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| Test Script  SAP S/4HANA - 18-09-20 | public |
| Delivery Insights enabled by IoT (4IH) |

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# Purpose

SAP Leonardo IoT enriches your delivery processes with real-time IoT sensor data and provides you with a holistic and transparent view of the entire delivery process. The sensor data is embedded into your existing processes to guarantee a seamless user experience.

With the flexible system configuration approach, you can monitor all kinds of sensor data such as temperature, humidity, acceleration, location, or radiation. Numerous use cases are possible and can be tailored to your needs.

As soon as an unusual sensor reading is detected by SAP Leonardo IoT, the system triggers a notification to the relevant parties in SAP S/4HANA, providing them with direct insight to action. You can then proactively react to critical supply situations, anticipate potential quality issues, increase the on-time delivery performance, and improve the customer satisfaction.

# Prerequisition

This section summarizes all prerequisites needed to conduct the test in terms of systems, users, master data, organizational data, and other test data and business conditions.

The process to be tested in this test script is part of an integration between SAP S/4HANA Cloud systems and SAP Cloud Platform.You will be able to process some of the test steps ONLY after activating scope item BD9 - Sell from Stock.

## System Access

|  |  |
| --- | --- |
| System | Details |
| System | Accessible via SAP Fiori Launchpad. Your system administrator provides you with the URL to access the various apps assigned to your role. |

## Roles

Assign the following business roles to your individual test users. Alternatively, if available, you can create business roles using the following spaces with pages and predefined apps for the SAP Fiori launchpad and assign the business roles to your individual test users.

Note These roles or spaces are examples provided by SAP. You can use them as templates to create your own roles or spaces.

For more information about business roles, refer to Assigning business roles to a user in the [Administration Guide to Implementation of SAP S/4HANA with SAP Best Practices](https://help.sap.com/viewer/S4HANA2020_AdminGuide) .

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name (Role) | ID (Role) | Description (Space) | ID (Space) | Log On |
| Internal Sales Representative | SAP\_BR\_INTERNAL\_SALES\_REP | Internal Sales | SAP\_BR\_INTERNAL\_SALES\_REP |  |
| Shipping Specialist | SAP\_BR\_SHIPPING\_SPECIALIST | Shipping | SAP\_BR\_SHIPPING\_SPECIALIST |  |

## Master Data, Organizational Data, and Other Data

The organizational structure and master data of your company has been created in your system during implementation. The organizational structure reflects the structure of your company. The master data represents materials, customers, and vendors, for example, depending on the operational focus of your company.

Use your own master data or the following sample data to go through the test procedure.

|  |  |  |  |
| --- | --- | --- | --- |
| Master Data | Value | Master Data Details | Comments |
| Plant | 1010 | Plant 1 DE |  |
| Storage Location | 101A | Std. storage 1 |  |
| Shipping Point | 1010 | Shipping Point 1010 |  |
| Sales Organization | 1010 | Dom. Sales Org |  |
| Distribution Channel | 10 | Direct Sales |  |
| Division | 00 | Product Division 00 |  |
| Sold-to Party/Ship-to Party/Payer | 10100003 | Customer domestic 03 |  |
| Material | TG12 |  |  |

For more information on creating master data objects, see the following [Master Data Scripts (MDS)](https://support.sap.com/content/dam/SAAP/Sol_Pack/BP_OP_ENTPR/BP_OP_ENTPR_S4HANA2020_7_Master_Data_EN_XX.htm)

Table 1: Master Data Script Reference

|  |  |
| --- | --- |
| Master Data ID | Description |
| BNF | Create Product Master of Type "Trading Good" |
| BND | Create Customer Master |
| 2YX | Create Customer-Material Info Record |

## Additional Manual Configuration

Before you can test this scope item, you must have completed the additional configuration steps that are described in the Set-Up Instructions for this scope item. These configuration steps are specific for your implementation and include mandatory settings that are not delivered by SAP and must be created by you. For more information, refer to the Set-Up Instructions for this scope item on [SAP Best Practices Explorer](https://rapid.sap.com/bp) (https://rapid.sap.com/bp/#/browse/scopeitems/<enter the scope item ID>).

## Preliminary Steps

All the necessary business configurations for Sales Order processing and Outbound Delivery processing with Handling Units must be done and working for this scenario.

A Situation Type either delivered by SAP (e.g. SD\_SALESORDER\_DELIVERY\_IOT\_EVENT) or customer defined activated.

Required configuration steps for displaying Notifications for new Situations shall be completed.

# Overview Table

The scope item consists of several process steps provided in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| Process Step | Business Role | Transaction | Expected Results |
| [Create Sales Order](#unique_9) [page ] 8 |  |  |  |
| [Create Outbound Delivery](#unique_10) [page ] 8 |  |  | Outbound delivery is created |
| [Execute Picking](#unique_11) [page ] 8 |  |  | The picking process involves taking goods from a storage location and staging the right quantity in a picking area where the goods are prepared for shipping |
| [Post Goods Issue](#unique_12) [page ] 8 |  |  | An advanced shipping notification is sent to the Buyer system |
| [Create Thing](#unique_13) [page ] 8 | Supplier |  | ASN is automatically sent to the Buyer system |
| [Assign Sensor](#unique_14) [page ] 9 | Supplier |  | Invoice is created and sent from the SAP S/4HANA system (supplier side) to the Buyer system |
| [Detect Issue in Delivery Condition](#unique_15) [page ] 10 |  |  |  |
| [React on Issue in Delivery Condition](#unique_16) [page ] 11 |  |  |  |

# Test Procedure

This section describes test procedures for each process step that belongs to this scope item.

## Create Sales Order

Please refer to steps 4.3-4.8 for Scope item BD9.

## Create Outbound Delivery

Please refer to step 4.9 for Scope item BD9.

## Execute Picking

Please refer to step Execute Picking for Scope item BD9.

## Post Goods Issue

Please refer to step Post Goods Issue for Scope item BD9.

## Create Thing

For monitoring the conditions of an Outbound Delivery, the Delivery needs to have a corresponding representation in form of a “Thing” in Leonardo IoT. The Thing which represents the Delivery needs to be an instance of the Thing Type created while executing the setup instructions of this Scope Item.

Procedure

Create a new Thing representing an Outbound Delivery as explained on the [SAP Help Portal page for Leonardo IoT](https://help.sap.com/viewer/product/SAP_Leonardo_IoT) -> Thing Modeler Apps (OData version) -> Thing Modeler: Overview -> Create a Thing.

Please consider some aspects when creating a Thing as part of this test:

In the Thing Modeler make sure to select the correct Package such that you can see the Thing Type created while executing the setup instructions of this Scope Item.

When creating the new Thing, make sure to set Name, Alternate Name and Description such that they clearly correspond to unique identifiers related to the Delivery in S/4 HANA Cloud.

Make sure to fill in and save meaningful values for all Basic Data properties you created while executing the setup instructions of this Scope Item.

Example:

Name: Delivery\_180004587

Alternate Name: 180004587

Description: IoT enabled Delivery 180004587

Thing Type:TG12

Authorization Group: TENANT\_ROOT\_<your\_tenant\_ID>

Optional step:

The creation of new Things incl. the replication of Basic Data values can be automated for productive usage, e.g. based on a custom application sitting in SAP Cloud Platform.

## Assign Sensor

For receiving and processing sensor values in Leonardo IoT, it is necessary to connect the Thing created in the previous step with a supported Connectivity Provider. In this Test Script we assume SAP Cloud Platform Internet of Things for the Cloud Foundry Environment is the Connectivity Provider of choice. For this purpose, we will make use of the Sensor created in SAP Cloud Platform Internet of Things for the Cloud Foundry Environment while executing the setup instructions of this Scope Item. For more information on sensor onboarding and the standard integration of Leonardo IoT and Cloud Platform Internet of Things for the Cloud Foundry Environment, please refer to [SAP Help Portal page for Leonardo IoT](https://help.sap.com/viewer/product/SAP_Leonardo_IoT) -> Thing Modeler Apps (OData version) -> Thing Modeler: Overview -> Create a Thing Type -> Thing Onboarding.

Procedure

1. In the Thing Modeler navigate to your newly created Thing and choose the tab Connectivity.
2. Select SAP Cloud Platform IoT Service for Cloud Foundry Environment as Provider.
3. Select the entry for Mapping which has been created as part of the Thing Type configuration while executing the setup instructions of this Scope Item (e.g. Acceleration Sensor Mapping).
4. Choose the value help button of the field below the Mapping (labeled e.g. Handling Unit Acceleration Sensor Type) and select the Sensor from Cloud Platform Internet of Things for the Cloud Foundry Environment which has been created while executing the setup instructions of this Scope Item (e.g. Acceleration Sensor 210987654).
5. Check the correct Property mapping in the lower part of the screen and choose Save.
6. Verify the assignment between Thing ID and Sensor ID is reflected in the Connectivity Information (small power plug icon in the upper right-hand corner). The plug icon should look “plugged in” and both IDs should be mentioned in the pop-up which comes up when choosing the icon.

## Detect Issue in Delivery Condition

For detecting issues with regards to the permissible condition of an Outbound Delivery and to automatically trigger the creation of a Situation in S/4 HANA, respective IoT sensor readings needs to reach SAP Internet of Things. To achieve this, the Sensor assigned to the newly created Thing as part of the previous stepacts as an endpoint for IoT data ingestion into SAP Cloud Platform. To eliminate to need of integrating physical IoT sensor hardware while executing this test script, respective sensor data incl. a critical condition can be simulated as described below.

Procedure

1. Send a simulated IoT sensor data message that contains Properties and measure values suitable to fulfill all conditions for triggering the Rules and Actions in SAP Internet of Things that were defined when executing the setup instructions of this Scope Item (e.g. send a simulated sensor value for Property Acceleration which is below -10).

Option 1:

Execute the following tutorial to simulate IoT sensor data in case your Device is assigned to Gateway Cloud MQTT (like in the example shown in the setup instructions of this scope item): [SAP Help Portal page for Cloud Platform Internet of Things for the Cloud Foundry Environment](https://help.sap.com/viewer/product/SAP_CP_IOT_CF) -> Tutorials -> Send Data with MQTT -> skip steps 1 to 4 as you executed them as part of the setup instructions already -> adapt the message payload, server URI, client ID and topics depending on the actual configuration of your Device and Sensor.

Example:

Client ID: 8006535979

Subscription Topic: ack/8006535979

Publication Topic: measures/8006535979

Payload:

{

"capabilityAlternateId": "handling\_unit\_condition",

"sensorAlternateId": "210987654",

"measures": [{

"Acceleration": "-15.67"

}]

}

Option 2:

Execute the following tutorial to simulate IoT sensor data in case your Device is assigned to Gateway Cloud REST (unlike in the example shown in the setup instructions of this scope item): [SAP Help Portal page for Cloud Platform Internet of Things for the Cloud Foundry Environment](https://help.sap.com/viewer/product/SAP_CP_IOT_CF) ->Tutorials -> Send Data with REST -> skip steps 1 to 4 as you executed them as part of the setup instructions already -> adapt the message payload example and endpoint URL depending on the actual configuration of your Device and Sensor.

Example:

Endpoint URL: https://<your\_IoT\_Service\_Instance\_Hostname>/iot/gateway/rest/measures/8006535979

Payload: {\"capabilityAlternateId\":\"handling\_unit\_condition\",\"sensorAlternateId\":\"210987654\",\"measures\":[{\"Acceleration\":\"-15.67\"}]}

1. Verifythe simulated measure arrived at Cloud Platform Internet of Things for the Cloud Foundry Environment via the Internet of Things Service Cockpit. You should be able to see the value sent in the previous step (e.g. -15.67), in the section Data Visualization of your Device.For further information please refer to the [SAP Help Portal page for Cloud Platform Internet of Things for the Cloud Foundry Environment](https://help.sap.com/viewer/product/SAP_CP_IOT_CF)-> End-User Information -> Internet of Things Service Cockpit ->Device Management ->Devices ->Inspect Device Measures.
2. Verify the simulated measure has been forwarded correctly to SAP Internet of Things by navigating to the Thing created earlier using the Thing Modeler. In the tab Measured Values, you should be able to see the value ingested as part of step 1 (e.g. -15.67) in the column Value of the respective Property. You may have to drill down into the correct Property Set before the respective Property and Value are displayed.

## React on Issue in Delivery Condition

In case the simulated IoT sensor data reached Leonardo IoT and the respective Rules and Actions were triggered successfully, a new IoT-based Situation has automatically been created in S/4 HANA Cloud. Depending on the configuration performed while executing the setup instructions of this Scope Item, the Situation created in S/4 HANA Cloud provides information on the nature of the issue and a reference to the related Business Object in S/4 HANA Cloud.

Procedure

1. Use the S/4 HANA Cloud Fiori Launchpad to review the new Situation created by Leonardo IoT (e.g. by using the Apps My Situations or Monitor Situations or by receiving a corresponding Notification in the Notification Area).
2. Review the Short Description and the Message Details of the new Situation to get an understanding of the issue in the delivery condition that caused the creation of this Situation (e.g. asignificant negative acceleration has been measured by the sensor assigned to a certain Delivery. This could mean that the respective Handling Unit fell down during shipment and that the shipped goods may be damaged).
3. Manually follow up on the Situation by performing necessary business actions (e.g. make a phone call to the affected Business Partner or trigger a replacement order in S/4 HANA Cloud)
4. Update the status of the new Situation after performing necessary business actions.
5. If you want to proceed with normal billing process, you can refer to scope item BD9; If you want to trigger the return process, please use BKP.

Optional:

For providing additional IoT and business-related context and to trigger follow up activities based on an S/4 HANA Cloud Situation to a responsible end user, e.g. a custom application with a scenario specific user interface could be used in parallel or in addition to the S/4 HANA Cloud standard apps.

# Appendix

## Ticket Component

In case of issues during the configuration, open an SAP support ticket for the following component.

|  |  |  |
| --- | --- | --- |
| Implementation Step | Component | Comment |
| SAP S/4 HANA Cloud | MM-PUR-GF-SIT |  |
| SAP Cloud Platform Internet of Things for the Cloud Foundry Environment | BC-NEO-SVC-IOT | See [SAP Help Portal page](https://help.sap.com/viewer/product/SAP_CP_IOT_CF)-> Get Support |
| SAP Cloud Platform Cloud Foundry environment | BC-CP-CF-XXX | See [SAP Note 1888290](https://launchpad.support.sap.com/#/notes/SAP Note 1888290) |
| SAP Leonardo IoT | IOT-BSV-XXX | See [SAP Help Portal page](https://help.sap.com/viewer/product/SAP_Leonardo_IoT)->Getting Started with SAP Leonardo IoT->General Information->Support |

Typographic Conventions

|  |  |
| --- | --- |
| Type Style | Description |
| Example | Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options.  Textual cross-references to other documents. |
| Example | Emphasized words or expressions. |
| EXAMPLE | Technical names of system objects. These include report names, program names, transaction codes, table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE. |
| Example | Output on the screen. This includes file and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools. |
| Example | Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation. |
| <Example> | Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system. |
| EXAMPLE | Keys on the keyboard, for example, F2 or ENTER. |

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