



SmartSpace®

Ubisense ISO 24730

From version 3.2

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# Introduction to ISO 24730

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ISO/IEC 24730 defines protocols for transferring information between different Real Time Location Systems.

SmartSpace ISO 24730 consists of Ubisense services and tools that allow a Ubisense system to *receive* real-time locations using a 'Text over Socket' connection over TCP/IP. The Ubisense services act as a client connecting to a server within a third-party RTLS system. The services are added to a Ubisense dataset which contains the Ubisense platform and, optionally, additional Ubisense applications.

The Ubisense ISO 24730 package is available for Microsoft® Windows® and for Linux.

## Purpose of this Manual

This User Manual is a guide to the configuration and use of the Ubisense ISO 24730 Interface. It is divided into the following sections:

- [ISO 24730 Service Installation](#): instructions for installing the components
- [ISO 24730 System Configuration](#): instructions for configuring the system
- [ISO 24730 Service Behavior](#): a description of the system's behavior

The user should read this entire manual before attempting to install and configure the system.

## References

[1] ISO/IEC 24730-1:2014(E) – Information technology – Real-time locating systems (RTLS) – Part 1: Application programming interface (API)

## ISO 24730 Service Installation

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There are two services in the SmartSpace ISO 24730 package: Configuration Server and Forwarder Server.

To install the ISO 24730 feature:

- Make sure that the SmartSpace platform includes a license for ISO 24730 version 3.2 or higher.
- Install the ISO 24730 feature using Service Manager.

For further information on installing SmartSpace features see SmartSpace Installation on the Ubisense Documentation Portal.

# ISO 24730 System Configuration

The Ubisense services are configured using the **ubisense\_iso24730\_client\_config.exe** tool. The configuration tool supports the following operations:

Mode	Description
list	List the current configuration in a form that can be stored in a batch file and used to recreate the configuration.
setserver	Define an external RTLS server which provides ISO24730 Locate Messages, specify its address and associate it with a Ubisense cell.
removeserver	Remove an external RTLS server.
setoptions	Set options for handling Locate Messages from an external RTLS server.
removeoptions	Remove options for an external RTLS server.
settransform	Set a transform to apply to positions in Locate Messages from an external RTLS server.
removetransform	Remove transform for an external RTLS server.

## list

### Syntax:

```
ubisense_iso24730_client_config.exe list
```

### Example output:

```
# List of all servers
ubisense_iso24730_client_config.exe setserver "AA" "Location Cell 00001"
"10.42.5.186" 11
ubisense_iso24730_client_config.exe setserver "BB" "Location Cell 00001"
"10.42.5.186" 22
# List of server options
ubisense_iso24730_client_config.exe setoptions -s "AA"
# List of server transforms
ubisense_iso24730_client_config.exe settransform "BB" 2 -1 0 -45 0 0
```

## setserver

### Syntax:

```
ubisense_iso24730_client_config.exe setserver <name> <cell> <host> <port>
```

### Parameters:

name	The unique name to give to the server. This name is used to give options and a transform to the server.
cell	The name of the Ubisense cell to associate with the server.
host	The DNS name or IP address of the server's host. The Forwarder Server will connect to this address.
port	The number of the port to connect to on the server's host. The Forwarder Server will connect on this port.

### Example:

```
ubisense_iso24730_client_config.exe setserver RTLS1 'Location Cell 00001' 10.42.5.222 12345
```

## removeserver

### Syntax:

```
ubisense_iso24730_client_config.exe removeserver <name>
```

### Parameters:

name	The unique name of the server.
------	--------------------------------

## setoptions

### Syntax:

```
ubisense_iso24730_client_config.exe setoptions [OPTIONS] <name> options Parameters:
```

name	The unique name of the server.
options	A list of custom options, of the form 'opt1=val1:opt2=val2', whose meaning is known to the forwarder.

### Options:

-s, --	Use synchronous method to pass position from Locate Message to Ubisense Cell, i.e. block
--------	--



until each position has been permanently stored. The default is to use an asynchronous updatesync method which returns immediately but does not guarantee that all positions will be persistent.

-b, - Use the tag battery level values from the Locate Message and pass them to the Ubisense usebattery Battery Monitor. The default is to ignore battery levels.

#### Custom Options:

KeepAliveTime The time (in seconds) that the connection should be kept alive, in the absence of any messages from the server, if the server does not send a KeepAlive message. Default is 5s.

BatteryUpdateInterval The time (in seconds) between successive battery status updates, if the battery level values from the Locate Message are being used and the value does not change. Default is 3600s.

#### Example:

```
ubisense_iso24730_client_config.exe setserver -b RTLS1
KeepAliveTime=30:BatteryUpdateInterval=300
```

## removeoptions

#### Syntax:

```
ubisense_iso24730_client_config.exe removeoptions <name>
```

#### Parameters:

name The unique name of the server.

## settransform

#### Syntax:

```
ubisense_iso24730_client_config.exe settransform [OPTIONS] <name> -- <off_x> <off_y>
<off_z> <yaw> [pitch] [roll]
```



Note: to allow negative values to be parsed correctly a double dash should appear after the server name.

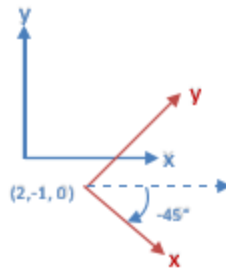
#### Parameters:

name The unique name of the server.

off_x	The offset to add to the x coordinate from the Locate Message after applying any rotation and before passing the position to the Ubisense Cell.
off_y	The offset to add to the y coordinate from the Locate Message after applying any rotation and before passing the position to the Ubisense Cell.
off_z	The offset to add to the z coordinate from the Locate Message after applying any rotation and before passing the position to the Ubisense Cell.
yaw	The rotation, in degrees, around the z axis (i.e. in the xy plane) to apply to positions from the Locate Message before the x, y & z offsets are added. The angle is the same as the angle from the x axis in the Ubisense coordinate system to the x axis in the external RTLS coordinate system.
pitch	(optional) The rotation, in degrees, around the y axis (i.e. in the xz plane) to apply to positions from the Locate Message before the x, y & z offsets are added.
roll	(optional) The rotation, in degrees, around the x axis (i.e. in the yz plane) to apply to positions from the Locate Message before the x, y & z offsets are added.

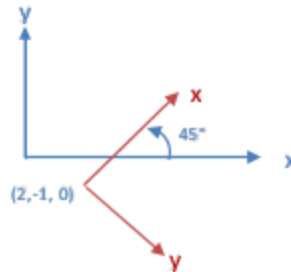
**Options:**

-l, --            The positions supplied in the Locate Message use left-handed axes, i.e. the y coordinate lefthanded must be negated. The default is to use righthanded axes which is what Ubisense uses.

**Example 1:**

Consider the two coordinate systems above where the blue axes are the Ubisense coordinate system and the red axes are the external RTLS coordinate system. The offset is the location of the origin in the external RTLS as expressed in the Ubisense coordinate system. In the example this is (2, -1, 0). The rotation is the angle between the x-axis of the Ubisense coordinate system and the x-axis of the external RTLS coordinate system. In the example this is -45 degrees. So the command to configure this transformation is

```
ubisense_iso24730_client_config.exe settransform RTLS1 -- 2 -1 0 -45
```

**Example 2:**

Consider the two coordinate systems above where the blue axes are the Ubisense coordinate system and the red axes are the external RTLS coordinate system. The external RTLS uses a left-handed coordinate system. The offset is the location of the origin in the external RTLS as expressed in the Ubisense coordinate system. In the example this is (2, -1, 0). The rotation is the angle between the x-axis of the Ubisense coordinate system and the x-axis of the external RTLS coordinate system. In the example this is +45 degrees. So the command to configure this transformation is

```
ubisense_iso24730_client_config.exe settransform -l RTLS1 -- 2 -1 0 45
```

## removetransform

### Syntax:

```
ubisense_iso24730_client_config.exe removetransform <name> Parameters:
```

**name** The unique name of the server.

# ISO 24730 Service Behavior

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## Configuration Server Behavior

The Configuration Server stores all the configuration values.

The Configuration Server is also responsible for deploying and undeploying the Forwarder Services for Ubisense Cells. The Configuration Service will ensure that those Cells which have external RTLS servers associated with them have Forwarder Servers deployed. If a Cell has an external RTLS server associated but no Forward Server then a Forwarder Server is deployed, for that cell, and started. If a Cell has a Forwarder Server but no external RTLS servers associated with it then the Forwarder Server is undeployed.



Note: if the Forwarder Server is manually stopped the Configuration Server will not restart it.

The behavior of the Configuration Server can be monitored with the `iso_24730_config` stream.

## Forwarder Server Behavior

The Forwarder Server connects to all the external servers which are associated with its Ubisense Cell. It creates a socket connection to each server using the host and port stored in the configuration. It then listens for and parses all messages sent by the server.

The Forwarder will parse and act on the `LocateMessageDefinition`, `KeepAlive` and `LocateMessage` messages. *It will ignore FieldDefinition messages as it only uses the default formats.*

When a `LocateMessage` message is received the position (x,y,z), battery status and timestamp are extracted.

The position is mapped from the coordinate system of the external RTLS to the Ubisense coordinate system as follows:

- a. if the 'left-handed flag' is set negate the y coordinate
- b. rotate new the position about the origin of the external RTLS coordinate system using the configured rotation
- c. add the x, y & z offsets to the new position

The Forwarder then determines which Ubisense Cell contains the position, using the extents of the Cells, and queues a Location Event, including the position and timestamp, to send to that Cell.

If the 'synchronous flag' is set then the Forwarder waits for each Location Event, in the queue, to be actioned before sending the next one, otherwise queued Location Events are sent as fast as possible. If the position is not in any Ubisense Cell then it is ignored.

If the 'use battery flag' is set then the battery status is sent to the Ubisense Battery Monitor.

The behavior of the Forwarder Server can be monitored with the `iso_24730_forwarder` stream.