

PI Adapter for EntireX

Ensuring Exactly Once Processing in the Adapter

Version 4.1.2

April 2016

This document applies to PI Adapter for EntireX Version 4.1.2 and all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

Copyright © 2004-2016 Software AG, Darmstadt, Germany and/or Software AG USA, Inc., Reston, VA, USA, and/or its subsidiaries and/or its affiliates and/or their licensors.

The name Software AG and all Software AG product names are either trademarks or registered trademarks of Software AG and/or Software AG USA, Inc. and/or its subsidiaries and/or its affiliates and/or their licensors. Other company and product names mentioned herein may be trademarks of their respective owners.

Detailed information on trademarks and patents owned by Software AG and/or its subsidiaries is located at <http://softwareag.com/licenses>.

Use of this software is subject to adherence to Software AG's licensing conditions and terms. These terms are part of the product documentation, located at <http://softwareag.com/licenses/> and/or in the root installation directory of the licensed product(s).

This software may include portions of third-party products. For third-party copyright notices, license terms, additional rights or restrictions, please refer to "License Texts, Copyright Notices and Disclaimers of Third-Party Products". For certain specific third-party license restrictions, please refer to section E of the Legal Notices available under "License Terms and Conditions for Use of Software AG Products / Copyright and Trademark Notices of Software AG Products". These documents are part of the product documentation, located at <http://softwareag.com/licenses> and/or in the root installation directory of the licensed product(s).

Use, reproduction, transfer, publication or disclosure is prohibited except as specifically provided for in your License Agreement with Software AG.

Document ID: XIE-PROG-412-20191119

Table of Contents

1 About this Documentation	1
Document Conventions	2
Online Information and Support	2
Data Protection	3
2 Ensuring Exactly Once Processing in the Adapter	5
Prerequisites	6
Asynchronous Processing in the Sender Adapter	6
Asynchronous Processing in the Receiver Adapter	7

1 About this Documentation

▪ Document Conventions	2
▪ Online Information and Support	2
▪ Data Protection	3

Document Conventions

Convention	Description
Bold	Identifies elements on a screen.
Monospace font	Identifies service names and locations in the format <code>folder.subfolder.service</code> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies: Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies: Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the symbol.
[]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

Online Information and Support

Software AG Documentation Website

You can find documentation on the Software AG Documentation website at <http://documentation.softwareag.com>. The site requires credentials for Software AG's Product Support site Empower. If you do not have Empower credentials, you must use the TECHcommunity website.

Software AG Empower Product Support Website

If you do not yet have an account for Empower, send an email to empower@softwareag.com with your name, company, and company email address and request an account.

Once you have an account, you can open Support Incidents online via the eService section of Empower at <https://empower.softwareag.com/>.

You can find product information on the Software AG Empower Product Support website at <https://empower.softwareag.com>.

To submit feature/enhancement requests, get information about product availability, and download products, go to [Products](#).

To get information about fixes and to read early warnings, technical papers, and knowledge base articles, go to the [Knowledge Center](#).

If you have any questions, you can find a local or toll-free number for your country in our Global Support Contact Directory at https://empower.softwareag.com/public_directory.asp and give us a call.

Software AG TECHcommunity

You can find documentation and other technical information on the Software AG TECHcommunity website at <http://techcommunity.softwareag.com>. You can:

- Access product documentation, if you have TECHcommunity credentials. If you do not, you will need to register and specify "Documentation" as an area of interest.
- Access articles, code samples, demos, and tutorials.
- Use the online discussion forums, moderated by Software AG professionals, to ask questions, discuss best practices, and learn how other customers are using Software AG technology.
- Link to external websites that discuss open standards and web technology.

Data Protection

Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.

2 Ensuring Exactly Once Processing in the Adapter

- Prerequisites 6
- Asynchronous Processing in the Sender Adapter 6
- Asynchronous Processing in the Receiver Adapter 7

Prerequisites

An asynchronous PI message cannot have a reply message. Thus the RPC program which creates the asynchronous PI message (Sender Adapter) or receives an asynchronous PI message (Receiver Adapter) must have INPUT parameters only. Parameters of direction OUT or INOUT are not allowed.

If you want to perform Exactly Once Processing, we recommend using the message protocol "EntireX Reliable RPC".

The remainder of this section describes the necessary steps to use Exactly Once Processing with the message protocol "EntireX RPC". It does not apply to Reliable RPC.

Since the standard RPC functionality uses (on a technical level) a synchronous request reply model, an RPC request always has a reply. In case of an asynchronous PI message, the reply generated by the RPC Server (Receiver scenario) or PI Adapter (Sender scenario) is "empty", which means that it basically contains a return code only.

Asynchronous Processing in the Sender Adapter

If an RPC Client application sends a message to the Sender Adapter the following steps are taken:

1. The RPC Client sends an RPC Call to the PI Adapter (INPUT parameters only).
2. The Adapter processes the RPC Call (conversion to XML), creates a PI message with Quality of Service Exactly Once and passes the message to the Adapter Engine
3. The Adapter sends back a reply (without payload data) to the RPC Client. This step happens in parallel to the further processing of the message in PI.

The following scenarios are possible on the client side:

1. The RPC Client receives a positive answer from the Adapter: the message has been delivered successfully.
2. The RPC Client receives a return code, which is neither a timeout nor a communication error: the message could not be delivered. The RPC Client should resend the message (in case of a configuration problem: first correct the configuration issue).
3. The RPC Client receives a return code, which is a timeout or a communication error: it is unclear if the message has been delivered. The RPC Client should resend the message. However, in this case the message might be delivered more than once.

So far, delivery of the message is guaranteed, but duplicates are possible.

If duplicate messages cannot be handled by the PI scenario and should not occur the following additional feature can be used:

- Optionally the RPC Client application creates a unique Message ID (UUID/GUID) as part of the message payload
 - This is always the first parameter of the RPC call, format has to be A36
 - Uniqueness is guaranteed by the Adapter within the scope Adapter/Broker/Serveraddress/Programname
- If the RPC Client sends a new message it must use a new Message ID
- If the RPC Client resends a message it must use the same Message ID
- Once the Adapter has successfully delivered the message to PI, it persists the Message ID
- If the Adapter receives a message with an already persisted Message ID the message will not be delivered again to PI

Exactly Once is now guaranteed, no duplicate messages will be created.

Asynchronous Processing in the Receiver Adapter

If the Receiver Adapter sends a message to the RPC Server application the following steps are taken:

1. The Adapter Engine passes a PI message with QoS Exactly Once to the PI Adapter.
2. The Adapter processes the PI message (conversion from XML), creates an RPC Call (only INPUT parameters) and calls the RPC Server.
3. The Adapter waits for a reply from the RPC Server (without payload data). Depending on the answer the Adapter either returns a Delivery Acknowledgement of type "deliveryAck" (if the RPC call was successful) or (in case of error) of type "deliveryErrorAck" back to the Integration Server.

The following scenarios are possible on the Sender Adapter side:

1. RPC Server returns no error to the Adapter: message has been processed successfully.
2. Adapter receives a return code, which is neither a timeout nor a communication error: message has not been processed. PI will resend the message to the Adapter, Adapter will call the RPC Server.
3. Adapter receives a return code, which is a timeout or a communication error: unclear if the message has been processed. Adapter logs this unknown status, PI will resend the message to the Adapter.

So far, delivery of the message is guaranteed, but duplicates are possible.

If duplicate messages cannot be handled by the RPC Server application and should not occur the following additional feature can be used:

- Optionally the Adapter sends the unique Message ID of the PI message to the RPC Server application as part of the message payload
 - This is always the first parameter of the RPC call, format has to be A36
- The RPC Server application should use this Message ID for duplicate message detection

Exactly Once is now guaranteed, no duplicates will be processed in the Server application.