Euronext conformance testing and algorithm declaration policy

Document title

EURONEXT CONFORMANCE TESTING AND ALGORITHM DECLARATION POLICY

Document type or subject

Policy

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PREFACE

WHAT'S NEW?

The following lists only the most recent modification made to this revision/version. For the Document History table, see the Appendix.

REVISION NO./ VERSION NO.	DATE	AUTHOR	CHANGE DESCRIPTION
1.0	4 Sep 2017	Euronext	Initial document
2.0	10 Oct 2017	Euronext	Minor Updates
3.0	03 Mar 2020	Euronext	Type of Conformance Required for the different types of members and the new contact details

ASSOCIATED DOCUMENTS

The following list of items are the associated technical documents, which either should be read in conjunction with this document or which provide other relevant information for Members and/or ISVs:

■   Technical documents available at Euronext Connect web page:

   –   Euronext Markets – OEG Connectivity Specification
   –   Optiq OEG Client Specifications Fix 5.0 Interface
   –   Optiq OEG Client Specification SBE Interface
   –   Euronext Cash Markets Optiq Kinematics Specifications
   –   Euronext Cash and Derivatives Markets – Optiq MDG Client Specifications
   –   MDG Conformance test SBE template
   –   MDG Conformance guidelines

- MDG Conformance scripts
- OEG Cash Conformance test Script
- OEG Derivatives Conformance Test Script
- OEG Conformance guidelines
- Short long code management application (SLC Manager)

CONTACT

Please find below the contact details for customer support teams at Euronext. The Operational Client Services , Membership and Customer Access Services ("CAS") teams support the technical on-boarding of Clients and ensuring their readiness by:

- on-boarding new Clients;
- configuring access to the test and production environments;
- sending functional and technical information to Clients related to Euronext Projects;
- answering technical and functional Client questions related to Euronext Projects;
- assisting Clients in their testing and validation on the EUA (test) environment;
- providing follow-up on Client conformance testing; and
- assessing Clients' state of readiness with regards to technical changes.

Team	Contact details
Operational Client Services	▪ Tel: +33 1 85 148 585 ▪ Email: clientsupport@euronext.com
Membership	▪ Tel: +31 (0)20 721 4264 ▪ Email: EuronextMembership@euronext.com
Customer Access Services	▪ Tel: +33 1 8514 8589 ▪ Email: CAS@euronext.com

Opening hours: Monday – Friday: 09:00 to 18:00 CET

CONTENTS

1. INTRODUCTION

This policy sets out the approach undertaken by Euronext in order to allow a Member, an ASP or an ISV (as defined below) to:

(i) certify that their trading applications and algorithms used for Euronext comply with all applicable law and regulation; and

(ii) provide details of how to ensure a trading application or an algorithm is eligible for deployment in the Euronext production environment.

The policy is divided into the following categories:

- The conformance test process; and
- Algorithm declaration

2. SCOPE/DEFINITIONS

For the purposes of this document:

- "**Access**" means:
  - On Euronext hosted solutions:
    - ➢ Order entry access;
    - ➢ Market data access;
    - ➢ Web access (TCS, Atom-X, Saturn); and
  - On third party hosted solutions:
    - ➢ Access to Euronext Block and Euronext Synapse.

- "**API**" means Application Programming Interface

- "**ASP**" means an application service provider who provides hosted service solutions to enable the use of the Euronext Trading Platform.

- "**Clients**" means Members, ISVs and ASPs who offer trading algorithms and / or who develop, test and deploy applications that inter-operate with the Euronext Trading Platform.

- "**Euronext Trading Platform**" means any of Euronext's electronic trading platforms, as modified and updated by Euronext from time to time.

- "**ISV**" means an independent software provider who develops ISV Software (i.e. software that provides an interface between third party software and the Euronext Trading Platform to enable securities and/or derivatives to be traded on the Trading Platform and who provides that software to one or more Members or other service providers.

- "**Markets**" means:
  - o For Cash : Equities, Structured Products, Bonds, Funds, TCS, Euronext Block, Euronext Synapse; and
  - o For Derivatives : Options, Futures, Commodities.

- "**Market Data**" means any market information (but not that used in a test environment) including, without limitation, quotes, prices, volumes, timestamps and other data in respect of, amongst other things, indices and securities, bonds, futures contracts, option contracts, commodities and other financial instruments, which is (i) marketed by Euronext and/or any Euronext group company and (ii) made available to any third party by Euronext and/or any Euronext group company subject always to separate terms and conditions between the third party and Euronext and/or any Euronext group company, such terms being available from Euronext on request.

- "**Member**" or "**Market Member**" has the meaning ascribed to it in the Euronext Trading Platform Agreement.

3. CONFORMANCE TESTING

3.1 PURPOSE AND TIMING OF THE CONFORMANCE TEST

To ensure the integrity of the market, Clients are required to conform applications that interface with Euronext in order to (i) interact with Euronext's matching logic and (ii) process the data flows coming to and from Euronext, as described by the external specifications relevant to each of Euronext's applications.

Conformance testing shall verify the functioning of the following, as provided in Article 9 of RTS 7 (Article 48(6) of Directive 2014/65/EU):

> *(a) the ability of the system or algorithm to interact as expected with the trading venue's matching logic and the adequate processing of the data flows from and to the trading venue;*
>
> *(b) the basic functionalities such as submission, modification or cancellation of an order or an indication of interest, static and market data downloads and all business data flows;*
>
> *(c) the connectivity, including the cancel on disconnect command, market data feed loss and throttles, and the recovery, including the intra-day resumption of trading and the handling of suspended instruments or non-updated market data.*

Clients shall be required to have taken and validated conformance testing for its trading application at least two weeks prior to the deployment of:

- a new Euronext trading application,
- a substantial update of an existing Euronext trading system requiring Client development and testing,
- a new Client trading application, algorithm or trading strategy, or
- a substantial update to a Client's trading application, algorithm or trading strategy.

Depending on the scope of changes made to the trading applications as listed above, Clients will be asked to either pass a mandatory or optional conformance test. In addition, a selection of functions or supported types of orders may be excluded if not used by the Client.

Conformance testing is not required for the following algorithm components:

- order initiation,
- order amendments, or any kind of software which is not generating messages to Euronext applications.

3.2 CLIENT REQUIRED ACTIONS TO COMPLETE CONFORMANCE TESTING

In order to successfully complete their conformance testing, Clients are required to:

1. Complete their on-boarding process and connect to the test and production platforms;
2. Test the new or upgraded application in the EUA environment;
3. Pass the formal conformance test;
4. Deploy the application into the production environment; and
5. In some cases, activate a new order entry session.

3.2.1   COMPLETING ON-BOARDING AND CONNECTIVITY

Before testing and taking their conformance tests, Clients need to have previously undertaken the following actions:

- Finalise the Euronext membership on-boarding process, through **Euronext Membership**
- Obtain access to the Euronext External User Acceptance (EUA) and production platforms, through **CAS.**

3.2.2   TESTING IN THE EXTERNAL USER ACCEPTANCE (EUA) ENVIRONMENT

Before taking their conformance tests, Clients are required to thoroughly test the new or upgraded trading application's interaction, basic functionalities and connectivity on the Euronext External User Acceptance (EUA) platform by themselves.

The OCS team can provide assistance and provide activity on the EUA platform by injecting orders, generating trades or producing any type of event that are generally conducted by the Client Relationship Officers in the Production environment. For example, OCS can halt an instrument, change collars, or modify a price reference and settlement.

3.2.3   PASSING THE CONFORMANCE TEST

There is no limitation to the number of conformance tests a Client can undertake. However, it is recommended that Clients thoroughly test their trading application on their own or with the help of a OCS Analyst before taking the conformance test.

In order to take their conformance test, Clients are required to:

- Inform OCS of which market(s) and functionalities they would like to test, either through a dedicated web form or by contacting OCS by email; and
- Either schedule an appointment with a OCS Analyst to take the conformance test or perform the test by themselves, depending on the type of test (order entry, trade reporting, market data) and the platform (Central Order Book or other systems) where the test is taken.

Scheduling an appointment with a OCS Analyst needs to be done at least two working days in advance via email. Conformance tests can take place at the following times:

Day	Time (CET)
Monday	9 am – 5 pm
Tuesday	9 am – 5 pm
Wednesday	2 pm – 5 pm
Thursday	9 am – 5 pm
Friday	9 am – 5 pm

The table below details the different types of members and the kind of Conformance Required

Type of Member/non-member	Light/Full Conformance	Conformance tests
New Euronext member using in-house solution	Full	Mandatory
New Euronext member using a new ISV solution	Full	Mandatory
New Euronext member using existing ISV solution	Light	Mandatory
New ISV	Full	Mandatory
Existing Euronext member using in-house solution and a new TMC/Member code	Light	Optional
Existing Euronext member using ISV solution and a new TMC/ Member code	Light	Optional
Existing Euronext member using in-house solution and joining a new exchange platform (Cash, derivatives, TCS etc)	Full	Mandatory
Existing Euronext member using ISV solution and joining a new exchange platform (Cash, derivatives, TCS etc)	Full	Mandatory
Existing Euronext member implementing a new in-house solution	Full	Mandatory
Existing Euronext member implementing a new ISV solution	Full	Mandatory
Existing Euronext member implementing new functionalities on their in-house solution	Light	Mandatory
Existing Euronext member implementing new functionalities on their ISV solution	Light	Optional
Existing Euronext member becoming MM	Light	Mandatory
Existing Euronext member upgrading their in-house solution	Light	Mandatory
Existing Euronext member upgrading their ISV solution	Light	Optional
Existing ISV upgrading their solution	Light	Mandatory
Existing Euronext member using in-house solution and joining a new market (Paris/Ams/Bru/Lis/Dublin/Oslo)	Light	Optional

Existing Euronext member using ISV solution and joining a new market (Paris/Ams/Bru/Lis/Dublin/Oslo)	Light	Optional
Existing Euronext member using in-house solution and joining an existing contract/instrument	Light	Optional
Existing Euronext member using ISV solution and joining an existing contract/instrument	Light	Optional
Existing Euronext member using in-house solution and joining a new contract/instrument	Light	Request confirmation from OCS Analyst
Existing Euronext member using ISV solution and joining a new contract/instrument	Light	Request confirmation from OCS Analyst
New or Existing Euronext member joining TCS web or e-TCS platform	-	Not required
Existing Euronext member using in-house solution and changing of protocol	Full	Mandatory
Existing Euronext member using an ISV solution and changing of protocol	Full	Mandatory
Saturn	-	No Conformance test , Validation of solution is recommended via the [webform]().

When conformance tests do not require an appointment with a OCS Analyst, Clients are required to:

- Test their application by following a dedicated test script published on the Connect Portal on Euronext website, and
- Provide the results of the tests to the OCS team, usually through a web form on the Client's Connect interface.

To help rationalize the testing, the conformance test is split into two: Full and Light conformance tests

'Full' Conformance test offers a style test that examines all functional and technical aspects available for the platform/market the client is conforming to. It will allow customers to validate the full scope of the Optiq order entry gateway (OEG), taking into account all message types that will be offered. This testing will be made available across all markets, and across all product types.

'Light' Conformance test is offered only to existing customers that had passed already a full conformance tests and wish to implement new functionalities for a particular platform/market. During light conformance testing, only limited functional messages are tested
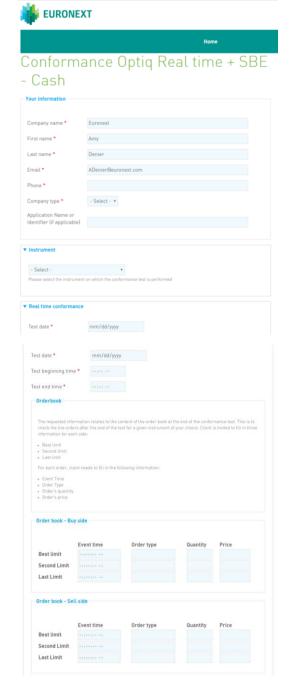
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Figure 1. Example of a web form for conformance testing without an appointment with OCS (partial)

Following the conformance test, the OCS Analyst will review the results of each test script to ensure that the test steps within each test script have been completed correctly and match the anticipated results.

Once these two requirements are complete, the OCS Analyst will provide feedback to the Client. If the test is successful, the Client will receive a certificate including the results of the conformance test and certifying the test was successfully completed. If the test is unsuccessful, the Client will receive feedback on where the test failed and why. The Client will be expected to make the necessary changes to its trading application and to pass the failed part of the conformance test again. The Client may directly liaise with the OCS Analyst if there is a perception that the issue causing the failure is linked to the conditions of the test environment.
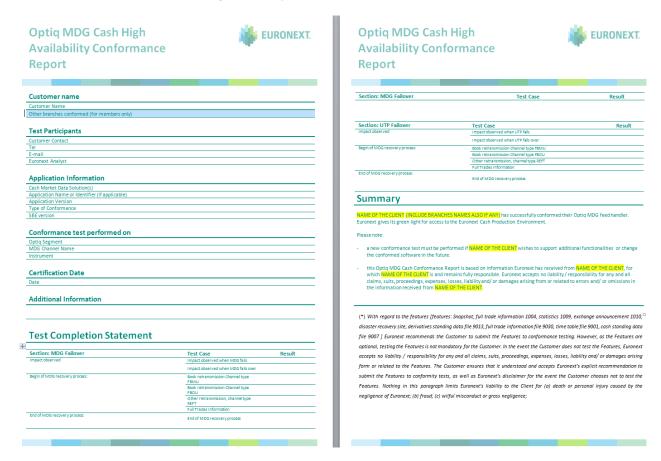
Figure 2. Example of a conformance test certificate

Conformance test scripts and associated guidelines can be found in the technical documentation section of the Euronext website:

- For legacy platform and current protocols, https://www.euronext.com/fr/it-documentation
- For Optiq platform, https://www.euronext.com/fr/optiq/documentation

3.2.4 DEPLOYMENT

Once the Client's trading application has successfully passed all the steps of the conformance test, it is eligible to be deployed and used in the Euronext production environment. Members will be authorised by Euronext to use the new software in the Euronext production environment. ISVs will be authorised by Euronext to deploy their conformed software to their customers.

3.2.5 TECHNICAL ACTIVATION SESSION

In case the launch of the trading application in production requires a new order entry session, an additional step may be required to ensure the application is configured properly. The Technical Activation Session ("**TAS**") is a test performed after the close of the market on the day prior to the expected first day in production. If passed successfully, this test allows the activation of the session and authorises the Client to inject orders on the production platform.

This test guarantees that the Client's application is properly configured and the initiation of the billing process in case the session is charged.

For more information on TAS, Clients are invited to contact the CAS team.

3.3   FAILURE TO PROVE CONFORMANCE TESTS HAVE BEEN SUCCESSFULLY PASSED

At any time, and in accordance with the relevant provisions of the Euronext Service Provider Agreement for ISVs or ASPs and/or the relevant provision of the Euronext Trading Platform Access Agreement for Members, Euronext can audit a Client. Where a technical or functional issue in the production environment is due to a Client application, Euronext will ask the Client to provide all the necessary evidence that a conformance test was successfully passed with the current version of the software.

If the Client fails to prove the software used in production is conformed, Euronext reserves the right to take any measure that it deems appropriate to guarantee the integrity of the market and the safety of the other market participants, including preventing access to the production environment by the application until a conformance test has been executed and successfully passed. It is the responsibility of the Client to ensure that the application used in production is compliant with applicable regulatory and Euronext requirements.

4.   ALGORITHM DECLARATION POLICY

4.1   PURPOSE AND TIMING OF ALGORITHM TESTING

Article 10 of RTS 7 (Article 48(6) of Directive 2014/65/EU) holds that *"Trading venues shall require their Members to certify that the algorithms they deploy have been tested to avoid contributing to or creating disorderly trading conditions prior to the deployment or substantial update of a trading algorithm or trading strategy and explain the means used for that testing."*

To avoid disorderly trading conditions, Euronext requires Members to have undertaken algorithm ("**algo**") testing for each of their trading algorithms prior to the deployment of:

- a new trading algorithm; or
- a material change made to an existing trading algorithm.

4.2   MEMBER REQUIRED ACTIONS

In order to successfully complete their algorithm declaration, Members are required to:

1. Complete their on-boarding, connectivity and conformance testing;
2. Test the algo in the EUA environment;
3. Document the algo testing methodology and change management policy
4. Certify and deployment the algo in the production environment;
5. Declare the Algo ID short and long code.

4.2.1   COMPLETING ON-BOARDING, CONNECTIVITY AND CONFORMANCE TESTING

Before completing their algo declaration, Clients need to have previously undertaken the following actions:

- Finalised the Euronext membership on-boarding process, through **Euronext Membership**;
- Obtained access to the Euronext External User Acceptance (EUA) and production platforms, through **CAS**; and
- Validated conformance testing of the trading application through which the algorithm will be deployed, with **OCS.**

4.2.2   TESTING THE ALGO IN THE EUA ENVIRONMENT

Members are required to thoroughly test algorithms prior to the deployment or substantial update of a trading algorithm or trading strategy to avoid contributing to or creating disorderly trading conditions. Euronext members are expected to perform their own algo testing in a 'suitable' test environment. Test environments can be a combination of the Euronext External Use Acceptance (EUA) platform, the customer's own test environment, or a third-party environment. Conditions to test algos must be equivalent to the production platform in terms of number and nature of Exchanges/platforms, instruments covered, volumes and types of orders received and injected, replay of exceptional events etc.

Members may leverage the Euronext EUA platform to perform algo testing under specific scenarios, such as stressed market conditions on particular instruments and abnormal events or situations. Please contact the OCS team to obtain more information on the Euronext testing environment.

4.2.3 DOCUMENT THE ALGO TESTING METHODOLOGY AND CHANGE MANAGEMENT POLICY

Members are required to clearly and thoroughly document their **algo testing methodology** by describing:

- the tests;
- the scope;
- the occurrences; and
- the tools utilised to conduct the tests.

Furthermore, Members are required to document their **change management policy**. This should include details of:

- how a software upgrade is performed in the production environment;
- what type of checks are made, by whom and when;
- what the mitigation plan is in case of failure; and
- how a rollback of the application can be executed.

These two documents need to be provided to Euronext upon request at least once a year, in accordance with Article 7 of RTS 7 (Article 48(1) of Directive 2014/65/EU).

A template for providing this information will be made available on the Euronext website at a later date.

For the avoidance of doubt and in accordance with applicable terms, Euronext disclaims all liability to the furthest extent under applicable law in relation to Members' activities on the Production environment.

4.2.4 CERTIFY AND DEPLOY THE ALGO IN THE PRODUCTION ENVIRONMENT

Once the Member has fully tested the algo, and documented the testing methodology and change management procedures, the algo is eligible to be deployed and used in the Euronext production environment. Upon using the algo in the Euronext production environment, the Member self-certifies that the algo has been properly tested.

4.2.4.1 ALGO DECLARATION

Any algorithm interacting with a Euronext platform must be uniquely identified with an Algo ID. Upon order entry, Members are required to identify the algo responsible for the decision making as well as the algo responsible for making the execution, using the 'short code' of the respective Algo ID. Short codes deployed in order entry are to be 'declared' via a mapping to the Algo ID 'long code' and 'code type' via the dedicated Short Long Code (SLC) Manager tool. Members are required to generate their own short codes. Members deploying an ISV algo may rely on the ISV to generate a short code, using negative integers appointed to the ISV by Euronext OCS.

New Algo ID declarations (mappings) are to be submitted to Euronext no later than 22:30 CET on the day algo has injected orders on a Euronext platform for the first time. Euronext will use the Algo ID long code in combination with order entry data for the purpose of regulatory reporting under RTS 24 of MiFID II. Please refer to the SLC Manager specifications for more information about the declaration of short and long code mappings.

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