

SIMATIC RTLS

Localization systems SIMATIC RTLS4030T

Operating Instructions

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Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Introduction

Purpose of the operating instructions

These operating instructions support you when installing and connecting the SIMATIC RTLS4030T transponder.

The configuration and the integration of the transponders in a network are not described in these operating instructions.

Scope of validity of the operating instructions

These operating instructions apply to the following transponders:

- RTLS4030T (CE; article number: 6GT2700-3DA03)
- RTLS4030T (FCC/NOM/ANATEL; article number: 6GT2700-3DA13)
- RTLS4030T (CMIIT; article number: 6GT2700-3DA23)
- RTLS4030T (ISED; article number: 6GT2700-3DA33)

Further documentation

You can find the complete documentation for all SIMATIC RTLS products at the following address:

Link: (<https://support.industry.siemens.com/cs/us/en/ps/25277>)

Trademarks

The following and possibly other names not identified by the registered trademark sign ® are registered trademarks of Siemens AG:

SIMATIC RTLS

Industry Online Support

In addition to the product documentation, the comprehensive online information platform of Siemens Industry Online Support offers support at the following Internet address:

(<https://support.industry.siemens.com/cs/start?lc=en-US>)

Apart from news, there you will also find:

- Project information: Manuals, FAQs, downloads, application examples etc.
- Contacts, Technical Forum
- The option submitting a support query: (<https://support.industry.siemens.com/My/us/en/>)
- Our service offer:

Right across our products and systems, we provide numerous services that support you in every phase of the life of your machine or system - from planning and implementation to commissioning, through to maintenance and modernization.

You will find contact information on the Internet at the following address:

(https://www.automation.siemens.com/aspa_app/?ci=yes&lang=en)

SITRAIN - Training for Industry

The training offer includes more than 300 courses on basic topics, extended knowledge and special knowledge as well as advanced training for individual sectors - available at more than 130 locations. Courses can also be organized individually and held locally at your location.

You will find detailed information on the training curriculum and how to contact our customer consultants at the following Internet address:

(<https://new.siemens.com/global/en/products/services/industry/sitrain/personal.html>)

RTLS Technology and Practice (ID-RTLS-TP)

Training and certification

After completing the RTLS certification training, you will be able to plan and implement small and medium-sized RTLS projects and provide efficient and multifaceted support in large projects. Your RTLS basics will be strengthened and, building upon them, you will receive new tools of the trade in order to offer customers the optimal solution for them. The complete project sequence is taken as a reference and important steps, resources and work results for each phase are presented. Comprehensive practical exercises in connection with troubleshooting techniques and a great deal of input from industrial projects allow you to internalize a confident approach to working with different types of localization projects. With the training documents, you also receive extensive reference material for your daily work.

Link: (<https://www.sitrain-learning.siemens.com/EN/en/rw35251/Industrielle-Identifikation-RTLS-Technologie-und-Praxis>)

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines, and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions form one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. These systems, machines and components should only be connected to the enterprise network or the Internet if and only to the extent necessary and with appropriate security measures (firewalls and/or network segmentation) in place.

You can find more information on protective measures in the area of industrial security by visiting: (<http://www.siemens.com/industrialsecurity>).

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends performing product updates as soon as they are available and using only the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To ensure that you are always informed about product updates, subscribe to the Siemens Industrial Security RSS feed at: (<https://www.siemens.com/cert>)

Note on firmware/software support

Check regularly for new firmware/software versions or security updates and apply them. After the release of a new version, previous versions are no longer supported and are not maintained.

Security recommendations

General

Note the following security recommendations to prevent unauthorized access:

- Keep the firmware up to date. Check regularly for security updates for the device. You can find information on this at the Industrial Security (<https://new.siemens.com/global/en/company/topic-areas/future-of-manufacturing/industrial-security.html>) website.
- Inform yourself regularly about security recommendations published by Siemens ProductCERT (<https://new.siemens.com/global/en/products/services/cert.html>).
- Evaluate your plant as a whole in terms of security. Use a cell protection concept with suitable products.
- This product requires an additional security concept to prevent unauthorized access.
- Transponder and infrastructure can be configured for radio channels according to IEEE 802.15.4-2015. You will find details in the section "Technical specifications".
- Ensure that the radio frequencies are not used for other purposes and are not affected by other interfering signals. This should be ensured within the operating range of the localization system.
- Interference in the frequency band used can impair the system and, in extreme cases, lead to localization failure.

Physical access

- Restrict physical access to the device to qualified personnel.
- Disable unused physical interfaces of the device. Unused interfaces could be used to gain access to the operating site.

Recycling and disposal



The products are low in harmful substances, can be recycled and meet the requirements of the Directive 2012/19/EU for disposal of waste electrical and electronic equipment (WEEE).


Do not dispose of the products at public disposal sites.

For environmentally compliant recycling and disposal of your electronic waste, please contact a company certified for the disposal of electronic waste or your Siemens representative.

Note the different national regulations.

Device description

2.1 Characteristics



SIMATIC RTLS4030T		Characteristics	
	Design	① Status indicators (LED)	
	General	② Battery compartment	The transponder is the mobile device for localization in the RTLS localization system. It sends position data to gateways which transmit the data to the Locating Manager server.




2.2 Order data RTLS4030T

Table 2- 1 Order data RTLS4030T

		Article number
SIMATIC RTLS4030T including 1 x battery CR123A	CE	6GT2700-3DA03
	FCC, NOM, ANATEL	6GT2700-3DA13
	CMIIT	6GT2700-3DA23
	ISED	6GT2700-3DA33

2.3 LED status indicator

The operating states of the transponder are indicated by the LED. These can assume the states from  and briefly light up .

LED	Meaning
	Red LED is off when the transponder is in operation
	Red LED lights up once for 1.5 seconds at system startup
	Flashes red (user LEDs flash) if you trigger flashing via the Locating Manager. You can configure the duration and frequency of flashing via the Locating Manager.

2.4 Dimension drawing

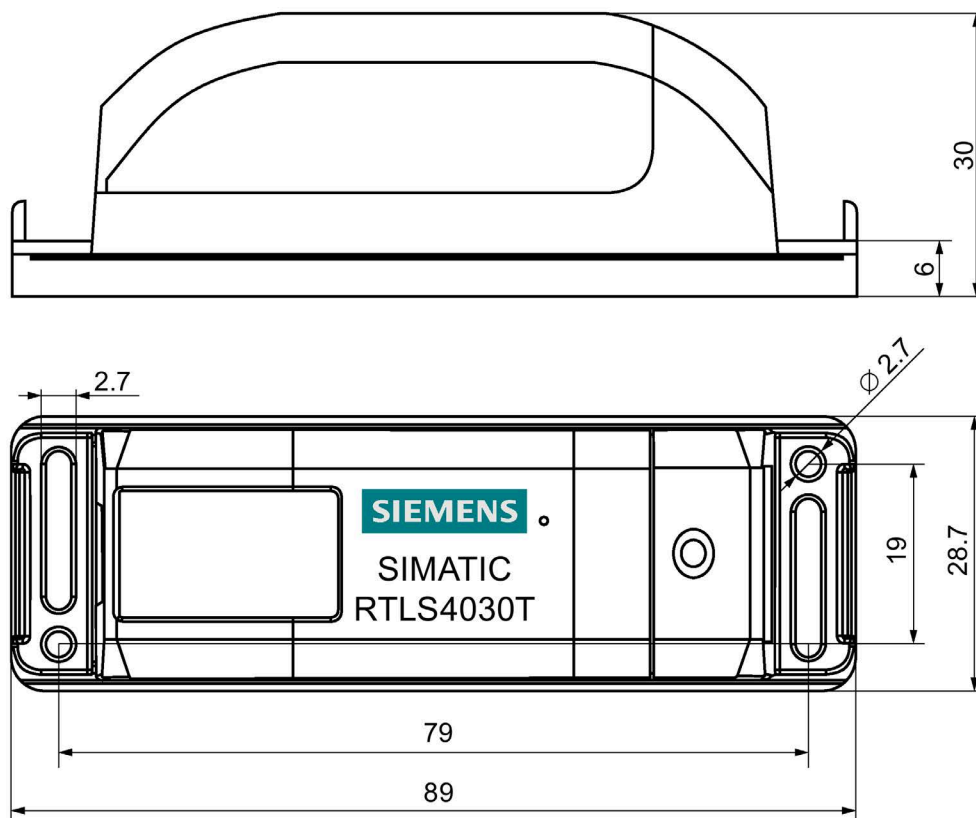


Figure 2-1 Dimension drawing SIMATIC RTLS4030T - All dimensions specified in millimeters

Installation & Operation

3.1 Notes on installation

Note

Before you install the transponders, read this section carefully to ensure problem-free installation and commissioning.

The transponders can only be used in conjunction with the RTLS localization system. The radio address of the transponder can be obtained from the data matrix code printed on the transponder.

Install the transponder in such a way that it has a direct line-of-sight connection to the gateways (360° panorama view). Any type of material can impact wireless localization. Wireless localization through metal is not possible. In this case, localization via wireless reflections can occur, which results in inaccurate determination of the location.

Check the transponder for damage before installation. The specified operating temperature ranges must be observed.

The transponder contains one lithium battery.



CAUTION

Fires and burns

Improper handling of batteries can lead result in fires and burns.

The enclosure of the transponder must not be squashed, punctured or exposed to other mechanical influences. It may only be opened to change batteries.

Never expose the transponder to fire, temperatures above 50 °C or direct sunlight for an extended period of time.

In dry environments, the transponder battery must be replaced.

Reflections and interferences

The antenna fields are weakened by absorbing materials and reflected by conducting materials. When electromagnetic fields are reflected or there are other radio sources, this will result in interferences. These circumstances will result in incorrect measurements; however, these can be largely detected and corrected with the appropriate software (e.g. SIMATIC RTLS Locating Manager). We still recommend that you prevent these influences. Especially objects that cannot be penetrated by radio waves can cause localization errors.

Note

Metal surfaces reflect radio waves more than any other types of surfaces. Water, on the other hand, attenuates radio waves. You should therefore evaluate your working environment and integration for these influences.

Coexistence and de-sensing

To prevent interfering with each other, radio applications will use different frequency bands. Use of these frequency bands is subject to state regulation. Because a frequency range is considered a finite good, technologies were developed over the years that enable a coexistence of different radio applications in the same frequency band. These technologies are also used by SIMATIC RTLS. However, interferences can still be caused by other radio devices. Arrangements are being made here, too, so that these interferences do not impact the operation of the RTLS localization system. To keep interferences to a minimum, the RTLS infrastructure components must not be installed in the close vicinity of other radio applications. Strong senders in close vicinity can interfere with the reception, even when they are located in neighboring frequency bands (de-sensing). This is true, for example, for the 2.4 GHz ISM band and PULSE in the UWB channel 5.

Assembling the transponder prior to starting up

Proceed as follows to assemble the transponder prior to starting up:

1. Insert the battery in the battery compartment according to the polarity direction.
2. Close the enclosure by first placing the top part into the bottom enclosure and letting it engage on the bottom.



CAUTION

Remove the battery before returning the transponder

Remove the battery before returning the transponder. Batteries must not be returned.

Battery change



CAUTION

Use approved batteries

Insertion of non-approved or damaged batteries may result in damage to the transponder or its surroundings. Only use batteries approved by the manufacturer, see section "Technical specifications (Page 15)". Before inserting a battery, make sure that it is not damaged.

Proceed as follows to replace the battery in the transponder:

1. Open the enclosure at the designated recess on the left-hand side in an upwards direction using a suitable tool.
2. Remove the battery to be replaced and wait 30 seconds before inserting the new battery while maintaining the polarity direction.
3. Close the enclosure again until you hear it click into place.

3.2 Cleaning and maintenance

The enclosure may only be opened to change batteries.

The transponder may only be repaired or opened for other types of work by an authorized maintenance company.

Improper opening or repair of the transponder may result in serious risks for the user. Opening the transponder without permission renders the warranty of the Siemens AG null and void.

Do not clean the enclosure with liquids or abrasive, caustic or flammable cleaning products.

Technical specifications

Table 4- 1 Technical specifications of the RTLS4030T transponder

6GT2700-3DA03, 6GT2700-3DA13 6GT2700-3DA23, 6GT2700-3DA33	
Product name	SIMATIC RTLS4030T
PULSE radio frequencies (localization)	
Wireless method	IEEE 802.15.4-2015 UWB HRP PHY
Transmission speed	850 Kbps
Operating frequency rated value	3993.6 MHz (UWB channel 2; CE, FCC, NOM, ANATEL) 6489.6 MHz (UWB channel 5; CE, NOM, ANATEL, CMIIT)
Bandwidth	499.2 MHz
Frequency range	3100 MHz ... 4800 MHz (CE, FCC, NOM, ANATEL) 6000 MHz ... 7000 MHz (CE, NOM, ANATEL, CMIIT)
Transmit power	0.037 mW (-41.3 dBm/MHz)
Range	Maximum 30 m
Accuracy of the localization (typical)	0.1 m
Antennas	Built-in UWB antenna
PHASE radio frequencies (communication and optional localization)	
Wireless method	IEEE 802.15.4
Transmission speed	1 Mbit/s
Operating frequency rated value	2400 ... 2480 MHz ISM band
Bandwidth	2 MHz; data transmission on 802.15.4; channels configurable
Frequency range	2400 MHz ... 2483.5 MHz
Transmit power	Maximum 4 dBm (configurable)
Range	Maximum 50 m
Accuracy of the localization (typical)	3 m
Antennas	Built-in 2.4 GHz antenna
Supply voltage	
Supply voltage	Battery CR123A: 3 V Lithium rechargeable Brand: VARTA (1550 mAh) or Panasonic (1400 mAh)
Service life (at 20 °C)	Standby: 1 year Operation: 100 % UWB localization with 1 second: 6 months

6GT2700-3DA03, 6GT2700-3DA13
6GT2700-3DA23, 6GT2700-3DA33

Permitted ambient conditions

Ambient temperature

- | | |
|-----------------------------|------------------|
| • During write/read access | • -10 ... +50 °C |
| • Outside write/read access | • -10 ... +50 °C |
| • During storage | • -10 ... +50 °C |

Design, dimensions, weights and connectors

Dimensions (L x W x H)	89 x 29 x 30 mm
Weight	90 g (incl. battery)
Degree of protection	IP54
Fastening method	2 screws M2.5 or cable ties
Enclosure	Plastic enclosure
Color	Anthracite

Approvals

Note

The specified approvals apply only when the corresponding mark is printed on the product. You can check which of the following approvals have been granted for your product by the markings on the type plate.

You can find the current EU Declaration of Conformity for these products on the Internet at Siemens Industry Online Support.

Link:

(<https://support.industry.siemens.com/cs/products?dtp=Certificate&mfn=ps&pnid=14970&lc=en-US>)

The products described in this document meet the requirements of the following EU directives:

- RoHS Directive 2011/65/EU
Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, official journal of the EU L174, 1 July 2011, pages 88-110
- Radio Equipment Directive 2014/53/EU (RED)
Directive of the European Parliament and of the Council of 16 April 2014 on the harmonization of the laws of the member states relating to placing radio equipment on the market; official journal of the EU L153, 22 May 2014, pages 62-106

UK Declaration of Conformity

The UK declaration of conformity is available to all responsible authorities at:

Siemens Aktiengesellschaft
Process Industries and Drives Division,
Process Automation
DE-76181 Karlsruhe
Germany

Importer UK:

Siemens plc,
Manchester M20 2UR

You can find the current UK Declaration of Conformity for these products on the Internet pages under Siemens Industry Online Support
(<https://support.industry.siemens.com/cs/en/en/view/109801531>).

The SIMATIC RTLS products described in this document meet the requirements of the following directives/regulation:

- Radio Equipment Regulations:
SI 2017/1206 Radio Equipment Regulations 2017, and related amendments
- RoHS Regulations:
SI 2012/3032 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012, and related amendments

RoHS directive (restriction of the use of certain hazardous substances)

The products described in these operating instructions meet the requirements of the EU directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Applied standard:

- IEC 63000
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

The products described in this document meet the requirements of the applied standards:

Article 3 (1) a) Protection of health and safety

- EN 62368-1
Equipment for audio/video, information and communication technology – Part 1: Safety requirements
- EN 62311
Assessment of electronic and electrical equipment related to human exposure restrictions in electromagnetic fields (0 Hz - 300 GHz)

The products described in these operating instructions meet the requirements of EU directive 2014/30/EU "Electromagnetic Compatibility" according to the designated standards for the following areas of application.

Article 3 (1) b) EMC

- ETSI EN 301 489-1
Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility for radio equipment and services - Part 1: Common technical requirements
- ETSI EN 301 489-17
Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility for radio equipment and services - Part 17:
Specific conditions for broadband data transmission systems
- ETSI EN 301 489-33
Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility for radio equipment and services - Part 33:
Special conditions for ultra-wideband (UWB) devices

- EN 55011
Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics – Limits and methods of measurement
- EN 55032 Class A, Class B
Electromagnetic compatibility of multimedia equipment – Emission requirements
- EN 55035
Electromagnetic compatibility of multimedia equipment - Immunity requirements
- EN 61000-6-1
Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
- EN 61000-6-2
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- EN 61000-6-3
Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
- EN 61000-6-4
Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

Article 3 (2) Efficient use of the radio spectrum

- ETSI EN 300 328
Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz ISM band and using wide band modulation techniques. Harmonized standard covering the essential requirements of article 3.2 of the EU Directive 2014/53/EU
- ETSI EN 302 065-2
Short Range Devices (SRD) using ultra-wideband technology (UWB); Harmonized standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 2: Requirements for UWB location tracking

FCC information

Siemens SIMATIC RTLS4030T (MLFB 6GT2700-3DA13); FCC ID SCF6032701

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RF Exposure guidance

In order to comply with FCC RF Exposure requirements, this device must be installed to provide at least 20 cm separation from the human body at all times.

NOTICE

FCC Regulations §15.521 Technical Requirements Applicable for All UWB Devices.

(a) UWB devices may not be employed for the operation of toys. Operation onboard an aircraft, a ship or a satellite is prohibited.

ISED information

Siemens SIMATIC RTLS4030T (MLFB 6GT2700-3DA33); IC ID 267X-4030T02

NOTICE (RSS-Gen Issue 5)

This device complies with license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS standard(s).

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement (RSS-102)

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Déclaration d'exposition aux radiations (RSS-102)

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20 cm entre le radiateur et votre corps.

EAC (Eurasian Conformity)

Eurasian Economic Union of Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan, the Kyrgyz Republic and the Russian Federation Declaration of conformity according to the technical regulations of the customs union (TR CU)

NOM información**Siemens SIMATIC RTLS4030T (MLFB 6GT2700-3DA13); IFT RCPSIRT19-1566**

La operación de este equipo está sujeta a las siguientes dos condiciones: (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

ANATEL

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados. Para maiores informações, consulte o site da ANATEL – (www.anatel.gov.br)