SIEMENS

SIMATIC RTLS

Localization systems
SIMATIC RTLS Initial position determination

Application manual

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Legal information

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:

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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.

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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.

Table of contents

1 General

This manual describes the operation of the "Initial position determination" functionality of the Locating Manager.

2 Application

You use the "Initial position determination" function to determine the position of transponders once again. You can configure this functionality so that it is executed automatically after starting the Locating Manager server. The functionality is located in the "Localization Configuration" client.

Note

This functionality can only be used with a valid license.

2.1 Definition of terms

Below please find a description of important terms used in the context of localization networks:

Term	Description
Gateway	Infrastructure device used with Ethernet
Transponder (TAG)	Mobile device to be localized in RTLS localization network
Infrastructure devices	Gateways
Nodes	All gateways and transponders of an RTLS localization network
Locating Manager server	Software that processes the localization data into position data that can be visualized
Client	Software for management and control of the RTLS localization system and the nodes
Localization	Position determination
Ranging	Distance measurement between a transponder and a gateway
Position calculation	Calculation performed by the Locating Manager server of the position coordinates based on the localization data and various filters
Visualization	Graphical representation of the determined position data
Exploration	Automatic search process to find unknown, for example, newly installed nodes within the radio range of the RTLS localization network
MHI	Multi-hypothesis initialization Determines the final position from multiple individual positions
TWR	Two-Way Ranging Determines the time of the UWB signal and calculates the distance between the nodes
TDOA	Time Difference of Arrival Time-based process to determine the positions of the transponders
UWB	Ultra-wideband Radio technology with wireless transmission

- Exact position localization area

  Localization areas that can send different positions.

  If an exact position localization area is configured to "Specify area coordinate", it will still remain an exact position localization area.

- Non-exact position localization area

  Localization areas that acquire a "condition" and do not calculate a position, such as areas of "Distance" or "Programmable" type.

2.2 State

The "Status information" section shows a list of all transponders for which the "Initial position determination" is enabled or has been initiated. Transponders for which the "Initial position determination" was not initiated, is already completed or was aborted are not listed in this area.

- Waiting

  Transponders waiting for activation

- Active

  Transponders for which the position is currently being determined

- Deactivating

  Transponders that are switched back to slow mode

2.3 Controller

You can set the general control of the "Initial position determination" functionality in the "Control" section. You can make the following settings:

- You can enable or disable the "Initial position determination" functionality using the "Module enabled" check box.

- Select the "Automatic start after "server ready"" check box to specify that the "Initial position determination" starts automatically every time the server is restarted.

- Select the "Accept external triggers and commands" check box to specify whether the "Initial position determination" is started by customer-specific interfaces. Automatic start at when the server starts is independent of this setting.

- You click the "Start calculation of initial position" button to run the initial position determination manually. The initial position determination is started for all transponders.

2.4　Configuration

You can configure the following parameters in the "Configuration" section:

- Use the "Time for transponder login" parameter to specify the maximum wait time for heartbeats of the transponders after the server start.

- Use the "Switchover attempts" parameter to specify the maximum number of attempts that a transponder needs to switch to active mode.

- Use the "Activity time of the transponders" to specify the maximum duration of the transponders in active mode before they are automatically switched to slow mode.

A number of measurements must be taken for the "Initial position determination". You will need the radius and the number of positions for this.

- Use the "Radius for stable position" parameter to specify a radius. If this specific number of positions is within this radius, they are confirmed as new positions.

- Use the "Number of stable positions" parameter to specify how many positions must be within the radius before the transponder position is considered to be stable.

Note

If a non-exact position localization area reports a position, it is immediately considered to be a stable position.

2.5　Configuration of the localization areas

If too many transponders are active simultaneously, this may result in load problems.

The "Initial position determination" uses load control to prevent too many transponders from running the initial position determination simultaneously in a localization area. The order of the transponders to be processed is determined by the order in which the heartbeats arrive. As soon as a heartbeat from a transponder arrives that is already processing the maximum number, this device is placed in the queue until the space for this device becomes available.

Use the "Maximum active count" parameter to specify the number of transponders for which the initial position determination is to be executed at the same time. If you have set 0 as "Maximum active count", initial position determination is prevented in this area. If transponders in this area are sent the command to start the initial position determination, they are marked as done and removed from the queue.

2.6   Manual position determination

You can use the "Manual position determination" function to trigger the initial position determination for a transponder immediately. Follow the steps outlined below:

1.   Select the individual transponders.

2.   You click the "Determine position" button to run an initial position determination. The set configurations have an effect on the manual position determination.

Note

If you want to exclude one or multiple transponders from the functionality during the initial position determination, click the "Stop" button of the respective transponder.

Response

The initial position sensing can only be started for transponders in the "Slow" state. It cannot be started when the transponder is in any other state and it is automatically aborted for the transponder when it exits the "Slow" or the "User" state.