

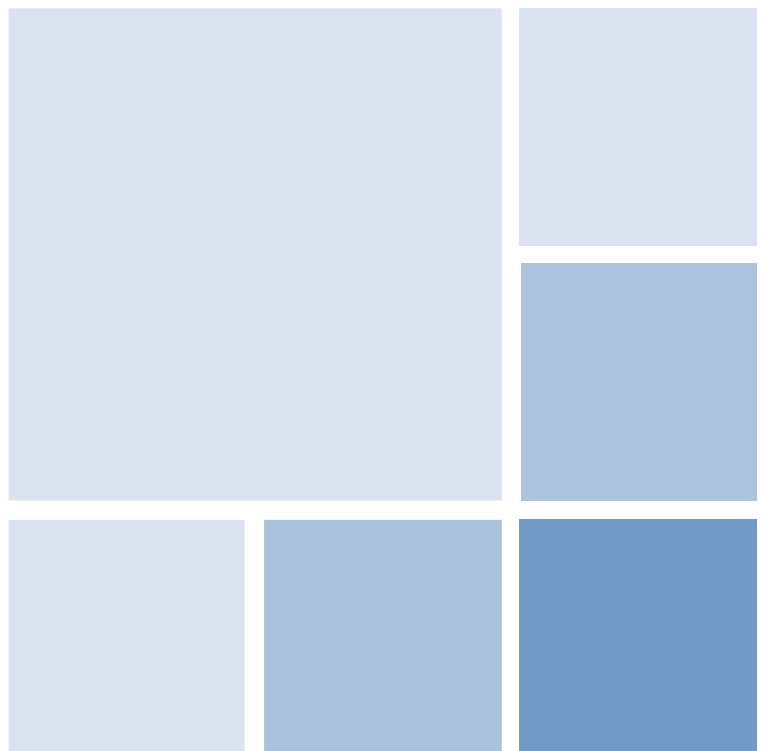


GLOBAL MARKETS DIVISION

SIGMA X Europe MTF™ Participant Manual

Version 1.1

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This manual contains practical information on the technology and operation of SIGMA X Europe MTF, as well as an overview of the Operator's main policies and business features. Such information is subject to modification by the Operator at any time.

Capitalised terms not defined in this manual shall have the meaning given to them in the SIGMA X Europe MTF Rulebook, unless the context requires otherwise.

II. About SIGMA X Europe MTF

SIGMA X Europe MTF is a multilateral trading facility, the aim of which is to target high quality liquidity.

On SIGMA X Europe MTF, there are three order books which operate independently of each other:

- (1) a non-displayed liquidity pool, where all Orders will be submitted for execution/crossing at the midpoint of the Primary Best Bid or Offer (“**PBBO**”) reference prices (see Section VI.A (*PBBO Formation and Crossing*)). This will enable the Operator to rely on the Reference Price Waiver and the Large In Scale Pre-Trade Transparency Waiver (Market in Financial Instruments Regulation EU600/2014 (“**MiFIR**”) Article 4(1)(a) and Article 4(1)(c) respectively, permitting it to operate as a non-displayed liquidity pool on which Orders are not subject to pre-trade transparency (the “**SIGMA X Europe Non-Displayed Book**”); and
- (2) a displayed liquidity pool, which will function as a periodic auction order book, with submitted Order triggering periodic Auctions. For each Auction, the Uncross price and volume will be published in compliance with the MiFIR transparency requirements applicable to a periodic auction trading system. There will be no reliance on any transparency waivers (the “**SIGMA X Europe Auction Book**”); and

For the avoidance of doubt, references to SIGMA X Europe MTF include the SIGMA X Europe Non-Displayed Book and the SIGMA X Europe Auction Book unless stated otherwise.

SIGMA X Europe MTF will operate during Primary Market hours of continuous trading (which excludes any auction periods) and offer trading in cash equities in Austrian, Belgian, Czech Republic, Danish, Dutch, Finnish, French, German, Hungarian, Irish, Italian, Norwegian, Portuguese, Spanish, and Swedish markets.

SIGMA X Europe MTF is operated by the Operator as an independent business with its own separate management structure.

Operation of SIGMA X Europe MTF will be overseen by the Head of SIGMA X Europe MTF (the “**Head of SIGMA X Europe**”) with the guidance of the Oversight Group. The Oversight Group consists of five (5) senior representatives from various areas of Goldman Sachs including the securities, operations, compliance and legal divisions. Participants are able to appeal any decision made by the Operator to the Appeals Officer in accordance with the SIGMA X Europe MTF Rulebook. The Appeals Officer is independent of the Operator.

Any matters referred to the Oversight Group or to the Appeals Officer will have the identity of the Participant redacted.

The Head of SIGMA X Europe, the Oversight Group, the Appeals Officer and the SIGMA X Europe MTF dedicated staff members are all subject to conflicts and confidentiality policies to preserve the independence of SIGMA X Europe MTF.

III. Participating in SIGMA X Europe MTF

A. Eligibility

Any entity that meets the Admission Criteria set out in SIGMA X Europe MTF Rulebook (the “**Rules**”) may become a Participant in any or all of the SIGMA X Europe MTF books by indicating this on the SIGMA X Europe MTF Participant Application Form available on the Website.

As well as supplying information to demonstrate compliance with the Admission Criteria, Participants will be required to provide information on matters including but not limited to incorporation (including constitutional documents), contact details of key personnel, regulatory status, permissions and the governmental authority or agency having regulatory oversight in respect of the Participant, where applicable.

In addition, to satisfy the Operator’s Credit Approval Checks, all Participants will need to:

- (1) provide the Operator with such information as it may reasonably require to (i) satisfy itself that it has complied with all applicable anti-money laundering checks, “know your customer” checks and other similar checks under all applicable laws and regulations and under any of the applicable policies of the Operator and (ii) demonstrate that they have appropriate anti-money laundering measures in place in compliance with all applicable law and regulations and with any of the applicable policies of the Operator; and
- (2) satisfy the credit standards, anti-money laundering checks and other requirements of the relevant Central Counterparty.

Participants must also complete conformance testing successfully. Conformance testing will involve:

- i. testing the functional interface between SIGMA X Europe MTF and each Participant, the relevant Central Counterparty and Participant’s agent bank to ensure that the Participant will be in a position to comply with ongoing regulatory requirements from time to time, including that the Participant’s systems or algorithms interact as expected with SIGMA X Europe MTF and that data flows to and from SIGMA X Europe MTF can be adequately processed;
- ii. end-to-end testing to verify the functionality of Participant’s applications, hardware and infrastructure through a number of test cases (e.g. buy, sell, cancel, correct) including static and market data downloads and all business data flows;
- iii. testing executions and netting methodology;
- iv. verifying that the Participant’s internal end-to-end and SIGMA X Europe MTF’s external end-to-end tests are matched; and
- v. verifying the connectivity, including the cancel on disconnect command, market data disconnections, and the recovery, including the intra-day resumption of trading and the handling of suspended instruments or non-updated market data.

The Participant must also undertake conformance testing within the SIGMA X Europe MTF conformance testing environment prior to any substantial update to a Participant’s trading system, trading algorithm or trading strategy.

The Operator shall provide the Participant with a report containing the results of the conformance testing.

In addition to the abovementioned conformance testing environment, an External User Acceptance environment is provided to allow Participants to test their algorithms in several scenarios, including disorderly trading conditions.

Participants will be required to demonstrate compliance with SIGMA X Europe MTF's requirements for use of its order submission systems upon admission and on a periodic basis, no less than annually.

B. Trading Capacities and Order Flagging

Participants are required to identify in relation to each Order such information as the Operator shall require in accordance with Commission Delegated Regulation (EU) 2017/580 supplementing MiFIR with regard to regulatory technical standards for the maintenance of relevant data relating to orders in financial instruments and as specified in the SIGMA X Europe MTF Technical Specifications document available on the Website. If this information is not included, the Order will be rejected.

SIGMA X Europe MTF supports trading in a principal or agency capacity. Where a Participant flags an Order as an agency Order, the Participant represents that it is submitting such Order in the legal capacity of an agent on behalf of its client.

Participants are required to flag each Order with the relevant trading capacity. If this information is not included, the Order will be rejected. Participants are solely responsible for every Order submitted by or through the Participant, regardless of whether such Orders are placed in a principal or agency capacity.

When trading on the SIGMA X Europe Non-Displayed Book, an Order will be automatically flagged by the Operator based upon the quantity of the incoming order. The Order flag will determine how the Order is categorised for the purposes of Post-Trade Transparency reporting (for further details see V. Market Guide – General, section D. Post-trade Market Data).

C. Access

All SIGMA X Europe MTF Participants will have access to the same functionality and services and will be subject to the same Fees. SIGMA X Europe MTF may be accessed either directly by a Participant or through a Participant by its client by use of a Direct Electronic Access arrangement, subject to the notice, trading ID and other requirements set out in this Participant Manual, the Participant Agreement and the Rules.

Access Methods via the Ap Fix Order Entry Gateway (including logins, ports and target IP) will be issued to each Participant as part of the connectivity set-up and testing, once a Participant's application to join SIGMA X Europe MTF has been approved. The following security measures are implemented:

- i. Network Source identification: in order for a Participant to connect to the Ap Fix Order Entry Gateway, the following mechanism is implemented:
 - A Participant can have one or multiple Ap FIX Order Entry Gateway accesses.
 - A Participant can connect into their designated ports only if their own IP addresses match with the range of authorised addresses for this particular port; and

- In case of error or intrusion, a message is written in the Ap FIX Order Entry Gateway log file which in turn can be trapped by a log viewer.
- ii. Order entry control: the Ap FIX Order Entry Gateway validates upon logon that the sender and target IDs provided within a message matches with those configured for the Participant's session as well as relevant pre-trade controls as further specified in Section V (*Market Guide – General*) below.

For the purposes of this Participant Manual, Direct Electronic Access refers to an arrangement whereby Participants' clients have a connection to SIGMA X Europe MTF without becoming Participants themselves. Under such arrangement, Participants' clients submit Orders to the Participant, which are then automatically routed through the usual internal systems/infrastructure and controls of the Participant and onto the SIGMA X Europe MTF.

For the avoidance of doubt, Participants are wholly responsible for all Orders submitted through their participation in SIGMA X Europe MTF.

D. Regulatory Obligations

Participants are required to ensure that all employees, officers or other related persons ("**Staff**") accessing the Services on the Participant's behalf comply with the Rules, Applicable Law and any rulings or guidance of any Regulator. This includes ensuring that Staff members are competent to trade, including the operation of any algorithms, on SIGMA X Europe MTF, that they have been adequately trained and made aware of their regulatory obligations, and that the appropriate control infrastructure and surveillance systems are in place to prevent market abuse or other unlawful or inappropriate behaviour. In addition, Participants must ensure that they comply with all applicable transaction reporting obligations, record retention requirements, as well as any regulatory requirements related to algorithmic trading (including operation of their own kill functionality), significant shareholdings and short selling.

The Operator bears no responsibility for fulfilling any of the obligations outlined above on the Participant's behalf.

For the purposes of article L. 531-12 of the French *code monétaire et financier*, the Participant gives its express consent that any information (including where it is confidential within the meaning of the aforementioned article) relating to the Participant, its clients and any Transaction may be disclosed by the Operator to any person, including in particular, any Regulator, where required for the specific purpose of the operation of SIGMA X Europe MTF and the Participant's membership in SIGMA X Europe MTF (including to comply with the terms of this Participant Manual). To this end, the Participant must obtain from its clients (including notably those having a Direct Electronic Access) an express written consent to such disclosure with respect of any information relating to the client or its Transactions.

E. Notices

The Operator shall publish or issue notifications to Participants from time to time informing them of interpretations, supplements or amendments to the Rules and the addition or removal of Securities. Such notifications will be communicated to each Participant either by email or by being issued on the Website by the Operator. The Operator will be under no obligation to notify Participants of pending market events or corporate actions which are likely to impact the pricing of Securities.

Notifications given by a Participant to the Operator must be delivered to the Operator by email, in accordance with the Rules. Where the Notice relates to significant events affecting the

Participant, for example, a change in regulatory status or a change of control, Participants must notify the Operator immediately, in accordance with the Rules.

F. Complaints procedure

Should a Participant wish to complain about any aspect of the Services, the Participant should contact the Head of SIGMA X Europe or, in the event that the complaint concerns the conduct of business on SIGMA X Europe MTF by another Participant, the Compliance Officer, in accordance with the procedure set out in the Rules.

G. Suspension or Termination of Access

In certain circumstances the Operator may suspend, terminate or restrict a Participant's access to the SIGMA X Europe Non-Displayed Book and/or the SIGMA X Europe Auction Book, and in some cases without prior notice. The Operator will notify Participants that their access has been suspended, restricted or terminated by way of email in accordance with the Rules.

H. Fees and Charges

Each Participant shall pay all applicable SIGMA X Europe MTF Fees. These will be set out in the Fee Schedule (as amended from time to time) displayed on the Website.

Fees will be charged by the Operator in US Dollars, on a monthly basis, using such FX rates as the Operator shall determine in its sole discretion. Upon request from a Participant, the Operator shall provide details of FX rates applied from time to time.

Any Fees imposed by the Operator may also be subject to French Value Added Tax or any other applicable taxes which each Participant shall also pay.

The Operator reserves the right to charge interest on any amount due to the Operator from the date on which payment was due to the date of actual receipt at such rate or rates as the Operator may specify from time to time in the Fee Schedule.

I. Tax and Levies

Purchases of certain shares on SIGMA X Europe MTF may be subject to stamp duty, levies or other forms of taxation. The general information provided below does not constitute tax advice, and Participants are urged to obtain independent advice regarding their tax liability and/or potential exemption status in the UK and Ireland, as well as other markets in which the Operator offers trading.

J. Irish Stamp Duty

With regard to purchases of Irish securities on SIGMA X Europe MTF, these may be subject to Irish stamp duty (as defined in the Stamp Duties Consolidation Act 1999) at the prevailing rate. Certain Participants purchasing shares on SIGMA X Europe MTF may be able to claim intermediary relief pursuant to section 75 Stamp Duties Consolidation Act 1999. In order for such a relief to be claimed, the Participant must be approved by the Irish Revenue Commissioners as an intermediary and the trade in question must not be carried out for the purposes of an excluded business, as defined in section 75 Stamp Duties Consolidation Act 1999. Participants that already have approval as a recognised intermediary by the Irish Revenue Commissioners for trading on other exchanges or designated markets do not need to apply for a separate approval for trades conducted on SIGMA X Europe MTF.

Copies of the guidance published by the Irish Revenue Commissioners on Irish intermediary relief and the Irish Revenue Commissioners self-certifying form for approval as an Irish intermediary are

available to Participants on the Irish Revenue Commissioners' website (www.revenue.ie/en/tax/stamp-duty/crest.html). Any applications for Irish intermediary status should be sent directly to the office of the Irish Revenue Commissioners and not to SIGMA X Europe MTF.

K. PTM Levy

In addition to stamp duty liability, Participants may also be subject to Panel of Takeovers and Mergers levy ("**PTM Levy**"). The PTM Levy is a charge levied on certain transactions in securities. The current levy rate is available on the Fees and Charges section of the Takeover Panel's website: <http://www.thetakeoverpanel.org.uk>.

L. Co-location

Co-location services are provided on a transparent, fair and non-discriminatory basis by a third-party provider to all Participants who subscribe to such services.

The following information is a high level summary of the technology requirements, full details of which are set out in the SIGMA X Europe MTF Technical Specifications. These documents are regularly updated and can be found on the Website.

A. Connectivity

Direct connectivity to the SIGMA X Atlas platform (“Ap”) is provided via the Ap FIX Order Entry Gateway. This is an open and direct Application Program Interface (“API”) allowing members and independent software vendors to interface their existing order management systems directly to the Ap FIX Order Entry Gateway using standard FIX 4.4. Access to SIGMA X Europe MTF through both messaging protocols is treated on a non-discretionary basis. Their respective performance may change over time relative to multiple factors.

For details please refer to the SIGMA X Europe MTF Technical Specifications.

B. Bandwidth Requirements

Participants will have access to bandwidth based upon their physical connectivity. At a minimum, the SIGMA X Ap Market Data Feed will require 1Mb/s.

C. Sessions

SIGMA X Europe MTF operates limits on the number of messages a Participant may submit within a 1 second time interval. Such limits may be configured by Participants during their initial set-up per session, subject to a maximum number of messages per session. For the avoidance of doubt, such configurations are on a non-discriminatory basis, such that there is equal treatment among Participants. Where a Participant breaches the maximum number of messages per session, messages exceeding the limit will be rejected.

SIGMA X Europe MTF manages the load balancing between the Ap Fix Order Entry Gateway at the point of set-up and it is monitored on a real time basis.

Cancel on Disconnect is mandatory for Order entry sessions. It is designed to cancel all open Orders submitted through that session in the event of a disconnection of that session.

D. FIX Specification

The general format of a Ap FIX Order Entry Gateway message is a standard header, followed by the message body fields and terminated with a standard trailer. The SIGMA X Europe MTF Technical Specifications detail the standard header and trailer of the private (or directed) messages used to communicate with the Ap Fix Order Entry Gateway application, which provides access to Participants to a UTP in its cash market versions. For details please refer to the SIGMA X Europe MTF Technical Specifications.

A. Eligible Securities

SIGMA X Europe MTF will offer trading in Securities traded on the primary trading venue of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Ireland, Netherlands, Norway, Portugal, Spain (SIGMA X Europe Non-Displayed Book only), Sweden. A list of Securities admitted to trading on SIGMA X Europe MTF, and the Regulated Market which the Operator has determined to be the Primary Market for each Security, can be found on the Website. SIGMA X Europe MTF will not support “grey market” trading, that is, trading in shares before they are issued in an initial public offering or prior to their becoming listed on a Primary Market, nor does it support conditional transactions in shares that are authorised for issuance but not yet issued.

Participants will be given access to trade in all Securities for which they have valid clearing arrangements, as confirmed by the relevant Central Counterparty.

The Operator reserves the right to add and delete Securities from the list of Securities if the Operator deems it necessary to do so. Any additions or deletions of Securities traded on the SIGMA X Europe MTF will be posted on the Website.

The Operator will not list securities which are not listed or admitted to trading on at least one Regulated Market.

The Operator recommends that Participants consult the latest list of tradable Securities on a daily basis, which is available on the Website and via the market data feed, and updated daily prior to market open.

B. Trading Hours

SIGMA X Europe MTF operates Monday to Friday from 09:00 to 17:30 Central European Time, with the exception of holiday days. A full schedule of holidays applicable to SIGMA X Europe MTF markets is available on the Website. Subject to the foregoing, SIGMA X Europe MTF will typically observe the practice of the Primary Market with respect to continuous trading hours (in the event that they differ from aforementioned trading hours) and business days, and where the Primary Market for a Security is closed, there will be no trading on SIGMA X Europe MTF in respect of such Security. If a Primary Market for a Security suspends trading temporarily due to an outage, trading in such Security will not continue on SIGMA X Europe MTF.

If a Primary Market or other Multilateral Trading Facility (as defined in the French *code monétaire et financier* and the *Règlement général de l'AMF*) suspends trading in a Security temporarily due to the AMF suspending the listing of such Security (a “**Regulatory Suspension**”), trade matching on SIGMA X Europe MTF in such Security will be halted for the duration of such Regulatory Suspension.

The Operator facilitates a continuous trading model and does not support opening, closing or other scheduled auction periods.

C. Trading Controls

Pre-trade controls

Participants will be subject to a number of pre-trade controls in respect of Orders submitted to SIGMA X Europe MTF, including the following:

- Maximum Order quantity calibrated per Security class;
- Price collars representing a maximum percentage deviation from the relevant reference price;
- Maximum Order value calibrated per Security class.

Orders submitted that breach the relevant controls for a particular Security will automatically be rejected.

In addition, orders that are submitted on the SIGMA X Europe Non-Displayed Book that are not compliant with the Volume Cap Controls described in section VI. Market Guide – SIGMA X Europe Non-Displayed Book will also be rejected.

In addition, Participants must ensure that at all times they have in place their own pre-trade controls, including in respect of maximum Order quantity, maximum Order value and appropriate limits on prices attached to Orders in order to mitigate the risk of erroneous trading on their part. Participants must provide information on such controls as part of the Participant Due Diligence Questionnaire.

Kill Functionality

Participants must have controls in place that allow them to be able to cancel immediately, as an emergency measure, any or all of its unexecuted Orders submitted to SIGMA X Europe MTF. This shall include Orders originating from individual traders, trading desks or any client with whom it has a Direct Electronic Access Agreement (where applicable).

Mechanisms to manage volatility

Each of the SIGMA X Europe Auction Book and the SIGMA X Europe Non-Displayed Book are dependent upon live reference market data feeds to facilitate trade matching. SIGMA X Europe MTF uses live reference market data feeds to initiate and end trading halts for each Security, based on the status of the Security on the reference market. This ensures a consistent approach per Security between regulated markets and SIGMA X Europe MTF. Examples of halts include:

- a halt for significant price movement in a Security; or
- if the primary market switches to an auction call on a scheduled or unscheduled basis.

In addition, SIGMA X Europe MTF applies a number of controls to manage the integrity of the market data.

All halts on SIGMA X Europe MTF are communicated via SIGMA X Ap Market Data feed or otherwise to Participants in accordance with the Rules.

Order to Trade Ratio

All Participants are subject to a maximum Order to Trade Ratio Policy (the “**OTR Policy**”). The OTR Policy is available on the Website.

D. Post-trade Market Data

Post-trade market data will be disseminated via SIGMA X Ap Market Data feed as close to real-time as possible, with no deferrals of such data available on SIGMA X Europe MTF. Participants can subscribe to the SIGMA X Ap Market Data feed directly or obtain it from external vendors

who have the relevant subscriptions. Where Participants subscribe directly, such data will be provided on a reasonable commercial basis. Further details are available on the Website.

Participants will receive confirmation of Orders executed by them on SIGMA X Europe MTF via the FIX or Binary message protocol. Trade reports for the SIGMA X Europe Non-Displayed Book and the SIGMA X Europe Auction Book will be differentiated by their respective MIC.

When trading on the SIGMA X Europe Non-Displayed Book, an Order will be automatically post-trade flagged by the Operator based upon the quantity of the incoming order:

- i. If the quantity of an incoming order exceeds the LIS threshold for the relevant instrument, the order will be flagged as LIS using the “LRGS” flag
- ii. If the quantity of an incoming does not exceed the LIS threshold, the order will be flagged as subject to the Reference Price Waiver using the “RFPT” flag

E. Order and Trade Instructions, including cancellations

Pull all Orders

If a Participant wishes to recall all Orders or a substantial part of all Orders submitted to SIGMA X Europe MTF by such Participant (a “**Pull All Orders Instruction**”), the Operator will only comply with such Pull All Orders Instruction if it is received from a person authorised by the Participant to submit Pull All Orders Instructions. A list of persons authorised by the Participant to submit Pull All Orders Instructions must be provided to the Operator at least five (5) business days prior to the relevant person submitting a Pull All Orders Instruction.

Erroneous Trades

In the event of a trading error, a Participant may apply to the Operator to have an executed Transaction cancelled and declared an erroneous trade, in accordance with the Rules. Examples of the type of Transactions that may constitute an erroneous trade may include, but are not limited to:

- i. A Transaction executed on the wrong side of the order book (buy or sell);
- ii. A Transaction which has resulted in the breach of an internal restriction;
- iii. A Transaction executed at a price level significantly different from any recognised benchmark;
- iv. A Transaction executed for an abnormal quantity for the Security in question;
- v. v. Any other Transaction which the Operator believes to result from a legitimate trading error.

All erroneous trade applications must be communicated to the SIGMA X Europe MTF Compliance Officer or Head of SIGMA X Europe immediately by telephone, to be followed by a written email request within thirty (30) minutes of execution. The contact details for the Compliance Officer and Head of SIGMA X Europe are available on the Website. The email should contain full details of the Transaction in question (including the time of execution, the Security, side (buy or sell), quantity and price) along with any other supporting information surrounding the execution of the Transaction.

The Compliance Officer or Head of SIGMA X Europe (as applicable) will inform all parties to the Transaction being reviewed by phone or email and will review the Transaction and any

supporting information provided by the parties to determine whether the Transaction constitutes an erroneous trade as soon as reasonable practicable. In making such determination, the Compliance Officer or Head of SIGMA X Europe (as applicable) may consider:

- i. information provided by the relevant Participants;
- ii. analysis of market data;
- iii. analysis of market events;
- iv. any discrepancy between the details of the relevant Transaction and the market conditions at the time of execution; or
- v. any other factors which the Compliance Officer or Head of SIGMA X Europe (as applicable) deems relevant.

If the Compliance Officer or Head of SIGMA X Europe (as applicable) considers that an erroneous trade has occurred, they may, in a timely manner, declare an erroneous trade and will promptly notify the parties to the Transaction of his decision and, where appropriate, will take any necessary action to facilitate cancellation of the erroneous trade, including but not limited to cancellation of post trade transparency reports.

The Operator may also cancel a Transaction where it believes such Transaction is erroneous, invalid, deceptive, fraudulent, may impair the integrity of SIGMA X Europe MTF or in case of malfunction of SIGMA X Europe MTF's mechanisms to manage volatility or of the operational and technical functions of the trading system, including issues related to the finalisation, clearing and settlement process for Transactions executed on SIGMA X Europe MTF, whether or not a Participant has made an application to have such Transaction declared an erroneous trade in accordance with the Rules.

All cancellations on SIGMA X Europe MTF are carried out in accordance with the Rules and procedures set out in this manual.

To the extent a Participant wishes to raise a complaint regarding the outcome of any process invoked under this Section 5.D, it should follow the complaints procedure specified in the Rules.

F. Default, Clearing and Settlement

All Transactions executed on the SIGMA X Europe Non-Displayed Book and SIGMA X Europe Auction Book must be cleared through the relevant Central Counterparty at the time the Transaction is effected (subject to the Transactions being notified to the relevant Central Counterparty and subject to compliance with certain conditions set out in the relevant Central Counterparty's rules, such as checking that each counterparty has appropriate clearing arrangements in place and that such shares have been validly traded). Transactions which are unable to be cleared through the relevant Central Counterparty will not be considered valid Transactions. In the event that a Participant fails to settle a Transaction executed on SIGMA X Europe MTF, all Transactions that have been cleared through the relevant Central Counterparty will be dealt with in accordance with the rules and procedures of the relevant Central Counterparty.

Assuming a Transaction has been validly cleared through the relevant Central Counterparty, each Participant that is a party to a cleared Transaction is released from its obligations under that Transaction vis-à-vis the other Participant, such obligations instead being owed to the relevant Central Counterparty, who upon such cleared Transaction, becomes the buyer to the seller and the seller to the buyer.

Transactions on SIGMA X Europe MTF will be settled in accordance with the settlement calendars of the Primary Market on which the relevant shares are listed. For the avoidance of doubt, the settlement date for all Transactions shall be no later than on the second business day after the trade date, where so required under Regulation (EU) 909/2014 (the Central Securities Depositories Regulation).

The Operator reserves the right to suspend or extend a settlement period in relation to all or specified Transactions in exceptional circumstances.

No securities which are delivered in settlement of a Transaction on SIGMA X Europe MTF may be subject to a charge or other encumbrance of any kind.

G. Execution reporting

SIGMA X Europe MTF shall publish information relating to quality of execution on a quarterly basis. Such information will be made available on the Website.

A. PBBO Formation and Crossing

The Operator will use the PBBO as the reference price for all trades executed on SIGMA X Europe Non-Displayed Book. The Operator will form the PBBO by taking into account prices displayed by the primary trading venue of each Security (i.e. the most relevant market in terms of liquidity or market of first listing as applicable). In case of Securities which are dual-listed, with one listing within the EEA and one listing outside of the EEA, the relevant market will be the EEA market. Where Securities are dual-listed within the EEA, the relevant market will be the most liquid of the two primary markets. In case the price of a Security is not available from the relevant primary trading venue, trading on that Security will be halted on SIGMA X Europe Non-Displayed Book.

The PBBO formed on the basis of prices displayed by the selected venues may be affected by latency insofar as there is a time delay between the price displayed by the venue at a particular time, and the receipt of the Operator of the relevant price information.

The crossing of Orders will take place at the midpoint of the PBBO. The midpoint of the PBBO is calculated by adding the Primary Best Bid and the Primary Best Offer and dividing by two. The midpoint will be rounded down to the number of decimal places (d.p.) which can be found in the List of Tradeable Securities on the Website. All executions will occur at this reference price.

B. Order priority for Execution

Orders are prioritised for quantity allocation on the basis of quantity and time. When Orders are submitted to SIGMA X Europe Non-Displayed Book, Orders with a larger quantity will be prioritised for quantity allocation ahead of other competing Orders. In the event that competing Orders have an equal quantity, the Order with the earliest assigned timestamp will be given priority. Once the executable quantity of an Order has been allocated for execution, trade generation commences, subject to the internalisation service or self-cross prevention service, if applicable (see below).

In addition, Participants may elect in the application form to make use of SIGMA X Europe MTF's internalisation service or self-cross prevention service. It is not possible for a Participant to use both services.

Once quantity allocation has been processed (on the basis of quantity and time prioritisation), if a participant has elected to make use of SIGMA X Europe MTF internalisation service, trade generation will take place between their own Orders instead of matching against Orders from other Participants, resulting in "**Internalised Trades**". Internalised Trades will not be submitted to the Central Counterparty for clearing and settlement but rather will be netted internally by the relevant Participant.

The self-cross prevention service allows Participants to prevent two Orders from the same Participant code from matching against themselves.

An explicit modification to the quantity of an Order may result in the loss of priority for such Order in accordance with the Order prioritisation sequencing in the Rules. However, an implicit

modification to the quantity of an Order due to an initial partial execution will not result in the loss of priority.

C. Order Types

The only Order type available is a **Peg Mid** Order to buy or sell at the midpoint of the PBBO, with or without a limit price (see Section V.G (*Rules to encourage quality liquidity and anti-gaming*) below).

D. Order Attributes

- i. **Day**: An Order to buy or sell a Security that is only valid for the current trading day. All Day Orders on SIGMA X Europe Non-Displayed Book, or the residual thereof, will be automatically cancelled when the Primary Market for the relevant Security ceases continuous trading at the end of the day.
- ii. **Immediate or Cancel (“IOC”)**: An Order to execute the maximum possible Order portion immediately and cancel any residual portion.
- iii. **Fill or Kill (“FOK”)**: An Order which must be executed as a complete Order as soon as it is submitted to SIGMA X Europe Non-Displayed Book, failing which the Order will be cancelled.

E. Tick Size

Where orders are submitted to the SIGMA X Europe Non-Displayed Book with limits, those limits must be compliant with the maximum number of decimal places (d.p.) for all stocks which can be found in the List of Tradeable Securities on the Website.

F. Pre-trade Market Data

The SIGMA X Europe Non-Displayed Book does not distribute pre-trade market data.

The Operator will reject all IOC and FOK Orders that it receives if it does not have sufficient inbound reference market data in respect of that stock. In respect of Day Orders, where the Operator does not have sufficient inbound reference market data for the relevant stock, all Day Orders will be entered into SIGMA X Europe Non-Displayed Book’s trading book, however, crossing will be suspended until the relevant market data is received.

G. Large in Scale (“LIS”)

Upon order entry, the Operator will assign a flag to mark the order as LIS with the flag “LRGS” if applicable, or otherwise with the Reference Price Waiver flag “RFPT”. The LRGS flag will be assigned if the quantity of the incoming order is greater than the minimum LIS threshold for the relevant instrument, as specified within Annex II of Commission Delegated Regulation 2017/587 supplementing MiFIR. If the incoming quantity does not satisfy this requirement it will be flagged as “RFPT”.

If the quantity of an order is amended below the LIS threshold, the LRGS flag will be removed, even if the order has been partially filled under the LRGS flag, and the RFPT flag assigned.

If the quantity of the order is amended above the LIS threshold, the RFPT flag will be removed, even if the order has been partially filled under the RFPT flag, and the LRGS flag assigned.

The Operator will make public the LRGS and RFPT flags in post-trade reporting (see V. Market Guide – General, section D. Post-trade Market Data).

H. Rules to encourage quality liquidity and anti-gaming

In order to provide high quality liquidity that is representative of genuine investment interest, Participants will be required to comply with the following anti-gaming provisions:

- i. **Limit Price on a Pegged Order:** Participants can choose to specify the highest price at which the Participant is willing to bid (if buying), or the lowest offer the Participant is willing to accept (if selling), referred to as the “Limit”. If the PBBO mid-point reference price moves above (or below) the specified Limit, the Order will become inactive. The Order will become active again when the PBBO mid-point reference price moves back within the Limit set by the Participant.
- ii. **Minimum Acceptable Quantity (“MAQ”):** A Participant may wish to specify a minimum quantity for an Order. If a Participant enters an Order on SIGMA X Europe Non-Displayed Book with a MAQ specified, that MAQ will be persistent during the whole life of the Order. A MAQ will only execute if opposing Orders, in aggregate, meet the MAQ specified by the Participant. By way of example, where Participant A specifies a minimum quantity of 100 with respect to an Order to buy 500 shares, in the event that Participant B sends an IOC to sell at the same price for 50 shares, Participant A’s Order would not cross with Participant B’s Order because Participant B’s Order of 50 shares is less than Participant A’s minimum quantity of 100. When a MAQ Order is partially filled, if the remaining quantity is lower than the initial MAQ, the MAQ will be reset to the remaining Order quantity. For example, if the MAQ is set at 200 shares and the Order submitted in the system is for 900 shares, the Order may achieve partial execution against another Order for 800 shares, at which point the MAQ will be reset at 100 shares.

I. Volume Cap Controls

The Operator is required to put in place controls to ensure trading in a particular Security does not exceed the permitted percentage of trading allowed under Art 5(1) MiFIR, which is as follows:

- i. trading in a Security carried out under the reference price waiver in the SIGMA X Europe Non-Displayed Book shall be limited to 4 % of the total volume of trading in that Security on all trading venues across the European Union over the previous 12 months.
- ii. overall European Union trading in a Security carried out under reference price waiver shall be limited to 8 % of the total volume of trading in that Security on all trading venues across the European Union over the previous 12 months.

Within five (5) working days of the end of each calendar month, the total volumes relevant to the limits set out above in each Security will be published by European Securities and Markets Authority. Where the limits have been exceeded for that Security, the national competent authorities will suspend the use of the reference price waiver within two working days for a period of six months. At the same time, trading in that particular Security on the SIGMA X Europe Non-Displayed Book under the reference price waiver will be suspended for a period of six months. The Operator will continue to accept orders in the SIGMA X Europe Non-Displayed Book if the order quantity satisfies the minimum LIS threshold for the relevant instrument within Annex II of Commission Delegated Regulation 2017/587 supplementing MiFIR as LIS trades are not subject to the Volume Cap controls.

The Operator shall notify the Participants of such suspension in reasonable time. For the avoidance of doubt, trading that Security on the SIGMA X Europe Auction Book will still be permitted.



Details of the list of suspended instruments can be found in the List of Tradeable Securities on the Website.

A. General Description

The SIGMA X Europe Auction Book is an order book where periodic Auctions are triggered by opposing Orders eligible for matching. Orders are validated at point of entry and monitored in real-time to identify where there are opposing orders present in the SIGMA X Europe Auction Book (“**Potential Match**”) within the Dynamic Price Band. Once identified, those Orders which create the Potential Match are used to calculate the Indicative Matching Price (“**IMP**”) and the initial Indicative Matching Volume (“**IMV**”). Subject to a Price Stabilisation anti-gaming process, the IMP will then be fixed and used for the Auction Uncross. At this point the IMP and IMV are published and the Auction call phase is then triggered. Participants can submit new Orders prior to the Auction call phase contributing to IMP and IMV or during the Auction call phase contributing to IMV only. Any updates to the IMV are published real-time. New Orders, amendments and cancelations are contingent on different rules depending on the Auction phase when they are entered. The length of the Auction call phase is randomised and once it has ended, the Auction Uncross starts, subject to a further Price Stabilisation check.

B. Dynamic Price Band formation

The “**Dynamic Price Band**” will be the PBBO of the relevant eligible Security. It will be calculated using market data feeds from the primary market of the relevant eligible Security, where available.

The Dynamic Price Band will determine whether Orders are eligible for the IMP calculation process as well as the Price Stabilisation anti-gaming measures.

C. Price Stabilisation

There are two Price Stabilisation checks that are run for each Auction. The first runs before the Auction call phase (the “**Pre-Auction Price Stabilisation Check**”); the second runs at the end of the Auction call phase and before the Uncross (the “**Post-Auction Price Stabilisation Check**”).

The Pre-Auction Price Stabilisation Check is a minimum time period where the Dynamic Price Band must remain constant. The time period looks back from the Potential Match, as well as forward. If there is no change in the Dynamic Price Band in that time, the Auction call phase is triggered. If the Dynamic Price Band moves, however, the matching process restarts. Should the IMP change during the Pre-Auction Price Stabilisation Check (due to new Orders or amendments being submitted), the Pre-Auction Price Stabilisation Check is restarted. New Orders or amendments that impact the IMV only will not restart the Pre-Auction Price Stabilisation Check.

The Post-Auction Price Stabilisation Check is to ensure that the IMP remains within the Dynamic Price Band at the end of the Auction. If this is the case, the Auction Uncross commences. If the IMP no longer falls within the Dynamic Price Band, the Auction is cancelled.

D. IMP Determination

The IMP determination process is triggered by a Potential Match and looks to maximize crossing

opportunities and offer price improvement to both buyers and sellers. A Potential Match can occur through new Order entry, Order amendment, trading halt or Dynamic Price Band movements. Accordingly, all Orders submitted to the SIGMA X Europe Auction Book, which are within the Dynamic Price Band, are monitored real-time. Orders that are too passive will not be considered; Orders cannot, however, be too aggressive, as, in the absence of any peg, an aggressive peg is automatically applied. The matching logic prioritises Orders on the basis of price (or notional price, see example in Section VII.F (Order Types)) (price and notional price together, “**Price**”), size and time, whilst taking into account minimum acceptable quantity limits (“**MAQ**”). The IMP is calculated as the midpoint price between the most passive bid Price and offer Price of the Orders that form the Potential Match. The IMP has a maximum number of decimal places (d.p.) for all stocks which can be found in the List of Tradeable Securities on the Website and will be rounded down where required.

Should new Orders or amendments be submitted during Pre-Auction Price Stabilisation Check, the matching logic will be re-run and a new IMP is determined, if necessary. At the point where the Auction call phase is triggered, the IMP is fixed for that Auction and will not change unless the auction is canceled; at that stage, new Orders or permitted amendments will only impact on the IMV.

E. Order priority for Execution

Those Orders received prior to the Auction call phase are prioritised on the basis of Price, size and time. Those Orders received during the Auction call phase are prioritised on the basis of time only. Orders can be submitted with a MAQ.

Participants may elect in the application form to make use of SIGMA X Europe MTF’s internalisation service or self-cross prevention service. It is not possible for a Participant to use the internalisation service at the same time as self-cross prevention.

Once IMV is allocated at Auction Uncross, if a participant has elected to make use of SIGMA X Europe MTF internalisation service, trade generation will take place between their own Orders instead of matching against Orders from other Participants, resulting in “Internalised Trades”. Internalised Trades will not be submitted to the Central Counterparty for clearing and settlement but rather will be netted internally by the relevant Participant.

The self-cross prevention service allows Participants to prevent two Orders from the same Participant code from matching against themselves.

An explicit amendment to an Order, where permitted, will result in a new timestamp and accordingly, may result in the loss of priority for such Order in accordance with the Order prioritisation sequencing in the Rules. However, an implicit modification to the quantity of an Order due to an initial partial execution will not result in the loss of priority.

F. Order Types

The Operator allows Orders to peg to the Dynamic Price Band as per the following, which determines the price of each Order for the purposes of the pricing algorithm (see Section VII.D - IMP Determination above):

- i. **Peg Bid:** An Order to buy or sell at a price (or better) which tracks the Best Bid, with or without limit (for further details on the limit, see section J below);
- ii. **Peg to Mid Point – Aggressive Whole Tick:** An Order to buy or sell at a price (or better) which tracks the midpoint of the Dynamic Price Band provided that midpoint rests at one whole tick. If the midpoint falls off-tick, buy orders will be rounded up to the next whole tick and sell orders will be rounded down to the next whole tick. All orders may be submitted with or without limit.

For example, assuming the PBBO is 10-13 with a tick of 1 the theoretical mid = 11.5 which is off-tick. A buy order will therefore be priced at 12 and a sell order will be priced at 11.

Following on with examples for IMP determination:

- A buy @ mid order priced at 12 interacts with a sell @ mid order priced at 11. If no other orders are present, the IMP will be determined as $IMP = 11.5$.
 - A buy @ mid order priced at 12 interacts with a sell Limit order priced at 12. If no other orders are present, the IMP will be determined as $IMP = 12$.
- iii. **Peg Ask:** An Order to buy or sell at a price (or better) which tracks the Best Offer, with or without limit; or
- iv. **Limit Order:** Where a Limit Order is submitted, an aggressive Peg is automatically applied to ensure it stays within the Dynamic Price Band.

For example, assuming the PBBO is 11-12:

- A buy limit Order @13 will have a notional price of 12 (as the most aggressive buy that falls within the Dynamic Price Band).
- A buy limit Order @12 will have a notional price of 12. If Dynamic Price Band changes to 10-11, the notional price will automatically be updated to 11 (as the most aggressive buy that falls within the Dynamic Price Band).
- A buy limit Order @11 will have a notional price of 11. If Dynamic Price Band changes to 12-13, the notional price remains 11, as here the Order is passive.

G. Order Attributes

- i. **Good for Day (“GFD”):** An Order to buy or sell a Security that is only valid for the current trading day. All GFD Orders on SIGMA X Europe Auction Book, or the residual thereof, will be automatically cancelled when the Primary Market for the relevant stock ceases continuous trading at the end of the day. Until then, the unfilled volume from those Orders will rest on the SIGMA X Europe Auction Book unless otherwise cancelled.
- ii. **Good for Auction (“GFA”):** An Order to buy or sell a Security that is only valid for a specific Auction. All GFA Orders on SIGMA X Europe Auction Book, or the residual thereof, will be automatically cancelled when that Auction uncrosses or is cancelled.

H. Tick Sizes

Where Orders are submitted to SIGMA X Europe Auction Book with limits, those limits must be at a full tick. The tick sizes are sourced in compliance with the MiFID tick size regime. Where an Order with an invalid tick is received, it will be rejected.

I. Pre-trade Market Data

Pre-trade market data will be disseminated via the SIGMA X Ap Market Datafeed. Participants can subscribe to this directly or obtain it from external vendors who have the relevant subscriptions. Where Participants subscribe directly, such data will be provided on a reasonable commercial basis. Further details are available on the Website.

SIGMA X Europe Auction Book pre-trade market data makes public the IMP and IMV that satisfies the Auction algorithm as described in Sections VII.D and VII.E.

Details of the message specifications can be found in the Market Data Specifications document on the SIGMA X Europe MTF Website.

J. Rules to encourage quality liquidity and anti-gaming

In order to provide high quality liquidity that is representative of genuine investment interest, SIGMA X Europe Auction Book has the following functionalities:

- i. **Price Stabilisation checks:** for more detail on the checks, see Section VII.C above.
- ii. **Limit Price on a Pegged Order:** Participants can choose to specify the highest price at which the Participant is willing to bid (if buying), or the lowest offer the Participant is willing to accept (if selling), referred to as the **Limit**. If the Dynamic Price Band moves above (or below) the specified Limit, the Order will become inactive. The Order will become active again when the Dynamic Price Band moves back within the Limit set by the Participant. As with Limit Orders, where the Limit Price on a Pegged Order is too aggressive, a notional price (the most aggressive within the Dynamic Price Band) is used.
- ii. **Minimum Acceptable Quantity:** A Participant may wish to specify a minimum quantity for an Order. If a Participant enters an Order on the SIGMA X Europe Auction Book with a MAQ specified, that MAQ will be persistent during the whole life of the Order (i.e. during the matching process, the IMP determination process and the Auction itself). A MAQ will only execute if opposing Orders, in aggregate, meet the MAQ specified by the Participant. By way of example, where Participant A specifies a minimum quantity of 100 with respect to an Order to buy 500 shares, in the event that Participant B sends an Order to sell at the same Price for 50 shares, Participant A's Order would not cross with Participant B's Order because Participant B's Order of 50 shares is less than Participant A's minimum quantity of 100. When a MAQ Order is partially filled, if the remaining quantity is lower than the initial MAQ, the MAQ will be reset to the remaining Order quantity. For example, if the MAQ is set at 200 shares and the Order submitted in the system is for 900 shares, the Order may achieve partial execution against another Order for 800 shares, at which point the MAQ will be reset at 100 shares.
- iii. **Cancellations/amendments of Orders:**

Prior to the Auction call phase, Orders can be cancelled and/or amended.

During the Auction call phase, Order cancellation messages will be rejected and only certain specified amendments can be made. These permitted amendments are:

- to increase the volume; and /or
- to make the Price more aggressive.

Note that amendments will result in a new timestamp for the Order.

VIII. SIGMA X Europe MTF Contact Details

For enquiries or further information on SIGMA X Europe MTF, please refer to the Website or direct your enquiry to the SIGMA X Europe MTF Support Team, whose contact details are available on the Website.

Goldman Sachs Paris Inc et Cie acts as the Operator of SIGMA X Europe MTF. It is not and will not be a Participant of SIGMA X Europe MTF. However, its Affiliates may be Participants of SIGMA X Europe MTF, subject to satisfying the eligibility criteria and other rules set out in these Rules. Goldman Sachs Paris Inc et Cie has put in place internal procedures in order to manage appropriately any resulting conflicts of interest.

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