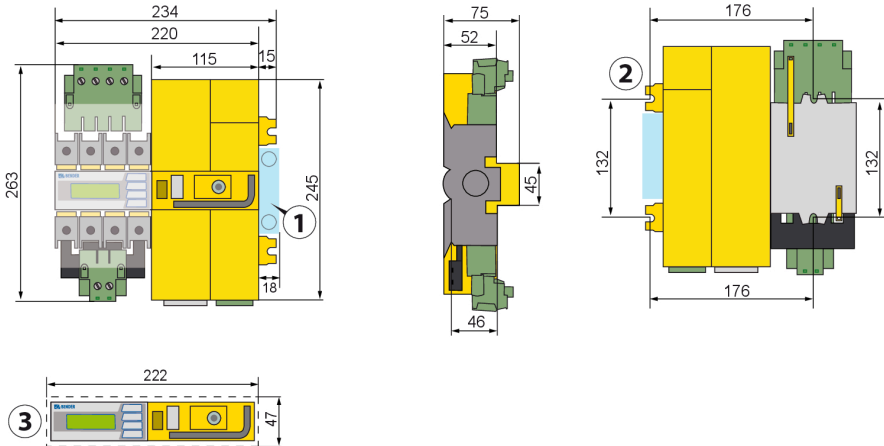
- ▶ Do not seal the device with plaster.

Required tools

Use the following tools to connect the power unit and the control cables:

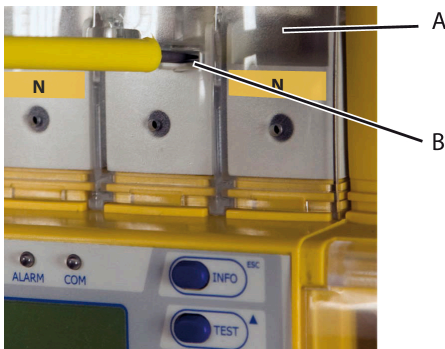
- Torx® screwdriver T20 or 6.5 x 1.2 mm
- Screwdriver 2.5 x 0.4 mm
- Allen key 4 mm

5.1.1 Dimension diagram



- 1 Additional space required for auxiliary contact when using the bypass switch
- 2 Rear view (dimensions for screw mounting on mounting plate)
- 3 Cutout for terminal cover

5.1.2 Removing terminal cover



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

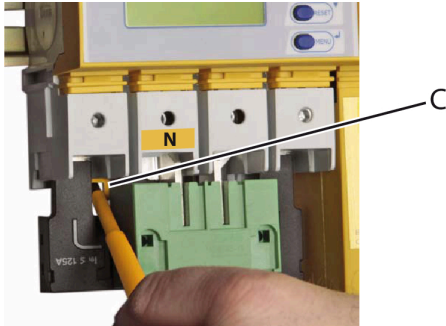
5.1.3 DIN rail mounting



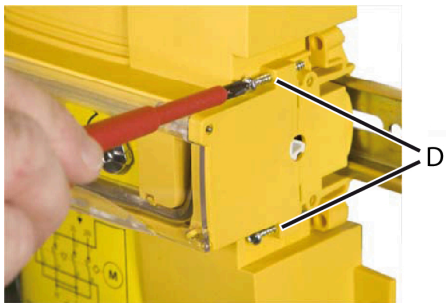
ADVICE
Material damage due to loose screws

If the screws are loose, ATICS® may be damaged by the vibrations generated during switching.

- ▶ Tighten the screws.



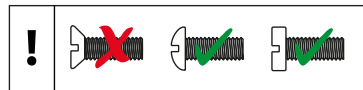
1. Place ATICS® on the top edge of the rail.
2. Use a screwdriver to pull down the lower yellow slide lock (C) and snap the ATICS® into place with slight pressure. Check that the slide lock has properly snapped into position by pulling slightly the lower part of the enclosure.
3. Fix all terminals with Allen screws terminals. Tightening torque: 5 N m.
4. Fasten the terminal covers.
5. Tighten screws (D) (PZ1, 8.8 lb-in, 1 N m).



5.1.4 Screw mounting on plate

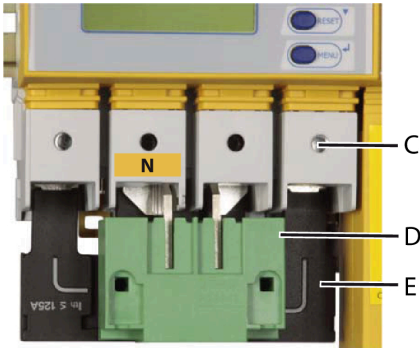


- Observe dimension diagram of rear view.
- Use M5 mounting screws.



CAUTION Reduced voltage clearances caused by screw heads or washers

- ▶ Use mounting screws with flat screw heads and flat washers to provide for sufficient clearance to live conductors (voltage clearance).
- ▶ If mounted on electrically conductive material: Earth the mounting plate and cover the area under the terminals with insulating material.



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 the ATICS® to the mounting plate with M5 mounting screws (22 lb-in, 2.5 N m) (see dimension diagram).
5. Insert the black bridge (E) bottom.
6. Plug in the green plug connectors (D) top and bottom.
7. Fix all terminals (C) with Allen screws. Tightening torque: 5 N m.
8. Fasten the terminal covers.

5.2 Connection

5.2.1 Short-circuit protection

When choosing the fuses in the supply lines and outgoing feeders of the transfer switching devices, observe the requirements of DIN VDE 0100-710 (VDE 0100 Part 710).

- Transformers for the IT system: Where transformers, their primary supply conductor and secondary outgoing line are concerned, overcurrent protective devices are only permitted for short-circuit protection. The transformer supply line from the transfer switching device and the transformer outgoing line to the next distribution board section should be installed short-circuit and earth-fault proof: (halogen-free, flexible single-core rubber cable NSHXAFö 1.8/3 kV).
- Protection of the cable system in group 2 medical locations: When choosing protective devices, it is essential to ensure that when the prospective short-circuit currents occur, the protective device upstream of a fault will selectively trip the protective devices which are further upstream.
- Connecting several load groups downstream of an automatic transfer switching device must not lead to all the load groups failing in the event of a fault.

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

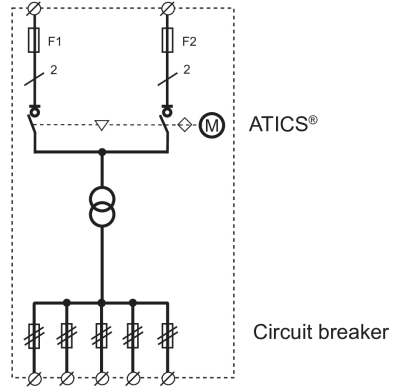
When choosing back-up fuses, observe both the maximum permissible values in accordance with the applicable local regulations and national and international standards to make sure that the contacts are weld-free.

The considerations presented below are based on the standard DIN VDE 0100-710 (VDE 0100-710).

Selecting a fuse for only one load

The circuit has only one load, the “IT system transformer”. Refer to the information provided by the transformer manufacturer for the minimum size of back-up fuses for the IT system transformer chosen.

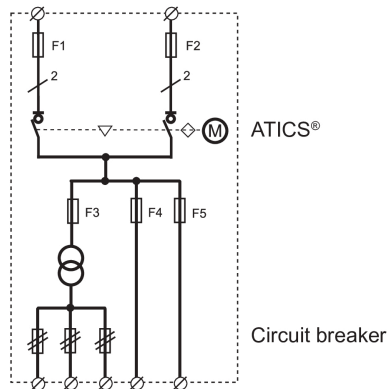
The rated operational current of the ATICS® must be greater than or the same as the rated operational current of the transformer. Refer to the technical specifications of the ATICS® for the maximum size of back-up fuses F1 or F2.



Selecting a fuse for several loads

This circuit branches into several load groups. This means that each fuse of each load group is moved downstream of the automatic transfer switching device. However, the maximum possible back-up fuse is calculated in the same way as described above.

The back-up fuse (F1 or F2) must match the backup fuse F3 (and of course F4 and F5) so that selective shutdown is ensured. The back-up fuse specified by the manufacturer for the IT system transformer must therefore be at least two steps smaller than the back-up fuse determined for ATICS® according to the above method.



Of course, the total current rating for the automatic transfer switching device must be calculated from the sum and simultaneity factor of all the load groups connected and the required or minimum rated current calculated according to the method above.

5.2.2 Connecting ATICS® safely



DANGER Danger to life due to electric shock!

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



1. Open the transparent cover.
2. Wait until "manual mode" appears on the display.
3. Set to switch position "0" using the Allen key.
4. Lock the device using a padlock.



DANGER Danger to life due to electric shock!

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

- For connection, strip 20 mm of insulation from cables 1, 2 and 3; do not use ferrules.
- Observe assignment of "ATICS® terminals".
- Always connect both supplies to the device from the top.
- Tighten the terminal screws to the specified torque. Check all screws regularly for tightness.



DANGER Hazardous voltages when operating the "-ES" version of ATICS® without the external ATICS-ES energy storage device!

As soon as no ATICS-ES is connected, plug the enclosed dummy plug (A370261) into the energy storage device connection of ATICS®.



WARNING Risk of destruction during insulation and voltage tests

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



WARNING Risk of destruction if connected incorrectly

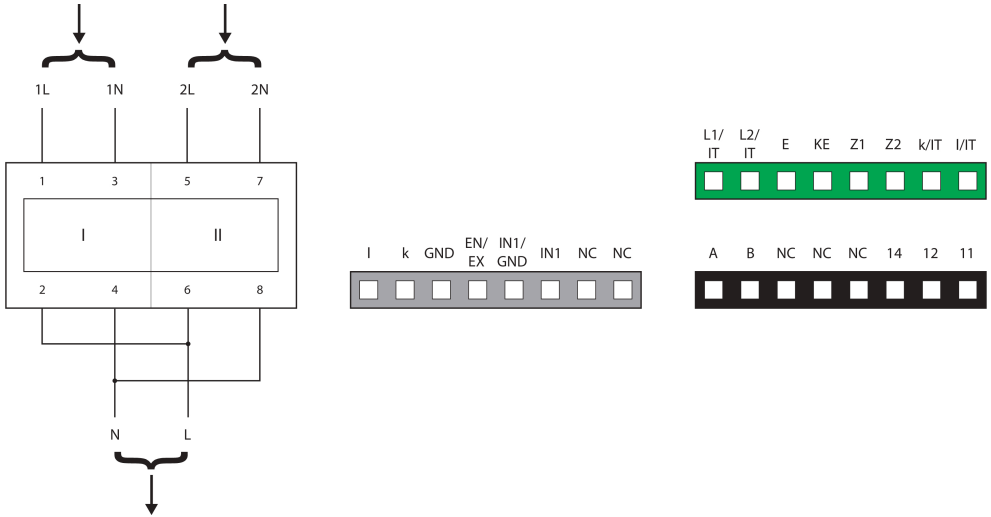
The terminals labelled GND must not be connected to PE.




CAUTION Incorrect insulation measurement possible.

ATICS® contains an insulation monitoring device. If another insulation monitoring device is connected, the devices will affect one another. This will lead to false measurements.

Only connect one insulation monitoring device in each interconnected IT system.

ATICS® terminals


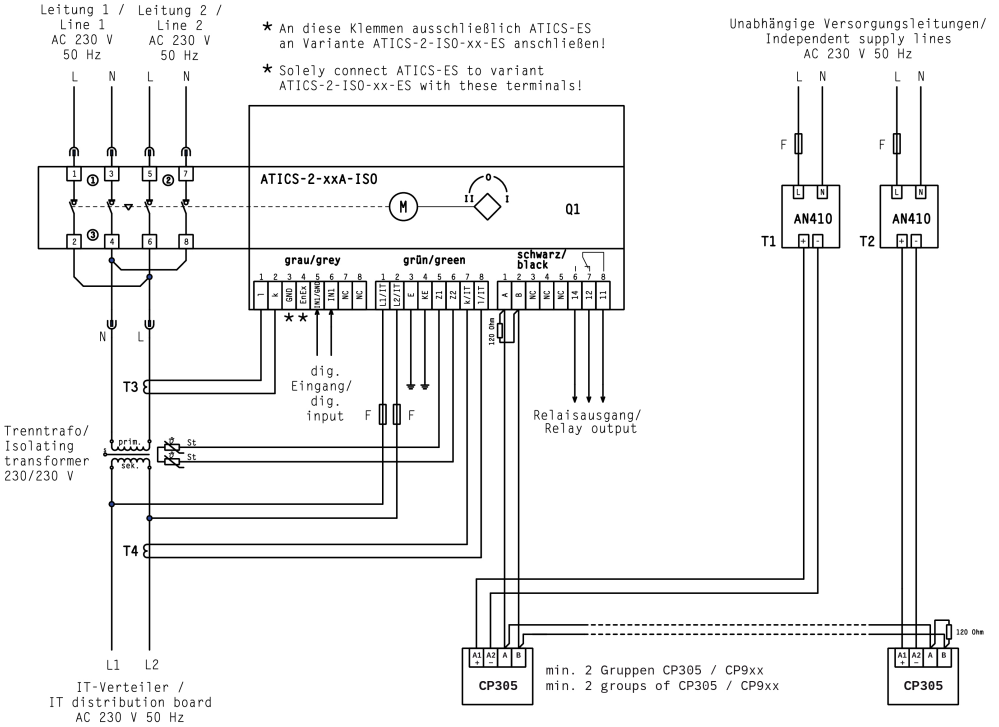
Colour	Terminal	Description
	1, 3	Connection line 1 (input line) L, N
	5, 7	Connection line 2 (input line) L, N
	4, 6	Connection line 3 (output line) N, L
grey	I, k	Connection measuring current transformer T3 (STW3) for monitoring the load current downstream the transfer switching and monitoring device (short-circuit monitoring)
	GND, EN/EX 	Connection is intended only for ATICS-2-ISO-ES to connect ATICS-ES energy storage device or for Bender-internal purposes (12 V). In other cases the connection must not be used. Cable length ≤ 2 m
	IN1/GND, IN1	Digital input, configurable (see chapter "Settings menu 6: Dig. input", page 66)
green	L1/IT, L2/IT	Connection to the IT system. Monitoring the insulation resistance. If an insulation fault exists: Feeding of a locating current for insulation fault location. Bipolar protection via 6 A back-up fuse.
	E, KE	Connection of E and KE with two separate lines to PE
	Z1, Z2	Temperature monitoring of the IT system transformer
	k/IT, I/IT	Connection for measuring current transformer STW2 to monitor the load current downstream of the IT system transformer (overload monitoring)
black	A, B	BMS bus connection
	14, 12, 11	Alarm relay, programmable function
	NC	Not used

5.2.3 ATICS® basic configuration



WARNING Risk of destruction if connected incorrectly

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

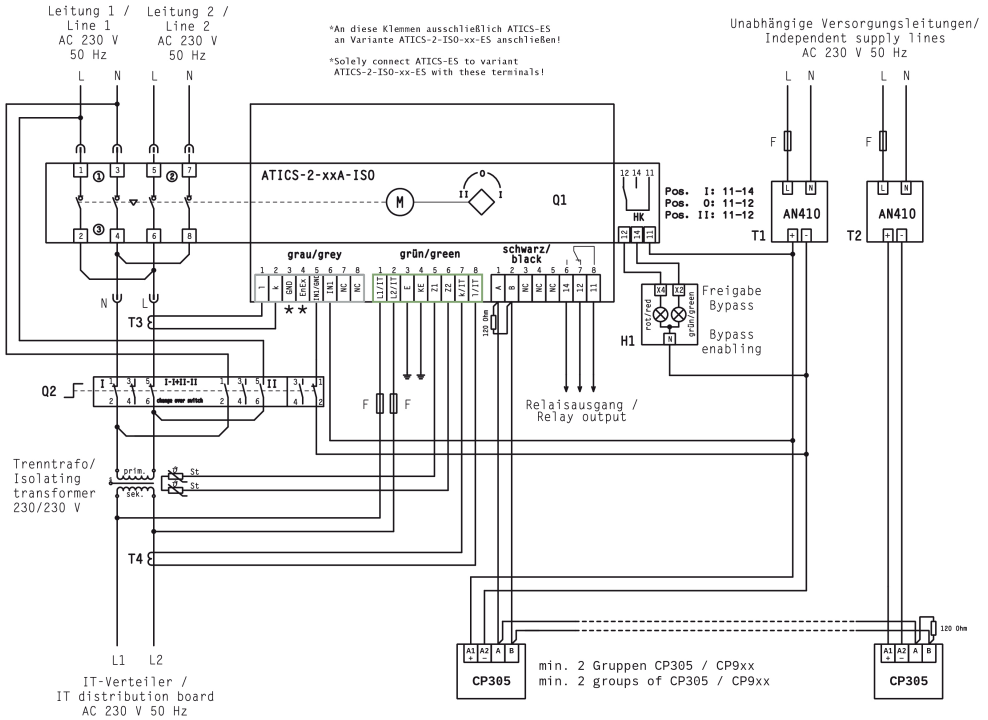


5.2.4 Connection example: ATICS® with bypass switch



WARNING Risk of destruction if connected incorrectly

The terminals marked with “*” are intended for Bender-internal purposes only. If this is ignored, ATICS® may be damaged.

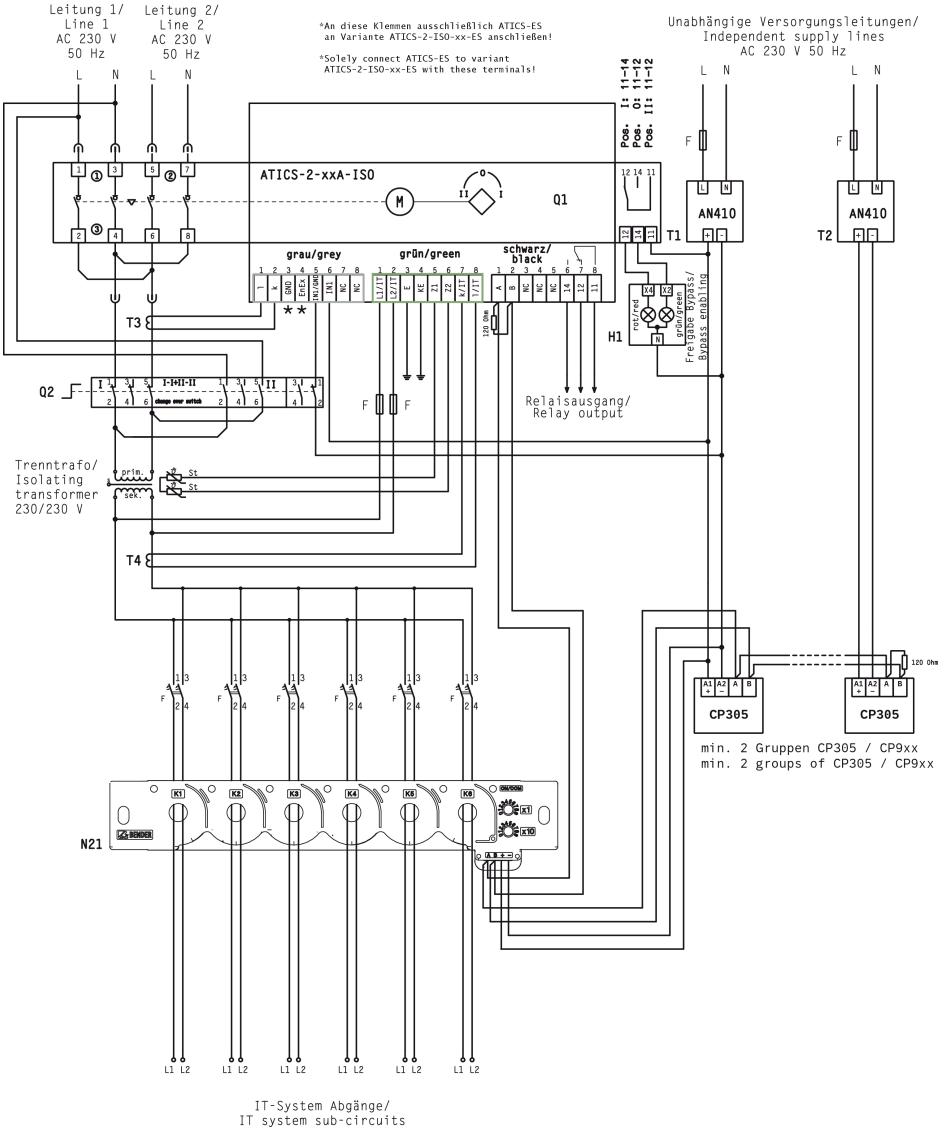


5.2.5 Connection example: ATICS® with bypass switch and EDS151



WARNING Risk of destruction if connected incorrectly

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



5.2.6 Connection example: ATICS® for 400-volt systems with N conductor



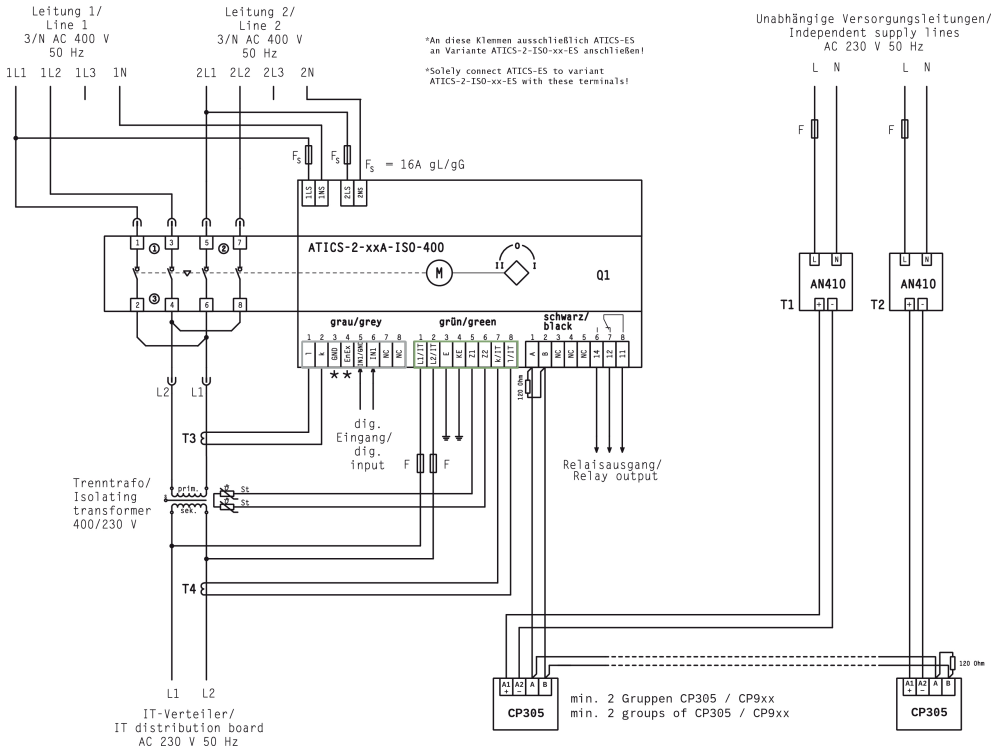
DANGER Risk of ineffective voltage monitoring

ATICS® must be supplied with power directly from the connected line (not from another phase) as shown. If this is not observed, the voltage monitoring does not function.



WARNING Risk of destruction if connected incorrectly

The terminals marked with “*” are intended for Bender-internal purposes only. If this is ignored, ATICS® may be damaged.



5.2.7 Connection example: ATICS® for 400-volt systems without N conductor



DANGER Risk of ineffective voltage monitoring

ATICS® must be supplied with power directly from the connected line (not from another phase) as shown. If this is not observed, the voltage monitoring does not function.

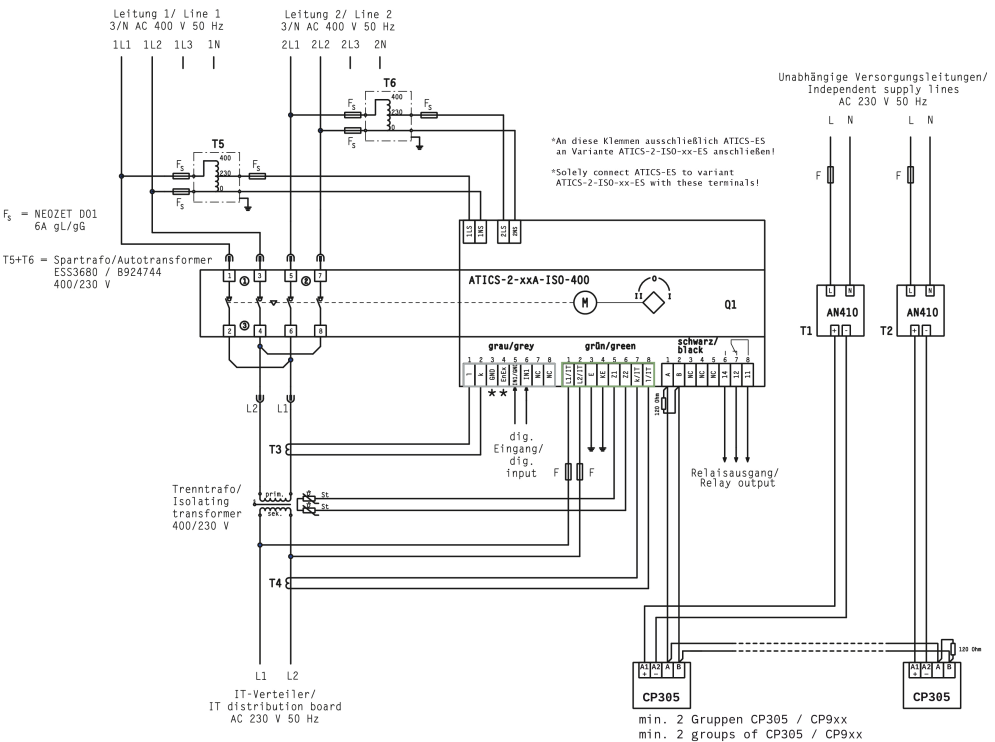


WARNING Risk of destruction if connected incorrectly

The terminals marked with “*” are intended for Bender-internal purposes only. If this is ignored, ATICS® may be damaged.



Only use the T5 and T6 autotransformers mentioned in the connection example.



5.2.8 Connection example: ATICS® with ATICS-ES energy storage device



WARNING Risk of destruction if connected incorrectly

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



Power supply for the ATICS-ES energy storage device

The AN412 power supply unit with order number B924150 must be used as power supply unit for the ATICS-ES energy storage device (highlighted in yellow).

5.2.9 Instructions for connection

Transformers for the IT system

The power for group 2 medical locations is supplied via an isolating transformer. Observe the requirements of DIN VDE 0100-710 (VDE 0100 Part 710) for transformers for medical IT systems.

Temperature sensors

Bender IT system transformers are equipped with the temperature sensors required according to their insulation class. These temperature sensors (maximum of 6 sensors connected in series) are connected to terminals Z1 and Z2.

BMS bus

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.

Alarm indicator and test combinations, alarm indicator and operator panels

Tasks:

- Display alarms from the ATICS® transfer switching device
- Mutual monitoring for failure
- Test of the ATICS® functions: start insulation monitoring, load current measurement and temperature monitoring and display of results.

For compatible devices see "Ordering information", page 90.

SCADA systems (Supervisory Control and Data Acquisition)

If messages from ATICS® are to be forwarded to a SCADA system, the following options are available:

- 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.

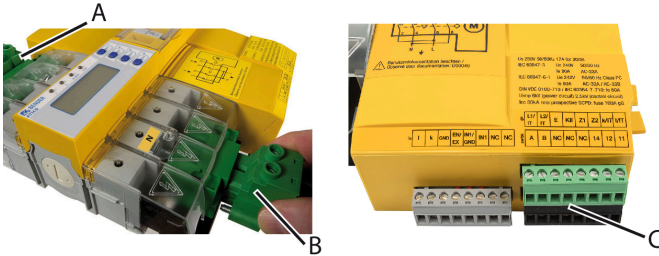
EDS151 insulation fault locator (optional)

The EDS151 insulation fault locator is used in conjunction with ATICS® to locate insulation faults in unearthed power supplies (IT systems). With the six integrated measuring current transformers, it records the locating current signals generated by ATICS® and evaluates them accordingly. Several EDS151 insulation fault locators may be used simultaneously.

Bypass switch (optional)

The ATICS-BP-... bypass switch makes it possible to test and change the ATICS® transfer switching and monitoring device without interrupting the power supply to the line downstream of the transfer switching device. To make settings, refer to chapter "Operation with bypass switch", page 78.

5.2.10 Fastening, inserting and securing connections



1. Connect the terminals according to the wiring diagram to the plug connectors (A, B) and the three connector plugs (C).
 - For connecting lines 1, 2 and 3 to the plug connectors (A,B):
 - stripping length: 20 mm, no ferrules
 - tool: Torx® screwdriver T20 or a slotted screwdriver of 6.5 x 1.2 mm
 - tightening torque: 2.5 N m ($\leq 25 \text{ mm}^2$) or 4.5 N m ($> 25 \text{ mm}^2$)
 - Ensure that the lines are short-circuit and earth-fault proof!
 - For connecting the lines to the three connector plugs (C):
 - stripping length: 7 mm
 - tool: slotted screwdriver of 2.5 x 0.4 mm
 - tightening torque: 0.22...0.25 N m
2. Insert bottom green plug connector (B) and secure with mounting screws.
3. Insert top green plug connector (A) and secure with mounting screws.
4. Insert the three connector plugs (C).



ATICS...400 only:

Plug the connector into the top (opposite side of C).



Only “-ES” version of ATICS®:

- Terminals S1+, S1-, S2+, S2-: Use the enclosed cable (orange), do not extend.
- Terminals EN/EX, GND: cable length $\leq 2 \text{ m}$

5.3 Other functions

5.3.1 Sealing the transparent cover



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

5.3.2 Manual mode



CAUTION Risk of injury from rotating Allen key

If ATICS® is in automatic mode although the transparent cover is open, the inserted Allen key may rotate and cause injury.

- ▶ Before using the Allen key, check whether the message “Manual mode” appears on the display.
- ▶ Avoid pressing the button below the transparent cover so that ATICS® does not switch to automatic mode.

Enabling manual mode



Variant A: Open the transparent cover. Set the digital input. “M/A” function must be set (see chapter “Settings menu 6: Dig. input”, page 66).

Variant B: Place the handle on the Allen key, use the Allen key to switch over.

5.3.3 Lock ATICS® with a padlock



1. Pull out locking device.
2. Insert padlock and close it.

Locking is only possible in manual mode (transparent cover open). The locking device can only be locked in switch position "0". Padlock shackle diameter: 4...8 mm (3/16" ...5/16"). The switch position cannot be changed until the lock has been removed and the locking device has been pushed in.

6 Commissioning, settings and testing

6.1 Design and installation

6.1.1 Safety advice

Ensure that the displays work correctly

MK... alarm indicator and test combinations, TM... alarm indicator and operator panels or BMS Ethernet gateways COM460..., which, together with ATICS®, are connected to a BMS bus must be provided 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.

Ensure that ATICS® switches

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 power supply.

Set the delay time $t(\text{start})$ ("Settings menu 1: Changeover", page 61) on the devices in such a way that after voltage recovery the devices switch to the preferred supply one by one.

Provide sufficient alarm indicators

Provide at least two places for alarm indicator and test combinations or alarm indicator and operator panels. These panels display messages from ATICS® and monitor each other for failure. This is an essential part of the safety concept (functional safety, SIL2).

Application examples of MK.../TM.../CP... in hospitals:

- Medical locations
- Continuously manned area (e.g. nurse service area)
- Technical area

Provide a fail-safe power supply for the MK.../TM.../CP...

The MK.../TM.../CP... for the medical and technical area must be supplied with power from different lines and sources.

Example: The TM... in medical locations is supplied from line 3 of the automatic transfer switching device. The MK... in technical areas is supplied from a fail-safe battery-supported line.

Prevent malfunctions caused by locating current

The locating current flowing between the IT system and earth can cause controller faults in sensitive system components such as PLCs or relays. Ensure that the locating current is compatible with the monitoring system.

6.1.2 Setting parameters of indicator devices



Configure MK.../TM.../CP.../COM465 in a meaningful way

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

Examples:

- *IT system overload. Switch off unnecessary loads.*
- *IT system insulation fault. Call Building Services Tel. -123.*

Indicator devices must display at least the following faults detected by the ATICS®:

- Failure line 1, failure line 2
- Device error, device failure ATICS®
- Insulation fault, overload, overtemperature
- Device error with complete text or error code

This is achieved by entering the ATICS® device address in the alarm address table. If necessary, individual messages can also be programmed for channels 1, 2, 5, 7...11. No individual text may be programmed for channel 6.

The failure of the other MK.../TM.../CP... must be reported.

MKs and TMs in technical areas are usually supposed to notify test and service reminders. For this purpose, for example, the setting "Display ATICS® warnings" must be enabled in the "TMK-SET" software in expert mode at "Parameters/Device Setup" tab "Parameter 2". In medical locations, test and service reminders should not normally be notified. For this purpose, this setting must be disabled here (factory setting).

Optionally, the EDS channels, if available, are to be displayed with circuit and/or room name.

6.1.3 ATICS® messages on the BMS bus (channel use)

BMS channel	Entry in the menu 1. Alarm/meas.values	Description	Operating 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 Switch-back lock	Return transfer delay time is enabled, counting backwards or Switch-back lock	Seconds	--	--
5	5. Automatic mode	Manual mode/ Bypass/Automatic mode	--	Alarm text**	--
6	6. Status	e.g. device error	--		Error code (see "Messages with error code or service code", page 73.
7	7. I(3):35A	Load current TN system	Current	Current	Connection fault current transformer
8	8. Dig. input	Dig. input	--**	Alarm text**	--
9	9. Insulation: 155kOhm	Insulation	Insulation value	Insulation fault, Insulation value	Connection fault mains/earth
10	10. Load: 55%	IT system load	Load current	Overload, load current	Connection fault current transformer
11	11. Temperature	Transformer temperature	--	Temperature	--
12	12. Fault location: --	EDS control	--	(EDS start)	--

* Message dependent on the parameter assignment in "Settings menu 1: Changeover", page 61 → "5. System"

** Message dependent on the input parameter assignment (see "Messages on the digital input", page 41)

The following different channel assignment applies to the test settings in the “Interface/Profile” menu:

BMS channel	Entry in the menu 1. Alarm/meas.values	Description	Operating message	Alarm message	Error
4	4. t(1->2)	Changeover period of the last test	Changeover period	--	--
7	7. TEST:tt.mm.yy	Next test due on (date)	Date	when due	--
8	8. Service:tt.mm.yy	Next service due on (date)	Date	when due	--

Messages on the digital input

The following operating and alarm messages may appear depending on the settings in chapter “Settings menu 6: Dig. input”, page 66:

Menu settings	Function of digital input	Alarm on BMS bus	BMS channel
off	Digital input disabled	No message	-
M/A	Enable manual mode	Alarm “Manual mode”	5
Bypass	Bypass enabled	Alarm “Manual mode”	5
no2->1	Enable switch-back lock	Operating message “Switch-back lock”	4
1<->2	Change preferred line	No message	
TEST	Carry out test changeover	No message	
ALARM	Convert message on the digital input into alarm on the BMS bus.	Alarm “Digital input”	8
OPL	Convert message on the digital input into alarm on the BMS bus.	Alarm “Insulation fault operating theatre light”	8

6.1.4 Tests, decommissioning

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

Observe 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 fatigue) and action must be taken.

6.2 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 s after 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 $t(2->1)$ 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 transfer switching devices. If the current monitoring (short-circuit detection) is disabled in the menu “Settings” → “Current”, an additional short-circuit current calculation and configuration of the response time $t(\text{on})$ is required.

- The total 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 transfer switching devices are connected in series in a power supply system, it is recommended that they be 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 $t(2 \rightarrow 1)$.

If extreme inrush current peaks (e.g. during generator start-up) are to be avoided in a system with several transfer switching devices with downstream transformers, the ATICS® version “-ES” with external ATICS-ES energy storage device (option, see chapter “Ordering information”, page 90) should be used. For this purpose, the parameter “Load disconn.” in “Settings menu 1: Changeover” must be set to “on” so that ATICS® switches to position “0” if both lines fail.

The delay time $t(\text{start})$ in the menu Setting/Changeover must be set differently for the individual devices so that the devices switch on in a staggered manner when the voltage returns.

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

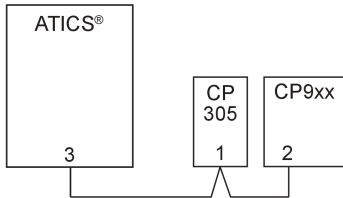
Keep the checklist with this manual in the vicinity of the device.

6.3 Addressing examples

i

Use 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 malfunction and must not be used. Please note the information in the “BMS bus” manual.

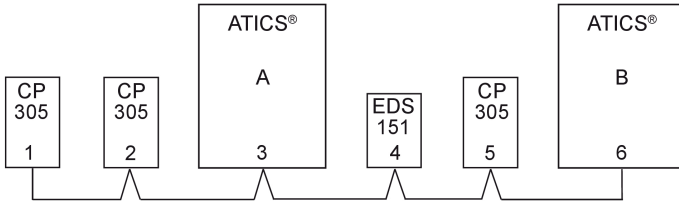
ATICS® with an MK.../CP305 and a TM.../CP9xx


Device	Parameter	Address settings for an automatic transfer switching device
ATICS®	Bus address	3
MK.../CP305	Address	1
	Test address	3
	Alarm address	3 / 2*
TM800/CP9xx	Address	2
	Test address	3
	Alarm address	3 / 1*

* These alarm addresses are used for mutual monitoring of the MK.../CP305 or TM.../CP9xx for device failure.

Two ATICS® devices

- one with an insulation fault locator
- with one alarm indicator and test combination in each case
- and central monitoring



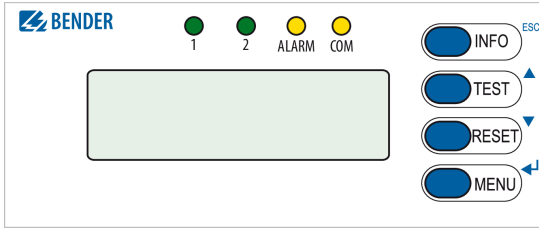
Device	Parameter	Address settings
ATICS® for area A	Bus address	3
First MK.../CP305 (Central monitoring)	Address	1
	Address	3 / 6
	Alarm address	2* / 3 / 4** / 5* / 6
Second MK.../CP305 for area A	Address	2
	Address	3
	Alarm address	1* / 3 / 4**
EDS151	Bus address	4
ATICS® for area B	Bus address	6
MK.../CP305 for area B	Address	5
	Address	6
	Alarm address	1* / 6

* These alarm addresses are used for mutual monitoring of the alarm indicator and test combinations.

** Program individual alarms for each EDS channel.

7 Operation

7.1 Operating and display elements



LED/Button	Description
LED "1"	lights up: Line 1 is ready
LED "2"	lights up: Line 2 is ready
LED "ALARM"	lights up: Alarm message present
LED "COM"	flashes: Communication via BMS bus
"INFO" "ESC"	Query standard information Exit menu function without changing parameters
"TEST" ▲	Call up test menu, change parameters, scroll
"RESET" ▼	Reset alarm and error messages, disable switch-back lock, change parameters, scroll
"MENU" ↵	Toggle between standard display, alarm display and MENU, confirm parameter changes

7.2 Quick reference guide

7.2.1 Display under normal operating conditions

- 1 Line 1: Measured values of mains voltage and frequency
- 2 Switch position of the automatic transfer switching device
- 3 Line 2: Measured values of mains voltage and frequency
- 4 Display of the load in the IT system in %. The maximum load current is adjustable.
- 5 Alarms or alternative displays*
- 6 Date
- 7 Measured value of insulation resistance

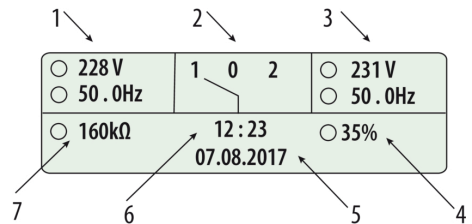


Figure: ATICS®-2 display: normal conditions

* Date, switch-back lock, manual mode, bypass mode, countdown timer for return transfer time

7.2.2 Display during fault condition

Alarm status:

- no alarm
- alarm

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

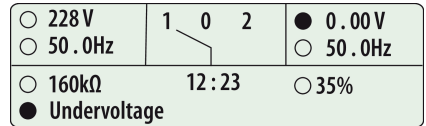


Figure: No voltage on line 2

Press \downarrow to display the current alarm:

- Line 1: ALARM
 - xx = serial number of the displayed alarm
 - yy = number of pending messages
- Line 2: Alarm status and alarm text
- Line 3: Measured value
- Line 4: Address and channel of the indicator device

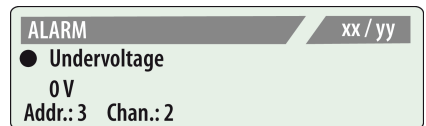


Figure: Alarm message "Undervoltage"

Use the buttons \blacktriangle , \blacktriangledown to select previous or next message.

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

Press \downarrow again to return to the main menu.

i *The alarm text displayed in case of failure of one line depends on the setting in the "System" menu in "Settings menu 1: Changeover", page 61.*

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

7.2.3 Test function

A test is used to check the device function. There are several ways to call up the 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 on the "Control" menu.

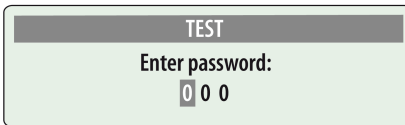
A test on the changeover function can also be triggered via a digital input (function similar to "Manual changeover").



Figure: Test menu

Menu item	Function	Reference
1. IT system	Test of the integrated insulation monitoring device (insulation resistance, load in %, overtemperature)	"Test menu 1: IT system", page 48
2. Autom. changeover	Test of the changeover function. Switches back automatically after time t(test).	"Test menu 2: Autom. changeover", page 48
3. Manual changeover	Test of the changeover function. Switches back after pressing the "RESET" button.	"Test menu 3: Manual changeover", page 49
4. Last changeover	Save last changeover as test.	"Test menu 4: Last changeover", page 50
5. Generator	Start generator without switching over. Terminate test by pressing the "RESET" button.	"Test menu 5: Generator", page 50
6. Test communication	Communication test via the BMS bus. To do this, simulate an alarm and send an alarm message via the BMS bus.	"Test menu 6: Test communication", page 51

i Test menus 2...4 are protected by a password (see chapter "Settings menu 11: Password", page 70). Password protection is only effective if the password has been enabled. When an attempt is made to open one of these menus, the password entry screen appears automatically:

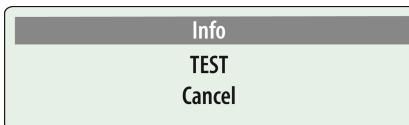


i During an "Autom. changeover" test or "Manual changeover" test, changeover does not take place until a delay time has elapsed which is indicated by the progress bar..

For technical reasons, the following menu items cannot be accessed via gateway (COM465..., CP700, ...):

- Control → Test → Manual changeover
- Control → Test → Generator
- Control → Test → Communication

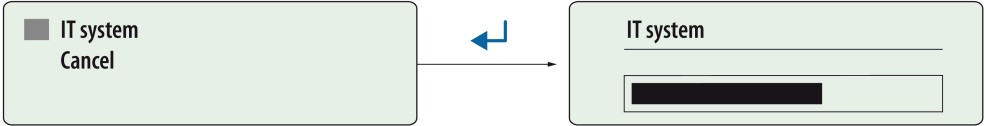
i If manual mode is selected for changeover (transparent cover open or digital input set to "manual changeover"), no changeover can take place at the test menu "Autom. changeover" or "Manual changeover". ATICS® then displays the following message:



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

i During an “Autom. changeover” or “Manual changeover” test, the changeover period $t(1 \rightarrow 2)$ is displayed. This is the time required for switching over from the preferred line to the redundant line. This time may differ from the return transfer time! See chapter “Time diagram: Changeover between preferred and redundant line”, page 15.

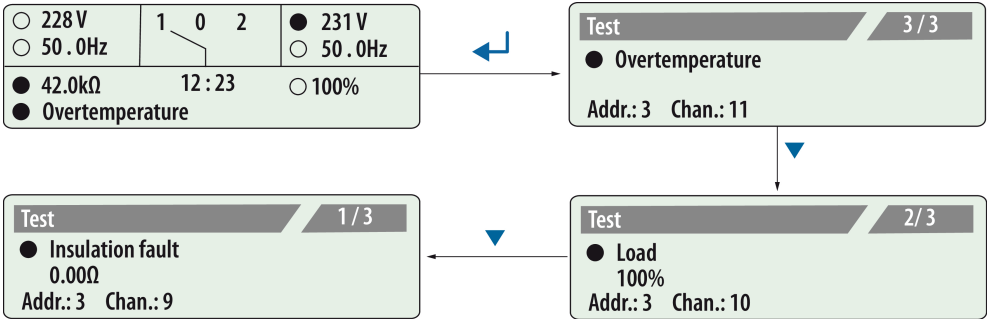
7.2.3.1 Test menu 1: IT system



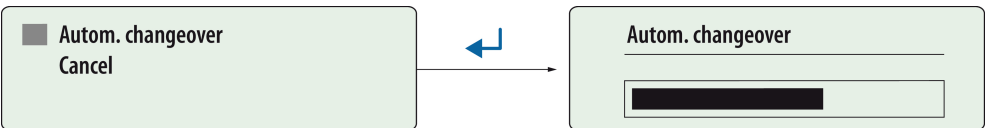
IT system Tests the integrated insulation monitoring device (insulation resistance, load in %, overtemperature). The progress of the test is shown on the display.

Cancel Return to test menu

Press the “ESC” button to leave the test function and then “Enter” to display the simulated measured values. These are available alarm messages for a few seconds after the test. The messages from this test are also stored in the history memory.



7.2.3.2 Test menu 2: Autom. changeover



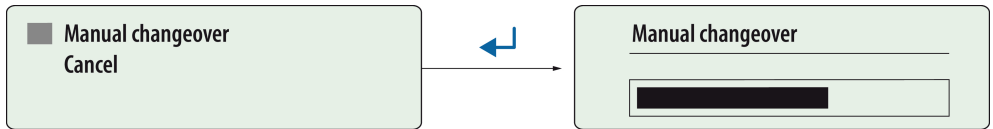
Autom. changeover Test of the changeover function. The device switches to the redundant line. The changeover period $t(1 \rightarrow 2)$ is displayed. After the set time $t(\text{test})$ has elapsed, the device switches back to the preferred line.

Cancel Return to test menu

Test	
t (1->2):	457ms
t (Test):	10s
Quit:	RESET

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

7.2.3.3 Test menu 3: Manual changeover



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

Cancel Return to test menu.

Test	
t (1->2):	○ 346ms
t (Test):	○ --
Cancel:	RESET

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



ADVICE

Test is accidentally not completed

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

1. Wait until "Quit: RESET" appears on the display.
2. Press the "RESET" button.
3. Check whether ATICS® has switched to the preferred line.



Manual mode aborts manual test

When the transparent cover is opened after switching 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 logger.

7.2.3.4 Test menu 4: Last changeover

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

Last changeover

1. Date: 20.09.18

2. Test: 02.03.19

Save

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

Save

Cancel

→

Save

- 1. Save** Saves the date of last changeover as test date, as long as that date is later than the previous entry.
- 2. Cancel** Return to test menu.

After saving, the date on which the next test is due is increased by the test interval (in this case, 6 months).

Last changeover

1. Date: 20.09.18

2. Test: 21.03.19

Save

The date of the test is saved in the test logger to send a reminder for 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.

7.2.3.5 Checking the ATICS-ES energy storage device (if installed)

Before each test, observe the LEDs on the ATICS-ES and wait until the energy storage device is fully charged.

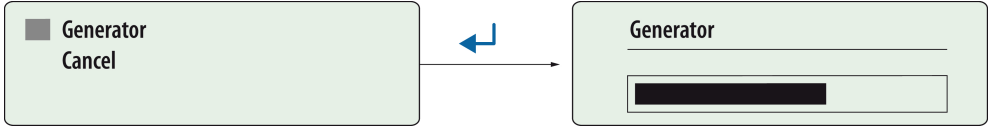
Carry out tests with isolator downstream bypass tap upstream of ATICS® feed.

Three tests are required:

- a) Line 1 off, then line 2 off → ATICS® must switch to position 0.
- b) Line 2 off, then line 1 off → ATICS® must switch to position 0.
- c) Perform "Autom. changeover" test with lines 1 and 2 on.

7.2.3.6 Test menu 5: Generator

Executing this function makes sense only when a generator is connected to the redundant line and the corresponding settings have been carried out (see chapter "Settings menu 1: Changeover", page 61). 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".



- Generator** Generator start relay is switched. The generator starts. However, there is no changeover to the redundant line.
Pressing the "RESET" button ends the test and switches off the generator.
- Cancel** Return to test menu.

Test	
t (1->2):	<input type="radio"/> 110ms
t (Test):	<input type="radio"/> --
Cancel:	RESET

The display shows the test duration.



ADVICE

Generator test is accidentally not completed

If the test menu "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.

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



ADVICE

Complete 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 and monitoring device will be dead. When the generator is switched off, ATICS® cannot check the redundant line.

- ▶ Test the generator and ATICS® at regular intervals to make sure they are working properly (see checklist, included in the scope of delivery).

7.2.3.7 Test menu 6: Test communication

Communication test 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...).

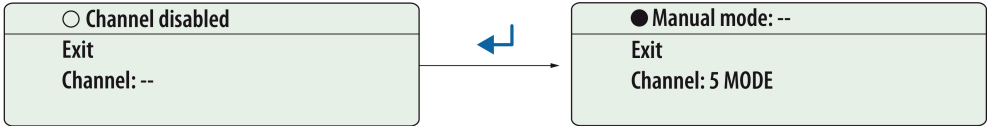
Check that these devices are responding to the alarm message as requested.

Select a channel:

1. Use ▲ button to go to the channel settings. Press ↵ to confirm.
2. Use the arrow buttons to select the channel for which the alarm message is to be simulated. Press ↵ to confirm.

The alarm status will change from (no alarm) to (alarm). If the alarm status is not displayed, the settings made for ATICS® will not permit simulation of this alarm.

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



i 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® messages on the BMS bus (channel use)", page 40.

7.2.4 Reset function

Functions

- Resetting the alarm and fault messages for the device
- Disabling the switch-back lock of the changeover function

Calling up the reset menu

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

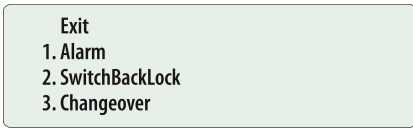
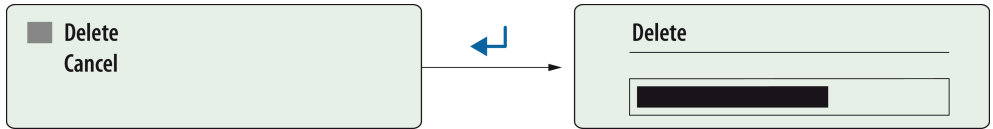


Figure: Reset menu

Menu item	Function	Reference
1. Alarm	Reset alarm and fault messages on the device.	"Reset menu 1: Alarm", page 53
2. SwitchBackLock	Disable the switch-back lock of the changeover function. The device switches back to the redundant line.	"Reset menu 2: SwitchBackLock", page 53
3. Changeover	Change alarm value for the: <ul style="list-style-type: none"> – 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 	"Reset menu 3: Changeover", page 53
4. Service alarm	Reset the service alarm.	"Reset menu 4: Service alarm", page 54

7.2.4.1 Reset menu 1: Alarm



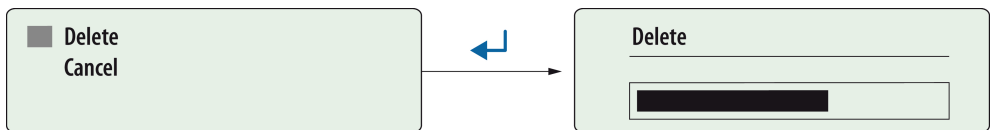
Delete Reset alarm and fault messages on the device. The progress of the test is shown on the display.

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 Return 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 to the history memory. The "ALARM" LED remains lit.

7.2.4.2 Reset menu 2: SwitchBackLock



Delete Disable the switch-back lock of the changeover function. The progress of the test is shown on the display. The device switches back to the redundant line.

Cancel Return to reset menu



There are different possibilities to disable the switch-back lock via gateway (COM4xx, CP700 etc.):

- *Via menu: Select "RESET" → "Switch-back lock".
Requirement: Parameter setting enabled (menu "Settings" → "Interface" → "Settings" → "On").*
- *Via Modbus control commands: Using the command "Changeover to line 1 or line 2".
Requirement: Testing enabled (menu "Settings" → "Interface" → "Test" → "On").*

7.2.4.3 Reset menu 3: Changeover

Component failure possible with increasing service life! For operation according to IEC 61508-2, additional limit values are monitored (number of switching cycles, operating time, number of switching cycles in the event of a short circuit). If the set limit values are exceeded, the device displays a prewarning or an alarm. The alarm can be "deleted" by increasing the limit values.

To ensure continued operation in accordance with IEC 61508-2, replace the device.

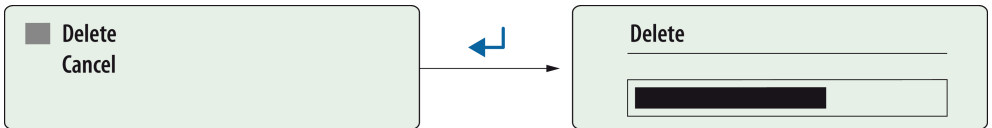


Regardless of the IEC 61508-2 standard, the safe function of the device is of course still guaranteed due to the cyclical self-monitoring functions.

Operation in accordance with DIN VDE 0100-710, DIN VDE 0100-718 or IEC 60364-7-710 is still possible if the prescribed measures are implemented (see chapter "Periodic verification and service", page 77).

Menu	Description
Exit	Go up one menu level
1. <input type="radio"/> Changeover: xxx	Number of changeovers performed
2. Alarm: <input type="radio"/> 8000	Alarm value for maximum number of changeovers performed*
Delete	Alarmwert um 500 Umschaltungen erhöhen
4. <input type="radio"/> Operat. time: xxh	Operating hours counter (h = hours, d = days, mo = months)
5. Alarm: <input type="radio"/> 120mo	Alarm value for maximum number of operating hours (prewarning after 108 months)*
Delete	The limit value for the permissible number of operating hours is increased by 13 months. The value is automatically increased by 13 months if the alarm has already been cleared once before and a successful test of the changeover process is carried out.
7: <input type="radio"/> Changeover I>: 0	Number of changeovers performed which were carried out with overcurrent of short-circuit current (see chapter "Menu 2: Changeover", page 59)
8. Alarm: <input type="radio"/> 1	Alarm value for maximum permitted number of changeovers performed which were carried out with overcurrent or short-circuit current*
Delete	Increase alarm value for changeover in case of overcurrent or short-circuit current by 1 changeover

* for functional safety according to IEC 61508-2:2010



Delete Set new alarm value. Clear alarm.
Cancel Return to reset menu.

7.2.4.4 Reset menu 4: Service alarm

- Resetting the service prewarning suppresses the service prewarning until the next service appointment.
- Resetting the service alarm sets the date for the next service appointment to "current date + service interval".

8 Menu mode: Operation and setting

8.1 Switching on and calling up the main menu

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



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

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

<input type="radio"/> 228 V	1 0 2	<input type="radio"/> 231 V
<input type="radio"/> 50 . 0Hz		<input type="radio"/> 50 . 0Hz
<input type="radio"/> 160kΩ	12 : 23	<input type="radio"/> 35%
	07.08.2017	

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

Exit
1. Alarm/meas.values
2. Changeover
3. History/Loggers

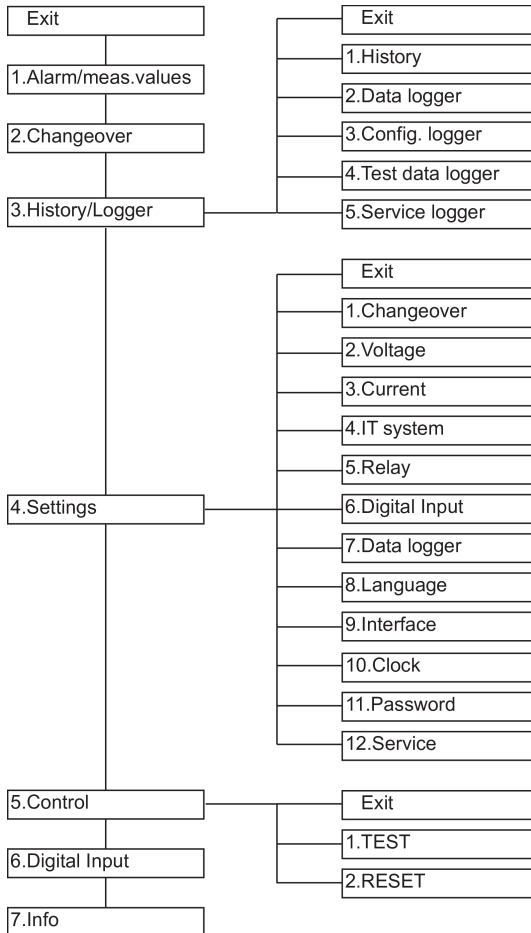
The following buttons can be used in the main menu:

- ▲, ▼ 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).

8.2 Menu overview diagram

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



8.3 Function of the main menu

Menu item	Function	Reference
Exit	Exit menu mode	
1. Alarm/meas.values	Display saved status messages, alarm messages and measured values	"Menu 1: Alarm/meas.values", page 57
2. Changeover	Display information on the changeover function (number, test)	"Menu 2: Changeover", page 59
3. History/Loggers	Display history memory, data logger, configuration logger, test logger and service logger	"Menu 3: History/Loggers", page 59
4. Settings	Various settings for this device	"Menu 4: Settings", page 60
5. Control	Run test and reset of this device	"Menu 5: Control", page 71
6. Dig. input	Display voltage level of the digital input	"Menu 6: Dig. input", page 71
7. Info	Display information on device type and firmware versions	"Menu 7: Info", page 71

8.3.1 Menu 1: Alarm/meas.values

Display current status messages, alarm messages and measured values.

The device shows the alarm status for each menu item: = no alarm, = alarm.

Menu	Description
Exit	Go up one menu level
1. <input type="radio"/> Line 1: 228V	Line 1: Measured value mains voltage
2. <input checked="" type="radio"/> Line 2: 183V	Line 2: Measured value mains voltage
3. <input type="radio"/> Position: 1	Switch position of the automatic transfer switching device
4. <input type="radio"/>	t(2->1):-- or
	Switch-back lock
5. <input type="radio"/> Automatic 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(3):35A	Load current downstream of the transfer switching and monitoring device I(3) or "CT connection" fault
8. <input type="radio"/> Dig. input:	Alarm digital input 1 (see chapter "Settings menu 6: Dig. input", page 66)
9. <input type="radio"/> Insulation:155k0hm	Measured value of insulation resistance

Menu	Description
10. <input type="radio"/> Load: 55%	Display of the load in the IT system in %. The maximum load current is adjustable. If a "CT connection" or "CT short-circuit" fault occurs, it will be displayed here.
11. <input checked="" type="radio"/> Temperature	Overtemperature of the IT system transformer
12. <input type="radio"/> Faultlocat:---	EDS start
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
15. <input type="radio"/> t(1->2): 356ms	Changeover period t(1->2) of the last test
16. <input type="radio"/> TEST: 02.07.19	Next test by (date)
17. <input type="radio"/> Service: 11.07.19	Next service by (date)

The following different channel assignment applies to the "Test" setting in the "Interface/Profile" menu:

Menu	Description
4. <input type="radio"/> t(1->2): 356ms	Changeover period t(1->2) of the last test
7. <input type="radio"/> TEST: 02.07.19	Next test by (date)
8. <input type="radio"/> Service: 11.07.19	Next service by (date)
15. <input type="radio"/> t(2->1): --	Return transfer delay time is enabled, seconds counting backwards or switchback lock enabled
16. <input type="radio"/> I(3):5A	Load current TN system
17. <input type="radio"/> Dig.input: --	Alarm digital input / channel disabled

i All messages (except measured value frequency) are also present on the BMS bus (see chapter "Messages with error code or service code", page 73).

8.3.2 Menu 2: Changeover

Display information on the changeover function (number, test).

The device shows the alarm status for each menu item: ○ = no alarm, ● = alarm.

Menu	Description
Exit	Go up one menu level
1. ○ Changeover: xxx	Number of changeovers performed
2. ○ Operat. time: 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) are considered to be overcurrents or short-circuit currents.
4. ○ TEST: tt.mm.jj	Date for next test (changeover)
5. ○ Service: tt.mm.jj	Date for next service
6. ○ TEST: tt.mm.jj	Date of the last test (TEST) or last changeover (LAST SWITCH)

8.3.3 Menu 3: History/Loggers

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

For information on the maximum number of events that can be stored, see “Technical data”, page 82. Once the maximum number of events which can be saved is reached, the latest event overwrites the oldest entry (entry 1).

Menu item	Function
Exit	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 an alarm indicator and operator panel or an alarm indicator and test combination.
2. Data logger	Displays the history of measured values: supply line 1, supply line 2, switch position of the transfer switching device, load current in the TN system downstream of the transfer switching and monitoring device I(3), insulation resistance and load on the IT system in %.
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): Local 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, see “Settings menu 5: Relay”, page 65.
4. Test logger	Displays the history of the tests carried out: date, time and changeover period. See “Time diagram: Changeover between preferred and redundant line”, page 15.
5. Service logger	Displays the history of the service measures carried out: Date, time and service codes. Meaning of the displayed service code: see “Messages with error code or service code”, page 73.

Operating example: History

1. Use the arrow buttons to select the required entry. The most recent entry appears first on the display. Older messages can be selected using the arrow buttons.
2. Press \downarrow to call up the message text of the selected entry. The path the message took to reach the device is displayed (in this case: insulation , BMS bus address 3, channel 9).
For more information on possible displays see "Fault and alarm messages", page 72.
3. Press \leftarrow again to return to the entry selection.

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

History		500 / 500
● Insulation fault		
min. 42 kΩ/max. 42 kΩ		
Addr.: 3	Chan.: 9	TEST

Repeat these operating steps for all messages. 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.

Operating example: Config.Logger

1. Use the arrow buttons to select the required entry. In this case: The settings for the digital input are changed here.
2. Press \downarrow 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 if the modification led to an undesirable behaviour of the device.

Config.Logger		10 / 17
Modific. (auto)		
Digital Input		
04.10.11 / 16:03:17		

Config.Logger		10 / 17
Function		
off -> 0		
Chan.: 1 (4/1)		

8.3.4 Menu 4: Settings

The settings menus are protected by a password (see chapter "Settings menu 11: Password", page 70).

Password protection is only effective if the password has been enabled. When opening one of those settings menus, the password entry screen appears automatically:

After entering a valid password, all settings menus (except the "Service" menu) are freely accessible until the menu mode is exited.

Settings	
Enter password:	
0 0 0	

The following menu items are available for configuring the device:

Menu item	Function	Reference
Exit	Go up one menu level	
1. Changeover	Adjust settings for changeover switch	"Settings menu 1: Changeover", page 61

Menu item	Function	Reference
2. Voltage	Adjust settings for voltage monitoring	"Settings menu 2: Voltage", page 63
3. Current	Adjust settings for current monitoring (short-circuit detection)	"Settings menu 3: Current", page 64
4. IT system	Adjust settings for IT system monitoring (monitoring of the insulation resistance as well as the load and temperature of the isolating transformer)	"Settings menu 4: IT system", page 64
5. Relay	Set mode of operation and function of alarm relay	"Settings menu 5: Relay", page 65
6. Dig. input	Set operating behaviour of the digital input	"Settings menu 6: Dig. input", page 66
7. Data loggers	Adjust settings for data loggers	"Settings menu 7: Data loggers", page 67
8. Languages	Select the operating language for the device (English, German, French, Polish)	"Settings menu 8: Language", page 68
9. Interface	Set the BMS bus address of this device, allow settings to be changed via the interface, allow performing a test via the interface.	"Settings menu 9: Interface", page 69
10. Clock	Set 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. MK.../TM.../CP...) synchronises all other devices every hour.	"Settings menu 10: Clock", page 69
11. Password	The device has two separate passwords for the "Settings" menu and the "TEST" menu. Adjustable in each case: change password, enable/disable password	"Settings menu 11: Password", page 70
12. Service	Only intended for settings by authorised Bender service personnel. Call up information about the device status and make settings for specific operating conditions.	"Settings menu 12: Service", page 71

8.3.4.1 Settings menu 1: Changeover

The times set in this menu determine the timing of a changeover. Observe also the time diagrams in chapter "The automatic transfer switching device", page 13.

Menu item	Function
Exit	Go up one menu level
1. t(start)	Delayed switch-on after complete power failure: Setting range: 0...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

Menu item	Function												
5. System	<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 safety power supply - Safety power supply</p> <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>	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
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												
6. SwitchBackLock	<p>on Switch-back lock enabled off Switch-back lock disabled</p> <p>See "Time diagram: Changeover between preferred and redundant line", page 15.</p>												
7. Preferred line	<p>1 Line 1 2 Line 2</p> <p>In generator mode, line 1 is always the preferred line.</p> <p>Note: A parameter change can result in an immediate changeover.</p>												
8. Test interval	<p>Interval for testing the changeover function: Setting range: Off, 1...24 months Resolution of setting: 1 month</p>												
9. Reminder	<p>Prewarning time for test interval (set value smaller than test interval): Setting range: off, 1...60 days Resolution of setting: 1 day</p>												
10. Serviceinterv.	<p>Service interval: Setting range: off, 6...48 months Resolution of setting: 6 months</p>												
11. Reminder	<p>Prewarning time for service interval (d = day): Setting range: off, 1...60 days Resolution of setting: 1 day</p>												
12. t(GenStart)	<p>Time delay for changeover to generator (measured from "Voltage line 2 = OK"): Setting range: 0...100 s (only active when System = Line G) Resolution of settings: 1 s / 5 s</p>												
13. t(GenMax)	<p>Maximum generator start time. Monitoring whether the generator starts (time until "Voltage line 2 = OK"). Setting range: 0...100 s (only active when System = Line G) Resolution of setting: 1 s / 5 s</p>												
14. t(Gen.off)	<p>Time delay for turning off the generator after switching 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</p>												

Menu item	Function
15. Load disconn.*	on: Operation with ATICS-ES; device switches to position "0" if both lines fail. off: Device remains in the last switch position if both lines fail.

* only for "-ES" version of ATICS®

8.3.4.2 Settings menu 2: Voltage

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

Example: Line 1 is set to "Undervolt.: 184V". 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 changeover to line 2 takes place. ATICS® returns to line 1 if the voltage on line 1 exceeds the pre-set value (in this case 184 V) plus the set hysteresis.

Selecting a line:

1. Use ▲ to go to the line setting. Press ↵ to confirm.
2. Use the arrow buttons to select one line (Voltage 1, 2) or both lines (Voltage 1...2). Press ↵ to confirm.

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

Figure: Setting voltage for one line

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

Figure: Setting voltage for both lines

Adjusting the settings:

Menu	Description
Exit	Go up one menu level
1. Undervolt.	Undervoltage; setting range: 160...207 V (278 V...360 V)**
2. Overvolt.	Overvoltage; setting range: 240...275 V (417 V...478 V)**
3. t(on)	Response delay*: Setting range: 50 ms ... 100 s Resolution of setting: 50 ms / 100 ms / 1 s / 5 s / 10 s
4. t(off)	Delay on release*: Setting range: 200 ms ... 100 s Resolution of setting: 50 ms / 100 ms / 1 s / 5 s / 10 s
5. Hysteresis	Setting range: 2...10 % Resolution of setting: 1 %

* Observe also the time diagrams

** Values for ATICS®...400 versions

8.3.4.3 Settings menu 3: Current

In this menu, you can adjust settings for current monitoring (short-circuit detection) downstream of the transfer switching and monitoring device (TN system). The current is detected via a measuring current transformer (T3 in "ATICS® basic configuration", page 28).

Menu	Description	
Exit	Go up one menu level	
1. Mode	on off	Current monitoring enabled No current monitoring
2. Current transformer	STW3 STW4	Bender measuring current transformer STW3 Bender measuring current transformer STW4
3. CT monitoring	on off	CT connection monitoring enabled CT connection monitoring disabled Note: External interference from loads can cause false tripping. In this case, the function has to be disabled. The functional safety of the transfer switching device is in no way impaired by this.

8.3.4.4 Settings menu 4: IT system

In this menu, you can adjust settings for IT system monitoring.

Menu	Description	
Exit	Go up one menu level	
1. Insulation	Setting range: Resolution of setting:	50...250 kΩ starting at 5 kΩ
2. Current transformer	Measuring current transformer T4 in "ATICS® basic configuration", page 28) STW2 Measuring current transformer STW3 Measuring current transformer SWL Split-core type measuring current transformer	
3. CT monitoring	on off	CT connection monitoring enabled CT connection monitoring disabled Note: External interference from loads can cause false tripping. In this case, the function has to be disabled. The functional safety of the transfer switching device is in no way impaired by this.
4. Load	Setting range: Resolution of setting: Setting values: Transformer Setting	5...50 A (STW2), 5...100 A (STW3, SWL) 1 A, IT system 3150 VA 14 A 4000 VA 18 A 5000 VA 22 A 6300 VA 28 A 8000 VA 35 A 10.000 VA 45 A
5. Hysteresis	Setting range: Resolution of setting:	5...30 % 1 % The setting only affects the value of the load current.
6. t(on)	Response delay load: Setting range: Resolution of setting:	0...100 s 1 s
7. t(off)	Delay on release load: Setting range: Resolution of setting:	0...100 s 1 s
8. Temperature	on off	Temperature monitoring enabled Temperature monitoring disabled

Menu	Description	
9. Fault location	on off	Insulation fault location disabled Insulation fault location enabled Note: This function is only available if a suitable master is connected via the BMS bus (e.g. MK.../TM.../CP.../COM465...).
10. IT system	230 115	Nominal voltage of the IT system being monitored: 230 V Nominal voltage of the IT system being monitored: 115 V

8.3.4.5 Settings menu 5: Relay

In this menu, you can adjust settings for the mode of operation and function of the relay output (alarm relay). These functions can be set: alarm message ("ALARM"), operating message ("Active"), generator start ("GenSt").

If "ALARM" is set and then "Line 1: on" is selected, the relay switches if line 1 fails. If "Active" is set and then "Line 1: on" is selected, the relay switches if line 1 operating. The setting "on" can be selected for several menus simultaneously. The relay switches when at least one of the conditions is met.

If a new alarm appears while another is already pending, the relay is deenergised briefly (approx. 1 s) and is energised again. This "new value behaviour" ensures that new alarms are reported when alarm messages are forwarded to SCADA systems.

If "GenSt" is set, the operating mode for the alarm relay will always be set to "N/C-T" on. The other settings on the "Relay" 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 is permanently set to:

- 1. Function: GenSt
- 2. Relay mode: N/C-T
- Menu items 4... 13: inactive

Adjusting the settings:

Menu	Description	
Exit	Go up one menu level	
1. Function	ALARM Active GenSt	Relay switches if at least one of the following menus 3... 13 is set to "on" and the corresponding alarm message appears. Relay switches if at least one of the following menus 3... 13 is set to "on" and the corresponding alarm message does not appear (operating 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 a generator start relay.
2. Relay mode	N/O operation N/C operation N/O-T operation N/C-T operation	Relay only switches in the event of an alarm. Relay only switches in the event of an alarm. Relay switches in the event of an alarm or a test. Relay switches in the event of an alarm or a test.
3. Line 1	on off	Line 1

Menu	Description	
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. Serviceinterv.	on off	Relay switches when service is due (interval elapsed).
9. Dig. input	on off	Alarm digital input. To ensure that the relay responds to the digital input, the functions "ALARM" or "R-OPL" must be additionally set in the "Setting"s → "Digital Input" menu.
10. Insulation	on off	Relay switches in the event of an insulation fault
11. Load	on off	Relay switches in the event of overload in the IT system
12. Temperature	on off	Relay switches in the event of overtemperature in the IT system transformer
13. Undervolt.	on off	Relay switches in the event of undervoltage at the ATICS® output (line 3)

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

8.3.4.6 Settings menu 6: Dig. input

In this menu, you can adjust settings for the mode of operation and function of the digital input. The digital input is electrically isolated. It is designed for an input of AC/DC 24 V. ATICS-2-ISO has a digital input and a relay output with a changeover contact.

For the 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".

i By selecting the function of the digital input, the recommended response value is automatically adjusted:

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

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

Adjusting the settings:

Menu	Description	
Exit	Go up one menu level	
1. Functions	NOTE: A parameter change can result in an immediate changeover. off Digital input disabled M/A Manual/Automatic. Manual mode means that automatic changeover can no longer take place. Bypass Alarm "Bypass operation" but test changeover possible no2->1 Switch-back lock. After switching to line 2, the changeover switch remains in this switch position. It remains there even when line 1 returns. Switching back to line 1 only takes place when the digital input is no longer set, line 2 fails or the "RESET" button has been pressed. The display shows the operating message "Switch-back lock". 1<->2 Changes the preferred line TEST A test changeover is carried out. In generator mode, the generator start relay is also switched. The test is completed when the output is reset. 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. OPL Generates an alarm "Insulation fault, operating theatre light". Other functions as for the setting "ALARM".	
2. Resp. value	0V 24V	At 0 V input is set. The selected function is carried out. At 24 V input is set. The selected function is carried out.
3. t(on)	Response delay: Setting range: Resolution of setting:	100 ms...100 s starting at 50 ms
4. t(off)	Delay on release: Setting range: Resolution of setting:	100 ms...100 s starting at 50 ms

8.3.4.7 Settings menu 7: Data loggers

In this menu, you can make settings for the data loggers. These data loggers (see chapter "Menu 3: History/Loggers", page 59) display the history of measured values:

- 1 Voltage line 1
- 2 Voltage line 2
- 3 Switch position of the transfer switching device
- 4 Load current I(3) in the TN system downstream of the transfer switching device
- 5 Insulation resistance
- 6 Load on the IT system in %



Premature wear of the memory module

The service life of the 500 memory locations of the EEPROM memory is limited to approx. 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 changes are saved every minute, the service life is increased to approx. 57 years. Select the settings in the "Datalogger" → "Modific." settings menu in a way that frequent saving over longer periods of time can be avoided.

To protect the memory module, a minimum threshold of 10 A for the load currents is incorporated in the data loggers downstream the transfer switching and monitoring device I(3) and a minimum threshold of 20 % is incorporated in the data logger for the IT system. Values below this limit threshold are only stored once. A new measured value will be stored in the memory only when this limit threshold is exceeded.

Selecting a data logger:

- Use ▲ to go to the data logger settings. Press ↵ to confirm.
- Use the arrow buttons to select one data logger (1, 2, ...) or all data loggers (1...6). Press ↵ to confirm.

No.: 5 Insulation	
Exit	
1. Modific.:	10.00 %
2. Overwrite:	yes

Figure: Set one data logger

No.: 1...6	
Exit	
1. Modific.:	10.00 %
2. Overwrite	yes

Figure: Set all data loggers

Adjust settings and delete data loggers:

Menu	Description
Exit	Go up one menu level
1. Modific.	Once the measured value has been changed by the set % value, a new measured value is stored in 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 has been reached, the current measured value overwrites the oldest entry. no Once the maximum number of measured values which can be saved has been reached, no further measured values are saved.
3. Delete	Delete Clear data logger. Cancel Do not clear data logger.


8.3.4.8 Settings menu 8: Language

Select the language for the menus and the messages to be displayed (alarm and operating messages) of the device.

Menu	Description
Exit	Go up one menu level
1. English	Select language. Changes take effect immediately.
2. Deutsch	
3. Français	
4. Polski	

8.3.4.9 Settings menu 9: Interface

Set the device address for the 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 address 1 (master). All other devices are addressed in consecutive order: 2,3,4,... There should be no gaps between the addresses. This is the only way to ensure the function of the system.

Menu	Description	
Exit	Go up one menu level	
1. Address	Setting range:	2...90
2. Settings	on off	Allow settings to be changed via interface (e.g. a COM465... Ethernet gateway). Do not allow settings to be changed via interface.
3. TEST	on off	Allow a test to be carried out via interface (e.g. a COM465... Ethernet gateway). Do not allow a test to be carried out via interface.
4. Failure monitoring	on off	Reports when no (more) communication with the BMS master is detected. It is not monitored whether a BMS master is present. This setting is required when ATICS® is used as a "Stand-alone" device without BMS master.  ADVICE When this setting is selected, the conditions for functional safety (SIL2) are no longer met and EDS functionality is not possible.
5. Profile	Stand. TEST	Standard setting for channel assignment for alarms/measured values and BMS channels Alternative setting (see "ATICS® messages on the BMS bus (channel use)", page 40 and "Menu 1: Alarm/meas.values", page 57)

8.3.4.10 Settings menu 10: Clock

Time and date are required for displays in the "History/Loggers" menu. The time setting is synchronised via the BMS bus. The device with address 1 (MK.../TM.../CP...) synchronises all other devices every hour.

The time setting for ATICS® is required for the rare case of use without a BMS bus. In this case, ATICS® displays the fault message "No master".

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



ADVICE

After a power failure of more than eight hours

Time and date are reset to factory settings.

Correct these settings to ensure that all dependent functions (history memory, logger, test interval, service interval...) deliver usable results.

8.3.4.11 Settings menu 11: Password

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

Menu	Description
Exit	Go up one menu level
1. Settings	Change the password for the "Settings" menu, enable/disable password. 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	Description
Exit	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 or disable the password protection for the "Settings" menu.</p> <p>on Password protection is enabled. When an attempt is made to open one of the settings menus, the password entry screen appears automatically:</p> <div data-bbox="456 801 856 922" style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Settings</p> <p>Enter password:</p> <p>0 0 0</p> </div> <p>After entering a valid password, all settings menus (except the "Service" menu) are freely accessible until the menu mode is exited.</p> <p>off Password protection is disabled.</p>

Changing the password menu "TEST"

Menu	Description
Exit	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 data-bbox="456 1295 856 1417" style="border: 1px solid black; padding: 10px; text-align: center;"> <p>TEST</p> <p>Enter password:</p> <p>0 0 0</p> </div> <p>off Password protection is disabled.</p>

8.3.4.12 Settings menu 12: Service

The service menu is intended for settings by authorised Bender service personnel. It is only accessible to the Bender service. In the service menu, information about the device status can be called up and settings for specific operating conditions can be made.

8.3.5 Menu 5: Control

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

Menu item	Function	Reference
Exit	Go up one menu level	
1. TEST	Call up test	"Test function", page 46
2. RESET	Call up reset	"Reset function", page 52

8.3.6 Menu 6: Dig. input

This menu indicates the voltage level of the digital input.

- Exit** Go up one menu level..
- The digital input is disabled.
- 0V Example: The response condition is not met.
The input has not been set. The set function is not carried out.*
- 24.0V Example: The response condition is met and the response delay has elapsed. The input has been set. The set function is carried out.*

* Whether the input is set to 0 V or 24 V depends on the set response value (see chapter "Settings menu 6: Dig. input", page 66).

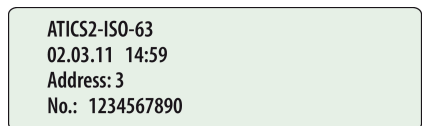


8.3.7 Menu 7: Info

This menu displays information about the device and the software. Press ▼ several times to display all the information. Please have this information ready in case you have any queries 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.

- 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...8: Software versions of the four controllers of the device
- ... Bender address, website
- ... Exit. Exit standard information.



9 Troubleshooting

9.1 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

9.1.1 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	<ul style="list-style-type: none"> • 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)	
Insulation fault	IT system has insulation fault	<ul style="list-style-type: none"> • Search for insulation fault. • Eliminate fault in the system.
Overload	Current consumption too high. Sporadic indication of load current, changing without any apparent reason. The fault can also be caused by an (impermissible) connection between k or l and PE.	<ul style="list-style-type: none"> • Check settings for transformer load current. • Switch off any loads that are not urgently needed. • Separate connection between k or l and PE.
Overtemperature	Temperature in the IT system transformer is too high	<ul style="list-style-type: none"> • Switch off any loads that are not urgently needed.
CT connection	Short circuit or interruption of connecting wire has been detected: <ul style="list-style-type: none"> • measuring current transformer STW2 (T4), isolating transformer load, channel 10 • Measuring current transformer STW3, channel 7 	<ul style="list-style-type: none"> • Check connecting wire of measuring current transformer.
System connection	Connection to the IT system interrupted or voltage in the system being monitored below 150 V	<ul style="list-style-type: none"> • Check connection of ports L1/IT, L2/IT to the IT system. • Check voltage in the IT system
Earth connection	Connection to PE interrupted	<ul style="list-style-type: none"> • Check that connections E and KE are each connected to PE with two separate lines.
	Impermissible connection Z1 or Z2 to PE	<ul style="list-style-type: none"> • Ensure that Z1 and Z2 are not connected to PE.
Device error + error code	For details about actions to be taken, refer to "Messages with error code or service code", page 73. The message is on channel 6 of the BMS bus.	
Short circuit distribution board	Short circuit detected	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • Replace ATICS®. • Separate connection between GND, k or l and PE.
Overcurrent I(3)	Overcurrent detected by measuring current transformer STW3	<ul style="list-style-type: none"> • Eliminate cause of overcurrent. • Eliminate any damage.

Fault/message	Description	Action
No master	There is no device with master function or back-up master (device with address "1") available on the RS-485 interface.	<ul style="list-style-type: none"> • Check BMS bus connection. • Check whether the master has failed or whether its address has changed. If the device is operated without a BMS bus, the "Failure monitoring" must be disabled, see chapter "Settings menu 9: Interface", page 69.
Service by ___ (date)	Reminder for next service	<ul style="list-style-type: none"> • Schedule appointment with the Bender service.
Functional test by ___ (date)	Reminder for next test	<ul style="list-style-type: none"> • Schedule appointment for next test. • Perform test.
Manual mode	Message "Manual mode" although manual mode has not been enabled	<ul style="list-style-type: none"> • Check the connections of the digital input
Error during changeover process	Occurs when the test set-ups do not supply sufficient current for switching the ATICS® coils.	<ul style="list-style-type: none"> • Only use test set-ups that provide the necessary peak current of 17 A.

9.1.2 Messages with error code or service code

Error/service code	Description	Action
1.xx, 4.xx, 9.xx	Fault message from the internal memory monitoring.	<ul style="list-style-type: none"> • Contact the Bender service.
3.10	Prewarning The max. number of operating hours will be reached in one year	<ul style="list-style-type: none"> • For functional safety SIL 2 requirements according to IEC 61508-2, the replacement must be planned. Alarm can be acknowledged (see chapter "Reset menu 3: Changeover", page 53)
3.11	Maximum number of operating hours exceeded for functional safety according to IEC 61508-2:2010.	<ul style="list-style-type: none"> • For functional safety SIL 2 requirements according to IEC 61508-2, the replacement must be carried out. Alarm can be acknowledged (see chapter "Reset menu 3: Changeover", page 53)
3.12	Maximum number of changeovers exceeded.	<ul style="list-style-type: none"> • Plan device replacement. Alarm can be acknowledged (see chapter "Reset menu 3: Changeover", page 53)
3.13	Changeover due to overcurrent or short circuit detected. These changeovers reduce the life of the device. Currents exceeding 130 A are considered to be overcurrents or short-circuit currents.	<ul style="list-style-type: none"> • Have qualified personnel assess the short-circuit load. Contact the Bender service. Alarm can be acknowledged (see chapter "Reset menu 3: Changeover", page 53)
3.50	Service alarm has been reset. Only displayed in the service logger menu.	<ul style="list-style-type: none"> • No action required.
4.61...4.66	Switch state error: Deviation between the target position of the switching logic and the reported position. This error occurs when the required input voltage is detected to have failed during the changeover.	<ul style="list-style-type: none"> • Reset, perform test changeover. If no error is displayed: OK • Check supply voltage or current limitation (17 A are required for switching) • If error persists: Replace device immediately
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.	<ul style="list-style-type: none"> • Replace device immediately.

Error/service code	Description	Action
8.21 ... 8.30	ISOMETER® or transformer monitoring error	<ul style="list-style-type: none"> Reset, then execute test of the IT system. Check that the current firmware is installed. When no fault is displayed: OK. Otherwise replace the device. Check that the bridge on the output side is properly installed.
8.22	Temperature sensor is defective or has earth potential.	<p>Diagnostic:</p> <ul style="list-style-type: none"> Disconnect the temperature sensor (Z1/Z2). When the fault is no longer displayed: Replace the temperature sensor or correct its cable routing.
8.51 ... 8.52	Fault internal power supply unit.	<ul style="list-style-type: none"> Execute "RESET" → "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	Fault during changeover process. Occurs when the voltage on the new line fails during the changeover. Also occurs when the test set-ups do not supply sufficient current for switching the ATICS® coils. Can also be caused by missing or improperly installed bridge on the output side. The fault can also be caused by an (impermissible) connection between GND, k or l and PE.	<ul style="list-style-type: none"> Check connection of the bridge on the output side, if necessary, re-tighten screws. Execute "RESET" → "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 $t(0) \geq 160$ ms. Delete this connection
8.69*	Error switching device / energy storage device The variant with energy storage device does not start in position 0	<ul style="list-style-type: none"> Check energy storage device and energy storage device connection. Perform changeover test. If no error is displayed: OK If error persists: replace device.

* only for "ES" version of ATICS®

If there is an error, proceed as follows:

1. If required, enable manual mode.
2. Note down what happened before the error: Operating steps, error messages of the device, environmental conditions, etc.
3. Have the article and serial number of the device at hand.
4. Contact the Bender service and state the type of error and the three-digit error code.

9.2 Frequently asked questions

A series of clicks is always heard 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 set to "Generator" for the redundant line in the settings menu 1 "Changeover", the coil test for line 2 is only performed if line 2 is live.

When executing the function "TEST" → "Generator", the coil test for line 2 is carried out directly after starting the generator.

Are the connections of the insulation monitoring device subject to regular testing?

Connection faults are recognised during the self test. Self tests are carried out:

- After switching the ATICS® power supply on
- After each changeover process
- When the "TEST IT system" function is executed
- Every hour
- Every minute, when any kind of ISOMETER® fault is detected

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 is it necessary to use two separate measuring current transformers?

The measuring current transformer STW3 (T3) is designed for short-circuit detection downstream of the transfer switching device.

The measuring current transformer T4 monitors the isolating transformer load of the IT system. If the load becomes too high, it will be indicated by the ATICS®. Excessive temperature (and the corresponding message "Overtemperature") can be avoided when the devices that are not urgently needed are switched off by the operating personnel.

Can a transformer be used for both tasks simultaneously (short-circuit and load current monitoring)?

No. For each of the tasks the ATICS® features different evaluating circuits.

Why does ATICS® not display the set time?

The time of ATICS® is set by the BMS bus master. The time is only required in the rare case when no BMS bus is used. In this case, ATICS® displays 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 disabled in the menu "Settings" → "Interface" → "Failure monitoring".

ATICS® does not switch 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® switch over.

The time delay can be due to the following reasons:

- ATICS® is just switching. The set time delay in switch position "0" (dead time) is several seconds (see "Settings menu 1: Changeover", page 61)
- ATICS® has just been supplied with voltage. After the time delay has elapsed, ATICS® is ready for operation.
- Within a short period of time, ATICS® carried out more than 12 changeovers. The time delay is required to cool the system.

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

Like many Bender devices, ATICS® can be monitored and configured by means of a Bender gateway CP700, COM46x..., etc. The gateways are operated via a web user interface that is displayed using an internet browser. One of the functions of these gateways is saving reports. A report is used to store the settings and measured values of a bus device. By creating a backup, data loss (e.g. by accidentally deleting settings) can be avoided. The backup can also be imported to another device of the same type. This may be necessary if a device is replaced or if several devices are to be configured for similar tasks.

ATICS® is continuously further developed and maintained. This also affects the content of the report file. If you try to save a report that was generated with an older ATICS® device (version older than 1.20) in an ATICS® device with a current firmware, this can lead to error messages. These error messages are displayed on the web user interface.

- Repeat the saving process of the report to ATICS® several times. This way, the majority of the parameters can still 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.

10 Periodic verification and service

10.1 Periodic verification

The use of Bender products ensures protective measures against certain hazards when operating electrical systems. The corresponding legal requirements are defined in the Ordinance on Industrial Safety and Health (BetRSichV) and the supplementary Technical Rules (TRBS):

Every company is obliged to draw up a risk assessment for its work equipment (electrical systems and equipment). With the help of the risk assessment, inspection intervals for the required periodic verification are to be determined.

As a guide, TRBS1201 refers to DGUV (German Social Accident Insurance) regulations 3 and 4 as well as to the supplementary DGUV regulations:

System/equipment	Inspection interval	Type of inspection	Inspected by
Electrical systems General	4 years	For safe condition. According to applicable electrotechnical rules	Qualified person
Electrical installations and stationary equipment in "Special installations or locations" (DIN VDE 0100 Group 700)	1 years		

According to TRBS1203, the tests must be carried out by a qualified person. The person carrying out the test must have the training and professional experience required and must be able to recognise, among other things, hazards caused by the inspection activity and the work equipment to be inspected.

The following periodic verification must be performed on electrical installations in compliance with the applicable local or national regulations. If no local/national regulations apply, at least periodic verification as recommended by DIN VDE 0100-710 (VDE 0100-710) should be performed.

Action	To be performed by	Interval
Function test of the IT system monitoring by pressing the test button on the corresponding operating units.	Medical personnel	Once every working day (recommended by Bender)
Function test of the IT system monitoring on the monitoring device see "Test menu 1: IT system", page 48.	Electrically skilled person	Monthly (recommended by Bender)
Services for the periodic verification of Bender products in electrical installations: <ul style="list-style-type: none"> • Function test of the transfer switching device. • Checking the effectiveness of the protective measures monitored by Bender products as well as their disconnecting and switching functions, see "Settings menu 1: Changeover", page 61, table row "10. Serviceinterv." • Optimum configuration of the Bender products • Testing by qualified persons • Documentation 	Bender service or electrically skilled person	annually*

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

10.2 Maintenance

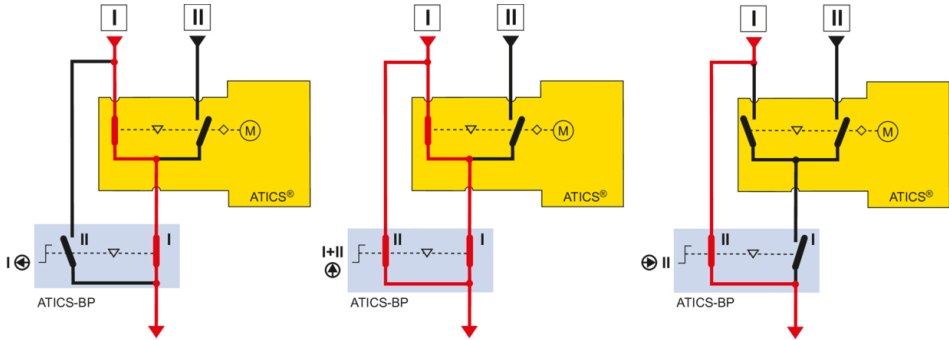
The intervals specified for periodic verification must be adhered to. We also recommend regularly checking the Allen screws on ATICS® and the Torx® screws of the connectors on the incoming and outgoing lines of the automatic transfer switching device to make sure they are tight.

10.3 Cleaning

The device may only be cleaned with a clean, dry, soft and antistatic cloth.

10.4 Operation with bypass switch

The ATICS®-BP-... bypass switch enables a parallel supply of line 3. Without interrupting the voltage on line 3, ATICS® can be switched or exchanged as required.



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.

i 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.



WARNING Risk of short circuit if "Enable bypass" light is ignored.

If ATICS® is not connected to the line to which the bypass switch is connected, a short circuit may occur between line 1 and line 2.

- ▶ Only operate the bypass switch when the green "Enable Bypass" light lights up.

If a voltage drop occurs on line 1 while the switch is set to "II" (bypass):

1. Initially leave the bypass switch in position "II".
Leave the transparent cover open so that ATICS® will not switch to line 2 automatically.
2. Switch ATICS® to position "0" or "I" using the Allen key.
3. Set the bypass switch to position "I".
4. Close the transparent cover to activate automatic mode.

Conditions for operation with the bypass switch

- Wiring must be carried out according to "Connection example: ATICS® with bypass switch", page 29.
- The following must be set in "Settings menu 6: Dig. input":
 - 1. Function → Bypass
 - 2. Response value → 0 V
 - 3. t(on) response delay → 100 ms
 - 4. t(off) delay on release → 100 ms


WARNING Electric shock

Mains voltage is present at the contacts of lines 1, 2 and 3, which causes an electric shock if touched.

- ▶ Only touch the insulated part of the connector.

10.5 Replacing ATICS®

The plug connectors make it easy to replace the device if

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


DANGER Danger to life due to electric shock

Touching live parts of the system carries the risk of electric shock.

- ▶ Before installing and connecting the device, make sure that the installation is deenergised.
- ▶ If ATICS® is bypassed, observe the regulations for working on live parts.

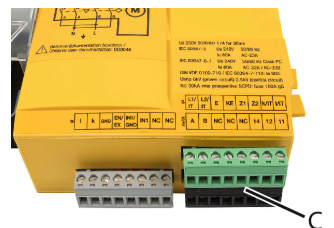
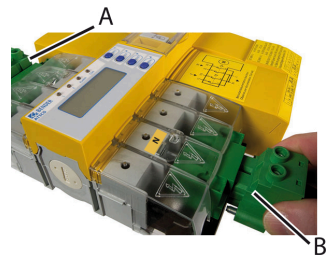
10.5.1 Removing existing ATICS®

Preparations

1. Record settings on existing ATICS®. The settings should match the entries in the checklist (see checklist, included in the scope of delivery).
2. Disconnect the device from the power supply or switch on the bypass switch. Switch existing ATICS® to manual operation, switch to position "0" and secure against unintentional switchon (see chapter "Connecting ATICS® safely", page 26).

Remove connections

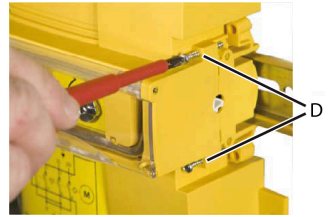
3. Undo the mounting screws on the top green plug connector and remove the connector (A).
4. Undo the fastening screws of the bottom green plug connector and remove the connector (B).
5. Remove the three connector plugs (C).
For ATICS...400 and -ES: Remove connector from upper part of the enclosure (opposite side of (C)).


ADVICE

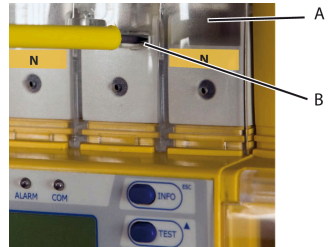
NOTICE! Extraneous voltage!

Removing ATICS® in case of DIN rail mounting

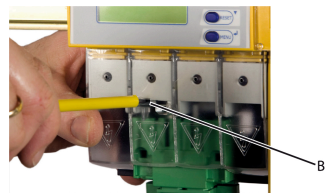
6. Undo screws (D).



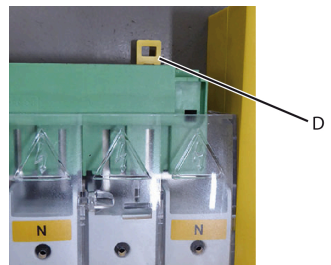
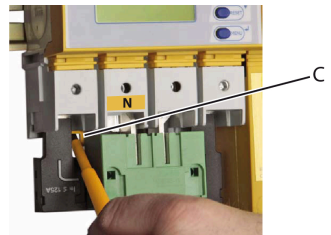
7. Remove lower and upper terminal covers (A) by using a screwdriver to push back the locking hook (B) located approximately in the middle of the cover in each case.



8. Use a screwdriver to pull the lower yellow slide lock (C) downwards and raise ATICS® slightly from below.



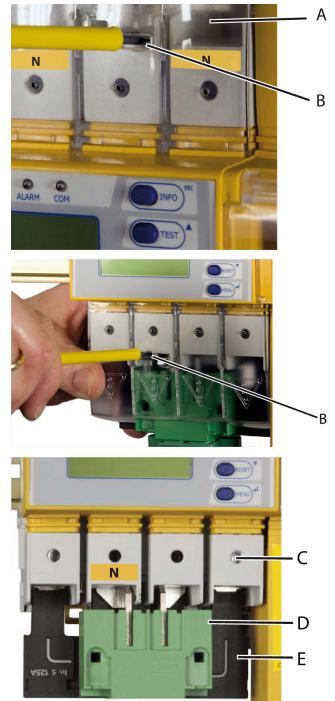
9. Use the screwdriver to pull the upper yellow slide lock (D) upwards and remove ATICS®.



Removing ATICS® in case of screw mounting

6. Remove lower and upper terminal covers (A) by using a screwdriver to push back the locking hook (B) in the middle of each cover.

7. Undo the Allen screws of the terminals (C).
8. Remove the green plug connectors (D) at top and bottom.
9. Remove the black bridge (E) at the bottom.
10. Undo the mounting screws and remove ATICS® from the mounting plate.



10.5.2 Installing a new ATICS®

Mounting

On DIN rail: see "DIN rail mounting", page 22.

On plate: see "Screw mounting on plate", page 23.

Connection

See "Connecting ATICS® safely", page 26.

11 Technical data

11.1 Technical data ATICS®

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

Overvoltage category	III
Pollution degree outside, inside	2
Rated insulation voltage	250 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

Supply voltage U_s	230 V (50/60 Hz)
Power consumption at 63 A	≤ 16 W
Power consumption at 80 A	≤ 28 W
Current during changeover process	17 A / <30 ms

Power section / switching elements

Rated operational voltage U_e	see "Ordering information", page 90
Frequency range f_n	48...62 Hz
Crest factor	≤ 1.2
Number of switching cycles (mechanical)	≥ 8000
Short-circuit currents	see table "Short-circuit currents", page 87
Short-circuit current I_{cc} and fuses	see table "Utilisation categories acc. to DIN EN 60947", page 87

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	20...300 V
Operating uncertainty	±1 %
Changeover period	t < 500 ms...100 s

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 (versions 63 A and 80 A) with STW3	130 A
Crest factor	min. 2
Hysteresis for short-circuit alarm	5 %

Cable length

Single wire $\geq 0.75 \text{ mm}^2$	0...1 m
Single wire, twisted $\geq 0.75 \text{ mm}^2$	1...10 m
Shielded cable	10...40 m
Cable: twisted pairs, shield connected to terminal I on one side, must not be earthed	recommended: J-Y(St)Y min. $n \times 2 \times 0.8$

IT system monitoring

Insulation monitoring

Nominal system voltage U_n (operating range)	230 V 50/60 Hz (80...275 V)
Measuring range	10 k Ω ... 1 M Ω
Measurement method	AMP (adaptive measuring pulse)
Response value R_{an1} (ALARM 1)	50...250 k Ω
Relative uncertainty	$\pm 15 \%$
Hysteresis	$\leq 25 \%$
Response time t_{an} at $R_F = 0.5 \times R_{an}$ and $C_e = 1 \mu\text{F}$	$\leq 5 \text{ s}$
Measuring voltage U_m	DC 12 V
Measuring current I_m (at $R_F = 0 \Omega$)	$\leq 53 \mu\text{A}$
Internal resistance R_i	$\geq 240 \text{ k}\Omega$
Impedance Z_i	$\geq 220 \text{ k}\Omega$
Internal resistance/impedance during test	$\geq 100 \text{ k}\Omega$
Permissible extraneous DC voltage U_{fg}	$\leq \text{DC } 370 \text{ V}$
Permissible system leakage capacitance C_e	$\leq 5 \mu\text{F}$
Automatic self test	every hour
Response time for loss of earth connection as well as loss of network connection	maximum 1 hour

Load current monitoring (IT system transformer)

Measuring current transformers	STW2, STW3, SWL-100 A
Measuring range I_L (TRMS)	10...110 % of the response value
Adjustable response value (STW2, STW3, SWL-100A)	5...(50) 100 A (1-A steps)

Relative uncertainty	±5 %
Crest factor	≤ 2
Response time	< 1 s
Response delay t_{on}	0...100 s (step-by-step in 1-s steps)
Delay on release t_{off}	0...100 s (step-by-step in 1-s steps)
Hysteresis	5...30 %
Response time CT connection monitoring	ca. 1 h (or immediately in case of "TEST Isometer")

Cable length

Single wire $\geq 0.75 \text{ mm}^2$	0...1 m
Single wire, twisted $\geq 0.75 \text{ mm}^2$	1...10 m
Shielded cable $\geq 0.5 \text{ mm}^2$	10...40 m
Cable: twisted pairs, shield connected to terminal I on one side, must not be earthed	recommended: J-Y(St)Y min. $n \times 2 \times 0.8$

Temperature monitoring (IT system transformer)

Response value	4 k Ω
Relative uncertainty	±10 %
Release value	1.6 k Ω
Response time (overtemperature or open-circuit temperature sensor)	≤ 2 s
PTC resistors acc. to DIN 44081	max. 6 in series

Insulation fault location

Locating current IT	< 1 mA
Test cycle/pause	2/4 s

Displays and data memory

Display: graphic display	languages DE, EN, FR, PL
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 logger	100 data records
Service logger	100 data records

Input

Digital inputs	1
Galvanic separation	yes
Control	via potential-free contacts
Operating mode	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	switch-back lock, manual/automatic mode, bypass mode, functional test, changeover to preferred line, alarm input for operating theatre lights, alarm input for other devices

Output

Switching element	1 potential-free changeover contact
Operating mode adjustable	n/o or n/c operation
Adjustable function	see "Settings menu 5: Relay", page 65
Electrical endurance under rated operating conditions	10,000 cycles

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

BMS interface

Interface / protocol	RS-485 / BMS
Baud rate	9.6 kbit/s
Cable length	≤ 1200 m
Cable: shielded, one end of shield connected to PE	recommended: CAT6/CAT7 min. AWG23
	alternative: twisted pair, one end of shield connected to PE J-Y(St)Y min. 2 × 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 acc. to IEC 60721

Stationary use (IEC 60721-3-3)	3K22
Transport (IEC 60721-3-2)	2K11
Long-term storage (IEC 60721-3-1)	1K22
Operating temperature	-25...+55 °C

Classification of mechanical conditions acc. to IEC 60721

Stationary use (IEC 60721-3-3)	3M11
Transport (IEC 60721-3-2)	2M4
Long-term storage (IEC 60721-3-1)	1M12

Terminals
Power section

Connection directly to ATICS®, for plug connections	screw-type terminals
rigid (flexible)/conductor sizes	10...70 mm ² (6...50 mm ²) / 8 (10)...0 AWG
Stripping length	15 mm
Tightening torque (hexagon socket 4 mm)	5 N m
Connection type	pluggable screw-type terminals
Conductor cross section, rigid min./max	1.5 mm ² / 35 mm ²
Conductor cross section, flexible min./max.	1.5 mm ² / 25 mm ²
Conductor cross section AWG min./max	20 / 2
Stripping length (do not use ferrules)	20 mm
Tightening torque (Torx® screwdriver T20 or slotted screwdriver 6.5 × 1.2 mm)	2.5 N m (≤ 25 mm ²) 4.5 N m (> 25 mm ²)
Torque setting for manual operation (hexagon socket 5 mm)	approx. 6 N m

Electronics

Connection	pluggable screw-type 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 × 0.4 mm)	0.22...0.25 N m

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	UL 94 V-0
DIN rail mounting	acc. to IEC 60715
Screw mounting	4 × M5
Dimensions incl. terminals (W × H × D)	234 × 270 × 73
Weight	approx. 3400 g

Short-circuit currents

	ATICS-2-63A-ISO	ATICS-2-80A-ISO
Thermal current I_{th} (40 °C)	63 A	80 A
Current rated as conditional short circuit with gG fuses according to DIN		
Conditional short-circuit current I_{cc} (kA eff.)	30	30
Associated fuse rating (A gG)	80	100
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 eff.)	7	7
Short-circuit operation (single switch)		
Current rated as short-time withstand I_{cw} 1 s (kA eff.)	4	4
Rated peak withstand current I_{cm} (kA peak)	17	17

Utilisation categories acc. to DIN EN 60947

Type	I_e AC-23A	I_e AC-23B	$I_e I_e$ AC-32A	$I_e I_e$ AC-32B	I_e AC-33B
ATICS-2-63A-ISO(-ES)	63 A	63 A	63 A	63 A	63 A
ATICS-2-80A-ISO(-ES)	80 A	80 A	80 A	80 A	80 A

11.2 TÜV test report according to VDE 0100 Part 710

Technischer Bericht Elektrische Sicherheit Sichtprüfung

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

Service-Auftrags-Nr.: 15246147
Kundenauftrags-Nr.: 2247997

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



Industrie Service

Mehr Sicherheit.
Mehr Wert.

Gegenstand: ATICS Umschalt- und Überwachungsgerät
Typ ATICS-2-63A-ISO inkl. Modulträger
UMA710-2-63-ISO-BP / UFA710-2-63-ISO-BP

Sachverständiger: Raimund Gebhart

Zeitraum: 14.11.2013 bis 10.12.2013

Grundlage der Prüfung: Auftrag 4620785 Pos. 020 vom 24.10.2013

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

Zusammenfassung: Die Umschalteneinrichtung für medizinisch genutzte Räume
vom Typ ATICS (genau Bezeichnung siehe oben) erfüllt
die Anforderungen an selbsttätige Umschalteneinrichtungen
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 des Modulträgers UMA710-2-80-ISO-BP /
UFA710-2-80-ISO-BP mit dem Modulträger UMA710-2-
63-ISO-BP sehen wir keine Bedenken, das obige Ergeb-
nis auch auf diese Variante zu übertragen.
(weitere wichtige Hinweise siehe Bericht)

Datum: 19.12.2013

Unsere Zeichen:
IS-EG1-MUC/geb

Dokument:
Bender_ATICS-
ISO_131114_Funktionsbewertun
g-Teil_710-2012_SUE-Rev01.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.

München, 19.12.2013

Thomas Wurl
Niederlassung München
Abteilung Elektrotechnik

Raimund Gebhart
Der Sachverständige



Sitz: München
Am Bergschl. München HRB 96 869
US-IdNr.: DE1294216
Informationen gemäß § 2 Abs. 1 DL-InfoV
unter www.tuev-sued.de/Impressum

Aufsichtsrat:
Karsten Xander (Vorsitzender)
Geschäftsführer:
Ferdinand Nauwieser (Sprecher),
Dr. Ulrich Klotz, Thomas Kaiz

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80685 München
Deutschland

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.

11.3 TÜV certificate regarding functional safety

TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD TÜV SÜD
 ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ CERTIFICADO ◆ CERTIFIKAT ◆ CERTIFICADO ◆ CERTIFICAT



Product Service

ZERTIFIKAT

Nr. Z10 077738 0002 Rev. 01

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

Fertigungsstätte(n): 077730

Prüfzeichen:



Produkt: Sicherheitsbauelemente
 Umschalteneinrichtung

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 (SIL2)
 EN 61508-2:2010 (SIL2)
 EN 61508-3:2010 (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: 2025-03-15

Datum, 2020-03-16

(Guido Neumann)

Seite 1 von 1
 TÜV SÜD Product Service GmbH • Zertifizierstelle • Ridlerstraße 65 • 80339 München • Deutschland

11.4 Standards and certifications

The transfer switching and monitoring device conforms to the following standards:

- DIN VDE 0100-710 (VDE 0100-710):2002-11*
- DIN VDE 0100-710 (VDE 0100-710):2012-10*
- DIN VDE 0100-710 (VDE 0100-710) 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*
- IEC 60364-7-710:2021-05
- 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
- DIN EN 61557-8 (VDE 0413-8):2015-12

Standard-compliant isolating transformer monitoring according to:

- DIN EN 61558-1 (VDE 0570-1):2006-07
- DIN EN 61558-1/Berichtigung 1 (VDE 0570-1/Amendment 1):2008-11
- DIN EN 61558-1/Berichtigung 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.



The EU Declaration of Conformity is available at the following Internet address:

bender.de/fileadmin/content/Products/CE/CEKO_Atics.pdf

11.5 Ordering information

ATICS®-...-DIO Variants

Type	Rated operational voltage U_e	Rated operational current I_e	Art. No.	Manual No.
ATICS-2-63A-ISO	AC 240 V	AC 63 A	B92057202	D00046
ATICS-2-63A-ISO-ES*	AC 240 V	AC 63 A	B92057206	D00046
ATICS-2-63A-ISO-400	AC 415 V	AC 63 A	B92057204	D00046
ATICS-2-80A-ISO	AC 240 V	AC 80 A	B92057203	D00046
ATICS-2-80A-ISO-ES*	AC 240 V	AC 80 A	B92057207	D00046

Type	Rated operational voltage U_e	Rated operational current I_e	Art. No.	Manual No.
ATICS-2-80A-ISO-400	AC 415 V	AC 80 A	B92057205	D00046

* with connection option for ATICS-ES energy storage device

Compatible alarm indicator and operator panels

Type	Description	Art. No.	Manual No.
CP907	COMTRAXX® CP907 7" white	B95061080	D00349
CP907 without flush-mounting enclosure		B95061093	D00349
CP915	COMTRAXX® CP915 15,6" white	B95061081	D00349
CP915	COMTRAXX® CP915 15,6" grey	B95061085	D00349
CP924	COMTRAXX® CP924 24" white	B95061083	D00349
CP924	COMTRAXX® CP924 24" grey	B95061084	D00349
CP9xx	COMTRAXX® CP9xx (customised versions)		
TM800	Medics Tableau	dis-continued	D00165

Compatible alarm indicator and test combinations

Type	Description	Art. No.	Manual No.
CP305-IO	COMTRAXX® CP305 - Control Panel	B95100051	D00425
CP305-C	COMTRAXX® CP305 - Control Panel (customised parameter settings)	B22030051	D00425
MK2430...	COMTRAXX® MK2430 series	dis-continued	D00129
MK800...	COMTRAXX® MK800	dis-continued	D00053

Optional Accessories

Type	Description	Art. No.	Manual No.
STW2	Measuring current transformer (load current monitoring IT system), I_e : AC 50 A	B942709	
STW3	Measuring current transformer (short-circuit monitoring) for ATICS® < 100 A; I_e : AC 100 A	B98021000	
SWL-100A	Measuring current transformer (load current monitoring IT system), I_e : AC 100 A	B92057252	

Type	Description	Art. No.	Manual No.
ATICS-BP-2-63A-SET	Bypass switch set (I_n : AC 63 A) comprising: <ul style="list-style-type: none"> • Bypass switch 63 A single, 2-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 	B92057253	D00162
ATICS-BP-2-80A-SET	Bypass switch set (I_n : AC 80 A) comprising: <ul style="list-style-type: none"> • Bypass switch 80 A single, 2-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 	B92057253	D00162
EDS151	Insulation fault locator	B91080101	D00107
ESS3680	Transformer 3.68 kVA, AC 400 V / 230 V For "ATICS® for 400 volt systems without N conductor", only the transformers recommended by Bender (T5, T6) may be used!	B924744	
ATICS-ES	Energy storage device for ATICS-2-63A-ISO-ES and ATICS-2-80A-ISO-ES	B72057255	D00009
AN412	Power supply unit DC 12 V for ATICS-ES energy storage device	B924150	

Description ATICS-2-...-ISO:

2-pole transfer switching and monitoring device with integrated insulation, load and temperature monitoring of the IT system, 1 dig. input, 1 relay output, short-circuit detection in TN systems, with sealable contact covers on the input and output sides, bridges on the output side and pluggable screw-type terminals for all connections. Measuring current transformers STW2 and STW3.

11.6 Additional documents

- ATICS® quick-start guide "ATICS-2-ISO...DEEN" (D00046)
- ATICS® Checklist

In addition, the instructions for the accessories used apply.

11.7 Document revision history

Date	Version	Valid from software version	State/Changes
04/2021	04	D333 V1.3x, D334 V1.3x, D335 V1.0x, D308 V1.2x	NEW: complete revision
11/2021	05	see above	Added: Chapter 10 "Technical Data": Changeover period Changed: Chapter 10.1: Supply voltage Chapter 10.1: Nominal system voltage Chapter 10.5: "Description of Ordering details"
04/2024	06	see above	Transfer to editorial system, editorial revision. Chapter 10.1 Periodic verification: reference changed after "Function test [...] on the monitoring device" Successor devices included: MK... > CP305; TM8000 > CP9xx

Date	Version	Valid from software version	State/Changes
02/2025	07	see above	Connection instructions for ATICS-ES added: <ul style="list-style-type: none">• Terminals GND, EN/EX in table Connecting ATICS® safely• Wiring diagram in Connection example: ATICS® with ATICS-ES energy storage device• Note in Fastening, inserting and securing connections



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