Industrial Edge: SIMOTION Trace Connector

Trace connector/ v1.1.0 / High frequency data collection/ Edge

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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.

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1 Introduction

1.1 Description

SIMOTION Trace Connector is a web-based application running on SIEMENS Industrial Edge V1.0. The SIMOTION Trace Connector can configure and execute tracejobs via the SIMOTION webserver interface and download the recorded traced data to the Edge device. Beside storing the recorded data in the database of the SIMOTION Trace Connector App, the recorded data is also published on the Edge Databus via MQTT.

1.2 Requirements

For the Version 1.0.0 of the application SIMOTION Trace Connector the following requirements are necessary:

- **"WebServer & OPC XML DA"**:

  The WebServer of the SIMOTION needs to be activated. This also enables automatically the used OPC XML DA protocol.
- **"Open ports"**:

  port 80 for Webserver and OPC XML DA
- **“SIMOTION Firmware Version”**

  Firmware Version needs to be V4.1 or newer
- **“Industrial Edge Device with RT V1 or higher”**

  Device license: 6ES7823-0EE00-4AY0

  Device: 6ES7647-8BD31-0CW1

NOTICE	**the app is currently not running on WinCC Comfort Panels with integrated Edge functionality**

1.3 Application structure

- **"Home"**:
  The Home screen gives an overview about recently recorded tracejobs and tracejob errors.
- **"SIMOTION"**:
  In the SIMOTION screen the connection of one or more SIMOTION controllers to the Trace Connector app can be setup by entering the IP address of the webserver.
- **"Variables"**:
  In the Variables screen the user preselects possible variables he wants to use in a trace configuration.
- **"Tracejobs"**:
  In the Tracejobs screen the user can define tracejobs. When defining a tracejob the user has several options for setting up the tracejob configuration, e.g. trigger conditions, scheduling.
- **"Logbook"**:
  The Logbook screen provides an overview over all recorded and saved tracejobs. Recorded traces can be visualized and downloaded to the PC in different formats.

1.4 Application version, license conditions and copyright notices

Current application version and license conditions for the third-party open source libraries used SIMOTION Trace Connector application can be found by clicking on information icon in left bottom corner of the footer component. This document is provided to customers to avoid copyright infringements.

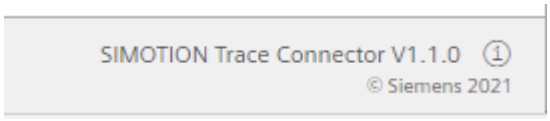

Figure 1 Licence conditions

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Please note the following license conditions and copyright notices applicable to Open Source Software and/or other components (or parts thereof):

Component	Open Source Software [Yes/No]	Acknowledgement/Comment	License conditions and copyright notices
@angular/cdk (npmjs) - 8.1.4	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @angular/cdk (npmjs) - 8.1.4
@angular/common - 9.0.2	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @angular/common - 9.0.2
@angular/compiler - 9.0.2	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @angular/compiler - 9.0.2
@angular/core - 9.0.2	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @angular/core - 9.0.2
@angular/forms - 9.0.2	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @angular/forms - 9.0.2
@angular/material - 8.1.4	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @angular/material - 8.1.4
@angular/platform-browser - 9.0.2	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @angular/platform-browser - 9.0.2
@angular/platform-browser-dynamic - 9.0.2	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @angular/platform-browser-dynamic - 9.0.2
@angular/router - 9.0.2	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @angular/router - 9.0.2
@busacca/ng-pick-datetime - 7.0.0	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT @busacca/ng-pick-datetime - 7.0.0
Angular - 9.0.2	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT Angular - 9.0.2
Apache Commons Lang - 3.4 (1)	Yes	Apache Commons Lang Copyright 2001-2015 The Apache Software Foundation This product includes software developed at The Apache Software Foundation (http://www.apache.org/). This product includes software from the Spring Framework, under the Apache License 2.0 (see: StringUtils.containsWhitespace())	LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT Apache Commons Lang - 3.4 (1)
Apache HttpClient - 4.5.8	Yes	Apache HttpClient Copyright 1999-2019 The Apache Software Foundation This product includes software developed at The Apache Software Foundation (http://www.apache.org/).	LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT Apache HttpClient - 4.5.8
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jdom - JDOM-2.0.6	Yes	- voluntary contributions made by Paul Eng on behalf of the Apache Software Foundation that were originally developed at iClick, Inc., software copyright (c) 1999. === Apache xml-commons xml-apis (redistribution of xml-apis.jar) Apache XML Commons Copyright 2001-2003,2006 The Apache Software Foundation. This product includes software developed at The Apache Software Foundation (http://www.apache.org/). Portions of this software were originally based on the following: - software copyright (c) 1999, IBM Corporation., http://www.ibm.com. - software copyright (c) 1999, Sun Microsystems., http://www.sun.com. - software copyright (c) 2000 World Wide Web Consortium, http://www.w3.org This product includes software developed by the Apache Software Foundation (http://www.apache.org/). This product includes software developed by the Apache Software Foundation (http://www.apache.org/ Apache Ant Copyright 1999-2010 The Apache Software Foundation The task is based on code Copyright (c) 2002, Landmark Graphics Corp that has been kindly donated to the Apache Software Foundation. === == NOTICE file corresponding to section 4(d) of the Apache License, == == Version 2.0, in this case for the Apache Xerces Java distribution. == === Apache Xerces Java Copyright 1999-2010 The Apache Software Foundation This product includes software developed at The Apache Software Foundation (http://www.apache.org/). Portions of this software were originally based on the following: - software copyright (c) 1999, IBM Corporation., http://www.ibm.com. - software copyright (c) 1999, Sun Microsystems., http://www.sun.com. - voluntary contributions made by Paul Eng on behalf of the Apache Software Foundation that were originally developed at iClick, Inc., software copyright (c) 1999. This product includes software developed by the Apache Software Foundation (http://www.apache.org/).	LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT jdom - JDOM-2.0.6
MapStruct - 1.3.1.Final	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT MapStruct - 1.3.1.Final
MapStruct Processor - 1.3.1.Final	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT MapStruct Processor - 1.3.1.Final
material-design-icons - 3.0.1	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT material-design-icons - 3.0.1
Microsoft/ntlm - 1.1.0.0	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT Microsoft/ntlm - 1.1.0.0
ngx-material-timepicker - 4.0.2	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT ngx-material-timepicker - 4.0.2
Org.eclipse.paho.client.mqttv3 - 1.2.0	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT Org.eclipse.paho.client.mqttv3 - 1.2.0
PostgreSQL Database Server - 12.2	Yes	'This product includes software derived from Dr Brian Gladman (gladman@seven77.demon.co.uk) 14th January 1999.'	LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT PostgreSQL Database Server - 12.2
Project Lombok - org.projectlombok:lombok - 1.16.6	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT Project Lombok - org.projectlombok:lombok - 1.16.6
Quartz Enterprise Job Scheduler - 2.3.1	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT Quartz Enterprise Job Scheduler - 2.3.1
RxJS - 6.5.4	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT RxJS - 6.5.4
Simple Logging Facade for Java (SLF4J) - 1.7.9 (2)	Yes	This product includes software developed by The Apache Software Foundation (http://www.apache.org/).	LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT Simple Logging Facade for Java (SLF4J) - 1.7.9 (2)
Spring Boot - 2.1.5.RELEASE	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT Spring Boot - 2.1.5.RELEASE
zone.js - 0.9.1	Yes		LICENSE AND COPYRIGHT INFORMATION FOR COMPONENT zone.js - 0.9.1

Figure 2 Third-party library list

2 User documentation

2.1 Create MQTT topic in IE Databus

The SIMOTION Trace Connector uses the MQTT protocol to communicate with the Edge Environment. The application publishes and subscribes to MQTT topics in the system application IE Databus.

To set-up the IE Databus application the user needs to configure a default user and password, which will be used for database connection and default MQTT topic under which trace data will be published. Default topic/user/password should be manually created at the beginning. For default configuration user needs to:

1. Open the IE Databus application and Launch the Configurator
2. Add an user in the “User View” by clicking on “Add User”
3. Enter the following information (Figure 3)

   Topic: SIMOTIONTraceConnector/#

   Username: edge

   Password: edge

   Permission: Publish and Subscribe
4. Click on “OK”

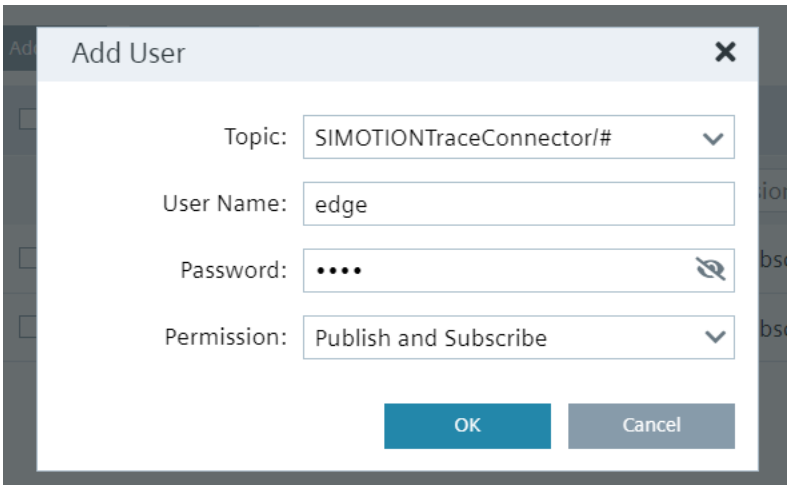


Figure 3 Default user and topic creation

The default topic will later be used for tracejob creation. If the user will not specify another MQTT topic all trace data will be published under the default “SIMOTIONTraceConnector/#”.

If the user wants to publish trace data under another MQTT topic, the user can create a new topic under the user “edge”. In example below a custom “fft” topic was created. (Figure 4)

NOTICE	all topics should be created under “edge” user and “edge” password. These credentials are used for further Edge environment connection and cannot be changed

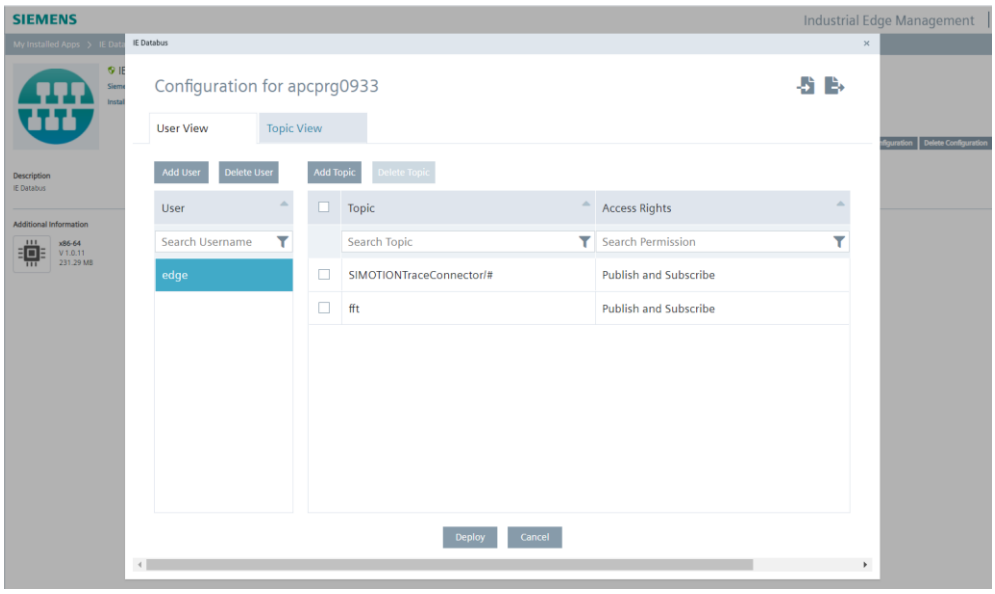


Figure 4 IE Databus custom topic

2.2 SIMOTION

The “SIMOTION” tab contains a table with detailed information about the connected SIMOTIONs and a button to connect new ones. The table includes SIMOTION type, serial number, firmware version, buffer size, cycle time, IP address and status. The entries in the table can be modified and deleted.

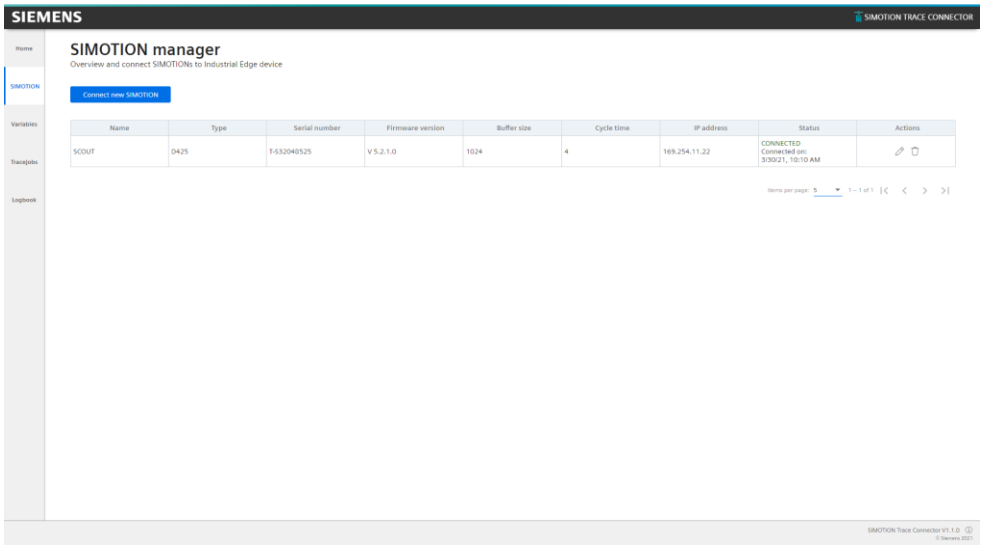


Figure 5 SIMOTION Manager

2.2.1 Connect new SIMOTION

The process of connection a new SIMOTION requires the correct IP address and a SIMOTION name. The given SIMOTION name represents the device only in the SIMOTION Trace Connector Application. The application uses the SIMOTION webserver and OPC XML DA protocol to test the connection.

To connect a new SIMOTION:

1. Click “Connect new SIMOTION” button. “Connect new SIMOTION” popup will be shown
2. Enter the correct IP address and SIMOTION name
3. Click on “Test connection” button to verify the connection
4. Click on “Save” button

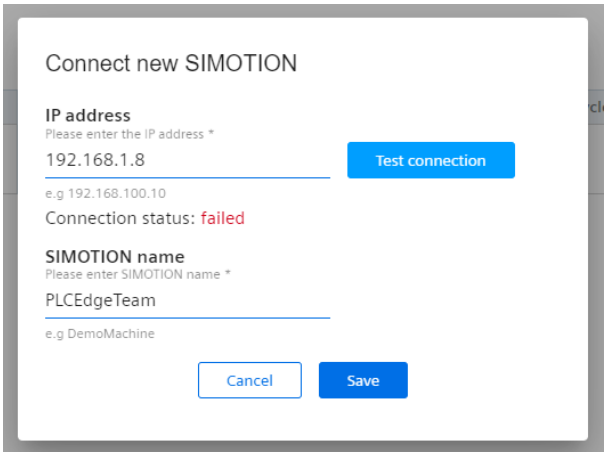


Figure 6 Connect new SIMOTION

NOTICE	please note that IP address should be unique in this network

If the SIMOTION was accessible and connection status was “success” the new SIMOTION will be shown in a table with loaded information. If the connection status was “failed” the SIMOTION will be added to the table without additional information.

2.2.2 Edit SIMOTION

To edit SIMOTION information, click on the “Edit” icon. “Edit SIMOTION” popup window should be opened. IP address and SIMOTION name can be modified here. “Edit” functionality is similar to Connect new SIMOTION2.2.1

Figure 7 Edit SIMOTION

2.2.3 Delete SIMOTION

To delete selected SIMOTION:

1. Click on “Delete” icon in “Action” column of selected table row. “Delete confirmation” popup should be opened (Figure 8)
2. Click “OK” button

After successful SIMOTION deletion information in the SIMOTION table will be updated automatically

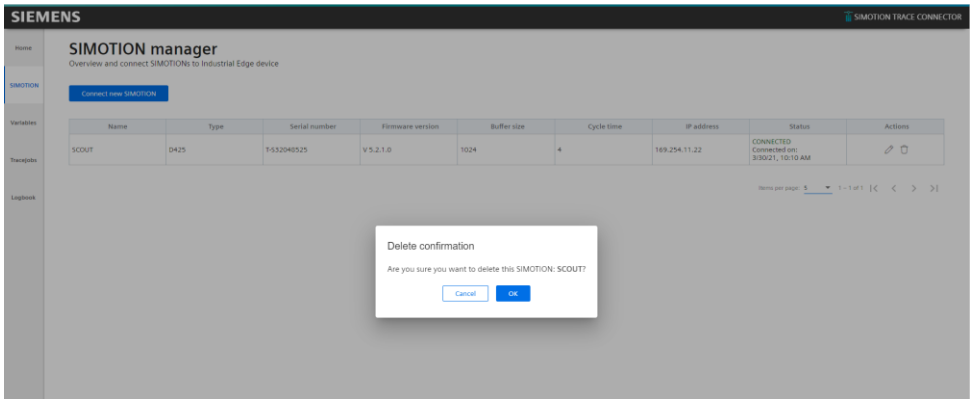


Figure 8 Delete SIMOTION

2.3 Variables

The “Variables” tab allows a user to preselect variables that will later be used to configure the tracejobs. The preselection must be done for each SIMOTION separately.

NOTICE	variable browsing function will only work with an activated WebServer on the SIMOTION controller. By default, the service is activated

After selecting a SIMOTION, the user can browse the variables loaded via OPCXML protocol and preselect them.

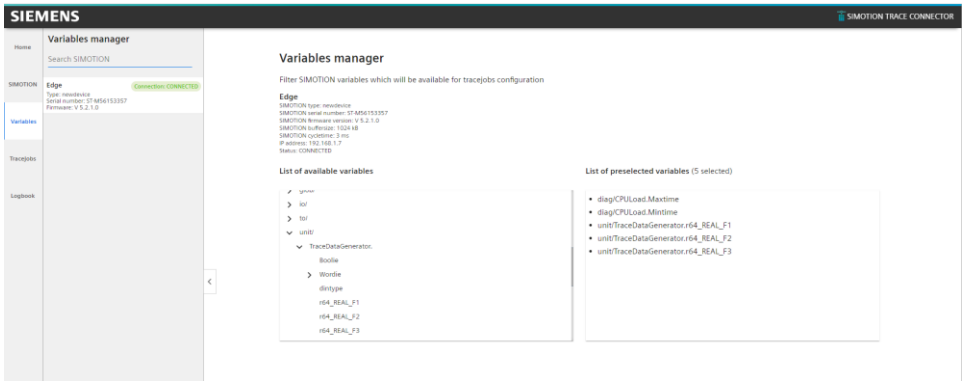


Figure 9 Variables manager

From the variables tree in the “List of available variables” the accessible variables can be freely selected. Click on them and they will automatically appear in “List of preselected variables” (Figure 9). To remove variables from the “List of preselected variables” click on the variable name, and it will be automatically deleted if it is not used by trace.

The attempt to delete a variable which is currently selected in some tracejob results in a pop-up error message (Figure 10).

NOTICE	variable that is set up in some trace cannot be deleted from “List of preselected variables”

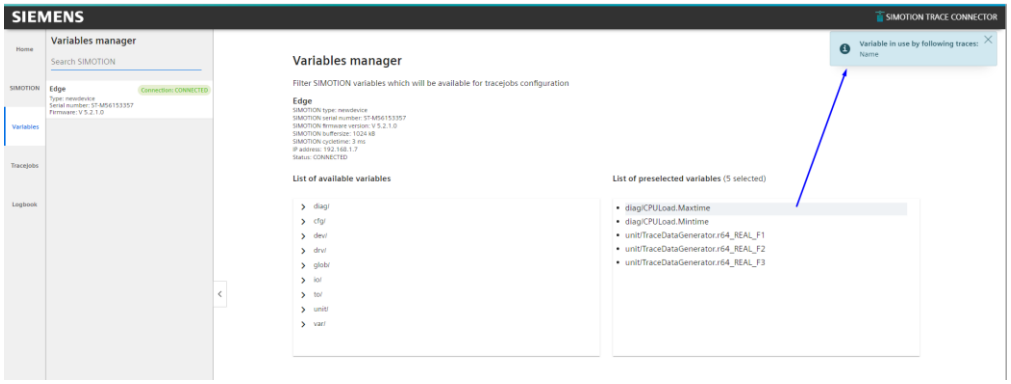


Figure 10 Variable deletion

2.4 Tracejobs

The “Tracejobs” tab allows user to configure and schedule traces for each setup SIMOTION controller. For the SIMOTION selected from the list, all defined tracejobs are listed in a table. Tracejobs table contains basic information about traces and it is possible to start, edit, duplicate and delete a tracejob configuration. The tracejobs are ordered according to their “date of change”, with the newest date on top of the list.

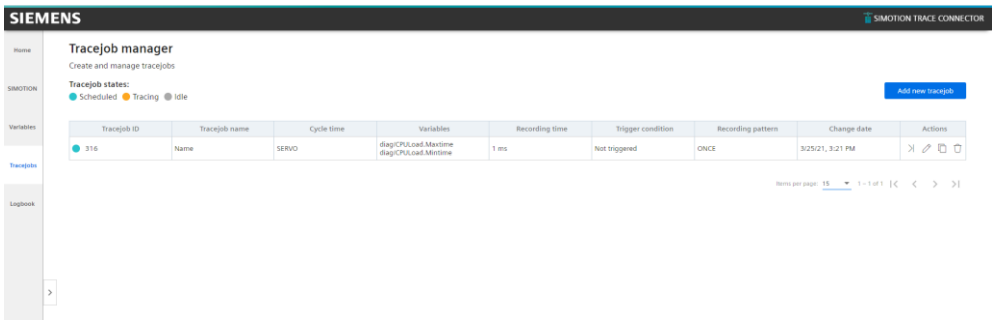


Figure 11 Tracejob Manager

2.4.1 Create new tracejob

To create a new tracejob click on the “Add New Tracejob” button. In the opened “Add New Tracejob” window it is possible to configure different options.

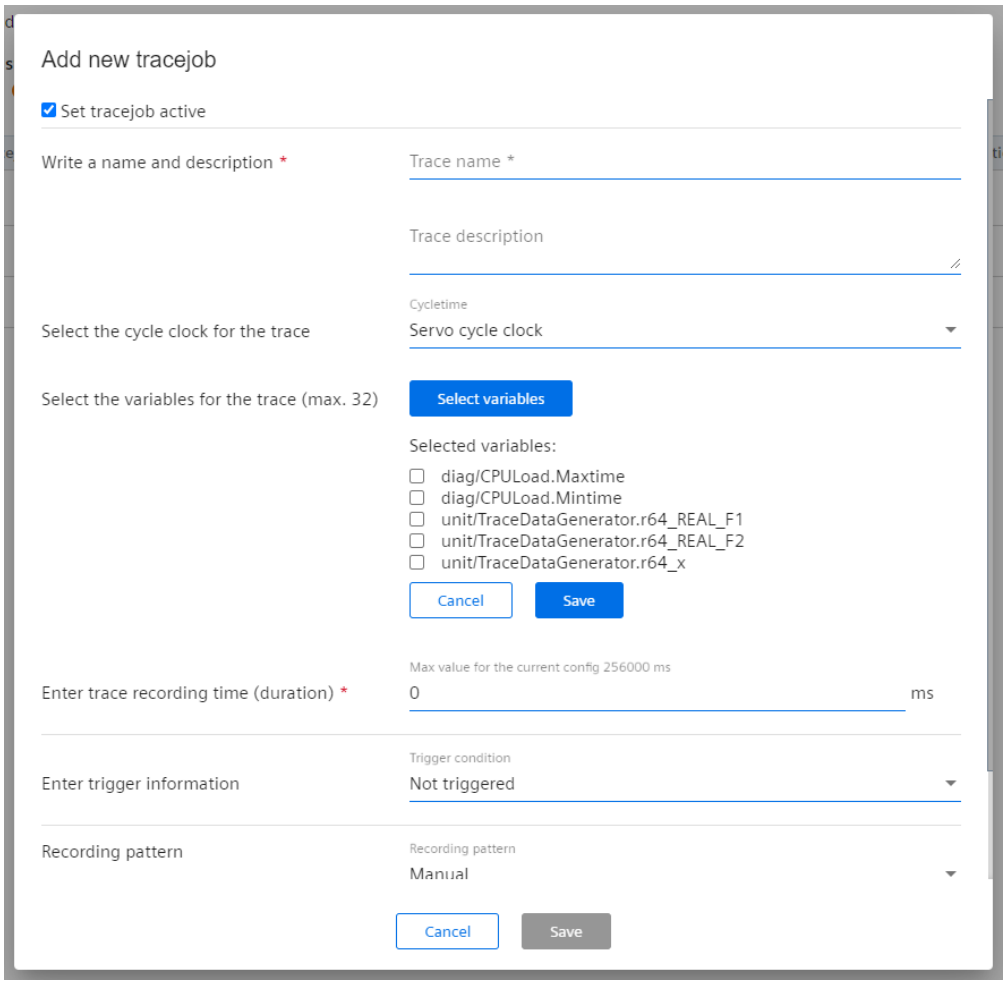


Figure 12 Tracejob configuration window

The following options can be configured within the configuration window (Figure 9):

- “Set tracejob active” checkbox activates the configured tracejob when it saved. Enable the tracejob.
- "Name" is required non-unique field. This name will be associated with a tracejob for better identification
- "Description" allows to attach a description of the tracejob
- "Cycle time" allows to select according to which SIMOTION cycle time clock the samples are going to be recorded. Default cycle type option is Servo Cycle clock. Other options are:
    - Servo Cycle clock,
    - IPO Cycle clock
    - IPO 2 Cycle clock.
- "Variable selection" is required field which allows to select variables from preselected variables defined in the "Variable” tab 2.3. All selected variables will be traced. Maximum number of variables for one trace is 32.
- "Recording time" is a required field in milliseconds. It defines the length of the trace recording time. The maximum recording time is calculated based on previous inputs: cycle time and variable selection, and is displayed above the input field
- "Trigger information" Input for trigger information is required. It allows to configure the trigger event of the tracejob. The different options are:

- Not triggered (default option). The tracejob can be triggered manually or scheduled. It will not be triggered automatically.
- Trigger on variable - Positive Edge. Defined variable will trigger the tracejob when the value is positive cross the configured threshold. Default threshold value is 0.
- Trigger on variable - Negative Edge. Defined variable will trigger the tracejob when the value is negative cross the configured threshold. Default value of the threshold is 0.
- Trigger on variable – Within a tolerance band. Defined variable will trigger the tracejob when the value is between the 2 specified limits.
- Trigger on variable – Outside a tolerance band. Defined variable will trigger the tracejob when the value is outside the range of 2 specified limits.
- Trigger on variable – Bit Pattern. Defined variable will trigger the tracejob when it has the same bit pattern as the comparison pattern. The bit mask and bit pattern are required in this case

• "Recording pattern" allows to schedule the tracejob on regular basis. By default, the tracejob is triggered based on a manual trigger event. The scheduler offers the following recording patterns:

- Manual
- Once
- Secondly
- Minutely
- Hourly
- Weekly
- Monthly
- Continuously

Further the start time and end time can be set by time or number of executions.

• “MQTT topic” allows the user to publish the recorded tracejob data on the internal SIMATIC IE Databus. By default if no MQTT topic is specified, the application will publish the recorded data as a json-file under, the default topic with following credentials:

User: edge

Password: edge

Topic: SIMOTIONTraceConnector/#

If the user wants to publish the trace data to another MQTT topic, he needs to specify it and input the topic name. The MQTT topic name needs to be created in the IE Databus application in advance with a default user: edge; password: edge.

For any MQTT topic the user will receive separate files for each variable and one file with all variables included. The Files will have a following path:

SIMOTIONTraceConnector/ SIMOTION-name/tracejobID/variable-name

SIMOTIONTraceConnector/ SIMOTION-name/tracejobID/fulltrace

NOTICE	it is not possible to schedule a tracejob if there is a time collision with an existing one

After the configuration of the tracejob the user needs to click on the “Save” button and the tracejob will be automatically added to the tracejobs table.

2.4.2 Tracejob status

The colored button in the front of each line indicate the status of the tracejob.

- Aqua blue: tracejob is scheduled and waiting for execution e.g. based on the scheduler
- Orange: tracejob is currently tracing
- Gray: tracejob is idle. Configured tracejob but not scheduled or running

A newly configured tracejob is automatically set as active by default. Because checkbox in the upper left corner “Set tracejob active” is checked. So, if user is not deselecting the checkbox manually and a recording pattern other than manual is selected then this new tracejob will show up in the list of tracejobs with a green circle in front of the tracejob ID.

NOTICE	multiple tracejobs can be “active” at the same time in the scheduler

Figure 13 Tracejob list with active tracejobs

2.4.3 Scheduling order/ process flow

SIMOTION can execute only one tracejob at a time, tracejob collision is not possible. In the Trace Connector application several tracejob sequences can be configured and be active at the same time but can’t be executed together. If the user tries to schedule a tracejob in a time slot that collide with an existing scheduled tracejob, the user will receive notification message with an error.

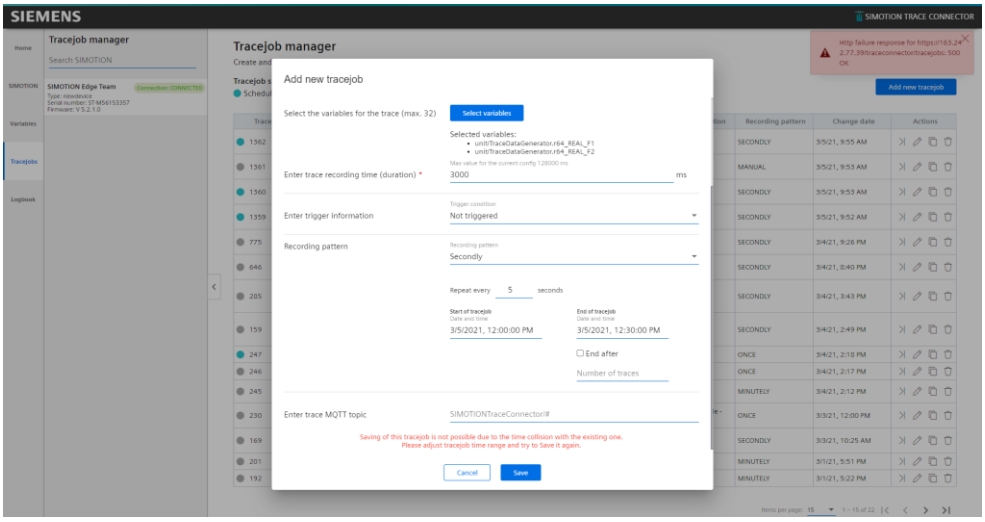


Figure 14 Tracejob collision error

It is possible to have multiple active tracejobs in a same time. For example, one tracejob sequence can be executed weekly and one daily if their end date has not come, both will be showed as active in the application.

In a case of Manual triggering Trace Connector put tracejobs in a queue and execute them one by one, not overwriting traces. Tracejobs are sent to SIMOTION based on FIFO (First In First Out) principle, so after one tracejob is finished, next one is taken. Manual tracejobs are put in a queue and executed when the next time slot is available.

Since multiple trace jobs can be active at the same time it is necessary to understand the sequence of operation of the tracejob scheduler. Following chart can help to understand this process:

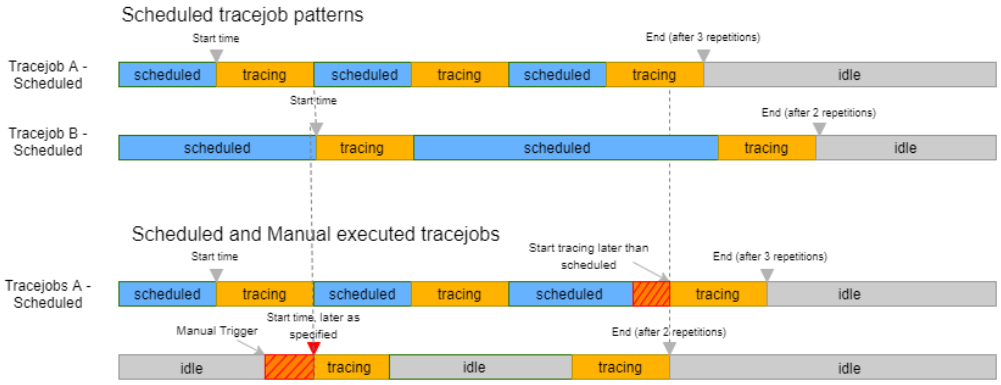


Figure 15 Difference between specified tracejob patterns and executed tracejob patterns

2.4.4 Edit tracejob

An already existing tracejob can be modified by clicking on the edit icon in the “Actions” column of the table. In opened “Edit tracejob” model user can modify needed fields and save them by clicking on a “Save” button. “Edit” functionality is similar to “Create new tracejob” functionality.

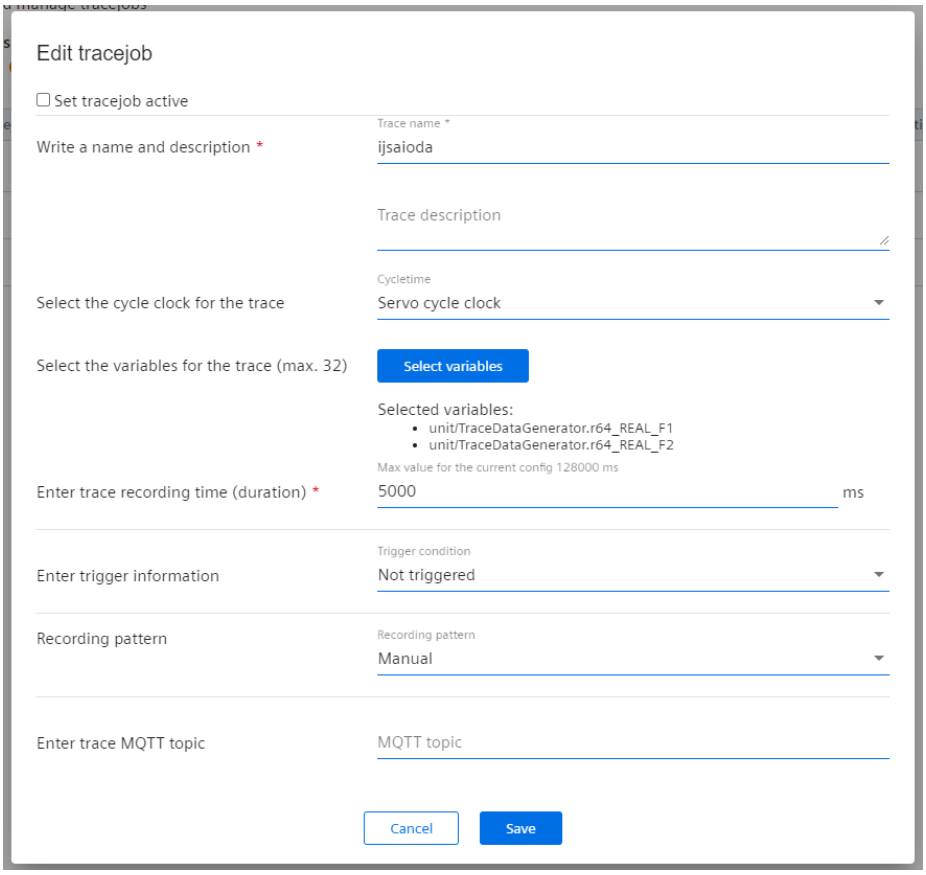


Figure 16 Edit tracejob

2.4.5 Delete tracejob

To delete a selected Tracejob:

1. Click on “Delete” icon in “Action” column of selected table row. “Delete confirmation” popup window should be opened (Figure 17)
2. Click “OK” button

After successful tracejob deletion information in the tracejob table will be updated automatically.

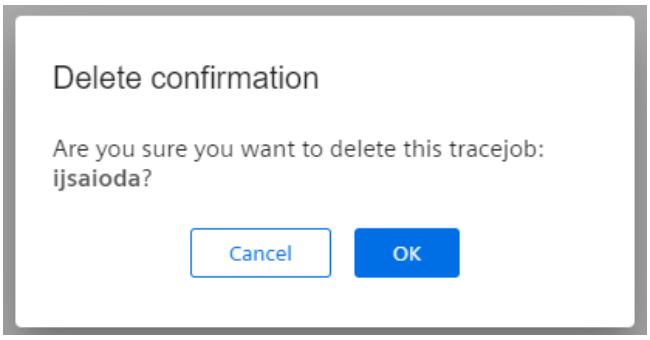


Figure 17 Tracejob delete confirmation

2.4.6 Tracejob scheduling and execution

The scheduling and automatic execution of a series of tracejobs is one of the main features of the SIMOTION Trace Connector. A built-in scheduler monitors the configured recording patterns of all active trace jobs. Shortly before a tracejob

needs to be executed it is sent to the SIMOTION controller for execution when there is currently no trace being run (see Figure 12)

There are several selection options for the recording pattern which can be clustered in 4 groups:

- **No recording pattern (default setting):**

Selector **“Manual**”:

No scheduling is applied to the tracejob.

Regardless whether the check box “set tracejob active” is ticked or not the tracejob will be listed in the tracejob list as idle. To execute this tracejob its run icon needs to be clicked.

- **One-time recording:**

Selector “**Once”**:

This leads to a single execution of the tracejob at the specified date and time.

After the first time configuration of this tracejob it will be set as active (default) and wait for the time trigger of its execution.

- **Repetitive recording**:

Selector **“secondly”, “minutely”, “hourly”, “daily”, “weekly”, “monthly”**:

The tracejob is executed between the set “start of tracejob” and “end of tracejob” date and time with the specified repetition cycle.

As an alternative to a specified end date of the recording pattern a number of repetition cycles can be chosen. To do so the user needs to select “End after” and input the number of cycles, instead of an end date. After the number of specified trace jobs was executed the scheduling will stop, and the tracejob will become idle.

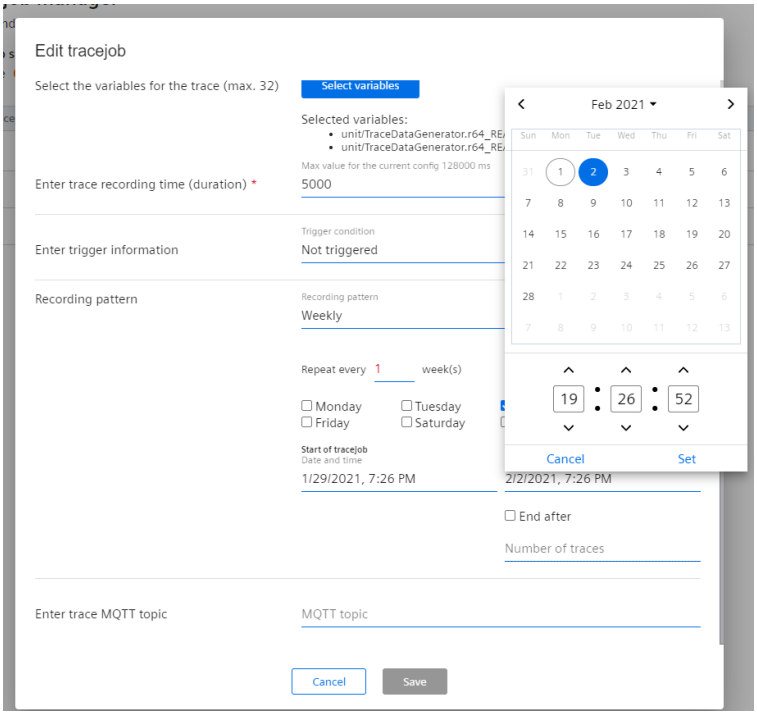


Figure 18 Tracejob configuration window with time picker for start / end date of a recording pattern

In Figure 18 a weekly repetitive recording pattern is selected. The selection of a start and end date of the tracejob defines the time range while the trace job is active. In the example above (Figure 18) the tracejob is active between December

1st at 2:00 p.m. and December 31st at 3:00 p.m.. However the tracejob will be only sent to the SIMOTION controller for execution on Wednesdays during the specified time range starting at 2:00 p.m.. This results in a recording pattern as shown in Figure 19

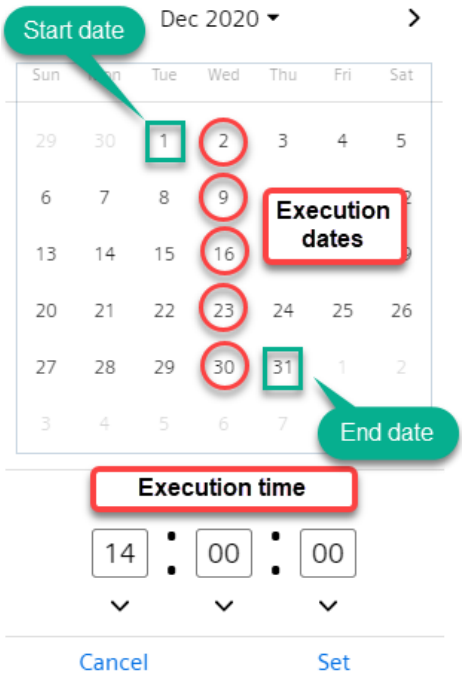


Figure 19 Execution dates and time as a result of the recording pattern

- **Continuous recording**:

Selector **“continuous”**:

The tracejob is continuously sent from the scheduler to the SIMOTION controller between the specified start and end date and time or the start date and time and until the specified number of recordings is achieved.

NOTICE	selection of the continuous recording pattern will not result in an endless trace. Tracejobs have specified duration and are executed in a queue one after another. Tracejob duration is an exact time in milliseconds, it can’t be endless

2.5 Logbook

The “Logbook” tab contains a table with logs of all executed tracejobs. The Table includes tracejob date and time, SIMOTION name, SIMOTION type, SIMOTION serial number, SIMOTION firmware version, SIMOTION recording time, SIMOTION cycle clock, tracejob name, tracejob id and tracejob status columns (Figure 20)

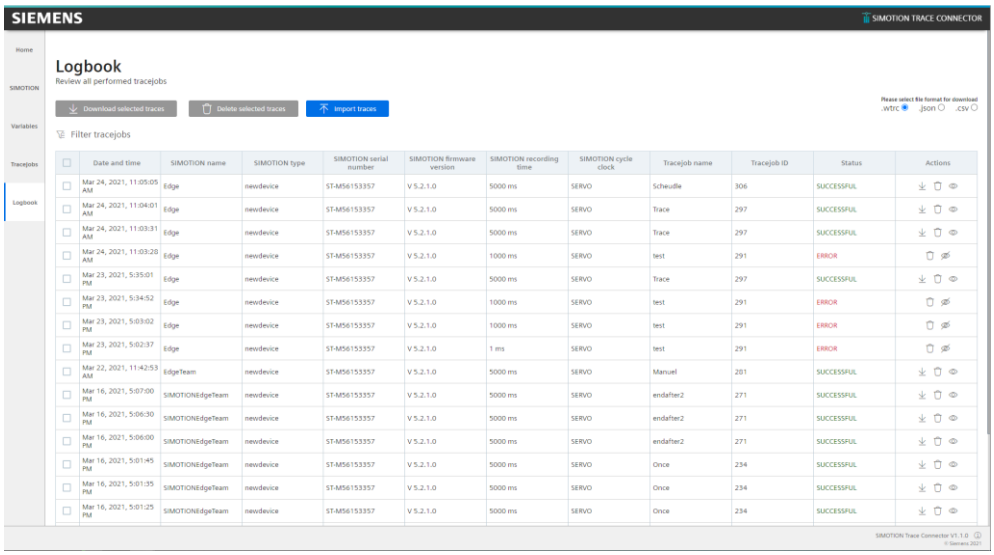


Figure 20 Logbook

2.5.1 Sort and filter tracejobs

Tracejobs table can be sorted and filtered by any column. For sorting one needs to click on the column header. An “Arrow” icon near the column name indicates the column which is currently the active sorting column. If the arrow icon faces upwards the column is sorted in ascending and if it faces downwards in descending order.

For filtering user needs to:

1. Click on ‘Filter tracejobs’ entry next to the funnel icon
2. Select column to filter
3. Input the correct value for filtering
4. Click on the “OK” button

After sorting and filtering the Logbook table will be updated automatically.

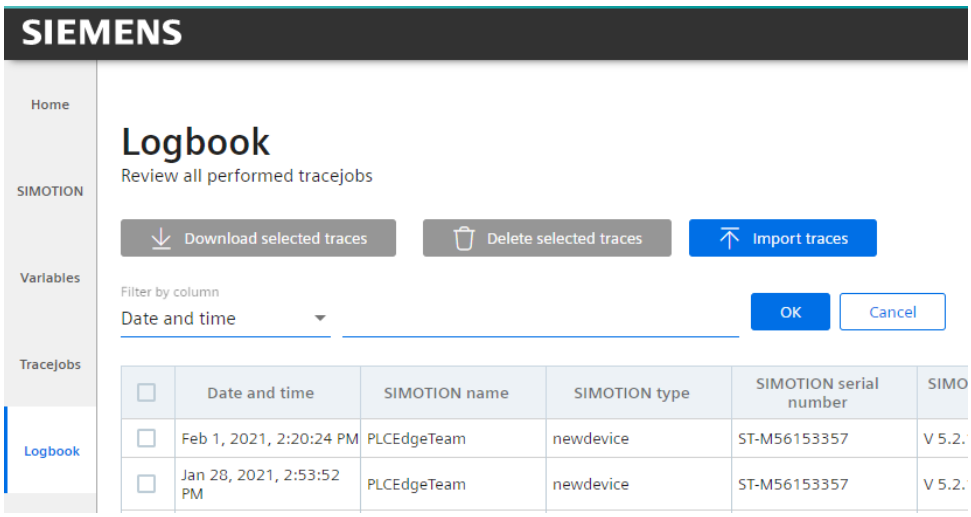


Figure 21 Logbook filtering and sorting

2.5.2 Delete tracejobs

Recorded tracejobs can be deleted from the database. To delete a tracejob the user needs:

1. Select tracejobs for multiple tracejob deletion
2. Click on “Delete selected tracejobs” or delete” icon in the action column of the selected tracejob row for single tracejob deletion. After “Delete confirmation” screen should be opened (Figure 22)
3. Click “OK” button to confirm delete action

After deletion Logbook table will be automatically updated.

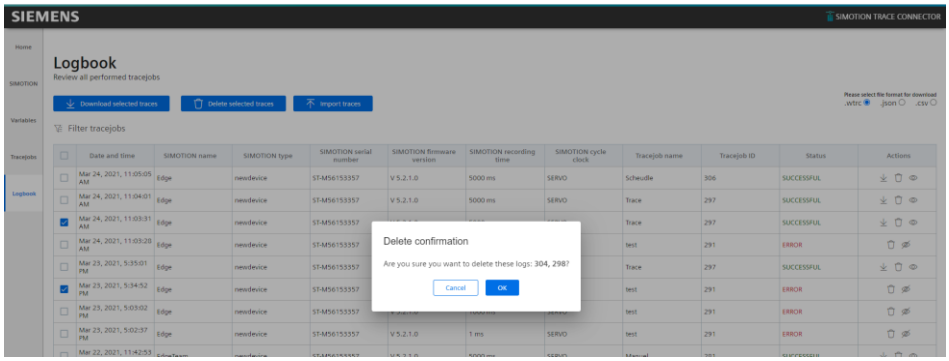


Figure 22 Logbook delete confirmation

2.5.3 Download tracejobs

Recorded tracejobs can also be downloaded to a local storage in the following file formats:

.wtrc, .json or .csv.. For downloading tracejobs the user needs to:

1. Select tracejobs
2. Chose file format: .wtrc, .json, .csv
3. Click “Download Selected Traces”

After successful download a “trace_data.zip” archive will be saved to a local folder.

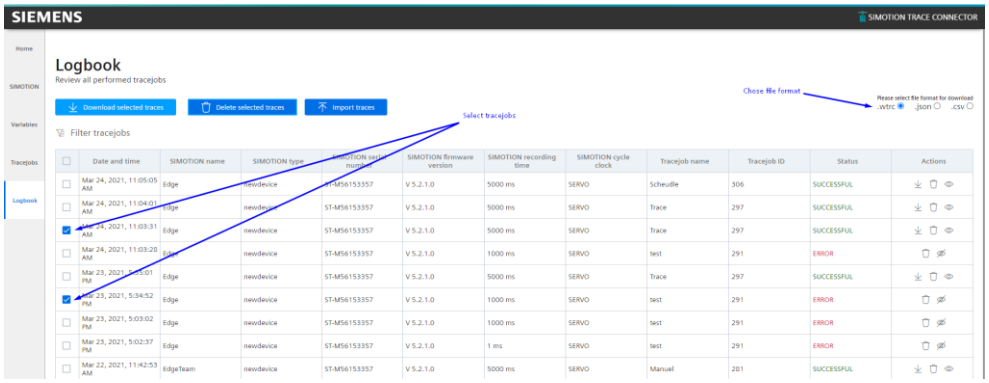


Figure 23 Logbook download tracejobs

2.5.4 Import Traces

Traces can be imported to the Logbook. For a trace import the user needs to:

1. Click “Import traces” button
2. Select an archive with data in a correct format (.wtrc, .json, .csv) from a local folder (Example: trace_data.zip)

NOTICE	identical traces cannot be added multiple times. Traces in the Logbook table should be unique

2.5.5 Trace visualization

Trace data can be visualized in a simple viewer. To open the visualization screen the user needs to click on the “View” icon in the Action column of the selected trace. In the viewer variables can be shown or hidden by clicking on the variable name. The displayed chart can be saved as an image to local folder by clicking on the “Download” icon in the top right corner of the window. To close this visualization screen the user has to click on a blank space outside the popup.

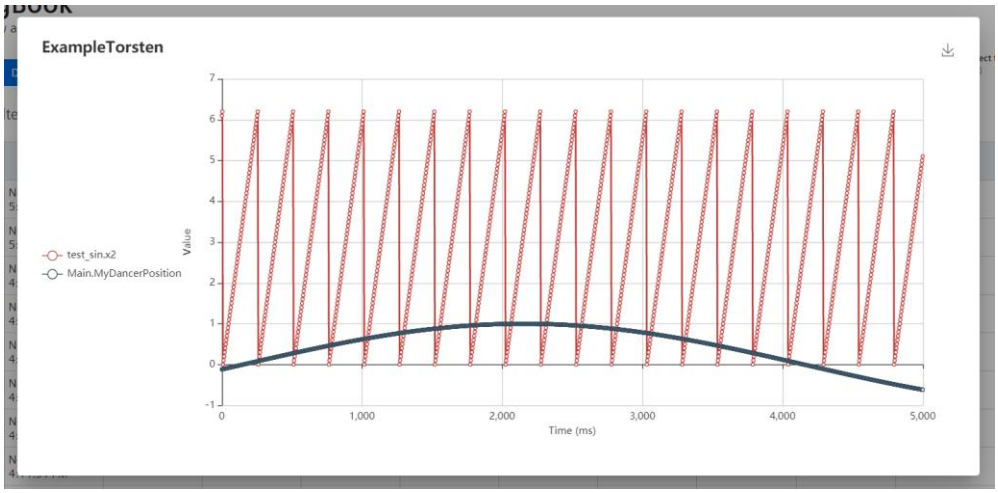


Figure 24 Logbook trace visualization

2.6 FlowCreator

To subscribe to the MQTT topic and see the traces in a FlowCreator application the user needs to create a MQTT node.

1. Select “mqtt in” node under “network” tab and drag it to flow creation working area
2. Open node properties and enter topic name (Figure 25). Default one should be “SIMOTIONTraceConnector/#”, if user needs specific topic, he should input a custom name
3. Connect node to server by clicking on “Edit” icon (Figure 26)

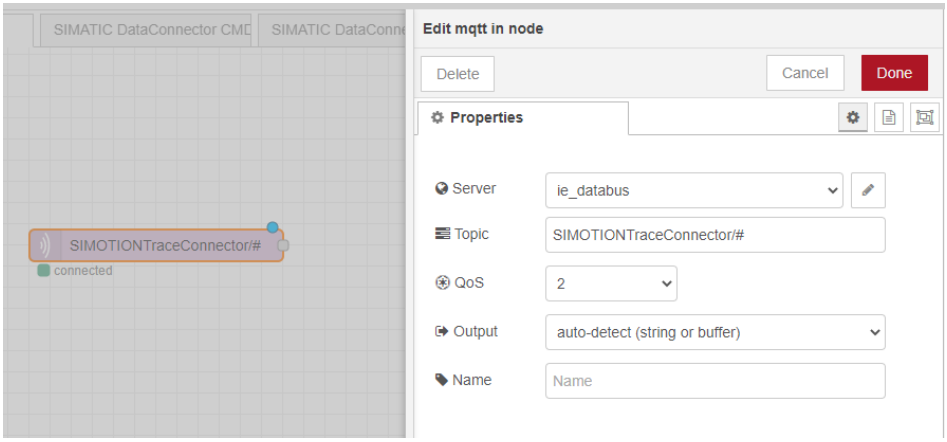


Figure 25 Node configuration

4. Input server name “ie_databus” with 1883 port in “Connection” tab
5. Input Username: edge and Password: edge in “Properties” tab
6. Click “Update”, user will be automatically returned to node properties

7. Click “Done” button

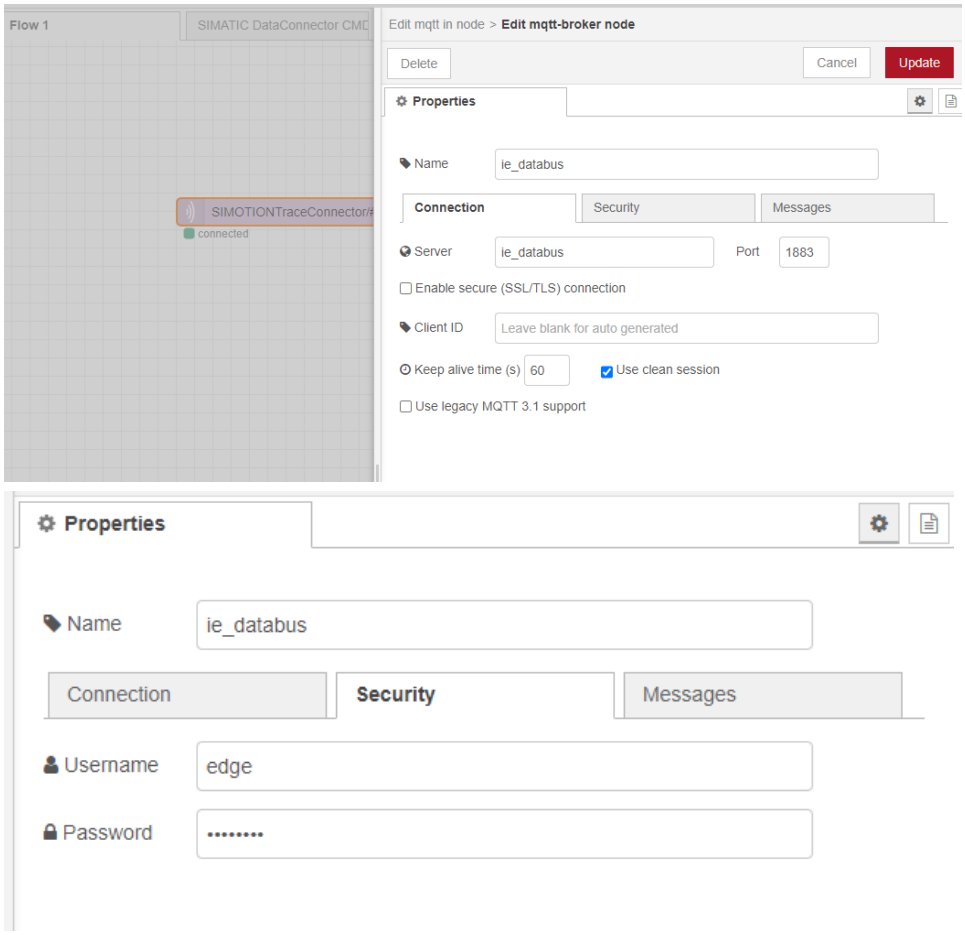


Figure 26 Server connection

8. Select “debug” node under “common” tab and drag it to flow creation working area

9. Connect “SIMOTIONTraceConnector/#” and debug nodes (Figure 27)

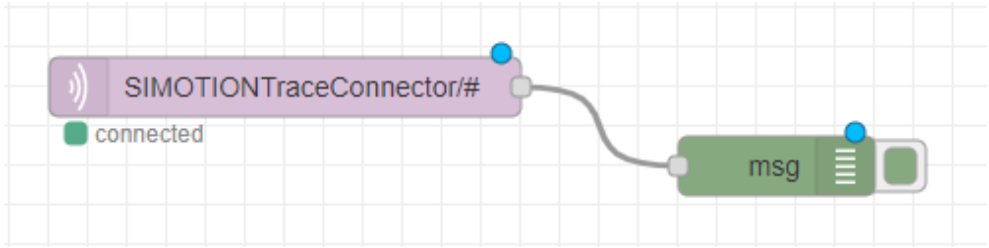


Figure 27 Nodes connection

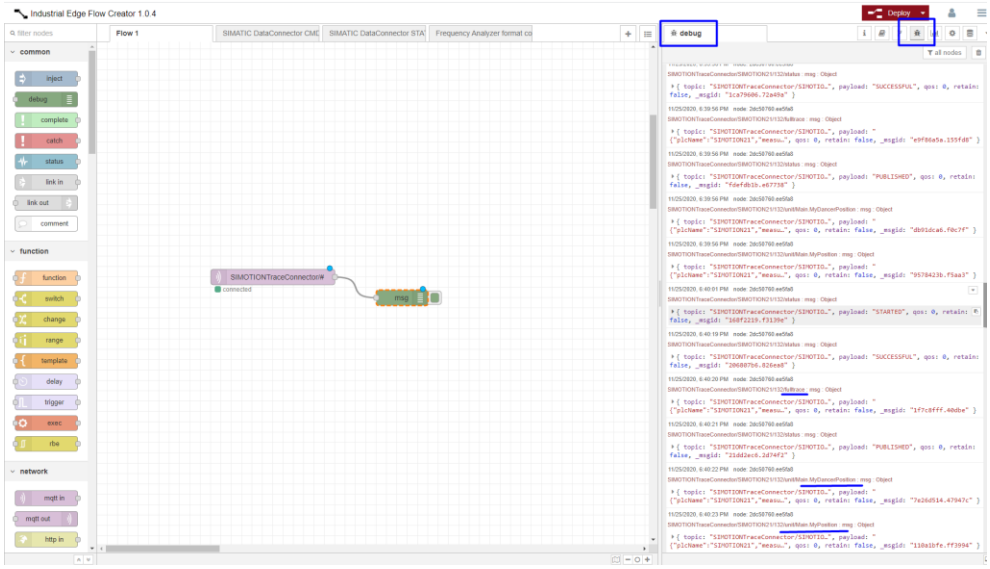


Figure 28 Trace view in FlowCreator application

After this process it would be possible to see traces in a debug tab of application. User will receive objects for each variable separately and also one for the full trace.

In Flow creator it is also possible to see the status of traces:

- Started
- Published
- Failed
- Error
- Successful

2.6.1 External triggering

SIMOTION Trace Connector allows to trigger a configured trace via MQTT by sending a JSON object to the topic SIMOTIONTraceConnector/trigger with the following input:

MQTT topic: SIMOTIONTraceConnector/trigger

JSON object : {

"id": TracejobID,

"priorityLevel": PriorityLevel

}

User needs to add two nodes in FlowCreator, node types are: inject and mqtt_out. For mqtt_out node topic should be created in IE Databus application in advance. After it should be connected to server with default user and password in FlowCreator (Figure 29).

User: edge

Password: edge

In inject node user needs to input JSON object (Figure 30). Example:

msg.payload = {"id":146,"priorityLevel":2}

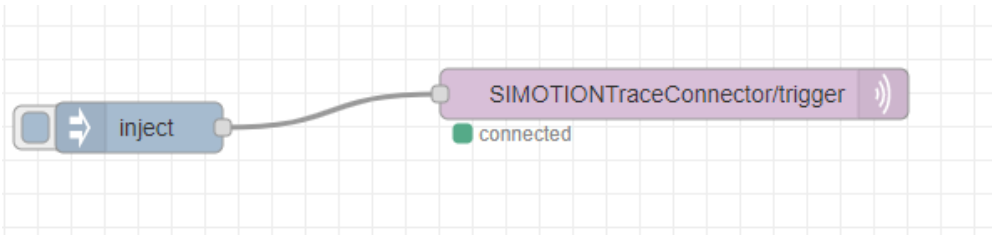


Figure 29 Server connection for trigger topic

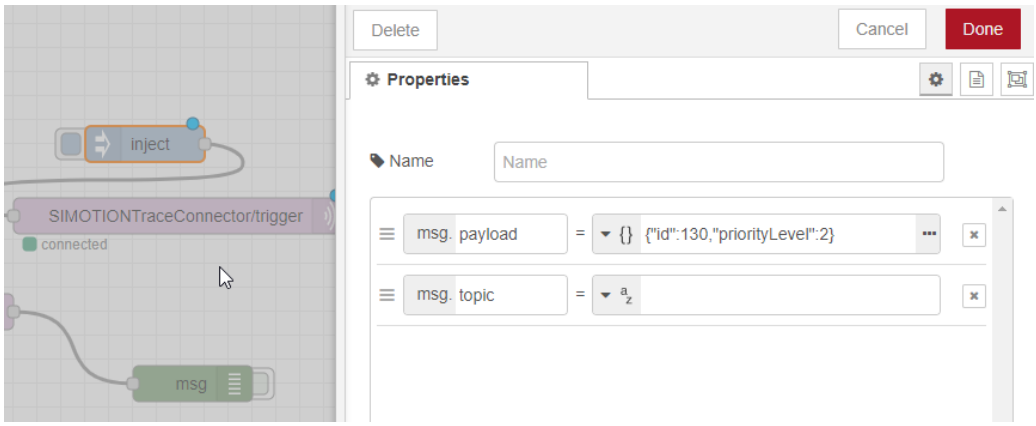


Figure 30 Inject node configuration

PriorityLevels are:

- 1 = stop other running tracejobs and execute tracejob immediately
- 2 (default) = execute when slot is free otherwise queue
- 3 = execute immediately when slot is free otherwise discard execution Recording pattern ONCE

After click “Deploy” button in a top right corner of the window. On successful injection status popup will be shown (Figure 31). In a debug tab it is possible to see tracejob information:

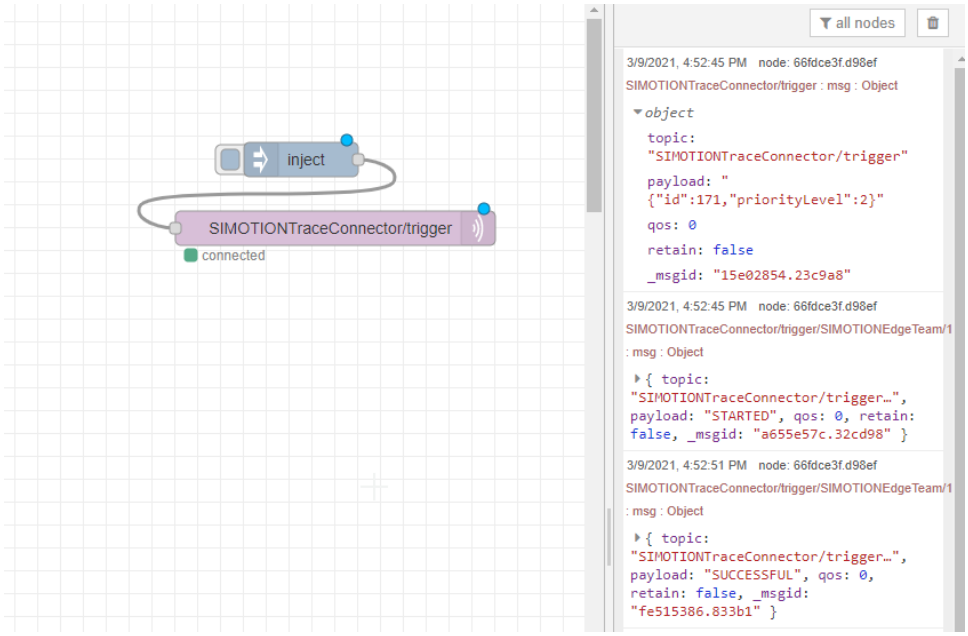


Figure 31 External trigger

SIMOTION Trace Connector supports the possibility to track the status of a configured tracejob under the following MQTT Topic path:

SIMOTIONTraceConnector/ SIMOTION-name/TracejobID/status

2.6.2 MQTT tracejob configuration

Using MQTT topic SIMOTIONTraceConnector/traceJobsConfig it is possible to receive tracejob object in a JSON format in a FlowCreator application.

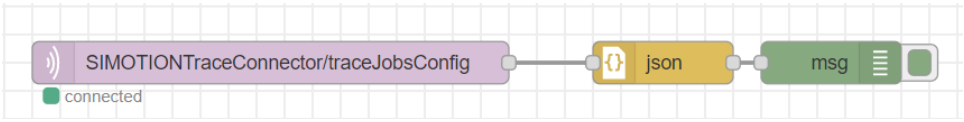


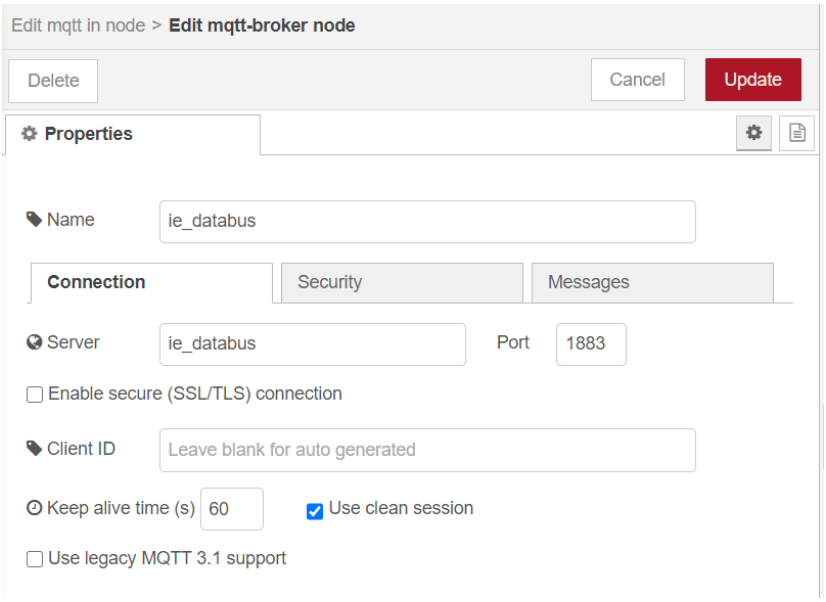
Figure 32 MQTT topic subscription

MQTT topic should be configured as an example below with:

Username: edge

Password: edge

in Properties -> Security tab of the mqtt node.



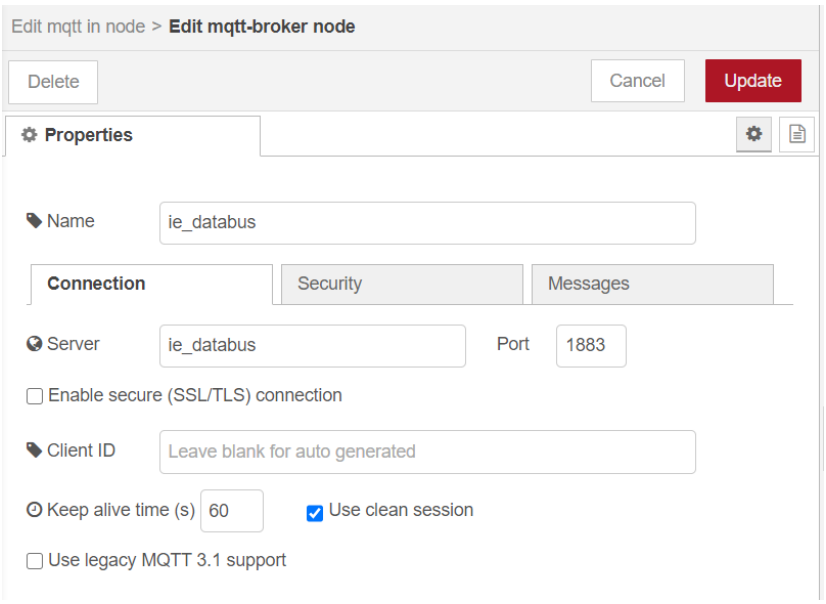


Figure 33 MQTT topic configuration

After topic configuration it is possible to receive information about tracejobs in json file format in a Debug tab. Received json example showed below(Figure 34):

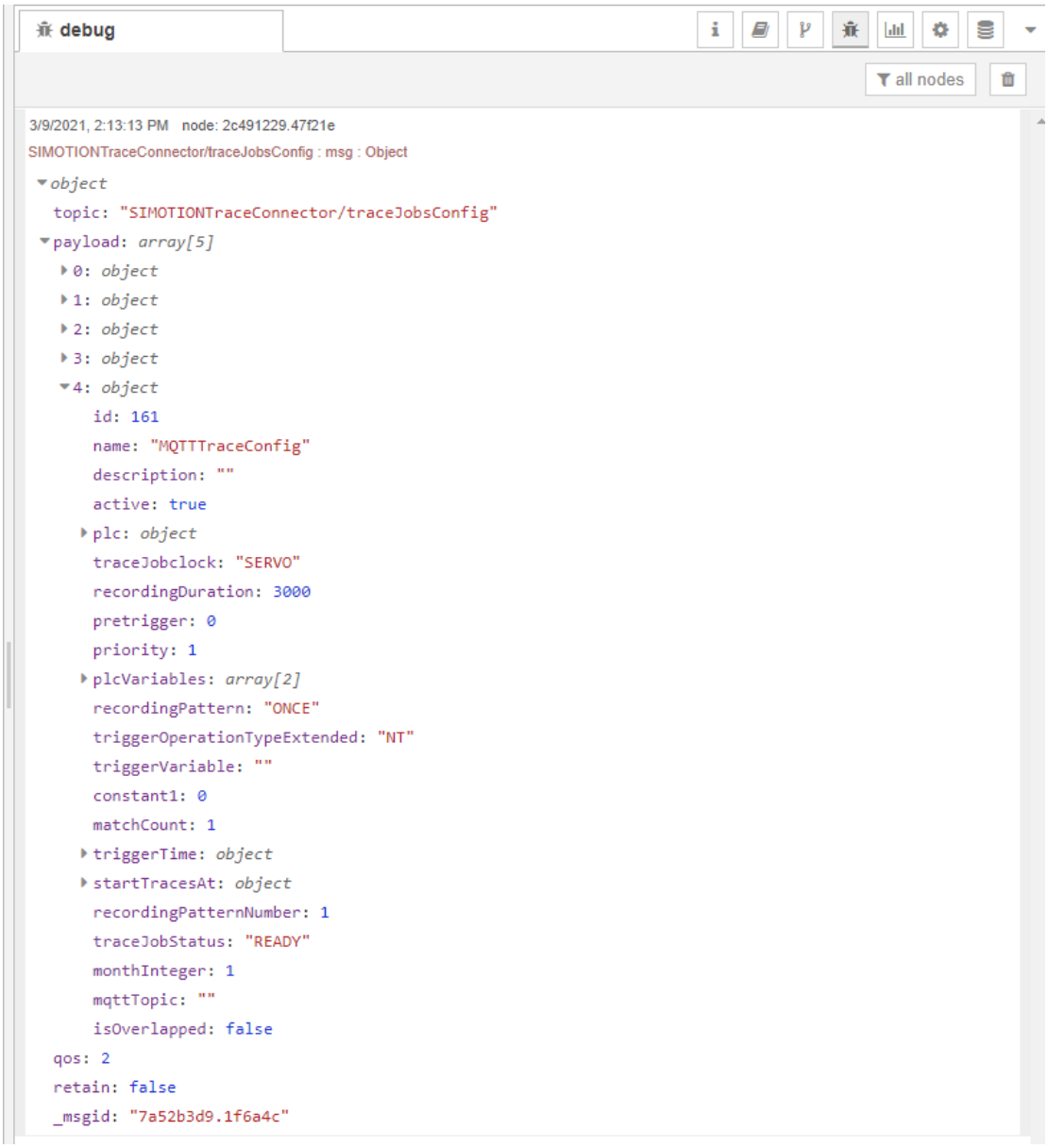


Figure 34 Tracejob JSON example

3 Appendix

3.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

support.industry.siemens.com

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts.

Please send queries to Technical Support via Web form:

support.industry.siemens.com/cs/my/src

SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

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Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android:

support.industry.siemens.com/cs/ww/en/sc/2067

3.2 Industry Mall

The Siemens Industry Mall is the platform on which the entire siemens Industry product portfolio is accessible. From the selection of products to the order and the delivery tracking, the Industry Mall enables the complete purchasing processing – directly and independently of time and location:
mall.industry.siemens.com

3.3 Related literature

Table 3-1

	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Download page of this entry https://support.industry.siemens.com/cs/ww/en/view/109784249

3.4 Change documentation

Table 3-2

Version	Date	Modifications
V1.0.5	12/2020	First version
V1.1.0	03/2021	First version