

10/2025

endrich NEWS

www.endrich.com

VISIT US AT SPS 2025!

Following our successful appearance at electronica in Munich last year, we are delighted to welcome you to SPS 2025 in Nuremberg this year..

Visit us from **25 to 27 November 2025** at **SPS in Nuremberg**, Hall 10.0, Stand 430 – and immerse yourself in the world of smart technologies.

Experience how compact mini-FAKRA breakout cables are setting new standards in the automotive and industrial sectors, how CONEC hybrid connectors elegantly combine power and data, and how the SmartBug 2.0 paves the way for intelligent IoT solutions with multi-sensor technology and machine learning.

We will also be presenting touch monitors for 24/7 use, powerful ARM- and x86-based embedded boards, and NeoMesh sensor nodes that make energy-efficient wireless networks a reality.

Our highlights combine technology with vision – for your next projects.

Let's talk in person – we look forward to discussing ideas, applications and challenges with you.

We look forward to seeing you and talking to you in person at SPS 2025 in Nuremberg.



**WIR SIND
DABEI!**

sps
smart production solutions

25.11. - 27.11.2025
NÜRNBERG | GERMANY
HALLE 10.0 // STAND 430

Ticket for SPS 2025

To receive your free ticket, please send an email with your first and last name, email address, and company name to SPS@novitronic.de. You will then receive your personal access code for the trade fair shortly afterwards.

SWITCHING WITHOUT MECHANICAL CONTACTS - AN OVERVIEW OF MAGNETIC SWITCHES

The simple process of turning a current on and off by a mechanical switch can be challenging: switching time, acoustical noise generation (klick-klack), low switching currents, limited number of switching cycles, mechanical size, mechanical force, etc may cause issues that have to be considered already during the design of an electronic assembly.

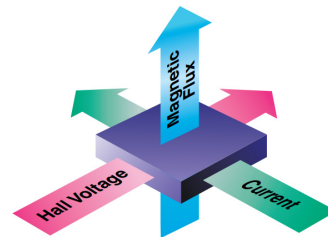


Reed contacts used as magnetic switches are well known for a long time. Still using mechanical contact blades, the switching on and off procedure in reed contacts is induced by a magnetic field. Many

disadvantages of mechanical switches like acoustical noise, limited switching cycles and mechanical force for switching are overcome with this kind of switches. But some others still remain and some new ones like mechanical sensitivity (glass break) are joining. Even though it is trivial, one advantage of both, mechanical switches and Reed contacts, is worth to mention: they are fully passive, i.e. they do not need any electrical energy for their operation.

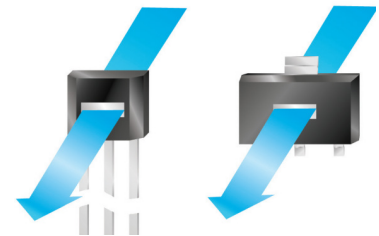


In 1879, Edwin Hall discovered the Hall effect. This effect describes that a magnetic field generates a voltage across a current carrying piece of metal. Evaluating this voltage, magnetic fields can be measured. Sensors, based on this principle could be implemented into integrated circuits which was the hour of birth for Hall switches.



Comparing the Hall voltage with internal threshold values, the output signal is switched between high- and low. Taking into account the direction of the magnetic field, several

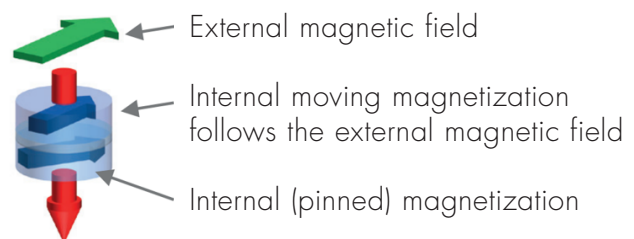
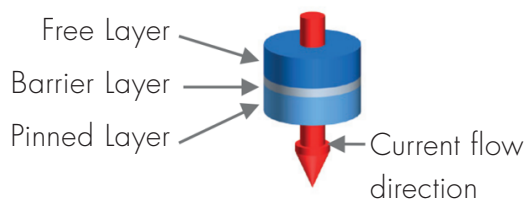
different switching behaviors can be generated (switch, latch, omnipolar). The output stage can be open drain/ open collector or push-pull.



In recent years, a completely different technology for magnetic switches has arisen. The Tunnel-Magneto Resistive (TMR) technology uses the fact that the resistance of a stack of two ferromagnetic layers (named free layer and pinned layer), separated by a very thin insulating barrier layer, depends on the relative orientation of the magnetization of the two ferromagnetic layers.

Measuring the resistance of this stack, the orientation and strength of a magnetic field can be measured. Similar as for Hall sensors this kind of sensor elements can be integrated into integrated circuits and therefore similar magnetic switches can be constructed. The main advantages of this TMR-technology are low current consumption and high sensitivity to magnetic fields.

NEWS



To summarize, both, Hall-effect and Tunnel-Magnetoresistive-effect switches are perfectly suited for magnetic switches with far better features than Reed switches or even mechanical switches. Magnetical switches of either technology show very fast switching behavior, are robust against vibrations,

are available in different switching modes (latch, switch, omnipolar), have infinite number of switching cycles, etc. For selected types, current consumption is smaller than the self-discharge current of e.g. the driving battery.

Economic **Magnesensor Technology Ltd**

Hall switch versions available:

- low power
- uni- or omnipolar
- TO92, SOT23, DFN 1010, QFN 2020 housings
- high sensitivity
- internal pull-ups
- speed & direction
- fan driver

Choose best fit and contact us!

Automotive **TDK**

Hall switch versions available:

- SOT23 or TO92UT housing
- two wire types available
- wide operation voltage 2.7 or 3 ... 24 V
- T_j : -40 ... 170°C
- programmable switching fields
- internal self-test
- automotive certified
- ASIL B ready and AEC-Q 100

Design-Tip

Knowing the strength of the magnetic field is essential for selection of the optimal sensor. Using an analog Hall sensor, the magnetic flux can be easily measured using a simple multimeter. Contact us and you will receive two analog Hall sensors of different sensitivity together with a short description for free!

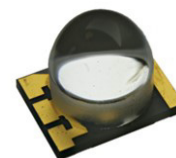
High Performance Industrial



TMR-switch versions available:

- low power consumption
- high sensitivity
- switching file customization possible
- small outline packages
- custom designed switching fields

IMPROVEMENT OF SORTING AND QUALITY CONTROL PROCESSES



Infrared light with wavelengths ranging from approximately 700 to 2500 nm is less scattered and is absorbed by molecular vibrations in biological tissues, making it suitable for deep tissue observation and sensing. This wavelength range is often referred to as the "biological window."

SWIR sensors (short-wavelength infrared) enable discrete biometric and surveillance imaging for the medical, industrial, and defense markets. In material identification, the extended wavelengths of SWIR LEDs reveal unique material characteristics, enhancing sorting and quality control tasks in industries such as pharmaceuticals and agriculture, among others.

The SWIR wavelengths in high-performance LED packages increase visibility when imaging through dust, fog, and smoke, delivering

highly reliable results in harsh environments such as extreme heat, humidity, or vibration.

Many applications use **SWIR LEDs** to illuminate an object, but illumination is often only half the story. Material identification relies on the ability to accurately measure the SWIR absorption, transmission, or reflectivity of the object: SWIR photodetectors.

APPLICATIONS

- Face recognition
- Analysis of nutritional information
- Photovoltaic defect inspection
- Liquid level inspection
- Solar simulation
- Under-glass sensors

LEDs	Footprint (mm/in)	Power	Optical Power (mW)	Radiant intensity	Wavelength	FWHM (nm)
OCI-490-20 ID1100	6046 (2418)	1000	324	1700	1100	55
OCI-480 ID1140	6046 (2418)	1000	360	104	1140	58
OCI-460 ID1200	3535 (1414)	1000	270	100	1200	70
OCI-490-20 ID1300	6046 (2418)	1000	72	319	1300	85
OCI-480 ID1450	6046 (2418)	1000	138	43	1450	80
OCI-460 ID1550	3535 (1414)	1000	120	45	1550	105
OCI-490-20 ID1650	6046 (2418)	1000	30	120	1650	150
OCI-490-20 ID1720	6046 (2418)	1000	42		1720	130
OCI-490-20 ID1900	6046 (2418)	1000	41		1900	130
OCI-490-20 ID2100	6046 (2418)	1000	10		2100	130
OCI-490-20 ID2200	6046 (2418)	1000	8.7		2200	150
OCI-490-20 ID2300	6046 (2418)	1000	3.2		2300	w

Detectors	Footprint (mm/in)	Type	Surface (mm²)	Wavelength (nm)	Dark current
EOPD-1300-1-0.3	3216 (1206)	SMD	0.3	1300 - 1500	0.3 nA
EOPD-1300-0-1.5-3	TO-46	THT	1.8	600 - 1750	2 µA
EOPD-1300-0-0.8-1	TO-46	THT	0.8	800 - 1750	1 µA

PRECISION CLOCKING FOR MODERN FPGAS: AN OVERVIEW OF SITIME TIMING SOLUTIONS

In recent years, FPGAs have evolved from basic logic blocks into highly integrated systems with memory, DSPs, AI processors, and network-on-chip structures. This evolution introduces increasingly complex requirements for timing and clocking, particularly in data centers, wireless infrastructure, and edge computing.

The Challenge: Complex Clocking in FPGAs

Modern FPGA designs require a variety of precise clock signals:

- **Reference clocks for SerDes transceivers** with low phase noise requirements
- **Real-time clocking (RTC) and timestamping** for GNSS or IEEE 1588
- **System and application clocks** for logic, memory, I/O banks, and configuration control

This creates a need for highly reliable, programmable, and robust timing sources that operate under extreme environmental conditions—such as -55°C to +125°C, high vibration, or humidity.

Application Example

Wireless Infrastructure

A key example is the combination of the **SiT95148 Network Synchronizer** and **SiT5503 Super-TCXO**, which enable IEEE 1588, GNSS, and SyncE synchronization in a software-defined radio setup. This solution delivers ultra-precise timing with ± 5 ppb stability for 5G fronthaul applications. The SiT95148 operates in DCO mode with 5 ppt resolution and generates reference clocks for SyncE, IEEE 1588, and GNSS.

Product	Function	Frequency Range	Feature
SiT8008 SiT8009	MHz Oscillator	1–137 MHz	Low power, Field Programmable
SiT5501 SiT5503	Super-TCXO	1–60 MHz	± 5 ppb, ± 0.3 ppb/°C
SiT95147 SiT95148	Network Synchronizer	1–220 MHz	Up to 4 inputs, 11 outputs Up to 2 GHz clock output frequencies Integrated phase jitter 70 fs (typ.)
SiT95145	Jitter Attenuator		
SiT95141 SiT91211 SiT91213	Clock Generator		
SiT9375 SiT9501	Differential Oscillator	25–644.5 MHz	LVPECL/LVDS/HCSL, 70–150 fs jitter

EML3505 1MHZ 3A, SYNCHRONOUS STEP-DOWN REGULATOR

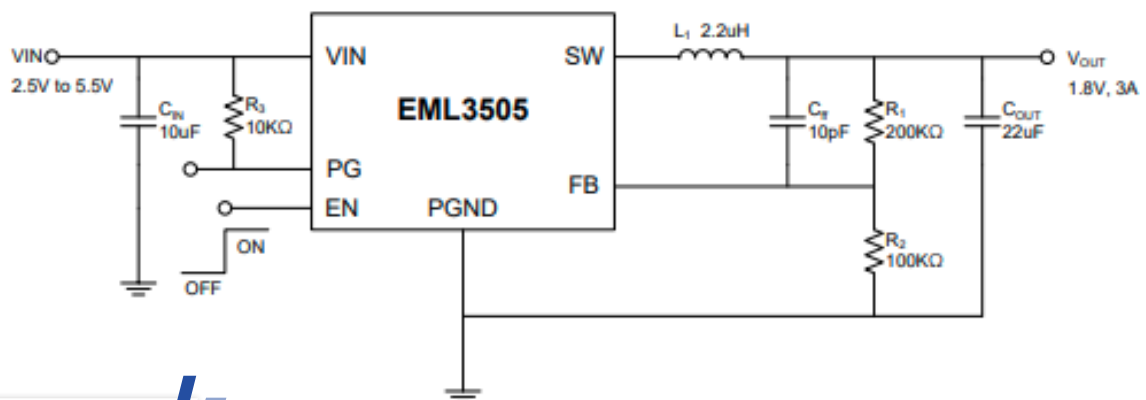
The EML3505 is a highly integrated, synchronous step-down DC/DC converter that is particularly suitable for portable and power-saving applications. With a wide input voltage range of 2.5 V to 5.5 V and an output current of up to 3 A, it covers many typical supply voltages in mobile devices and wireless systems.

An outstanding feature is the very low quiescent current of only 25 μ A in PFM mode, making the device particularly suitable for battery-powered devices with long standby times. For high energy efficiency under varying loads, the regulator uses three automatically switching modes (PFM mode, PWM mode, LDO mode).

Thanks to the internal switching frequency of 1 MHz, space-saving passive components can be used, which simplifies the layout and reduces the size of the device. The integrated synchronous architecture eliminates the need for an external Schottky diode, which saves additional components and improves efficiency (up to 97%).

Additional features such as excellent transient response, integrated over-temperature protection, and a minimum output voltage of 0.6 V enable use in modern digital circuits with low core voltage.

Typical Application



FEATURES

- Input range: 2.5 V to 5.5 V, up to 3 A output
- Three-mode operation (PWM, PFM, LDO) for dynamic efficiency scaling
- Ultra-low quiescent current: 25 μ A (PFM), 256 μ A (PWM)
- 1 MHz switching frequency for small external components
- Synchronous internal switching
- Supports low output voltages down to 0.6 V

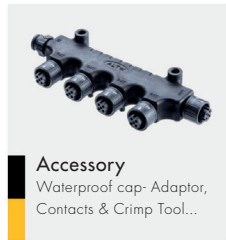
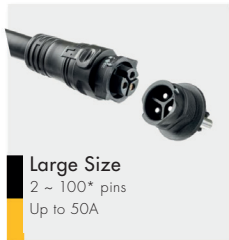
APPLICATIONS

- Industrial automation
- Industrial IoT modules & gateways
- Building automation
- Smart metering
- Agricultural automation

NEWS

X-LOK CONNECTOR

- Alternative solution to M12
- Spring loaded push lock design
- Protection up to IP68
- Power AC/DC, data, signal, hybrid
- Saving on-site installation time & costs
- UL1977 & 2238+50e
- Eliminating workmanship errors



X-Lok Push Lock Connector

Amphenol LTW's X-Lok Push Lock connector offers secure, efficient and cost effective connectivity. Now unveiling the metal design, the robust construction and intuitive push lock mechanism can ensure reliable connections in the very roughest conditions. It is suitable for applications that requires extreme environmental resistance.

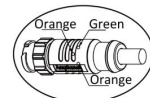
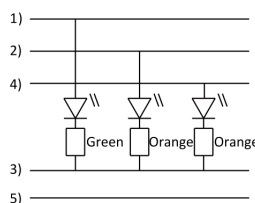
The X-Lok Series enable quicker installation than traditional threaded solutions. With UL1977 &

2238+50e certification, ALTW's X-Lok is your ideal solution for harsh environment and outdoor applications.

- IP68 mated or unmated
- Support high speed data transmission (Cat. 6A)
- Saving on-site installation time & costs
- Exponentially increase installation outputs
- Power, data / signal, hybrid
- Blind mating with audible and tactile feedback

X-Lok Mini Size with LED Indicator

- Suitable for factory automation & EN61373 / SAE J2839 shock & vibration approved
- With LED indicator colors: Green / Orange / Orange
- Starts from 3 / 4 / 5 pins
- Temperature -40°C ~ 105°C
- Long service life $\geq 1,000$ cycles
- Protection class IP68
- Corrosion resistance up to 500h
- Right angle / straight available



Part Number:
Female Connector,
Female Contact
Male Connector,
Male Contact

ULTRA HIGH DENSITY ALTERNATIVE SOLUTION TO M12

Amphenol LTW's 33-pin Ultra High-Density (UHD) X-Lok Mini Size push lock connector boasts compact design and high contact density, providing space efficiency and enhanced data transmission. Ideal for the newest automation systems, sensor arrangements, industrial cameras, medical equipment as well as measurement and control technology. It offers a versatile and costeffective solution for various industries, ensuring optimal performance in constrained spaces.



- Up to 33 contacts
- Metal, shielded
- High performance
- Blind mate
- Audible feedback
- Push-lock quick mating

Features and Specification:

Current Rating	0.5A
Voltage Rating	30V
Temperature Range	-40 °C ~ 105°C
Waterproof Rating	IP68 (1M/24Hrs)
Durability	1000 Cycles
Salt Spray	48 Hours
Mating Style	Push Lock

Amphenol LTW



Contact for information: Mrs. Yigit · **phone:** +49 7452 6007-6631 · **e-mail:** b.yigit@endrich.com

HEADQUARTERS

endrich Bauelemente Vertriebs GmbH
P.O.Box 1251 · 72192 Nagold,
Germany
T +49 7452 6007-0
E endrichnews@endrich.com
www.endrich.com

SALES OFFICES IN EUROPE

France
Paris:
T +33 1 86653215
france@endrich.com
Lyon:
T +33 1 86653215
france2@endrich.com

Spain
Barcelona:
+34 93 2173144
spain@endrich.com
Hungary
Budapest:
T +36 1 2974191
hungary@endrich.com

Austria & Slovenia
Gmunden:
+43 1 6652525
austria@endrich.com

Switzerland – Novitronic
Zurich:
T +41 44 30691-91
info@novitronic.ch

IMPRINT

Publisher: endrich Bauelemente Vertriebs GmbH, Hauptstr. 56, 72202 Nagold, Germany, Tel: +49 7452 6007 0, Fax: +49 7452 6007 70, E-mail: endrich@endrich.com, Web: www.endrich.com, Managing Director: Dr. Christiane Endrich, Registered office: Nagold, HRB Stuttgart 340213, VAT identification number: DE144367280, Concept: endrich Bauelemente Vertriebs GmbH, Reprints, including extracts, only with the written permission of endrich Bauelemente Vertriebs GmbH. All information and details in this brochure have been compiled to the best of our knowledge and belief, but without guarantee. Subject to price changes, errors, typesetting and printing errors. Status 05.10.2023

If you no longer wish to receive endrich news by mail, please send an e-mail to newsletter@endrich.com

Certified acc. to ISO 9001:2015 / 14001:2015