MAGIC EEC

ETI/EDI Converter

Hardware Manual

Audio
Video
Technologies

A publication of
AVT Audio Video Technologies GmbH

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INDEX

1 INTRODUCTION

MAGIC EEC allows the conversion from ETI to EDI and EDI to ETI signals.

Typical applications are Ensemble Multiplexers, which cannot generate an ETI signal anymore (e. g. Fraunhofer ContentServer), but which must be fed to the transmitter via E1 lines with ETI or Ensemble Multiplexers, which only have ETI inputs/outputs (e. g. Rohde & Schwarz DM001), but which are to be fed via IP lines with EDI.

The system has two LAN interfaces by default. These are freely programmable in terms of functions, configuration, monitoring, SNMP and EDI input/output. The ETI interface has one G. 703/G. 704 input/output each.

The system is configured via the PC software included in the scope of delivery and displays the status of the ETI or EDI input data streams and all system parameters in a very clear manner. All events are stored in the device in a log file, which can be retrieved via the PC software or alternatively stored in a network folder.

MAGIC EEC supports SNMP v1/v2c protocol for connection to up to four independent network management systems.

In addition, alarm messages can be output via eight potential-free and programmable contacts. Alternatively, eight programmable TTL GPIO contacts are available.

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 date carriers.

1.4 Construction

MAGIC EEC 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 EEC** 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 EEC front view

MAGIC EEC rear view with optional redundant power supply

1.5 Functionality

MAGIC EEC is equipped with a G.703/G.704 input/output (for ETI signal) and two LAN interfaces which can be configured freely regarding their functionality (input/output for EDI signal, control and configuration, SNMP). A second ETI module can be equipped, whereby an additional and unrestricted ETI output is available. This may be used as a monitoring output or to supply a redundant ensemble multiplexer, for example.

Configuration and control are especially comfortable with the MAGIC EEC Windows PC software which is included in delivery and which communicates with the system via the LAN interface.

For an external alarm signalling eight TTL contacts and eight relays are provided. All alarm or status events are also stored in an internal system logfile, which is readable via the logfile browser of the PC software. Alternatively, an automatic download in e.g. a network folder is possible.

Via the integrated SNMP agent, which supports the SNMP v1/v2 protocols, control of the system can be realised for up to four independent network management systems.

With the optional SDC upgrade a **MAGIC EEC** system can be upgraded to a full **MAGIC SDC Switch & Converter**.

Options

- **Monitoring output**
  A second ETI module can be optionally equipped, which means that an additional unrestricted ETI output is available. This can be used, for example, as a monitoring output or to supply a redundant Ensemble Multiplexer.
- **SDC Upgrade**
  The optional SDC upgrade allows a MAGIC EEC system to be upgraded to a full-featured MAGIC SDC Switch & Converter.
- **Dual converter mode**
  With this upgrade MAGIC EEC has two independent ETI/EDI converters. For the Dual Converter mode you need a MAGIC EEC with monitoring output (second ETI module).
- **Dual LAN Upgrade**
  Optional extension with two additional Ethernet interfaces. The assignment of functions such as EDI, SNMP etc. is freely configurable. However, a second EDI module can then no longer be assembled.
  Redundant Power Supply
  Optionally a redundant power supply can be used, the 5V DC table power supply is included in this hardware upgrade.
- **N+1 Redundancy Upgrade**
  The N+1 redundancy upgrade adds an additional EDI input to the system to enable non-seamless redundancy switching in the event of errors in the EDI input signal of the main path. This option provides a cost-effective N+1 redundancy solution using our MAGIC DABMUX Go or MAGIC DABMUX plus in an N+1 multiplex setup. This feature is only available in EDI → ETI conversion mode.

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 EEC** 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 EEC** 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 EEC 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 '#'.

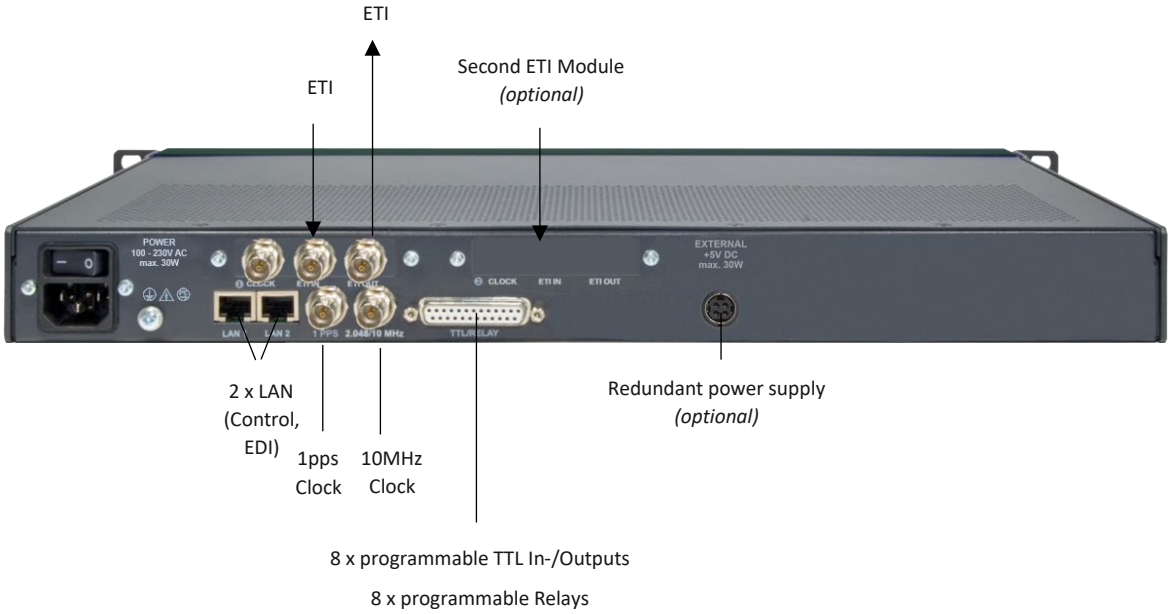
2.4 Front status LEDs

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 (Channel 1 configured OFF)
  - ON (no input errors for Channel 1)
  - BLINK (input errors for Channel 1)
- INFO 2: yellow
  - OFF (Channel 2 configured OFF)
  - ON (no input errors for Channel 2)
  - BLINK (input errors for Channel 2)

2.5 Wiring

MAGIC EEC has an ETI module and can be extended with a second ETI module or the Dual LAN 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 EEC front view

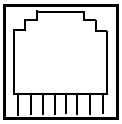
MAGIC EEC rear view with optional redundant power supply

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

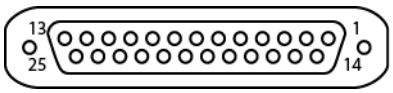


Pin	Signal		Electrical characteristics
1	TX+	Data out +	Recommendation: IEEE 802.3/Ethernet Data rate (Auto neg.): 10/100 Mbit/s Recommended cable: CAT5 or higher Max. cable length: 100m
2	TX-	Data out -	
3	RX+	Data in +	
4	not used		
5	not used		
6	RX-	Data in -	
7	not used		
8	not used		

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



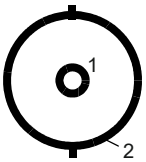
Pin	Signal		Electrical characteristics
1	TTL 1	output	**TTL interface:**
2	TTL 2	output	Capacity of the TTL outputs:
3	TTL 3	output	Maximum voltage: 3.3V
4	TTL 4	output	Maximum current: 10mA
5	TTL 5	output	
6	TTL 6	output	**Relay interface:**
7	TTL 7	output	Capacity of the relays:
8	TTL 8	output	Maximum voltage: 48V
9	RELAY 4 (B)	output, NO	Maximum current: 200mA
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

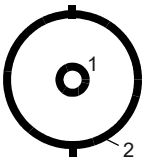
3.3 Clock interfaces

Pin assignment: CLOCK, BNC SOCKET “1 PPS”



Pin	Signal	Electrical characteristics
1	CLOCK IN	Amplitude: 2,0 to 5,5 V_{0P}
2	GND	Impedance: 75 Ohm unbalanced

Pin assignment: CLOCK, BNC SOCKET “10 MHz”



Pin	Signal	Electrical characteristics
1	CLOCK IN	Amplitude: 2,0 to 5,5 V_{0P}
2	GND	Impedance: 75 Ohm unbalanced

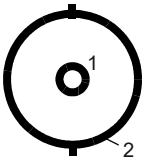
3.4 Network interfaces

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

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

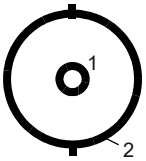
The following options are possible: *Monitoring Output* if two ETI modules are installed or *EDI/ETI converting* if the EDI upgrade is available.

Pin assignment: CLOCK, BNC SOCKET "1/2 CLOCK"



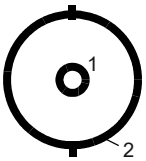
Pin	Signal	Electrical characteristics
1	Data – T3 in/ T3 out	Amplitude: 0,5 to 3,5 V_{0P} (Input)
2	GND	Impedance: 75 Ohm unbalanced Range: 100 m

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

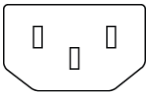
Pin assignment: E1 OUT



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

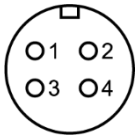


100 – 230 V AC, 50 – 60 Hz, auto adjusting, max. 30 W

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
2,4	+5 V	Power: max. 30W

4 TECHNICAL DATA

Line interfaces:

- E1 (ETI) 2.048-MHz, G.703/G.704
- LAN (EDI) 10/100 Base-T, RJ45

Standards:

- ETSI ETS 300 799 (ETI)
- ETSI TS 102 693 (EDI)

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 260 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 EEC ETI/EDI Converter	800890
ETI Module	470100
MAGIC EEC to SDC Upgrade	800892
Dual Converter Upgrade	800895
N+1 Redundancy Upgrade	430598
Dual LAN Upgrade	802034
Redundant Power Supply Upgrade	802035

5.2 Scope of delivery

- MAGIC EEC
    - 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 -

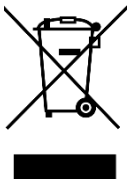
Nordostpark 91

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 EEC ETI/EDI Converter 800890
Product name(s):

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

Elektromagnetische Verträglichkeit (EMV) *Electromagnetic compatibility (EMC)*	2014/30/EU
Niederspannungs-Richtlinie *Low voltage directive*	2014/35/EU
Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS) *Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)*	2011/65/EU 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 **Name(n):** Wolfgang Peters
Place, date: 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.