

## ES610

### A/D Module of the Compact Device Family



Robust, powerful measuring modules must be easy and convenient to cable and easy to integrate into the measurement and calibration system being used. ETAS has developed a new family of compact modules that meets these requirements. Of this family, the ES610 is the member that measures analog voltages.

The metallic housings of this new module family are robust and appealing, and thanks to a clever idea, it is easy to quickly connect the modules of this generation with each other to simplify handling several devices. A well thought-out cable concept makes it possible to connect the modules quickly and intuitively in a manner that protects them from polarity inversion. The modules are well suited for rough handling during calibration in the vehicle and on the test bench.

#### Modern and Proven Transmission Protocol

A proven and powerful Ethernet with TCP/IP protocol is used to transfer data between the modules and to the PC. In contrast to CAN and SMB there are no bandwidth limitations. Easy module handling with automatic assignment of IP addresses, future integration into the in-house network, and diagnosis and remote maintenance of the modules via the

Internet are just a few of the benefits of this technology.

If several measurement modules are used in a network, the ES600 system module synchronizes the connected modules and thus ensures a time stability in the range of milliseconds.

#### Precise Measurements

The ES610 measures analog voltages via 16 channels that are electrically isolated from each other and from the supply voltage to achieve a consistently high common-mode rejection, thereby ensuring maximum measuring accuracy even at low voltages. The 16 Bit resolution allows high-precision measurements. The ES610 reaches a basic voltage measurement accuracy of up to 2 mV.

To maintain the high precision even at large temperature fluctuations in daily operations, the measuring module has an ultra-low temperature coefficient of only 10 ppm/°C. Aside from the demand for high acquisition rates, it is also necessary to measure signals that often only vary very slowly. For such cases, the ES610 features a configurable acquisition rate and adjustable software filters that make it possible to reduce data during acquisition. The fastest acquisition

#### At a Glance

16 electrically isolated measuring channels for analog voltages

Measuring channels electrically isolated from the supply voltage

Adjustable acquisition rate per channel, max. 2 ksamples/s, min. 0.5 samples/s

Parameterized software filter for signal smoothing

High measurement accuracy through 16 Bit resolution

Two selectable measuring ranges of  $\pm 10$  V and  $\pm 60$  V

Data transfer to PC or ES600 via Ethernet

Solid, functional metal housing

Member of the ETAS Tool Family - supported by INCA

ETAS Calibration Service

rate is 2 kHz, independent of the number of active channels. Anti-aliasing 4th order filters in each channel ensure a clean analog/digital conversion without undesirable signal mixtures.

### Tailored for the Automotive Industry

The ES610 uses a power-saving transfer rate of 10 MBit/s to minimize the power consumption and heat-up of the device. In addition, the module detects when the connection to the PC is interrupted and automatically switches to stand-by mode. This

reduces the load on the vehicle electrical system. The module can also be connected directly to the battery voltage supply for long periods.

Furthermore, the ES610 has a wide temperature range suitable for tests in winter as well as in summer. Like other ETAS products, the input voltage range is suitable for automotive applications and protected against reverse voltage, and solid plug connectors are used for connections to the module.

### Technical Data

Item	Characteristics	Description
General	Dimensions (H/ W/D)	72 x 128 x 160 mm / 2.8 x 4.9 x 6.3 in.
	Weight	1150 g / 2.54 lbs
Environment	Temperature range	-40 to +70 °C / -40 to 158 °F (operation); -40 to +85 °C / -40 to 185 °F (storage)
Power supply	Operating voltage (reverse voltage protection)	6 to 32 V DC, reverse-voltage protected up to 40 V, protected against load dump
Current consumption	Continuous	340 mA (continuous);
	Standby	5 mA (stand-by), each at 12 V
PC interface	Connection	10 MBit/s Base-T Ethernet
	Protocol	TCP/IP
	IP address	dynamically via INCA
Inputs	Number of channels	16
	Resolution	16 Bit, higher at slower sampling rates
	Acquisition rate	0.5 samples/s to 2 ksamples/s, configurable per channel
	Input voltage ranges	±10 V, ±60 V
	Input filter	Low-pass of 4th order, limit frequency 1 kHz, max. overshooting 3 %
	Input impedance	> 15 MΩ    1 nF (±10 V); 2 MΩ    1 nF (±60 V)
	Messfehler	2 mV + (U <sub>in</sub> * 0.05 %) in the ±10 V measuring range 12 mV + (U <sub>in</sub> * 0.05 %) in the ±60 V measuring range
	Temperature drift	10 ppm/°C, relative to input voltage
	Electrical insulation of inputs	±100 V channel to channel, channel to supply voltage
	Support by ETAS software	

For complete ordering information and accessories for the ES610 module, please refer to [www.etas.com/ES610](http://www.etas.com/ES610).

For more information, please contact your local ETAS representative.

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