



API Integration

Agravis



Description

This document describes the integration API between **Agravis** and the **Robot Depalletizing Station**. This API adheres to the JSON-RPC 2.0 Specification, accessible at <https://www.jsonrpc.org/specification>, and operates through a single HTTP POST endpoint for sending commands with parameters. All API calls are synchronous, blocking until the system completes the execution of the specified function.

Outline

The primary communication between Sereact and Customer is conducted via REST/JSON APIs:

- **Request Ready (Agravis → Sereact):**
 - The Customer requests state of the the Robotic Station
 - Returns success if robot is ready for operation
- **Pick Request - Execution Call (Agravis → Sereact):**
 - The Customer requests to start picking from a specific pallet to a specific target bin.
 - The Robot Station provides the status of a pick job with target bin status

API Endpoints

Request Ready

Customer → Sereact

This method will call the robot to check if the station is ready to perform picking tasks.

Example Request

```
{
  "jsonrpc": "2.0",
  "id": 1,
  "method": "robot.check_ready",
}
```

Parameters:

- Method: robot.check_ready to validate robot is ready

Expected Result

```
{
  "jsonrpc": "2.0",
  "result": {
    "success": true,
  }
}
```

Pick Request - Execution Call

Customer → Sereact

This method will call the robot grasp from a pallet and place it into the target bin.

```
⌘ {
  "jsonrpc": "2.0",
  "id": 2,
  "method": "robot.grasp_until_empty",
  "params": {
    "palletId": "qrf343",
    "pickArea": "pick_1",
    "placeArea": "place_1"
  }
}
```

⌘ Parameters:

- id: UUID
- method: robot.grasp_until_empty
- params:
 - palletId: Information related to the pallet docked to the pick area.
 - placeArea: Designated area for placing the grasped items.
 - pickArea: Designated area for picking items.

Pick Response - Success

Sereact → Customer

The Robot Station provides the final status of a pick request. We will respond back after a few picks when the place area is full with `isTargetFull` field set to true.

```
⌘ {
  "jsonrpc": "2.0",
  "result": {
    "success": true,
    "payload": {
      "itemsPicked": 3,
      "itemsPlaced": 3,
      "isTargetFull": true,
      "isPalletEmpty": true
    }
  },
  "id": 2
}
```

⌘ Parameters:

- success: A boolean indicating whether the API method was called successful.
- payload: Additional details about the results, including:
 - itemsPicked: Number of items picked from the pallet.
 - itemsPlaced: Number of items placed in the target.
 - isTargetFull: Boolean indicating whether the placing is full or not.
 - isPalletEmpty: Boolean indicating whether the pallet is empty or not.

Error Response

Sereact → Customer

Whenever a request is unsuccessful, our API will return an error response with an error type and message. You can use this information to understand better what has gone wrong and how to fix it. Most of the error messages are pretty helpful and actionable. Below is a template for an error response:

```
{
  "jsonrpc": "2.0",
  "error": {
    "code": "ERROR_CODE",
    "message": "ERROR_MESSAGE",
    "data": {
      "status": "error",
      "title": "ERROR_TYPE",
      "description": "ERROR_DESCRIPTION",
      "itemsPicked": 1,
      "itemsPlaced": 0,
      "isTargetFull": false,
      "isPalletEmpty": false
    }
  },
  "id": 2
}
```

Parameters

- code: The code of the error
- message: The message from the error
- data: The data object within the error response provides additional details about the encountered error:
 - status: error
 - title: The detailed error code
 - description: The detailed description of the error.
 - itemsPicked: Number of items picked from the pallet, before the error.
 - itemsPlaced: Number of items placed in the target, before the error.
 - isTargetFull: Boolean indicating whether the placing is full or not.
 - isPalletEmpty: Boolean indicating whether the pallet is empty or not.

Error Codes:

Sereact → Customer/HMI

Here is the list of typical error messages, codes and resolution steps:

Error Code	Code	Description	Severity	Resolution
-32000	E_STOP_TRIGGERED	Emergency stop was activated. Operation halted for safety reasons.	Critical	Inspect the reason for the emergency stop activation. If all clear, release the emergency stop. Resume the system by dragging the resume button.
-32001	SAFETY_GUARD_VIOLATION	A safety guard was breached. The robot is in safe stop.	Critical	Inspect the doors and the safety system. Ensure the doors are closed and the cell is empty. If all clear, the system will ask for visual confirmation. Follow the instructions on the screen.
-32002	FENCE_SAFETY_GUARD_FAILURE	The fence safety guard system has failed or is not connected. The robot is in safe stop.	Critical	Inspect the doors and the safety system. Ensure the doors are closed and the cell is empty. If all clear, the system will ask for visual confirmation. Follow the instructions on the screen.
-32003	SOFTWARE_ERROR	A software fault occurred, possibly due to a bug or unexpected condition.	Critical	Call the second line of support. For 2nd line: Contact Sereact's support team.
-32004	DUPLICATE_ID	Station got duplicated requests	Operational	No action needed. This is an operational warning.
-32005	ROBOT_FAILURE	The robot is not responding or is disconnected from the control system.	Critical	Call the second line of support. For 2nd line: Call Sereact's support team.
-32007	HARDWARE_FAILURE	Failure of <components>	Critical	Call the 2nd line of support. For 2nd line: Contact Sereact's support team.
-32009	GRIPPER_FAILURE	Gripper malfunctioned, possibly due to misalignment or mechanical issue.	Operational	Call the second line of support. For 2nd line: Contact Sereact's support team.
-32010	PICK_FAILURE	The robot failed to pick up the object, possibly due to incorrect positioning.	Operational	No action needed. This is an operational warning.
-32011	PLACE_FAILURE	The robot failed to place the object at the designated location.	Operational	No action needed. This is an operational warning.
-32012	PLACE_FAILURE_UNSAFE	The robot failed to place the object at the designated location.	Critical	Human Intervention. Check the Placing Position
-32013	BARCODE_SCANNER_FAILURE	The barcode scanner is not functioning or disconnected, affecting operation.	Operational	Monitor the barcode state on the HMI's 'Testing' page. Call the 2nd line of support. For 2nd line: Check the cables for the barcode scanner. For 2nd line: If

				the issue persists, contact Sereact's support team.
-32014	CAMERA_FAILURE	The camera system is not functioning, possibly affecting object recognition or positioning.	Operational	Call 2nd line of support. For 2nd line: Check the cables. For 2nd line: If the issue persists contact Sereact's support team.
-32015	BARCODE_SCAN_FAILURE	The barcode scanner is unable to read correct barcodes, affecting operation.	Operational	Monitor the barcode state on the HMI's 'Testing' page. Call the 2nd line of support. For 2nd line: Check the cables for the barcode scanner. For 2nd line: If the issue persists, contact Sereact's support team.
-32016	SOURCE_BIN_EMPTY	The bin from which the robot was supposed to pick an item is empty.	Operational	No action needed. This is an operational warning.
-32019	TARGET_BIN_INBOUND_FAILURE	The target bin failed to inbound.	Critical	Human Intervention. Check the Inbound Position.
-32020	TARGET_BIN_OUTBOUND_FAILURE	The target bin failed to outbound.	Critical	Human Intervention. Check the Inbound Position.
-32021	TARGET_BIN_FULL	The bin from which the robot was supposed to place an item is full.	Operational	No action needed. This is an operational warning.
-32022	ITEM_DROPPED_SAFE	The robot dropped the item during the pick or place operation.	Operational	No action needed. This is an operational warning.
-32023	ITEM_DROPPED_UNSAFE	The robot dropped the item during the pick or place operation.	Critical	Human Intervention. Clear the area ...
-32024	INCOMPATIBLE_ITEM	Station received incompatible items that cannot be picked with the current configuration.	Operational	No action needed. This is an operational warning.
-32025	MISSALIGNED_COMPONENTS	The Station is missing <key component> to operate.	Critical	Human Intervention. Please make sure <component> is available.
-32026	MAINTENANCE_MODE_ACTIVE	The system is in maintenance mode	Maintenance	For 2nd line: Please turn the key-switch to exit the maintenance mode.
-32027	FIRE_ALARM_TRIGGERED	Fire alarm triggered	Critical	Follow standard evacuation procedures.
-32029	AIR_PRESSURE_IS_LOW	Air pressure is low	Critical	Call the 2nd line of support. For the 2nd line: Check the air pressure at the compressor.
-32030	WMS_COMMUNICATION	Error with the WMS communication	Critical	Call the 2nd line of support. For 2nd line: Try to press the confirm button. For 2nd line: If the issue is not resolved contact Sereact's support team.