

10/2023

# endrich NEWS

[www.endrich.com](http://www.endrich.com)

## Beautiful forest!



Wolfgang Endrich

Do you still remember your school days? The biology class? What is photosynthesis?

It is the physical-chemical process that takes place in every plant and some bacteria, namely the conversion of water (H<sub>2</sub>O) and carbon dioxide (CO<sub>2</sub>) to glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>) and oxygen (O<sub>2</sub>) under the influence of sunlight. Without this process, which applies to all plants and thus also trees on this earth, there would be no oxygen in the atmosphere and thus no life on earth.

That is why we urgently need green meadows and forests for our life. And if you reverse this process, i.e. burn wood, for example, the process takes place in reverse, so to speak, i.e. carbon dioxide is produced, among other things. Carbon dioxide is one of the causes that triggered the climate change. In addition, when wood is burned, fine dust emissions are produced, which are particularly harmful to the lungs and just as harmful as those produced by road traffic and industry. Furthermore, in addition to the toxic carbon monoxide, the gases methane (CH<sub>4</sub>) and nitrous oxide are also produced, with methane and nitrous oxide contributing 25 and 298 times more to global warming than the same amount of carbon dioxide.

The Federal Environment Agency therefore finds the promotion of pellet heating, as envisaged in the new Building Energy Act (GEG), not particularly desirable (according to information in the Stuttgarter Zeitung of early September'23). It is concluded that it is not positive for our ecological balance. The forests, they say, are far too important for our ecosystem.

About 1.1 million households in Germany use any kind of wood in the form of logs, wood pellets or wood chips for heating in boilers. Furthermore, there are 11.2 million households in which so-called single-room fireplaces, for example fireplaces or tiled stoves, are installed, which could be detrimental to improving our climate balance.

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Add to this the forest fires here in Germany as well as in Greece, Italy, Spain and especially in Canada, which have already had a considerable impact on the environment and continue to do so. Unfortunately, the timber industry, e.g. in Brazil, does not like to hear this, where huge amounts of forest land are still being converted into pasture land for cattle breeding, or in Romania, for example, where huge areas of forest are being cut down to produce cheap furniture.

With all the understanding for the use of natural resources, one unfortunately forgets that a forest may be quickly cleared, but it takes decades until it grows back again or no thought is even given to reforestation.

A sad example are countries with bare mountains, especially in the whole Mediterranean area, e.g. Greece, where the coveted cedar and oak wood was needed for the huge fleets in the Middle Ages and no one thought about what consequences this would have for posterity. The fertile soil was washed away, leaving only rocks.

For thousands of years, mankind has committed unconscionable overexploitation of the treasures of our nature. The climate balance could only be described as balanced if a corresponding amount of wood could grow back in time. But this has not happened at all in the last two millennia, especially in the last century.

Germany is also a sad example of how forests have been sacrificed to increasing agriculture. Just think of the original Black Forest or the impenetrable forests in northern Germany that served our ancestors as protection against the Roman military.

Environmental awareness has been steadily reduced in our thinking and the cutting down of forests is perceived as a completely natural process. We have sung about the beautiful forest in poems and songs, but the subject of reforestation to protect the environment has not been an issue for us in the last 2,000 years.

Only the clear change in our climate, the increasing global warming have abruptly jolted us out of our reverie. The clearly visible changes in the environment, the melting of the glaciers in the Alps or at the North and South Poles, the flood disasters, etc. were necessary to wake up humanity and take note of the overexploitation of nature and try to put a stop to it.

The inventions of nuclear power and the use of the wind and solar industries were beneficial inventions that were unfortunately unnecessarily slowed down and hindered in their effect by hysterical political decisions (e.g. ending the use of nuclear power) or the egoism of some fellow citizens (that wind turbines would disfigure the landscape). Not to mention the many regulations, so that, for example, it takes six years to get an approval for a wind turbine!

Unfortunately, the political decision-makers in our government have not been any smarter than the voters either, and have now caused us to engage in an extreme race against time to prevent or at least contain even greater damage to our country's energy supply for industry and households. Any law that sustainably reduces global warming is good, but the new Building Energy Act which is driven by ideologies, is inherently bad.

If you ban lignite and hard coal, wood and pellets have to be banned too!

Every newly planted tree needs approx. 40-50 years to form the wood mass that makes felling profitable!

But: An old tree produces about 1,000 kg of oxygen per year (enough for 10 people), and can filter up to 1,000 kg of dust, bacteria and fungal spores from the air! Therefore, "afforestation" of cities and communities is also important.

It's a pity that not all people know that!

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# NEWS

## THE EMBEDDED MULTI-MEDIA CARD - eMMC

The Embedded Multi-Media Card, or eMMC, is an embedded, non-volatile memory system that has both NAND flash memory and a flash memory controller integrated on a single silicon die that abstract concepts such as bad block management, wear-leveling and ECC and is fused onto the host device's motherboard (where the "embedded" part of the name comes from).

For developers, eMMC's standardized interface not only has good scalability but also has the advantage of low cost. To ensure the integrity of data storage in different usage environments, ESMT designed various power-loss scenarios (POR, SPOR) during the qualification phase and underwent tens of thousands of stress tests before being launched on the market.

Density:	Part Description:	Configuration & Package:	Technology
4GB	FC51L04SMSA-2.5BWGE	153ball eMMC5.1	2D MLC Nand
8GB	FC51L08SFY3A-2.5BWGE	153ball eMMC5.1	2D MLC Nand
8GB	FC51J08SJS1A-2.5BWGI2AQ	153ball eMMC5.1 pSLC, Industrial grade	3D TLC Nand
16GB	FC51J16SJS1A-2.5BWGE2AF	153ball eMMC5.1	3D TLC Nand
16GB	FC51J16SJS1A-2.5BWGI2CQ	153ball eMMC5.1 pSLC, Industrial Grade	3D TLC Nand
32GB	FC51J32SJS1A-2.5BWGE2A	153ball eMMC5.1	3D TLC Nand
64GB	FC51J64SJS1A-2.5BWGE2C	153ball eMMC5.1	3D TLC Nand

For long life application, ESMT provided a pseudo single level cell (pSLC) mode eMMC, which along with the higher endurance, better data retention, performance and reliability gains.

ESMT has established a firmware development team to provide customers with more timely technical support and prepare for the independent development of firmware technology in the near future.

### APPLICATIONS

- PCs Servers and Workstations
- PCs Peripherals, Industrial Products
- Consumer Products
- Communication Products
- Embedded Products

### FEATURES

- Compatible to JEDEC Embedded Multi Media Card (eMMC) Electrical Standard (5.1)
- Data bus width: 1bit(Default), 4bit and 8bit
- Not support large sector size (4KB)
- Interface power: VCCQ (1.70V~1.95V or 2.7V~3.6V ), Memory power: VCC ( 2.7V~3.6V )
- Temperature: Operation(-25C~85C)/ (-40C~85C), storage(-40C~85C)
- Bus Mode
- High speed SDR: up to 52MB/s
- High speed DDR: up to 104MB/s @ 52MHz
- HS-200 : up to 200MB/s @ 200MHz
- HS-400 : up to 400MB/s @ 200MHz
- Field Firmware Update (FFU)
- Command Queuing
- ECC Engine: BCH (2D NAND), LDPC (3D NAND)
- User Density: 4GB – 64GB



## CT40X - NEW TMR MAGNETIC CURRENT SENSOR WITH BEST PERFORMANCE-TO-COST BALANCE FROM CROCUS TECHNOLOGY

The new CT40x series enables an outstanding balance of performance and cost without compromise.

Supporting both AC and DC current measurements, the CT40x seamlessly integrates into diverse power systems and applications. It offers ratiometric output from the supply voltage, ensuring accurate and consistent measurements even in dynamic operating conditions. The CT40x arrives pre-calibrated with factory-trimmed sensitivity and output voltage, eliminating the need for additional calibration and saving valuable installation time and effort. CT40x provides flexibility in power supply requirements supporting both 3.3V and 5V.

### The CT40x will be available in multiple package options for contact and contactless sensing.

- For contact current sensing, there is an impressive range of  $\pm 10A$  to  $\pm 65A$ ;
- For contactless current sensing, there is no limit to the amount of current measurable in the application.

The Contactless CT40x is capable of high resolution measurements thanks to its high SNR with detectivity at  $\sim 5 \mu T$ . It also offers immunity to stray magnetic fields through differential sensing without the need for shields and concentrators. The CT40x's remarkable bandwidth of 500kHz captures rapid current fluctuations with precision, enabling real-time monitoring and rapid response. It exhibits an outstanding typical total error of less than  $\pm 3\%$  FS ( $-40^{\circ}C$  to  $125^{\circ}C$ ), providing confidence in its accuracy and reliability across a wide range of operating temperatures.

The CT40x TMR sensor offers pin-to-pin compatibility, making it a seamless replacement for Hall sensors while providing long-awaited performance improvements. Compared to resistor shunts, the CT40x offers a smaller size, greater efficiency and inherent galvanic isolation, eliminating the need for bulky and power-consuming shunt resistors. Compared to traditional CT (current transformer) solutions such as those used in server rack Power Distribution Units (PDUs), the CT40x boasts a smaller footprint and lower cost, providing a more compact and cost-effective current sensing solution.

### ADVANTAGES

- Total error of well less than 1% typical and a max error of less than 3% over the full temperature range
- Designed to meet UL and IEC isolation standards, the CT40x assures compliance and safety in diverse applications

### AVAILABLE TYPES & PACKAGES

- Ratiometric contact current sensor CT4021 (package SOIC8)
- Ratiometric contact current sensor CT4032 (package SOICW16)
- Ratiometric contactless current sensor CT4051 (package SOIC8)

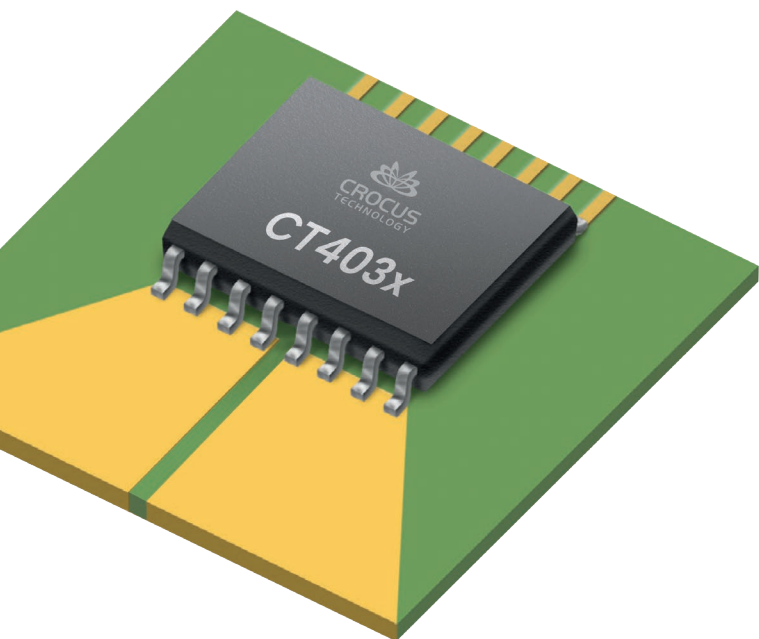
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The CT40x finds applications across a wide range of industries and sectors, similar to the CT41/2/3x, though targeted toward the cost-sensitive segments which still demand performance:

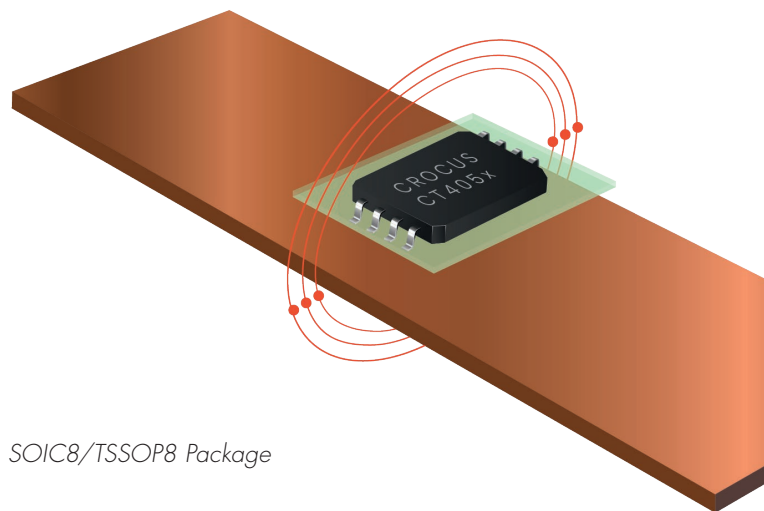
- In solar and power inverters, it enables precise current sensing, enhancing system efficiency and performance.
- For motor drives, the CT40x's exceptional accuracy and wide current range allow precise control and monitoring.
- In HVAC, UPS, and various EV charging applications, it ensures efficient operation and system protection.
- Additionally, the CT40x enhances current sensing capabilities in residential and industrial equipment, from home appliances to industrial products, ensuring optimal performance, safety, and energy efficiency.

The CT40x is sampling now!

**Mass Production: end of 2023**



SOICW16 Package



SOIC8/TSSOP8 Package

## BRAND NEW: Unipolar TMR Switch CT8212

CT8212 is NOT a CT81xx with lower power consumption! It is a wholly new product with unique operating principle with very targeted performance

- Unipolar only
- 25 nA draw when the magnet is present (20 mT)
- 200 nA draw when the magnet is not present (1 mT)
- 20 mT has been chosen as a rather high value of B-field to cater to very compact designs where the magnet needs to be very close the sensors
- This sensor is ideal when the magnet is present by default, and the signal of the switch shall be triggered once the target magnet moves away
- This sensor is ideal, where an object needs to be in a desired position, and a signal shall be triggered once the object moves out of this position:
  - Is the door / window closed?
  - Is a lock in position?
  - Is the receptacle in position to begin filling?
  - Is the connector in position to start charging?
- Deal for battery driven devices

## LOW POWER AD HOC MESH NETWORK

NeoCortec was founded in 2008 and is based in Copenhagen - Denmark. It is an innovator and supplier of Ultra Low Power Wireless Mesh Networks solutions.

NeoCortec's main focus is their mesh network based on their self-developed mesh protocol, usable in 868MHz, 915MHz or 2.5GHz. Their core technology is patented in major markets.

### Wireless Mesh Network Modules:

The unique NeoCortec ultra-low power Ad-Hoc Wireless Mesh Networking Protocol is available in a range of pre-approved modules for 2.4 GHz and Sub-1 GHz frequency bands. The modules are suitable for a wide range of applications. The modules share the same footprint, which means the modules based on different frequencies are interchangeable. End products using the NeoMesh technology can change the wireless module without any need of redesign.

		
<b>NC1000C-8</b> <b>NC1000P-8</b>	<b>NC1000C-9</b> <b>NC1000P-9</b>	<b>NC2400C</b> <b>NC2400P</b>
<ul style="list-style-type: none"><li>868MHz SRD band</li><li>+10dBm output power</li><li>LineOfSight appr. 300m</li></ul>	<ul style="list-style-type: none"><li>915MHz ISM band</li><li>+10dBm output power</li><li>LineOfSight appr. 300m</li></ul>	<ul style="list-style-type: none"><li>Global: 2.4GHz ISM band</li><li>+1dBm output power</li><li>LineOfSight appr. 100m</li></ul>
<ul style="list-style-type: none"><li>C version: u. FL conn.</li><li>P version: RF on pad</li><li>2x UARTs, GPIO, 12C, DC/ADC</li><li>Typical power consumption 20 qA</li></ul>		
		

## APPLICATIONS

- Wireless Sensor Networks
- Automatic Meter Reading
- Advanced Metering Infrastructure
- Mobile Ad-Hoc Networks
- Home Control & Building Automation
- Industrial Automation
- Alarm and Security Systems
- Agricultural and Forest Monitoring

## FEATURES

- Real time dynamic mesh network
- All devices typically run for 7 years of lifetime on two AA batteries.
- Installation is easy since no cables are required.
- Up to 65000 nodes in the same network
- Enable connectivity to hard-to-reach devices, e.g. devices in the basement
- The network can cover a really large geographical area by a multihop approach
- Very high reliability in receiving packets
- Low package loss
- Self-healing ad hoc network

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## NEOMESH PROTOCOL

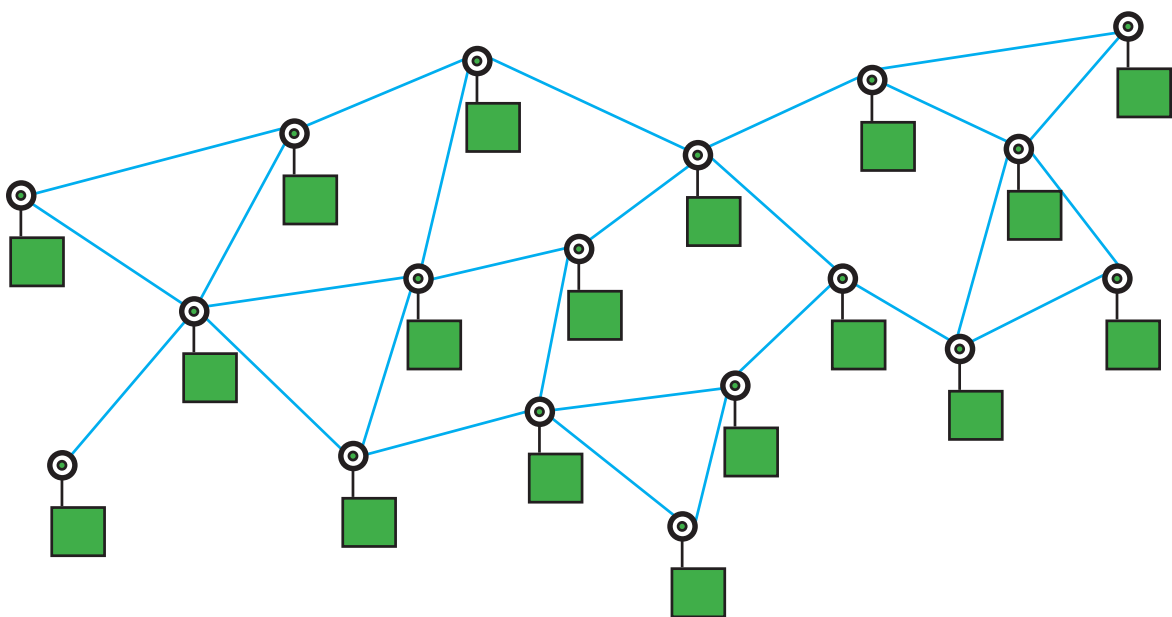
This Wireless Mesh Networking Protocol represents a paradigm shift from traditional network architectures.

Unlike the traditional solution with a central network manager controlling communication between nodes, this protocol uses autonomous intelligent nodes as a backbone. This feature empowers each node to act as an independent entity, facilitating direct communication between nodes without the need for a central authority. The result is a unified network that simply works no matter how large or complex it becomes. As additional nodes join the network, they seamlessly connect to the existing nodes, strengthening the coverage and performance of the network and creating a cohesive communications network that can span long distances.

Whether nodes are added, removed, or repositioned, the network remains robust and fully functional, ensuring uninterrupted connectivity for all devices and users.

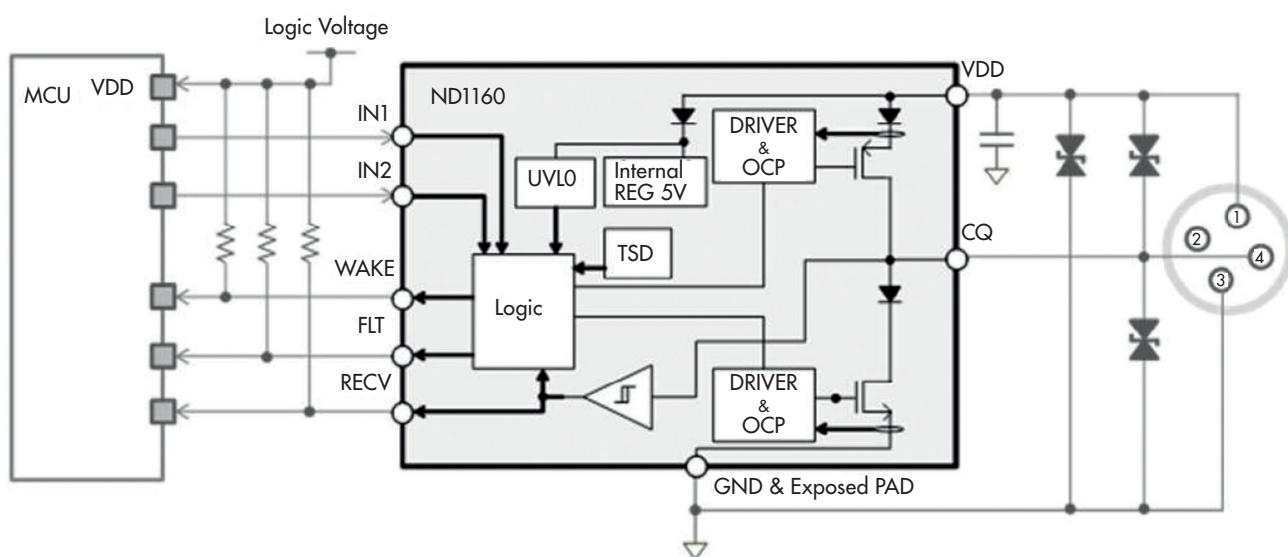
The NeoMesh network follows a time-synchronized protocol where each node spends most of its time in a sleep state. This architectural approach ensures a highly predictable and exceptionally low power consumption pattern for each node in the network. As a result, all nodes consume nearly the same amount of power, allowing each network node to operate efficiently for many years on small batteries.

The NeoMesh is intended for smooth product development and shorter time to market because it is simple to build, integrate, change and expand (easy scalability). There are no hidden costs for licenses or alliances, NeoMesh networks are totally subscription free, no recurring fees means a total ownership of the network operations. It is available on NeoCortec modules or on license module for integration onto own PCB.



## IO-LINK DEVICE® TRANSCEIVER ND1160

The ND1160 transceiver implements the IO-Link® interface for industrial bidirectional, point-to-point communication. The ND1160 is guaranteed that capable Current: 200mA and operating Voltage: 8.5V to 36V. The ND1160 can be set operating mode: high-side, low-side and push pull by input pin logic. In addition, the ND1160 is integrated the over current protection, the thermal shutdown and reverse current protection.



ND1161 Typical Application Circuit

### APPLICATIONS

- For Industrial Sensors
- Programmable Logic Controller
- Actuator as Proximity Switch
- Light Curtain

### FEATURES

- IO-Link® Compliant: COM3 available
- Operating Voltage Range 8.5V to 30V
- Output Current 200mA (min.)
- Operating Voltage Range 8.5V to 30V
- Over Current Protection < 500mA
- Thermal Shutdown
- Reverse Current Protection
- Package DFN8-WA, WCSP12

**NISSHINBO**



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