RFU65x

THE MEASURING RFID DEVICE WITH INTEGRATED PASSAGE AND DIRECTION DETECTION

RFID

SICK
Sensor Intelligence.

REFINED, TRIED-AND-TESTED RFID TECHNOLOGY

Conventional RFID devices record RFID tags over large distances depending on the sender power, aperture angle, tag properties, and application environment. The strength of the signals also helps to filter tags and assign them to the reading event. Directions of movement can only be derived using additional, external antennae and intelligent algorithms. But these kinds of restrictions are now a thing of the past thanks to the RFU65x. The RFU65x is capable of determining the position (angle) at which the tag responds and uses this information in combination with the additional, integrated logic to detect not only instances of passage, for example, but also the direction of movement. This saves on the need for additional antennae and costs whilst also speeding up and simplifying familiar applications.

## Automotive industry – final assembly and vehicle delivery

The final assembly process is where the vehicle moves on its own wheels for the first time as it approaches areas such as special test facilities. The RFU65x provides support here when it comes to clearly identifying the vehicles. Its added position (angle) sensing function and integrated passage and direction detection capabilities make it the ideal solution for handling particular situations involving intersections or cross traffic.

Logistics – incoming and outgoing goods store and manned forklift trucks

Trucks are generally loaded up in loading bays using either manned forklift trucks or a manual lift truck. It is essential to check which goods are being loaded, as well as when, where, what for, and where they are going to. The RFU65x is capable of identifying both the loading vehicle and the goods themselves to provide you with the "passage and direction" attribute. Objects with tags that are located in the immediate vicinity are identified; however, they are filtered out as "static" tags and only used for diagnostics purposes if required.

Work space

The operating range of the RFU65x covers an angle of ±45° with a typical sensing range of 5 m. RFID tags are recorded below a certain measuring angle in relation to the zero point of the RFU65x. Algorithms can be used to derive instances of passage – including the direction of movement – from the various measuring points.
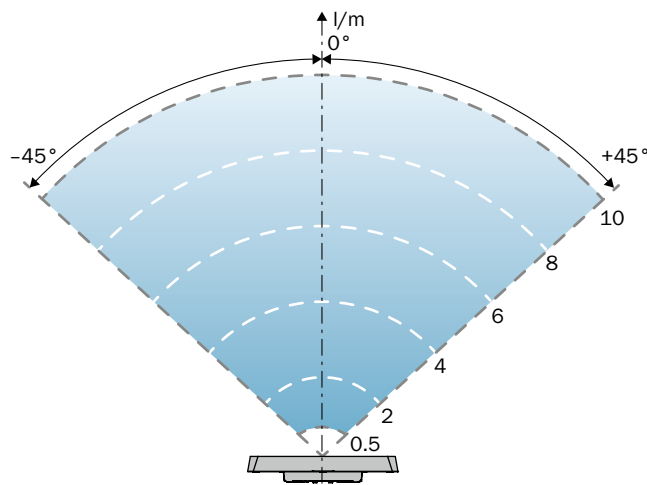
Support from SOPAS ET configuration software

Quick start (angle indicator)

The quick start serves as a demo mode. Just like the other variants in the RFU6xx product family, a list of the tags found within the reading field is generated. In addition to the tag signal value (RSSI), information on whether the tag corresponds to a data standard is also provided. Tags which have been read (UII) receive the attribute of the specific measuring angle relative to the zero point of the RFU65x (represented as an absolute value and as a bar).

Integrated algorithms which can be used to determine the direction of movement

The RFU65x makes it possible to derive an instance of passage – including the direction of movement – from a variety of measuring points for individual tags. The algorithms required for this form part of the RFU65x firmware and can be easily adapted to meet the requirements involved in customer applications. As the RFU65x does not require a trigger, it is even possible to record tags which move in opposite directions at the same time.

Diagnostics (blocking/non-blocking "static" tags)

From a diagnostics perspective, it is essential to be able to record tags which are parked near the reading zone, for example (static tags). To this end, an existing "Blocking Mode" (which only records objects that are clearly moving) can be deactivated for specific, targeted applications. This then means that the positions of all tags can be displayed. All tag-specific data (such as UII, UM, TID, RSSI, and angle) and application-specific data (such as time, trigger, read duration, and re-reading) can be saved in chronological order in the device or on the SD card for diagnostic purposes.

Support from the SICK software-development platform

The product family provides system integrators with the ability to install additional application software directly within variants of the RFU6xx. The platform is activated by a copy-protection dongle. The user can now develop and manage device-specific application software through the SICK development environment, and even transfer this to other devices. This can be facilitated via a range of programming techniques, including JAVA, LUA, and C++ (in the planning stages).

The advantages of RFU65x at a glance

- ✓ Extremely high reading reliability – records existing tags at maximum read rate and even determines angles in real time.

- ✓ Space-saving – the RFU65x is a compact device which does not need any external antennae. This means additional cables and mechanisms such as masts are simply not required. Even additional software which can be used to determine the direction of movement is redundant.

- ✓ Rugged and durable – the RFU65x meets the requirements of enclosure rating IP 67 and can even be directly installed outdoors. What's more, by adding an extra accessory, it can even be installed in hot climates with direct exposure to sunlight.

- ✓ Flexible – the RFU65x is based on the design of the RFU6xx product family and includes a diverse range of interfaces and protocols. Familiar functions and existing tools, such as function blocks and APIs, can continue to be used in the same way. The RFU65x also supports the SICK software-development platform so that additional software can be used directly within the device.

Detailed technical data

Performance

	RFU65x
Version	Long range
Product category	Read/write device with integrated antenna
Radio equipment approval, output power	Europe: ETSI EN 302 208-2 V1.4.1, max. 2 W (ERP [1]) USA/Canada: FCC Part 15.247 / CAN ICES-3 (A); NMB-3(A) / NOM-121, max. 3.2 W (EIRP [2])
Carrier frequency	Europe: 865.6 MHz to 867.6 MHz USA/Canada: 902.75 MHz to 927.25 MHz
RFID standard	EPCglobal UHF Class 1 Generation 2, ISO/IEC 18000-6 C
Sensing range	Typical 5 m [3]
Antenna	Integrated, circular polarized, 80°/55° aperture angle, typical front-to-back ratio of > 15 dB
Service functions	Parameter cloning via integrated microSD memory card slot or externally via CMC module in CDB650
Other functions	Output tag position/angle, diagnostics, updateable firmware, flexible data output format (freely configurable), heartbeat, triggering

[1] ERP = Equivalent Radiated Power.
[2] EIRP = Equivalent Isotropic Radiated Power.
[3] Depending on tag used and ambient conditions.

Interfaces

Host	Ethernet TCP/IP; Ethernet IP; PROFINET IO; RS-232/422/485; CANopen; SICK CAN Network
Service	Ethernet TCP/IP; USB; RS-232
External fieldbus modules	PROFIBUS DP; PROFINET IO; EtherCAT; DeviceNet
Switching inputs	4 ("Sensor 1", "Sensor 2", 2 inputs via optional CMC600 parameter memory in CDB620/CDM420)
Switching outputs	4 ("Result 1", "Result 2", 2 outputs via optional CMC600 parameter memory in CDB620/CDM420)
Optical indicators	8 LEDs, one of which with multiple colors (function configurable via SOPAS ET, alternatively controlling with SW commands, status indicators)
Acoustic indicators	1 beeper (can be switched off or allocated a function for indicating events)
Configuration software	SOPAS ET

Mechanics/electronics

Electrical connections	1 x M12, 17-pin plug; 1 x M12, 4-pin Ethernet female connector
Operating voltage, power consumption	12 V DC to 30 V DC, max. 26 W
Housing	Aluminum die cast
Enclosure rating	IP 67
Dimensions (L x W x H)	400 mm x 252 mm x 70 mm

Ambient data

Electromagnetic compatibility (EMC)	EN 301489-3 V1.6.1
Vibration resistance	EN 60068-2-6 (2008-02)
Shock resistance	EN 60068-2-27 (2009-05)
Ambient operating temperature	–25 °C to +60 °C
Storage temperature	–30 °C to +70 °C

Ordering information

Radio equipment approval	Type	Part no.
Europe	RFU650-10100	1073556
USA/Canada	RFU650-10101	1076522

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