

MAGIC SDC ETI/EDI Switch & Converter

Hardware Manual

A publication of
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1 INTRODUCTION

MAGIC SDC enables trouble-free switching of a redundant DAB multiplexer system. The output signal of each DAB multiplexer is permanently monitored. If an error is detected in a multiplex, the system automatically switches to the redundant input.

The system can be used as a classic *ETI switch* for E1 G. 703/G. 704 lines or optionally as an *EDI switch* for IP networks.

If the EDI option is available, the system also enables *conversion from EDI to ETI* and vice versa, so that DAB multiplexers that no longer support a native ETI can still be integrated into the existing ETI infrastructure.

The system is configured via the PC software included in the scope of delivery and displays the status of the ETI/EDI input data streams and all system parameters in a very clear manner. The software can also be used to manually switch the input for e. g. service purposes.

1.1 Conventions

In this manual the following conventions are used as text markers:



The **Tip** symbol marks information which facilitates the operation of the system in its daily use.



The **Note** symbol marks general notes to observe.



The **Attention** symbol marks very important advice that is absolutely to observe. In case of non-observance malfunctions and even system errors are possible.

1.2 Safety

The unit described has been designed to the latest technical parameters and complies with all current national and international safety requirements. It operates on a high level of reliability because of long-term experience in development and constant and strict quality control in our company.

This manual contains basic safety instructions that must be observed during configuration and operation. It is essential that the user reads this manual before the system is used and that a current version of the manual is always kept close to the equipment.

1.3 General safety requirements

To keep the technically unavoidable residual risk to a minimum, it is absolutely necessary to observe the following rules:

- Transport, storage and operation of the unit must be under the permissible conditions only.
- Installation, configuration and disassembly must be carried out only by trained personal based on the respective manual.
- The unit must be operated by competent and authorised users only.
- The unit must be operated in good working order only.
- The device must be protected from water.
- The device may only be installed in indoor rooms.
- The device may only be cleaned with a dry cloth.
- Any conversions or alterations to the unit or to parts of the unit (including software) must be carried out by trained personnel authorised by the manufacturer. Any conversions or alterations carried out by other persons lead to a complete exemption of liability.
- Only specially qualified personnel are authorised to remove and override safety measures, and to carry out the maintenance of the system.
- External software is used at one's own risk. Use of external software can affect the operation of the system.
- Use only tested and virus-free data carriers.

1.4 Construction

MAGIC SDC contains a mainboard with an additional connector, a display, a keypad and five LEDs.

The functions of the system are implemented in a 19" x 1U housing, the dimensions are 434 mm x 44,5 mm x 260 mm. **MAGIC SDC** can be used as a table-top device or it can be mounted in 19" racks. The 19" mounting brackets are included in delivery.



MAGIC SDC front view



MAGIC SDC rear view with optional ETI Module and Dual LAN Upgrade



MAGIC SDC rear view with optional 2 x ETI Module and redundant power supply upgrade

1.5 Functionality

MAGIC SDC enables trouble-free switching of a redundant DAB multiplexer system. The output signal of each DAB multiplexer is permanently monitored. If an error is detected in a multiplex, the system automatically switches to the redundant input.

In its function as ETI switch **MAGIC SDC** provides two G.703/G.704 inputs and outputs and supports ETI-NI as well as ETI-NA. During a power breakdown the signal is automatically bridged. To use the system as EDI switch it is additionally equipped with two LAN interfaces.

As GPS inputs a 10 MHz as well as a 1pps input are available. The time reference is received via NTP.

The system is configured via the PC software included in the scope of delivery and displays the status of the ETI/EDI input data streams and all system parameters in a very clear manner. The software can also be used to manually switch the input for e. g. service purposes.

For an external alarm signalling eight TTL contacts and eight relays are provided. An integrated protocol storage is also available.

With the implemented SNMP functionality, the system can also be integrated into a network management system via its LAN interface.

Options

- **Dual LAN Upgrade**

With the Dual LAN Upgrade, the system can be expanded by two additional LAN interfaces, so that a total of four LAN interfaces are available. The assignment of functions such as EDI, SNMP etc. is freely configurable. In addition, an ETI module can be equipped. A second Dual LAN module is not possible.

- **ETI Module**

With the ETI module, the system can be extended by an ETI input/output. In addition, either a second ETI module or the Dual LAN module can be equipped.

- ETI switching if two ETI modules are installed
- EDI/ETI switching and converting if the EDI upgrade is available

- **EDI Upgrade**

With the EDI upgrade, the system can be extended by an EDI input/output.

- EDI switching
- EDI/ETI switching and converting if an ETI module is available

- **EDI Redundancy Upgrade**

Automatic switching over of two linked SDC systems using the EDI outputs. The EDI upgrade is required for this functionality.

- **Redundant Power Supply**

Optionally a redundant power supply can be used, the 5V DC table power supply is included in this hardware upgrade.

2 PUTTING THE SYSTEM INTO OPERATION

2.1 Mounting

With its dimensions of (width x height x depth) 434 mm x 44.5 mm (1U) x 260 mm the **MAGIC SDC** system can either be used as desktop device or mounted into a 19-inch rack. 19" mounting brackets are included in delivery. When mounting the unit please keep in mind that the bending radius of the connected cables is always greater than the minimum allowed value.

When the **MAGIC SDC** is installed, please make sure that there is sufficient cooling: It is recommended to keep a spacing of ca. 3 cm from the openings. In general, the ambient temperature of the system should be within the range of +5 °C and +45 °C. These thresholds are specially to observe if the system is inserted in a rack. The system works without ventilation.



The system temperature can be indicated on the display under MENU > STATUS INFORMATION > DEVICE TEMPERATURE or in the software under Extras > System Monitor > System Temperature.

During operation humidity must range between 30 % and 85 %.



Attention! Incorrect ambient temperature and humidity can cause functional deficiencies.

Improper use of the unit can lead to a loss of warranty claim.

2.2 Connection to the mains voltage



Attention! High touch current possible! Before connecting the power supply, MAGIC SDC must be earthed.

For this purpose, the earthing cable must have a conductor cross-section of at least 2.5mm² if it is mechanically protected, or otherwise 4.0mm².

The following graphic symbols are located on the rear of the unit to indicate the correct and safe use.



After plugging the power cable and switching on the device, the unit boots within 30 seconds.

An additional power supply socket for connecting an external 5 V power supply unit is optional available.

2.3 Operational elements at the front side

The system has an illuminated graphical display with a resolution of 160 x 32 pixel and 19 operating buttons.

On the right next to the display there are two softkeys whose current functions are indicated on the display. In the middle there are two cursor buttons (upwards/downwards) as well as an OK button. The numerical pad supports the characters 0...9, '*' and '#'.



2.4 Front status LEDs

The system has five LEDs for status indication. When the device boots, all five LEDs blink.

- POWER: green
 - OFF
 - ON

- SYNC: yellow
 - OFF (no alarm)
 - ON (configured reference clock available)
 - BLINK (configured reference clock missing)

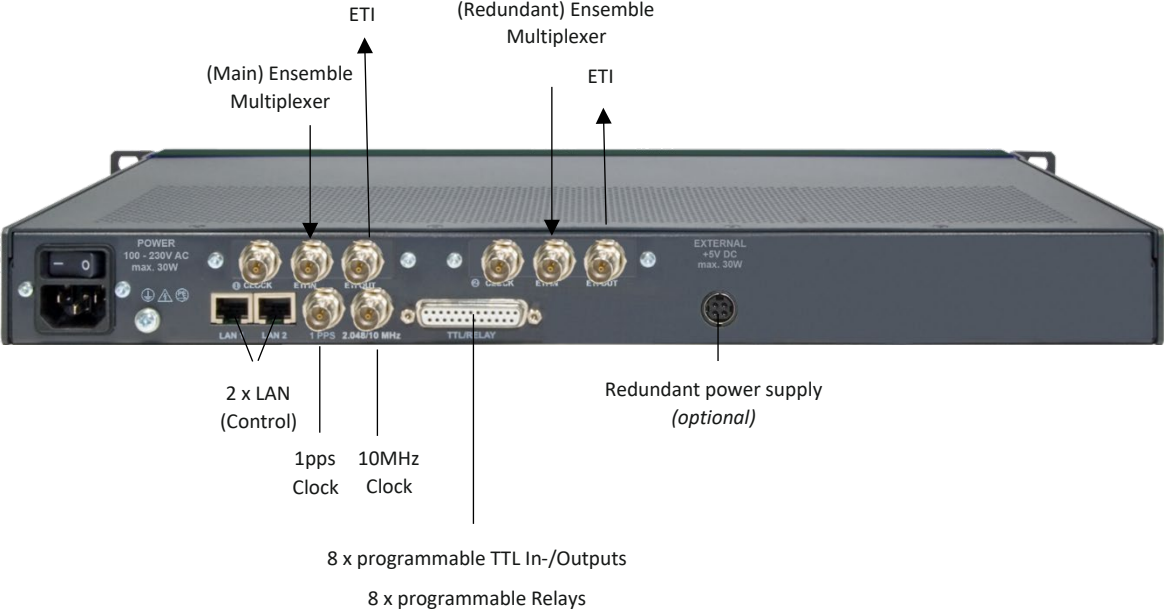
- ALARM: red
 - OFF (no alarm)
 - ON (any application alarm)
 - BLINK (any system/hardware alarm)

- INFO 1: yellow
 - OFF (no input selected)
 - ON (Input 1 selected automatically)
 - BLINK (Input 1 selected manually)

- INFO 2: yellow
 - OFF (no input selected)
 - ON (Input 2 selected automatically)
 - BLINK (Input 2 selected manually)

2.5 Wiring

MAGIC SDC has two module slots and can be extended with the Dual LAN Upgrade, one or two ETI modules and/or the EDI Upgrade. A redundant power supply is also available as an option.



3 INTERFACES

3.1 MAGIC SDC

On the front side of the unit 5 LEDs for status indication are available. The connectors for the interfaces are at the rear side of the unit.



MAGIC SDC front view



MAGIC SDC rear view with optional ETI Module and Dual LAN Upgrade



MAGIC SDC rear view with optional 2 x ETI Module and redundant power supply upgrade

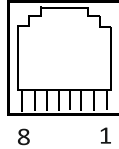
3.2 Control and data interfaces

3.2.1 Ethernet interfaces LAN 1 / LAN 2

The LAN 1 and LAN 2 interfaces can be used as control interfaces. One of the two interfaces can also be used to connect it to an NTP Server. Additionally, it can be used as EDI input. For the LAN interfaces RJ-45 sockets are used.

Pin assignment: ETHERNET INTERFACES LAN 1 / LAN 2

Socket: RJ-45



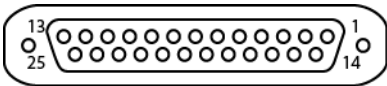
| Pin | Signal | | Electrical characteristics |
|-----|----------|------------|---|
| 1 | TX+ | Data out + | Recommendation: IEEE 802.3/Ethernet Data rate (Auto neg.): 10/100 Mbit/s Recommended cable: CAT5 or higher Max. cable length: 100m |
| 2 | TX- | Data out - | |
| 3 | RX+ | Data in + | |
| 4 | not used | | |
| 5 | not used | | |
| 6 | RX- | Data in - | |
| 7 | not used | | |
| 8 | not used | | |

3.2.2 TTL/Relay interface

The TTL/relay interface is realised as a 25-pin socket. It provides eight TTL inputs/outputs as well as eight relay contacts. This interface can be used for external signalling of alarms. The programming of the available functions is possible via the Windows PC Software.

Pin assignment: TTL/RELAY INTERFACE

Socket: SUB-D 25-pin



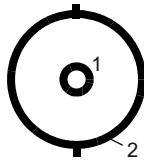
| Pin | Signal | | Electrical characteristics |
|-----|-------------|------------|---|
| 1 | TTL 1 | output | TTL interface: Capacity of the TTL outputs: Maximum voltage: 3.3V Maximum current: 10mA Relay interface: Capacity of the relays: Maximum voltage: 48V Maximum current: 200mA |
| 2 | TTL 2 | output | |
| 3 | TTL 3 | output | |
| 4 | TTL 4 | output | |
| 5 | TTL 5 | output | |
| 6 | TTL 6 | output | |
| 7 | TTL 7 | output | |
| 8 | TTL 8 | output | |
| 9 | RELAY 4 (B) | output, NO | |
| 10 | RELAY 5 (B) | output, NC | |
| 11 | RELAY 6 (B) | output, NC | |
| 12 | RELAY 7 (B) | output, NO | |
| 13 | RELAY 8 (B) | output, NO | |
| 14 | RELAY 1 (A) | output, NC | |
| 15 | RELAY 1 (B) | output, NC | |
| 16 | GND | | |
| 17 | RELAY 2 (A) | output, NC | |
| 18 | RELAY 2 (B) | output, NC | |
| 19 | RELAY 3 (A) | output, NO | |
| 20 | RELAY 3 (B) | output, NO | |
| 21 | RELAY 4 (A) | output, NO | |
| 22 | RELAY 5 (A) | output, NC | |
| 23 | RELAY 6 (A) | output, NC | |
| 24 | RELAY 7 (A) | output, NO | |
| 25 | RELAY 8 (A) | output, NO | |

NO = normally open

NC = normally closed

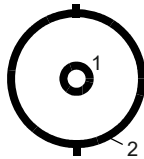
3.3 Clock interfaces

Pin assignment: CLOCK, BNC SOCKET "1 PPS"



| Pin | Signal | Electrical characteristics |
|-----|---------------|---------------------------------------|
| 1 | CLOCK IN/ OUT | Amplitude: 0,5 to 1,9 V _{OP} |
| 2 | GND | Impedance: 75 Ohm unbalanced |

Pin assignment: CLOCK, BNC SOCKET "10 MHz"



| Pin | Signal | Electrical characteristics |
|-----|---------------|---------------------------------------|
| 1 | CLOCK IN/ OUT | Amplitude: 0,5 to 1,9 V _{OP} |
| 2 | GND | Impedance: 75 Ohm unbalanced |

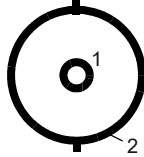
3.4 Network interfaces

3.4.1 E1 (2-Mbit/s) interface (Module Slot 1 and/or 2)

With the optional ETI module, the system can be extended by an ETI input/output. In addition, either a second ETI module or the Dual LAN module can be equipped.

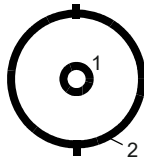
The following options are possible: *ETI switching* if two ETI modules are installed or *EDI/ETI switching and converting* if the EDI upgrade is available.

Pin assignment: CLOCK, BNC SOCKET "1/2 CLOCK" – not in use



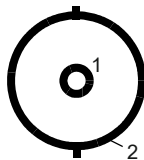
| Pin | Signal | Electrical characteristics |
|-----|----------------------|---|
| 1 | Data – T3 in/ T3 out | Amplitude: 0,5 to 1,9 V _{OP} (Input) 1.5 V _{OP} (Output) |
| 2 | GND | Impedance: 75 Ohm unbalanced Range: 100 m |

Pin assignment: E1 IN



| Pin | Signal | Electrical characteristics |
|-----|--------------|--|
| 1 | Data – F1 in | Amplitude: 3 V _{PP} |
| 2 | GND | Impedance: 75 Ohm unbalanced Range: 100 m |

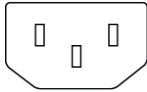
Pin assignment: E1 OUT



| Pin | Signal | Electrical characteristics |
|-----|---------------|--|
| 1 | Data – F1 out | Amplitude: 3 V _{PP} |
| 2 | GND | Impedance: 75 Ohm unbalanced Range: 100 m |

3.5 Power supply

3.5.1 AC power supply socket



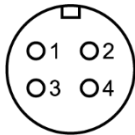
100 – 230 V AC, 50 – 60 Hz, auto adjusting, max. 30 W

3.5.2 Optional DC power supply socket

Only use the +5 V DC power supply provided by AVT.

Pin assignment: 5 V power supply socket

Socket: KYCON KPJ-S4



| Pin | Signal | Electrical characteristics |
|-----|--------|----------------------------------|
| 1,3 | GND | Voltage: + 5V Power: max. 30W |
| 2,4 | +5 V | |

4 TECHNICAL DATA

Line interfaces:

- E1 2.048-MHz, G.703/G.704
 Time slot 16 is not used
 Signal is bridged during power failure

Synchronisation

- ETI EN 300797
 Ensemble Transport Interface
 - ETI (NA, G.704) 5592
 - ETI (NA, G.704) 5376
 - ETI (NI, G.703)
 - DAB-Modes: I, II, III, IV

Control interfaces:

- 2 x Ethernet 10/100 Mbit/s
 - Optional: Dual LAN Upgrade
- 8 x TTL Input/Output
- 8 x Relays

Display:

- Graphical, resolution 160 x 32 pixels
- Illuminated (can be switched off)

Power supply:

- Integrated power supply:
AC 100 – 230 V
Power max. 30 W
- Redundant external power supply (opt.):
DC +5 V
Power max. 30 W

Power consumption:

- Typ. 15 W, max. 30 W

Dimensions (W x H x D):

- 434 mm x 44.5 mm x 250 mm

Weight:

- Ca. 2.4 kg

Further Information:

- Temperature Range +5 – 45 °C
- Relative humidity 30 – 85 %
- Mains voltage 100 – 230V
- Mains frequency 50 – 60 Hz
- Power consumption max. 30 W

5 GENERAL

5.1 Order numbers

| | |
|---|--------|
| MAGIC SDC Redundancy Switch & Converter | 804115 |
| Dual LAN Upgrade | 802034 |
| ETI Module | 470100 |
| EDI Upgrade | 800991 |
| Redundant Power Supply Upgrade | 802035 |

5.2 Scope of delivery

- MAGIC SDC
 - 1 x external power supply adapter
 - 4 x Self-adhesive feet
 - 19" Mounting brackets

5.3 Declaration of conformity

Find the declaration of conformity at the end of this document.

6 SERVICE INFORMATION

6.1 Software and firmware updates

Download software updates from our website. No registration required.

<http://www.avt-nbg.de>

Navigate to ***Downloads > Software***.

6.2 Support

Our support is available on working days:

Monday to Friday from 09:00 - 16:30 CET.

Support portal: **<https://avt-nbg.zammad.com>**

Email: **support@avt-nbg.de**

Phone number: **+49 911 5271-110**



To deal with your problem efficiently please note down the factory number of the unit as well as the software version that you use.

The factory number is visible in the software under ***Administration > Registration***.

If you bought the system via your local dealer, please contact them first.

6.3 Repairs

If your unit is defective, please contact us before sending in the device.

To send in the system please fill in the included ***Service Request***¹ and send the unit to the following address:

AVT Audio Video Technologies GmbH

- Repairs -

Nordostpark 91

90411 NÜRNBERG

GERMANY

¹ Or download from:

<https://avt-nbg.de/download/other/service-request-avt.pdf>

6.4 WEEE (Directive on Waste Electrical and Electronic Equipment)

Due to Directive 2012/19/EU on waste disposal, this device must be recycled.

All electrical and electronic equipment must be disposed of separately from general household waste via approved collection points or disposal companies. The proper disposal and separate collection of old electrical and electronic equipment serves to prevent possible damage to the environment and health. The device contains valuable raw materials that can be recycled.



For proper recycling, send the device to us:

AVT Audio Video Technologies GmbH

- Recycling -

Nordostpark 91

90411 NÜRNBERG

GERMANY

WEEE Reg. No. DE83099164

Only prepaid parcels will be accepted!



These instructions only apply to appliances installed and sold in countries of the European Union. In countries outside the European Union, other regulations may apply to the disposal of electrical and electronic equipment.

Always recycle packaging material and electrical appliances or their components through authorised collection points or disposal companies.

CE EU-Konformitätserklärung

EU-Declaration of Conformity

Name des Anbieters: AVT Audio Video Technologies GmbH
Supplier's name:

Anschrift des Anbieters: Nordostpark 91
Supplier's address: 90411 Nürnberg
Germany

erklärt, dass das Produkt
declares, that the product

Produktname(n): MAGIC SDC Redundancy Switch & Converter 804115
Product name(s):

mit den Vorschriften folgender Europäischer Richtlinien übereinstimmt:
conforms to the standards of the following European directives:

Elektromagnetische Verträglichkeit (EMV) 2014/30/EU
Electromagnetic compatibility (EMC)

Niederspannungs-Richtlinie 2014/35/EU
Low voltage directive

**Beschränkung der Verwendung bestimmter gefährlicher
Stoffe in Elektro- und Elektronikgeräten (RoHS)** 2011/65/EU
*Restriction of the use of certain hazardous substances in
electrical and electronic equipment (RoHS)*
incl. amendment 2015/863/EU

Die Übereinstimmung wird nachgewiesen durch vollständige Einhaltung folgender Normen:
The conformity is evidenced by strictly meeting the following standards:

- EN IEC 62368-1
- EN IEC 63000
- EN 55032
- EN IEC 61000-6-2
- EN IEC 61000-6-4
- EN 55016-2-1
- EN 55016-2-3
- EN 61000-3-2
- EN 61000-3-3
- EN 61000-4-2
- EN 61000-4-3
- EN 61000-4-4
- EN 61000-4-5
- EN 61000-4-6
- EN 61000-4-8
- EN 61000-4-11

Ort, Datum: Nürnberg, 01.07.2022
Place, date:

Name(n): Wolfgang Peters
Name:

Rechtsverbindliche Unterschrift:
Legally binding signatures:



Telefon: +49 911 5271-0
Phone:

Diese Erklärung beinhaltet keine Zusicherung von Eigenschaften.
This declaration includes no warranty of properties.

Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
The safety instructions specified in the product documentation delivered must be observed.