IIOT AND WIRELESS

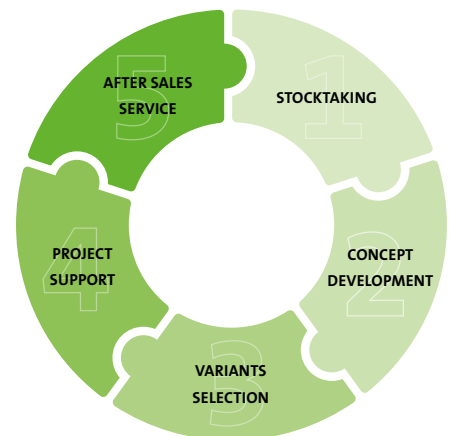## by Murrelektronik

IIOT AND WIRELESS

Technologies change.
Sometimes slowly, sometimes quickly, but steadily!

Technological change affects many areas of an organization. Change allows Purchasing to realize new savings potentials and Engineers can optimize a machine layout while the Plant Operator works with an easy-to-maintain machine that communicates current conditions. All the while, Management gets real time data on machine usage and so much more. The entire organization benefits because production is only briefly interrupted for predetermined maintenance.

Our Services – Your Added Value

We are here to support you during the implementation of IIoT and Wireless Applications. We focus on a system concept that is right for you. From on site analysis of current conditions, to the creation of a comprehensive plan, to the implementation of the optimal solution for you. With technical plans, electronic product data as well as support during commissioning and training, we are right there to help, even after delivery.

The future is full of technological challenges for us to master together.

Murrelektronik-nexogate

The Murrelektronik-nexogate is used to transfer data from the controller directly to the Murrelektronik-Cloud. The device also offers an option to transfer data from Bluetooth distributors or multisensors to the cloud.

Bluetooth Distributor

M12 Bluetooth distributors transmit signals simply, safely, and reliably to the Murrelektronik-nexogate and from there on to the controller or cloud. Data from retrofitted sensors can be collected quickly and easily in the field without additional wiring.

MIRO BT

MIRO BT replaces fieldbus able when connecting moving applications. Cost prohibitive slip rings are no longer required for high-quality transmission.

Multisensor

Multisensors can be installed later and allow for information collection. The data is transmitted to the Murrelektronik-nexogate and then made available in the cloud.

From the sensor ...

Murrelektronik-nexogate is the ideal cloud interface for intelligent use of machine and system data.

Many people in a company depend on up-to-date process data. The data can be used for a variety of purposes including optimizing or increasing machine availability or scheduling maintenance.

Murrelektronik-nexogate brings data from the industrial field into the cloud. This compact, control cabinet component is integrated into the Ethernet communication system as an additional device and transfers data to the Murrelektronik cloud via a cellular network making transmission independent of your location's IT infrastructure.

This example shows the integration of a Murrelektronik-nexogate module into an existing PROFINET system. Here the module sends preselected data, which are managed in the controller on a higher level, to the Murrelektronik-Cloud. If the controller supports other fieldbus protocols in addition to PROFINET, EtherNet/IP or EtherCAT, then that input, output or process data can also be transmitted.

Murrelektronik Cloud/
Customer specific Cloud

IO-Link

PROFINET
EtherNet/IP
EtherCAT

32 modules possible

Maximum Added Value

- Simple, safe and easliy installed system for IIoT applications
- Simple integration into various systems
- Change device settings remotely
- Smart Data for Predictive Maintenance
- Supports the optimization of service calls
- Integrated alarm functions
- Encrypted data transmission (TLS 1.2, AES-256)
- No effect on the IT network
- Uniform worldwide mobile communications costs allow full cost control
- Globally deployable with permanently installed eSIM card
- Different antenna designs allow for a wide range of installation options. The antennas can be attached directly to the device or mounted through a control cabinet wall.

Murrelektronik-nexogate Starter Package

Murrelektronik offers a starter kit with all of the important components and information you need to get started in the world of IIoT. Everything you need to set up your first IIoT application is in the starter package.

The starter package includes a **Murrelektronik-nexogate**, an **omni-directional antenna** and a starting balance of **50 cloud credits**. The package also includes the **activation of a customer area in the cloud** and an **initial start-up** (online) by a system consultant.

... into the cloud

Murrelektronik offers a ready-to-use and easy-to-use device management and data cloud that allows your employees to manage all Murrelektronik-nexogate devices globally and remotely. Without special IT knowledge, login authorizations can be controlled and smart data can be made available in the form of dashboards or via an API interface. This data can be accessed – at any time, from any place. Which employees receive which information is defined. It is possible, for example, that the production planner receives information about the current output of a plant, while the maintenance technician is shown the temperature of the servo motors. For this reason, the Murrelektronik-Cloud can be used to define who can see which data and with what level of detail.

Sometimes problems arise during production. In these cases, a fast response is required to avoid major disruptions or expensive downtimes. For this reason, threshold values can be defined for the key figures. If one of the values is not met or exceeded, an email or text message is sent so action can be taken. The transmission is encrypted, and a logfile documents the sending and receipt of the information.

Alarm chains can be set for notifications and message acknowledgement logged. In this way, your service team can be better informed and unnecessary costs can be reduced.

This is only a small selection of the many options available with Murrelektronik-nexogate. Contact us to learn more about how we can meet your needs.

Application Example

Every day, crate sorting machines at a logistics center handle countless individual items that move at a very high speed through the plant via various conveyor belts. These belts are subject to heavy mechanical wear (abrasion), which can cause the belts to tear or no longer have the necessary friction to move the crates.

Timely advance warning is very important so that hours do not elapse before a torn or worn belt is replaced.

A distance sensor is used to measure the wear and tear of the belts. That data is transferred to the cloud via the Murrelektronik-nexogate. A supervisor can remotely evaluate when or where a belt needs to be replaced and in what time frame this should be scheduled thus avioding failures and downtimes during operation.

Credits

Billing is based on a prepaid pay-per-use model. You pay for the amount of data transmitted so you are only paying for what you need, when you need it. The Murrelektronik-nexogate cloud credits are put into a single account that is available to all of your Murrelektronik-nexogate modules. Cost are transparent and easily calculated no matter where in the world your plant is located or data is transmitted.

If you need to deactivate an application for a period of time, you can do it without incurring additional costs. So you are only paying for what you are using at all times.

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> When setting up a cloud and integrating the Murrelektronik-nexogate interface into a machine or plant's automation, Murrelektronik's system consultants offer valuable support – from the initial idea to commissioning and beyond.
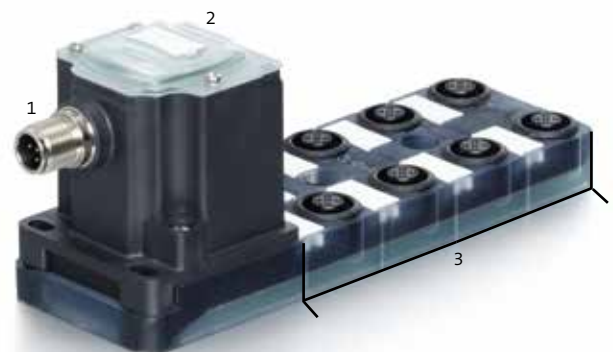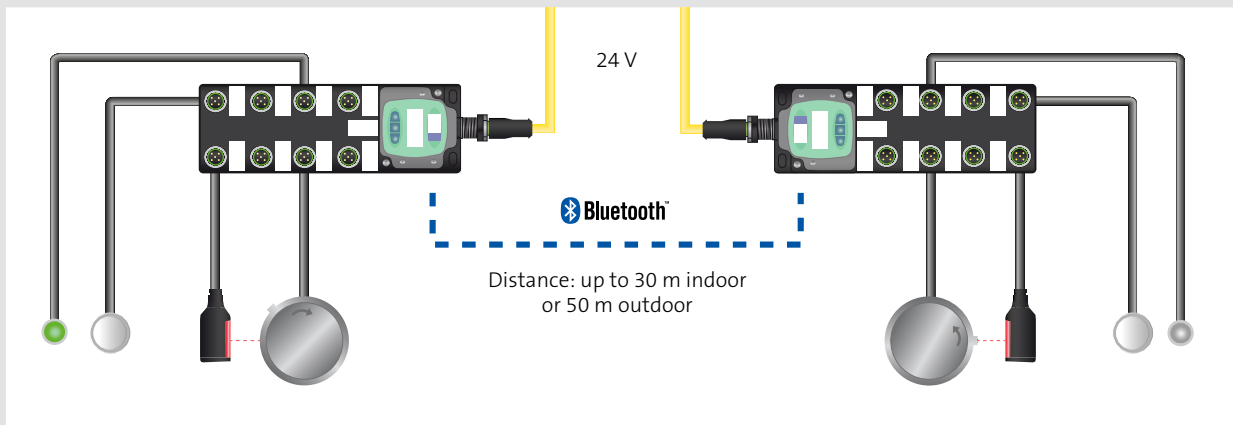
Wireless Data Transmission

The M12 Bluetooth distributors transmit analog and digital I/O signals simply, safely and reliably. The most diverse point-to-point connections, which were previously made with countless cables, can now be easliy implemented by radio links.

The modules are available with 4 or 8 M12 connections and have a radio data transmission range of up to 30m indoor or 50m outdoor.

The integrated antenna makes for a compact distributor whose robust housing makes it ideal for industrial use.

Furthermore, radio communication is suited for the plant and machine retrofitting as the Bluetooth distributors are designed for sensor manufacturers, machine builders and end customers.

1= Power supply 24 V   2= Status-LED   3= I/O

24 V

Bluetooth™

Distance: up to 30 m indoor
or 50 m outdoor

Example 1: I/O Exchange

This shows data transmission/communication
with two paired Bluetooth distributors (bidirectional data exchange). Sensors and actuators are
connected directly to the distributors. If the button
on the left side is pressed, the turntable/motor
on the right side rotates. The markings or „elevations" on the turntable are detected by the reflex
light sensor – also on the right side – and the LED
on the left side lights up.

PROFINET®
EtherNet/IP™
EtherCAT.➡
Bluetooth™

Bluetooth™

24 V

Bluetooth™

24 V
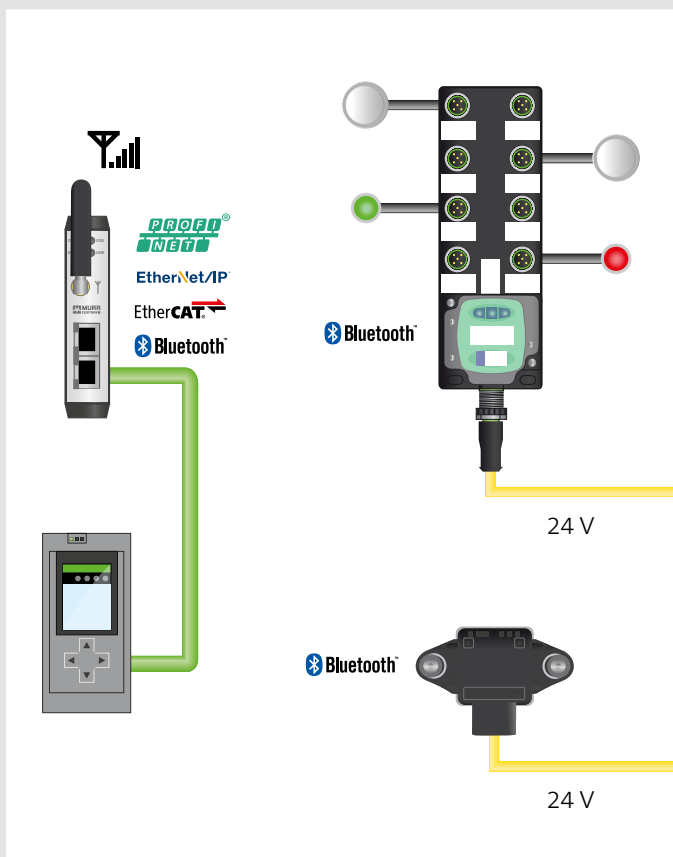
**Example 2: Communication between
a Bluetooth distributor and
Murrelektronik-nexogate**

The Bluetooth distributors send analog
and digital signals directly to the Murrelektronik cloud via the Murrelektronik-
nexogate module. The analog or digital
outputs can be controlled via the controller.

**Example 3: Multisensor communication
with a Murrelektronik-nexogate**

The multisensor sends its measurements
directly to the Murrelektronik cloud via
Murrelektronik-nexogate. This sensor can
record or transmit several different values
simultaneously.

Wireless

MIRO BT – The Ideal Alternative to Fieldbus Cable

MIRO BT is used for the wireless exchange of Ethernet fieldbus data. By using the latest Bluetooth technology, data can be transmitted safely and reliably, with maximum availability and performance, at distances of up to 100 meters even in difficult wireless environments.

To ensure a safe and maximum possible availability of a machine or plant, the MIRO BT radio system performs intelligent pre-processing of the data packets in the radio system – processing a new data packet every millisecond.

The robust housing and the electronic components used make MIRO BT particularly suitable for mobile applications and industrial environments.

MIRO BT's IP65 rating enables it to be mounted in the immediate vicinity of the process and provides additional flexibility in the planning and implementation of complex installation solutions.

- Up to 6 PROFINET devices can be operated via one radio master
- Maximum performance even in difficult radio environments
- Optimum availability
- IP65 Rating

MIRO BT – Function

This PROFINET device can be configured as master or slave. A master can operate up to four slaves (wireless devices). A total of 6 PROFINET devices can be connected to one or more slaves per master. In principle, all PROFINET devices that have a PROFINET IO interface can be connected via radio.
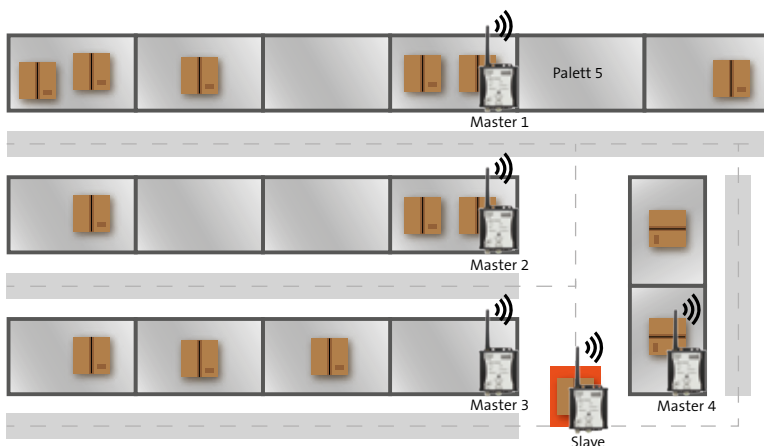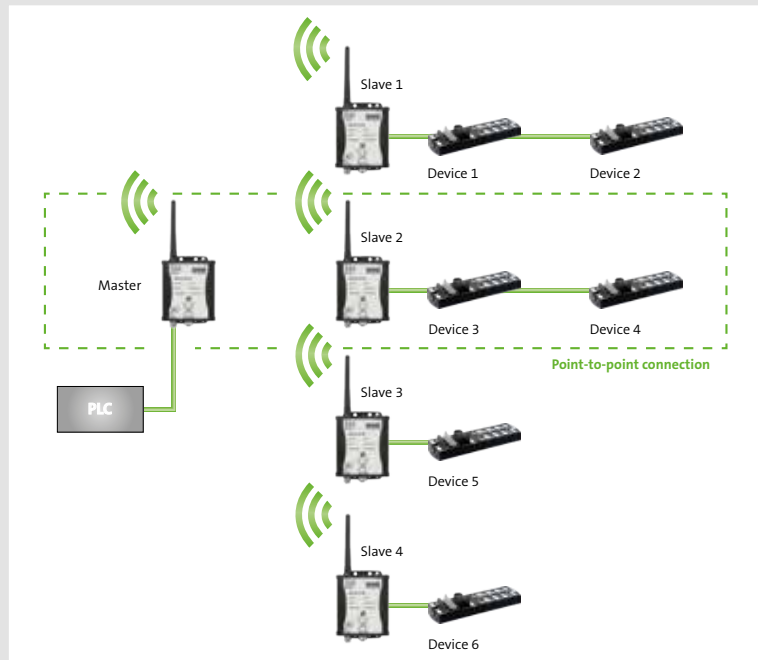
This application shows a Automated Guided Vehicle (AGV), which is equipped with a controller and a MIRO-BT slave. When the vehicle moves to its target position (e.g. pallet 5), the master is addressed and data communication between the master and slave can take place. Direct 1:1 communication between master and slave allows the AGV to be connected to the respective machine/system. With the MIRO BT, other mobile applications with multiple connections can also be easily implemented, such as:

- Intralogistics systems in which several stationary PROFINET controllers have access to the PROFINET devices installed in the automated guided vehicle system (AGV), e.g. to control grippers.

- Harbor systems in which a PROFINET controller installed in the ship enables access to stationary PROFINET devices installed in the harbor facility, e.g. to switch on pumps.

MIRO BT Performance

MIRO BT is suitable for safety applications. For maximum (safety) system availability of complex applications, we recommend MIRO BT Performance. MIRO BT Performance, specially designed for system availability, ensures maximum stability of the radio links. MIRO BT Performance allows you to connect up to eight PROFINET devices.

The MIRO BT family is ideal for use in cable car applications and CNC machines or inside the free-fall tower of a leisure park.

Murrelektronik's system consultants offer valuable support when selecting the right device for your application.

MIRO-BT Technology Advantages

- Company WLAN networks are not affected
- High security - proprietary and MAC-related connection
- High number of MIRO-BT devices in a small space in contrast to WLAN networks
- Integration without intervention in the control system (see replacement of a PROFINET cable)
- Plug & Play possible with preconfigured devices
- Highly available and reliable data transmission
- New possibilities through UDP functions (e.g. use in applications with Automated Guided Vehicle, AGV)
- One article number - device can be configured as a master or slave

MIRO BT Applications

- Plant-wide signal acquisition (difficult to reach sensors, decentralized plant areas)
- Automated Guided Vehicles, Stacker Cranes, Cranes ...
- Possible replacement for optical data transmission (e.g. data light barrier, as the radio link ensures stable transmission that is not affected by external influences)
- Mobile operating units or workstations
- Tool change
- Robot applications

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UDP – User Datagram Protocol

Antennas

Directional Antenna

Directional antennas bundle electromagnetic waves and radiate them in a certain direction. Directional antennas can be aimed specifically at a corresponding remote station (horizontal and vertical opening angle of e.g. 80°). A greater range of the radio signal can be achieved as compared to omnidirectional antennas.

Directional antennas are ideal for wall mounting. In general, they are designed for implementation on applications with fixed objects or a linear movement like cable cars, elevators or overhead cranes that only move in one direction.

Omnidirectional Antenna

Omnidirectional antennas radiate electromagnetic waves uniformly in all directions (360° opening angle). This antenna should be positioned vertically.

This antenna is ideal for mobile applications with more than one movement direction like rotating or mobile applications. For this reason, omnidirectional antennas should ideally be mounted free-standing like at the top of a mast so they can transmit evenly in all directions on a horizontal plane.

Radio Link between Directional Antenna and Omnidirectional Antenna

If the application involves both a fixed and a rotating, or moving, object, both types of antennas may be required.

This is often the case in Automated Guided Vehicles (AGV), since the transport system can, and may, move freely or according to specifications within a defined area. An installation like this is easily with all of the options offered by Murrelektronik.

Order data

	Murrelektronik-nexogate cloud interface PN	Murrelektronik-nexogate cloud interface EIP	Murrelektronik-nexogate cloud interface EC	Murrelektronik-nexogate industrial controller
Approvals: CE				
Order data	Art.-No.	Art.-No.	Art.-No.	Art.-No.
	57000	**57001**	**57002**	**57009**
Electrical data				
Input voltage	9 ... 33 V DC			
Operating current	≤ 200 mA			
Ports				
Fieldbus	PROFINET (10/100 MBit/s; 2 x RJ45)	EtherNet/IP (10/100 MBit/s; 2 x RJ45)	EtherCAT (10/100 MBit/s; 2 x RJ45)	Ethernet port (10/100 MBit/s; 1 x RJ45)
Supply	Screw terminals			
Wireless technology				
Mobile communication standard	3 G			-
Frequency	2 G 850 MHz/900 MHz/1800 MHz/1900 MHz; UMTS B1, B2, B5, B6, B8, B19			-
Antenna input	SMA (50 Ω)			-
Mechanical data				
Standards	approved in following countries: AT, BE, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FI, FR, GB, HR, HU, IE, IS, IT, JP, LI, LT, LU, LV, MT, NL, NO, PL, PT, RO, SE, SI, SK			
Protection class	IP20			
Fastening type	snaps onto mounting rail TH35 (EN 60715)			
Dimensions H × W × D	100 x 22 x 115			
Weight in g (net)	150			120
Temperature range	-20 ... +60 °C (storage temperature - 40 ... +75 °C)			
Housing material	plastic			
Housing color	black			
Radio approval	MIC Mark			-

	Antenna 0° with 3-m cable, SMA	Antenna 90°, SMA	Antenna 0° with feed-through, SMA
Radio approval:			
Approvals: CE			
Order data	Art.-No.	Art.-No.	Art.-No.
	57070	**57071**	**57072**
Electrical data			
Frequency	800/850/900/1800/1900 + 2100 MHz + 2600 MHz	750–960 MHz, 1700–2150 MHz, 2370–2650 MHz	
Amplification	0 dBi to +5 dBi	0 dB	
Mechanical data			
Protection class	IP69K (when built-in)	IP54	
Operating temperature	-40 °C bis +85 °C		
Torque	0,8 Nm		

Murrelektronik-nexogate cloud credits						
	10	20	50	100	200	500
Art.-No.	**57081**	**57082**	**57085**	**57091**	**57092**	**57095**

Order data		Art.-No.
Murrelektronik-nexogate starter kit PN	Set	**9101210**
Murrelektronik-nexogate starter kit EIP	Set	**9101211**
Murrelektronik-nexogate starter kit EC	Set	**9101212**

Bluetooth distributor

Order data		Art.-No.		Art.-No.
Set	8 DI - - - 8 DO	**57060**	4 DI/DO - - - 4 DI/DO	**57061**

Other configurations available upon request

PROFINET® **PROFIsafe**

MIRO BT

MIRO BT Performance

Approvals:

CE c(UL)us Listed

Order data		Art.-No.		Art.-No.
Master/Slave		**57018**		**57028**
Ports				
Fieldbus	Ethernet 10/100 Mbit/s; M12, D-coded			
Supply voltage	M12, 5-pole, A-coded			
Operating voltage	9...33 V DC			
Operating current	Max. 150 mA			
Devices	6		8	
Wireless technology				
Frequency	2,4 GHz Bluetooth			
Transmission power	Max. 100 mW			
Number of wireless slaves	Max. 4			
Coverage indoor	100 m			
Antenna connection	SMA (50 Ohm)			
Mechanical data				
Protection class	IP65			
Fastening type	screwable, M4			
Dimensions H × W × D	125 x 86 x 41 mm			
Temperature range	-20...+60°C			
Housing material	metal			
Radio approval	FCC, KC-Mark			

Picture	Ports	Radio standard	Length	Art.-No.
	2,4 GHz antenna cable 0° / 90°, SMA	📶 Bluetooth	0,5 m	**57040**
	2,4 GHz antenna cable 0° / 90°, SMA		1,0 m	**57041**
	2,4 GHz antenna cable 0° / 90°, SMA		4,0 m	**57043**
	2,4 GHz antenna cable 0° / 90°, SMA		10,0 m	**57045**
	2,4 GHz omnidirectional antenna SMA 2,5 dBi *Suitable for antenna cable, for mounting on a plate, cover, sheet metal, cabinet feed-through*	Bluetooth		**57031**
	2,4 GHz omnidirectional antenna 0°/ 90° SMA port *Can be connected directly to the MIRO BT as a rod antenna (0°) or with an angle as a 90° antenna*	Bluetooth		**57030**
	Omnidirectional antenna 0°, Outdoor, SMA	Bluetooth		**57034**
	Directional antenna 0°, SMA	Bluetooth		**57033**
	Overvoltage protection- 2,4 GHz antenna, SMA *Protects the antenna line between the radio user and the antenna from overvoltage.*			**57039**
	Antenna splitter, SMA *Offers the possibility to connect two antennas in parallel.*			**57037**
	Mounting set for directional antenna 57033			**57038**

Notes

MURR ELEKTRONIK

stay connected

↘ **www.murrelektronik.com**

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