FAQ about algorithmic trading

This document is for information purpose only, and shall not be interpreted as legally binding towards its author (EPEX SPOT SE). For more information on legal obligations, please refer to EPEX SPOT Rules and Regulations in the download section of our website www.epexspot.com.

What is algorithmic trading?

In general terms, algorithmic trading refers to the use of systems for trading, in which a computer algorithm automatically determines individual parameters of orders, with limited or no human intervention.

Currently, no regulation applicable to spot markets provides any definition of algorithmic trading. Under MIFID II[1], "algorithmic trading" refers to trading in financial instruments where a computer algorithm automatically determines individual parameters of orders such as whether to initiate the order, the timing, price or quantity of the order or how to manage the order after its submission, with limited or no human intervention, and does not include any system that is only used for the purpose of automatic routing orders to one or more trading venues or for the processing of orders involving no determination of any trading parameters or for the confirmation of orders or the post-trade processing of executed transactions.

"A system shall be considered as having no or limited human intervention where, for any order or quote generation process or any process to optimise order-execution, an automated system makes decisions at any of the stages of initiating, generating, routing or executing orders or quotes according to pre-determined parameters[2]".

What is the difference between algorithmic trading and high frequency trading (HFT)?

High-frequency trading is a specific **subset of algorithmic trading** where a trading system analyses data or signals from the market at **high speed** and then sends or updates **large numbers of orders within a very short time** period in response to that analysis. In particular, high-frequency algorithmic trading may contain elements such as order initiation, generating, routing and execution which are determined by the system without human intervention for each individual trade or order, short time-frame for establishing and liquidating positions, high daily portfolio turnover, high order-to-trade ratio intraday and ending the trading day at or close to a flat position. High-frequency algorithmic trading is characterised, among others, by high message intraday rates which constitute orders, quotes or cancellations.[3]

Under MIFID II[4] "high-frequency algorithmic trading technique" means an algorithmic trading technique characterised by:
  (a)   infrastructure intended to minimise network and other types of latencies, including at least one of the following facilities for algorithmic order entry: co-location, proximity hosting or high-speed direct electronic access;
  (b)   system-determination of order initiation, generation, routing or execution without human intervention for individual trades or orders; and
  (c)   high message intraday rates which constitute orders, quotes or cancellations".

---

[1] Article 4(1)(39) of the Directive 2014/65/EU
[2] Article 18 of the Commission delegated Regulation (EU) No. 2017/565
[3] Whereas 61 of the Directive 2014/65/EU
[4] Article 4(1)(40) of the Directive 2014/65/EU

Minimizing latency for HFT practice is a crucial element for its performance. When identifying HFT, the French regulatory body AMF (Autorité des marchés financiers) for example relies on various metrics, including a metric based on the lifetime of cancelled orders and the classification includes two sets of conditions:
- Condition 1 based on a comparison with other market participants: the participant must have cancelled at least 'x' orders during the year and the average lifetime of its cancelled orders should be less than the average lifetime of all cancelled orders in the Limit Orderbook
- Condition2 is based on a set threshold: the participant must have cancelled at least 'y' orders with a lifetime of less than 0.1 second (i.e. the participant quickly updates the orders in the limit order book) and the top percentile of its cancelled orders must be less than 500 microseconds (i.e. the participant regularly uses high-speed access to the market).

High daily number of messages → according to BaFin min 75k per day.

What are the risks associated with algorithmic trading and HFT?

HFT and algorithmic trading entail increased risk of overloading trading systems due to large volumes of orders as well as generating duplicative or erroneous orders or otherwise malfunctioning in a way that may create a disorderly market.

Additionally, algorithmic trading or HFT techniques may, like any other form of trading, lead to certain behaviors which are prohibited under REMIT (see below "*Which laws/regulations apply for algorithmic trading at EPEX SPOT?*").

MiFID II regulation describes the risks associated with the development of HFT for both market participants and trading venues:
- increased risk of the overloading of the systems of trading venues;
- risks of algorithmic trading generating duplicative or erroneous orders or otherwise malfunctioning in a way that may create a disorderly market;
- risk of algorithmic trading systems overreacting to other market events which can exacerbate volatility if there is a pre-existing market problem;
- like any other form of trading, lend themselves to certain forms of behavior which is prohibited under Regulation (EU) No 596/2014.[5]

One of the main identified issues[6] concerned
- the vast amounts of difficult-to-process data, which could clog the system as well as possibly progressively exclude humans from the level playing field;
- the placement of duplicative or erroneous orders and a high ratio of unexecuted orders to transactions. The negative consequences of malfunctioning or manipulative algorithms can be exacerbated through algorithms interacting with one another without any human intervention to counteract any unforeseen aftereffects;
- Exacerbate a market event and lead to unforeseen effects;
- Algorithms can be used as a tool to manipulate the market on the one hand, but can also themselves be subject to manipulation on the others;
- Algorithms may trigger additional algorithms (cascade effect), leading to an increase in volatility.

Are there benefits to algorithmic trading and HFT?

- The main advantages of Algorithmic trading and HFT are related to Speed, Accuracy and Cost reduction: Speed: algorithms are written beforehand and thus the set of instructions is executed

---

[5] Regulation (EU) No 596/2014 of the European Parliament and of the Council of 16 April 2014 on market abuse (market abuse regulation)
[6] ACER quarterly report Q4 2018

automatically. This is not the case for a manual trader. Among others, this provides much better trading opportunities than the manual alternative;
- Accuracy: linked to reducing human / typing mistake in manual trading. It is also the answer to erase human emotion which may interfere with the trading and diminish profits;
- Possibility to backtest (members requested on several occasions realistic sandbox);
- Cost reduction: linked to the fact that Algorithms do not need constant human supervision however necessity to control on real time the behavior.

In current landscape, trading via an algorithm has become rather a necessity, in order to stay competitive. This trend is increasing, more and more Algos arrive on the market.

Which laws/ regulations apply for algorithmic trading at EPEX SPOT?

Regulation of algorithmic trading strictly concerns financial instruments as defined under MIFID II.

EPEX SPOT offers spot products which do not fall under the scope of MIFID II. As a consequence, there is currently no binding regulation applicable to algorithmic trading at EPEX SPOT.

However, trading at EPEX SPOT is regulated by Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency (REMIT). In this respect, EPEX SPOT's Market Surveillance monitors algorithmic trading based on it REMIT Regulation and also based on EPEX SPOT Rules and Regulations and in particular the Code of Conduct:

- Prohibition of Market Manipulation (REMIT Article 5)
- It is prohibited to enter orders **without a due economic justification** and to **place orders without the intention of executing them** (Article 2 EPEX SPOT Code of Conduct)
- Market participants are responsible for ensuring that their technical environment **does not disrupt** or **interfere with EPEX systems** (Section 4 EPEX SPOT Operational Rules)
- Exchange members undertake **not to manipulate the Order-to-Trade Ratio** (OTR) (Article 11 EPEX SPOT Code of Conduct)

In its REMIT Quarterly ACER guidance on the application of REMIT and transaction reporting, Issue No. 15 / Q4 2018, ACER deems that "*provisions from the financial legislation and experience from financial market authorities could prove useful in the context of REMIT*".

EPEX SPOT closely monitors any upcoming change REMIT regulation in relation to algorithmic trading.

What does EPEX SPOT Rules and Regulations say about algorithmic trading?

Exchange Members must operate on EPEX SPOT through one or more designated natural persons (Exchange Traders). Exchange Traders are admitted by EPEX SPOT SE only if they are reliable and have the necessary professional qualifications.

As a general principle, Exchange Members must ensure at all times that all orders placed and all transactions executed have **an economic justification**. EPEX SPOT SE may request such justification, meaning the reason that allows the Exchange Member:
- to decide to buy or sell for its own account;
- to trade on behalf of its client, knowing that the third-party's interest in buying or selling is genuine when placing an Order or executing a Transaction on the Exchange.

Such reason should include but is not limited to the trading strategy, in particular:
- retail/supply;
- hedging the risks of positions taken on the market;
- speculating in order to try to benefit from a situation on the market by assuming risks;
- arbitrage between several market areas and the circumstances behind the decision to place the relevant order.

EPEX SPOT SE may permit Exchange Members to use order routing systems in accordance with the Operational Rules.

Exchange Members are responsible for ensuring that the order routing facility is used properly in accordance with the Rules and Regulations, in particular the Code of Conduct[7]. This applies to any orders entered into EPEX SPOT Trading Systems via an order routing system, by third parties who are not admitted to the Exchange.

EPEX SPOT SE may restrict or revoke the permission to use an order routing system to Exchange Members failing to comply with these requirements.

Trading Systems (ETS and M7) can be accessed through an API (Application Programming Interface). When implementing the API, the Exchange Member or its providers undertake to respect the technical terms of reference, which are available on request from market operations. Before the API is released, the Exchange Member or its provider must perform tests in a simulation environment, covering all functionalities of the application.

EPEX SPOT SE may refuse the access to ETS and/or M7 to an application that could endanger the stability of the Trading System[8].

EPEX SPOT SE may audit on-site the compliance with said Rules and Regulations.

In the event that the use of services by the Exchange Member disrupts the operation of EPEX SPOT Trading System, EPEX SPOT SE will contact the Exchange Member in order to terminate such disruptions. If these disruptions cannot be terminated within a reasonable time period, or if they endanger EPEX SPOT Trading System, then EPEX SPOT SE may suspend the Exchange Member's access to the market.

Does EPEX SPOT impose an order/transaction ratio?

As detailed in § 73 EPEX SPOT Operational Rules, EPEX SPOT imposes an Intraday Trading System usage fees (OTR), as follows:

100 € / OTR alert as from 5 alerts per month – applicable to Intraday BE-DE-AT-FR-CH-GB-NL

The Order-to-Trade figure (OTR) reflects the following formula applicable per Member: Orders are identified through their identification number in the Trading System. Transactions are orders executed partially or integrally. When no transaction is executed, the OTR corresponds to the orders sent per instrument by the member. The ratio is calculated using the order and trades concluded from the opening to the closure of the contract expiry. Blocks are not subject to OTR calculation. EPEX SPOT can decide to waive usage fees on specific products or instrument. In that case, EPEX SPOT will inform Members through a Market Notice. There is a different OTR for each instrument for which a member

---

[7] §40 Exchange Rules
[8] §85 and 87 of EPEX SPOT Operational Rules

sent at least one order. An OTR alert occurs for a couple (instrument; Member) when the OTR level is strictly greater than 100. The first 4 OTR alerts of the month are free of charge per member. As from 5 OTR alerts in the month, a usage fee of 100 € / OTR alert is charged. Notwithstanding the application of the Code of Conduct, EPEX SPOT SE reserves the right to exclude manipulated transactions from the statistics.

Does EPEX SPOT consider adjusting Rules and Regulation to deal with algorithmic trading?

- Increasing awareness on algorithm consequences with ACER and National Regulatory Authorities. No concrete action plan so far.
- Discussions with EPEX SPOT members via Workshops.
- Observed problems: monitoring (outside REMIT scope, which is MS role) and prevention – who does what internally (e.g. algo miscalibration)?

How does algorithmic trading work at EPEX SPOT?

Members developing their Software connected to M7 API have to notify EPEX SPOT Market Operation and follow a Software Conformation process (Purely technical tests)

EPEX SPOT Conformance test

a. Aim: connectivity test.
   - The idea is to detect unintended disconnection, because each reconnection (initialization phase) generates many queries to access the orderbook information and thus can overload the sever.

b. Process: Purely declarative, lasts 24 hours
   - The member is asked to stay connected non-stop for 24 hours. A few functionalities are tested (submission and modification of an order, execution, recall request…), then a script that submits many orders is launched and the member is asked to test as many functionalities as possible. But the functional analysis is done by the member, EPEX SPOT will only focus on the number of connection/disconnection.
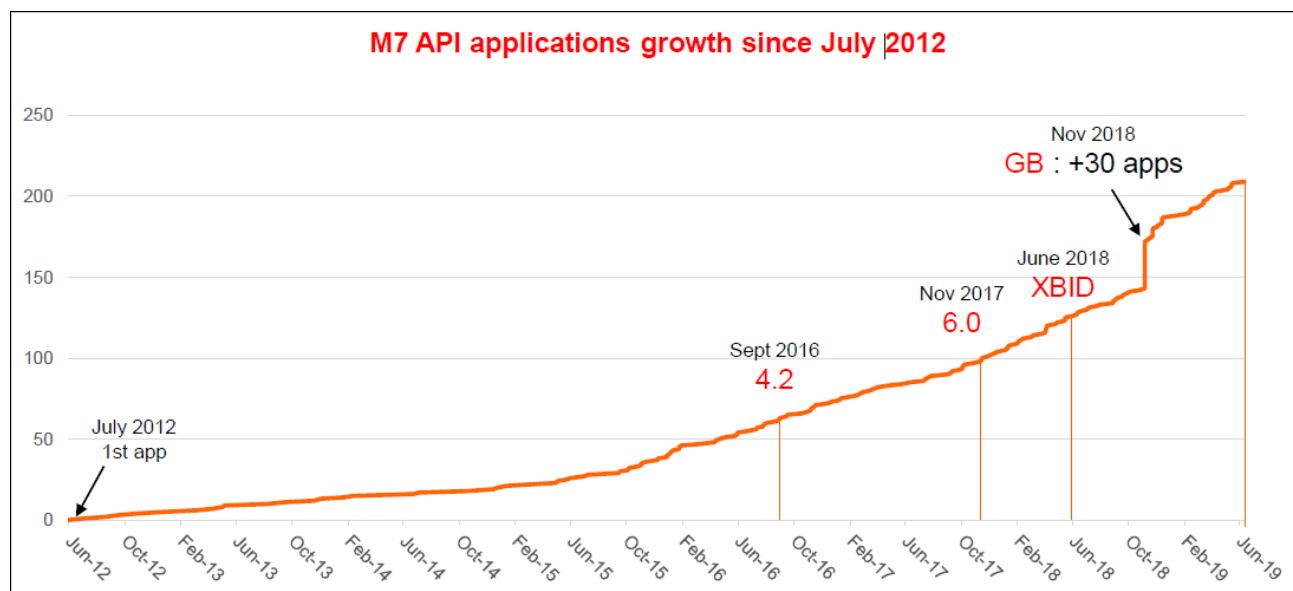
   The conformance test was updated with XBID:

   - Before: bilateral call with Market Operation

   - Now (mass conformance test): the MP only needs to send an email informing when he starts and ends the test. Then, afterwards, Mops checks log to verify the # log in/log out

c. Point of attention
   - Control: EPEX SPOT has no means to verify that the application that went through the conformance test is the same that will be put in production afterwards.
   - Even though the conformance test specifies that "*the Exchange Member declares that its Software Implementation has been fully and successfully tested prior to the start of the Software Conformance Process […]*", in practice the conformance test can be done before the finalisation of the algorithm.
   - Algorithms challenges: The conformance is not designed to cope with algorithms. However, looking at MiFid2, the requirement for Conformance test are not quite 'basic'.

Development of automated trading at EPEX SPOT: API background and achievements
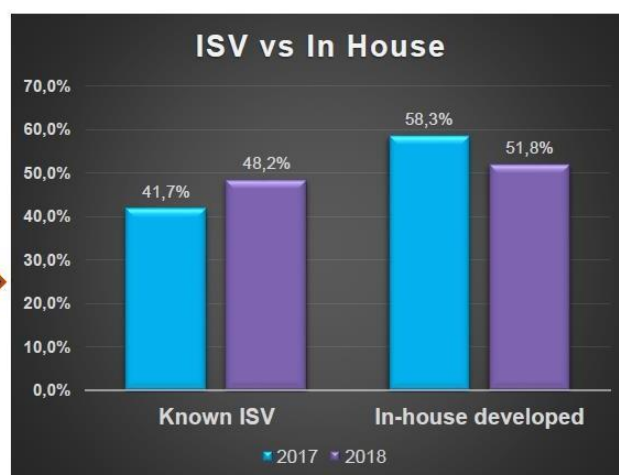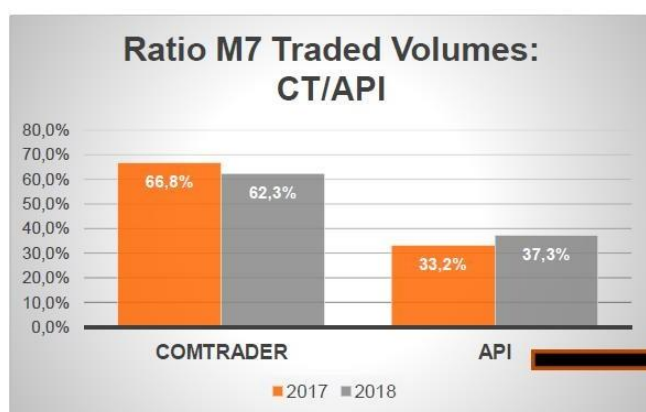
At EPEX SPOT, the number of API connections increased steadily over the last years. Today, 201 API applications and 190 members are connected to the exchange
- Following the market and positions (pure read only: 40%)
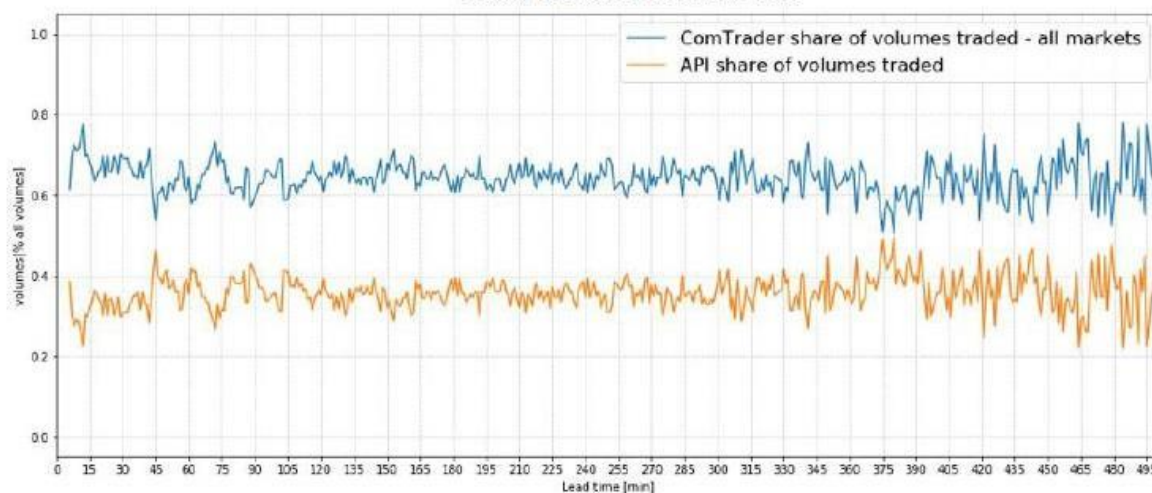- And/ or automating trading strategies

EPEX has been offering an API-friendly ecosystem for more than 6 years. 1/3 of M7 volumes are traded directly via a custom API app (+4% vs 2017).
- 48% (+7% vs 2017) via ISVs (16 M7, listed on EPEX website)
- 52% via an in-house application

The split of volumes between APIs and ComTrader is the following (source: EPEX SPOT):

1-hour products per lead time

15-min products per lead time